



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE JOB PERFORMANCE MEASURE

LESSON TITLE PREVENT A RCIC HIGH EXHAUST PRESSURE TRIP (PLANT)

LESSON LENGTH .5 HRS MAXIMUM STUDENTS 1

### INSTRUCTIONAL MATERIALS INCLUDED

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LR001505 Rev. No. 4

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden DATE 10/01/01

REVISED BY Ron Hayden DATE 06/15/09

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use.**

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A

**Special Setup Instructions:**

N/A

**JPM Instructions:**

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** None

**Safety Items:** None

**Task Number:** RO-0545, EO-1447

**Validation Time:** 4 Minutes

**Prerequisite Training:** N/A

**Time Critical:** No

**PPM Reference:** PPM 5.6.1 Step 6.15 Rev. 17

**Location:** Plant

**NUREG 1123 Ref:** 295003 AA1.03 (4.4/4.4)

**Performance Method:** Simulate

## JPM CHECKLIST

<b>PROCEDURE VALIDATION</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	Due to a series of events Columbia Generating Station has entered into a station blackout. PPM 5.6.1 is being performed.
<b>INITIATING CUE:</b>	The CRS has directed you to prevent a RCIC high exhaust pressure trip by performing PPM 5.6.1 Step 6.15. Inform the control Room when the trip has been prevented. The performance of this JPM will be simulated. Control manipulations will not be performed.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME:</b> _____			
<b>CUE: Cue response of simulated actions based on procedure and student actions</b>			
<b>Step 6.15.1</b>	Close RCIC-V-756A (RCIC-PS-9A Instrument Isolation Valve)	Simulates turning handwheel in the clockwise direction to close RCIC-V-756A	S / U *
<b>Step 6.15.2</b>	Remove the pipe cap between RCIC-PS-9A and RCIC-V-756A	Indicates wrench to be used and that the pipe cap between RCIC-PS-9A and RCIC-V-756A would be turned counter-clockwise to remove it	S / U *
<b>Step 6.15.3</b>	Close RCIC-V-756B, (RCIC-PS-9B Instrument Isolation Valve)	Simulates turning handwheel in the clockwise direction to close RCIC-V-756B	S / U *
<b>Step 6.15.4</b>	Remove the pipe cap between RCIC-PS-9B and RCIC-V-756B	Indicates wrench to be used and that the pipe cap between RCIC-PS-9B and RCIC-V-756B would be turned counter-clockwise to remove it	S / U *
<b>Termination Criteria: Student informs CRS that the RCIC high exhaust pressure trip has been prevented</b>			
<b>RECORD TERMINATION TIME:</b> _____			
<b>Transfer to "Results of JPM" page the following information: Procedures validated prior to use; Comments from marked up evaluator's procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b>			

**RESULTS OF JPM:  
PREVENT A RCIC HIGH EXHAUST PRESSURE TRIP**

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard:** A RCIC high exhaust pressure trip has been prevented per PPM 5.6.1.

<b>Overall Evaluation</b>	<b>Exam Code</b>
SAT / UNSAT (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	4 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

Due to a series of events Columbia Generating Station has entered into a station blackout.

PPM 5.6.1 is being performed.

### Cue:

The CRS has directed you to prevent a RCIC high exhaust pressure trip by performing PPM 5.6.1 Step 6.15.

Inform the control Room when the trip has been prevented.

**THE PERFORMANCE OF THIS JPM  
WILL BE SIMULATED.**

**CONTROL MANIPULATIONS  
WILL NOT BE PERFORMED.**



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE JOB PERFORMANCE MEASURE

LESSON TITLE RESPOND TO CONTROL ROOM HVAC HIGH RADIATION

(PLANT) (FAULTED)

LESSON LENGTH .5 HRS MAXIMUM STUDENTS 1

**INSTRUCTIONAL MATERIALS INCLUDED**

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LO001595 Rev. No. 1

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden DATE 2006

REVISED BY Ron Hayden DATE 6/16/09

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use.**

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A

**Special Setup Instructions:**

N/A

**JPM Instructions:**

Verify the current procedure against the JPM. If the procedure is a different revision than listed in the JPM, ensure the critical steps still match. If the critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** None

**Safety Items:** None

**Task Number:** RO-0114

**Validation Time:** 10 minutes

**Prerequisite Training:** N/A

**Time Critical:** NO

**PPM Reference:** ABN-RAD-CR Rev. 5

**Location:** PLANT

**NUREG 1123 Ref:** 288000A2.02 (3.7/3.8)

**Performance Method:** SIMULATE

# JPM CHECKLIST

<b>PROCEDURE VALIDATION</b>	Regarding procedure copies for evaluator and student, if the procedure revision is different from that listed on the JPM, verify that the critical task steps are the same. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	A Reactor Building High Radiation signal is present. All automatic actions have been verified. The "B" Control Room Ventilation and Emergency Filtration systems have been secured and the "A" Control Room ventilation (WMA-FN-51A) and Emergency Filtration Fans (WMA-FN-54A) are operating. A Hi-Hi radiation alarm has been confirmed on the Northwest remote air intake (WOA-RIS-31A/B reads 5,000 CPM). No alarm is observed on the Southeast side (WOA-RIS-32A/B reads normal).
<b>INITIATING CUE:</b>	The CRS has directed you to isolate the Northwest Remote Air Intake per ABN-RAD-CR. Notify the CRS when actions per ABN-RAD-CR have been completed for the high radiation condition. CONTROL MANIPULATIONS WILL NOT BE PERFORMED. ALL ACTIONS AND STEPS WILL BE SIMULATED.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME: _____</b>			
<b>Step 7.1.1</b>	Verify WOA-V-51B is open (SE #2) Remote intake outboard isolation	Checks the stem position indicator is pointed to OPEN	S / U
<b>Cue: If candidate checks WOA-V-51B is open and independent verification of the step has been performed.</b>			
<b>Step 7.1.2</b>	Verify WOA-V-52B is open (SE #2) Remote intake inboard isolation	Checks the stem position indicator is pointed to OPEN	S / U
<b>Cue: If candidate checks WOA-V-52B is open and independent verification of the step has been performed.</b>			
<b>Step 7.1.3</b>	Unlock and close WOA-V-51A, NW (#1) Remote Intake Outboard Isolation. If remote air intake #1 is isolated using only valve WOA-V-52A, then N/A this step and step 7.1.4	Observes that the valve is open and attempts to close it.  See Cue below.  This step should be N / A'ed	S / U *
<b>Cue: When student attempts to close WOA-V-51A, inform the student that the operator is broken and the valve is danger tagged in the open position.</b>			



Comments	Element	Standard	Sat/Unsat
<b>Step 7.1.4</b>	Verify WOA-V-51D Opens, NW (#1) Remote Intake Purge, (WOA-V-51A Closed)	Per Step 7.1.3, this step is N / A'ed	N/A
<b>Step 7.1.5</b>	Unlock and close WOA-V-52A, NW (#1) Remote Intake Inboard Isolation	Simulates using key to unlock the lock.  Uses handwheel and closes WOA-V-52A.	S / U *
<b>Step 7.1.6</b>  E-CP-COHV/1 is labeled COHV-1. Cover for F4 is labeled with a 4 and door aid indicates TB-F4	If remote air intake #1 is isolated using only valve WOA-V-52A, then remove fuse F4 in Control, Cable Spreading and Critical Switchgear Rooms Control Panel E-CP-COHV/1 (RW 525) to open WOA-V-51D, NW (#1) Remote Intake Purge. Otherwise N/A	Simulates pulling fuse F4. Fuse is in the panel and is located in the upper left side of the panel	S / U *
<b>Cue: If candidate checks, WOA-V-51D opens.</b>			
<b>Termination Criteria: Student informs CRS that the NW Remote Air Intake is isolated, only WOA-V-52A is closed, and Fuse F4 has been pulled.</b>			
<b>RECORD TERMINATION TIME: _____</b>			
<b>Transfer the following information to the “Results of JPM” page: Procedures validated prior to use; Comments from marked up evaluator’s procedure copy; Unsatisfactory critical tasks; Total JPM time. The marked up procedure and remaining JPM pages may be discarded.</b>			

**RESULTS OF JPM:  
RESPOND TO CONTROL ROOM HVAC HIGH RADIATION  
(ONE INTAKE)**

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard:** The Northwest Remote Air Intake to the Control Room Ventilation System is isolated per ABN-RAD-CR.

<b>Overall Evaluation</b>	<b>Exam Code</b>
SAT / UNSAT (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	10 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

- A Reactor Building High Radiation signal is present
- All automatic actions have been verified
- The "B" Control Room Ventilation and Emergency Filtration systems have been secured and the "A" Control Room ventilation (WMA-FN-51A) and Emergency Filtration Fans (WMA-FN-54A) are operating
- A Hi-Hi radiation alarm has been confirmed on the Northwest remote air intake (WOA-RIS-31A/B reads 5,000 CPM)
- No alarm is observed on the Southeast side (WOA-RIS-32A/B reads normal)

### Cue:

The CRS has directed you to isolate the Northwest Remote Air Intake per ABN-RAD-CR

Notify the CRS when actions per ABN-RAD-CR have been completed for the high radiation condition

**CONTROL MANIPULATIONS WILL NOT BE  
PERFORMED**

**ALL ACTIONS AND STEPS WILL BE SIMULATED**



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE JOB PERFORMANCE MEASURE

LESSON TITLE RESTART OF RPS-MG-1 AND REPOWER RPS BUS (FAULTED) (PLT)

LESSON LENGTH .5 HRS MAXIMUM STUDENTS 1

### INSTRUCTIONAL MATERIALS INCLUDED

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LO001641 Rev. No. 1

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Donald Hughes DATE 06/10/08

REVISED BY Ron Hayden DATE 10/21/08

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use.**

### MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

None

**Special Setup Instructions:**

None

**JPM Instructions:**

Verify the current procedure against the JPM. If the procedure is a different revision than listed in the JPM, ensure the critical steps still match. If the critical steps have changed, the JPM should be revised.

Evaluator and student shall use the current procedure. The instructor should mark off steps as they are completed, note comments, and transfer the comments to the results of JPM page.

**Tools/Equipment:** None.

**Safety Items:** None

**Task Number:** RO-0248

**Validation Time:** 12 Minutes

**Prerequisite Training:** N/A

**Time Critical:** No

**PPM Reference:** SOP-RPS-START Section 5.1 and 5.3 Rev. 0

**Location:** Plant

**NUREG 1123 Ref:** 212000A2.01 (3.7/3.9)

**Performance Method:** Simulate

## JPM CHECKLIST

<b>PROCEDURE VALIDATION</b>	Verify the revision number of procedure copies for evaluator and student. If the procedure revision is different from that listed on the JPM, the critical tasks must be verified. The evaluator copy may be used for marking step completion and comments.
<b>INITIAL CONDITIONS:</b>	RPS Division A has been de-energized due to a fault. The fault has been identified and corrected. The RPS-MG-1 supply breaker (RPS-DISC-7A1B) on MC-7A is closed.
<b>INITIATING CUE:</b>	The CRS has directed you to restart RPS-MG-1 and repower the Division 1 RPS bus in accordance with SOP-RPS-START section 5.1 and 5.3. Inform the CRS when the RPS bus has been re-powered. The performance of this JPM is simulated. Control manipulations will not be performed.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME: _____</b>			
<b>CUE: Cue response of simulated actions based on procedure and operator actions for steps without a separate cue</b>			
Step 5.1.1	Verify RPS-DISC-7A1B is CLOSED (RPS Bus Mtr Gen MG-1 Supply Bkr) (E-MC-7A)	Given in initial conditions	N / A
Step 5.1.2a	Perform the following at E-CP-C72/S001A (RPS- MG-1 Control Panel):  Verify the MOTOR OFF indicating light illuminated (green)	Observes the green MOTOR OFF indicating light is illuminated	S / U
<b>CUE: Green light is illuminated, red light is extinguished</b>			
Step 5.1.2b	Verify RPS-CB-MG1 OPEN (Generator Output Breaker)	Observes RPS-CB-MG1 is open with lever in OFF position	S / U
<b>CUE: The lever for RPS-CB-MG1 is in the OFF position</b>			
Step 5.1.2c	DEPRESS and HOLD RPS-RMS-MG1/ START, pushbutton (MOTOR ON)	Simulates depressing and holding RPS-RMS- MG1/ START, MOTOR ON pushbutton depressed	S / U *
Step 5.1.2d	Verify the following: <ul style="list-style-type: none"> <li>• MOTOR OFF indicating light extinguished (green)</li> <li>• MOTOR ON light illuminates (red)</li> </ul>	Observes the green MOTOR OFF indicating light extinguishes and the red MOTOR ON indicating light is illuminated	S / U
<b>CUE: Red light is illuminated, Green light is extinguished</b>			

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>CUE: If asked, the RPS MG set is up to speed (should take LT 5 seconds)</b>			
Step 5.1.2e	When RPS-MG-1 has come up to speed, then release RPS-RMS-MG1/START pushbutton	Simulates releasing the MOTOR ON pushbutton when cued that RPS-MG-1 is up to speed	S / U *
Step 5.1.2f	If voltage is not indicated at rated speed, then momentarily depress RPS-RMS-MG1/START, MOTOR ON pushbutton to reset the trip	Verbalizes that voltage indication would be expected	S / U *
<b>Cue: When the operator checks voltage, cue that no voltage is indicated.</b>			
Step 5.1.2f	If voltage is not indicated at rated speed, then momentarily depress RPS-RMS-MG1/START, MOTOR ON pushbutton to reset the overvoltage trip	Simulates momentarily depressing the RPS-RMS-MG1/START, MOTOR ON pushbutton	S / U *
<b>Cue: When the operator checks voltage, cue that voltage is now indicated on RPS-VM-MG1A.</b>			
Step 5.1.2g	Verify RPS-VM-MG1A voltage stabilizes at about 120 VAC	Observes voltage stabilizes at 120 VAC	S / U
<b>Cue: When the operator checks voltage, cue that voltage is stable at 120 VAC on RPS-VM-MG1A.</b>			
Step 5.1.2h	Close RPS-CB-MG1	Simulates closing RPS-CB-MG1 by pushing up on lever to ON	S / U *
Step 5.1.3	PROCEED to Section 5.3	Performs section 5.3 as follows:	S / U
Step 5.3.1	VERIFY Section 5.1 completed	Section 5.1 just completed	S / U
Step 5.3.2	Obtain required EPA breaker keys from the control room key locker	Obtains breaker key# 166 and #168 from CR key locker	S / U *
<b>NOTE: The student does not have to go to the control room to obtain keys. Ask where the keys are kept – student should verbalize the keys are in the key locker outside the Shift Manages office.</b>			
Step 5.3.3a	CLOSE RPS-EPA-3A as follows (EPA Breaker) (RPS-MG2 Room):  VERIFY breaker keylock switch S1 in NORMAL	Observes switch S1 on RPS-EPA-3A is in NORMAL	S / U
Step 5.3.3b	VERIFY breaker keylock switch S2 in OPER	Observes switch S2 on RPS-EPA-3A is in OPER	S / U
Step 5.3.3c	VERIFY the POWER IN indicator illuminated	Observes POWER IN light illuminated	S / U

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>CUE: When step below (5.3.3d) is done, the under voltage and under frequency lights are illuminated.</b>			
Step 5.3.3d	IF any of the following indicators are not extinguished, THEN ROTATE keylock switch S2 to the RESET AND RETURN to OPER: <ul style="list-style-type: none"> <li>• OVER VOLTAGE</li> <li>• UNDER VOLTAGE</li> <li>• UNDER FREQUENCY</li> <li>• POWER OUT</li> </ul>	Rotates the breaker key lock S2 switch to RESET  Rotates S2 back to OPER	S / U *
<b>CUE: When step below (5.3.3e) is done and if properly reset, the undervoltage and under frequency lights are not illuminated.</b>			
Step 5.3.3e	VERIFY the following indicators extinguished: <ul style="list-style-type: none"> <li>• OVERVOLTAGE</li> <li>• UNDERVOLTAGE</li> <li>• UNDERFREQUENCY</li> <li>• POWER OUT</li> </ul>	Observes all lights extinguished	S / U
Step 5.3.3f	OPEN RPS-EPA-3A to reset it	Resets RPS-EPA-3A by pushes lever fully downward	S / U *
Step 5.3.3g	Close RPS-EPA-3A	Closes RPS-EPA-3A by lifting up on lever	S / U *
Step 5.3.3h	VERIFY POWER OUT indicator illuminated	Observes POWER OUT light illuminated	S / U
<b>CUE: When checked, the POWER OUT indicator is illuminated.</b>			
Step 5.3.4	IF the UNDERVOLTAGE light is illuminated and the breaker is closed, THEN INITIATE a work request	Observes UNDERVOLTAGE light out	S / U
Step 5.3.5a	CLOSE RPS-EPA-3C as follows (EPA Breaker) (RPS-MG2 Room):  VERIFY breaker keylock switch S1 in NORMAL	Observes switch S1 on RPS-EPA-3C is in NORMAL	S / U
Step 5.3.5b	VERIFY breaker keylock switch S2 in OPER	Observes switch S2 on RPS-EPA-3C is in OPER	S / U
<b>CUE: When checked, the POWER IN indicator is illuminated.</b>			
Step 5.3.5c	VERIFY the POWER IN indicator illuminated	Observes POWER IN light illuminated	S / U
<b>CUE: When checked, the undervoltage and under frequency lights are illuminated.</b>			



\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
Step 5.3.5d	IF any of the following indicators are not extinguished, THEN ROTATE keylock switch S2 to the RESET AND RETURN to OPER: <ul style="list-style-type: none"> <li>• OVERVOLTAGE</li> <li>• UNDERVOLTAGE</li> <li>• UNDERFREQUENCY</li> <li>• POWER OUT</li> </ul>	Rotates the breaker key lock S2 switch to RESET  Rotates S2 back to OPER	S / U *
<b>CUE: If reset properly, the undervoltage and under frequency lights are not illuminated.</b>			
Step 5.3.5e	VERIFY the following indicators extinguished: <ul style="list-style-type: none"> <li>• OVERVOLTAGE</li> <li>• UNDERVOLTAGE</li> <li>• UNDERFREQUENCY</li> <li>• POWER OUT</li> </ul>	Observes all lights extinguished	S / U
Step 5.3.5f	OPEN RPS-EPA-3C to reset it	Resets RPS-EPA-3C by pushes lever fully downward	S / U *
Step 5.3.5g	Close RPS-EPA-3C	Closes RPS-EPA-3C by lifting up on lever	S / U *
<b>CUE: When checked, the POWER OUT indicator is illuminated.</b>			
Step 5.3.5h	VERIFY the POWER OUT indicator illuminated	Observes POWER OUT light illuminated	S / U
Step 5.3.5i	IF the UNDERVOLTAGE light is illuminated and RPS-EPA-3C is CLOSED, THEN INITIATE a work request to evaluate	Observes UNDER VOLTAGE light out	S / U
Step 5.3.6	Verify Generator A Feed white power available indicating light illuminated (H13-P610)	Contacts the Control Room and asks if the light is illuminated	S / U
<b>CUE: When checked, the power available light is illuminated.</b>			
<b>Termination Criteria: Student informs the CRS that Division 1(A) RPS bus is powered.</b>			
<b>RECORD TERMINATION TIME: _____</b>			
<b>Transfer to JPM Results Page the following information: Procedures validated prior to use; Comments from marked up evaluator's procedure copy; Unsatisfactory critical tasks; Total JPM time. Marked Up procedure and remaining JPM pages may be discarded.</b>			

# RESULTS OF JPM RESTART RPS MG-1 AND REPOWER THE RPS BUS

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard:** RPS-MG-1 is running and RPS Bus has been re-energized per SOP-RPS-START.

