

JOB PERFORMANCE MEASURE

Job Position SRO / RO	No. JP-OP-315-0110-407	Revision 1
JPM Title Conduct Control Rod Drive Coupling Integrity Test with Coupling Failure	Duration 15 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: SIM

Evaluator: _____

JPM Type:	Normal / Alternate Path / Time Critical	Start Time _____
Evaluation Method:	Perform / Walkthrough / Discuss	Stop Time _____
Location:	Plant / Simulator / Classroom	Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
* 1.				*11.							
* 2.				12.							
3.				13.							
4.				*14.							
5.				15.							
6.											
7.											
* 8.											
* 9.											
*10.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ **PASS** _____ **FAIL**

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Conduct Control Rod Drive Coupling Integrity Test with Coupling Failure	No.: JP-OP-315-0110-407 Revision: 1 Page 2
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JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware of control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Conduct Control Rod Drive Coupling Integrity Test with Coupling Failure	No.: JP-OP-315-0110-407 Revision: 1 Page 3
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JPM Information

System:

C1102 – Control Drive and Drive Mechanism

Task:

74311 - Perform actions for Control Rod re-coupling not successful OR Control Rod cannot be verified coupled

References: Required (R) / Available (A)

AOP 20.106.02 (R)
SOP 23.623 (R)
ARPs 3D76 & 3D80 (A)

Tools and Equipment Required:

Marked up 23.623, Attachment 2

Initial Conditions:

- A plant startup is in progress.
- Reactor power level is ~55%.
- You are the P603 operator.

Initiating Cue(s):

The CRS directs you to continue the reactor startup with rods on Post-LPSP Control Rod Pull Sheet A-9/4, from control rod 22-39. I will act as your Verifier.

Terminating Cue(s):

Control Rod 22-39 is disarmed in accordance with 20.106.02.

Task Standard:

CRD Coupling Integrity Test is performed in accordance with 23.623. Control Rod 22-39 is disarmed in accordance with 20.106.02.

Licensed Operator Exam Information (required for NRC exams)

Safety Function/Category:

1 – Reactivity Control
11 – Abnormal Plant Evolutions

K/A Reference:

K/A SYSTEM: 201003 - Control Rod and Drive Mechanism

K/A STATEMENT:

A2 Ability to (a) predict the impacts of the following on the CONTROL ROD AND DRIVE MECHANISM; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)
A2.02 Uncoupled rod 3.7 / 3.8

Maintenance Rule Safety Classification:

B1100-07

Maintenance Rule Risk Significant? (Yes or No)

No

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JPM Title Conduct Control Rod Drive Coupling Integrity Test with Coupling Failure	No.: JP-OP-315-0110-407 Revision: 1 Page 4
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PERFORMANCE EVALUATION

Start Time _____

ELEMENT	STANDARD
CUE: Provide examinee with Cue Sheet, Rod Pull Sheet, and marked up 23.623, Attachment 2.	
NOTE: Rod can be continuously withdrawn using Override vs. notching out.	
* 1. Turn on Rod Select Power.	* 1. Informs CRS, then turns on Rod Select Power.
* 2. Begin withdrawing Control Rod 22-39 from Position 24 to 48 by notching rod, or continuously withdrawing iaw 23.623.	* 2. Rod Movement Control taken to OUT NOTCH. When the settle function is complete, this step is repeated until the rod is at Position 48. OR Rod Out Notch Override taken to OVERRD and Rod Movement Control taken to OUT NOTCH.
NOTE: When rod 22-39 reaches Position 48, the Four-Rod Display indicates blank, annunciators 3D76 and 3D80 alarm, and the rod's DRIFT light indicates on the Full Core Display.	
Alternate Path Begins Here	
3. Respond to 3D76 Rod Overtravel alarm. Inform CRS of rod overtravel past Position 48.	3. CRS is informed of 3D76 Rod Overtravel alarm.
4. [IR 1.] Verify Control Rod overtravel at 4-Rod Display by checking that no position number is indicated in window and Full Out light on the Full Core Display is out.	4. 4-Rod Display and Full Core Display is checked for selected rod.
5. [IR 2.] Verify 3D80, CONTROL ROD DRIFT, is received.	5. 3D80, CONTROL ROD DRIFT, is verified to be in alarm.
CUE: The CRS will direct the performance of AOP 20.106.02, Condition C.	
6. [IR 3.] Recommend CRS enters 20.106.02.	6. Recommends entering 20.106.02.
CUE: If asked, the CRS will contact the SNE to evaluate the rod pattern.	
7. [C.1] Direct the Station Nuclear Engineer to evaluate the effect on Control Rod Pattern.	7. Station Nuclear Engineer contacted.
NOTE: Change in NI should be observed between notches 40-44 .	
* 8. [C.2.a] Insert CRD in notch mode until nuclear instrumentation indicates Control Rod is being inserted.	* 8. Uncoupled rod is inserted one notch at a time until nuclear instrumentation indicates Control Rod is being inserted.
NOTE: The operator MAY elect to reset the rod drift per 3D80 SA 2. At some point after the overtravel condition is resolved; however this is not a critical task.	
CUE: The SM and SNE give permission to withdraw control rod.	
* 9. [C.2.b] Obtain permission from the SM and SNE to withdraw Control Rod.	* 9. Requests permission from the SM and SNE to withdraw Control Rod.

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ELEMENT	STANDARD
*10. [C.2.c] Fully withdraw Control Rod in notch mode while observing nuclear instrumentation response.	*10. Rod Movement Control taken to OUT NOTCH. When the settle function is complete, this step is repeated until the rod is at Position 48.
NOTE: The following steps are directed by 20.106.02, step C.2.d, and performed per 23.623.	
*11. [6.1.2.2.a] Attempt to withdraw Control Rod from Position 48 by notching rod.	*11. Rod Movement Control taken to OUT NOTCH.
12. [6.1.2.2.b] Verify Control Rod is coupled as follows: 1) Rod settling back to Position 48. 2) Annunciator 3D76, CONTROL ROD OVERTRAVEL, does not alarm.	12. Identifies rod does not settle back to Position 48 and 3D76 alarms. The selected control rod is NOT coupled.
CUE: The CRS acknowledges the report, then directs the performance of AOP 20.106.02, Conditions E	
13. Inform CRS that control rod 22-39 re-coupling is not successful.	13. CRS is informed that control rod 22-39 re-coupling is not successful.
*14. [E.1] Fully insert Control Rod.	*14. Control Rod 22-39 is fully inserted.
CUE: Notify Examinee that time compression may be used for activities performed outside of the Control Room. Report that amphenols are disconnected, or C11-F103 and C11-F105 are closed, whichever has been directed.	
15. [E.2] Disarm affected HCU by one of the following methods: - Disconnect amphenols to directional control valves. OR - Close C11-F103, then C11-F105	15. NO directed to disarm HCU 22-39 by one of the following methods: - Disconnect amphenols to directional control valves. OR - Close C11-F103, then C11-F105
CUE: End the JPM when Control Rod 22-39 is disarmed in accordance with 20.106.02.	

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

* Critical Steps

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Evaluator Notes:

Provide the examinee the pull sheets for the next control rod to be withdrawn to position 48 (LPSP Pull Sheet A-9/4, marked with rods pulling from 24 to 48) and 23.623 Attachment 2 marked up with current rod pattern.

This JPM can be performed at low power (startup) or at higher power (control rod pattern adjustment). If this JPM is being performed at low power, provide normal pull sheets; if being performed at high power provide rod pattern adjustment sheets.

The examiner will act as the SNE to verify the correct control rod is selected for movement.

The trainee may jump directly to 20.106.02 vs. reviewing ARP 3D76 or 3D80.

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

Generic Notes and Cues:

None

System Specific Notes and Cues:

None

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

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FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title
Conduct Control Rod Drive Coupling Integrity Test with
Coupling Failure

No.: JP-OP-315-0110-407
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Simulator Setup

IC#:

IC-15

Malfunctions:

Number	Title	Value	Delay	Ramp
C11MF0395	CONTROL ROD 22-39 UNCOUPLED	ACTIVE	0	0

Remote Functions:

Number	Title	Value	Delay	Ramp
C11RF0398	Re-Initialize NUMAC RWM	RESET	0	0

Override Functions:

Number	Title	Value	Delay	Ramp
None				

Special Instructions:

1. Initialize the simulator to IC-15 (or the selected IC), and place the simulator in RUN.
3. Open and Execute Lesson JP0110-407.Isn, or set the malfunctions as indicated above.

Cue Sheet: (JP-OP-315-0110-407)

Initial Conditions:

- A plant startup is in progress.
- Reactor power level is ~55%.
- You are the P603 operator.
- All reactivity briefs have been concluded.

Initiating Cue(s):

The CRS directs you to continue the reactor startup with rods on Post-LPSP Control Rod Pull Sheet A 9/4, from control rod 22-39. I will act as your Verifier.

Cue Sheet: (JP-OP-315-0110-407)

Initial Conditions:

- A plant startup is in progress.
- Reactor power level is ~55%.
- You are the P603 operator.
- All reactivity briefs have been concluded.

Initiating Cue(s):

The CRS directs you to continue the reactor startup with rods on Post-LPSP Control Rod Pull Sheet A 9/4, from control rod 22-39. I will act as your Verifier.

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

Instructions: Use this sheet to record Technical Specification verifications for those control rods pulled to Position 48 for a second time which may occur during low power maneuvering. Enter the rod number and a check to indicate satisfactory performance. If performance is unsatisfactory, enter NO and take corrective action as prescribed in Tech Specs.

[illegible]

- (1) IF NO, SEE TECHNICAL SPECIFICATION 3.1.3 and 3.9.4.
- (2) IF NO, SEE TECHNICAL SPECIFICATION 3.1.3.

FOR TRAINING USE ONLY

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

FULL OUT/COUPLING VERIFICATION

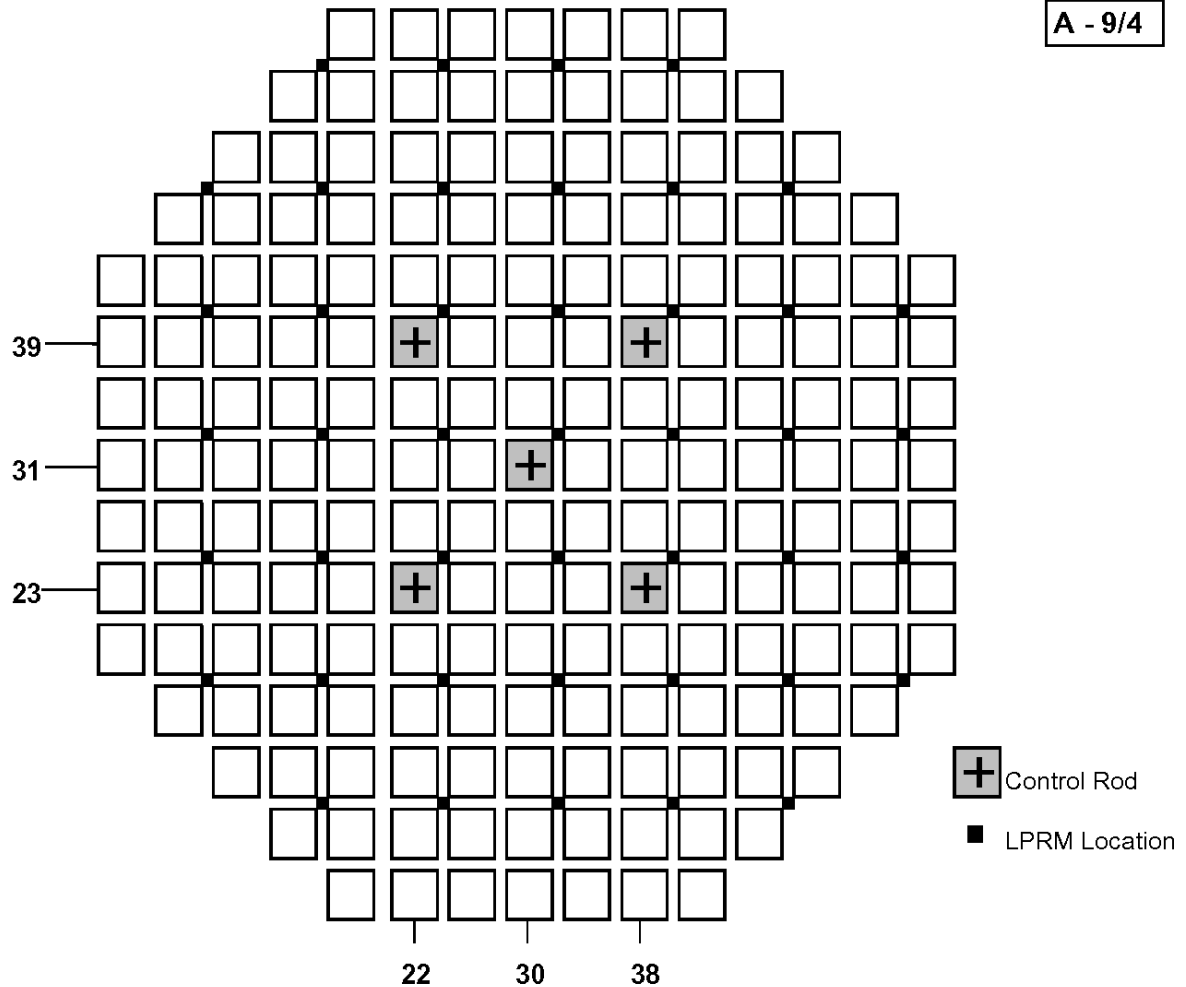
Instructions: Use this sheet to record Technical Specification verifications for those control rods pulled to Position 48 in accordance with Section 6.1, CRD Coupling Integrity Test. Enter the date and initial to indicate satisfactory performance. If performance is unsatisfactory, enter NO and take corrective action as prescribed in Tech Specs.

59					<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>				
55				<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>		
51			<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	
47		<i>TB</i>	<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>	<i>TB</i>	
43	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>
39	<i>TB</i>	<i>TB</i>	<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>	<i>TB</i>	<i>TB</i>
35	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>
31	<i>TB</i>	<i>TB</i>	<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>	<i>TB</i>	<i>TB</i>
27	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>
23	<i>TB</i>	<i>TB</i>	<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>	<i>TB</i>	<i>TB</i>
19	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>
15		<i>TB</i>	<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>		<i>TB</i>	<i>TB</i>	
11			<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>		
7				<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>			
3					<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>	<i>TB</i>				
	2	6	10	14	18	22	26	30	34	38	42	46	50	54	58

Send completed form to 290 OBA for retention

FOR TRAINING USE ONLY

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**



ROD	FROM	TO	P603 Initials	Verifier Initials	Notes
22-39	24	48			
38-23	24	48			
38-39	24	48			
22-23	24	48			
30-31	24	48			

Prepared: SNE 1 / Today
SNE Initials/Date

Reviewed: SNE 2 / Today
SNE Initials/Date

Approved: OPS / Today
OPS Initials/Date

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

**Plant Technical Procedure - Fermi 2
Abnormal Operating Procedure**

Reference Use

**20.106.02
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UNCOUPLED/DROPPED CONTROL ROD (FROM REACTOR CORE)

Revision Summary

- 1) Added Note 3 per CARD 17-25703.

Attachments - None

Enclosures - None

<i>Information and Procedures</i>							
DTC TPNPP	DSN 20.106.02	Revision 15	Date Issued 09/08/2017	DCR # 17-1294	File # 1703.02	IP Code: I	Recipient

FOR TRAINING USE ONLY

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Page 2

CAUTIONS - None

NOTES

1. To obtain mCi/sec use the **“Off Gas Log Radiation Monitors Conversion Factors” sheet** (posted on the rear of the H11-P601). This correlates actual reading to Technical Specifications limit of ≤ 340 mCi/sec (Section 3.7.5).
2. If bypassing RWM is necessary, then compliance with Technical Specifications, Section 3.3.2.1, Control Rod Block Instrumentation, will be required.
3. When performing the following step, the Rod Movement Control Switch may be required **to be held in the “TN” position longer than normal to achieve position 46.**

COMPONENT DESCRIPTIONS

D11-R601, Off Gas Log Scale PRMS Recorder (Rear of H11-P601)

IMMEDIATE ACTIONS

CONDITION	ACTION
NONE	

SUBSEQUENT ACTIONS

CONDITION	ACTION
	----- NOTE 1 -----
A. Control Rod dropped out of core. <input type="checkbox"/>	<input type="checkbox"/> A.1 Check Off-Gas radiation monitors (~10 min delay time). <input type="checkbox"/> A.2 Verify core thermal limits (SNE or STA). <input type="checkbox"/> A.3 Direct Chemistry to sample Reactor Water and Off-Gas.
B. High Off-Gas radiation detected. <input type="checkbox"/>	<input type="checkbox"/> B.1 PERFORM 20.000.07, Fuel Cladding Failure.
C. Control Rod uncoupled. <input type="checkbox"/>	<input type="checkbox"/> C.1 Declare Control Rod inoperable. <input type="checkbox"/> C.2 Direct SNE to evaluate effect on Control Rod Pattern ----- NOTE 2 ----- ----- NOTE 3 ----- <input type="checkbox"/> C.3 Attempt to re-couple rod: <div style="margin-left: 40px;"> <input type="checkbox"/> a. Insert Control Rod in notch mode until nuclear instrumentation indicates Control Rod is inserting. <input type="checkbox"/> b. Obtain permission from SM and SNE to withdraw Control Rod. </div>

(continued)

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CAUTIONS

1. C11-F103, Drive Water Riser Isolation Valve, must be closed before C11-F105, Exhaust Water Riser Isolation Valve, is closed to prevent damage.

NOTES

2. If bypassing RWM is necessary, then compliance with Technical Specifications, Section 3.3.2.1, Control Rod Block Instrumentation, will be required.

COMPONENT DESCRIPTIONS

C11-F103, Drive Water Riser Isolation Valve (At HCU)
C11-F105, Exhaust Water Riser Isolation Valve (At HCU)

SUBSEQUENT ACTIONS

CONDITION	ACTION
C. (continued) <input type="checkbox"/>	<input type="checkbox"/> C.3 (continued) <ul style="list-style-type: none"> <input type="checkbox"/> c. Fully withdraw Control Rod in notch mode while observing nuclear instrumentation response. <input type="checkbox"/> d. Perform a coupling check (23.623).
D. Control Rod verified re-coupled. <input type="checkbox"/>	<input type="checkbox"/> D.1 Position Control Rod as directed by SNE.
E. Control Rod re-coupling not successful. <input type="checkbox"/> OR Control Rod cannot be verified coupled.	<div style="text-align: center;">----- NOTE 2 -----</div> <input type="checkbox"/> E.1 Fully insert Control Rod. <div style="text-align: center;">----- CAUTION 1 -----</div> <input type="checkbox"/> E.2 Disarm affected HCU by one of the following methods: <ul style="list-style-type: none"> <input type="checkbox"/> Disconnect amphenols to directional control valves. <div style="text-align: center;">OR</div> <ul style="list-style-type: none"> <input type="checkbox"/> a. Close C11-F103. <input type="checkbox"/> b. Close C11-F105.

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SYMPTOMS

- 3D76, CONTROL ROD OVERTRAVEL
- 3D80, CONTROL ROD DRIFT
- Loss of position indication (past position 48) when rod is fully withdrawn
- Unexplained change in Reactor Power

TECHNICAL SPECIFICATIONS

- Section 3.1.3, Control Rod Operability
- Section 3.1.6, Rod Pattern Control
- Section 3.3.2.1, Control Rod Block Instrumentation
- Section 3.9.5, Control Rod Operability--Refueling
- Section 3.10.7, Shutdown Margin (SDM) Test--Refueling

END

JOB PERFORMANCE MEASURE

Job Position RO	No. JP-OP-315-0118-002	Revision 1
JPM Title Startup SBFW System after RFP Trip - Alt Path	Duration 5 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: SIM

Evaluator: _____

JPM Type: Normal / **Alternate Path** / Time Critical Start Time _____
 Evaluation Method: **Perform** / Walkthrough / Discuss Stop Time _____
 Location: Plant / **Simulator** / Classroom Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
1.											
2.											
* 3.											
* 4.											
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6.											
* 7.											
8.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ **PASS** _____ **FAIL**

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Startup SBFW System after RFP Trip - Alt Path	No.: JP-OP-315-0118-002 Revision: 1 Page 2
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JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Startup SBFW System after RFP Trip - Alt Path	No.: JP-OP-315-0118-002 Revision: 1 Page 3
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JPM Information

System:

N2103 – Standby Feedwater System

Task:

23.107.01.003 - Start the SBFW system in the normal mode

References: Required (R) / Available (A)

23.107.01, Standby Feedwater (R)

Tools and Equipment Required:

None

Initial Conditions:

- You are the Control Room LNO.
- N RFPT has just tripped
- AOP 20.107.01, "Loss of Feedwater or Feedwater Control" has been entered.

Initiating Cue(s):

The CRS directs you to inject to the RPV with Standby Feedwater at 1200 gpm

Terminating Cue(s):

SBFW is injecting to the vessel at ~850 gpm.

Task Standard:

SBFW is injecting to the vessel per AOP 20.107.01

Licensed Operator Exam Information (Required for NRC Exams Only)

Safety Function:

2 – Reactor Water Inventory Control

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 259001 – Reactor Feedwater System

K/A STATEMENT:

A4 Ability to Manually Operate/Control in the Control Room

A4.02 Manually start/control a RFP/TDRFP 3.9 / 3.7

Maintenance Rule Safety Classification:

N2103-01

Maintenance Rule Risk Significant? (Yes or No)

Yes

JOB PERFORMANCE MEASURE

JPM Title Startup SBFW System after RFP Trip - Alt Path	No.: JP-OP-315-0118-002 Revision: 1 Page 4
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PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
CUE: When examinee has determined the correct procedure and section to use, provide him a copy of 23.107.01, section 6.0 for him to mark up.			
NOTE: JPM is based on, SBFW initiation using Enclosure A, SBFW Manual Operation. If examinee selects 23.107.01, Enclosure A hard card at H11P601, provide a copy of the hard card to mark up. Enclosure A step numbers are in parentheses. Steps 2 and 4 may be delayed until candidate makes the determination that the desired flow cannot be obtained with one pump.			
1.	[6.1.2.1] (1.1) Start N2103-C003A, West Pump A Aux Lube Oil Pump, if available.	1.	Starts N2103-C003A, West Pump A Aux Lube Oil Pump.
2.	[6.1.2.1] (1.2) Start N2103-C003B, East Pump B Aux Lube Oil Pump.	2.	Starts N2103-C003B, East Pump B Aux Lube Oil Pump.
* 3.	[6.1.2.3] (1.3) Start N2103-C001, West Standby Feedwater Pump A.	* 3.	Starts N2103-C001, West Standby Feedwater Pump A.
* 4.	[6.1.2.3] (1.4) Start N2103-C002, East Standby Feedwater Pump B.	* 4.	Starts N2103-C002, East Standby Feedwater Pump B.
5.	[6.1.2.4.1] (1.5) Verify N2103-F001, SBFW Disch To RPV Iso Valve, automatically opens (first pump).	5.	Verifies N2103-F001, SBFW Disch To RPV Iso Valve, automatically opens (first pump).
Alternate Path Begins Here			
NOTE: N2103-F002 breaker trips when the attempt is made to open the valve.			
6.	[6.1.2.5] (1.6) Throttle open N2103-F002, SBFW 6" Disch Flow Ctrl Vlv, to achieve desired flow.	6.	Depresses N2103-F002 OPEN pushbutton and notes that valve position indication is lost. Reports to the CRS that position indication lost on N2103-F002. May recommend using N2103-F003 to inject water to RPV.
CUE: Acknowledge Report. If necessary, ask candidate for recommended action. If as a recommendation is made, direct examinee to perform recommended actions.			
* 7.	[6.1.2.5] Throttle open N2103-F003, SBFW 4" Disch Flow Ctrl Vlv.	* 7.	Fully open N2103-F003, SBFW 4" Disch Flow Ctrl Vlv.
8.	Report to CRS that N2103-F003 is full open and flow is about 850 gpm.	8.	Informs CRS that SBFW is injecting to RPV at ~850 gpm.
CUE: Acknowledge Report.			
CUE: Terminate JPM when SBFW is injecting with the N2103-F003 full open (~850 gpm).			

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

* Critical Step

JOB PERFORMANCE MEASURE

JPM Title Startup SBFW System after RFP Trip - Alt Path	No.: JP-OP-315-0118-002 Revision: 1 Page 5
------------------------------------------------------------	--------------------------------------------------

Evaluator Notes:

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

FAILURE TO WEAR ALL PPE REQUIRED FOR TASK PERFORMANCE WILL RESULT IN FAILURE OF THIS JPM.

Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Ex.: Pump start: "Switch has been rotated to the start position, red light is lit, green light is out, amperage initially pegs out high, and is now indicating X amps."

Pump stop: "Switch has been rotated to the stop position, green light is lit, red light is out, amperage indicates 0 amps."

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

System Specific Notes and Cues:

None

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Startup SBFW System after RFP Trip - Alt Path	No.: JP-OP-315-0118-002 Revision: 1 Page 6
------------------------------------------------------------	--------------------------------------------------

FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title Startup SBFW System after RFP Trip - Alt Path	No.: JP-OP-315-0118-002 Revision: 1 Page 7
------------------------------------------------------------	--------------------------------------------------

Simulator Setup

IC#:

IC-20 or any full power IC.