Overall Evaluation	Exam Code
SAT / UNSAT (Circle One)	

Verified Procedure #/Rev. Used for JPM (Initial box)	Validation/Critical Time	JPM Completion Time
	12 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

RPS Division A has been de-energized due to a fault

The fault has been identified and corrected

The RPS-MG-1 supply breaker (RPS-DISC-7A1B) on MC-7A is closed.

### Cue:

The CRS has directed you to restart RPS-MG-1 and re-power the RPS bus in accordance with SOP-RPS-START section 5.1 and 5.3.

Inform the CRS when the RPS bus has been re-powered.

**THE PERFORMANCE OF THIS JPM IS  
SIMULATED.**

**CONTROL MANIPULATIONS  
WILL NOT BE PERFORMED.**



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE JOB PERFORMANCE MEASURE

LESSON TITLE PERFORM CRO1 REVIEW OF RPV HEATUP SURVEILLANCE (ADMIN)

LESSON LENGTH .5 HRS MAXIMUM STUDENTS 1

### INSTRUCTIONAL MATERIALS INCLUDED

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_  
Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_  
JPM PQD Code LO001688 Rev. No. 0  
Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden DATE 6/17/09

REVISED BY \_\_\_\_\_ DATE \_\_\_\_\_

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use**

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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**Special Setup Instructions:**

Fill out cover page. Fill in the data on Attachments 9.3 and 9.5 as follows:

Perform Instrument Channel check requirements and fill in data as follows: RRC-TR-650 (Pt 1 & 2 and RWCU-Ti-607 PT5) = 100°F; MS-PI-9, RFW-PI-605 and RCIC-PI-602 at zero psig. Place an double asterisk on RCIC-PI-2 and on from of surveillance indicate the asterisk indicates RCIC is isolated as RPV/P is LT 75 psig

100 °F readings = Temp is 101°F and pressures are 0 psig with double asterisk for RCIC

200°F readings = Temp 204 and 205 and pressures 2 and 3 psig. Zero for RCIC and double asterisk

300°F readings = Temp is 311, 313 and 314 and pressures are 67 and 68 (same for RCIC as above)

Heatup Log should start at time 0600 and a reading every 15 minutes. Last reading is done at 0915

Coolant Temp is from RRC-TR-650 (1) and enter starting at top as follows:101, 115, 127, 149, 167, 190, 205, 207, 226, 247, 259, 279, 290, 313

RPV Pressure is read on MS-PI-9 and data is: 0, 3, 1, 0, 3, 2, 3, 4, 4, 12, 22, 37, 41, 67

Saturation Temp is N/A for all times

15 Min dT data is: N/A, 14, 12, 22, 18, 23, 15, 8, 19, 21, 12, 20, 11 ,23

Projected Hourly data is: N/A, 56, 48, 88, 72, 92, 60, 32, 76, 84, 48, 80, 44, 92

Actual Hourly dT (from/To/°F) from top is: N/A / N/A / N/a (N/A the first 4 lines) and at 0700 data is: 0600-0700-66, 0615-0715-75, 0630-0730-78, 0645-0745-58, 0700-0800-59, 0715-0815-57, 0730-0839-54, 0745-0845-72, 0800-0900-64, 0815-0915-66

RPV Metal Temp is read on RWCU-TI-607 Pt. 5 and data from top is: 100, 116, 129, 152, 160, 193, 204, 207, 229, 241, 253, 271, 281, 303

Initial Data taker and CRO1 and use CRO1 initials for block records within limits

Initial appropriate steps in procedure as complete

**JPM Instructions:**

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** None

**Safety Items:** N/A

**Task Number:** RO-0186

**Validation Time:** 15 minutes

**Prerequisite Training:** N/A

**Time Critical:** No

**PPM Reference:** OSP-RCS-C101 Rev. 7

**Location:** Admin JPM

**NUREG 1123 Ref:** 2.1.25 (3.9 / 4.2)

**Performance Method:** Perform

## JPM CHECKLIST

<b>PROCEDURE VALIDATION</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	Columbia is starting up with a heatup in progress. Both RRC Pumps are running. RWCU-P-1A is running at 50 gpm CRO1 has requested that you perform a peer check of the results of the heatup surveillance that have been recorded so far.
<b>INITIATING CUE:</b>	Perform the requested peer check of the RPV Heatup Surveillance, OSP-RCS-C101. Indicate the result of your review on the JPM Answer Sheet. When you are done, hand the filled in JPM Answer Sheet and surveillance attachments to the examiner.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME:</b> _____			
<b>CUE: Cue response of simulated actions based on procedure and student actions</b>			
	The student is given a copy of surveillance OSP-RCS-C101 which is filled in with data and cued to perform the CRO1 review	Performs the review and determines that all data is within the acceptable heatup limits	S / U *
<b>RECORD TERMINATION TIME:</b> _____			
<b>Transfer to "Results of JPM" page the following information: Procedures validated prior to use; Comments from marked up evaluator's procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b>			

## RESULTS OF JPM: PERFORM CRO1 REVIEW OF RPV HEATUP SURVEILLANCE

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard: The JPM Answer Sheet is initialed indicating that all data is within limits**

<b>Overall Evaluation</b>	<b>Exam Code</b>
SAT / UNSAT (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	10 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

Columbia is starting up with a heatup in progress.  
Both RRC Pumps are running

RWCU-P-1A is running at 50 gpm

CRO1 has requested that you perform a peer check of the results of the heatup surveillance that have been recorded so far

### Cue:

**Perform the requested peer check of the RPV  
Heatup Surveillance, OSP-RCS-C101**

**Indicate the result on the JPM Answer Sheet**

**When you are done, hand the filled in JPM  
Answer Sheet and surveillance attachments to  
the examiner**



# JPM ANSWER SHEET

## **If all data is within limits:**

1. Initial the line indicating all data is within limits.

## **If all data is NOT within limits:**

1. Red circle the out-of-tolerance readings on the surveillance attachment
2. Initial the line indicating all data is not within limits

**All data entered on OSP-RCS-C101 is within limits**

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**Initials**

**All data entered on OSP-RCS-C101 is not within limits**

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**Initials**



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE JOB PERFORMANCE MEASURE

LESSON TITLE MAIN TURBINE CHANGE OF LOAD RATE DETERMINATION (ADMIN)

LESSON LENGTH .5 HRS      MAXIMUM STUDENTS 1

### INSTRUCTIONAL MATERIALS INCLUDED

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LO001573 Rev. No. 1

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden      DATE 06/19/06

REVISED BY Ron Hayden      DATE 06/17/09

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use**

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A

**Special Setup Instructions:**

N/A

**JPM Instructions:**

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** SOP-MT-START

**Safety Items:** None

**Task Number:** RO-0325

**Validation Time:** 7 Minutes

**Prerequisite Training:** N/A

**Time Critical:** No

**PPM Reference:** SOP-MT-START Rev. 10

**Location:** Any

**NUREG 1123 Ref:** 245000 K5.07 (2.6 / 2.9)

**Performance Method:** Perform

## JPM CHECKLIST

<b>PROCEDURE VALIDATION</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	Columbia is in the process of starting up. The Main Turbine is on the line and is currently 5% loaded per SOP-MT-START Attachment 6.1.
<b>INITIATING CUE:</b>	You have been directed to determine the time required to change load from Columbia's current load to a load of 95%. Assume a fatigue index of 15,000 cycles. Inform the CRS (Examiner) of your determination when complete by writing it and circling it on Attachment 6.1.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME: _____</b>			
		Refers to SOP-MT-START Attachment 6.1	S / U
		Correlates 5% load to a First Stage Steam Temperature of 50°F	S / U
		Correlates 95% load to a First Stage Steam Temperature of 285°F (accept 280° to 290°)	S / U
		Calculates difference (285°-50°) to be 235°F (accept 230° to 240°)	S / U *
		Plots First Stage Steam Temperature Change to Time to Change Load-Hours using the 15,000 cycles curve and determines time to change load is 3.25 hours (Accept a range of 2.8 hours to 3.5 hours)	S / U *
<b>Termination Criteria: Student hands examiner Attachment 6.1 and has indicated that the time to change load from 5% to 95% based on a 15,000 cycle index is 3.25 hours.</b>			
<b>RECORD TERMINATION TIME: _____</b>			
<b>Transfer to "Results of JPM" page the following information: Procedures validated prior to use; Comments from marked up evaluator's procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b>			

**RESULTS OF JPM:  
MAIN TURBINE CHANGE OF LOAD RATE DETERMINATION**

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard:** The Time to change Load has been calculated, written and circled on Attachment 6.1 of SOP-MT-START and is within the range allowed.

<b>Overall Evaluation</b>	<b>Exam Code</b>
SAT / UNSAT (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	7 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

Columbia is in the process of starting up.

The Main Turbine is on the line and is currently 5% loaded.

### Cue:

**You have been directed to determine the time required to change load from Columbia's current load to a load of 95% per SOP-MT-START Attachment 6.1.**

**Assume a fatigue index of 15,000 cycles.**

**Inform the CRS (Examiner) of your determination when complete by writing it and circling it on Attachment 6.1.**



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE	LICENSED OPERATOR INITIAL TRAINING	
COURSE TITLE	ADMIN JOB PERFORMANCE MEASURE	
LESSON TITLE	DETERMINE CLEARANCE REQUIREMENTS FOR FPC-P-1A (ADMIN)	
LESSON LENGTH	.5 HRS	MAXIMUM STUDENTS 1
	<b>INSTRUCTIONAL MATERIALS INCLUDED</b>	
Lesson Plan PQD Code	_____	Rev. No. _____
Simulator Guide PQD Code	_____	Rev. No. _____
JPM PQD Code	LO001644	Rev. No. 0
Exam PQD Code	_____	Rev. No. _____
DIVISION TITLE	Nuclear Training	
DEPARTMENT	Operations Training	
PREPARED BY	Ron Hayden	DATE 10/6/08
REVISED BY	_____	DATE _____
TECHNICAL REVIEW BY	_____	DATE _____
INSTRUCTIONAL REVIEW BY	_____	DATE _____
APPROVED BY	_____	DATE _____
	Operations Training Manager	

**Verify materials current IAW SWP-TQS-01 prior to use.**

# DETERMINE CLEARANCE REQUIREMENTS FOR FPC-P-1A

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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#### Simulator ICs; Malfunctions; Triggers; Overrides:

N/A

#### Setup Instructions:

Have the following drawings ready for candidate to reference:

M-526 Sheet 1

E-503 Sheet 7 and Sheet 12

EWD-38E-001

EWD-38E-021

#### JPM Instructions:

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the "Results of JPM" page.

**Tools/Equipment:** N/A

**Safety Items:** N/A

**Task Number:** RO-1181

**Validation Time:** 15 minutes

**Prerequisite Training:** N/A

**Time Critical:** No

**PPM Reference:** PPM 1.3.64; SWP-OPS-3; M-526-1; E-503-7  
E-503-12; EWD-38E-001; EWD-38E-021

**Location:** Simulator / Classroom

**NUREG 1123 Ref:** 2.2.13 4.1 / 4.3

**Performance Method:** Perform



# DETERMINE CLEARANCE REQUIREMENTS FOR FPC-P-1A

## JPM CHECKLIST

<b>PROCEDURE VALIDATION:</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	Columbia is operating at full power. It is a Division 1 work week. Maintenance wants to replace the pipe coupling (3 inch to 6 inch) located at the discharge of FPC-P-1A.
<b>INITIATING CUE:</b>	You have been directed to determine the clearance order boundary component, required component position, and component tagging requirement necessary to perform work on the coupling downstream of FPC-P-1A.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME: _____</b>			
	Identifies boundary and valve position required to isolate coupling downstream of FPC-P-1A	References M-526-1 and determines the following valves should be closed to isolate FPC-P-1A: <ul style="list-style-type: none"> <li>• FPC-V-114</li> <li>• FPC-V-115A</li> <li>• FPC-V-116A</li> <li>• FPC-V-181A</li> </ul>	S / U
	Determines tagging requirements	Determines the following valves should be danger tagged: <ul style="list-style-type: none"> <li>• FPC-V-114</li> <li>• FPC-V-115A</li> <li>• FPC-V-116A</li> <li>• FPC-V-181A</li> </ul>	S / U *
	Identifies FPC-P-1A Vent and Drain valves	Refers to M-526-1 Detail 3 and determines vent and drain valves for FPC-P-1A: <ul style="list-style-type: none"> <li>• FPC-V-187A (Vent)</li> <li>• FPC-V-150A (Drain)</li> </ul>	S / U

## DETERMINE CLEARANCE REQUIREMENTS FOR FPC-P-1A

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
	Determines tagging requirements	Determines that either FPC-V-187A AND/OR FPC-V-150A should be danger tagged opened	S / U *
	Identifies breaker and position required to isolate FPC-P-1A electrically	References E-503 sheet 12 and determines breaker 9B on MC-7B-B should be open/off	S / U
	Determines tagging requirements	Determines that breaker 9B on MC-7B-B should be danger tagged	S / U *
	Identifies breaker and position required for FPC-V-181A	References E-503 sheet 7 and determines breaker 1C on MC-7B-A should be open/off	S / U *
	Determines tagging requirements	Determines that breaker 1C on MC-7B-A should be danger tagged	S / U *
	Identifies Control Switch requirements for FPC-P-1A	References EWD-38E-001 for FPC-P-1A and determines switch should be danger or blue tagged in AUTO or AUTO after STOP or IR-71 position	S / U *
	Identifies Control Switch requirements for FPC-V-181A	References EWD-38E-021 for FPC-V-181A and determines switch should be danger or blue tagged in the NORM or NORM after CLOSE position	S / U *
<b>Termination Criteria: Student completes the attached answer sheet and hands it to the examiner.</b>			
<b>RECORD TERMINATION TIME: _____</b>			
<b>Transfer to “Results of JPM” page the following information: Procedures validated prior to use; Comments from marked up evaluator’s procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b>			

## DETERMINE CLEARANCE REQUIREMENTS FOR FPC-P-1A

ANSWER KEY:

<b>COMPONENT</b>	<b>REQUIRED POSITION</b>	<b>TYPE OF TAG (Blue/ Danger/Caution)</b>
FPC-V-114	Closed	Danger
FPC-V-115A	Closed	Danger
FPC-V-116A	Closed	Danger
Breaker 9B for FPC-P-1A on MC-7B-B	Open/Off	Danger
Breaker 1C for FPC-V-181A on MC-7B-A	Open/Off	Danger
FPC-V-150A and / or FPC-V-187A	Open	Danger
Control Switch for FPC-P-1A	Auto or Auto after Stop or IR-71	Danger or Blue
Control Switch for FPC-V-181A	Norm or Norm after Close	Danger or Blue

# DETERMINE CLEARANCE REQUIREMENTS FOR FPC-P-1A

## RESULTS OF JPM:

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard:** Student correctly identifies the components, component position, and tagging requirements to mechanically and electrically isolate FPC-P-1A.

Overall Evaluation	Exam Code
SAT / UNSAT (Circle One)	

Verified Procedure #/Rev. Used for JPM (Initial Box)	Validation/Critical Time	JPM Completion Time
	15 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

Columbia is operating at full power.

It is a Division 1 work week.

Maintenance wants to replace the pipe coupling (3 inch to 6 inch) located at the discharge of FPC-P-1A.

### Cue:

**You have been directed to determine the clearance order boundary component, required component position, and component tagging requirement necessary to perform work on the coupling downstream of FPC-P-1A.**

# JPM ANSWER SHEET

The following is required to perform work on coupling downstream of FPC-P-1A:

COMPONENT	REQUIRED POSITION	TYPE OF TAG (BLUE/DANGER/CAUTION )

When completed, hand this sheet to the examiner.



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE JOB PERFORMANCE MEASURE

LESSON TITLE DETERMINATION OF STAY TIME IN A HIGH RADIATION AREA  
~~(ADMIN)~~

LESSON LENGTH .5 HRS MAXIMUM STUDENTS 1

**INSTRUCTIONAL MATERIALS INCLUDED**

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LR001794 Rev. No. 2

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden DATE 10/24/06

REVISED BY Ron Hayden DATE 6/17/09

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use.**

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A

**Special Setup Instructions:**

Candidate needs access to a set of procedures that includes GEN-RPP-06.

**JPM Instructions:**

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** N/A

**Safety Items:** N/A

**Task Number:** RO-0557; SRO-0026

**Validation Time:** 10 Minutes

**Prerequisite Training:** N/A

**Time Critical:** NO

**PPM Reference:** GEN-RPP-06 Rev. 5;  
GEN-RPP-11 Rev. 5

**Location:** Admin JPM

**NUREG 1123 Ref:** 2.3.4 (3.2 / 3.7)

**Performance Method:** Perform



## JPM CHECKLIST

<b>PROCEDURE VALIDATION</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	You have been selected to work with maintenance on a valve in a High Radiation Area. The job is expected to take five hours. You have an accumulated dose of 1600 mrem for the calendar year. The work area dose rate is at the minimum value for the High Radiation Area.
<b>INITIATING CUE:</b>	Determine your personal maximum stay time for this job. Write your answer on the bottom of this page and hand it to the examiner.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME:</b> _____			
	Determines radiation Admin limit	Determines a 2 rem TEDE Admin limit is applicable	S / U *
	Determines the minimum High Radiation Area dose rate	Determines the minimum High Radiation Area dose rate is 100 mrem/hr	S / U *
	Calculates dose remaining to reach admin limit of 2 rem (2000 mrem)	Calculates 400 mrem (2000 – 1600 = 400) remains to reach limit	S / U *
	May also use a dose limit of 1800 mrem	Calculates 200 mrem (1800 – 1600 = 200) remains to reach limit	
	Calculates maximum stay time	Calculates stay time: 400 mrem divided by 100 mrem/hr equals 4 hrs  Calculates stay time: 200 mrem divided by 100 mrem/hr equals 2.0 hrs	S / U *
	Documents maximum stay time	On Student Information Card documents maximum stay time of 4.0 hours if 2 rem used or a stay time of 2.0 hours if 1800 mrem was used	S / U *

**\* Items are Critical Steps**

Comments	Element	Standard	Sat/Unsat
<b>Termination Criteria: Candidate fills out bottom of cue sheet indicating his maximum stay time and hands it to examiner.</b>			
<b>RECORD TERMINATION TIME: _____</b>			
<b>Transfer to “Results of JPM” page the following information: Procedures validated prior to use; Comments from marked up evaluator’s procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b>			

**RESULTS OF JPM:  
DETERMINATION OF MAXIMUM STAY TIME**

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard:** Candidate determines that 4.0 hours is his personal maximum stay time if 2 rem used and 2.0 hours if 1800 mrem used and that is indicated on the bottom of the cue sheet handed back to the examiner.

<b>Overall Evaluation</b>	<b>Exam Code</b>
SAT / UNSAT (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	10 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

You have been selected to work with maintenance on a valve in a High Radiation Area.

The job is expected to take five hours.

You have an accumulated dose of 1600 mrem for the calendar year.

The work area dose rate is at the minimum value for the High Radiation Area.

### Cue:

**Determine your personal maximum stay time for this job.**

**Write your answer on the bottom of this page and hand it to the examiner.**

My MAXIMUM stay time for this job is: \_\_\_\_\_



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE JOB PERFORMANCE MEASURE

LESSON TITLE DETERMINE IF VOLUNTARY ENTRY INTO AIA IS ALLOWABLE

LESSON LENGTH .5 HRS MAXIMUM STUDENTS 1

**INSTRUCTIONAL MATERIALS INCLUDED**

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LO001687 Rev. No. 0

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden DATE 6/16/09

REVISED BY \_\_\_\_\_ DATE \_\_\_\_\_

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use**

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A

**Special Setup Instructions:**

Student should have access to SOPs and Volume 3 procedures

**JPM Instructions:**

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** None

**Safety Items:** None

**Task Number:** SRO-0122

**Validation Time:** 10 Minutes

**Prerequisite Training:** N/A

**Time Critical:** N/A

**PPM Reference:** PPM 3.2.1 Rev. 60

**Location:** Admin JPM

**NUREG 1123 Ref:** 2.1.25 (3.9 / 4.2)

**Performance Method:** Perform

## JPM CHECKLIST

<b>PROCEDURE VALIDATION</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	Columbia Generating Station is shutting down per PPM 3.2.1. Reactor Power is 60%. Per the Reactivity Control Plan and CRS direction, Rod Line is 90%. RFW-TI-5 on H13-P840 is reading 340°F. Core Flow is 55 Mlbm/Hr. A planned entry into the Area Of Increased Awareness is scheduled for your shift
<b>INITIATING CUE:</b>	On the page provided indicate if you would or would not direct the planned AIA entry. Fill in all required information based on your answer.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME:</b> _____			
<b>CUE: Cue response of simulated actions based on procedure and student actions</b>			
	Refers to PPM 3.2.1 for Normal Plant Shutdown and notes Step 5.1.29 that states: Prior to a planned entry into the AIA (i.e. Single Loop Operation), then verify Reactor Feedwater temperature, as indicated on RFW-TI-5 (H13-P840), is within the Normal Operating Region Attachment 7.3		S / U  S / U
	Refers to Attachment 7.3, plots the parameters given, and recognizes that the plant is currently in the 'Operation Prohibited' region.	Initials block for would not direct planned entry into AIA  And fills in a reason similar to operation outside the Normal Operating Region of PPM 3.2.1 Attachment 7.3	S / U *
<b>Termination Criteria: Student hands filled in form (Page 5 of 5) to the examiner.</b>			
<b>RECORD TERMINATION TIME:</b> _____			
<b>Transfer to "Results of JPM" page the following information: Procedures validated prior to use; Comments from marked up evaluator's procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b>			

**RESULTS OF JPM:  
PLANNED ENTRY INTO AIA**

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard: Student handout is initialed for would not direct entry into AIA and a reason similar to operation is currently in the 'Operation Prohibited' region of PPM 3.2.1 Attachment 7.3**

<b>Overall Evaluation</b>	<b>Exam Code</b>
SAT / UNSAT (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	10 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_



## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

Columbia Generating Station is shutting down per PPM 3.2.1

Reactor Power is 60%

Per the Reactivity Control Plan and CRS direction, Rod Line is 90%

RFW-TI-5 on H13-P840 is reading 340°F

Core Flow is 55 Mlbm/Hr

A planned entry into the Area Of Increased Awareness is scheduled for your shift

### Cue:

**On the page provided indicate if you would or would not direct the planned AIA entry**

**Fill in all required information based on your answer**

## JPM ANSWER SHEET

YES - I would direct the planned entry into the Area of Increased Awareness.

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Initials

NO – I would not direct the planned entry into the Area Of Increased Awareness for the following reason(s):

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Initials



## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE LICENSED OPERATOR INITIAL TRAINING

COURSE TITLE ADMIN JOB PERFORMANCE MEASURE

LESSON TITLE DETERMINE COMPENSATORY MEASURES FOR INOPERABLE  
PREACTION SYSTEM AND ISSUE A FIRE PROTECTION SYSTEM  
IMPAIRMENT (ADMIN)

LESSON LENGTH .5 HRS      MAXIMUM STUDENTS 1

**INSTRUCTIONAL MATERIALS INCLUDED**

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LO001686 Rev. No. 0

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden      DATE 6/22/09

REVISED BY \_\_\_\_\_      DATE \_\_\_\_\_

TECHNICAL REVIEW BY \_\_\_\_\_      DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_      DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_      DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use**

DETERMINE COMPENSATORY MEASURES FOR INOPERABLE PREACTION SYSTEM AND  
 ISSUE A FIRE PROTECTION SYSTEM IMPAIRMENT

**MINOR REVISION RECORD**

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

**JPM SETUP**

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A

**Setup Instructions:**

Ensure candidate has access to a set of Volume One procedures and specifically to PPM 1.3.10B.  
 Ensure candidate has access to a LCS book.

Have a copy of the Fire Protection System Impairment Notification form ready to give to candidate after impairment is identified.

**JPM Instructions:**

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** N/A

**Safety Items:** N/A

**Task Number:** SRO-0158

**Validation Time:** 20 minutes

**Prerequisite Training:** N/A

**Time Critical:** NO

**PPM Reference:** PPM 1.3.10B Rev. 14;  
 LCS 1.10.2 and 1.10.6 and Bases

**Location:** Simulator/Plant/Table Top

**NUREG 1123 Ref:** 2.1.25 (2.8 / 3.1)

**Performance Method:** Perform

DETERMINE COMPENSATORY MEASURES FOR INOPERABLE PREACTION SYSTEM AND  
ISSUE A FIRE PROTECTION SYSTEM IMPAIRMENT

**JPM CHECKLIST**

<b>PROCEDURE VALIDATION:</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	As the Production SRO, you have been informed that during investigation into the cause of the inoperable fire detection system affecting the Reactor/Radwaste Corridor, elevation 441', a worker accidentally stepped onto the preaction sprinkler pipe for the Reactor/Radwaste Corridor, causing the pipe to break in half.
<b>INITIATING CUE:</b>	Based on the report provided, determine if compensatory actions are required. Initial the attachment indicating either actions are required or actions are not required. If actions are required fill in those actions on the JPM Answer Sheet. When you are done with your assessment and have filled in the required information, hand the JPM Answer Sheet to your examiner.

**\* Items are Critical Steps**

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME: _____</b>			
	Refers to LCS 1.10.6 table 1.10.6-1 and determines that the inoperable fire detection system is associated with detection zone 66D. The note indicates that any one of the four zones being disabled, disables all four sub-zones. Refers to LCS 1.10.2 and determines the broke preaction pipe is also associated with System P66.		S / U
	Per LCS 1.10.2A, a Fire Protection System Impairment is required immediately AND establish a Continuous Fire Tour with backup fire suppression equipment within 1 hour.		S / U * S / U *
<b>NOTE: The other possible compensatory measure is to manually flood the preaction sprinkler system piping and establish an hourly fire tour. This can not be accomplished as the cue indicates the preaction sprinkler pipe has been broke in half.</b>			
<b>The candidate should fill in the JPM Answer Sheet indicating:</b>			
<b>1. A Fire Protection System Impairment is required immediately</b> <b>2. A Continuous Fire Tour with backup fire suppression equipment needs to be established within 1 hour.</b>			
<b>CUE: Once the candidate informs the examiner that a FPSI Permit is required to be completed, provide the candidate with a blank form to fill out (Attachment 9.1 of PPM 1.3.10B) and inform the candidate that the Fire Marshall is not on site.</b>			

DETERMINE COMPENSATORY MEASURES FOR INOPERABLE PREACTION SYSTEM AND  
ISSUE A FIRE PROTECTION SYSTEM IMPAIRMENT

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
	The FPSI Permit is filled out with the following information: <ul style="list-style-type: none"> <li>• System Impaired: Preaction is checked</li> <li>• Reason for Impairment: Inoperable Preaction Sprinkler System (Broken Pipe)</li> <li>• Building/Elevation: Reactor/Radwaste Corridor, 441' elevation</li> <li>• Compensatory Action Taken: Establish a Continuous Fire Tour with backup fire suppression equipment</li> </ul>		S / U *  S / U *  S / U *  S / U *
<p><b>Termination Criteria: Student hands the examiner a completed FPSI permit.</b></p>			
<p style="text-align: center;"><b>RECORD TERMINATION TIME: _____</b></p>			
<p><b>Transfer to “Results of JPM” page the following information: Procedures validated prior to use; Comments from marked up evaluator’s procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b></p>			

DETERMINE COMPENSATORY MEASURES FOR INOPERABLE PREACTION SYSTEM AND ISSUE A FIRE PROTECTION SYSTEM IMPAIRMENT

**RESULTS OF JPM:**

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard:** Candidate identifies that a Continuous Fire Tour needs to be established within 1 hour and an FPSI permit is required to be initiated and completes the form with the required information.

<b>Overall Evaluation</b>	<b>Exam Code</b>
<b>SAT / UNSAT</b> (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	20 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

As the Production SRO, you have been informed that during investigation into the cause of the inoperable fire detection system affecting the Reactor/Radwaste Corridor, elevation 441', a worker accidentally stepped onto the preaction sprinkler pipe for the Reactor/Radwaste Corridor, causing the pipe to break in half.

### Cue:

Based on the report provided, determine if compensatory actions are required.

Initial the attachment indicating either actions are required or actions are not required.

If actions are required fill in those actions on the JPM Answer Sheet.

When you are done with your assessment and have filled in the required information, hand the JPM Answer Sheet to your examiner.



# JPM ANSWER SHEET

INITIAL HERE IF NO ACTIONS ARE REQUIRED: \_\_\_\_\_

INITIAL HERE IF ACTIONS ARE REQUIRED: \_\_\_\_\_

IF ACTIONS ARE REQUIRED, THEY ARE: \_\_\_\_\_

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## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE JOB PERFORMANCE MEASURE

LESSON TITLE VERIFY TAGOUT FOR RHR-P-3 (Admin)

LESSON LENGTH .5 HRS      MAXIMUM STUDENTS 1

### INSTRUCTIONAL MATERIALS INCLUDED

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LO001689 Rev. No. 0

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden      DATE 6/17/09

REVISED BY \_\_\_\_\_      DATE \_\_\_\_\_

TECHNICAL REVIEW BY \_\_\_\_\_      DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_      DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_      DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use**

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

### JPM SETUP

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A

**Special Setup Instructions:**

Ensure candidate has the following drawings: M 521-2; M521-3; E-503-8; EWD-9E-010

**JPM Instructions:**

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** None

**Safety Items:** None

**Task Number:** SRO-0434

**Validation Time:** 13 Minutes

**Prerequisite Training:** N / A

**Time Critical:** N / A

**PPM Reference:** PPM 1.3.64 Rev. 14

**Location:** Admin JPM

**NUREG 1123 Ref:** 2.2.15 (3.9 / 4.3)

**Performance Method:** Perform

## JPM CHECKLIST

<b>PROCEDURE VALIDATION</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	Columbia is in a refueling outage. A tagout for RHR-P-3 is in process of being approved. As the Production SRO, the Shift Manager has directed you to perform the final approval before the tagout is hung.
<b>INITIATING CUE:</b>	Perform a review of the tagout for RHR-P-3. Indicate on the JPM answer sheet if you would approve this tagout as written, or not approve it because discrepancies were noted. Fill in the applicable information on the JPM Answer Sheet based upon your review. When completed hand the JPM Answer Sheet to your examiner.