Malfunctions:

Number	Title	Value	Delay	Ramp
N21MF0029	NRFPT Trip	Active	0	0

Remote Functions:

Number	Title	Value	Delay	Ramp
N21RF0020	MOV N2103F002 Breaker cd='P601_A296_1 EQ 1'	OPEN	0	0

Override Functions:

Number	Title	Value	Delay	Ramp
None				

Special Instructions:

1. Load desired IC.
2. Place in **RUN**.
3. Open and execute Lesson 315-0118-002.Isn.
4. Place the simulator in **FREEZE**.
5. Give examinee cue, and place simulator in **RUN** when examinee is ready.

Cue Sheet: (JP-OP-315-0118-002)

Initial Conditions:

- You are the Control Room LNO.
- N RFPT has just tripped
- AOP 20.107.01, "Loss of Feedwater or Feedwater Control" has been entered.

Initiating Cue(s):

The CRS directs you to inject to the RPV with Standby Feedwater at 1200 gpm

Cue Sheet: (JP-OP-315-0118-002)

Initial Conditions:

- You are the Control Room LNO.
- N RFPT has just tripped
- AOP 20.107.01, "Loss of Feedwater or Feedwater Control" has been entered.

Initiating Cue(s):

The CRS directs you to inject to the RPV with Standby Feedwater at 1200 gpm

**SBFW MANUAL OPERATION
(H11-P601)**

NOTE: Copy of this enclosure is located at panel H11-P601.

1.0 INITIATION

1. Start N2103-C003A, West Pump A Aux Lube Oil Pump, if available.
2. Start N2103-C003B, East Pump B Aux Lube Oil Pump, if available.
3. If available, start N2103-C001, West Standby Feedwater Pump A.
4. If available, start N2103-C002, East Standby Feedwater Pump B.
5. Verify N2103-F001, SBFW Disch To RPV Iso Valve, automatically opens (first pump).
6. Throttle open N2103-F002, SBFW 6" Disch Flow Ctrl Vlv, until desired flow is achieved.

2.0 SHUTDOWN

1. Close N2103-F002, SBFW 6" Disch Flow Ctrl Vlv.
2. Shutdown N2103-C001, West Standby Feedwater Pump A.
3. Shutdown N2103-C002, East Standby Feedwater Pump B.
4. Verify N2103-F001, SBFW Disch To RPV Iso Valve, automatically closes.

NOTE: Allow Aux Lube Oil Pumps to run 5 minutes following SBFW pump shutdown.

5. Shutdown N2103-C003A, West Pump A Aux Lube Oil Pump, if running.
6. Shutdown N2103-C003B, East Pump B Aux Lube Oil Pump, if running.

END

6.0 NORMAL OPERATIONS

6.1 Startup Of The SBFW System (Normal Mode)

NOTE: During an emergency, SBFW may be initiated using Enclosure A, SBFW Manual Operation.

6.1.1 Prerequisites

1. System is in standby in accordance with Section 5.0, Placing the SBFW System in Standby.
2. System injection is required as determined by SM

or

Reactor Vessel Level is decreasing and Reactor Feedwater Pumps are unavailable.

3. Condensate Storage Tank level is greater than 10.0 ft.
4. To provide a flow path from SBFW Pump min-flow, lube oil cooling, and seal water return to CST or CRT, one of the following valves shall be open:
 - a. P1100-F606, CST Common Rtrn Iso Valve

or

- b. P1100-F610, CRT Common Rtrn Iso Valve

6.1.2 Detailed Procedure

NOTE: All controls and indications are on COP H11-P601, unless otherwise noted.

1. Start N2103-C003A (B), West (East) Pump A (B) Aux Lube Oil Pump, if available.

NOTE: If SBFW pumps are needed for vessel inventory and Aux Lube Oil Pump is running, Step 6.1.2.2 can be omitted without damage to the SBFW Pump.

2. If Lube Oil Pump is running, dispatch an operator to verify lube oil pressure and flow as follows:
 - a. Lube oil pressure on N21-RA04 (RA03), SBFW Pump A (B) Lube Oil Supply Press Indicator, is greater than 15 psig.
 - b. If oil pressure is not between 15 and 20 psig adjust pressure per Section 7.3, Lube Oil Pressure Adjustment.
 - c. There is oil flow through all four bull's eye flow indicators (two on pump and two on motor).

NOTE: If SBFW Pump A (B) is started without running the Auxiliary Oil Pump, the SBFW Pump Bearing oil should be sampled before subsequent starts.

CAUTION

**SBFW injection temperature is significantly below moderator temperature;
Reactor power transients may occur.**

3. Start N2103-C001 (2), West (East) Standby Feedwater Pump A (B).
4. Verify the following:
 - a. N2103-F001, SBFW Disch To RPV Iso Valve, automatically opens (first pump).
 - b. If running, N2103-C003A (B), West (East) Pump A (B) Aux Lube Oil Pump, automatically stops.
 - c. Lube oil pressure on N21-RA04 (RA03), SBFW Pump A (B) Lube Oil Supply Press Indicator, is greater than 15 psig.
 - d. If oil pressure is not greater than 15 psig, adjust pressure per Section 7.3, Lube Oil Pressure Adjustment.
 - e. There is oil flow through all four bull's eye flow indicators (two on pump and two on motor).

5. Perform the following:
 - At high RPV pressure, throttle N2103-F002, SBFW 6" Disch Flow Ctrl Vlv.
 - At low RPV pressure, throttle N2103-F003, SBFW 4" Disch Flow Ctrl Vlv.
6. If more flow is desired, repeat Steps 6.1.2.1 through 6.1.2.5 for the second SBFW Pump.
7. If more flow is desired, perform the following:
 - At high RPV pressure, throttle N2103-F003, SBFW 4" Disch Flow Ctrl Vlv.
 - At low RPV pressure, throttle N2103-F002, SBFW 6" Disch Flow Ctrl Vlv.
8. If N2103-F001, SBFW Disch To RPV Iso Valve, isolates due to reaching Level 8, the valve may be re-opened once level is below Level 8.

END OF SECTION

JOB PERFORMANCE MEASURE

Job Position RO	No. JP-OP-315-0105-403	Revision 0
JPM Title Reactor Flow Limiter Failure	Duration 20 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: _____ SRO / RO

Evaluator: _____

JPM Type: **Normal** / Alternate Path / **Time Critical** Start Time _____

Evaluation Method: **Perform** / Walkthrough / Discuss Stop Time _____

Location: Plant / **Simulator** / Classroom Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
1.											
2.											
3.											
4.											
* 5.											
6.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ **PASS** _____ **FAIL**

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Reactor Flow Limiter Failure	No.: JP-OP-315-0105-403 Revision: 0 Page 2
-------------------------------------------	--------------------------------------------------

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Reactor Flow Limiter Failure	No.: JP-OP-315-0105-403 Revision: 0 Page 3
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JPM Information

System:

B3100 - Reactor Recirculation System

Task:

23.138.01.006 - Operate RR MG set in speed control mode of operation

References: Required (R) / Available (A)

23.138.01, Reactor Recirc System, Attachment I (R)
3D168, Reactor Pressure High (R)

Tools and Equipment Required:

None

Initial Conditions:

- You are an P603 operator.
- The plant is operating normally at full power and conditions are as you see them.
- 3D168 REACTOR PRESSURE HIGH has just alarmed.

Initiating Cue(s):

Respond to 3D168 REACTOR PRESSURE HIGH.

Terminating Cue(s):

Reactor Recirc Pump speed is lowered to reduce reactor pressure to <1045 psig.

Task Standard:

Reactor pressure is reduced to <1045 psig (Technical Specification Value) within 15 minutes of alarm.

Licensed Operator Exam Information (Required for NRC Exams Only)

Safety Function:

3 - Reactor Pressure Control
4 - Heat Removal From Reactor Core

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 241000 - Reactor/Turbine Pressure Regulating System

K/A STATEMENT:

A4. Ability to manually operate and/or monitor in the control room:

A4.02 Reactor pressure..... 4.1* / 4.1*

Maintenance Rule Safety Classification:

B2100-05

Maintenance Rule Risk Significant? (Yes or No)

Yes

JOB PERFORMANCE MEASURE

JPM Title Reactor Flow Limiter Failure	No.: JP-OP-315-0105-403 Revision: 0 Page 4
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PERFORMANCE EVALUATION

Start Time _____

ELEMENT	STANDARD
CUE: Provide examinee with Cue Sheet.	
1. Acknowledge and announce 3D168, REACTOR PRESSURE HIGH	1. Acknowledges and announces 3D168, REACTOR PRESSURE HIGH.
IPCS TIME 3D168 ALARMED: _____	
CUE: Acknowledge valid REACTOR PRESSURE HIGH. Direct candidate to perform required actions of ARP. When examinee selects ARP 3D168 at H11P603, provide a copy to mark up.	
2. Verify Reactor Pressure greater than 1045 psig.	2. Verifies Reactor Pressure greater than 1045 psig on the following: <ul style="list-style-type: none"> • C32-R609, Reactor Pressure Recorder • C32-R605A, Div 1 RPV Pressure Ind. • C32-R605B, Div 2 RPV Pressure Ind. • C32-K816, FW & RR Flat Panel Display
3. Verify Pressure Regulator setpoint	3. Verifies Pressure Regulator setpoint is between 944 and 949 psig on N30-R601B Regulator Setpoint.
4. Verify Reactor Flow Limiter is set correctly for current plant conditions.	4. Identifies Reactor Flow Limiter is not set correctly per GOP for plant conditions on N30-R941 Reactor Flow Limit Indication <ul style="list-style-type: none"> • May report Reactor Flow Limiter setpoint to CRS • May Depresses the RAISE pushbutton on the REACTOR FLOW LIMIT CONTROLS. • May report to CRS that cannot change Reactor Flow Limiter setpoint.
CUE: If examinee ask for guidance, ask for recommendations and then direct the examinee to perform those recommendations.	
*5. Reduce reactor power using flow on RR MG Set A and/or RR MG Set B to lower reactor pressure to less than 1045 psig within 15 minutes.	*5. Reduce reactor power by: <ul style="list-style-type: none"> • Adjusts RR MG A/B set speed controller to lower speed. • Lowers speeds incrementally. • Monitor changes in Rx flow and Rx power as RR MG set speed changes.
CUE: If the examinee has not matched flows, provide CUE as CRS to mark loops flows. If candidate wishes to match flows then allow the candidate to match flows.	
6. Verify or adjust as necessary RR MG set speeds as need to ensure that indicated North and South RR MG Set speeds agree within 3%, as indicated on B31-R621A & B, N and S RR MG Set Speed Controller, process variable (PV) or if available, C32-816, FW & RR Flat Panel Display.	6. Make small adjustments to RR MG set A and B as necessary so that indicated North and South RR MG Set speeds agree within 3%
IPCS TIME Rx Pressure < 1045: _____	

JOB PERFORMANCE MEASURE

JPM Title Reactor Flow Limiter Failure	No.: JP-OP-315-0105-403 Revision: 0 Page 5
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ELEMENT	STANDARD
CUE: Terminate JPM when Reactor Pressure is <1045 psig.	

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

* **Critical Step**

JOB PERFORMANCE MEASURE

JPM Title Reactor Flow Limiter Failure	No.: JP-OP-315-0105-403 Revision: 0 Page 6
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Evaluator Notes:

<p>ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.</p> <p>FAILURE TO WEAR ALL PPE REQUIRED FOR TASK PERFORMANCE WILL RESULT IN FAILURE OF THIS JPM.</p>

Generic Notes and Cues:

<p>CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.</p> <p>Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.</p>

System Specific Notes and Cues:

None

Task Performance and Cues:

<p>The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.</p>

Critical Steps:

<p>Critical Tasks are identified by asterisk (*) and bolded steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.</p>

JOB PERFORMANCE MEASURE

JPM Title Reactor Flow Limiter Failure	No.: JP-OP-315-0105-403 Revision: 0 Page 7
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FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

[illegible]

Response:

[illegible]

Question:

Reference

Response:

[illegible]

JOB PERFORMANCE MEASURE

JPM Title Reactor Flow Limiter Failure	No.: JP-OP-315-0105-403 Revision: 0 Page 8
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Simulator Setup

IC#: Any full power IC.

Malfunctions:

Number	Title	Value	Delay	Ramp
None				

Remote Functions:

Number	Title	Value	Delay	Ramp
--------	-------	-------	-------	------

Override Functions (Setup Steps):

Number	Title	Value	Delay	Ramp
P804_A242_1	Rx Flow Limit Raise Switch	0	N/A	N/A
H_P804_A243_2	Rx Flow Limit Lower Light	0	N/A	N/A
H_P804_A243_1	Rx Flow Limit Lower Switch (Note 1)	1	N/A	N/A
H_P804_A241_1	Rx Flow Limit Indicator (Note 2)	120	N/A	N/A

Override Functions (JPM Steps):

Number	Title	Value	Delay	Ramp
P804_A243_1	Rx Flow Limit Lower Switch (Note 2)	1	N/A	N/A

Notes:

1. When the Rx Flow Limiter reaches 90%, the Lower Switch Override is removed.
2. When RPV pressure is ~1032 psig, the Rx Flow Limit Lower Switch Override is removed AND the indicator is restored (override deleted).

Special Instructions:

1. Load desired IC, and place the simulator in **RUN**.
2. Open and execute lesson 315.0105.403.
3. Trigger "Setup"
4. Freeze sim after 3D168 REACTOR PRESSURE HIGH alarms
5. Place sim in run when ready to start JPM

Cue Sheet: (JP-OP-315-0105-403)

Initial Conditions:

- You are an P603 operator.
- The plant is operating normally at full power and conditions are as you see them.
- 3D168 REACTOR PRESSURE HIGH has just alarmed..

Initiating Cue(s):

Respond to 3D168 REACTOR PRESSURE HIGH.

Cue Sheet: (JP-OP-315-0105-403)

Initial Conditions:

- You are an P603 operator.
- The plant is operating normally at full power and conditions are as you see them.
- 3D168 REACTOR PRESSURE HIGH has just alarmed.

Initiating Cue(s):

Respond to 3D168 REACTOR PRESSURE HIGH.

JOB PERFORMANCE MEASURE

Job Position SRO / RO	No. JP-OP-315-0043-016	Revision 0
JPM Title RCIC System Start, SBFW Failure	Duration 5 minutes	Page COVER SHEET

Examinee: _____ SRO / RO / NO / STA

Evaluator: _____

JPM Type: Normal / **Alternate Path** / Time Critical

Evaluation Method: **Perform** / Walkthrough / Discuss

Start Time _____

(Circle method used) Plant / **Simulator** / Classroom

Stop Time _____

Total Time: _____

PERFORMANCE EVALUATION SUMMARY							
Element	S	U	Comments	Element	S	U	Comments
1.							
2.							
3.							
4.							
5.							
* 6.							
* 7.							
* 8.							
* 9.							
10.							

_____ SATISFACTORY

_____ UNSATISFACTORY

OVERALL EVALUATOR COMMENTS:

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title RCIC System Start, SBFW Failure	No.: JP-OP-315-0043-016 Revision: 0 Page 1
----------------------------------------------	--------------------------------------------------

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title RCIC System Start, SBFW Failure	No.: JP-OP-315-0043-016 Revision: 0 Page 2
----------------------------------------------	--------------------------------------------------

System:

E5100 – Reactor Core Isolation Cooling System

Task:

02E5100004 - Initiate Reactor Core Isolation Cooling in Manual Mode

Task/Safety Function Note: With SBFW for level control, Low Low set would be for heat removal. Because SBFW fails and RCIC is then used, RCIC can then be used for Level Control (SF2) and heat removal. (SF4)

References: Required (R) / Available (A)

23.206, "Reactor Core Isolation Cooling System", Enclosure B (R)
6M721-5709-1, RCIC Functional Operating Sketch (A)

Tools and Equipment Required:

None

Initial Conditions:

- You are the Control Room LNO.
- A Reactor Scram has occurred and the reactor is shutdown.
- EOP flow charts have been entered.

Initiating Cue(s):

- The CRS directs you to start SBFW manually and inject to the vessel to maintain Reactor Water Level 173-214".
- Another operator will address plant alarms not associated with this task.

Terminating Cue(s):

RCIC is injecting to the RPV at approximately 650 gpm with level increasing.

Task Standard:

RCIC has been started manually and is injecting to the RPV at approximately 650 gpm IAW 23.206.

Licensed Operator Exam Information (required for NRC exams)

Safety Function:

2 - Reactor Water Inventory Control, 4 Heat Removal from the Core

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 217000 - Reactor Core Isolation Cooling System

K/A STATEMENT:

A4. Ability to manually operate and/or monitor in the control room:

A4.04 Manually initiated controls3.6 / 3.6

Maintenance Rule Safety Classification:

E5100-01

Maintenance Rule Risk Significant? (Yes or No)

Yes

JOB PERFORMANCE MEASURE

JPM Title RCIC System Start, SBFW Failure	No.: JP-OP-315-0043-016 Revision: 0 Page 3
----------------------------------------------	--------------------------------------------------

PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
PREREQUISITES: None			
CUE: Provide Examinee with CUE SHEET.			
NOTE: During an emergency, SBFW may be initiated using Enclosure A, SBFW Manual Operation. If examinee selects 23.107.01, Enclosure A hard card at H11P601, provide a copy of the hard card to mark up. Enclosure A step numbers are in parentheses.			
1.	[6.2.1] (1.1) Start N2103-C003A, West Pump A Aux Lube Oil Pump, if available.	1.	Starts N2103-C003A, West Pump A Aux Lube Oil Pump.
2.	[6.2.1] (1.2) Start N2103-C003B, East Pump B Aux Lube Oil Pump.	2.	Starts N2103-C003B, East Pump B Aux Lube Oil Pump.
NOTE: Alternate Path start here. Examine may report that SBFW Pumps pump trips to CRS as they occur			
3.	[6.2.3] (1.3) Start N2103-C001, West Standby Feedwater Pump A.	3.	Attempts to start N2103-C001, West Standby Feedwater Pump A. <ul style="list-style-type: none">Reports to the CRS that N2103-C001, West Standby Feedwater Pump A is tripped.
4.	[6.2.3] (1.4) Start N2103-C002, West Standby Feedwater Pump B.	4.	Attempts to start N2103-C002, East Standby Feedwater Pump B. <ul style="list-style-type: none">Reports to the CRS that N2103-C002, East Standby Feedwater Pump B is tripped.Reports SBFW is not available for injection. May suggest using RCIC to inject.
CUE: Acknowledge Report. If recommendation is made, direct examinee to perform recommended actions. If no recommendation is made ask for recommendation.			
NOTE: Examinee should use 23.206, Enclosure B hard card at H11P601. It is not intended to perform or verify 23.206, Section 5.4, Manual Initiation.			
5.	Start E5101-C004, RCIC Baro Cndr Vacuum Pump.	5.	Starts E5101-C004.
* 6.	Open E5150-F046, RCIC Oil Clr Clg Water Iso Vlv.	* 6.	Opens E5150-F046.
NOTE: Examinee should make Hi-Com announcement and Crew Update “Starting RCIC”			
* 7.	Open E5150-F095, RCIC Turb Stm Inlet Byp Vlv.	* 7.	Opens E5150-F095.
* 8.	After approximately 15 seconds, open E5150-F045, RCIC Turb Steam Inlet Vlv.	* 8.	Opens E5150-F045.
* 9.	Open E5150-F013, RCIC Disch To FW Inbd Iso Valve.	* 9.	Opens E5150-F013.

JOB PERFORMANCE MEASURE

JPM Title RCIC System Start, SBFW Failure	No.: JP-OP-315-0043-016 Revision: 0 Page 4
----------------------------------------------	--------------------------------------------------

ELEMENT	STANDARD
NOTE: E51-K615 may not need to be adjusted to obtain proper flow rate. Flow is indicated on E51-R613. There may be changes in level and RCIC Flow due to Low-Low Set cycling.	
10. Adjusts flow as necessary with E51-K615, RCIC Discharge Flow Controller.	10. Examinee may adjust flow as necessary to raise RPV Water Level of 173-214 inches.
CUE: End JPM when RCIC is injecting a approximately 650 gpm with level increasing.	

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

*** Critical Step**

JOB PERFORMANCE MEASURE

JPM Title RCIC System Start, SBFW Failure	No.: JP-OP-315-0043-016 Revision: 0 Page 5
----------------------------------------------	--------------------------------------------------

Evaluator Notes:

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Ex.: Pump start: "Switch has been rotated to the start position, red light is lit, green light is out, amperage initially pegs out high, and is now indicating X amps."

Pump stop: "Switch has been rotated to the stop position, green light is lit, red light is out, amperage indicates 0 amps."

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

Manual valves are checked in the closed direction (MOP02 and MOP05). Valve stem position may aid in valve position determination, but cannot be used as Independent Verification (MOP02).

Ex.: Verify valve closed: "Valve handwheel indicates no valve movement in the clockwise direction."

Verify valve open: "Valve handwheel has been rotated slightly in the clockwise direction and returned to the original positions."

Closing a valve: "Valve handwheel has been rotated in the fully clockwise direction until no additional valve movement. Valve stem is down."

Opening a valve: "Valve handwheel has been rotated in the fully counterclockwise direction until no additional valve movement, valve stem is out."

Controllers have an Auto light that is GREEN when selected and AMBER (YELLOW) when Manual is selected. When in Manual, the open and closed pushbuttons control the parameter to be changed by adjusting position or speed. When the deviation meter is nulled, then the process can be shifted to Auto to allow the desired setpoint to control the process.

System Specific Notes and Cues:

None

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee. Notify Examinee that time compression may be used for activities performed outside of the Control Room.

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title RCIC System Start, SBFW Failure	No.: JP-OP-315-0043-016 Revision: 0 Page 6
----------------------------------------------	--------------------------------------------------

FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title RCIC System Start, SBFW Failure	No.: JP-OP-315-0043-016 Revision: 0 Page 7
----------------------------------------------	--------------------------------------------------

Simulator Setup

IC#:

20

Malfunctions:

Number	Title	Value	Delay	Ramp
E41MF005	HPIC LOGIC A SPURIOUS ISLOATION	ACTIVE		
N21MF0032	SBFW A TRIP	ACTIVE		
N21MF0032	SBFW B TRIP	ACTIVE		

Remote Functions:

Number	Title	Value	Delay	Ramp
N/A				

Override Functions:

Number	Title	Value	Delay	Ramp
N/A				

Special Instructions:

Ensure reactor level is approx. 130-170 inches and steady with scram in.

Cue Sheet (JP-OP-315-0043-001)

Initial Conditions:

- You are the Control Room LNO.
- A Reactor Scram has occurred and the reactor is shutdown.
- EOP flow charts have been entered.

Initiating Cue(s):

- The CRS directs you to start SBFW manually and inject to the vessel to maintain Reactor Water Level 173-214”.
- Another operator will address plant alarms **not** associated with this task.

Cue Sheet (JP-OP-315-0043-001)

Initial Conditions:

- You are the Control Room LNO.
- A Reactor Scram has occurred and the reactor is shutdown.
- EOP flow charts have been entered.

Initiating Cue(s):

- The CRS directs you to start SBFW manually and inject to the vessel to maintain Reactor Water Level 173-214”.
- Another operator will address plant alarms **not** associated with this task.

SBFW MANUAL OPERATION (H11-P601)

NOTE: Copy of this enclosure is located at panel H11-P601.

1.0 INITIATION

1. Start N2103-C003A, West Pump A Aux Lube Oil Pump, if available.
2. Start N2103-C003B, East Pump B Aux Lube Oil Pump, if available.
3. If available, start N2103-C001, West Standby Feedwater Pump A.
4. If available, start N2103-C002, East Standby Feedwater Pump B.
5. Verify N2103-F001, SBFW Disch To RPV Iso Valve, automatically opens.
6. Throttle open N2103-F002, SBFW 6" Disch Flow Ctrl Vlv, until desired flow is achieved.

2.0 SHUTDOWN

1. Close N2103-F002, SBFW 6" Disch Flow Ctrl Vlv.
2. Shutdown N2103-C001, West Standby Feedwater Pump A.
3. Shutdown N2103-C002, East Standby Feedwater Pump B.
4. Verify N2103-F001, SBFW Disch To RPV Iso Valve, automatically closes.

NOTE: Allow Aux Lube Oil Pumps to run five minutes following SBFW pump shutdown.

5. Shutdown N2103-C003A, West Pump A Aux Lube Oil Pump, if running.
6. Shutdown N2103-C003B, East Pump B Aux Lube Oil Pump, if running.

END

RCIC MANUAL OPERATION (H11-P601)

INITIATION

1. Start E5101-C004, RCIC Baro Cndr Vacuum Pump.
2. Open E5150-F046, RCIC Oil Clr Clg Water Iso Vlv.
3. Start RCIC System as follows:
 - a. Open E5150-F095, RCIC Turb Stm Inlet Byp Vlv.
 - b. After approximately 15 seconds, open E5150-F045, RCIC Turb Steam Inlet Vlv.
4. Open E5150-F013, RCIC Disch To FW Inbd Iso Valve.
5. Adjust flow as necessary with auto E51-K615, RCIC Discharge Flow Controller.
6. Perform or verify complete steps of Section 5.4, Manual Initiation.

SHUTDOWN

1. Place RCIC Turbine Trip pushbutton collar in ARMED.
2. Depress RCIC Turbine Trip pushbutton, and verify:
 - a. If open, E5150-F059, RCIC Turbine Inlet Trip Throttle Valve, closes.
 - b. RCIC Turbine speed is decreasing or is at zero.
 - c. If open, E5150-F013, RCIC Disch to FW Inbd Iso Valve, closes.
 - d. If open, E5150-F019, RCIC Min Flow Vlv, closes.
3. Perform or verify complete step of Section 8.1, RCIC Shutdown.