\* Items are Critical Steps

Comments	Standard	Sat/Unsat
<b>RECORD START TIME: _____</b>		
	Reviews M521-2 and M521-3 to determine tagging boundary. Observes that RHR-V-85C has been left off of the tagout	S / U *
	Reviews E-503-8 and EWD 9E-010 and determines that RHR-P-3 is electrically isolated with a Disconnect and not a Circuit Breaker and the disconnect position is OFF not Racked Out	S / U *
	Reviews tagout and determines that RHR-V-737(V) required position is Closed but should be OPEN	S / U *
	Reviews tagout and determines that RHR-V-737(V) and RHR-V-738(D) have caution tags but at least one of them should have danger tag	S / U *
<b>Termination Criteria: Candidate hands the completed JPM answer sheet to the examiner</b>		
<b>RECORD TERMINATION TIME: _____</b>		
<b>Transfer to "Results of JPM" page the following information: Procedures validated prior to use; Comments from marked up evaluator's procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b>		

<b>RHR-P-3 the Disconnect should be OFF not Racked Out</b>
<b>RHR-V-85C not included on tagout but should be danger tagged closed</b>
<b>RHR-V-737(V) is tagged closed but should be tagged open</b>
<b>RHR-V-737(V) is caution tagged but should be danger tagged and/or RHR-V-738(D) is caution tagged but should be danger tagged</b>

## RESULTS OF JPM: REVIEW/APPROVE RHR-P-3 TAGOUT

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard: The JPM Answer Sheet has been reviewed and the deficiencies have been identified.**

<b>Overall Evaluation</b>	<b>Exam Code</b>
SAT / UNSAT (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	13 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

Columbia is in a refueling outage

A tagout for RHR-P-3 is in process of being approved

As the Production SRO, the Shift Manager has directed you to perform the final approval before the tagout is hung

### Cue:

**Perform a review of the tagout for RHR-P-3**

**Indicate on the JPM answer sheet if you would:  
approve this tagout as written, or  
not approve it because discrepancies were noted**

**Fill in the applicable information on the JPM  
Answer Sheet based upon your review**

**When completed hand the JPM Answer Sheet to  
your examiner**

## JPM ANSWER SHEET

EQUIPMENT ID	TAG TYPE	EQUIPMENT DESCRIPTION	PLACEMENT CONFIGURATION
RHR-RMS-P/3	Equipment Configuration	RHR WATER LEG PUMP - RHR-P-3	STOP
RHR-42-8B7A	Danger	RHR-P-3 DISCONNECT	RACKED OUT
RHR-V-85B	Danger	WATER LEG ISOLATION	CLOSED
RHR-V-210	Danger	WATER LEG MINIMUM FLOW	CLOSED
RHR-V-82	Danger	WATER LEG SUCTION	CLOSED
RHR-V-737(V)	Caution	SYSTEM VENT	CLOSED
RHR-V-738(D)	Caution	SYSTEM DRAIN	OPEN

I WOULD APPROVE TAGOUT AS WRITTEN: \_\_\_\_\_  
Initials

I WOULD NOT APPROVE THIS TAGOUT. ALL DISCREPANCIES NOTED BELOW: \_\_\_\_\_  
Initials




## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE LICENSED OPERATOR INITIAL TRAINING

COURSE TITLE ADMIN JOB PERFORMANCE MEASURE

LESSON TITLE ESTIMATE MAIN CONDENSER AIR EJECTOR GROSS GAMMA  
ACTIVITY RATE AND DETERMINE ACTIONS (ADMIN)

LESSON LENGTH .5 HRS      MAXIMUM STUDENTS 1

**INSTRUCTIONAL MATERIALS INCLUDED**

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

JPM PQD Code LO001590 Rev. No. 1

Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden      DATE 2006

REVISED BY Ron Hayden      DATE 6/21/09

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use**



ESTIMATE MAIN CONDENSER AIR EJECTOR GROSS GAMMA ACTIVITY RATE  
AND DETERMINE ACTIONS

ESTIMATE MAIN CONDENSER AIR EJECTOR GROSS GAMMA ACTIVITY RATE  
AND DETERMINE ACTIONS

**MINOR REVISION RECORD**

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

**JPM SETUP**

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A

**Setup Instructions:**

Candidate needs a calculator and access to ABN-OG

**JPM Instructions:**

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** N/A

**Safety Items:** N/A

**Task Number:** SRO-0658

**Validation Time:** 10 minutes

**Prerequisite Training:** N/A

**Time Critical:** NO

**PPM Reference:** ABN-OG Rev. 1

**Location:** Simulator/Table Top

**NUREG 1123 Ref:** 271000A2.04 (4.1)

**Performance Method:** Perform

ESTIMATE MAIN CONDENSER AIR EJECTOR GROSS GAMMA ACTIVITY RATE  
AND DETERMINE ACTIONS

**JPM CHECKLIST**

<b>PROCEDURE VALIDATION:</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	Columbia is operating at full power. Various alarms are locked in due to suspected fuel pin damage. Offgas system parameters are as follows:  OFFGAS POST TREATMENT RADIATION MONITOR, OG-RIS-601A, is in alarm  OFFGAS SYSTEM EXHAUST FLOW, OG-FR-620, is reading 43 SCFM  SJAЕ CONDENSER OUTLET RADIATION MONITOR, OG-RR-604, is reading 7821 mr/hr
<b>INITIATING CUE:</b>	Based on the above, per ABN-OG, determine what action, if any, should be taken. Fill in the result of your determination on the JPM Answer Sheet provided.

\* Items are Critical Steps

Comments	Element	Standard	Sat/Unsat
<b>RECORD START TIME: _____</b>			
	Refers to ABN-OG and, using bases for step 4.1.2 calculates the following: Main Condenser Gross gamma activity = OG-RR-604 X OG-FR-620 divided by 1000		S / U
	Main Condenser Gross gamma activity = 7821 mr/hr times 43 SCFM divided by 1000 OR Main Condenser Gross gamma activity = 336.303 mCi/sec		S / U
	Based on a Main Condenser Gross gamma activity reading of 336 mCi/sec, candidate determines that a power reduction per PPM 3.2.4 to maintain Main Condenser Gross gamma activity LT 332 mCi/sec is required.		S / U *
<b>Termination Criteria: Student hands the JPM Answer Sheet to the examiner</b>			
<b>RECORD TERMINATION TIME: _____</b>			
<b>Transfer to “Results of JPM” page the following information: Procedures validated prior to use; Comments from marked up evaluator’s procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.</b>			

ESTIMATE MAIN CONDENSER AIR EJECTOR GROSS GAMMA ACTIVITY RATE  
AND DETERMINE ACTIONS

**RESULTS OF JPM:**

**Examinee (Please Print):** \_\_\_\_\_

**Evaluator (Please Print):** \_\_\_\_\_

**Task Standard:** Candidate fills out the attachment and has determined that a power reduction per PPM 3.2.4 is required to maintain Main Condenser Gross gamma activity LT 332 mCi/sec.

<b>Overall Evaluation</b>	<b>Exam Code</b>
SAT / UNSAT (Circle One)	

<b>Verified Procedure #/Rev. Used for JPM (Initial Box)</b>	<b>Validation/Critical Time</b>	<b>JPM Completion Time</b>
	10 Minutes / NA	

**COMMENTS:**

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**Evaluator's Signature:** \_\_\_\_\_ **Date:** \_\_\_\_\_

## STUDENT JPM INFORMATION CARD

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### Initial Conditions:

Columbia is operating at full power.

Various alarms are locked in due to suspected fuel pin damage.

Offgas system parameters are as follows:

OFFGAS POST TREATMENT RADIATION MONITOR, OG-RIS-601A, is in alarm

OFFGAS SYSTEM EXHAUST FLOW, OG-FR-620, is reading 43 SCFM

SJAE CONDENSER OUTLET RADIATION MONITOR, OG-RR-604, is reading 7821 mr/hr

### Cue:

Based on the above, per ABN-OG, determine what action, if any, should be taken.

Fill in the result of your determination on the JPM Answer Sheet provided.

# JPM ANSWER SHEET

INITIAL HERE IF NO ACTIONS ARE REQUIRED: \_\_\_\_\_

INITIAL HERE IF ACTIONS ARE REQUIRED: \_\_\_\_\_

ACTIONS IF REQUIRED: \_\_\_\_\_

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## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE LICENSED OPERATOR INITIAL TRAINING

COURSE TITLE ADMIN JOB PERFORMANCE MEASURE

LESSON TITLE CLASSIFY THE EVENT AFTER DYNAMIC EXAM SCENARIO (TC) (SIM)

LESSON LENGTH .5 HRS      MAXIMUM STUDENTS 1

**INSTRUCTIONAL MATERIALS INCLUDED**

Lesson Plan PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_  
Simulator Guide PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_  
JPM PQD Code LO001604 Rev. No. 1  
Exam PQD Code \_\_\_\_\_ Rev. No. \_\_\_\_\_

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY Ron Hayden      DATE 6/17/06

REVISED BY Ron Hayden      DATE 6/18/09

TECHNICAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW BY \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED BY \_\_\_\_\_ DATE \_\_\_\_\_

Operations Training Manager

**Verify materials current IAW SWP-TQS-01 prior to use.**

## MINOR REVISION RECORD

Minor Rev Number	Description of Revision	Affected Pages	Entered By	Effective Date	Manager Approval

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### JPM SETUP

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**Simulator ICs; Malfunctions; Triggers; Overrides:**

N/A – Scenario completed per Scenario Guide.

**Setup Instructions:**

This JPM is designed to be performed after completion of a Dynamic Exam Scenario.

**JPM Instructions:**

This JPM is a ‘Generic’ JPM that may be used anytime a JPM is run after a simulator dynamic exam. The values that are filled in by the student are applicable to the scenario performed. Indicate the scenario PQD code this JPM was run against in the comment section of the results page.

Verify Current Procedure against JPM and ensure procedure critical steps match if procedure is different revision than listed in JPM. If critical steps have changed, the JPM should be revised.

The evaluator and student shall use current procedure. The evaluator should mark off steps as they are completed, note comments, and transfer the comments to the “Results of JPM” page.

**Tools/Equipment:** N/A

**Safety Items:** N/A

**Task Number:** SRO-0529, SRO-0629

**Validation Time:** 15 minutes

**Prerequisite Training:** N/A

**Time Critical:** Yes 30 minutes

**PPM Reference:** PPM 13.1.1

**Location:** Simulator

**NUREG 1123 Ref:** 2.4.41 (2.9 / 4.6)

**Performance Method:** Perform



## JPM CHECKLIST

<b>PROCEDURE VALIDATION:</b>	Procedure copies for evaluator and student, if procedure revision is different from that listed on JPM, critical tasks reverified. Evaluator copy may be used for marking step completion, and comments.
<b>INITIAL CONDITIONS:</b>	You have just been relieved as the SRO following the scenario. It is not raining outside.
<b>INITIATING CUE:</b>	The Shift Manager has directed you to classify the event and initiate a CNF for the just completed scenario. This will be the initial classification. The CNF should be initiated for the highest classification related to this scenario. Present a completed Classification Notification Form to the examiner. This is a time critical JPM and your time starts now.

\* Items are Critical Steps

Comments	Standard	Sat/Unsat
<b>RECORD START TIME: _____</b>		
	Fills in the following information:	
	1. Checks block 1a or 1b (Emergency or Drill)	1. S / U *
	2. Enters '1'	2. S / U
	3. Enters name and phone number	3. S / U *
	4. Checks block 4.a and enters date and time	4. S / U *
	5. Checks Block 5C for Site Area Emergency	5. S / U *
	6. Leaves Blank	6. S / U
	7. Enters Wind Speed of '8.2'; Wind Direction of '269'; Checks 'No' for precipitation; Enters 'C' for Stability Class	7. S / U *
	8. Checks No Release	8. S / U
	9. Checks N/A	9. N/A
	10. Checks N/A	10. N/A
	11. Checks No	11. S / U
	12. Enters EAL# 3.1.S.1; Enters description similar to: Drywell Pressure Response not consistent with LOCA conditions	12. S / U *
	13. Checks either block a, b, or d	13. S / U
<b>Termination Criteria: Student hands the examiner the completed Classification Notification Form.</b>		
<b>RECORD TERMINATION TIME: _____</b>		

**Transfer to “Results of JPM” page the following information: Procedures validated prior to use; Comments from marked up evaluator’s procedure copy; Unsatisfactory critical tasks; Total JPM time; Marked Up procedure and remaining JPM pages may be discarded.**



## **STUDENT JPM INFORMATION CARD**

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### **Initial Conditions:**

You have just been relieved as the SRO following the scenario.  
It is not raining outside.

### **Cue:**

The Shift Manager has directed you to classify the event and initiate a Classification Notification Form for the just completed scenario

This will be the initial classification

The CNF should be initiated for the highest classification related to this scenario

Present the completed CNF to the examiner

**THIS IS A TIME CRITICAL JPM AND  
YOUR TIME STARTS NOW**



# INSTRUCTIONAL COVER SHEET

PROGRAM OPERATIONS TRAINING

COURSE TITLE COLUMBIA GENERATING STATION SIMULATOR EXAMINATION

LESSON TITLE Swap CRD pumps; RPS-B Trip with a Scrammed Rod That Fails To Insert and FDR-V-4 that Fails to Close; RFP-B Control Oil Pressure Drop; Steam Leak Causes RCIC Isolation; RCIC-V-8 & 63 Fail to Auto Close; Feed Line Rupture; HPCS-P-1 Shaft Break; LOCA; ED On RPV Low Level

LENGTH OF LESSON 1.5 Hours  
; INCLUDED

Lesson Plan PQD Code	_____	Rev. No.	_____
Simulator Guide PQD Code	<u>LO001677</u>	Rev. No.	<u>0</u>
JPM PQD Code	_____	Rev. No.	_____
Exam PQD Code	_____	Rev. No.	_____

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY **Ron Hayden** DATE 05/28/09

REVISED BY \_\_\_\_\_ DATE \_\_\_\_\_

VALIDATED BY \_\_\_\_\_ DATE \_\_\_\_\_

TECHNICAL REVIEW \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED \_\_\_\_\_ DATE \_\_\_\_\_

**Operations Training Manager**

**Verify materials current IAW SWP-TQS-01 prior to use.**

Facility: Columbia

NRC Scenario No: 1

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

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

\_\_\_\_\_

\_\_\_\_\_

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Initial conditions: Columbia is operating in MODE 1 at full Power.

Turnover: Swap running CRD pumps to CRD-P-1A running and CRD-P-1B in stby

Event No.	Timeline	Event Type*	Event Description
1.	T = 0	N (ATC)	Swap CRD Pumps from CRD-P-1A running to CRD-P-1B running
2.	T = 10	C (All) TS (CRS)	Loss of RPS-B; FDR-V-4 Fails to Close; Also - a scrammed rod. Rod 18-11 fails to fully insert
3.	T = 10	R (ATC) TS (CRS)	Reduce Reactor Power with RRC Flow to LE 80 Mlbm/hr Drive control rod 18-11 that failed to fully insert
4.	T = 25	C (ATC)	RFW B Control Oil pressure loss; Aux Oil Pump fails to auto start
5.	T = 30	C (BOP) TS (CRS)	RCIC Steam Line Break; RCIC-V-8 & RCIC-V-63 fail to auto close
6.	T = 50		Leak in the CBP discharge piping leading to a reactor scram and loss of the Condensate and Feedwater systems
7.	T = 55	M (All)	LOCA - Containment Sprays
8.	T = 55	C (BOP)	HPCS-P-1 Shaft Break
9.	T = 55		LOCA - RPV Level Drop
10.	T = 70	M (All)	Emergency Depressurization when RPV Level Drops to TAF
11.	T = 75		Re-Initiation of Containment Sprays

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

## SCENARIO DESCRIPTION

The scenario begins with Columbia operating at full power. Turnover information will direct CRD Pumps be swapped.

**EVENT 1** – Swap CRD pumps to CRD-P-1B running and CRD-P-1A in standby

**EVENT 2** - After the CRD pump swap, there will be a loss of RPS B due to a failed MG set motor. FDR-V-4 fails to close on the loss of RPS and will not close when manually attempted.

**EVENT 3** - On the loss of RPS B, control rod 18-11 will scram due to blown fuses on the A RPS side. The rod will not fully insert and is at position 10. The crew will reduce core flow to LE 80 Mlbm/hr and drive rod 18-11 full in.

The CRS will refer to Tech Specs for the scrambled control rod 18-11.

The CRS will refer to Tech Specs for FDR-V-4.

RPS B will be repowered from alternate power supply.

**EVENT 4** - A slow loss of control oil pressure on the B Reactor Feedwater Pump. The Auxiliary Oil Pump will fail to auto start but can be started manually.

**EVENT 5** - A steam line rupture in the RCIC supply line that causes a RCIC isolation. On the isolation, RCIC-V-8 and RCIC-V-63 fail to auto close. When manually attempted both RCIC-V-8 and RCIC-V-63 will close. The CRS will enter ABN-RAD-HIGH and EOP PPM 5.3.1, Secondary Containment Control and will refer to Tech Specs for RCIC System being OOS.

**EVENT 6** - A rupture of the condensate line downstream of the Condensate Booster Pumps that will require a manual Reactor scram. The RFW pumps will trip and all Condensate and Condensate Booster Pumps will have to be secured in order to stop the leak.

**EVENT 7** - A LOCA will develop shortly after the Reactor scram. Containment sprays will be initiated as appropriate.

**EVENT 8** - When RPV Level drops to -50 inches, HPCS will initiate and the MSIVs will close. When HPCS initiates, HPCS-P-1 shaft breaks.

**EVENT 9** - RPV level will drop to Top Of Active Fuel.

**EVENT 10** - When RPV level reaches -163 inches, the CRS will direct an Emergency Depressurization be performed.

**EVENT 11** - When RPV Level is GT TAF, Containment Sprays will be initiated as appropriate.

The scenario will be terminated when RPV level is being returned with injection from low pressure ECCS pumps, Sprays have been re-initiated as appropriate, or as directed by the scenario coordinator.



<b>Event No. 1</b>		
<b>Description:</b> Swap CRD Pumps to CRD-P-1B running and CRD-P-1A in standby The event is initiated by turnover information and will be performed after shift turnover		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 0	CRS	Directs to swap CRD pumps to CRD-P-1B running and CRD-P-1A in standby
	ATC	<p>Refers to SOP-CRD-Pumps Section 5.1:</p> <ul style="list-style-type: none"> <li>• Step 5.1.1 - Contacts OPS 2 and verifies oil level in each CRD-P-1B oil bottle is GE ½ full</li> <li>• Step 5.1.2 – Contacts OPS2 and verifies oil level in CRD-P-1B gear unit bulls eye GE ½ full</li> <li>• Flags P603.A7 3.6 and 5.8 as expected alarms</li> <li>• Step 5.1.3 Places CRD-FC-600 in MANUAL</li> <li>• Ensures announcement is made for CRD pump swap</li> <li>• Step 5.1.4 - Starts CRD-P-1B</li> <li>• Step 5.1.5 - Stops CRD-P-1A</li> <li>• Step 5.1.6 – Nulls CRD-FC-600</li> <li>• Shift CRD-FC-600 to Automatic</li> <li>• 5.1.8 – Slowly adjusts CRD-V-3 to establish approximately 260 psid on CRD-DPI-602</li> </ul>
<b>ROLEPLAY:</b> As OPS2 report CRD-P-1B running normally		
<b>COMMENTS:</b>		

<b>Event No. 2</b>		
<p><b>Description:</b> Loss of RPS-B; FDR-V-4 Fails to Close; Control Rod 18-11 scrams but fails to fully insert (see event 3)</p> <p>This event is initiated when the RCC pump swap is completed by <b><u>ACTIVATING TRIGGER 1</u></b></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 10	ATC	<p>Acknowledges alarms</p> <p>Reports half scram system B</p> <p>Reports control rod scram (&amp; accumulator light) illuminated 18-11 and it is NOT full in (at position 10)</p> <p>Reports power/pressure/level</p> <p>Refers CRS to ABN-ROD due to the scrambled control rod</p> <p>(Refer to Event 3 for the remainder of actions associated with control rod)</p>
	BOP	<p>Informs CRS of RPS Trouble annunciator.</p> <p>Refers to 4.800.C5 DROP 9-5 RPS BUS B TROUBLE:</p> <ul style="list-style-type: none"> <li>• Announces to immediately stop all maintenance and surveillance testing in progress that has a potential for generating a trip on unaffected RPS channel (RPS A system)</li> <li>• Refers CRS to ABN-RPS</li> </ul> <p>Contacts OPS 2 and directs investigation of RPS B loss</p>
<p><b>ROLEPLAY:</b> As OPS 2 wait three minutes and report that the B RPS MG Set is not running, the motor is hot to the touch, and there is an electrical smell in the room with no indication of fire</p>		

<b>Event No. 2</b>		
	BOP	<p>Per ABN-RPS:</p> <p>Throttles open RWCU-V-104</p> <p>Ensures all automatic actions have occurred</p> <p>When checked, notes that FDR-V-4 did not close</p> <p>Attempts to close FDR-V-4 and notes and reports that it did not close when C/S taken to close position</p>
	SRO	<p>Refers to Tech Spec 3.6.1.3 and notes condition A applies</p> <p>Directs RPS-B be energized from alternate power</p>
	BOP	<p>Repowers RPS B as follows:</p> <ul style="list-style-type: none"> <li>• Verifies alternate power available by observing Alternate Feed white light illuminated</li> <li>• Places the RPS Power Source Select Switch in position ALT B</li> </ul>
<p><b>BOOTH OPERATOR: When the <u>SCRAM (NOT B RPS)</u> is reset, remove the scrambled rod malfunction in the Director window (right click on the line and select remove)</b></p>		

<b>Event No. 2</b>		
	BOP	Restores RPS B per step 4.6.2: <ul style="list-style-type: none"><li>• Reset half scram at H13-P603</li><li>• Resets MS Line Monitors MS-RIS-610B and 610D at P633</li><li>• Depresses Isolation logic A &amp; B reset P/B</li><li>• Depresses Isolation logic C &amp; D reset P/B</li><li>• Resets RC-1 by depressing WMA-RMS-FAZ/3AXY on RC-1</li><li>• Resets RC-2 by depressing WMA-RMS-FAZ/3BXY on RC-2</li><li>• Opens RRC-V-19 and RRC-V-20</li><li>• Opens EDR-V-19 and EDR-V-20 (LEAK DET DRYWELL EQUIP DRAIN FLOW HIGH is an anticipated annunciator)</li><li>• Opens TIP-V-15</li><li>• Returns RWCU to service per SOP-RWCU-START</li></ul>
<b>COMMENTS: Event 4 may be commenced any time after RC-1 and RC-2 are reset.</b>		

<b>Event No. 3</b>		
<b>Description:</b> Control Rod 18-11 Scrams but fails to go full in (stuck at position 10) The event is initiated when the loss of RPS B is activated		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 10	ATC	<p>Reports control rod scram light illuminated for 18-11</p> <p>Reports entry into ABN-ROD</p> <p>Reports control rod 18-11 does not indicate full in</p> <p>Selects control rod 18-11 and reports it is at position 10</p>
	SRO	<p>Enters ABN-ROD and directs subsequent actions per section 4.2:</p> <ul style="list-style-type: none"> <li>• Directs core flow be lowered to LE 80 Mlbm/hr</li> </ul>
	ATC	<p>Observes both RRC pump individual controllers are in Auto (RRC-M/A-R676A and 676B) and depresses the LOWER Pushbutton on the Master Controller (RRC-M/A-R675) to lower flow as directed</p> <p>Reports RRC flow is LE 80 Mlbm/hr (should be about 42 Hz) (RPV High level alarm is expected)</p>
	SRO	Per ABN-ROD directs section 4.2.3 be performed
	ATC	<p>Per ABN-ROD step 4.2.3:</p> <ul style="list-style-type: none"> <li>• Selects rod 18-11</li> <li>• Depresses the Continuous Insert P/B</li> <li>• Drives rod 18-11 full in</li> <li>• Releases Continuous Insert P/B and verifies it remains full in</li> <li>• Resets rod accumulator trouble and control rod drift annunciators</li> <li>• Directs CRS to Tech Spec – Reactivity</li> </ul> <p>Reports power/level/pressure after rod insertion</p>

<b>Event No. 3</b>		
	ATC	Acknowledges SDV Not Drained Alarm and refers to ARP (This alarm may or may not annunciate depending on speed of RPS B reset. It takes about 8.5 minutes to get this alarm)  Verifies SDV vent and drains open when Scram is reset
	SRO	May direct BOP to check SDV level indications
	SRO	Refers to Tech Spec 3.1.3 Condition C  Requests information on slow and inoperable control rods  Directs STA to initiate a MON run  Notes that a CR should be generated to document the rod problems
<p><b>ROLEPLAY: IF asked inform the CRS that a MON run has been performed and no thermal or preconditioning limits have been exceeded</b></p> <p><b>ROLEPLAY: If asked there are NO inop or slow control rods</b></p>		
<p><b>COMMENTS:</b></p>		

<b>Event No. 4</b>		
<b>Description:</b> Slow drop of RFW-P-1B Control Oil Pressure with failure of RFW-P-AOP/1B to start. <b>The event is initiated any time after the BOP operator resets RC-1 and RC-2 by ACTIVATING TRIGGER 2 (It takes about 2 minutes to get alarm)</b>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 25	ATC	Acknowledges TURB B CNTR OIL PRESS LOW annunciator and refers to ARP  Reports current control oil pressure (at approx 70 psig) on RFT-PI-2/1B
	ATC	Notes that RFW-P-AOP/1B should have started per ARP but is not running and informs the CRS
	SRO	Directs RFW-P-AOP/1B be started (RO may start the pump without direction – auto action that should have occurred but did not)
	BOP	Dispatches OPS 3 to investigate
	ATC	Starts RFW-P-AOP/1B and reports the pump start to CRS  Reports control oil pressure returned to normal and clearing of control oil pressure low annunciator
	SRO	Contacts Production SRO/System Engineer to investigate problem with RFW-P-AOP/1B
<b>ROLEPLAY: If OPS 3 is contacted report no obvious signs of a control oil leak and you will continue your investigation</b>		
<b>COMMENTS:</b>		

<b>Event No. 5</b>		
<p><b>Description:</b> RCIC Steam Line Break resulting in RCIC isolation signal with RCIC-V-8 and RCIC-V-63 failing to auto close (may be closed manually)</p> <p>The event is initiated when the B RFW Aux Oil Pump is started by <b><u>ACTIVATING TRIGGER 3</u></b> (It takes 90 seconds to get alarm and 4 minutes to get the RCIC isolation signal)</p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<b>Critical Task is to Close RCIC-V-8 and RCIC-V-63 to stop steam leak</b>		
T = 30	BOP	<p>Acknowledges REACTOR BUILD RAD HIGH alarm (602-A5 3-1) and reports TIP Drive Area, ARM-RIS- 7, reading GT 25 mr/hr and rising</p> <p>Informs CRS of ABN-RAD-HIGH and Secondary Containment EOP entry condition</p>
	SRO	<p>Announces entry into ABN-RAD-HIGH and PPM 5.3.1 'Secondary Containment Control'</p> <p>Per ABN-RAD-HIGH, directs evacuation of personnel in the Reactor Building</p>
<b>ROLEPLAY: As OPS2 report that there is steam coming from the room above the TIP room and you are leaving the Reactor Building</b>		
	BOP/ATC	Evacuates Reactor Building as directed
	BOP	<p>Acknowledges LEAK DET RWCU/RCIC PIPE AREA TEMP HIGH alarm and investigates Leak Detection Monitors to determine temperature</p> <p>Reports temperatures as they rise above alarm points</p>
	BOP/ATC	Acknowledges alarms and informs CRS of EOP Entry conditions on RWCU Room Temperature Hi-Hi and RCIC Pipe Routing Area Temperature Hi Hi Alarms H13-P601 A2 1-1 & 2-2 and H13-P601 A3 1-8 & 2-5



<b>Event No. 5</b>		
	SRO	Re-enters PPM 5.3.1 as necessary
	BOP	<p>Reports Leak Detection Monitor point A1-5, LD-TE-24K, RWCU/RCIC Room 313, is GT Max Safe value of 212°F when it occurs</p> <p>Reports Leak Detection Monitor points A2-4, LD-TE-24F, is GT Alarm but LT Max Safe value of 340°F</p>
	BOP/ATC	Reports RCIC Trip annunciator and RCIC Steam Line valves RCIC-V-8 and RCIC-V-63 failed to close
	SRO	Directs RCIC-V-8 and RCIC-V-63 be manually closed
	BOP	Obtains keys and closes RCIC-V-8 and RCIC-V-63 and reports closure to CRS
	SRO	<p>Refers to Tech Specs 3.5.3 and performs actions for Condition A:</p> <ul style="list-style-type: none"> <li>• Immediately verify by admin means HPCS is operable</li> <li>• Restore RCIC to operable status in 14 days</li> </ul>
	BOP	Reports clearing of high temperature alarms and dropping area temperatures indicating the leak is isolated
<b>COMMENTS:</b>		

<b>Event No. 6</b>		
<p><b>Description:</b> Leak in the CBP discharge piping leading to a loss of the condensate/feedwater systems as a feed source and a reactor scram</p> <p>The event is initiated after actions associated with RCIC steam leak are completed by <b><u>ACTIVATING TRIGGER 4</u></b></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 50	<b>ROLEPLAY: As OPS3 report there is a water line rupture in the Turbine Building 441' elevation. It looks like water is coming from the Condensate Booster Pumps discharge line and you are getting out of the area</b>	
	ATC	Checks pressures associated with the Condensate and Feedwater systems and observes lowering RFW pump suction pressures and informs the CRS
	SRO	Enters ABN-FLOODING  May direct evacuation all personnel from the Turbine Building
	BOP	Announces a evacuation of personnel in the Turbine Building if directed
	ATC	Acknowledges RFW PUMP SUCT PRESS LOW alarms (If reactor has not been manually scrammed)
	SRO	Directs CRO1 to insert a manual reactor scram
	ATC	Performs immediate scram actions: <ul style="list-style-type: none"> <li>• Announces to listen up for the scram report</li> <li>• Places Mode Switch to Shutdown</li> <li>• Reports APRMs downscale</li> <li>• Reports Reactor Pressure and trend</li> <li>• Reports RPV level and trend</li> <li>• Reports EOP entry condition on Low RPV Level</li> </ul>

<b>Event No. 6</b>		
	SRO	Repeats back scram report and enters PPM 5.1.1, RPV Control, on Low RPV Level
	ATC	Reports trip of both RFW pumps on low suction pressure
	SRO	Directs all Condensate and Condensate Booster Pumps be stopped
	BOP/ATC	Secures Condensate and Condensate Booster Pumps as directed
<b>ROLEPLAY: If Condensate pumps are not secured, as OPS3 report water is still flowing from line rupture.</b>		
<b>ROLEPLAY: If asked, as OPS3 report the water has stopped coming from piping rupture.</b>		
<b>COMMENTS:</b>		

<b>Event No. 7</b>		
<b>Description:</b> LOCA (Containment Spray)		
This event is auto initiated when the MSIVs close		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 55	<b>BOP</b>	Recognizes MSIV closure and updates Crew that the MSIVs are closed and he has pressure control on SRVs at 800 to 1000 psig pressure band
	<b>BOP</b>	Recognizes rising DW Pressure and reports EOP entry at 1.68 psig  Also reports additional primary containment EOP entries as they occur
	<b>SRO</b>	Enters EOP 5.2.1, Primary Containment Control and re-enters 5.1.1 RPV Control, due to high DW pressure  Directs actuations for +13", -50" and 1.68 psig be verified as appropriate
	<b>BOP</b>	Reports Wetwell pressure when it reaches 2 psig
	<b>SRO</b>	Directs Wetwell sprays/Suppression Pool Cooling with RHR A  Directs securing sprays if pressure drops below 1.68 psig
	<b>BOP</b>	Using quick card, initiates wetwell sprays and supplements with suppression cooling

<b>Event No. 7</b>		
	<b>RO/BOP</b>	Reports Wetwell pressure when it reaches 12 psig
	<b>SRO</b>	Directs Drywell Cooling Fans be secured
	<b>BOP</b>	Secures Drywell Cooling Fans as directed
	<b>SRO</b>	Directs DSIL verification Directs Drywell Sprays be initiated with RHR B Directs securing sprays if drywell pressure drops below 1.68 psig
	<b>BOP</b>	Verifies within DSIL and using quick card, initiates Drywell Sprays as directed  Reports Sprays effective as Drywell pressure drops
<b>COMMENTS: Drywell Spray initiation may be delayed until after Emergency Depressurization</b>		

<b>Event No. 8</b>		
<b>Description:</b> HPCS-P-1 Shaft Breaks		
This event is activated at the beginning of the scenario but only realized when HPCS initiates		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 55	BOP	When HPCS initiates on High Drywell Pressure or RPV/L at -50", verifies HPCS status  Recognizes that HPCS-P-1 is running with no flow and only 100 psig discharge pressure and informs CRS
	SRO	Directs HPCS-P-1 be checked
<b>ROLEPLAY: If asked, as OPS2 report that there are parts to the shaft coupling for HPCS-P-1 all over the HPCS Pump room</b>		
	SRO	May directs HPCS-P-1 be secured
	BOP	Secures HPCS-P-1 if directed
<b>COMMENTS:</b>		

<b>Event No. 9</b>		
<b>Description:</b> LOCA (RPV Level Drop)		
This event starts when scram is initiated		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 55	<b>ATC</b>	<p><b><i>Reports RPV level drop</i></b></p> <p>Gives RPV level reports as level continues to lower</p> <p>May direct ABN-CRD-MAXFLOW be performed</p>
<p><b>NOTE – From scram time it takes about 1.5 minutes to get to -50”</b></p> <p><b>It takes another 7 minutes to get to -129”</b></p> <p><b>It takes another 80 seconds to get to TAF at -161”</b></p> <p><b>It takes another 30 seconds to get to -183”</b></p>		
	<b>SRO</b>	<p><b><i>Directs ADS be inhibited when ADS timers initiate (at -129”)</i></b></p> <p>As level drops, expands RPV band given</p>
	<b>ATC/BOP</b>	<b><i>When RPV/L drops to -129” and the ADS timers intimate, takes both ADS inhibit switches to inhibit</i></b>
	<b>ATC/BOP</b>	<p>Reports RPV level as it transitions from Wide Range to Fuel Zone indicators</p> <p>Reports RPV level at -161” (TAF)</p>

**COMMENTS:**



<b>Event No. 10</b>		
<b>Description:</b> Emergency Depressurization and Return RPV Level to +13" to +54"		
This event is initiated when RPV Level reaches -161" (Top Of Active Fuel)		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<b>Critical Task is to Emergency Depressurize the RPV when RPV Level reaches TAF at -161"</b>		
T = 70	<b>SRO</b>	Determines that Emergency Depressurization is required at -161"  Exits the pressure leg of PPM 5.1.1 and enters PPM 5.1.3, Emergency RPV Depressurization  Determines wetwell level is GT 17' and directs 7 ADS SRVs be opened
	<b>ATC/BOP</b>	Opens 7 ADS SRVs as directed
	<b>SRO</b>	Directs containment sprays and Suppression Pool cooling be secured to facilitate RPV injection  Directs RPV Level be returned to +13" to +54" level band
	<b>RO/BOP</b>	Secures sprays and Suppression Pool cooling as directed  Allows ECCS injection valves to open at 470 psig and RPV injection as it occurs  Reports RPV level rising and when GT -161 inches
<b>COMMENTS:</b>		

<b>Event No. 11</b>		
<b>Description: Re-initiation of Wetwell and Drywell Sprays</b> This event is initiated by the SRO when RPV level is greater than TAF		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 75	<b>SRO</b>	Directs initiation of Wetwell sprays if WW Pressure is GT 2 psig Directs initiation of Drywell sprays if Wetwell Pressure is GT 12 psig Directs Suppression Pool Cooling as required
	<b>ATC/BOP</b>	Secures injection systems as necessary to return RPV level to +13" to +54" band  Initiates Wetwell and Drywell sprays as appropriate  Initiates suppression pool cooling if directed
<b>Termination Criteria: The scenario will be terminated when RPV level is being returned with injection from low pressure ECCS pumps, Sprays have been re-initiated as appropriate, or as directed by the scenario coordinator</b>		

## **TURNOVER INFORMATION**

Initial conditions: Columbia is operating in MODE 1 at full Power.