NOTE: Copy of this enclosure is located at panel H11-P601.

JOB PERFORMANCE MEASURE

Job Position SRO / RO	No. JP-OP-315-0139-005	Revision 1
JPM Title Manually Isolate HPCI System (Alt Path)	Duration 10 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: SIM

Evaluator: _____

JPM Type: Normal / **Alternate Path** / Time Critical Start Time _____

Evaluation Method: **Perform** / Walkthrough / Discuss Stop Time _____

Location: Plant / **Simulator** / Classroom Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
1.				*11.							
2.				*12.							
* 3.				*13.							
* 4.				14.							
* 5.				15.							
* 6.				16.							
7.				17.							
* 8.				18.							
* 9.				*19.							
*10.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ **PASS** _____ **FAIL**

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Manually Isolate HPCI System (Alt Path)	No.: JP-OP-315-0139-005 Revision: 1 Page 2
------------------------------------------------------	--------------------------------------------------

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Manually Isolate HPCI System (Alt Path)	No.: JP-OP-315-0139-005 Revision: 1 Page 3
------------------------------------------------------	--------------------------------------------------

JPM Information

System:

E4100 - High Pressure Coolant Injection System

Task:

63658 - Start HPCI in the Test Mode

References: Required (R) / Available (A)

23.202, High Pressure Coolant Injection System (R)

Tools and Equipment Required:

None

Initial Conditions:

- You are the Control Room NSO.
- HPCI is to be run in the Test Mode.
- RHR Division 1 is in Torus Cooling.
- Division 1 SGTS is in operation.
- All other prerequisites have been met.

Initiating Cue(s):

The CRS directs you to start HPCI in the Test Mode in accordance with 23.202, Section 6.1.

Terminating Cue(s):

HPCI System is manually isolated.

Task Standard:

HPCI System is shutdown and isolated in accordance with ARP 2D49 and/or 2D53.

Licensed Operator Exam Information (required for NRC exams)

Safety Function:

SF-5 Containment Integrity

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 223002 Primary Containment Isolation System/Nuclear Steam Supply Shut-Off

K/A STATEMENT:

A2. Ability to (a) predict the impacts of the following on the PRIMARY CONTAINMENT ISOLATION SYSTEM/NUCLEAR STEAM SUPPLY SHUT-OFF and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.03 System logic failures..... 3.0/3.3

Maintenance Rule Safety Classification:

E4100-06

Maintenance Rule Risk Significant? (Yes or No)

No

JOB PERFORMANCE MEASURE

JPM Title Manually Isolate HPCI System (Alt Path)	No.: JP-OP-315-0139-005 Revision: 1 Page 4
------------------------------------------------------	--------------------------------------------------

PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
CUE: Provide examinee with Cue Sheet.			
1.	[6.1.2.1] Verify or place E41-K820, Test Iso/PCV E41-F011 Ctrlr, in AUTO.	1.	E41-K820 is verified in AUTO.
2.	[6.1.2.2.a] On E41-K820, depress D button until S comes ON.	2.	S is verified ON.
* 3.	[6.1.2.2.a.1)] Turn the pulser knob to set the valve position open setpoint to approximately 56.5% on the digital display.	* 3.	Pulser knob is turned until ~56.5 is read on the digital display.
* 4.	[6.1.2.2.b] On E41-K820, depress D button until Y comes ON.	* 4.	D button is depressed until Y comes ON.
* 5.	[6.1.2.2.b.1)] If Reactor Pressure is >150 psig, turn the pulser knob to set the discharge pressure setpoint to 250 psi on the digital display.	* 5.	Pulser knob is turned until 250 is read on the digital display.
* 6.	[6.1.2.3] Place E4100-M001, HPCI Test Line Iso/PCV E41-F011 Selector Switch, in OPER.	* 6.	E4100-M001 is placed in OPER.
7.	[6.1.2.4] Verify E41-F011, HPCI/RCIC Test Iso/PCV, closed.	7.	E41-F011 is verified closed.
* 8.	[6.1.2.5] Open E4150-F008, HPCI Test Line Iso Vlv.	* 8.	E4150-F008 is opened.
* 9.	[6.1.2.6] Open T4600-F406, HPCI to SGTS Iso Vlv.	* 9.	T4600-F406 is opened.
*10.	[6.1.2.7] Place E4101-C003, HPCI Baro Cndr Vacuum Pump CMC switch, in RUN, and verify pump starts.	*10.	HPCI Baro Cndr Vacuum Pump CMC switch is placed in RUN, and pump is verified to start.
*11.	[6.1.2.8] Open E4150-F003, HPCI Stm Sply Oybd Iso Vlv.	*11.	E4150-F003 is opened.
*12.	[6.1.2.9] Open E4150-F059, HPCI Oil Clr Clg Water Iso Vlv.	*12.	E4150-F059 is opened.
*13.	[6.1.2.10] Simultaneously: <ul style="list-style-type: none">Place E4101-C005, HPCI Turbine Aux Oil Pump, in RUN, and verify pump starts, ANDOpen E4150-F001, HPCI Turb Stm Sply Iso Vlv.	*13.	Perform the following: <ul style="list-style-type: none">HPCI Turbine Aux Oil Pump is placed in RUN, and pump start verified, ANDE4150-F001 is opened.
14.	[6.1.2.11] Verify HPCI Pump and Turbine starts and speed increases.	14.	HPCI Pump and Turbine start and speed increase is verified.

JOB PERFORMANCE MEASURE

JPM Title Manually Isolate HPCI System (Alt Path)	No.: JP-OP-315-0139-005 Revision: 1 Page 5
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ELEMENT		STANDARD	
Alternate Path begins when HPCI Turbine speed reaches 3000 rpm.			
NOTE: If examinee begins to respond to back panel alarms, inform them that another control room operator will respond to those alarms			
CUE: As CRS, acknowledge alarm report.			
15.	Respond to annunciators 1D70, Steam Leak Detection Diff Temp High, and 1D66, Steam Leak Detection Ambient Temp High.	15.	Announces the alarms to the CRS, and references the appropriate ARPs.
CUE: If examinee requests H11-P614 information, report that alarmed module is for HPCI Equipment Room, and temperature is reading 155°F.			
16.	[1D66/1D70] Direct an operator to RR H11-P614, NSSS Temperature Recording and Leak Detection Cabinet, to determine alarmed module and temperature.	16.	Directs operator to RR H11-P614, NSSS Temperature Recording and Leak Detection Cabinet, to determine alarmed module and temperature.
CUE: As CRS, acknowledge alarm report.			
17.	Respond to annunciators 2D49, HPCI Logic A Isolation Trip Signal Initiated, and 2D53, HPCI Logic B Isolation Trip Signal Initiated.	17.	Announces the alarms to the CRS, and references the appropriate ARPs.
CUE: If examinee reports the isolation failure and requests direction, direct examinee to manually isolate the HPCI System.			
18.	[2D49/2D53] Verify HPCI Turbine has tripped and is isolated.	18.	Verifies HPCI Turbine has tripped and recognizes system has NOT isolated.
NOTE: Closing either E41-F002 or E41-F003 will effectively isolate the HPCI System.			
*19.	[2D49/2D53] Manually close E41-F002, HPCI Steam Supply Inboard Isolation Valve, and/or E41-F003, HPCI Steam Supply Outboard Isolation Valve.	*19.	Manually closes E41-F002, HPCI Steam Supply Inboard Isolation Valve, and/or E41-F003, HPCI Steam Supply Outboard Isolation Valve.
CUE: End JPM when the HPCI System is manually isolated.			

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

* Critical Step

JOB PERFORMANCE MEASURE

JPM Title Manually Isolate HPCI System (Alt Path)	No.: JP-OP-315-0139-005 Revision: 1 Page 6
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Evaluator Notes:

This is an Alternate Path JPM. The steam supply line will break as speed increases, and the system will fail to automatically isolate.

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

Controllers have an Auto light that is GREEN when selected and AMBER (YELLOW) when Manual is selected. When in Manual, the open and closed pushbuttons control the parameter to be changed by adjusting position or speed. When the deviation meter is nulled, then the process can be shifted to Auto to allow the desired setpoint to control the process.

System Specific Notes and Cues:

None

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Manually Isolate HPCI System (Alt Path)	No.: JP-OP-315-0139-005 Revision: 1 Page 7
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FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title Manually Isolate HPCI System (Alt Path)	No.: JP-OP-315-0139-005 Revision: 1 Page 8
------------------------------------------------------	--------------------------------------------------

Simulator Setup

IC#:

IC-20

Malfunctions:

Number	Title	Value	Delay	Ramp
E41MF0007	HPCI Steam Line Break [NOTE 1] <i>cd=' H_P602_A137_1 GT 3000'</i>	20	0	0

Remote Functions:

Number	Title	Value	Delay	Ramp
EOPRF0022	E41-F002 Isolation Defeat for RPV Venting [NOTE 2] <i>cd=' P602_A117_3 EQ 1'</i>	DEFEAT	0	0
EOPRF0023	E41-F003 Isolation Defeat for RPV Venting [NOTE 2] <i>cd=' P602_A117_3 EQ 1'</i>	DEFEAT	0	0

Override Functions:

Number	Title	Value	Delay	Ramp
N/A				

NOTE 1: Conditional on HPCI Turbine speed >3000 rpm (H_P602_A137_1 GT 3000).

NOTE 2: Conditional on HPCI Turbine Aux Oil Pump in RUN (P602_A117_3 EQ 1).

Special Instructions:

1. Initialize the simulator to **IC-20** and place in **RUN**.
2. Start SGTs T4600-C003, Div. 1 SGTs Exhaust Fan.
3. Start Div. 1 RHRSW:
 - a. Throttle open E4150-F068A for 5 seconds.
 - b. Start one RHRSW Pump.
 - c. Throttle open E4150-F068A to ~6000 gpm.
 - d. Start the second RHRSW Pump.
 - e. Fully open E4150-F068A.
4. Start Div. 1 RHR in Torus Cooling:
 - a. Open E1150-F028B, Div. 2 Torus Isolation Vlv.
 - b. Start one Div. 1 RHR Pump.
 - c. Throttle open E1150-F024B, Div. 2 Torus Cooling Vlv, to ~10,000 gpm.
5. Pump down Torus using TWMS to -1 inches.
6. Placard alarms per Pre-job brief documents. Consider allowing candidates to review the Pre-job brief documents in secure location prior to entering simulator to perform JPM
7. Open and execute lesson **JP0139-005**.Isn.
8. Trigger First Step.

Cue Sheet: (JP-OP-315-0139-005)

Initial Conditions:

- You are the Control Room NSO.
- HPCI is to be run in the Test Mode.
- RHR Division 1 is in Torus Cooling.
- Division 1 SGTS is in operation.
- All other prerequisites have been met.

Initiating Cue(s):

The CRS directs you to start HPCI in the Test Mode in accordance with 23.202, Section 6.1.

JOB PERFORMANCE MEASURE
Cue Sheet: (JP-OP-315-0139-005)

Initial Conditions:

- You are the Control Room NSO.
- HPCI is to be run in the Test Mode.
- RHR Division 1 is in Torus Cooling.
- Division 1 SGTS is in operation.
- All other prerequisites have been met.

Initiating Cue(s):

The CRS directs you to start HPCI in the Test Mode in accordance with 23.202, Section 6.1.

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

**Plant Technical Procedure - Fermi 2
System Operating Procedure**

Continuous Use

**23.202
Revision 110A
Page 1**

HIGH PRESSURE COOLANT INJECTION SYSTEM

Revision Summary

- 1) Revised E4100-F232 to open and capped with weep hole on Attachment 1 per CARD 15-29016.
- 2) Revised E4100-F174 to closed and capped in Attachment 1.
- 3) Added MLS05 as a use reference.
- 4) Added a space between steps 6.1.2.16 and 6.1.2.17. No revision bar was used. ACR 17-1497.

Attachments

- | | | |
|---|--------|--------------------------------------------------------------|
| 1 | 101516 | Initial HPCI Valve Lineup |
| 2 | 031005 | HPCI Electrical Lineup |
| 3 | 062104 | HPCI Instrument Lineup |
| 4 | 011110 | E4150-F041 Isolation Defeat |
| 5 | 011110 | HPCI Standby Verification Checklist |
| 6 | 011110 | Verification Checklist For Section 5.1 Initial Fill And Vent |
| 7 | 011110 | Verification Checklist For Section 7.3 Lube Oil Sampling |

Enclosures

- | | | |
|---|--------|----------------------------------------------------------------------------|
| A | 110209 | Local-Manual Operation of E41-F011, HPCI/RCIC Test Iso/Press Control Valve |
| B | 082611 | Table of Expected HPCI Lube Oil Pressures |
| C | 031312 | HPCI Manual Operation (copy located at H11-P602) |
| D | 020802 | HPCI and RCIC Controllers |

Information and Procedures							
DTC TPNPP	DSN 23.202	Revision 110A	Date Issued 10/05/2017	DCR# 16-1101 ACR# 17-1497	File # 1703.02	IP Code: I	Recipient

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1.0 PURPOSE

To prescribe the method for operating the High Pressure Coolant Injection (HPCI) System.

1.1 System Description

If an accident involving loss of coolant at a relatively low flow rate occurs, HPCI System provides emergency core cooling. Over a period of time, even a break in a small process line could reduce reactor vessel water level to a point where core cooling would be impaired without significantly reducing reactor vessel pressure. Under such conditions, Low Pressure Emergency Core Cooling Systems (Residual Heat Removal and Core Spray) would not be able to inject coolant into the core. However, HPCI System is designed to pump water into the core while it is fully pressurized, and provide adequate core cooling until reactor vessel pressure drops to the point where Low Pressure Core Cooling Systems can operate.

The HPCI System uses a turbine-driven pump assembly, operated by reactor steam pressure, to pump water into the reactor vessel by way of the feedwater line. Makeup water is supplied initially from the Condensate Storage Tank (CST). If water in the CST falls below 32" (from tank bottom) or water in the Suppression Pool rises 3.5" above normal, HPCI pump suction is automatically transferred to the Suppression Pool. If a break or a leak is detected in the HPCI steam line, the system is automatically shut down, isolated, and inhibited from subsequent restart. If HPCI steam line pressure drops to less than or equal to 100 psig, the HPCI system is also shut down and isolated. HPCI is inhibited from an automatic restart should reactor steam pressure subsequently rise unless the isolation signal SEAL-IN is reset.

If Reactor Water Level 1 or High Drywell Pressure condition occurs, HPCI Condensate and Vacuum Pumps will trip and will not restart until RHR logic Low Level SEAL-IN is reset.

2.0 REFERENCES

2.1 Use References

- 2.1.1 23.104, Condensate Storage and Transfer System
- 2.1.2 23.205, Residual Heat Removal System
- 2.1.3 23.404, Standby Gas Treatment System
- 2.1.4 24.000.01, Situational Surveillance/LCO Action Tracking
- 2.1.5 29.100.01 SH 2, Primary Containment Control
- 2.1.6 MLS05, Notifications/General Regulatory Reporting Requirements

2.2 Potential Use References

2.2.1 Technical Specifications/TRM

- Technical Specifications, Section 3.3.5.1, Emergency Core Cooling System (ECCS) Instrumentation
- Technical Specifications, Section 3.3.5.2, Reactor Core Isolation Cooling (RCIC) System Instrumentation
- Technical Specifications, Section 3.3.6.1, Primary Containment Isolation Instrumentation
- Technical Specifications, Section 3.5.1, ECCS - Operating
- Technical Specifications, Section 3.6.2.1, Suppression Pool Average Temperature
- Technical Specifications, Section 3.6.1.8, Suppression Chamber-to-Drywell Vacuum Breakers
- TRM Section TR 3.3.5.1, Emergency Core Cooling System (ECCS) Instrumentation
- TRM Section TR 3.3.5.2, Reactor Core Isolation Cooling (RCIC) System Instrumentation
- TRM Section TR 3.3.6.1, Primary Containment Isolation Instrumentation

2.2.2 Drawings

M-2035	System Diagram - High Pressure Coolant Injection System
M-2043	System Diagram - High Pressure Coolant Injection System
M-2006	System Diagram - Condensate Storage System Unit 2
I-2221-1-10	Various HPCI system Schematics Diagrams
M-5708-01	High Pressure Coolant Injection System Functional Operating Sketch

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 If Suppression Pool average water temperature is $\geq 95^{\circ}\text{F}$, comply with Technical Specifications, Section 3.6.2.1, Suppression Pool Average Temperature.
- 3.2 Entry into HPCI turbine area during operation is hazardous due to high radiation and possible airborne contamination.
- 3.3 When HPCI turbine is running, turbine speed must be ≥ 2000 rpm to ensure stability of operation.
- 3.4 If the Main Generator is **not** on-line during HPCI turbine testing, Reactor Power and Steam Flow must be stable with Turbine Bypass Valves open $\geq 27\%$ to absorb HPCI start transient.
- 3.5 The following valves are preset (throttled) to maintain specific oil pressures (listed below) on the HPCI Turbine Lube Oil and Control Oil Systems. Improper adjustment of these valves can cause damage or malfunction of the HPCI System. Do not adjust these valves unless permission has been obtained from the Shift Manager.

Valve	Description	Pressure
E4100-F129	Thrust Bearing Oil Supply Throttle Valve	14 to 18 psig
E4100-F131	Trip Unit Oil Sply Manual Throttle Valve	17 to 23 psig
E4100-F135	Governor End Journal Bearing Oil Sply Throttle Valve	9 to 13 psig
E4100-F137	Coupling End Journal Bearing Oil Sply Throttle Valve	9 to 13 psig
E4100-F139	Main Pump/Gear Reducer Oil Sply Man Throttle Valve	19 to 26 psig

- 3.6 Radiation Protection must be notified that the HPCI System and the Standby Gas Treatment System will be operated.
- 3.7 Do **not** exceed Suppression Pool maximum average temperature of 105°F during testing which adds heat to the Suppression Pool.
- 3.8 E41-F011, HPCI/RCIC Test Iso/PCV, shall be closed **and** E4100-M001, E41-F011 HPCI/RCIC Test Iso/PCV, selector switch, in ISOLATE except during operation in the test mode.
- 3.9 Before completing warm-up of the HPCI steam supply line, steam supply line must be completely drained of water to prevent moisture carry-over or water intrusion into the Lube Oil Reservoir. This is verified by 2D77, HPCI TURBINE INLET DRAIN POT LEVEL HIGH, clear.
- 3.10 Suppression Pool level must be maintained below +1 inch to prevent auto suction transfer due to placing the RHR System in the Torus Cooling Mode.

- 3.11 When the HPCI System is **not** needed to control RPV water level following a LOCA, primary containment isolation valves, E4150-F021, HPCI Turb Exh Stop Ck Valve, and E4150-F022, HPCI Turb Exh Pot Drain Stop Check Vlv, shall be closed.
- 3.12 E4150-F008, HPCI Test Line Iso Vlv, **and** E41-F011, HPCI/RCIC Test Iso/PCV, should **not** be opened at the same time unless HPCI is in operation. This condition depressurizes the discharge line to the CST setting up the potential for damaging flow transients. If HPCI is shutdown prior to E4150-F008 **and** E41-F011 being closed a fill and vent must be performed prior to placing HPCI in standby.
- 3.13 Operation with E41-F011, HPCI/RCIC Test Iso/PCV, less than 9% open and between 29 to 47% open should be minimized due to being in high wear region for valve internals.
- 3.14 E4150-F007, HPCI Pump Disch Otbd Iso Vlv, is susceptible to pressure locking and may **not** open under certain conditions. If E4150-F007, HPCI Pump Disch Otbd Iso Vlv, is closed due to leakage past E4150-F006, HPCI Pump Disch Inbd Iso Vlv, the HPCI System shall be considered inoperable.
- 3.15 If E41-K615, HPCI Pump Flow Controller, is **not** in its standby lineup position (AUTO set at 5250 gpm), comply with Technical Specifications, Section 3.5.1, ECCS - Operating.
- 3.16 If running HPCI in Test Mode and it is desired to manually lineup injection to the reactor vessel, E41-F011, HPCI/RCIC Test Iso/PCV, must be closed before opening E4150-F006, HPCI Pump Disch Inbd Iso Vlv, to prevent E4150-F008, HPCI Test Line Iso Vlv, from torquing out while closing against full HPCI flow.
- 3.17 If the following conditions exist, HPCI has the potential to trip on High Exhaust Pressure due to water intrusion:
- HPCI is in Standby.
 - 2D66, HPCI CNDR VAC TANK LEVEL HIGH, alarms.
 - HPCI is automatically or manually initiated.
- 3.18 Operation of the HPCI System will add heat to the Torus. Drywell Pressure may be less than Torus Pressure, and Torus to Drywell Vacuum Breakers may open. Comply with the following Technical Specifications:
- Section 3.6.2.1, Suppression Pool Average Temperature.
 - Section 3.6.1.8, Suppression Chamber-to-Drywell Vacuum Breakers.

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CM

- 3.19 If aligned to the Torus (in standby) for more than twelve consecutive hours without HPCI Keep Fill System in operation, HPCI should be considered inoperable, due to potential drain down of system piping. Reference CARD 98-11671 and TMPE 97-0345. The twelve hour clock can be reset by valving in the CST and venting the discharge line high point vent. If aligned for more than one hour on torus suction a high point vent when suction returned to CST or keep fill restored should be performed.
- 3.20 Operation of HPCI system in conjunction with Hydrogen Water Chemistry system in service will add hydrogen to the suppression chamber atmosphere.
- 3.21 When HPCI is aligned to the Torus without HPCI Keep Fill System in operation for greater than one hour:
- There is a potential for a void to form causing a pressure transient with HPCI startup.
 - When HPCI Suction is realigned to CST, the discharge line high point vent should be vented.
 - HPCI will not be considered inoperable in this condition (CARD 01-20890).
- 3.22 If the lower Alphanumeric display on E41-K615, HPCI Pump Flow Controller, reads **“AOUT1 OC”** or **“FLOW BAD”**, a **CARD should be initiated and HPCI declared inoperable.**
- 3.23 The E41-K615, HPCI Pump Flow Controller setpoint of 5250 gpm is based on the required Tech Spec flow (5000 gpm) plus the instrument loop accuracy (± 250 gpm for the original GEMAC). The Moore 353 Controller instrument loop accuracy is ± 94.5 gpm thus HPCI Pump Flow Controller Replacement, will not require any controller setpoint changes.
- 3.24 In standby, the HPCI steam supply line inside the Drywell normally drains to the main steam lines (E4150-F003 restricts flow to the inlet drain pot). Upon MSIV closure this path is lost.
- 3.25 HPCI Booster Pump lube oil level could take over two hours to stabilize following a HPCI run.
- 3.26 Limit extended HPCI pump operation with indicated flow less than 1200 gpm to minimize time HPCI is on minimum flow, and to prevent draining CST to Suppression Pool.

- 3.27 With HPCI running and vacuum breaker function unavailable, a subsequent trip / shutdown may result in a water slug from the suppression pool rapidly accelerating into the exhaust line. This condition would create large stresses on the exhaust line, valves, piping and supports. Therefore HPCI should be removed from standby whenever the exhaust line vacuum breaker is not functional.
- 3.28 To lower the risk of thermal binding of E4150-F006, HPCI Pump Disch Inbd Iso Vlv, it should be cycled every 15 minutes for one hour following injection to RPV.

END OF SECTION

4.0 GENERAL PREREQUISITES

- 4.1 CST is in service in accordance with 23.104, "Condensate Storage and Transfer System," **and** has a minimum level of 9 feet (150,000 gallons) as indicated on P11-R801, DST, CRT, & CST Level Recorder (COP H11-P805).
- 4.2 Suppression Pool is -2 to +2 inches as indicated on T50-R804A (B), Div 1 (2) Torus Level Recorder, [COP H11-P601 (P602)].

- 4.3 The following systems are in service to support HPCI operation:

- AC Electrical Power System.
- DC Electrical Power System.
- Station and Control Air System (test valve).
- Main Steam Line drains.
- Standby Gas Treatment System, (either division).

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- 4.4 The following Attachments have been completed:

- Attachment 1, HPCI Initial Valve Lineup.
- Attachment 2, HPCI Electrical Lineup.
- Attachment 3, HPCI Instrument Lineup.

END OF SECTION

6.0 NORMAL OPERATION

6.1 Test Mode

NOTE: This mode of HPCI can be used as a means of depressurizing the Reactor Vessel after a shutdown.

6.1.1 Prerequisites

1. HPCI System is aligned for standby in accordance with Section 5.2, Standby Mode.
2. Standby Gas Treatment System has been started in accordance with 23.404, "Standby Gas Treatment System."
3. If HPCI System is to be operated in accordance with this section of the procedure for **other** than an emergency or abnormal situation:
 - The HPCI auxiliary oil pump has been operated prior to HPCI turbine startup and proper oil pressures (as shown in Enclosure B) have been verified locally. The pump should be subsequently shutdown after verification in preparation for system startup.
 - Radiation Protection must be notified that HPCI and Standby Gas Treatment System will be operated.
 - If Main Generator is **not** on line, reactor power and steam flow have been stabilized with Turbine Bypass Valves open $\geq 27\%$.
 - Torus Cooling Mode of RHR System is in service in accordance with 23.205, "Residual Heat Removal System."

NOTE (1): Barometric Condenser Vacuum Pump and Condensate Pump will trip at Level 1 or High Drywell Pressure.

NOTE (2): If HPCI initiation signal is received while in Test Mode (CST to CST), HPCI System will automatically realign and inject to the RPV.

6.1.2 Detailed Procedure

1. Verify or place E41-K820, Test Iso/PCV E41-F011 Ctrlr, in AUTO (manual operation is acceptable but not preferred).

2. If E41-K820, Test Iso/PCV E41-F011 Ctrlr is in AUTO, set E41-K820, Test Iso/PCV E41-F011 Ctrlr, as follows:
 - a. On E41-K820, depress D button until S comes ON.
 - 1) Turn the pulser knob to set the valve position open setpoint to approximately 56.5% on the digital display.
 - b. On E41-K820, depress D button until Y comes ON.
 - 1) If Reactor Pressure is > 150 psig, turn the pulser knob to set the discharge pressure setpoint to 250 psi on the digital display.
 - 2) If Reactor Pressure is ≤ 150 psig, turn the adjustment knob to set the discharge pressure setpoint to Reactor Pressure +100 psi on the digital display.
3. Place, E4100-M001, E41-F011 HPCI/RCIC Test Iso/PCV, selector switch in OPER.
4. Verify E41-F011, HPCI/RCIC Test Iso/PCV, closed.
5. Open E4150-F008, HPCI Test Line Iso Vlv.
6. Open T4600-F406, HPCI To SGTS Iso Vlv (COP H11-P817).
7. Place E4101-C003, HPCI Baro Cndr Vacuum Pump CMC switch, in RUN, **and** verify pump starts.
8. Open E4150-F003, HPCI Stm Sply Otbd Iso Vlv.

NOTE: If MSIVs are closed, allow five minutes for the steam line to drain before opening E4150-F001, HPCI Turb Stm Sply Iso Vlv.

9. Open E4150-F059, HPCI Oil Clr Clg Water Iso Vlv.

CAUTION

When HPCI Turbine is running, Turbine speed must be ≥ 2000 rpm to ensure stability of operation.

10. Start HPCI System by performing the following simultaneously:
 - Place E4101-C005, HPCI Turbine Aux Oil Pump, in RUN, and verify pump starts.
 - Open E4150-F001, HPCI Turb Stm Sply Iso Vlv.
11. Verify HPCI Pump and Turbine starts and speed increases.

NOTE: When HPCI Pump Discharge Pressure is > 125 psig and pump flow is < 650 gpm, E4150-F012, HPCI Pump Min Flow Vlv, will auto open. When flow is > 1200 gpm, E4150-F012, HPCI Pump Min Flow Vlv, will auto close.

12. Verify proper operation of E4150-F012, HPCI Pump Min Flow Vlv.

NOTE: Minimize operating E41-F011, HPCI/RCIC Test Iso/PCV, $< 9\%$ open and between 29% to 47% open due to being a high wear region of valve internals.

CAUTION

To prevent draining CST to Suppression Pool through the HPCI Minimum Flow Line, DO NOT run HPCI pump with indicated flow < 1200 gpm for an extended period of time.

13. If E41-K820, Test Iso/PCV E41-F011 Ctrlr is in MANUAL:
 - a. When HPCI discharge pressure increases above 250 psig, maintain HPCI discharge pressure approximately 100 psi above reactor pressure by adjusting E41-F011, HPCI/RCIC Test Iso/PCV, with the pulser knob for E41-K820, Test Iso/PCV E41-F011 Ctrlr.

14. If E41-K820, Test Iso/PCV E41-F011 Ctrlr is in AUTO:
 - Verify E41-F011, HPCI/RCIC Test Iso/PCV, strokes open to approximately 56.5% (E41-K820, V-Display), after pump discharge pressure exceeds either:
 - 250 psig (E41-K820, P-Display) if Reactor Pressure > 150 psig.
 - Reactor Pressure + 100 psig (E41-K820, P-Display) if Reactor Pressure ≤ 150 psig.
15. Verify E4101-C005, HPCI Turbine Aux Oil Pump stops.
16. Verify E4101-C004, HPCI Baro Cndr Cond Pump, cycles ON and OFF, and maintains level below the high alarm.
17. Verify the following valves close:
 - E4100-F028, HPCI Stm Sply Drn Pot Inbd Iso.
 - E4100-F029, HPCI Stm Sply Drn Pot Otbd Iso.
 - E4100-F025, HPCI Cond to DRW Otbd Iso Valve.
 - E4100-F026, HPCI Cond to DRW Inbd Iso Valve.

NOTE: As RPV pressure decreases, HPCI Pump discharge flow and pressure must be adjusted to regulate RPV cool down rate.

18. Adjust HPCI flow as necessary per the following:
 - a. Adjust flow using E41-K615, HPCI Pump Flow Controller.
 - b. If E41-K615, HPCI Pump Flow Controller, is **not** in its standby lineup position (AUTO set at 5250 gpm), comply with Technical Specifications, Section 3.5.1, ECCS - Operating.
19. If injection to the Reactor Vessel is required:
 - a. Place, E4100-M001, E41-F011 HPCI/RCIC Test Iso/PCV, selector switch in ISOLATE.
 - b. Verify E41-F011, HPCI/RCIC Test Iso/PCV, closes.
 - c. Open E4150-F006, HPCI Pump Disch Inbd Iso Vlv.

- d. Verify E4150-F008, HPCI Test Line Iso Vlv, auto closes.
 - e. When flow is > 1200 gpm, verify E4150-F012, HPCI Pump Min Flow Vlv, closes.
20. Return to Test Mode as follows:
- a. Close E4150-F006, HPCI Pump Disch Inbd Iso Vlv.
 - b. Open E4150-F008, HPCI Test Line Iso Vlv.
 - c. Place, E4100-M001, E41-F011 HPCI/RCIC Test Iso/PCV, selector switch in OPER.
 - d. When flow is > 1200 gpm, verify E41-F012, HPCI Pump Min Flow Vlv, closes.
21. If using Test Mode for a non-emergency operation:
- Log Suppression Pool temperature every 5 minutes in accordance with 24.000.01, "Situational Surveillances/LCO Action Tracking," Attachment 10, Torus Average Water Temperature During Testing Which Adds Heat to Torus.
22. When testing has been completed, shutdown HPCI System in accordance with Section 8.1, HPCI Shutdown.

END OF SECTION

JOB PERFORMANCE MEASURE

Job Position SRO / RO	No. JP-OP-315-0158-402	Revision 3
JPM Title Loss 64C and EDG 12 Fails to Start	Duration 10 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: _____ SRO / RO

Evaluator: _____

JPM Type: **Normal** / Alternate Path / Time Critical Start Time _____

Evaluation Method: **Perform** / Walkthrough / Discuss Stop Time _____

Location: Plant / **Simulator** / Classroom Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
* 1.											
* 2.											
* 3.											
4.											
* 5.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ **PASS** _____ **FAIL**

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Loss 64C and EDG 12 Fails to Start	No.: JP-OP-315-0158-402 Revision: 3 Page 2
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JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title
Loss 64C and EDG 12 Fails to Start

No.: JP-OP-315-0158-402
Revision: 3
Page 3

JPM Information

System:

R1400 - 4160/480V ESF Electrical Distribution

Task:

74965 - Restore North RR MG.
64234 - Manually initiate a start of SGTS
64864 - Shift Divisions of CCHVAC

References: Required (R) / Available (A)

20.300.64C, Loss of Bus 64C (R)
20.300.72C, Loss of Bus 72C (R)

Tools and Equipment Required:

None

Initial Conditions:

- You are the 3rd NSO.
- Reactor Power is at 100%.
- A transient has occurred resulting in the indicated plant conditions.

Initiating Cue(s):

The CRS has directed you to evaluate and report status of electrical distribution system.

Terminating Cue(s):

AOP 20.300.72C, "Loss of Bus 72C", Subsequent Actions, Conditions A.1, B, and C are completed.

Task Standard:

The electrical walkdown will determine that 4160V Bus 64C has tripped and EDG 12 does not start due to a bus fault. Actions are taken in response to the loss of 480V Bus 72C in accordance with steps A.1, B and C of 20.300.72C, Loss of Bus 72C.

Licensed Operator Exam Information (required for NRC exams)

Safety Function:

SF-6 - Electrical

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 262001 - AC Electrical Distribution

K/A STATEMENT:

A2. Ability to (a) predict the impacts of the following on the A.C. ELECTRICAL DISTRIBUTION; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations: (CFR: 41.5 / 45.6)

A2.04 Types of loads that, if de-energized, would degrade or hinder plant operation..... 3.8/4.2

Maintenance Rule Safety Classification:

R1400-01

Maintenance Rule Risk Significant? (Yes or No)

Yes

JOB PERFORMANCE MEASURE

JPM Title Loss 64C and EDG 12 Fails to Start	No.: JP-OP-315-0158-402 Revision: 3 Page 4
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PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
NOTE: Examinee will announce actions which change plant conditions/alarms with “Crew Update.”			
*1.	Perform an electrical walkdown.	*1.	Determines that Bus 64C tripped, breakers B6 and B8 are open indicating a bus fault, and the EDG did not start.
CUE: When Bus 64C lockout is reported, acknowledge the report as CRS. Announce entry into 20.300.72C, Loss of Bus 72C. Direct the examinee to perform Conditions A.1, B and C of AOP 20.300.72C. If asked, other control room operators will be performing other AOP steps.			
*2.	[A.1] Place RR MG North Cooling Fan in OFF/RESET, then in RUN.	*2.	RR MG North Cooling Fan CMC switch placed in OFF/RESET, then in RUN.
*3.	[B.1] Start Div 2 SGTS.	*3.	Div 2 SGTS Exhaust Fan CMC switch placed in RUN.
4.	[C.1] Place Div 1 CCHVAC Mode Select Switch in ALL STOP.	4.	Div 1 CCHVAC Mode Select Switch placed in ALL STOP.
*5.	[C.2] Place Div 2 CCHVAC Mode Select Switch in ALL AUTO.	*5.	Div 2 CCHVAC Mode Select Switch placed in ALL AUTO.
CUE: End JPM when AOP 20.300.72C, steps A.1, B, and C are completed.			

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

* Critical Step

JOB PERFORMANCE MEASURE

JPM Title Loss 64C and EDG 12 Fails to Start	No.: JP-OP-315-0158-402 Revision: 3 Page 5
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Evaluator Notes:

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

Controllers have an Auto light that is GREEN when selected and AMBER (YELLOW) when Manual is selected. When in Manual, the open and closed pushbuttons control the parameter to be changed by adjusting position or speed. When the deviation meter is nulled, then the process can be shifted to Auto to allow the desired setpoint to control the process.

System Specific Notes and Cues:

None

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Loss 64C and EDG 12 Fails to Start	No.: JP-OP-315-0158-402 Revision: 3 Page 6
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FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title Loss 64C and EDG 12 Fails to Start	No.: JP-OP-315-0158-402 Revision: 3 Page 7
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Simulator Setup

IC#:

IC-20 or any full power IC.

Malfunctions:

Number	Title	Value	Delay	Ramp
R11MF0012	4160V Bus Trip 64C	ACTIVE	0	0

Remote Functions:

Number	Title	Value	Delay	Ramp
None				

Override Functions:

Number	Title	Value	Delay	Ramp
None				

Special Instructions:

1. Initialize simulator to selected IC.
2. Place simulator in RUN.
3. Open and execute lesson **JP0158-402**.lsn

Cue Sheet: (JP-OP-315-0158-402)

Initial Conditions:

- You are the 3rd LNO.
- Reactor Power is at 100%.
- A transient has occurred resulting in the indicated plant conditions.

Initiating Cue(s):

The CRS has directed you to evaluate and report status of electrical distribution system.

Cue Sheet: (JP-OP-315-0158-402)

Initial Conditions:

- You are the 3rd LNO.
- Reactor Power is at 100%.
- A transient has occurred resulting in the indicated plant conditions.

Initiating Cue(s):

The CRS has directed you to evaluate and report status of electrical distribution system.

**Plant Technical Procedure - Fermi 2
Abnormal Operating Procedure**

**20.300.72C
Revision 11
Page 1**

LOSS OF BUS 72C

Revision Summary

- 1) Added T.S. 3.6.4.3, 3.7.2, 3.7.3, 3.7.4, 3.8.4, and TRM 3.6.8 to references per CARD 11-27937.

Implementation Plan

- 1) This procedure goes into effect upon issuance.
- 2) No further training is required.

Attachments

- 1 021601 Bus 72C De-Energized Loads - MCR
- 2 060204 Bus 72C De-Energized Loads - Plant

Enclosures

- A 060204 List of Affected Loads

<i>Information and Procedures</i>							
DTC	DSN	Revision	Date Issued	DCR #	File #	IP Code:	Recipient
TPNPP	20.300.72C	11	10/27/2011	11-1237	1703.02	I	

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

20.300.72C
Revision 11
Page 2

IF	RBCCW/Div 1 EECW cooling water flow to drywell isolated and cannot be restored.	THEN	Within 2 minutes trip Recirc Pump A.
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CAUTIONS - None

NOTES

1. Entry into Tech Spec LCO 3.0.3 is required while in Mode 1, 2, 3 due to 72CF Auto transfer being inoperable.
2. If ESF Bus 72C Pos 3C opens due to a fault on MCC 72CF, automatic throwover is blocked.
3. The Scoop Tube Positioner will automatically lock on loss of power to the Scoop Tube Positioner.

COMPONENT DESCRIPTIONS

T4100-C012, RR MG Set North Cooling Fan (H11-P817)

T4600-C004, Div 2 SGTS Exhaust Fan (H11-P817)

IMMEDIATE ACTIONS

CONDITION	ACTION
NONE	

SUBSEQUENT ACTIONS

CONDITION	ACTION
	----- NOTE 1 ----- ----- NOTE 2 -----
A. MCC 72CF initially powered from 72C. <input type="checkbox"/>	<input type="checkbox"/> A.1 Verify MCC 72CF transferred to Alternate (23.321).
B. North RR MG Set in service. <input type="checkbox"/>	----- NOTE 3 ----- <input type="checkbox"/> B.1 Place RR MG North Cooling Fan in OFF/RESET, then in RUN. <input type="checkbox"/> B.2 Take Local Manual control of North RR MG Set (23.138.01).
C. RBHVAC tripped. <input type="checkbox"/>	<input type="checkbox"/> C.1 Start Div 2 SGTS.
D. RPS Bus A initially powered from Alternate. <input type="checkbox"/>	<input type="checkbox"/> D.1 Start RPS MG Set A and restore RPS Bus A (23.316). <input type="checkbox"/> D.2 Review loads lost and impact on plant systems (23.316, Enc A).
E. RHR Shutdown Cooling was in service.	E.1 PERFORM 20.205.01, Loss Of Shutdown Cooling.

(continued)

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

20.300.72C
Revision 11
Page 4

IF	RBCCW/Div 1 EECW cooling water flow to drywell isolated and cannot be restored.	THEN	Within 2 minutes trip Recirc Pump A.
-----------	----------------------------------------------------------------------------------------	-------------	---------------------------------------------

CAUTIONS - None

NOTES

4. Loss of 72C results in a loss of all cooling to the South RR MG Set. If 72C cannot be readily restored, shutdown of the South RR MG Set will be required. IPCS Points B31DT2134 through B31DT2139 have an alarm setpoint at 194°F and a Max Design temperature of 248°F.
5. When MPU 4 is powered from its alternate source, and either the normal or alternate source is being supplied by an EDG, the normal supply breaker must be opened to prevent an out of phase transfer from occurring automatically.

COMPONENT DESCRIPTIONS

P4200-C001, North RBCCW Pump (H11-P602)
P4200-C002, Center RBCCW Pump (H11-P602)
P4200-C003, South RBCCW Pump (H11-P602)

SUBSEQUENT ACTIONS (continued)

CONDITION		ACTION	
		----- NOTE 4 -----	
F.	South RR MG Set in service.	<input type="checkbox"/>	<input type="checkbox"/> F.1 Monitor South RR MG temperatures from IPCS Points B31DT2134 through B31DT2139 (H11-P805).
G.	North RBCCW Pump was in service.	<input type="checkbox"/>	<input type="checkbox"/> G.1 Start standby RBCCW Pump. <input type="checkbox"/> G.2 PERFORM 20.127.01, Loss Of Reactor Building Closed Cooling Water System.
H.	Div 1 CCHVAC tripped.	<input type="checkbox"/>	<input type="checkbox"/> H.1 Place Div 1 CCHVAC Mode Select Switch in ALL STOP. <input type="checkbox"/> H.2 Place Div 2 CCHVAC Mode Select Switch in ALL AUTO.
		----- NOTE 5 -----	
I.	MPU 4 initially powered from Normal (Dist Cab 72C-2C Ckt 3).	<input type="checkbox"/>	<input type="checkbox"/> I.1 Verify MPU 4 transferred to Alternate supply (Dist Cab 72B-3B Ckt 5). <input type="checkbox"/> I.2 Open Dist Cab 72C-2C Ckt 3 (RB4-C15). <input type="checkbox"/> I.3 PERFORM 20.300.MPU, Loss Of An MPU.
J.	Components de-energized.	<input type="checkbox"/>	<input type="checkbox"/> J.1 Perform the following: <div style="margin-left: 40px;"><input type="checkbox"/> Attachment 1. <input type="checkbox"/> Attachment 2.</div> <input type="checkbox"/> J.2 Review Enclosure A. <input type="checkbox"/> J.3 Inform ISO via Helpdesk of power loss which affects Fiber Optic Hub 'G' of the LAN/WAN.

(continued)

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

20.300.72C
Revision 11
Page 6

IF	RBCCW/Div 1 EECW cooling water flow to drywell isolated and cannot be restored.	THEN	Within 2 minutes trip Recirc Pump A.
-----------	----------------------------------------------------------------------------------------	-------------	---------------------------------------------

CAUTIONS

1. If Shutdown Cooling (SDC) was in service when power was lost and RPS A was on ALTERNATE, restoring power to MCC 72C-3A will cause E1150-F009 to stroke CLOSED. Verify 72C-3A Pos 3C is OFF prior to energizing MCC 72C-3A, per 23.316, Attachment 4A.

CM

2. If bus protective (lockout) relays actuated, verify bus has been tested and verified fault free prior to bus protective relay reset and bus restoration.

NOTES

1. May need to place Throwover Mode Selector Switch in MANUAL then back to AUTO to reset relay 52xx.

COMPONENT DESCRIPTIONS

R3200-S020B, Div 1 130VDC Batt Charger 2A-2 (H11-P809)
R3200-S020C, Div 1 130VDC Batt Charger 2A1-2 (H11-P809)

R3200-S023B, Div 1 24VDC Batt Charger 2IA-2 (H11-P809)
R3200-S025, Spare 24VDC Battery Charger AB (AB3-F11)

SUBSEQUENT ACTIONS (continued)

CONDITION			ACTION	
K.	Div 1 130VDC Batt Charger 2A-2 tripped.	<input type="checkbox"/>	<input type="checkbox"/> K.1	Place Spare Div 1 130/260VDC Battery Charger in service (23.309).
L.	Div 1 24VDC Batt Charger 2IA-2 tripped.	<input type="checkbox"/>	<input type="checkbox"/> L.1	Place Spare 24VDC Battery Charger AB in service (23.310).
			----- NOTE 1 -----	
			----- CAUTION 1 -----	
			----- CAUTION 2 -----	
M.	Loss of Bus 72C corrected.	<input type="checkbox"/>	<input type="checkbox"/> M.1	Restore power to Bus 72C (23.321).

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Revision 11
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SYMPTOMS

- 9D10, DIV I ESS BUS 72C BKR TRIPPED
- Tripped indication on Bus 64C Pos C11 (H11-P809)
- Tripped indication on Bus 72C Pos 1B (H11-P809)
- Zero volts indicated on 480V Bus Volt Ind, when selected to 72C (H11-P809)
- Zero current indicated on Bus 72C XFMR Pri Current Ind (H11-P809)
- ESF BUS 72C POWER ON light off (H11-P809)

TECHNICAL SPECIFICATIONS

- Section 3.5.1, ECCS—Operating
- Section 3.6.4.3, Standby Gas Treatment (SGT) System
- Section 3.7.2, Emergency Equipment Cooling Water (EECW) / Emergency Equipment Service Water (EESW) System and Ultimate Heat Sink
- Section 3.7.3, Control Room Emergency Filtration (CREF) System
- Section 3.7.4, Control Center Air Conditioning (AC) System
- Section 3.8.7, Distribution Systems-Operating
- Section 3.8.8, Distribution Systems-Shutdown

TECHNICAL REQUIREMENTS MANUAL

- Section TR 3.6.8, Drywell Spray

END OF TEXT

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

BUS 72C DE-ENERGIZED LOADS - MCR

Place the following in OFF/RESET or OPEN as applicable:

H11-P809

- ☐ Bus 72C Pos 1B, 480V Normal Feed To Bus 72C
- ☐ Bus 72C Pos 1C, 480V X-Tie To Bus 72B
- ☐ Bus 72C Pos 2C, 480V Feed To Dist Pnl 72C-2C
- ☐ Bus 72C Pos 4A, 480V Feed To MCC 72C-4A
- ☐ Bus 72C Pos 2D, 480V Feed To Dist Pnl 72C-2D
- ☐ Bus 72C Pos 3C, 480V Normal Feed To MCC 72C-F
- ☐ Bus 72C Pos 3A, 480V Feed To MCC 72C-3A
- ☐ Bus 72C Pos 2A, 480V Feed To MCC 72C-2A
- ☐ Bus 72C Pos 2B, 480V Feed To RB Normal Ltg Pnl MDN-1
- ☐ Bus 64C Pos C11, 4160V Feed To Bus 72C
- ☐ R3200-S020B, Div 1 130VDC Batt Charger 2A-2
- ☐ R3200-S023B, Div 1 24VDC Batt Charger 2IA-2

H11-P601

- ☐ P4400-C001A, Div 1 EECW Pump

H11-P602

- ☐ P4200-C001, North RBCCW Pump
- ☐ G3303-C001A, North RWCU Recirc Pump A
- ☐ G3303-C001B, South RWCU Recirc Pump B

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

BUS 72C DE-ENERGIZED LOADS - MCR

H11-P808

- ☐ T4700-C002, Div 1 DW 2 Spd Cooling Fan #2
- ☐ Bus 72C Pos 4D, Div 1 Standby Gas Treatment System
- ☐ T4100-B007, Div 1 CCHVAC Supply Fan
- ☐ T4100-B009, Div 1 CCHVAC Chiller
- ☐ T4100-C031, Div 1 CCHVAC Return Air Fan
- ☐ T4100-C041, Div 1 CCHVAC Chilled Wtr Pump
- ☐ T4100-B028, Div 1 CCHVAC Equip Room Cooler
- ☐ T4100-C047, Div 1 CCHVAC Emerg Makeup Fan
- ☐ Bus 72C Pos 3B, Div 1 H₂ Recombiner
- ☐ T4100-B016, Div 1 SGTS Room Cooler
- ☐ T4100-B018, Div 1 RHR Pumps Room Cooler
- ☐ T4100-B036, Div 1 TRS Room Cooler
- ☐ T4100-B034, Div 1 EECW Pump Room Cooler

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

BUS 72C DE-ENERGIZED LOADS - MCR

H11-P808

- ☐ T4100-C001, RB East Supply Fan
- ☐ T4100-C002, RB Center Supply Fan
- ☐ T4100-C003, RB West Supply Fan
- ☐ T4100-C004, RB East Exhaust Fan
- ☐ T4100-C005, RB Center Exhaust Fan
- ☐ T4100-C006, RB West Exhaust Fan
- ☐ T4100-C015, RB Sample Sink Bstr Exh Fan
- ☐ T4100-C016, RB CA Equip Room Bstr Exh Fan
- ☐ U4100-C001, TB North Supply Fan
- ☐ U4100-C002, TB Center Supply Fan
- ☐ U4100-C003, TB South Supply Fan
- ☐ U4100-C004, TB North Exhaust Fan
- ☐ U4100-C005, TB Center Exhaust Fan
- ☐ U4100-C006, TB South Exhaust Fan

Place the following in the ALL STOP position:

- ☐ 1st Floor TB Exhaust Booster Fans
- ☐ 2nd Floor TB Exhaust Booster Fans
- ☐ 3rd Floor TB Exhaust Booster Fans
- ☐ Basement TB Exhaust Booster Fans

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

BUS 72C DE-ENERGIZED LOADS - PLANT

CIRC WATER TOWERS

- ☐ Place R1600-S065, North Clg Twr Throwover Switch, in ALTERNATE
- ☐ S/D and restart Cooling Tower Deice System if necessary (23.101)

ON RESPECTIVE TRANSFORMERS

- ☐ Place R1600-S080, Xfmr #64 Aux Power Throw-Over Switch in NORMAL
- ☐ Place R1600-S081, Xfmr #64 Aux Power Throw-Over Switch, in NORMAL