Turnover: A PM is scheduled to swap CRD Pumps.

After shift turnover swap CRD pumps to CRD-P-1B running and CRD-P-1A in standby.

OPS 2 is standing by for the CRD Pump swap evolution.

## **SIMULATOR SETUP INSTRUCTIONS**

Reset to IC-213.

**SCHEDULE**

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<!-- This file contains a Thunder Simulations Schedule -->
<SCHEDULE>
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<ITEM row = 1>
  <TIME>1</TIME>
  <ACTION>Insert malfunction AOV-SCN013F after 1 to FAIL_AS_IS</ACTION>
  <DESCRIPTION>FDR-V-4 DW FLOOR DRN OUTBD ISOL</DESCRIPTION>
</ITEM>

<ITEM row = 2>
  <TIME>1</TIME>
  <ACTION>Insert malfunction PMP-CSS001B after 1</ACTION>
  <DESCRIPTION>HPCS-P-1 HPCS PUMP SHAFT BREAK</DESCRIPTION>
</ITEM>

<ITEM row = 3>
  <TIME>1</TIME>
  <ACTION>Insert malfunction MAL-RMC005-1811 after 1</ACTION>
  <DESCRIPTION>ROD 1811 STUCK at position 10</DESCRIPTION>
</ITEM>

<ITEM row = 4>
  <TIME>1</TIME>
  <ACTION>Insert malfunction MOV-RCI016F to FAIL_AUTO_CLOSE</ACTION>
  <DESCRIPTION>RCIC-V-8 Fails to Auto Close</DESCRIPTION>
</ITEM>

<ITEM row = 5>
  <TIME>1</TIME>
  <ACTION>Insert malfunction MOV-RCI012F to FAIL_AUTO_CLOSE</ACTION>
  <DESCRIPTION>RCIC-V-63 Fails to Auto Close</DESCRIPTION>
</ITEM>

<ITEM row = 6>
  <TIME>1</TIME>
  <ACTION>Insert malfunction ANN-820B2F06 to OFF</ACTION>
  <DESCRIPTION>GLAND SEAL STM PRESS HIGH</DESCRIPTION>
</ITEM>

<ITEM row = 8>
  <TIME>1</TIME>
  <EVENT>1</EVENT>
  <ACTION>Insert remote LOA-EPS277 to TRIP on event 1</ACTION>
  <DESCRIPTION>RPS-CB-MG2 MG-B OUTPT BKR O/C</DESCRIPTION>
</ITEM>

<ITEM row = 9>
  <TIME>1</TIME>
  <EVENT>1</EVENT>
  <ACTION>Insert malfunction MAL-RMC007-1811 on event 1</ACTION>
  <DESCRIPTION>ROD 1811 SINGLE ROD SCRAM</DESCRIPTION>
</ITEM>

<ITEM row = 11>
  <TIME>1</TIME>
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```

<EVENT>29</EVENT>
<ACTION>Insert malfunction MAL-RMC005-1811 after 1 on event 29 delete in
3</ACTION>
  <DESCRIPTION>Deletes stuck rod malfunction</DESCRIPTION>
</ITEM>

<ITEM row = 12>
  <TIME>1</TIME>
  <ACTION>Event Events/LO001677.evt</ACTION>
  <DESCRIPTION>Brings in Events</DESCRIPTION>
</ITEM>

<ITEM row = 14>
  <TIME>1</TIME>
  <EVENT>2</EVENT>
  <ACTION>Insert override IND-FPT022 to 68 in 120 on event 2</ACTION>
  <DESCRIPTION>RFT-PI2-1B TURBINE OIL CONTROL PRESS METER SIGNAL
M</DESCRIPTION>
  </ITEM>

<ITEM row = 15>
  <TIME>1</TIME>
  <EVENT>2</EVENT>
  <ACTION>Insert override IND-FPT023 to 18 in 120 on event 2</ACTION>
  <DESCRIPTION>RFT-PI3-1B TURBINE OIL BEARING PRESS METER SIGNAL
M</DESCRIPTION>
  </ITEM>

<ITEM row = 16>
  <TIME>1</TIME>
  <EVENT>2</EVENT>
  <ACTION>Insert malfunction ANN-840A1E05 after 110 to ON on event 2</ACTION>
  <DESCRIPTION>CONTROL OIL TURB B PRESS LOW</DESCRIPTION>
</ITEM>

<ITEM row = 18>
  <TIME>2</TIME>
  <EVENT>28</EVENT>
  <ACTION>Insert malfunction ANN-840A1E05 to ON after 1 on event 28 delete in
1</ACTION>
  <DESCRIPTION>Removes Control Oil TURB B press low on Aux Pump red light
illuminated</DESCRIPTION>
  </ITEM>

<ITEM row = 20>
  <TIME>2</TIME>
  <EVENT>28</EVENT>
  <ACTION>Insert override IND-FPT023 to 18 after 1 on event 28 delete in
1</ACTION>
  <DESCRIPTION>Returns RFT-PI3-1B to normal on LO Pump red light
illuminated</DESCRIPTION>
  </ITEM>

<ITEM row = 21>
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  <EVENT>28</EVENT>
  <ACTION>Insert override IND-FPT022 to 68 after 1 on event 28 delete in
1</ACTION>
  <DESCRIPTION>Returns RFT-PI2-1B to normal on LO Pump red light
illuminated</DESCRIPTION>
  </ITEM>

```

```
<ITEM row = 22>
  <TIME>1</TIME>
  <EVENT>3</EVENT>
  <ACTION>Insert malfunction MAL-RCI006 to 2000000 in 3600 on event
3</ACTION>
  <DESCRIPTION>RCIC BREAK BETWEEN RCIC-V-8 & PCN</DESCRIPTION>
</ITEM>

<ITEM row = 24>
  <TIME>1</TIME>
  <EVENT>4</EVENT>
  <ACTION>Insert malfunction MAL-CFW006 to 20000 in 600 on event 4</ACTION>
  <DESCRIPTION>LEAK IN COMMON CBP DISCHARGE</DESCRIPTION>
</ITEM>

<ITEM row = 26>
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  <EVENT>26</EVENT>
  <ACTION>Insert malfunction MAL-RRS004B to 2 in 1200 on event 26</ACTION>
  <DESCRIPTION>RECIRC LINE RUPT- RRC-P-1B SUCT</DESCRIPTION>
</ITEM>

<ITEM row = 28>
  <TIME>3</TIME>
  <EVENT>27</EVENT>
  <ACTION>Insert override OVR-FPT002B to ON on event 27</ACTION>
  <DESCRIPTION>RFW TURBINE 1A EMERG TRIP</DESCRIPTION>
</ITEM>

<ITEM row = 29>
  <TIME>3</TIME>
  <EVENT>27</EVENT>
  <ACTION>Insert override OVR-FPT007B to ON on event 27</ACTION>
  <DESCRIPTION>RFW TURBINE 1B EMERG TRIP</DESCRIPTION>
</ITEM>

<ITEM row = 30>
  <TIME>3</TIME>
  <EVENT>27</EVENT>
  <ACTION>Insert malfunction ANN-840A1H03 to ON on event 27</ACTION>
  <DESCRIPTION>RFW PMP A SUCT PRESS LOW</DESCRIPTION>
</ITEM>

<ITEM row = 31>
  <TIME>3</TIME>
  <EVENT>27</EVENT>
  <ACTION>Insert malfunction ANN-840A1H07 to ON on event 27</ACTION>
  <DESCRIPTION>RFW PMP B SUCT PRESS LOW</DESCRIPTION>
</ITEM>

</SCHEDULE>
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**EVENTS**

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<!-- This file contains a Thunder Simulations Event -->
<EVENT>
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    <TRIGGER id="26" description="Inserts LOCA when MSIVs
close">X010194G&gt0</TRIGGER>
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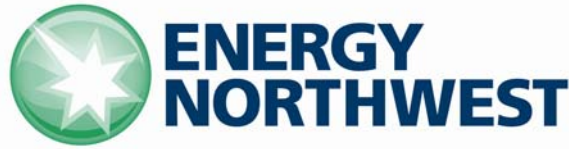
```
    <TRIGGER id="27" description="Trips both RFW Pumps when B/U scram light
on">X030004F&gt0</TRIGGER>
```

```
    <TRIGGER id="28" description="Deletes RFW-B lube oil
malfunctions">X8A0160R&gt0</TRIGGER>
```

```
    <TRIGGER id="29" description="Deletes Stuck rod when Insert P/B light
illuminates">XRL0033I &gt0</TRIGGER>
```

```
</EVENT>
```





## INSTRUCTIONAL COVER SHEET

PROGRAM TITLE      OPERATIONS TRAINING

COURSE TITLE      COLUMBIA GENERATING STATION SIMULATOR EXAMINATION

LESSON TITLE      Start ASD Channel 1A1; Raise Power with Flow; Swap RCC Pumps; 'B' Flow Unit Failure; FPC-P-1B Failure; Main Turbine Trip on High MSR Level; Hydraulic ATWS; Reduced SLC Capacity; Lower RPV Level; S/R/S Inserts Rods

LENGTH OF LESSON 1.5 Hours  
 ; INCLUDED

Lesson Plan PQD Code	_____	Rev. No.	_____
Simulator Guide PQD Code	<u>LO001678</u>	Rev. No.	<u>0</u>
JPM PQD Code	_____	Rev. No.	_____
Exam PQD Code	_____	Rev. No.	_____

DIVISION TITLE    Nuclear Training

DEPARTMENT      Operations Training

PREPARED BY      **Ron Hayden**      DATE      05/30/09

REVISED BY      \_\_\_\_\_      DATE      \_\_\_\_\_

VALIDATED BY      \_\_\_\_\_      DATE      \_\_\_\_\_

TECHNICAL REVIEW      \_\_\_\_\_      DATE      \_\_\_\_\_

INSTRUCTIONAL REVIEW      \_\_\_\_\_      DATE      \_\_\_\_\_

APPROVED      \_\_\_\_\_      DATE      \_\_\_\_\_

---

**Operations Training Manager**

**Verify materials current IAW SWP-TQS-01 prior to use.**

Facility: Columbia  
 Examiners: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

NRC Scenario No: 2  
 Operators: \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Initial conditions: Columbia is operating at reduced power. Yesterday ASD Channel 1A 1 tripped. The problem has been corrected and Channel 1A1 is ready to be re-started.

Turnover: Start ASD Channel 1A1 per SOP-RRC-ASD. Step 5.6.1 is complete. After the channel is started, raise Reactor Power with flow to exit the OPRM Enabled Region. The SNE is working on a reactivity plan to continue the power increase from that point. Also RCC Pumps need to be swapped for run time equalization. Start RCC-P-1A and place RCC-P-1C in standby.

Event No.	Timeline	Event Type*	Event Description
1.	T = 0	N (ATC)	Start ASD Channel 1A1, RRC ASD to Auto
2.	T = 0	N (BOP)	Swap RCC Pumps to RCC-P-1A running and RCC-P-1C in Standby
3.	T = 10	R (ATC)	Raise Power with Flow to Exit OPRM Enabled Region
4.	T = 20	C (BOP) TS (SRO)	RCIC Coupling bolts failed, Trip RCIC; Protect HPCS and ADS TS 3.5.3A
5.	T = 30	C (ATC) TS (SRO)	Flow Unit B Failure; Tech Spec (LCS 1.3.2.1 and TS 3.3.1.1)
6.	T = 35	(C) BOP	FPC-P-1B Failure; FPC-P-1A Fails to Auto Start
7.	T = 40	(C) BOP	MSR Drain Tank Valves Fail Causes High MSR Level and MT Trip
8.	T = 45	M (All)	Hydraulic ATWS; Lower RPV Level and Establish LL
9.	T = 50	C (ATC)	Reduced SLC
10.	T = 55	N (BOP)	Perform PPM 5.5.10 and 5.5.11 to insert Control Rods
11.	T = 65		ATWS Clears and RPV Level is Returned to Normal

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

## SCENARIO DESCRIPTION

The scenario begins with Columbia at approximately 56% power with RRC Pumps running at 32 Hz. ASD Channel 1A1 tripped yesterday and is now ready to be returned to service. When the Crew takes the shift they will re-start ASD Channel 1A1 and swap RCC Pumps.

**EVENT 1** – Start RRC ASD Channel 1A1

**EVENT 2** – Swap running RCC pumps to RCC-P-1A running and RCC-P-1C in standby

**EVENT 3** – When Channel 1A1 is restarted, place RRC-A ASD into Auto and raise power with flow to exit the OPRM Enabled Region.

**EVENT 4** - Failure of RCIC Coupling Bolts. The Control Room will be contacted and informed that the coupling for the RCIC Turbine to Pump has only 2 of 5 bolts engaged. The crew should insert a RCIC trip to prevent it from starting and refer to TS 3.5.3 Condition A.

**EVENT 5** - Failure of the B Flow Unit. The ATC operator will investigate alarms and determine the B Flow Unit has an active INOP trip. The CRS will refer to Tech Specs (LCS1.3.2.1 and TS 3.3.1.1) and direct the Flow Unit be bypassed.

**EVENT 6** - Failure of FPC-P-1B. FPC-P-1A will not auto start on low pressure but the BOP operator will start FPC-P-1A manually and secure FPC-P-1B.

**EVENT 7** – High Level MSR Drain Tank. A failure of the valves for MSR Drain Tank will occur. The BOP operator will attempt to take manual control and reduce drain tank level but will not be successful. Eventually a MSR High Level alarm annunciates. The crew should take action and insert a manual scram and trip the Main Turbine which will trip on High MSR Level in 30 seconds from receipt of the alarm.

**EVENT 8** – Hydraulic ATWS and Lower RPV Level. When a scram is inserted the crew will determine a hydraulic ATWS occurs. Reactor Power will be about 25%. The RRC Pumps trip when the MT Trips. The CRS will direct all injection be secured and lower RPV level to LT -65". When RPV level is about -100", Reactor Power will be LT 5%

**EVENT 9** – Reduce SLC capacity. When the CRS directs SLC initiation, both SLC pumps start but only 20 gpm SLC flow will develop.

**EVENT 10** – Insert Control Rods. Rod Insertion. PPM 5.5.10 and 5.5.11 will be performed to insert Control Rods.

**EVENT 11** – The rods will insert on the first S/R/S. When all rods are in, RPV Level will be returned to +13" - +54" band.

The scenario will be terminated when RPV level is being returned to normal band or as directed by the scenario coordinator.