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

LIST OF AFFECTED LOADS

R1400-S023A, Div 1 Bus 72C		
Pos 1B		Normal Feed To Bus 72C
Pos 1C		X-Tie To Bus 72B
Pos 2A		Feed To MCC 72C-2A
Pos 2B		Feed To RB Normal Lighting Panel MDN-1
Pos 2C	R1600-S022B	72C-2C BOP 480 VAC Distribution Panel
Pos 2D	R1600-S022A	72C-2D BOP 480VAC Distribution Panel
Pos 3A		Feed To Bus 72C-3A
Pos 3B		Feed To MCC 72C-3B
Pos 3C		Normal Feed To MCC 72C-F
Pos 3D	P4400-C001A	Div 1 EECW Pump
Pos 4A		Feed To Bus 72C-4A
Pos 4B	T4100-B009	Div 1 CCHVAC Chiller
Pos 4C	P4200-C001	North RBCCW Pump
Pos 4D	R1600-S003F	Div 1 Standby Gas Treatment Fuse Panel
R1600-S022B, Distr Cab 72C-2C		
Ckt 1	T3100-E001	Reactor Building Freight Elevator
Ckt 2		480V AC Service Switches RB 4 Flr RR MG Sets A&B
Ckt 3	R3101-S004	MPU #4 (Normal Source)
Ckt 4		Spare
Ckt 5	F1100-E003A(B)	5th Fl Refueling Platform
Ckt 6		5th Fl Jib Crane Receptacles
Ckt 7	F1100-E023	5th Fl Refueling Crane
Ckt 8	B3103-C003A	North RR MG Set Scoop Tube Positioner
R1600-S022A, Distr Cab 72C-2D		
Ckt 1	R1600-S065	North Cooling Tower Throwover Switch
Ckt 2	C7102-S002A	RPS Alternate Power Supply "A" Transformer
Ckt 3	Y02G583D01 &	Y05G583D01 Transformer Area Welding Receptacles
Ckt 4	T4100-B040A(B)	Div 1 Swgr Rm Compressor/Condenser (Fan Coil Unit)
Ckt 6	R1600-S080	Xfmr #64 Aux Power Throw-Over Switch
Ckt 7	T4100-B056	Cable Tray Area Fan Cooling Unit
Ckt 8	R1700-S002B	72C-2D-1 BOP 120 VAC Distribution Panel
Ckt 9		Spare
Ckt 10	T4100-B057	Second Floor Personnel Change Area A/C Unit

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

LIST OF AFFECTED LOADS

R1600-S022A, Distr Cab 72C-2D		
Ckt 1	R1700-S002C E5101-C003	120VAC Termination Cabinet RCIC Baro Cndr Cond Pump Motor Heater
Ckt 2	R1700-S002C E5101-C004	120VAC Termination Cabinet RCIC Baro Cndr Vacuum Pump Motor Heater
R1600-S003A, MCC 72C-2A		
Pos 1B	T4100-C031	Div 1 CCHVAC Return Air Fan
Pos 1C	T4100-C047	Div 1 CCHVAC Emerg Makeup Fan
Pos 1D	T4100-C041	Div 1 CCHVAC Chilled Water Pump
Pos 2A	T4100-B007	Div 1 CCHVAC Supply Fan Heater #1
Pos 2B	T4100-B007	Div 1 CCHVAC Supply Fan Heater #2
Pos 2D	T4100-D011A	Div 1 CCHVAC Emerg Make-up Air Filter Unit Heater
Pos 1A-R	T4100-B007	Div 1 CCHVAC Supply Fan
Pos 1B-R	T4100-B028	Div 1 CCHVAC Equip Room Cooler
Pos 1C-R	T4100-B016	Div 1 SGTS Room Cooler
Pos 2A-R	T4100-B007	Div 1 CCHVAC Supply Fan Heater #3
Pos 2B-R	T4100-B007	Div 1 CCHVAC Supply Fan Heater #4
Pos 2C-R	T4100-B009A	Div 1 CCHVAC Chiller Oil Pump
Pos 2D-R	T4100-C053	Div 1 CCHVAC Equip Room Cable Tray Cooling Fan
R1600-S003B, MCC 72C-3A		
Pos 1A	P4400-F614	Div 1 EECW To Penet Clr's Iso
Pos 1B	T4804-F603A	Div 1 TRS DW Suct Inbd Iso Vlv
Pos 1C	R3101-S001	MPU #1 Div 1
Pos 2A	T4100-B036	Div 1 TRS Room Cooler
Pos 2C	T4804-F605A	Div 1 TRS Dw Suct Otbd Iso Vlv
Pos 3A	T4100-B018	Div 1 RHR Pumps Room Cooler
Pos 3C	E1150-F009	RHR SDC Inbd Suction Iso Vlv
Pos 3D	E1150-F022	RHR Head Spray Inboard Iso Vlv
Pos 4A	E4150-F002	HPCI Stm Sply Inbd Iso Vlv
Pos 4B	B2103-F016	MS Line Inbd Drain Iso Valve
Pos 4C	P4400-F607B	Div 2 EECW Dw Otbd Return Vlv
	NOTE: EDP 29183	Changed P4400-F607B power supply to Div 1 power source.
Pos 4D	P4400-F606A	Div 1 EECW DW Otbd Supply Vlv
Pos 5A	E1150-F003A	Div 1 RHR Hx Outlet Valve
Pos 5B	E1150-F004C	Div 1 RHR Pump C Torus Suct Iso Vlv

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

LIST OF AFFECTED LOADS

R1600-S003B, MCC 72C-3A (continued)		
Pos 5C	E1150-F006C	Div 1 RHR Pump C SDC Suct Iso Vlv
Pos 5D	E1150-F016A	Div 1 RHR Dw Spray Otbd Iso Vlv
Pos 6A	E1150-F047A	Div 1 RHR Hx Inlet Vlv
Pos 6B	E1150-F068A	Div 1 RHR Hx Serv Wtr Outlet FCV
Pos 6C	E1150-F021A	Div 1 RHR Dw Spray Inbd Iso Vlv
Pos 6D	E1150-F048A	Div 1 RHR Hx Bypass Vlv
Pos 7A	P4400-F602A	Div 1 EECW Makeup Tnk Iso Vlv
Pos 7B	P4400-F605A	Div 1 EECW To NW Sump Hx Iso Vlv
Pos 7C	P4400-F601A	Div 1 EECW Return Iso Vlv
Pos 7D	P4400-F603A	Div 1 EECW Supply Iso Vlv
Pos 8A	E2150-F004A	Div 1 CS Otbd Iso Vlv
Pos 8B	E2150-F005A	Div 1 CS Inbd Iso Vlv
Pos 9A	T4100-B034	Div 1 EECW Pump Room Cooler
Pos 9B	R3200-S023B	Div 1 24VDC Batt Charger 2IA-2
Pos 9C	T4700-C002	Div 1 DW 2 Spd Cooling Fan # 2
Pos 10A	H21-P282	H2-02 Monitoring System Analyzer Cabinet
Pos 10D	P4400-C002A	EECW Div 1 Makeup Pump
Pos 10E	R3200-S020B	Div 1 130VDC Batt Charger 2A-2
R1600-S003E, MCC 72C-3B		
Pos 1A	T4804-Z001	West Hydrogen Recombiner
Pos 1B		Primary Ckt Bkr For 3 KVA Control Transformer
Pos 1C		Ckt Bkr For Blower Motor Starter & Contactor
Pos 1D		Ckt Bkr For Htr Scr Power Controller
Pos 2A		Ckt Bkr Dist Panel "A" 120VAC 1 Phase
72C-3B-2A Ckt Bkr Dist Panel "A" 120VAC 1 Phase		
Ckt 1	H11-P886	Control Power to Control Panel
Ckt 2	H11-P886	Control Power to Control Panel
Ckt 3		Control Power @ MCC
Ckt 4	H11-P886	Control Power to Control Panel
Ckt 5	H11-P886	Control Power to Control Panel
Ckt 6		Control Power for Trickle Htr @ MCC
Ckt 7		Control Power for Wtr Vlv @ MCC
Ckt 8		Spare

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

LIST OF AFFECTED LOADS

R1600-S003C, MCC 72C-4A		
Pos 1A	G3305-C003A	RWCUC F/D A Hold Pump
Pos 1B	G3305-C003B	RWCUC F/D B Hold Pump
Pos 1C	G3305-C004	RWCUC F/D's Precoat Pump
Pos 1D	G3305-D002	RWCUC F/D's Precoat Tank Agitator
Pos 1E	G3305-D110	RWCUC F/D's Resin Tank Agitator
Pos 2A	G3352-F031	Restricting Orifice Byp Vlv
Pos 2B	G3352-F042	RWCUC Return Iso Valve
Pos 2C	G3352-F044	RWCUC F/D Sys Bypass Valve
Pos 2D		(G3352-F104 abandoned in place)
Pos 3A	T4100-C014	RR MG Set South Cooling Fan
Pos 3B	G4153-F035	FPCCUC To CST Drain Valve
Pos 3C	G3352-F119	RWCUC Supply Suct Iso Vlv
Pos 3D	G1101-C028	RWCUC Phase Sep's Sludge Disch Mix Pump
Pos 4A	G4153-F032	FPCCUC F/D Bypass Valve
Pos 4B	T4100-C013	RR MG Set Center Cooling Fan
Pos 4C	T4100-D011	CCHVAC Emerg Makeup Air Filter Unit
Pos 4D	T4100-C016	RB CA Equip Room Bstr Exh Fan
Pos 4E	T4100-C015	RB Sample Sink Bstr Exh Fan
Pos 5A	B3103-S001A	North RR MG Set Motor and Generator Heaters
Pos 5B	B3103-S001B	South RR MG Set Motor and Generator Heaters
Pos 5E	T4100-D016	CCHVAC Recirc Air Filter Unit

END

JOB PERFORMANCE MEASURE

Job Position RO/SRO	No. JP-OP-315-0127-004	Revision 1
JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	Duration 10 Minutes	Page 1

*2 times Duration for ILO Exams

Examinee: SIM

Evaluator: _____

JPM Type: **Normal** / Alternate Path / Time Critical Start Time _____

Evaluation Method: **Perform** / Walkthrough / Discuss Stop Time _____

Location: Plant / **Simulator** / Classroom Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
1.											
* 2.											
* 3.											
* 4.											
* 5.											
* 6.											
.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 2
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OVERALL EVALUATOR COMMENTS:

_____ **PASS** _____ **FAIL**

Evaluator Signature / Date:

/

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 3
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JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware of control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 4
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References: Required (R) / Available (A)

20.300.72E, "Loss of Bus 72E" (R)

Tools and Equipment Required:

None

Preferred Evaluation Method:

Perform	<u> X </u>	Walkthrough	<u> </u>	Discuss	<u> </u>
Plant	<u> </u>	Simulator	<u> X </u>	Classroom	<u> </u>

Evaluator Notes:

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED.

This JPM should be performed in the simulator control room.

K/A Reference:

Safety Function 7: Instrumentation

212000 Reactor Protection System

A2. Ability to (a) predict the impacts of the following on the REACTOR PROTECTION SYSTEM ; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those abnormal conditions or operations:

A2.02 RPS bus power supply failure RO 3.7 SRO 3.9

Task Standard:

Examinee shifts RPS B to Alternate power supply, resets RPS half-scam, NSSSS isolation signals, and restores to one CCHVAC makeup fan operating.

Initial Conditions:

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 5
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- Plant was operating steady state at 100% power.
- No equipment was out of service.
- A loss of MCC 72E-5B has occurred.

Initiating Cue(s):

- You are the CRLNO.
- Plant conditions are as you see them.
- You have been directed to perform Subsequent Actions A and C. of 20.300.RPSA, Loss of RPS B.

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 6
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PERFORMANCE EVALUATION

Time Start _____

<u>Elements</u>	<u>Standards</u>
CUE: Provide Examinee with CUE SHEET.	MCC 72E-5B is deenergized, Normal power to RPS is lost.
1. Verify Div 2 RPS Pwr Source Sel switch red TRANS AVAIL light is on (H11-P810).	1. On Panel H11-P810, verifies that red light is illuminated, indicating that alternate power supply is available.
* 2. Place Div 2 RPS Pwr Source Sel switch in ALTERNATE.	* 2. Places Div 2 RPS Pwr Source Sel switch in ALTERNATE
* 3. Cycle Scram Reset switch.	* 3. On Panel H11-P601, cycles Scram Reset switch.
* 4. Depress Inboard MSIV isolation RESET pushbutton (H11-P601).	* 4. On Panel H11-P601, depresses Inboard MSIV isolation RESET pushbutton.
* 5. Depress Outboard MSIV isolation RESET pushbutton (H11-P602).	* 5. On Panel H11-P602, depresses Outboard MSIV isolation RESET pushbutton.
* 6. Shutdown Emergency Makeup Fan of the non-operating CCHVAC division.	* 6. Shuts down Emergency Makeup Fan of the non-operating CCHVAC division by taking the CMC Switch to OFF/RESET.
Cue: Terminating JPM when Examinee shifts RPS B to Alternate power supply, resets RPS half-scam, NSSSS isolation signals, and restores to one CCHVAC makeup fan operating.	

_____ SATISFACTORY

_____ UNSATISFACTORY

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 7
--------------------------------------------------------------------------------------------------	--------------------------------------------------

Stop Time _____

*** Critical Step**

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 8
--------------------------------------------------------------------------------------------------	--------------------------------------------------

FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for Followup question(s):

Question:

Reference:

Response:

Question:

Reference

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 9
--------------------------------------------------------------------------------------------------	--------------------------------------------------

Response:

JOB PERFORMANCE MEASURE

JPM Title Restore Power to RPS Bus B Following a Loss of Normal Power Supply (Loss of 72E)	No.: JP-OP-315-0127-004 Revision: 0 Page 10
--------------------------------------------------------------------------------------------------	---------------------------------------------------

Simulator Setup

IC#:

IC 17, 100% Power

Malfunctions:

Number	Title	Value
R11 MF2567	TRIP OF 72E-5B (72E-5B MCC/72E)	Active

Remote Functions:

Number	Title	Value
None		

Override Functions:

None

Special Instructions:

Initiate IC17, bring in malfunction and freeze simulator prior to bringing candidate into simulator.

JOB PERFORMANCE MEASURE

Initial Conditions:

- Plant was operating steady state at 100% power.
- No equipment was out of service.
- A loss of MCC 72E-5B has occurred.

Initiating Cue(s):

- You are the CRLNO.
- Plant conditions are as you see them.
- You have been directed to perform Subsequent Actions A and C. of 20.300.RPSA, Loss of RPS B.

JOB PERFORMANCE MEASURE

Initial Conditions:

- Plant was operating steady state at 100% power.
- No equipment was out of service.
- A loss of MCC 72E-5B has occurred.

Initiating Cue(s):

- You are the CRLNO.
- Plant conditions are as you see them.
- You have been directed to perform Subsequent Actions A and C. of 20.300.RPSA, Loss of RPS B.

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

**Plant Technical Procedure - Fermi 2
Abnormal Operating Procedure**

**20.300.RPSB
Revision 0
Page 1**

Reference Use

LOSS OF RPS B

Revision Summary

- 1) New Procedure.

Attachments - None

Enclosures

A 121216 RPS B Impacted Valves

<i>Information and Procedures</i>							
DTC TPNPP	DSN 20.300.RPSB	Revision 0	Date Issued 04/07/2017	DCR # 16-1757	File # 1703.02	IP Code: I	Recipient

FOR TRAINING USE ONLY

20.300.RPSB

Revision 0

Page 2

CAUTIONS - None

NOTES

1. All Subsequent Actions that restore systems assume that RPS B has been energized and MSIV isolation logic has been reset.

COMPONENT DESCRIPTIONS

C7102-S001B, RPS MG Set B

C7100-M605, Scram Reset Switch (H11-P603)

A7100-M120, Inbd MSIV Iso Reset Sw (H11-P601)

A7100-M146, Otbd MSIV Iso Reset Sw (H11-P602)

IMMEDIATE ACTIONS

CONDITION	ACTION
NONE	

SUBSEQUENT ACTIONS

CONDITION	ACTION
A. RPS B initially powered from RPS MG Set B. <input type="checkbox"/>	<input type="checkbox"/> A.1 Verify Div 2 RPS PWR Source Sel Switch red TRANS AVAIL light on (H11-P810). <input type="checkbox"/> A.2 Place Div 2 RPS PWR Source Sel Switch in ALTERNATE (H11-P810).
B. RPS B initially powered from RPS B Alternate Transformer. <input type="checkbox"/>	<input type="checkbox"/> B.1 Start C7102-S001B RPS MG Set B (23.316)
C. RPS B energized. <input type="checkbox"/>	<p align="center">----- NOTE 1 -----</p> <input type="checkbox"/> C.1 Cycle Scram Reset Switch (H11-P603) <input type="checkbox"/> C.2 Depress Inboard MSIV Isolation Reset Pushbutton <input type="checkbox"/> C.3 Depress Outboard MSIV Isolation Reset Pushbutton <input type="checkbox"/> C.4 Shutdown Emergency Makeup Fan of the non-operating CCHVAC division.

(continued)

20.300.RPSB
Revision 0
Page 4

CAUTIONS

1. Do not remove from scan or insert a substitute value for IPCS Point G33DT2502 (Reactor Water Cleanup Inlet Temperature) or G33DT2503 (Reactor Water Cleanup Outlet Temperature).

NOTES

2. RR MG Set should be shutdown if RR Pump Seal Cavity temperatures approach 200°F. Seal damage may occur.
3. Rapidly opening B3100-F008A (B), N (S) RR Pump Seal Wtr Iso Vlv, will cause thermal shock and may result in N (S) RR Pump Seal failure.

COMPONENT DESCRIPTIONS

B3100-F008A, N RR Pump Seal Wtr Iso Vlv (RB1-E11, 12' up)
B3100-F008B, S RR Pump Seal Wtr Iso Vlv (RB1-E11, 12' up)
B3100-F016A, N RR Pump Seal Wtr Otbd Iso (H11-P603)
B3100-F016B, S RR Pump Seal Wtr Otbd Iso (H11-P603)

SUBSEQUENT ACTIONS (continued)

CONDITION	ACTION
D. RHR Shutdown Cooling was in service.	<div> <input type="checkbox"/> <input type="checkbox"/> D.1 Depress E1150-F015B SDC Iso Reset pushbutton and verify E1150-F015B seal in light is off. (H11-P602) </div> <div> <input type="checkbox"/> D.2 PERFORM 20.205.01 Loss of Shutdown Cooling </div> <div> <input type="checkbox"/> D.3 If RHR sampling was aligned, restore sample points as directed by Chemistry. </div>
E. RWCU was in service.	<div> <p align="center">----- CAUTION 1 -----</p> <input type="checkbox"/> <input type="checkbox"/> E.1 If CTP is >15%, direct STA/SNE insert a substitute value of 0 for IPCS Point G33CF6004 [RWCU Inlet Flow (NSSS)]. </div> <div> <input type="checkbox"/> E.2 PERFORM 20.707.01 Loss of RWCU </div>
F. Reactor Recirc Seal Purge isolated AND CRD Pump operating.	<div> <p align="center">----- NOTE 2 -----</p> <input type="checkbox"/> <input type="checkbox"/> F.1 Close B3100-F008A </div> <div> <input type="checkbox"/> F.2 Close B3100-F008B </div> <div> <input type="checkbox"/> F.3 Open B3100-F016A </div> <div> <input type="checkbox"/> F.4 Open B3100-F016B </div> <div> <p align="center">----- NOTE 3 -----</p> <input type="checkbox"/> F.5 Slowly open, over a one to two-minute period, B3100-F008A </div> <div> <input type="checkbox"/> F.6 Slowly open, over a one to two-minute period, B3100-F008B </div>

(continued)

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

20.300.RPSB

Revision 0

Page 6

CAUTIONS - None

NOTES - None

COMPONENT DESCRIPTIONS

T4901-F468, Div 2 DW Pneumatics Sply Otbd Iso Vlv (H11-P817)

T4901-F602, Div 2 DW Pneumatics Sply Inbd Iso Vlv (H11-P817)

G1154-F600, DW Flr Drn Sump Inbd Cntm Iso Vlv (H11-P602)

G1154-F018, DW Equip Drn Sump Inbd Cntm Iso Vlv (H11-P602)

P5002-D002, Div 2 Control Air Compressor

SUBSEQUENT ACTIONS (continued)

CONDITION			ACTION	
G.	Div 2 Drywell Pneumatics isolated	<input type="checkbox"/>	<input type="checkbox"/> G.1	Open T4901-F468.
			<input type="checkbox"/> G.2	Open T4901-F602.
H.	Drywell Floor and Equipment Drain Sumps isolated	<input type="checkbox"/>	<input type="checkbox"/> H.1	Open G1154-F600.
			<input type="checkbox"/> H.2	Take G1154-F018 Reset Switch to Reset.
			<input type="checkbox"/> H.3	Turn Mode Selector Switch S90 for Drywell Equipment Drain Sump Discharge and Recirculation Valves to DISCHARGE and hold until valves have repositioned.
I.	PCRMS Valves isolated.	<input type="checkbox"/>	<input type="checkbox"/> I.1	Start PCRMS (23.408).
J.	Secondary Containment isolation signal received.	<input type="checkbox"/>	<input type="checkbox"/> J.1	Shift CCHVAC to Normal (23.413).
			<input type="checkbox"/> J.2	Start RBHVAC (23.426).
			<input type="checkbox"/> J.3	Shutdown SGTS (23.404).
K.	Div 2 Control Air Compressor Auto started.	<input type="checkbox"/>	<input type="checkbox"/> K.1	Place P5002-D002 CMC in OFF.
			<input type="checkbox"/> K.2	Place P5002-D002 CMC in AUTO.
L.	Components affected.	<input type="checkbox"/>	<input type="checkbox"/> L.1	Review Enclosure A and 23.316 (Enclosure B).
			<input type="checkbox"/> L.2	Restore components to their SOP lineup position or as directed by the CRS

20.300.RPSB
Revision 0
Page 8

SYMPTOMS

10D71, DIV II RPS BUS 1B POWER FAILURE

3D74, TRIP ACTUATORS B1/B2 TRIPPED

TECHNICAL SPECIFICATIONS

Section 3.3.1.1, Reactor Protection System (RPS) Instrumentation

Section 3.3.6.2, Secondary Containment Isolation Instrumentation

Section 3.3.7.1, CREF System Instrumentation

Section 3.4.6, RCS Leakage Detection Instrumentation

Section 3.6.1.3, Primary Containment Isolation Valves

END OF TEXT

RPS B IMPACTED VALVES

H11-P602

B2103-F019, Mn Stm Line Otbd Drain Iso Vlv
B3100-F020, RR Sample Line Otbd Iso Vlv
G1154-F600, DW Flr Drn Sump Inbd Cntm Iso Vlv
G1154-F018, DW Equip Drn Sump Inbd Cntm Iso Vlv
G3352-F004, RWCU Supply Otbd Iso Vlv
G3352-F220, RWCU to FW Otbd Cont Iso Vlv

H11-P603

B3100-F016A, N RR Pump Seal Wtr Otbd Iso
B3100-F016B, S RR Pump Seal Wtr Otbd Iso

H11-P807

G5100-F601, South TWMS Pmp Otbd Suct Iso Vlv
G5100-F603, North TWMS Pmp Otbd Suct Iso Vlv
G5100-F605, TWMS Return to RHR Otbd Iso Vlv
G5100-F607, TWMS Return to CS Otbd Iso Vlv

H11-P808

T4800-F455, DW Press Ctrl Inbd Iso Vlv
T4600-F401, **Torus 20" Purge Iso Vlv**
T5000-F455, PCMS Rad Mon Outlet Inbd Iso Vlv
T5000-F456, PCMS Rad Mon Inlet Inbd Iso Vlv

H11-P817

T46-F421, SC hard Vent Otbd Iso Vlv
T4800-F405, Torus Air Inlet Iso Vlv
T4800-F456, Torus Press Ctrl N2 Sply Iso
T4901-F602, Div 2 DW Pneumatics Sply Inbd Iso Vlv
T4901-F468, Div 2 DW Pneumatics Sply Otbd Iso Vlv

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

RPS B IMPACTED VALVES

H21-P018 (RBB B-15)

E1100-F080A, Div 1 RHR Heat Exch Outlet Sample Otbd Iso Vlv

H21-P021 (RBB B-9)

E1100-F080B, Div 2 RHR Heat Exch Outlet Sample Otbd Iso Vlv

END

JOB PERFORMANCE MEASURE

Job Position SRO / RO	No. JP-OP-315-0166-404	Revision 0
JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	Duration 15 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: SIM

Evaluator: _____

JPM Type: **Normal** / Alternate Path / Time Critical Start Time _____

Evaluation Method: **Perform** / Walkthrough / Discuss Stop Time _____

Location: Plant / **Simulator** / Classroom Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
1.											
* 2.											
3.											
* 4.											
5.											
6.											
7.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ **PASS** _____ **FAIL**

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	No.: JP-OP-315-0166-404 Revision 0 Page 2
-------------------------------------------------------------------------------------------------------	-------------------------------------------------

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	No.: JP-OP-315-0166-404 Revision 0 Page 3
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JPM Information

System:

T4600 - Standby Gas Treatment System

Task:

77039 – Perform Div 2 SGTS Filter & SC Isolation Damper Operability Test

References: Required (R) / Available (A)

24.404.04, "Division 2 SGTS Filter And Secondary Containment Isolation Damper Operability Test" (R)
23.404, "Standby Gas Treatment System" (R)

Tools and Equipment Required:

Marked up copy of 24.404.04 to step 5.2.
Stopwatch

Initial Conditions:

- You are the Third NSO.
- RBHVAC is operating normally, CCHVAC is in the NORMAL Mode, and Div 1 & 2 SGTS are in standby.
- Maintenance is complete on the T4100-F010 Damper (solenoid was replaced).
- The CRS and CRNSO have released partial surveillance 24.404.04.
- The surveillance is scheduled on the POD, to be performed on your shift.
- SPF Form is filled out, approved, and correct.
- The surveillance is complete up to Section 5.2.
- A pre-job brief has been conducted with all participants.
- Sections 3.0 and 4.0 are complete.
- The RB Rounds operator is on the AB 5th Floor, standing by for your direction.

Initiating Cue(s):

The CRS directs you to perform 24.404.04, Division 2 SGTS Filter And Secondary Containment Isolation Damper Operability Test, Section 5.2. (**T4100-F010 ONLY**)

Terminating Cue(s):

Terminate JPM when 8D29, DIV II REAC BLDG ISO PB ARMED clears.

Task Standard:

Perform Division 2 SGTS Filter And Secondary Containment Isolation Damper Operability Test in accordance with 24.404.04.

JOB PERFORMANCE MEASURE

JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	No.: JP-OP-315-0166-404 Revision 0 Page 4
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Licensed Operator Exam Information (required for NRC exams)

Safety Function/Category:

SF9 - Radioactivity Release

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 288000 – Plant Ventilation Systems

K/A STATEMENT:

A3 - Ability to monitor automatic operations of the PLANT VENTILATION SYSTEMS including:

A3.01 Isolation / Initiation Signals..... 3.8 / 3.8

K/A SYSTEM: 290001 – Secondary Containment

K/A STATEMENT:

A4 - Ability to manually operate and/or monitor in the control room:

A4.01 Reactor Building D/P 3.3 / 3.4

A4.12 Surveillance Testing 2.8 / 3.2

Maintenance Rule Safety Classification:

T4600-06

Maintenance Rule Risk Significant? (Yes or No)

Yes

JOB PERFORMANCE MEASURE

JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	No.: JP-OP-315-0166-404 Revision 0 Page 5
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PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
CUE: Inform the examinee that all communications will be directed to you and you will provide the necessary information and response. Provide Examinee with CUE SHEET and the marked up copy of 24.404.04.			
CUE: Report as RB Rounds that SGTS Totalizer Meter indicates 451 hours.			
1.	[5.2.1] Record initial indication on T46-R400B, Div 2 SGTS Elapsed Time Totalizer (T46-P404, AB5-G14).	1.	Directs RB Rounds to obtain SGTS Totalizer Meter Reading.
*2.	[5.2.2] Place collar of Division 2 Manual Isolation TRIP pushbutton in ARMED and verify Annunciator 8D29, DIV II REAC BLDG ISO PB ARMED, alarms.	*2.	Places Div 2 Manual Isolation TRIP pushbutton collar in ARMED. Verifies 8D29, DIV II REAC BLDG ISO PB ARMED, alarms.
3.	[5.2.3] Make the following announcement over the Hi-Com: "Attention all personnel, Division 2 SGTS is now in operation. No use of solvents or painting is permitted in the Reactor Building while SGTS is running."	3.	Makes Hi-Com announcement and Crew Update.
NOTE: RBHVAC will trip, and Div 2 SGTS will auto start, and CCHVAC will shift to Recirculation Mode.			
*4.	[5.2.4] Depress Division 2 Manual Isolation TRIP pushbutton, measure stroke time of T4100-F010 to nearest 1/10th second, then record stroke time and verify acceptance criteria met.	*4.	Observe and record stroke time as follows: <ul style="list-style-type: none"> Depresses Division 2 Manual Isolation TRIP pushbutton and simultaneously start stop watch Measures and records the stroke time for T4100-F010 damper by stopping the stop watch when the red light for the damper extinguishes Verifies the damper stroke time meets the acceptance criteria Records time and initials for acceptance criteria.
5.	[5.2.5] Record indication on T46-R800B, Div 2 SGTS Exh Gas Flow Recorder, and start time.	5.	Records flow on Div 2 SGTS Exh Gas Flow Recorder. Records start time.

JOB PERFORMANCE MEASURE

JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	No.: JP-OP-315-0166-404 Revision 0 Page 6
-------------------------------------------------------------------------------------------------------	-------------------------------------------------

ELEMENT	STANDARD
6. [5.2.6] Place all RBHVAC Supply and Exhaust Fan CMC switches in OFF/RESET.	6. Places/verifies all RBHVAC Supply and Exhaust Fan CMC switches in OFF/RESET. <ul style="list-style-type: none"> T4100-C001, C002, C003 RB (EAST/CENTER/WEST) SUPPLY FAN T4100-C004, C005, C006 RB (EAST/CENTER/WEST) EXHAUST FAN
7. [5.2.7] Place collar of Division 2 Manual Isolation TRIP pushbutton in DISARMED and verify Annunciator 8D29, DIV II REAC BLDG ISO PB ARMED, clears.	7. Places Div 2 Manual Isolation TRIP pushbutton collar in DISARMED, and verifies 8D29, DIV II REAC BLDG ISO PB ARMED, clears.
CUE: Terminate JPM when 8D29, DIV II REAC BLDG ISO PB ARMED clears.	

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____ * Critical Step

JOB PERFORMANCE MEASURE

JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	No.: JP-OP-315-0166-404 Revision 0 Page 7
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Evaluator Notes:

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

System Specific Notes and Cues:

None

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	No.: JP-OP-315-0166-404 Revision 0 Page 8
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FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title Perform Div 2 SGTS Filter and Secondary Containment Isolation Damper Operability Test	No.: JP-OP-315-0166-404 Revision 0 Page 9
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Simulator Setup

IC#:

IC-20 or any full power IC.

Malfunctions:

Number	Title	Value	Delay	Ramp
None				

Remote Functions:

Number	Title	Value	Delay	Ramp
None				

Override Functions:

Number	Title	Value	Delay	Ramp
None				

Special Instructions:

1. Initialize to the desired IC, and place the simulator in **RUN**.

Cue Sheet: (JP-OP-315-0166-404)

Initial Conditions:

- You are the Third NSO.
- RBHVAC is operating normally, CCHVAC is in the NORMAL Mode, and Div 1 & 2 SGTS are in standby.
- Maintenance is complete on the T4100-F010 Damper (solenoid was replaced).
- The CRS and CRNSO have released partial surveillance 24.404.04 (T4100-F010 PMT stroke time) for you to perform.
- The surveillance is scheduled on the POD, to be performed on your shift.
- The SPF Form is filled out, approved, and is correct.
- The surveillance is complete up to Section 5.2.
- A pre-job brief has been conducted with all participants.
- Sections 3.0 and 4.0 are complete.
- The RB Rounds operator is on the AB 5th Floor, standing by for your direction.

Initiating Cue(s):

The CRS directs you to perform 24.404.04, Division 2 SGTS Filter And Secondary Containment Isolation Damper Operability Test, Section 5.2.
(T4100-F010 ONLY)

JOB PERFORMANCE MEASURE
Cue Sheet: (JP-OP-315-0166-404)

Initial Conditions:

- You are the Third NSO.
- RBHVAC is operating normally, CCHVAC is in the NORMAL Mode, and Div 1 & 2 SGTS are in standby.
- Maintenance is complete on the T4100-F010 Damper (solenoid was replaced).
- The CRS and CRNSO have released partial surveillance 24.404.04 (T4100-F010 PMT stroke time) for you to perform.
- The surveillance is scheduled on the POD, to be performed on your shift.
- The SPF Form is filled out, approved, and is correct.
- The surveillance is complete up to Section 5.2.
- A pre-job brief has been conducted with all participants.
- The RB Rounds operator is on the AB 5th Floor, standing by for your direction.

Initiating Cue(s):

The CRS directs you to perform 24.404.04, Division 2 SGTS Filter And Secondary Containment Isolation Damper Operability Test, Section 5.2.
(T4100-F010 ONLY)

JOB PERFORMANCE MEASURE

Job Position SRO / RO	No. JP-OP-315-0150-001	Revision 2
JPM Title Startup Fuel Pool Ventilation Exhaust Radiation Monitor D11-K609A	Duration 15 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: PLANT

Evaluator: _____

JPM Type: **Normal** / Alternate Path / Time Critical

Evaluation Method: Perform / **Walkthrough** / Discuss

Start Time _____

(Circle method used) **Plant** / Simulator / Classroom

Stop Time _____

Total Time: _____

PERFORMANCE EVALUATION SUMMARY							
Element	S	U	Comments	Element	S	U	Comments
* 1.							
* 2.							
* 3.							
4.							
5.							
6.							

_____ SATISFACTORY

_____ UNSATISFACTORY

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ PASS _____ FAIL

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Startup Fuel Pool Ventilation Exhaust Radiation Monitor D11-K609A	No.: JP-OP-315-0150-001 Revision: 2 Page 1
--------------------------------------------------------------------------------	--------------------------------------------------

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Startup Fuel Pool Ventilation Exhaust Radiation Monitor D11-K609A	No.: JP-OP-315-0150-001 Revision: 2 Page 2
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JPM Information

System:

D1100 – Radiation Monitoring

Task:

02D1100007 - Operate the Division I/II Fuel Pool Ventilation Exhaust Radiation Monitors

References: Required (R) / Available (A)

23.625, Process Gaseous Radiation Monitoring (R)

Tools and Equipment Required:

None

Initial Conditions:

- You are the Patrol LNO.
- Troubleshooting was performed on Fuel Pool Ventilation Exhaust Radiation Monitor D11-K609A. Troubleshooting is complete.

Initiating Cue(s):

- The CRS directs you to place Div I Fuel Pool East Ventilation Exhaust Radiation Monitor D11-K609A in service in accordance with 23.625.
- All procedure prerequisites are complete to place this radiation monitor in service.

Terminating Cue(s):

Fuel Pool Vent Exhaust Radiation Monitor D11-K609A is in service per 23.625.

Task Standard:

Fuel Pool Vent Exhaust Radiation Monitor D11-K609A has been started up in accordance with 23.625.

Licensed Operator Exam Information (required for NRC exams)

Safety Function:

9 – Radioactivity Release

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 272000 - Radiation Monitoring System

K/A STATEMENT:

- A1. Ability to predict and/or monitor changes in parameters associated with operating the RADIATION MONITORING SYSTEM controls including: (CFR: 41.5 / 45.5)
- A1.01 Lights, alarms, and indications associated with normal operations. 3.2 / 3.2

Maintenance Rule Safety Classification:

D1100-03

Maintenance Rule Risk Significant? (Yes or No)

Yes

JOB PERFORMANCE MEASURE

JPM Title Startup Fuel Pool Ventilation Exhaust Radiation Monitor D11-K609A	No.: JP-OP-315-0150-001 Revision: 2 Page 3
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PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
NOTE: Cues are indicated on the line above (just prior to) the step for which they are/may be required.			
CUE: Provide examinee with Cue Sheet and copy of 23.625.			
CUE: Mode Selector Switch (S1) is NOT in OPERATE.			
* 1.	[8.2.1.1] At D11-K609A, Div 1 Fuel Pool E Vent Exh Rad Monitor, verify Mode Selector Switch (S1) is in OPERATE.	* 1.	Verifies Mode Selector Switch (S1) is in OPERATE.
CUE: IF candidate calls the Main Control Room, grant permission to place Mode Selector Switch (S1) in OPERATE.			
CUE: Mode Selector Switch (S1) is in OPERATE.			
* 2.	[8.2.1.1] Place Mode Selector Switch (S1) in OPERATE.	* 2.	Places Mode Selector Switch (S1) in OPERATE.
CUE: RESET Pushbutton (S2) has been depressed.			
* 3.	[8.2.1.2] At D11-K609A, Div 1 Fuel Pool E Vent Exh Rad Monitor, depress RESET Pushbutton (S2).	* 3.	Depresses RESET Pushbutton (S2).
CUE: White LOW light (DS-1) is OFF.			
4.	[8.2.1.3.a] At D11-K609A, Div 1 Fuel Pool E Vent Exh Rad Monitor, verify white LOW light (DS-1) is OFF.	4.	Verifies white LOW light (DS-1) is OFF.
CUE: Amber HIGH light (DS-2) is OFF.			
5.	[8.2.1.3.b] At D11-K609A, Div 1 Fuel Pool E Vent Exh Rad Monitor, verify amber HIGH light (DS-2) is OFF.	5.	Verifies amber HIGH light (DS-2) is OFF.
CUE: Alarms 3D27, 3D31, and 3D35 are clear.			
6.	[8.2.2] Verify the following alarms are clear: <ul style="list-style-type: none">3D27, DIV I/II FP VENT EXH RADN MONITOR DNSCL/INOP3D31, DIV I/II FP VENT EXH RADN MONITOR UPSCALE3D35, DIV I/II FP VENT EXH RADN MONITOR UPSCALE TRIP	6.	Contacts the Control Room to verify alarms 3D27, 3D31, and 3D35 are clear.
CUE: End JPM when Fuel Pool Vent Exhaust Radiation Monitor D11-K609A is in service.			

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

* Critical Step

JOB PERFORMANCE MEASURE

JPM Title Startup Fuel Pool Ventilation Exhaust Radiation Monitor D11-K609A	No.: JP-OP-315-0150-001 Revision: 2 Page 4
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Evaluator Notes:

Do not permit the examinee to operate any plant equipment. Placing the Mode Selector Switch in any position other than OPERATE will trip RBHVAC.

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Ex.: Pump start: "Switch has been rotated to the start position, red light is lit, green light is out, amperage initially pegs out high, and is now indicating X amps."

Pump stop: "Switch has been rotated to the stop position, green light is lit, red light is out, amperage indicates 0 amps."

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

Manual valves are checked in the closed direction (MOP02 and MOP05). Valve stem position may aid in valve position determination, but cannot be used as Independent Verification (MOP02).

Ex.: Verify valve closed: "Valve handwheel indicates no valve movement in the clockwise direction."

Verify valve open: "Valve handwheel has been rotated slightly in the clockwise direction and returned to the original positions."

Closing a valve: "Valve handwheel has been rotated in the fully clockwise direction until no additional valve movement. Valve stem is down."

Opening a valve: "Valve handwheel has been rotated in the fully counterclockwise direction until no additional valve movement, valve stem is out."

Controllers have an Auto light that is GREEN when selected and AMBER (YELLOW) when Manual is selected. When in Manual, the open and closed pushbuttons control the parameter to be changed by adjusting position or speed. When the deviation meter is nulled, then the process can be shifted to Auto to allow the desired setpoint to control the process.

System Specific Notes and Cues:

None

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee. Notify Examinee that time compression may be used for activities performed outside of the Control Room. Notify Examinee if JPM is Time Critical (only if JPM is **NOT** Alternate Path.)

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title
Startup Fuel Pool Ventilation Exhaust Radiation Monitor D11-
K609A

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FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title Startup Fuel Pool Ventilation Exhaust Radiation Monitor D11-K609A	No.: JP-OP-315-0150-001 Revision: 2 Page 6
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Simulator Setup

IC#:

N/A

Malfunctions:

Number	Title	Value	Delay	Ramp
N/A				

Remote Functions:

Number	Title	Value	Delay	Ramp
N/A				

Override Functions:

Number	Title	Value	Delay	Ramp
N/A				

Special Instructions:

N/A

Cue Sheet: (JP-OP-315-0150-001)

Initial Conditions:

- You are the Patrol LNO.
- Troubleshooting was performed on Fuel Pool Vent Exhaust Radiation Monitor D11-K609A. The troubleshooting is complete.

Initiating Cue(s):

- The CRS directs you to place the Div I Fuel Pool East Ventilation Exhaust Radiation Monitor D11 K609A in service in accordance with 23.625.
- All procedure prerequisites are complete to place this radiation monitor in service.

Cue Sheet: (JP-OP-315-0150-001)

Initial Conditions:

- You are the Patrol LNO.
- Troubleshooting was performed on Fuel Pool Vent Exhaust Radiation Monitor D11-K609A. The troubleshooting is complete.

Initiating Cue(s):

- The CRS directs you to place the Div I Fuel Pool East Ventilation Exhaust Radiation Monitor D11 K609A in service in accordance with 23.625.
- All procedure prerequisites are complete to place this radiation monitor in service.

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**Plant Technical Procedure - Fermi 2
System Operating Procedure**

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PROCESS GASEOUS RADIATION MONITORING

Revision Summary

- 1) Revised torus vent rad monitor per EDP 3711.

Attachments – See pages 2 and 3

Enclosures

A	121202	Process Gaseous Radiation Monitors
B	061407	Eberline System SS-1 Unit and Channel Number Assignments
C	121202	SS-1 Status Conditions
D	121202	SS-1 System Status Annunciator
E	112895	Communication Error Messages
F	061099	Process Gaseous Radiation Monitors Assignments
G	061099	Process Gaseous Radiation Monitor Trips
H	071099	Table of Required Attachments

<i>Information and Procedures</i>							
DTC	DSN	Revision	Date Issued	DCR #	File #	IP Code:	Recipient
TPNPP	23.625	47	04/13/2017	17-0570	1703.02	I	

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Attachments

1	050306	Off Gas Monitoring Valve Lineup
2	061407	OSSF Vent Exhaust Valve Lineup
3	061407	RB Exhaust Plenum Valve Lineup
4	031201	TB Vent Exhaust Valve Lineup
5	061407	RWB Vent Exhaust Valve Lineup
6	061407	Div 1 SGTS Exhaust Valve Lineup
7	061407	Div 2 SGTS Exhaust Valve Lineup
8	031201	Div 1 SGTS Exhaust ARM AXM-1 Valve Lineup
9	031201	Div 2 SGTS Exhaust ARM AXM-1 Valve Lineup
10	031201	Div 1 RB Vent Exhaust Valve Lineup
11	031201	Div 2 RB Vent Exhaust Valve Lineup
12	111209	Div 1 CCHVAC Emerg Air S Inlet Valve Lineup
13	111209	Div 2 CCHVAC Emerg Air S Inlet Valve Lineup
14	111209	Div 1 CCHVAC Emerg Air N Inlet Valve Lineup
15	111209	Div 2 CCHVAC Emerg Air N Inlet Valve Lineup
16	031201	Div 1 CCHVAC Makeup Air Valve Lineup
17	031201	Div 2 CCHVAC Makeup Air Valve Lineup
18	032912	Fuel Pool Vent Exhaust Electrical Lineup
19	032912	Main Steam Line Electrical Lineup
20	032912	Off Gas Monitoring Electrical Lineup
21	032912	Div 1 Containment Area Hi Range Electrical Lineup
22	032912	RWB Vent Exhaust Electrical Lineup
23	032912	OSSF Vent Exhaust Electrical Lineup
24	032912	RB Exhaust Plenum Electrical Lineup
25	032912	TB Vent Exhaust Electrical Lineup
26	032912	Div 2 Containment Area Hi Range Electrical Lineup
27	032912	Div 1 and Div 2 SGTS Exhaust Electrical Lineup
28	032912	Balance of Plant Monitoring Electrical Lineup
29	022203	Deleted
30	032912	Div 1 Two Minute Holdup Pipe Electrical Lineup
31	032912	Div 2 Two Minute Holdup Pipe Electrical Lineup
32	032912	Div 1 RB Vent Exhaust Electrical Lineup
33	032912	Div 2 RB Vent Exhaust Electrical Lineup
34	032912	Div 1 CCHVAC Makeup Air Electrical Lineup
35	032912	Div 2 CCHVAC Makeup Air Electrical Lineup
36	032912	Div 1 CCHVAC Emerg Air S Inlet Electrical Lineup
37	032912	Div 2 CCHVAC Emerg Air S Inlet Electrical Lineup
38	032912	Div 1 CCHVAC Emerg Air N Inlet Electrical Lineup
39	032912	Div 2 CCHVAC Emerg Air N Inlet Electrical Lineup
40	032912	SS-1 Electrical Lineup
41	041117	Torus Hard Vent Electrical Lineup

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Attachments

42	031201	Off Gas Monitoring Instrument Lineup
43	031201	Fuel Pool Vent Exhaust Instrument Lineup
44	031201	Deleted
45	031201	Div 1 Containment Area Hi Range Instrument Lineup
46	031201	Div 2 Containment Area Hi Range Instrument Lineup
47	031201	Div 1 RB Vent Exhaust Instrument Lineup
48	031201	Div 2 RB Vent Exhaust Instrument Lineup
49	061407	Div 1 CCHVAC Emerg Air S Inlet Instrument Lineup
50	061407	Div 2 CCHVAC Emerg Air S Inlet Instrument Lineup
51	061407	Div 1 CCHVAC Emerg Air N Inlet Instrument Lineup
52	061407	Div 2 CCHVAC Emerg Air N Inlet Instrument Lineup
53	031201	Div 1 CCHVAC Makeup Air Instrument Lineup
54	031201	Div 2 CCHVAC Makeup Air Instrument Lineup
55	031201	Torus Hard Vent Instrument Lineup
56	031201	Div 1 Two Minute Holdup Pipe Instrument Lineup
57	031201	Div 2 Two Minute Holdup Pipe Instrument Lineup
58	031201	Main Steam Line Instrument Lineup

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	MONITORS	

1.0 PURPOSE

To prescribe the method for operating the Process Gaseous Radiation Monitoring System.

1.1 System Description

Each monitoring unit consists of the following components: a detector, a monitor or analyzer, an auxiliary trip unit (when a monitor is used), and a recorder located in the Control Room. Some of the process monitors use sampling devices to draw a sample from the process for examination.

The Process Gaseous Radiation Monitoring System consists of the following monitors:

1.1.1 General Electric

1. *Off-Gas Radiation Monitor System

This monitor subsystem continuously measures the radioactivity in the condenser off-gas at the discharge of the 2.2-minute delay pipe after it has passed through the steam-jet air-ejector and the recombiner. The monitor detects the radiation level which is attributable to the radioactive gases produced in the reactor and transported in the steam through the turbine to the condenser.

2. *Main Steam Line Radiation Monitor System

This monitor subsystem continuously measures the radioactive gases coming from the reactor through the main steam lines. These are activation gases which come mainly from activation of oxygen, and fission gases which come from small fuel leaks and "tramp" uranium impurities. If the reactor fuel fails and a gross release of fission products occurs, the monitoring subsystem provides a trip signal to the RPS to limit fuel damage and to contain the released fission products, thus limiting carryover to the turbine and condenser.

*Denotes Technical Specification/Offsite Dose Calculation Manual (ODCM) Item.

3. *Fuel Pool Ventilation Exhaust Radiation Monitor Systems

This monitor subsystem measures the activity from the fuel pool area ventilation exhaust ducts which discharge into the Reactor Building ventilation exhaust system. The fuel pool contains gaseous activity due to mixing with the reactor coolant system during each refueling. Diffusion of this activity from the pool generates airborne activity which is swept into the spent fuel pool area ventilation system. During refueling operation (including criticality tests) the monitors act to detect a high radiation level in the duct work which could be due to fission gases from a refueling accident or a rod drop accident. Two independent redundant monitors are provided on each of the east and west exhaust duct legs. The detectors are located as far upstream of the building isolation valve as possible to allow for reaction time to close the valve and prevent the release of activity.

1.1.2 Eberline

1. *Reactor Building Exhaust Plenum Radiation Monitor System

This monitor subsystem measures the activity in the Reactor Building exhaust plenum prior to its discharge to the environment. The activity this monitor is designed to detect is due to corrosion and fission products from the Reactor/Auxiliary Building ventilation system and from the off-gas system. The gaseous activity in the exhaust is mainly due to the condenser off-gas. The particulate and iodine activity is accumulated on filters viewed by solid-state beta scintillation, and gamma scintillation detectors. The filters are counted in the chemistry laboratory count room to aid in determining the quantities of specific radionuclides released. The gaseous activity is monitored by a beta scintillator and energy-compensated Geiger-Mueller (G-M) tube viewing the same gas sample volume and a high-range noble gas monitor utilizing another energy-compensated G-M Tube.

*Denotes Technical Specification/ODCM Item.

2. *Standby Gas Treatment System (SGTS) Post-Accident Radiation Monitor System

This monitor subsystem measures the radioactivity in the exhaust vent lines from the SGTS after an accident has occurred and prior to discharge to the environment. The activities these monitors are designed to detect are fission products (following an accident) from the Reactor Building which have been treated by the SGTS (there is a monitor on each SBT system). The activity in the exhaust is expected to be high levels of noble gases resulting from a breach of primary integrity. The gaseous activity of the SGTS unit exhaust is monitored by two energy-compensated Geiger-Mueller (G-M) tubes. In addition, a grab sample pallet contains an energy compensated G-M tube, and a particulate filter and charcoal cartridge in a removable, shielded holder to allow count room analysis of particulates and iodine in the exhaust.

This SGTS Accident Range Radiation Monitoring System is normally maintained in standby condition and changes to a normal operate condition upon receipt of an external "on" signal from its associated System Particulate Iodine Noble Gas (SPING) radiation monitor.

3. *Standby Gas Treatment (SGTS) Radiation Monitor System

This monitor subsystem measures the radioactivity in the exhaust vent lines from the SGTS prior to its discharge to the environment. There is a monitor on both SGTS systems. The activity these monitors are designed to detect is fission products from the Reactor Building which have been treated by the SGTS. If the monitor alarms on one SGTS, the main control room operator can shutdown the faulty SGTS system and use the second SGTS system to clean up the air being discharged. The gaseous activity in the exhaust is expected to normally be below detectable levels. Particulate and iodine activity is accumulated on filters viewed by solid-state beta scintillation, and gamma scintillation detectors. These filters are counted in the chemistry laboratory count room to aid in determining the quantities of specific radionuclides released. The gaseous activity is monitored by a beta scintillator and energy-compensated Geiger-Mueller (G-M) tube viewing the same gas sample volume.