<b>Event No. 1</b>		
<b>Description:</b> Start RRC-P-1A ASD Drive 1A1		
This event is initiated by shift turnover		
Time	Position	Applicants Actions or Behavior
T = 0	SRO	Directs that ASD Channel 1A1 be started per SOP-RRC-ASD Section 5.6.
	ATC	<p>Commences Section 5.6 at step 5.6.2:</p> <ul style="list-style-type: none"> <li>a. Verifies frequency of drive 1A2 at LE 35 Hz</li> <li>b. Depresses the ASD START button</li> <li>c. Verifies the red lamp illuminates (observes red light illuminates, green light goes out and channel failure limit alarm clears)</li> <li>d. Verifies heater breaker is OFF by contacting OPS4</li> </ul> <p>Informs CRS that ASD Channel 1A1 has been started</p>
<b>ROLEPLAY: If asked the Heater Breaker is in the OFF position</b>		
<b>COMMENTS:</b>		

<b>Event No. 2</b>		
<p><b>Description:</b> Swap RCC Pumps to RCC-P-1A running and RCC-P-1C secured.</p> <p>The event is initiated by turnover information and will be performed immediately after shift turnover</p>		
Time	Position	Applicants Actions or Behavior
T = 0	CRS	Direct RCC-P-1A be started and RCC-P-1C be secured
	BOP	<p>Refers to SOP-RCC-OPS Section 5.1.1a and starts RCC-P-1A:</p> <ul style="list-style-type: none"> <li>• Contacts OPS 2 and verifies RCC-V-1A is OPEN</li> <li>• Contacts OPS 2 and verifies RCC-V-2A is OPEN</li> <li>• Place RCC-RMS-P-1A in AUTO after START</li> </ul> <p>Refers to section 5.1.2c:</p> <ul style="list-style-type: none"> <li>• Places RCC-RMS-P-1C in AUTO after STOP</li> <li>• Contacts OPS 2 and verifies RCC-V-23C CLOSED</li> </ul>
<b>ROLEPLAY: RCC-V-1A and RCC-V-2A are open and RCC-V-23C did close when asked</b>		
<b>COMMENTS:</b>		

<b>Event No. 3</b>		
<b>Description:</b> Place ASD in Auto and Raise Power With Flow to Exit OPRM Enabled Region The event is initiated by the SRO when ASD Channel 1A1 has been started		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 10	SRO	Directs ATC to place A RRC Pump ASD control in Automatic
	ATC	Verifies Master and Individual controller setpoints matched and places RRC-A ASD in Auto
	SRO	Directs ATC to raise Reactor Power with flow to exit the OPRM Enabled Region at a rate not to exceed 10 MWE/minute
	ATC	Raises reactor power with flow as directed
<b>COMMENTS:</b>		

<b>Event No. 4</b>		
<b>Description:</b> RCIC Turbine Shaft Coupling Bolts Missing – Inops RCIC		
The event is initiated by OPS 2 contacting the Control Room when power has been raised and the OPRM Region has been exited		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 20		<b>ROLEPLAY: As OPS 1 call the control room on extension 2393 and inform the reactor operator that you are down in the RCIC Room and found a nut on the turbine by the pump coupling. What I found is that only two of the five bolts for the coupling that connects the turbine to the pump are still engaged.</b>
	BOP	Answers the phone and informs the CRS that the RCIC turbine/pump coupling only has 2 of the 5 bolts still connected.
	SRO	Calls Production/Work Control and informs them of the RCIC turbine situation
<b>ROLEPLAY: If called as Production/Work Control acknowledge the info and tell them a team will be put together to investigate.</b>		
	SRO	Directs BOP operator to insert a manual trip of the RCIC turbine to prevent it from starting
	BOP	Trips the RCIC turbine by either depressing the Turbine Trip P/B or manually closing RCIC-V-1
	SRO	Refers to Tech Specs 3.5.3 Condition A: <ul style="list-style-type: none"> <li>• Verifies HPCS operable by administrative means and</li> <li>• Restore RCIC to operable status within 14 days</li> </ul>
	SRO/BOP	Refers to OI-49 and determines that HPCS and ADS-SYS 1A/B be protected
	BOP	Places protected signs of HPCS and both ADS divisions



<b>Event No. 4</b>		
		Contacts OPS2 to hang protected signs on HPCS system
<b>COMMENTS:</b>		

<b>Event No. 5</b>		
<b>Description:</b> Flow Unit B Failure		
The event is initiated when the OPRM Region has been exited and is initiated by <b><u>ACTIVATING TRIGGER 1</u></b>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 30	ATC	Acknowledges Rod Out Block and Flow Reference Off Normal annunciators, informs CRS and refers to ARP for Flow Reference Off Normal (P603 A8 3-6)
	ATC	Per ARP determines the white light is illuminated indicating Flow Unit B is INOP  Refers CRS to LCS 1.3.2.1 and TS 3.3.1.1 and TS Bases page 3.3.1.1-9
	SRO	Refers to LCS 1.3.2.1 and TS 3.3.1.1 and TS Bases page 3.3.1.1-9 and determines requirement is to place in trip within 12 hours
	SRO	Directs ATC Operator to bypass Flow Unit B
	ATC	Places Flow Unit B in the Bypass position  Notes the INOP light goes out and the BYPASS light illuminates
<b>COMMENTS:</b>		

<b>Event No. 6</b>		
<p><b>Description</b> Lowering FPC System pressure with a failure of the standby pump to Auto Start</p> <p>The event is initiated when Tech Specs have been referenced for RCIC and systems protected by <b><u>ACTIVATING TRIGGER 2</u></b></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 35	BOP	<p>Acknowledges CIRCULATION PUMP B DISCHARGE PRESS LOW on P627.FPC2 3-1 and refers to ARP</p> <p>Informs CRS of the alarm and that the automatic actions should be an Auto start of FPC-P-1A but that FPC-P-1A did not auto start</p> <p>(The BOP may start pump and then inform CRS of actions based on auto action that should have occurred but did not)</p>
	SRO	Directs the start of FPC-P-1A if not already running
	SRO	Directs that FPC-P-1B be secured
	BOP	Secures FPC-P-1B as directed (If FPC-P-1B is stopped before FPC-P-1A restores pressure, it may restart unless the control switch is put in the (Pull to Lock) IR-69 position)
	SRO	Contacts production/Work Control/OPS2 to investigate FPC-P-1B
<b>COMMENTS:</b>		

<b>Event No. 7</b>		
<p><b>Description:</b> Failure of MSR Drain tank 1A level control valves HD-LIC-9A and 9A2 closed</p> <p>The event is initiated by <b><u>ACTIVATING TRIGGER 3</u></b> after actions for Flow Unit and FPC failures have been completed</p> <p>(Drain Tank alarm annunciates in 10 seconds and it takes about 6 minutes to get MSR A High Level Alarm after trigger activation)</p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 40	BOP	<p>Acknowledges alarm and reports MSR Drain Tank 1A Level High alarm. Refers to ARP.</p> <p>Investigates controllers at H13-P835 to ensure they are in Auto and recognizes the controllers are opening drain valves but level continues to rise. May attempts manual operation but valve is already full open.</p> <p>Reports controllers functioning in Auto (or Manual) and level indication is off scale high.</p>
	SRO	Conduct a brief on actions if level continues to rise and MSR Level High alarm is received.
	ATC/BOP	Acknowledges and reports MSR A Level High alarm and refers to ARP (Turbine Trip has a 30 second time delay)
	SRO	Directs a manual reactor scram prior to automatic scram actuation (SRO may direct a scram prior to MSR A high Level alarm)
	ATC	<p>Scrams the reactor and performs immediate operator actions of PPM 3.3.1:</p> <ul style="list-style-type: none"> <li>• mode switch to shutdown</li> <li>• monitors/reports Power/Pressure/Level</li> </ul> <p>Recognizes failure to scram (ATWS) – <b>(REFER TO EVENT 8)</b></p>
<b>COMMENTS:</b>		

<b>Event No. 8</b>		
<p><b>Description:</b> Hydraulic ATWS</p> <p>This event is setup at the beginning of the scenario and occurs automatically when a manual scram is inserted</p>		
<b>Critical Task is to lower RPV level and establish an LL (Lowered Level).</b>		
Time	Position	Applicants Actions or Behavior
T = 45	ATC	<p>Continues with immediate scram actions after recognizing all control rods did not insert:</p> <ul style="list-style-type: none"> <li>• Depress the manual scram pushbuttons</li> <li>• Initiate ARI and verifies valves opened</li> <li>• Insert SRMs and IRMs</li> </ul> <p>Announce EOP entry into PPM 5.1.1 on low Reactor Water level and/or Power GT 5% and a scram required</p> <p>Reports reactor power</p>
	SRO	<p>Enters PPM 5.1.1 and directs/verifies that the Mode Switch has been placed in SHUTDOWN and exits PPM 5.1.1 via the Power leg to PPM 5.1.2, RPV Control ATWS</p> <p>Directs BOP to:</p> <ul style="list-style-type: none"> <li>• Inhibit ADS and take manual control of HPCS</li> <li>• Verify all appropriate isolations and initiations have occurred</li> <li>• Verify pressure is being maintained by the bypass valves</li> </ul>
	BOP	Takes both ADS control switches to the INHIBIT position and

<b>Event No. 8</b>		
		<p>acknowledges associated BISIs</p> <p>Arms and Depresses the HPCS system initiation P/B while holding the control switch for HPCS-P-1 to STOP</p> <p>Closes HPCS-V-4 when it get fully opened</p> <p>Reports completion to SRO</p>
	SRO	<p>Directs bypassing the MSIV isolation interlocks per PPM 5.5.6</p> <p>Directs performance of PPM 5.5.1</p>
	BOP	<p>Performs PPM 5.5.6 and updates Crew:</p> <p>At H13-P609 places MS-RMS-S84 to BYPASS</p> <p>At H13-P611 places MS-RMS-S85 to BYPASS</p> <p>Performs PPM 5.5.1 and updates Crew:</p> <p>At H13-P625 places HPCS-RMS-S25 in OVERRIDE</p> <p>At H13-P629 places LPCS-RMS-S21 in OVERRIDE</p> <p>At H13-P629 places RHR-RMS-S105 in OVERRIDE</p> <p>At H13-P618 places RHR-RMS-S106 in OVERRIDE</p> <p>At H13-P618 places RHR-RMS-S107 in OVERRIDE</p>
	SRO	<p>Direct the ATC to:</p> <p style="padding-left: 40px;">Stop and prevent all injection into the RPV except by Boron injection systems, RCIC, and CRD</p> <p style="padding-left: 40px;">Lower level to a band less than –65 inches but greater than –183 inches (preferred band is –80” to –140”)</p> <p style="padding-left: 40px;">Records the upper limit as LL</p> <p style="padding-left: 40px;">Maintain level as directed from LL to –183 inches with systems</p>

<b>Event No. 8</b>		
		listed in Table 5 (Band should be –80” to –140”)
	SRO	Directs SLC initiation when RRC pumps are off (SLC may be started prior to this as RRC-Pumps are off when MT Trips) <b>(REFER TO EVENT 9)</b> .
	ATC	<p>Uses Quick Cards to stops and prevent condensate and feedwater and lines up on the startup flow control valves as directed</p> <p>Reports EOP entry on low RPV level</p> <p>Reports Reactor Power as it drops due to lowering level</p> <p>When Reactor Power is LT 5%, marks RPV level to establish an LL</p> <p>Maintains RPV level between LL and –183 inches as directed (–80 inches to –140 inches)</p>
	SRO	Directs PPM 5.5.10 and 5.5.11 (Tabs B, F) performance for a hydraulic ATWS. <b>(REFER TO EVENT 10)</b>
<b>COMMENTS:</b>		

<b>Event No. 9</b>		
<p><b>Description:</b> Failure of SLC pumps to deliver normal SLC flow to RPV</p> <p>This event is activated at the beginning of the scenario and realized by the crew when SLC control switches are taken to OPER to initiate SLC</p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 50	SRO	Recognizes RRC Pumps have tripped off and directs SLC initiation before SP temp reaches 110°F
	ATC	<p>Initiates SLC per the quick card:</p> <p>Swaps keys and places two switches to OPER</p> <p>Verifies squib valves fire</p> <p>Verifies RWCU-V-4 closure</p> <p>Verifies flow and SLC tank level</p> <p>Reports reduced SLC flow (about 18 gpm) and initial tank level</p>
<b>COMMENTS:</b>		



<b>Event No. 10</b>		
<p><b>Description:</b> Insert control rods using PPM 5.5.10 and 5.5.11 Tab B.</p> <p>This event is initiated by the SRO direction.</p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 55	SRO	Directs PPM 5.5.10 and PPM 5.5.11 be performed to insert control rods
	BOP	<p>Performs:</p> <p>PPM 5.5.10 - Override ARI Logic – pulls 2 fuses</p> <p>PPM 5.5.11 Tab B – Starts the second CRD Pump, places the SDV HIGH LEVEL Trip control switch to BYPASS on P603, and determines that scram cannot be reset per PPM 5.5.11</p> <p>PPM 5.5.11 Tab F – The second CRD Pump should already be running, the SDV HIGH LEVEL Trip control switch should already be in BYPASS on P603, and determines that CRD drive header pressure can be established per PPM 5.5.11</p> <p>Directs Instructor to perform back panel operations associated with Tab B and Tab F</p>
<p><b>FLOOR OPERATOR:</b> Take direction from BOP to perform back panel steps of Tab B (Step Q-3 to perform attachment 6.1) and Tab F (Step Q-6 to perform attachment 6.2).</p> <p>Activate Trigger 28 to install RPS jumpers and Trigger 30 to install RSCS jumpers</p> <p>When completed with steps, initial by the blocks and inform the BOP operator that they are completed by standing next to Board S and giving the crew an update:</p> <p>“UPDATE READY - Attachment 6.1 per Tab B and Attachment 6.2 per Tab F of PPM 5.5.11 has been completed, END OF UPDATE.”</p>		

<b>Event No. 10</b>		
	BOP	Performs remainder of PPM 5.5.11 Tab B actions to scram/reset/scram: <ul style="list-style-type: none"> <li>• resets Scram and notes time</li> <li>• After 2 minutes, checks rod density and inserts a manual reactor scram and informs CRS of results</li> </ul> If rods do not insert continues scram/reset/scram Tab B
	BOP	Performs remainder actions of PPM 5.5.11 Tab F: <ul style="list-style-type: none"> <li>• Places RWM Bypass Control Switch to BYPASS</li> <li>• Informs CRS of readiness to drive rods</li> </ul>
	SRO	Directs rod insertion starting at rod 10-43 and inserting every other rod every other row until all rods are inserted skipping the peripheral rods
	BOP	Drives Control Rods as directed
<p><b>COMMENTS: It may take two S/R/S actions before all rods go in.</b></p>		

<b>Event No. 11</b>		
<b>Description:</b> Control Rods Insert and RPV Level returned to +13" to +54" band		
This event is activated when RPV level has been lowered and S/R/S is being performed		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<b>Critical Task is to insert Control Rods by performing PPM 5.5.11 Scram/Reset/Scram</b>		
<b>BOOTH OPERATOR: When RPV Level has been lowered and is being controlled in the desired band, and scram/reset/scram is being performed to insert control rods:</b>		
<b><u>Remove malfunctions associated with ATWS (CRD007A1, 7A2, 7B1 and 7B2)</u></b>		
T = 65	BOP	Checks control rod density  Initiates a manual scram  Notes Control Rod motion  Recognizes and reports All Rods In to the SRO
	SRO	Directs SLC be stopped
	RO	Takes control switches out of OPER and observes both SLC pumps stop
	SRO	Exits PPM 5.1.2 and re-enters PPM 5.1.1  Directs RPV level be raised to +13" to +54" band with available systems
	RO	Raises RPV level into band as directed
<b>TERMINATION POINT – The scenario will be terminated when RPV level has been returned to normal operating band.</b>		
<b>COMMENTS:</b>		

## **TURNOVER INFORMATION**

Initial conditions: Columbia is operating at reduced power. Yesterday ASD Channel 1A 1 tripped. The problem has been corrected and Channel 1A1 is ready to be re-started.

Turnover: Start ASD Channel 1A1 per SOP-RRC-ASD. Step 5.6.1 is complete.

After the channel is started, raise Reactor Power with flow to exit the OPRM Enabled Region. The SNE is working on a reactivity plan to continue the power increase from that point.

Additionally, RCC Pumps need to be swapped for run time equalization. Start RCC-P-1A and place RCC-P-1C in standby.

# **SIMULATOR SETUP INSTRUCTIONS**

Load IC 220.

#### SCHEDULE

```

<!-- This file contains a Thunder Simulations Schedule -->
<SCHEDULE>

  <ITEM row = 1>
    <TIME>0</TIME>
    <ACTION>Insert malfunction MAL-CRD007A1</ACTION>
    <DESCRIPTION>HYDRAULIC ATWS EAST SDV BLOCKAGE</DESCRIPTION>
  </ITEM>

  <ITEM row = 2>
    <TIME>0</TIME>
    <ACTION>Insert malfunction MAL-CRD007A2 to 90</ACTION>
    <DESCRIPTION>HYDRAULIC ATWS EAST SDV</DESCRIPTION>
  </ITEM>

  <ITEM row = 3>
    <TIME>0</TIME>
    <ACTION>Insert malfunction MAL-CRD007B1</ACTION>
    <DESCRIPTION>HYDRAULIC ATWS WEST SDV BLOCKAGE</DESCRIPTION>
  </ITEM>

  <ITEM row = 4>
    <TIME>0</TIME>
    <ACTION>Insert malfunction MAL-CRD007B2 to 90</ACTION>
    <DESCRIPTION>HYDRAULIC ATWS WEST SDV</DESCRIPTION>
  </ITEM>

  <ITEM row = 5>
    <TIME>0</TIME>
    <ACTION>Insert malfunction PMP-SLC001F to 75</ACTION>
    <DESCRIPTION>SLC-P-1A SLC PUMP 1A REDUCED FLOW (25% of
normal)</DESCRIPTION>
  </ITEM>

  <ITEM row = 6>
    <TIME>0</TIME>
    <ACTION>Insert malfunction PMP-SLC002F to 75</ACTION>
    <DESCRIPTION>SLC-P-1B SLC PUMP 1B REDUCED FLOW (25% of
normal)</DESCRIPTION>
  </ITEM>

  <ITEM row = 9>
    <TIME>0</TIME>
    <EVENT>1</EVENT>
    <ACTION>Insert malfunction MAL-NIS006B to INOP on event 1</ACTION>
    <DESCRIPTION>APRM FLOW UNIT B FAIL</DESCRIPTION>
  </ITEM>

  <ITEM row = 10>
    <TIME>0</TIME>
    <ACTION>Insert override OVR-FPC003E to OFF</ACTION>
    <DESCRIPTION>FPC-P-1A FAILS TO AUTO START</DESCRIPTION>
  </ITEM>

  <ITEM row = 11>
    <TIME>0</TIME>
    <ACTION>Insert malfunction PMP-FPC002B on event 2</ACTION>
    <DESCRIPTION>FPC-P-1B SHAFT BREAK</DESCRIPTION>