A High Radiation Alarm from the mid-range noble gas detector initiates an external "on" signal to its associated AXM-1 SGTS Post Accident Radiation Monitor system. This monitor then goes into an automatic flush cycle to isolate itself.

Additionally, both the Normal SPING and the AXM have their sample lines heat traced.

*Denotes Technical Specification/ODCM Item.

4. *Turbine Building Ventilation Exhaust Radiation Monitor System

This monitor subsystem measures the radioactivity in the Turbine Building exhaust prior to its discharge to the environment. The activity this monitor detects is from fission products in the steam which may leak from the turbine or other components in the building. The gaseous activity is expected to be normally below detectable levels. The particulate and iodine activity is accumulated on filters viewed by solid-state beta scintillation, and gamma scintillation detectors. The filters are counted in the chemistry laboratory count room to aid in determining the quantities of specific radionuclides released. The gaseous activity is monitored by a beta scintillator and energy-compensated Geiger-Mueller (G-M) tube viewing the same gas sample volume.

5. *Radwaste Building Ventilation Exhaust Radiation Monitor System

This monitor subsystem measures the radioactivity in the Radwaste Building exhaust prior to its discharge to the environment. The activity this monitor detects is from samples in the laboratory fume hoods, tank vents, the extruder fill station, and ventilation exhaust from contaminated cubicles. The gaseous activity is expected to normally be below detectable levels. The particulate and iodine activity is accumulated on filters viewed by solid-state beta scintillation, and gamma scintillation detectors. The filters are counted in the chemistry laboratory count room to aid in determining the quantities of specific radionuclides released. The gaseous activity is monitored by a beta scintillator and energy-compensated Geiger-Mueller (G-M) tube viewing the same gas sample volume.

6. *Onsite Storage Facility Ventilation Exhaust Radiation Monitor System.

This monitor subsystem measures the radioactivity in the Radwaste Onsite Storage Facility exhaust prior to its discharge to the environment. The activity this monitor detects is a result of the storage and handling of radwaste and equipment in the building. Any type of activity is normally expected to be below detectable levels. The particulate and iodine activity is accumulated on filters viewed by solid-state beta scintillation, and gamma scintillation detectors. The filters are counted in the chemistry laboratory count room to aid in determining the quantities of specific radionuclides released. The gaseous activity is monitored by a beta scintillator and energy-compensated Geiger-Mueller (G-M) tube viewing the same gas sample volume.

*Denotes Technical Specification/ODCM Item.

1.1.3 Gulf

1. *Control Center Makeup Air Radiation Monitor System

This monitor system measures the activity in the makeup air to the main Control Room. No measurable activity is expected to be present in the makeup air. However, in the event of a design basis accident, fission gases could escape from the main coolant system and be drawn into the makeup air intake. There are redundant monitors at the makeup air intake.

A representative sample for each monitor is extracted from the ventilation duct which passes through the gas monitor, a low-flow alarm switch, and finally through a sample pump before being returned to the ventilation duct.

2. Two-Minute Holdup Pipe Exhaust Radiation Monitor System

This monitor system measures the activity from the mechanical vacuum pumps after the discharge from the two-minute delay pipe. In addition, it also monitors the turbine gland sealing system exhaust which enters the off-gas system at the discharge of the mechanical vacuum pumps. The mechanical vacuum pumps are normally used only during startup to remove large quantities of air from the system at high flow rates. After the off-gas flow-rate is reduced to normal levels, the flow is rerouted through the off-gas treatment system and the mechanical vacuum pumps are shut off. The monitors initially detect the activity due to fission gases produced in the reactor and transported in the steam through the turbine to the condenser. Later, the monitors detect the same gases which come through the turbine gland sealing system. Two redundant monitors are provided with the detectors mounted adjacent to the discharge line.

Each shielded monitor has a gamma-sensitive scintillation detector which is mounted adjacent to the off-gas pipe.

*Denotes Technical Specification/ODCM Item.

3. Control Center Emergency Air Inlets Radiation Monitor System

This monitor system measures the activity in the emergency air supply ducts to the main Control Room. No measurable activity is expected in the emergency air supply. A secondary emergency air makeup intake is added to the north side of the auxiliary building, along with radiation detectors in both the existing air makeup intake and the second air intake. Therefore, either inlet for makeup air to the control center can be selected from either side of the potential release points, depending on the relative activity.

A representative sample for each of the four monitors is extracted from the emergency ventilation duct through a stainless steel sample tube, which passes through the gas monitor, a low-flow alarm switch, and a sample pump before being returned to the duct.

4. Station Air to RWCU Filter Demin

NOTE: Station Air to RWCU Filter Demin is not installed at this time.

5. *Reactor Building Ventilation Exhaust Radiation Monitor System

This monitor subsystem measures the radioactivity in the Reactor Building ventilation system exhaust duct prior to its discharge from the building. During normal operation and during refueling operation (including criticality tests), the monitors act to detect a high activity level in the ductwork. Two redundant monitors are located on the common line upstream of the isolation dampers.

A continuous representative sample is extracted from the common duct through a low flow alarm switch, the gas monitor, and then through a sample pump prior to being returned to the ventilation duct.

6. *Containment Area High Range Radiation Monitor System

This monitor subsystem measures the radioactivity in the containment area for detection of intense gamma radiation. The gamma radiation detector, a gamma ionization chamber, detects radiation from 100 to 108 R/hr. The detector is encased in stainless steel to protect it from containment sprays and high temperature. Two independent monitors are located in the containment and input to monitors in the Relay Room to give alarms to aid the operator in assessing conditions during accident conditions.

*Denotes Technical Specification/ODCM Item.

2.0 REFERENCES

2.1 Use References - None

2.2 Potential Use References

2.2.1 Procedures

- 23.413, Control Center HVAC
- 3D4, DIV I/II OFF GAS RADN MONITOR TROUBLE
- 3D8, DIV I/II OFF GAS RADN MONITOR UPSCALE
- 3D12, DIV I/II OFF GAS RADN MONITOR HIGH-HIGH
- 3D16, 2 MINUTE HOLDUP PIPE RADN MONITOR TROUBLE
- 3D20, 2 MINUTE HOLDUP PIPE RADN MONITOR UPSCALE
- 3D24, 2 MINUTE HOLDUP PIPE RADN MONITOR UPSCALE TRIP
- 3D27, DIV I/II FP VENT EXH RADN MONITOR DNSCL/INOP
- 3D28, DIV I/II RB VENT EXH RADN MONITOR TROUBLE
- 3D31, DIV I/II FP VENT EXH RADN MONITOR UPSCALE
- 3D32, DIV I/II RB VENT EXH RADN MONITOR UPSCALE
- 3D33, OFF GAS RADN MONITOR END OF TIMER PERIOD
- 3D35, DIV I/II FP VENT EXH RADN MONITOR UPSCALE TRIP
- 3D36, DIV I/II RB VENT EXH RADN MONITOR UPSCALE TRIP
- 3D37, CONT CENTER MAKEUP AIR RADN MONITOR TROUBLE
- 3D38, CONT CENTER EMERG AIR DIV I RADN MON TROUBLE
- 3D39, CONT CENTER EMERG AIR DIV II RADN MON TROUBLE
- 3D41, CONT CENTER MAKEUP AIR RADN MONITOR UPSCALE
- 3D42, CONT CENTER/RB VENT RADN MON FLOW LOW

- 3D43, DIV I/II CONTM AREA RADN MONITOR TROUBLE
- 3D44, EFFLUENT PROCESS RADN MONITOR TROUBLE
- 3D45, CONT CENTER MAKEUP AIR RADN MONITOR UPSCALE TRIP
- 3D46, RW BLDG VENT EXHAUST RADN MONITOR UPSCALE/INOP
- 3D48, TURBINE BLDG VENT EXHAUST RADN MONITOR UPSCALE/INOP
- 3D73, TRIP ACTUATORS A1/A2 TRIPPED
- 3D74, TRIP ACTUATORS B1/B2 TRIPPED
- 3D82, MN STM LINE RADIATION UPSCL/INOP CHANNEL TRIP
- 3D83, MN STM LINE CH A/B/C/D RADN MONITOR UPSCALE
- 3D84, MN STM LINE CH A/B/C/D RADN MONITOR DOWNSCALE
- 3D10-RWC, RW BLDG VENT EXHAUST RADIATION UPSCALE
- 3D12-RWC, RW BLDG VENT EXHAUST RADIATION UPSCALE TRIP

2.2.2 Technical Specifications/TRM/ODCM

- Technical Specifications, Section 3.3.1.1, Reactor Protection System (RPS) Instrumentation
- Technical Specifications, Section 3.3.3.1, Post Accident Monitoring (PAM) Instrumentation
- Technical Specifications, Section 3.3.6.1, Primary Containment Isolation Instrumentation
- Technical Specifications, Section 3.3.6.2, Secondary Containment Isolation Instrumentation
- Technical Specifications, Section 3.3.7.1, Control Room Emergency Filtration (CREF) System Instrumentation.

- TRM Section TR 3.3.1.1, Reactor Protection System (RPS) Instrumentation
- TRM Section TR 3.3.3, Accident Monitoring Instrumentation
- TRM Section TR 3.3.6.1, Primary Containment Isolation Instrumentation
- TRM Section TR 3.3.6.2, Secondary Containment Isolation Instrumentation
- TRM Section TR 3.3.7.1, Control Room Emergency Filtration (CREF) System Instrumentation
- ODCM Section 3.3.7.12, Radioactive Gaseous Effluent Monitoring Instrumentation

2.2.3 Drawings

I-2181-01	System Diagram – Process Radiation Monitor Subsystems
I-2185-01	Schematic Diagram – Process Radiation Monitoring System Powering Distribution
I-2185-02	Schematic Diagram – Process Radiation Monitoring System Annunciator Inputs
I-2185-03	Schematic Diagram – Process Radiation Monitoring System Main Steam Line Rad Mon Subsystem D1103
I-2185-04	Schematic Diagram – Process Radiation Monitoring System Off Gas Rad Mon Subsystem D1102
I-2185-05	Schematic Diagram – Process Radiation Monitoring System Off Gas Vent Pipe Rad Mon Subsystem
I-2185-07	Schematic Diagram – Process Radiation Monitoring System Fuel Pool Ventilation Rad Mon Subsystem Part 1
I-2185-08	Schematic Diagram – Process Radiation Monitoring System Fuel Pool Ventilation Rad Mon Subsystem Part 2

3.0 PRECAUTIONS AND LIMITATIONS

- 3.1 Trips initiated on the Gulf RP-30 modules (during a test or otherwise) will actuate its associated control function unless trip contacts have been jumpered.
- 3.2 Placing the Mode Selector switch for the Main Steam Line Radiation monitors in any position other than OPERATE will actuate RPS and NSSS trip logic.
- 3.3 Placing the Mode Selector switch of the Fuel Pool Monitoring Sub System INDICATOR and TRIP UNIT to any position other than "OPERATE" will produce the equivalent of a "HIGH RADIATION TRIP" of this Subsystem.
- 3.4 Eberline monitor flush sequence shall be initiated only as directed by Radiation Protection.
- 3.5 Notify Radiation Protection whenever any Process Radiation Monitor's status is changed (placed in service, removed from service, flushed, placed in standby, etc).
- 3.6 Trips initiated on the following Eberline Sping Monitors during a functional test will actuate its associated control function:
 - D11-P279, TB Vent Exhaust Sping
 - D11-P281, RWB Vent Exhaust Sping
- 3.7 SS-1 provides the alarm function required by ODCM 3.3.7.12 for each low range noble gas activity monitor, as well as providing required functions for SGTS AXMs required by TR 3.3.3. Ensure compliance when the SS-1 is out of service.
- 3.8 If SS-1 locks-up and a reset restores function, a CARD needs to be written to trigger Maintenance Rule Functional Failure review.
- 3.9 During the initial minutes of an accident transient, spurious signals may occur in the reading from the Containment Area High Range Radiation Monitors.

END OF SECTION

8.0 D11-K609A, B, C, D, DIV 1 AND DIV 2 FUEL POOL E AND W VENT EXH DUCT RAD MONITORS

NOTE: All controls and indications for D11-K609A, B, C, D, Div 1 and 2 Fuel Pool E and W Vent Exh Rad Monitors, are located on RR H11-P606.

8.1 Prerequisites

- 8.1.1 Applicable Process Gaseous Radiation Monitoring Lineups have been completed.
- 8.1.2 D11-K609A, B, C, D, Div 1 and 2 Fuel Pool E and W Vent Exh Rad Monitors, have been calibrated and functionally tested in accordance with applicable I&C procedure.

8.2 Detailed Procedure

NOTE: D11-R605, Fuel Pool Vent Exh East Duct PRMS Recorder (COP H11-P601), has two inputs: D11-K609A and B, Div 1 and Div 2 Fuel Pool E Vent Exh Rad Monitor (blue pen and red pen). D11-R606, Fuel Pool Vent Exh West Duct PRMS Recorder (COP H11-P812), has two inputs: D11-K609C and D, Div 1 and Div 2 Fuel Pool W Vent Exh Rad Monitor (blue pen and red pen).

CAUTION

Placing the Mode Selector Switch (S1) in any position other than OPERATE will trip Reactor Bldg HVAC.

- 8.2.1 Perform the following steps at each Fuel Pool Vent Exh Duct Rad Monitor:
 - D11-K609A, Div 1 Fuel Pool E Vent Exh Rad Monitor
 - D11-K609B, Div 2 Fuel Pool E Vent Exh Rad Monitor
 - D11-K609C, Div 1 Fuel Pool W Vent Exh Rad Monitor
 - D11-K609D, Div 2 Fuel Pool W Vent Exh Rad Monitor
1. Verify Mode Selector Switch (S1) is in OPERATE.
 2. Depress RESET Pushbutton (S2).

3. Verify following conditions on monitor module:

- a. White LOW Light (DS-1) is OFF.
- b. Amber HIGH Light (DS-2) is OFF.

8.2.2 Verify the following alarms are clear:

- 1. Annunciator 3D27, DIV I/II FP VENT EXH RADN MONITOR DNSCL/INOP.
- 2. Annunciator 3D31, DIV I/II FP VENT EXH RADN MONITOR UPSCALE.
- 3. Annunciator 3D35, DIV I/II FP VENT EXH RADN MONITOR UPSCALE TRIP.

END OF SECTION

JOB PERFORMANCE MEASURE

Job Position NO	No. JP-OP-802-3006-305	Revision 4
JPM Title Defeat ARI Logic Trips	Duration 30 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: PLANT

Evaluator: _____

JPM Type: **Normal** / Alternate Path / Time Critical Start Time _____

Evaluation Method: Perform / **Walkthrough** / Discuss Stop Time _____

Location: **Plant** / Simulator / Classroom Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
1.											
2.											
* 3.											
* 4.											
5.											
* 6.											
* 7.											
8.											
* 9.											
* 10.											
* 11.											
* 12.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ **PASS** _____ **FAIL**

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Defeat ARI Logic Trips	No.: JP-OP-802-3006-305 Revision: 4 Page 2
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JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Defeat ARI Logic Trips	No.: JP-OP-802-3006-305 Revision: 4 Page 3
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JPM Information

System:

C1150 – Control Rod Drive Hydraulic System

Task:

75837 - Defeat ARI Level 2 Trips
75838 - Defeat ARI High Pressure Trips

References: Required (R) / Available (A)

29.ESP.10, Defeat of ARI Logic Trips (R)

Tools and Equipment Required:

None

Initial Conditions:

- You are the Reactor Building Rounds Operator.
- The plant has scrammed, and power is **NOT** less than 3%.

Initiating Cue(s):

The CRS directs you to defeat ARI Logic Trips per 29.ESP.10 for level **AND** pressure.

Terminating Cue(s):

ARI logic trips have been defeated per 29.ESP.10.

Task Standard:

ARI functions have been defeated in accordance with 29.ESP.10.

Licensed Operator Exam Information (required for NRC exams)

Safety Function:

1 – Reactivity Control

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 295037- SCRAM Condition Present and Reactor Power Above APRM Downscale or Unknown

K/A STATEMENT:

EA1 Ability to operate and/or monitor the following as they apply to SCRAM CONDITION PRESENT AND REACTOR POWER ABOVE APRM DOWNSCALE OR UNKNOWN :

EA1.03 ARI/RPT/ATWS: Plant-Specific.....4.1 / 4.1

Maintenance Rule Safety Classification:

C1100-03

Maintenance Rule Risk Significant? (Yes or No)

Yes

JOB PERFORMANCE MEASURE

JPM Title Defeat ARI Logic Trips	No.: JP-OP-802-3006-305 Revision: 4 Page 4
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PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
NOTE: Cues are indicated on the line above (just prior to) the step for which they are/may be required.			
CUE: Provide Examinee with CUE SHEET.			
1.	[1.1] Obtain EOP Cabinet key.	1.	Examinee obtains the key to the EOP cabinet from the SM, CRS or SM Key Locker.
CUE: Hand examinee a copy of 29.ESP.10 and a laser pointer after the examinee demonstrates how he would obtain an Emergency Support Procedure Package from the SM's locked cabinet. Examinee should indicate any necessary tools he will take with him.			
2.	[1.1] Open EOP Cabinet and obtain ESP support package.	2.	Examinee opens cabinet, finds the correct package and ensures the proper equipment is in the package.
NOTE: Examinee should proceed to Testability Panels on Aux Building Fourth Floor (AB4).			
NOTE: Plug-in relays have seismic clips which need to be removed first and then the relays are grasped on both sides and pulled straight back out of the cabinet. Minimum PPE per ODE14 Attachment 9 is safety glasses and 100% cotton long sleeve shirts.			
CUE: B3100-M038A is removed.			
* 3.	[2.1.1] At H21-P082 (AB4-F12): Remove plug-in relay B3100-M038A.	* 3.	Locates relay and describes removal. (Squeeze both sides of Seismic Clips, then pull to remove. Next grasp the relay on both sides and pull to remove, then place relay in package.)
CUE: B3100-M038C is removed.			
* 4.	[2.1.2] At H21-P082 (AB4-F12): Remove plug-in relay B3100-M038C.	* 4.	Locates relay and describes removal.
CUE: Removed relays are in the EOP Defeat Package.			
5.	[2.1.3] Places removed relays in the EOP Defeat Package.	5.	Places removed relays in the EOP Defeat Package.
CUE: B3100-M038B is removed.			
* 6.	[2.2.1] At H21-P083 (AB4-F11): Remove plug-in relay B3100-M038B.	* 6.	Locates relay and describes removal.
CUE: B3100-M038D is removed.			
* 7.	[2.2.2] At H21-P083 (AB4-F11): Remove plug-in relay B3100-M038D.	* 7.	Locates relay and describes removal.
CUE: Removed relays are in the EOP Defeat Package.			
8.	[2.2.3] Places removed relays in the EOP Defeat Package.	8.	Places removed relays in the EOP Defeat Package.

JOB PERFORMANCE MEASURE

JPM Title Defeat ARI Logic Trips	No.: JP-OP-802-3006-305 Revision: 4 Page 5
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ELEMENT		STANDARD	
CUE: B21-N611A SETPOINT Pot is fully clockwise.			
* 9.	[3.1.1] At H21-P082 (AB4-F12): Adjust MTU SET POINT ADJ Pot fully clockwise on B21-N611A using a small screwdriver.	* 9.	Locates MTU and SETPOINT Pot and describes clockwise adjustment.
CUE: B21-N611C SETPOINT Pot is fully clockwise.			
* 10.	[3.1.2] At H21-P082 (AB4-F12): Adjust MTU SET POINT ADJ Pot fully clockwise on B21-N611C using a small screwdriver.	* 10.	Locates MTU and SETPOINT Pot and describes clockwise adjustment.
CUE: B21-N611B SETPOINT Pot is fully clockwise.			
* 11.	[3.2.1] At H21-P083 (AB4-F11): Adjust MTU SET POINT ADJ Pot fully clockwise on B21-N611B using a small screwdriver.	* 11.	Locates MTU and SETPOINT Pot and describes clockwise adjustment.
CUE: B21-N611D SETPOINT Pot is fully clockwise.			
*12.	[3.2.2] At H21-P083 (AB4-F11): Adjust MTU SET POINT ADJ Pot fully clockwise on B21-N611D using a small screwdriver.	*12.	Locates MTU and SETPOINT Pot and describes clockwise adjustment.
Cue: IF candidate contacts the Main Control Room, acknowledge that 29.ESP.10 is complete.			
CUE: End JPM when 29.ESP.10 is complete for level and pressure.			

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

* Critical Step

JOB PERFORMANCE MEASURE

JPM Title
Defeat ARI Logic Trips

No.: JP-OP-802-3006-305

Revision: 4

Page 6

Evaluator Notes:

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

FAILURE TO WEAR ALL PPE REQUIRED FOR TASK PERFORMANCE WILL RESULT IN FAILURE OF THIS JPM.

Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Ex.: Pump start: "Switch has been rotated to the start position, red light is lit, green light is out, amperage initially pegs out high, and is now indicating X amps."

Pump stop: "Switch has been rotated to the stop position, green light is lit, red light is out, amperage indicates 0 amps."

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

Manual valves are checked in the closed direction (MOP02 and MOP05). Valve stem position may aid in valve position determination, but cannot be used as Independent Verification (MOP02).

Ex.: Verify valve closed: "Valve handwheel indicates no valve movement in the clockwise direction."

Verify valve open: "Valve handwheel has been rotated slightly in the clockwise direction and returned to the original positions."

Closing a valve: "Valve handwheel has been rotated in the fully clockwise direction until no additional valve movement. Valve stem is down."

Opening a valve: "Valve handwheel has been rotated in the fully counterclockwise direction until no additional valve movement, valve stem is out."

Controllers have an Auto light that is GREEN when selected and AMBER (YELLOW) when Manual is selected. When in Manual, the open and closed pushbuttons control the parameter to be changed by adjusting position or speed. When the deviation meter is nulled, then the process can be shifted to Auto to allow the desired setpoint to control the process.

System Specific Notes and Cues:

ESP Defeats are installed either by installing a jumper, lifting leads, or removing a plug-in relay or fuse.

Installing Jumpers:

- Ensure the operator goes to the SM and obtains the key to the EOP cabinet.
- Upon unlocking the cabinet, the operator finds the correct package and ensures the proper equipment is in the package.
- Per the attached drawing, locate the panel and verify the panel opened is correct and the operator has opened the correct side door.
- Within the panel, locate the proper terminal strip and verify that the proper terminal number is selected.
- Using proper safety techniques, a jumper is landed on each terminal ensuring that no other terminal is touched or cabinet ground is touched with the free end.
- Repeat until all jumpers are installed per the package.
- For some cabinets, the terminals are separated load to source side of the terminal point by a Knife Switch. In these cabinets the direction of the ESP has the knife switch screw unlocked and opened prior to installing the defeat. This will be spelled out and then the same rules as above apply.

JOB PERFORMANCE MEASURE

JPM Title Defeat ARI Logic Trips	No.: JP-OP-802-3006-305 Revision: 4 Page 7
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- When both ends are safely landed on all jumpers per the package in the proper location, the operator calls the control room and informs them that the defeat is installed.

Lifting Leads:

- Ensure the operator goes to the SM and obtains the key to the EOP cabinet.
- Upon unlocking the cabinet, the operator finds the correct package and ensures the proper equipment is in the package.
- Per the attached drawing, locate the panel and verify the panel opened is correct and the operator has opened the correct side door.
- Within the panel, locate the proper terminal strip and verify that the proper terminal number is selected.
- Using the proper safety techniques, remove the locking screw and remove the wire from the terminal point keeping it from making contact with the other cabinet wiring or cabinet sides.
- Tape the wire electrical end or install the boot provided.
- For some terminal points, more than one wire will be terminated at the proper point. For these, the instruction will read "Lift and separate leads". This means remove the leads safely and place each into boots or tape separately.
- For some cabinets, the terminals are separated load to source side of the terminal point by a Knife Switch. In these cabinets the direction of the ESP has the knife switch screw unlocked and opened prior to installing the defeat. This will be spelled out and then the same rules as above apply.
- When all leads are removed per the package in the proper location, the operator calls the control room and informs them that the defeat is complete.

Remove Plug-in Relay or Fuse:

- Ensure the operator goes to the SM and obtains the key to the EOP cabinet.
- Upon unlocking the cabinet, the operator finds the correct package and ensures the proper equipment is in the package.
- Per the attached drawing, locate the panel and verify the panel opened is correct and the operator has opened the correct side door.
- Locate the plug-in relay or fuse and verify the defeat package to the relay, or fuse in question, labels.
- Plug-in relays have seismic clips which need to be removed first and then grasped on either side and pulled straight back out of the cabinet.
- Fuses need to be grasped by fuse pullers and pulled out evenly and in one motion. There is a fuse identifier mylar cover on some fuses which needs to be removed to reach the fuse.
- The one exception is the Main Turbine Bypass Dump System fuses which set in the H11P632 cabinet in a fuse block. FS59 & FS60 are contained in a block that can be pulled out much like the plug-in relay without the seismic clip.
- When all steps are complete, contact the control room and announce that the defeat is completed

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

JPM Title Defeat ARI Logic Trips	No.: JP-OP-802-3006-305 Revision: 4 Page 8
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FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title Defeat ARI Logic Trips	No.: JP-OP-802-3006-305 Revision: 4 Page 9
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Simulator Setup

IC#:

N/A

Malfunctions:

Number	Title	Value	Delay	Ramp
N/A				

Remote Functions:

Number	Title	Value	Delay	Ramp
N/A				

Override Functions:

Number	Title	Value	Delay	Ramp
N/A				

Special Instructions:

N/A

Cue Sheet (JP-OP-802-3006-305)

Initial Conditions:

- You are the Reactor Building Rounds Operator.
- The plant has scrammed, and power is **NOT** less than 3%.

Initiating Cue(s):

The CRS directs you to defeat ARI Logic Trips per 29.ESP.10 for level **AND** pressure.

Cue Sheet (JP-OP-802-3006-305)

Initial Conditions:

- You are the Reactor Building Rounds Operator.
- The plant has scrammed, and power is **NOT** less than 3%.

Initiating Cue(s):

The CRS directs you to defeat ARI Logic Trips per 29.ESP.10 for level **AND** pressure.

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

**Emergency Support
Procedure**

**29.ESP.10
Revision 4
Page 1**

DEFEAT OF ARI LOGIC TRIPS

Revision Summary

- 1) Added a Table of Contents and separated each major section onto a separate page per CARD 99-19350. No rev bars used.
- 2) Changed NSS/NASS to SM/CRS respectively. No rev bars used.
- 3) Added steps to Section 2.0 to address storing of removed components per CARDS 99-12296 and 01-17317.

Implementation Plan

- 1) This procedure goes into effect upon issuance.
- 2) No training is required.

Continuous Use

This procedure SHALL be performed as written. Each step shall be read by the user before performing that step; performed in the sequence given; and when required, signed off as it is completed before proceeding to the next step.

Attachments - None

Enclosures - None

<i>Information and Procedures</i>				
DSN 29.ESP.10	Revision 4	DCR# 01-1689	DTC TPNPP	File # 1703.02
IP Code I	Date Approved 10-30-01	Released By D. Adams/s/	Date Issued 10-30-01	Recipient

FOR TRAINING USE ONLY

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1.0 Required Equipment.....	3
2.0 Defeat of ARI Level 2 Trips.....	3
3.0 Defeat of ARI High Press Trips	4
Material and Equipment Available	4
References	5

PURPOSE

This procedure provides instructions for defeating all ARI Logic Trips when directed by the Emergency Operating Procedure or Severe Accident Guideline Flowcharts. Performance of Section 2.0 removes the reactor low level inputs to ARI, allowing multiple trips and resets of ARI from the Control Room. Normally only Section 2.0 is necessary. If a High Press condition exists, Section 3.0 may be performed to move High Press Trip setpoints up out of the way.

1.0 REQUIRED EQUIPMENT

- ☐ 1.1 EOP Defeat Package from SM EOP Locker. A key to this locker is available from the SM, CRS, and the SM Key Locker.

2.0 DEFEAT OF ARI LEVEL 2 TRIPS

2.1 At H21-P082 (AB4-F12):

- ☐ 2.1.1 Remove plug-in relay B3100-M038A.
- ☐ 2.1.2 Remove plug-in relay B3100-M038C.
- ☐ 2.1.3 Place removed relays in the EOP Defeat Package. |

2.2 At H21-P083 (AB4-F11):

- ☐ 2.2.1 Remove plug-in relay B3100-M038B.
- ☐ 2.2.2 Remove plug-in relay B3100-M038D.
- ☐ 2.2.3 Place removed relays in the EOP Defeat Package. |

END OF SECTION

3.0 DEFEAT OF ARI HIGH PRESS TRIPS

NOTE: This section only needs to be performed if the ARI High Press Trip is not clear.

3.1 At H21-P082 (AB4-F12):

- ☐ 3.1.1 Adjust MTU SET POINT ADJ Pot fully clockwise on B21-N611A using a small screwdriver.
- ☐ 3.1.2 Adjust MTU SET POINT ADJ Pot fully clockwise on B21-N611C using a small screwdriver.

3.2 At H21-P083 (AB4-F11):

- ☐ 3.2.1 Adjust MTU SET POINT ADJ Pot fully clockwise on B21-N611B using a small screwdriver.
- ☐ 3.2.2 Adjust MTU SET POINT ADJ Pot fully clockwise on B21-N611D using a small screwdriver.

MATERIAL AND EQUIPMENT AVAILABLE

The EOP Defeat Package for this procedure contains:

- One small screwdriver
- H21-P082 Key 98
- H21-P083 Key 99
- An Operator key

The SM EOP Locker contains the following materials:

- Flashlights
- Low voltage electrical gloves
- Leather gloves
- Electrical tape

Additional material and equipment is available in the Emergency Equipment Lockers. Procedure 28.508.04, "Emergency Equipment Monthly Inventory/Inspection," contains a listing of locations, material, and equipment.

REFERENCES

I-2045-23

I-2045-28A

I-2055-11

I-2055-24

I-2105-17

I-2105-18

I-2105-19

I-2282-43

I-2282-48

END

JOB PERFORMANCE MEASURE

Job Position SRO / RO	No. JP-OP-802-3006-321	Revision 3
JPM Title Defeat RBCCW/EECW to Drywell Isolations	Duration 25 minutes*	Page 1

*2 times Duration for ILO Exams

Examinee: PLANT

Evaluator: _____

JPM Type: **Normal** / Alternate Path / Time Critical Start Time _____

Evaluation Method: Perform / **Walkthrough** / Discuss Stop Time _____

Location: **Plant** / Simulator / Classroom Total Time: _____

PERFORMANCE EVALUATION SUMMARY											
Element	S	U	Comment	Element	S	U	Comment	Element	S	U	Comment
* 1.											
* 2.											
* 3.											

OPERATOR FUNDAMENTALS OBSERVATION				
Monitor operator fundamentals during the JPM set. Rate each area based on the criteria by placing a checkmark in the appropriate column. Indicate the comment number associated with the observation.				
Operator Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations	Comment Number
Monitoring				
Control				
Conservatism				
Teamwork				
Knowledge				

OVERALL EVALUATOR COMMENTS:

_____ PASS _____ FAIL

Evaluator Signature / Date: _____ / _____

JOB PERFORMANCE MEASURE

JPM Title Defeat RBCCW/EECW to Drywell Isolations	No.: JP-OP-802-3006-321 Revision: 3 Page 2
------------------------------------------------------	--------------------------------------------------

JPM Observation Criteria

Fundamental	Meets all Expectations	Opportunity for Improvement	Does not meet Expectations
Monitoring	Equipment status monitored at proper frequency, using multiple means if available. Understood which indications were critical.	Some monitoring was performed but undue focus on task or lack of system knowledge prevented ideal monitoring.	Did not recognize key equipment status indicators, too much focus on single indications and ignored total system status.
Control	Task preview used to prepare for job. Aware of control bands and maintained them. Configuration control maintained.	Adequate control of system maintained throughout task but some improvements could be made such as better manual control or greater depth of knowledge for anticipating system response.	No anticipation of results of actions. Unaware or control bands or not able to maintain them. Lack of knowledge of how to control system parameters.
Conservatism	Low threshold for identification of problems. Questioning attitude. Uses "stop when unsure" if needed. Sensitive to nuclear safety.	Some opportunities existed to question before proceeding, High focus on task completion without consideration for other system affects.	Proceeds even when unsure with unanswered questions. High threshold for problem conditions.
Teamwork	Routinely communicates system status changes to the team. Communicates actions before taking them.	Communicated most status and actions. Some improvement would be warranted.	Routinely takes action without informing the team.
Knowledge	Able to anticipate system response based on solid system knowledge. Good working knowledge of generic fundamentals to predict and monitor system response.	Plant, system, or generic fundamental knowledge has some gaps.	Unable to predict system response, unsure of generic fundamentals concepts related to plant operation. Only relied on procedure for operating knowledge.

JOB PERFORMANCE MEASURE

JPM Title Defeat RBCCW/EECW to Drywell Isolations	No.: JP-OP-802-3006-321 Revision: 3 Page 3
------------------------------------------------------	--------------------------------------------------

JPM Information

System:

P4400 - EECW / RBCCW

Task:

51995 - Defeat RBCCW/EECW Cooling Water to Drywell Isolations

References: Required (R) / Available (A)

29.ESP.23, Defeat of RBCCW/EECW to Drywell (R)
ODE-14, Attachment 9, Energized Equipment Work Permit (A)

Tools and Equipment Required:

None

Initial Conditions:

- You are the Control Room LNO.
- EOP flowcharts direct defeat of RBCCW/EECW Isolations.

Initiating Cue(s):

The CRS directs you to defeat RBCCW/EECW Isolations per 29.ESP.23.

Terminating Cue(s):

RBCCW/EECW Isolation is defeated per 29.ESP.23.

Task Standard:

RBCCW/EECW Isolation is defeated per 29.ESP.23.

Licensed Operator Exam Information (required for NRC exams)

Safety Function:

SF-8 Plant Service Systems

K/A Reference: (from NUREG 1123)

K/A SYSTEM: 295024 - High Drywell Pressure

K/A STATEMENT:

EA1. Ability to operate and/or monitor the following as they apply to HIGH DRYWELL PRESSURE:
EA 1.07PCIS/NSSSS..... 3.8 / 3.9

Maintenance Rule Safety Classification:

P4400-01

Maintenance Rule Risk Significant? (Yes or No)

Yes

JOB PERFORMANCE MEASURE

JPM Title Defeat RBCCW/EECW to Drywell Isolations	No.: JP-OP-802-3006-321 Revision: 3 Page 4
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PERFORMANCE EVALUATION

Start Time _____

ELEMENT		STANDARD	
NOTE: Cues are indicated on the line above (just prior to) the step for which they are/may be required.			
CUE: Provide examinee with Cue Sheet. After SM EOP Locker is opened, provide examinee with copy of 29.ESP.23 and ODE-14, Attachment 9.			
* 1.	[1.1] Retrieve EOP Defeat Package from SM EOP Locker.	* 1.	EOP Defeat Package retrieved from SM EOP Locker.
NOTE: While working in the Relay Room panels, all conductive jewelry should be removed, and safety glasses and 100% cotton long sleeves should be worn.			
CUE: The Lead at Terminal B-171 is lifted.			
* 2.	[2.1] At RR H11-P857, lift lead at Terminal B-171 (Division 1).	* 2.	Lead at Terminal B-171 lifted.
CUE: The Lead at Terminal E-191 is lifted.			
* 3.	[2.2] At RR H11-P870, lift lead at Terminal E-191 (Division 2).	* 3.	Lead at Terminal E-191 lifted.
CUE: End JPM when RBCCW/EECW Isolation is defeated per 29.ESP.23.			

_____ SATISFACTORY

_____ UNSATISFACTORY

Stop Time _____

* Critical Step

JOB PERFORMANCE MEASURE

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Evaluator Notes:

Ensure SM informed of JPM walkthrough in relay room and cabinet doors opened for walkthrough of this task.

Stop the JPM if, at any time, this JPM interferes with plant operation.

ENSURE ALL INDUSTRIAL AND PERSONNEL SAFETY PRACTICES ARE USED AND ENFORCED AT ALL TIMES.

Generic Notes and Cues:

CMC switches will turn RED and amperage will increase when the switch is rotated to the start position started. The current should initially be five to seven times the normal running amps with the ammeter flashing. As counter EMF is developed, the amperage will lower to the normal running amperage and the ammeter will no longer flash. CMC switches will turn GREEN when the pumps are stopped and amperage will decrease to zero.

Ex.: Pump start: "Switch has been rotated to the start position, red light is lit, green light is out, amperage initially pegs out high, and is now indicating X amps."

Pump stop: "Switch has been rotated to the stop position, green light is lit, red light is out, amperage indicates 0 amps."

Remotely operated valve position is determined with open and close indicating lights. A RED light only would indicate that the valve is open. A GREEN light only would indicate that the valve is closed. Dual indication would indicate that the valve is in some intermediate position.

Manual valves are checked in the closed direction (MOP02 and MOP05). Valve stem position may aid in valve position determination, but cannot be used as Independent Verification (MOP02).

Ex.: Verify valve closed: "Valve handwheel indicates no valve movement in the clockwise direction."

Verify valve open: "Valve handwheel has been rotated slightly in the clockwise direction and returned to the original positions."

Closing a valve: "Valve handwheel has been rotated in the fully clockwise direction until no additional valve movement. Valve stem is down."

Opening a valve: "Valve handwheel has been rotated in the fully counterclockwise direction until no additional valve movement, valve stem is out."

Controllers have an Auto light that is GREEN when selected and AMBER (YELLOW) when Manual is selected. When in Manual, the open and closed pushbuttons control the parameter to be changed by adjusting position or speed. When the deviation meter is nulled, then the process can be shifted to Auto to allow the desired setpoint to control the process.

System Specific Notes and Cues:

ESP Defeats are installed either by installing a jumper, lifting leads, or removing a plug-in relay or fuse.

Installing Jumpers:

- Ensure the operator goes to the SM and obtains the key to the EOP cabinet.
- Upon unlocking the cabinet, the operator finds the correct package and ensures the proper equipment is in the package.
- Per the attached drawing, locate the panel and verify the panel opened is correct and the operator has opened the correct side door.
- Within the panel, locate the proper terminal strip and verify that the proper terminal number is selected.
- Using proper safety techniques, a jumper is landed on each terminal ensuring that no other terminal is touched or cabinet ground is touched with the free end.
- Repeat until all jumpers are installed per the package.
- For some cabinets, the terminals are separated load to source side of the terminal point by a Knife Switch. In these cabinets the direction of the ESP has the knife switch screw unlocked and opened prior to installing the defeat. This will be spelled out and then the same rules as above apply.

JOB PERFORMANCE MEASURE

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- When both ends are safely landed on all jumpers per the package in the proper location, the operator calls the control room and informs them that the defeat is installed.

Lifting Leads:

- Ensure the operator goes to the SM and obtains the key to the EOP cabinet.
- Upon unlocking the cabinet, the operator finds the correct package and ensures the proper equipment is in the package.
- Per the attached drawing, locate the panel and verify the panel opened is correct and the operator has opened the correct side door.
- Within the panel, locate the proper terminal strip and verify that the proper terminal number is selected.
- Using the proper safety techniques, remove the locking screw and remove the wire from the terminal point keeping it from making contact with the other cabinet wiring or cabinet sides.
- Tape the wire electrical end or install the boot provided.
- For some terminal points, more than one wire will be terminated at the proper point. For these, the instruction will read " Lift and separate leads". This means remove the leads safely and place each into boots or tape separately.
- For some cabinets, the terminals are separated load to source side of the terminal point by a Knife Switch. In these cabinets the direction of the ESP has the knife switch screw unlocked and opened prior to installing the defeat. This will be spelled out and then the same rules as above apply.
- When all leads are removed per the package in the proper location, the operator calls the control room and informs them that the defeat is complete.

Remove Plug-in Relay or Fuse:

- Ensure the operator goes to the SM and obtains the key to the EOP cabinet.
- Upon unlocking the cabinet, the operator finds the correct package and ensures the proper equipment is in the package.
- Per the attached drawing, locate the panel and verify the panel opened is correct and the operator has opened the correct side door.
- Locate the plug-in relay or fuse and verify the defeat package to the relay, or fuse in question, labels.
- Plug-in relays have seismic clips which need to be removed first and then grasped on either side and pulled straight back out of the cabinet.
- Fuses need to be grasped by fuse pullers and pulled out evenly and in one motion. There is a fuse identifier mylar cover on some fuses which needs to be removed to reach the fuse.
- The one exception is the Main Turbine Bypass Dump System fuses which set in the H11P632 cabinet in a fuse block. FS59 & FS60 are contained in a block that can be pulled out much like the plug-in relay without the seismic clip.
- When all steps are complete, contact the control room and announce that the defeat is completed.

Task Performance and Cues:

The Elements of this JPM are step by step in accordance with the procedure. The Standard is that the procedure is performed as written. The Cues are as listed above for indication or as each step is completed the appropriate information is reported to the examinee.

Critical Steps:

Critical Tasks are identified by asterisk (*) and **bolded** steps on the cover sheet. Verify that the latest revision of the procedure is used and critical tasks are correctly identified.

JOB PERFORMANCE MEASURE

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FOLLOW-UP DOCUMENTATION QUESTIONS

Reason for follow-up question(s):

Question:

Reference:

Response:

Question:

Reference

Response:

JOB PERFORMANCE MEASURE

JPM Title Defeat RBCCW/EECW to Drywell Isolations	No.: JP-OP-802-3006-321 Revision: 3 Page 8
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Simulator Setup

IC#:

N/A

Malfunctions:

Number	Title	Value	Delay	Ramp
N/A				

Remote Functions:

Number	Title	Value	Delay	Ramp
N/A				

Override Functions:

Number	Title	Value	Delay	Ramp
N/A				

Special Instructions:

N/A

Cue Sheet: (JP-OP-802-3006-321)

Initial Conditions:

- You are the CRLNO.
- EOP flowcharts direct defeat of RBCCW/EECW Isolations.

Initiating Cue(s):

The CRS directs you to defeat RBCCW/EECW Isolations per 29.ESP.23.

Cue Sheet: (JP-OP-802-3006-321)

Initial Conditions:

- You are the CRLNO.
- EOP flowcharts direct defeat of RBCCW/EECW Isolations.

Initiating Cue(s):

The CRS directs you to defeat RBCCW/EECW Isolations per 29.ESP.23.

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

**Emergency Support
Procedure**

**29.ESP.23
Revision 5
Page 1**

DEFEAT OF RBCCW/EECW COOLING WATER TO DRYWELL ISOLATION

Revision Summary

- 1) Updated Enclosure A per EDP-32523.

Implementation Plan

- 1) This procedure goes into effect upon issue.

Continuous Use

This procedure SHALL be performed as written. Each step shall be read by the user before performing that step; performed in the sequence given; and when required, signed off as it is completed before proceeding to the next step.

Attachments - None

Enclosures

A 082304 Relay Room Interlock Defeat Panel Locations

<i>Information and Procedures</i>				
DSN 29.ESP.23	Revision 5	DCR # 04-1114	DTC TPNPP	File # 1703.02
IP Code I	Date Approved 11-30-04	Released By P. Scott /s/	Date Issued 12-1-04	Recipient

PURPOSE

This procedure provides instructions for defeating the High Drywell Pressure input to EECW/EESW logic to permit restoration of RBCCW/EECW Cooling Water to the Drywell when directed by 20.300.SBO, "Loss of Offsite and Onsite Power (Division 1 only)," the Emergency Operating Procedure, or Severe Accident Guideline Flowcharts. RBCCW Low Differential Pressure, EDG Digital Load Sequencer, and manual initiation signals remain functional.

1.0 REQUIRED EQUIPMENT

- ☐ 1.1 EOP Defeat Package from SM EOP Locker. A key to this locker is available from the SM, CRS, and the SM Key Locker.

2.0 DEFEAT OF RBCCW/EECW COOLING WATER TO DRYWELL ISOLATION

NOTE: Upon completion of this procedure, cooling water to the Drywell may be restored which will reduce flow to other loads.

CAUTION

The following steps involve working with energized circuits.

- ☐ 2.1 At RR H11-P857, lift lead at Terminal B-171 (Division 1).
- ☐ 2.2 At RR H11-P870, lift lead at Terminal E-191 (Division 2).

MATERIAL AND EQUIPMENT AVAILABLE

The EOP Defeat Package for this procedure contains:

- One screwdriver
- Two terminal boots
- An Operator key

The SM EOP Locker contains the following materials:

- Flashlights
- Low voltage electrical gloves
- Leather gloves
- Electrical tape

Additional material and equipment is available in the Emergency Equipment Locker. Procedure 28.508.04, "Emergency Equipment Monthly Inventory/Inspection," contains a listing of locations, material, and equipment.

REFERENCES

I-2441-12

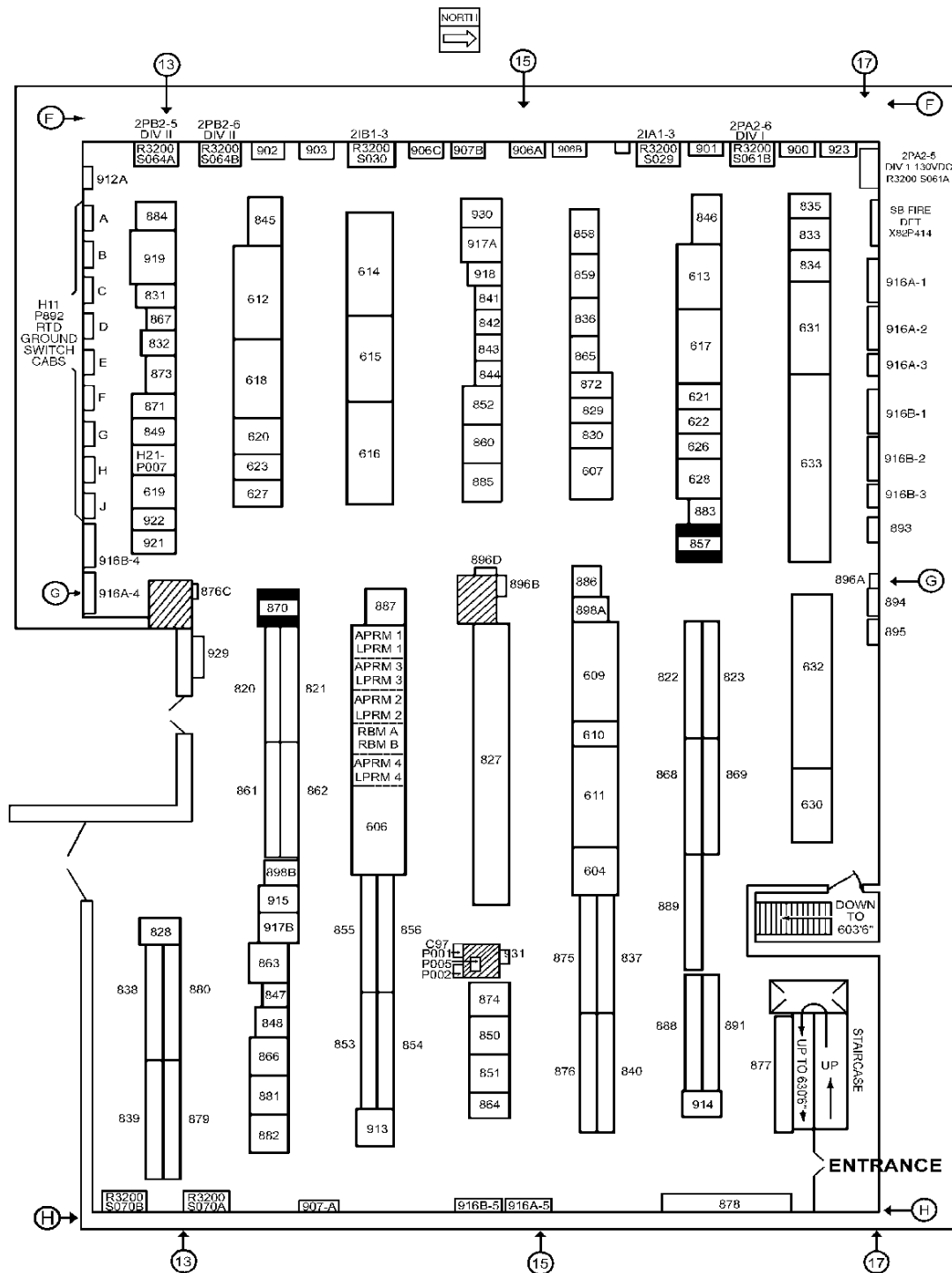
I-2441-13

END OF TEXT

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

29.ESP.23
Enclosure A, Page 1 of 1
082304

RELAY ROOM INTERLOCK DEFEAT PANEL LOCATIONS



END

FOR TRAINING USE ONLY

**JOB PERFORMANCE MEASURE
FOR TRAINING USE ONLY**

**ODE-14
Attachment 15, Page 1 of 1
Revision 10**

ENERGIZED EQUIPMENT WORK PERMIT

PART 1 - WORK SCOPE

This form is discussed during the pre-job briefing. Items briefed are based on the hazards involved in the activity.

WO/PST/Procedure Number: _____ Date: _____

Description of work being performed: Lift/Land leads / Test Equipment 120VAC in MCR, RWCR, RR or
at Testability

PART 2 - SHOCK HAZARD

Maximum Voltage: 120V ☒ AC ☐ DC Voltage Rated Gloves required? ☐ Yes ☒ No

Limited Approach Boundary: 4 (ft) Restricted Approach Boundary (QEW only) Avoid (ft)
Contact

PART 3 - FLASH HAZARD

Hazard Risk Category

☒ Part 5 - Comments ☐ Calculation _____ cal/cm²
☒ N/A* ☐ 1 ☐ 2 ☐ 4

Arc Flash Boundary: None (ft)

PART 4 - PERSONAL PROTECTIVE EQUIPMENT

Personal protective equipment and tools in addition to those directed from Part 5 - Comments

☐ Insulated Tools ☐ Red Safety Ribbon / Safety Monitor ☐ Lanyards for tools
☐ Rubber Mats/Blankets ☐ Remove all conductive jewelry ☐ Other: _____

PART 5 - COMMENTS

The following information was extracted from MMA18, Enclosure A, Tables 1 and 2.1.

For lift/land leads or remove/install test equipment, the Hazard Risk Category is NA*

Personal Protective Equipment

- Natural fiber long sleeves
- Natural fiber pants

NOTE (1): Voltage insulating gloves are also required in situations where there is a danger of hand contact with exposed energized parts. The QEW performing the work determines "Danger of Contact." If no "Danger of Contact" exists, rubber insulating gloves are not required. The QEW can reduce the danger of contact by utilizing distance, use of voltage rated barriers, or work techniques.