```

</ITEM>

<ITEM row = 13>

<TIME>0</TIME>

<EVENT>3</EVENT>

<ACTION>Insert malfunction AOV-FWH059F to CLOSE on event 3</ACTION>

<DESCRIPTION>HD-LCV-9A1 HD-TK-1A LEVEL CONTROL VALVE</DESCRIPTION>

</ITEM>

<ITEM row = 14>

<TIME>0</TIME>

<EVENT>3</EVENT>

<ACTION>Insert malfunction AOV-FWH060F to CLOSE on event 3</ACTION>

<DESCRIPTION>HD-LCV-9A2 HD-TK-1A LEVEL CONTROL DUMP VLV</DESCRIPTION>

</ITEM>

</SCHEDULE>



**INSTRUCTIONAL COVER SHEET**

PROGRAM TITLE OPERATIONS TRAINING

COURSE TITLE COLUMBIA GENERATING STATION SIMULATOR EXAMINATION

LESSON TITLE Raise Power with Flow; Start CW-P-1C; Control Rod Exercise  
 Surveillance Finds an Uncoupled Rod That Won't Re-Couple; SGT  
 Surveillance – Controller Failure; Minimum Seismic EQ; CW Rupture -  
 Causes Back Pressure To Rise Requiring a Manual Scram; OBE; Loss of  
 Offsite Power; DW Floor Rupture; RHR-P-2A Breaker Fails to Close,  
 RHR-V-16B Fails Closed; Emergency Depressurize on exceeding High  
 Drywell Temp

LENGTH OF LESSON 1.5 Hours  
 ; INCLUDED

Lesson Plan PQD Code	_____	Rev. No.	_____
Simulator Guide PQD Code	<u>LO001679</u>	Rev. No.	<u>0</u>
JPM PQD Code	_____	Rev. No.	_____
Exam PQD Code	_____	Rev. No.	_____

DIVISION TITLE Nuclear Training

DEPARTMENT Operations Training

PREPARED BY **Ron Hayden** DATE 05/31/09

REVISED BY \_\_\_\_\_ DATE \_\_\_\_\_

VALIDATED BY \_\_\_\_\_ DATE \_\_\_\_\_

TECHNICAL REVIEW \_\_\_\_\_ DATE \_\_\_\_\_

INSTRUCTIONAL REVIEW \_\_\_\_\_ DATE \_\_\_\_\_

APPROVED \_\_\_\_\_ DATE \_\_\_\_\_



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**Operations Training Manager**

**Verify materials current IAW SWP-TQS-01 prior to use**



## **SCENARIO DESCRIPTION**

EVENT 1 - Start CW-P-1C

EVENT 2 – Power will be raised to 95% with Flow

EVENT 3 – Perform OSP-CRD-W701 (Control Rod Exercise Surveillance). Control Rod 22-59 will be uncoupled when checked. When Recoupling is attempted the rod will not recouple. Tech Specs will be referenced and the rod should be driven full in and isolated with cooling flow maintained

EVENT 4 – Perform OSP-SGT-M702 (Standby Gas treatment System B Operability Surveillance). The controller will fail as is when flow reaches 3100 cfm. The unit may be shut down. Tech Specs will be referenced

EVENT 5 – Minimum Seismic Earthquake results in a CW Line rupture outside the protected area. As a result, Main Turbine back pressure will start to rise. The crew should recognize that the event is not recoverable and insert a manual scram and remove the MT from service

EVENT 6 – After the immediate scram actions have been performed, a OBE will occur causing a loss of Startup Power, then a loss of Backup Power (and the Drywell Floor Ruptures and a LOCA starts – refer to Event 7)

EVENT 7 – Drywell Floor Rupture and LOCA

EVENT 8 – Inability to Spray (RHR-P-2A Breaker Fails and RHR-V-16B will not open)

EVENT 9 – Emergency Depressurize due to Drywell Temperature when it cannot be restored and maintained LT 330°F

The scenario will be terminated when RPV level is being returned to normal or as directed by the scenario coordinator

<b>Event No. 1</b>		
<b>Description:</b> Start CW-P-1C per SOP-CW-START		
This event is initiated by shift turnover		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 0	SRO	Directs the start of CW-P-1C per SOP-CW-START
	BOP	<p>Performs SOP-CW-START Section 5.2:</p> <ul style="list-style-type: none"> <li>• 5.2.1 – Step is N/A</li> <li>• 5.2.2 – Contacts OPS4 to verify</li> <li>• 5.2.3 – Contacts OPS4 to verify</li> <li>• Makes plant announcement of CW-P-1C start</li> <li>• 5.2.5 – Verifies bay level is GT 441' (is reading 442')</li> <li>• 5.2.6 – Places C/S for CW-V-13C and TSW-V-115C to OPEN and when valves start to open releases switch</li> <li>• 5.2.7 – Verifies CW-P-1C Blue ready to start light is illuminates</li> <li>• 5.2.8 – Verifies 6 towers on line per P&amp;L 4.2</li> <li>• 5.2.9 – Step is N/A</li> <li>• 5.2.10 – Places CW-P-1C C/S to START and verifies pump starts, discharge valve opens, and CW-V-13C and TSW-V-115C close</li> </ul> <p>Informs CRS that CW-P-1C is running</p>
<b>COMMENTS:</b>		

<b>Event No. 2</b>		
<b>Description:</b> Raise Power with Flow This event is initiated by shift turnover		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 0	SRO	Directs ATC to raise power with flow to achieve 95% reactor power at a rate not to exceed 10MWE/min
	ATC	Notes Reactor Power and Main Generator Output  Verifies both RRC pumps individual controllers are in AUTO and depresses Master Controller Raise P/B to increase flow/power as directed
<b>COMMENTS:</b>		

<b>Event No. 3</b>		
<b>Description:</b> Control Rod Exercise. Control Rod 22-59 is not coupled and will not re-couple This event is initiated by shift turnover and started after Reactor Power is 95%		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 10	SRO	Directs performance of OSP-CRD-W701
	ATC	Performs OSP-CRD-W701 section 7.8 for rod 18-59 with coupling check OK: <ul style="list-style-type: none"> <li>• Selects the rod</li> <li>• Inserts rod 1 notch</li> <li>• Verifies position changes</li> <li>• Continuously withdraws rod</li> <li>• Verifies position change</li> <li>• Verifies coupling integrity (no alarm)</li> <li>• Verifies position 48</li> <li>• Repeats for next rod</li> </ul>
	ATC	Performs for rod 22-59 and receives ROD OVERTRAVEL annunciator (P603.A7.1-8)
	ATC	Acknowledges alarm and refers to ARP: <ul style="list-style-type: none"> <li>• Notify SM and SNE of condition</li> <li>• Insert control rod 22-59 to position 00 to accomplish recouping</li> <li>• Continuous withdraws 22-59 and receives ROD OVERTRAVEL alarm again</li> </ul>

<b>Event No. 3</b>		
	SRO	<p>Declares Control Rod 22-59 inoperable</p> <p>Refers to Tech Spec 3.1.3 Condition C and verifies total number of slow or inop rods is LE 8 immediately AND Fully insert the inop rod within 3 hours AND disarm the associated CRD within 4 hours</p> <p>Directs control rod 22-59 be fully inserted</p>
	SRO	May direct SOP-CRD-HCU section 5.4 be performed for rod 22-59
<p><b>ROLEPLAY: If directed to isolate rod acknowledge task only - no manipulations need to be done.</b></p> <p><b>ROLEPLAY: If asked, there are no slow or inop control rods.</b></p> <p><b>ROLEPLAY: If asked, conditions allow control rod 22-59 to be inserted and then withdrawn.</b></p>		
<p><b>COMMENTS:</b></p>		

<b>Event No. 4</b>		
<b>Description:</b> Perform SGT B Monthly Surveillance OSP-SGT-M702 The event is initiated by the turnover and is performed after CW-P-1C is started		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<b>BOOTH OPERATOR: Have SGT Flow displayed on computer <u>and when flow reaches 3100 CFM ACTIVATE TRIGGER 1</u></b>		
T = 10	SRO	Directs Standby Gas Treatment System B monthly operability surveillance, OSP-SGT-M702 be performed
<b>ROLEPLAY – If asked there are no paint fumes, etc. in SGT area and SGT integrity is done</b>		
	BOP	<p>Performs OSP-SGT-M702 as directed:</p> <ul style="list-style-type: none"> <li>• 7.1.1 - Contacts OPS 2 and verifies no paint fumes</li> <li>• 7.1.2 - Contacts OPS 2 and verifies SGT integrity</li> <li>• 7.1.3 - Records moisture reading on SGT-MI-4B (reads zero)</li> <li>• 7.1.4 - Verifies SGT-V-2B is open (Rx Bldg inlet)</li> <li>• 7.1.5 - Verifies SGT-V-3B1 is open (fan 1B2 inlet)</li> <li>• 7.1.6 - Depresses BISI Manual Out of Service pushbutton</li> <li>• 7.1.7 - Informs CRS to enters SGT system B as inoperable in the TS surveillance log</li> <li>• 7.1.8 - Places SGT-DPIC-1B2 in MANUAL</li> <li>• 7.1.9 - Adjusts SGT-DPIC-1B2 output to minimum (100%)</li> <li>• 7.1.10 - Places SGT-EHC-1B2 control switch to ON</li> <li>• 7.1.11 - Verifies SGT-FN-1B2 auto starts 10 sec. after heaters energize</li> <li>• 7.1.12 - Promptly opens SGT-V-5B2 (exhaust to stack)</li> <li>• 7.1.13 - Slowly adjusts SGT-DPIC-1B2 to obtain 4800 CFM ± 480CFM</li> </ul>
<b>BOOTH OPERATOR: <i>When flow reaches 3100 CFM</i> <u>ACTIVATE TRIGGER 1</u></b>		



<b>Event No. 4</b>		
	BOP	Observes and reports to the CRS that the DPIC cannot be adjusted and appears to have failed-as-is with SGT flow at about 3100 CFM
	SRO	<p>May directs BOP to shutdown the SGT system and restore the lineup</p> <p>Refers to Tech Specs due to DPIC failure and determines TS 3.6.4.3 Condition A applies as SGT-FN-1A-1 is already tagged out – Restore SGT B within 7 Days</p> <p>May contact Production/Work Control/SSS</p>
<p><b>ROLEPAY: If asked to secure or leave SGT-B running ask the crew to leave it running so mechanics can go check it out.</b></p>		
	BOP	<p>May use SOP-SGT-SHUTDOWN to secure SGT or use surveillance and do steps in reverse order</p> <p>Per SOP-SGT-SHUTDOWN Section 5.1.2:</p> <p>Take the following switches to PULL TO LOCK:</p> <ul style="list-style-type: none"> <li>• SGT-EHC-1B2</li> <li>• SGT-V-2B</li> <li>• SGT-V-3B1</li> <li>• SGT-V-2B2</li> <li>• SGT-V-5B1</li> <li>• SGT-V-5B2</li> </ul> <p>When SGT-EHC-1B1 and SGT-FN-1B1 starts then place SGT-EHC-1B1 to OFF</p>
<p><b>COMMENTS:</b></p>		

<b>Event No. 5</b>		
<p><b>Description:</b> Minimum Seismic Earthquake results in Circ Water Rupture Outside Protected Area requiring a Reactor Scram and Main Turbine Trip</p> <p>This event is initiated when the two surveillances are completed and Tech Specs have been reviewed by <b><u>ACTIVATING TRIGGER 2 – BOOTH OPERATOR SEE BELOW INSTRUCTIONS</u></b></p>		
Time	Position	Applicants Actions or Behavior
<b>BOOTH OPERATOR: Start EQ track on lowest volume and run for 5 seconds and then ACTIVATE TRIGGER 2. Allow EQ track to run another 5 seconds then stop it</b>		
T = 35	BOP	<p>Acknowledges Minimum Seismic Alarm, pulls ARP and refers CRS to ABN-EARTHQUAKE</p> <p>Investigates and reports indications on Bd. L (16 Amber and no red lights)</p>
<b>ROLEPLAY: 30 seconds after EQ contact Control Room as OPS 4 and report that you felt the earth shake just a minute ago</b>		
	SRO	Directs announcement per ABN-EARTHQUAKE be performed
	BOP	Makes announcement and directs SAS (meets booth operator at booth door) to repeat on the Maintenance and Security radio channels
<b>ROLEPLAY: When EQ announcement has been performed contact the control room as OPS 4 and report a large piping break between the cooling towers has resulted in a large volume of water flowing away form the plant into the desert</b>		
	SRO	May direct announcement concerning pipe rupture be performed
	BOP	<p>Makes announcement if directed</p> <p>Reports lowering MWe output and rising MT Back Pressure</p>
NOTE: It takes about 9 minutes to get to a back pressure reading of 5.7 and MWe to be 948 MWe – longer if power is reduced in an attempt to keep plant/Main Turbine on line longer		
	SRO	<p>Determines that it is necessary to trip the Main Turbine due to rising back pressure</p> <p>Conducts a brief on scram and MT trip</p>

<b>Event No. 5</b>		
	SRO	<p>May direct a RRC flow reduction prior to directing the Reactor Scram</p> <p>Directs ATC to insert a manual scram</p>
	ATC	<p>Lowers Core Flow if directed</p> <p>Announces “Listen up for the scram report”</p> <p>Performs immediate scram actions:</p> <ul style="list-style-type: none"> <li>• Places Reactor Mode Switch in SHUTDOWN</li> <li>• Monitors Power, Pressure, and Level</li> <li>• Verifies all rods inserted</li> <li>• Inserts IRMs and SRMs by depressing INSERT P/B</li> </ul> <p>Reports EOP entry on low RPV water level</p>
	SRO	<p>May direct MT Trip prior to its auto trip</p> <p>Enters PPM 5.1.1 on Low RPV Level and directs restoration of RPV level to +13 inches to +54 inches (a -40” to +50 “ band should be given) with RCIC and/or Condensate and Feed system</p>
<b>COMMENTS:</b>		

<b>Event No. 6</b>		
<p><b>Description:</b> Operating Basis Earthquake; Loss of Startup Power (10 sec. TD); Loss of Backup Power (120 sec. TD)</p> <p>This event is initiated by <u>ACTIVATING TRIGGER 3 AFTER the scram report and after EOPs have been entered – BOOTH OPERATOR SEE BELOW INSTRUCTIONS</u></p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<p><b>BOOTH OPERATOR: Start EQ track on lowest volume and take 19 seconds to get to full volume. After 4 seconds <u>ACTIVATE TRIGGER 3</u>. Allow EQ track to run another 5 seconds after reaching max volume and then stop it</b></p>		
<p><b>Critical step is to initiate systems required to restore RPV level back to +13" to =54"</b></p>		
T = 55	BOP	<p>Reports OBE annunciator, pulls ARP and refers SRO to ABN-EARTHQUAKE.</p> <p>Investigates and reports indications on Bd. L (all red and yellow lights illuminated)</p>
	BOP	<p>Investigates electrical boards when the Startup Transformer locks out and updates crew that Startup power is locked out and Backup power is on SM-7 and SM-8. SM-4 is powered from DG-3</p>
	SRO	<p>Due to the loss of feedwater directs RPV level restoration with RCIC and/or HPCS and/or CRD</p>
	ATC	<p>Initiates RCIC and or HPCS using quick cards</p> <p>Restarts CRD pump</p> <p>Uses RCIC and/or HPCS to maintain RPV Level</p>
	BOP	<p>Investigates electrical board when Backup Transformer locks out and updates crew that Backup power is locked out and SM-7 and SM-8 are powered from Diesel Generators</p>
	SRO	<p>Directs RPV Pressure be maintained with SRVs with a band of 800 to 1000 psig</p>

	BOP/ATC	Cycles SRVs as necessary to maintain RPV Pressure between 800 and 1000 psig (When LOCA starts SRVs will not have to be cycled to control RPV pressure)
	SRO	Directs actuations for low RPV level be verified
	BOP	Verifies and reports actuations complete
	BOP/ATC	Recognizes that CAS compressors and TSW are not running.  Directs OPS 3 to place FW on CAS Heat Exchanger cooling and reset and restart CAS compressors A and B
<p><b>BOOTH OPERATOR: When directed and after appropriate time delay, place firewater on CAS and reset and restart the CAS compressors and report results to control room</b></p>		
<p>COMMENTS:</p>		

<b>Event No. 7</b>		
<b>Description:</b> LOCA (on a 120 sec. TD); Drywell Floor Failure; RHR-P-2A Breaker Fails to Close This event is initiated from trigger 3 which has already been activated		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
T = 55	BOP	Reports Drywell Pressure rising and at 1.68 psig reports EOP entry into PPM 5.2.1 (reports others as they occur – SP/T, SP/L, DW/T)
	SRO	Directs actuations for 1.68 psig DW/P be verified
	BOP	Verifies actuations for 1.68 psig and notes RHR-P-2A is not running Attempts to manually close RHR-P-2A breaker and notes it does not close Reports 1.68 actuation findings to CRS
	BOP	Observes that Wetwell and Drywell pressures are approximately the same and informs the CRS  Reports Wetwell pressure when GT 2 psig
	SRO	Directs Wetwell Sprays be initiated with RHR-P-2B  May direct SP Cooling be initiated  Directs sprays be terminated when WW/P drops below 1.68 psig
	BOP	Initiates Wetwell sprays using quick card and opens RHR-V-27B  Initiates Suppression Pool Cooling using quick card if directed  Reports Wetwell sprays initiated
<b>COMMENTS:</b>		

<b>Event No. 8</b>		
<b>Description:</b> Inability to Spray Drywell		
This event is initiated from trigger 3 which has already been activated		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<b>T = 65</b>	BOP	Reports Drywell Temperature as it approaches 285°F (It takes 6 minutes to reach 285°F after trigger 3 is initiated)
	SRO	Ensures parameters are within DSIL, WW/L LT 51', RRC pumps are stopped and directs Drywell Cooling Fans be secured
	ATC/BOP	Stops Drywell Cooling Fans and reports completion to CRS
	SRO	Directs Drywell sprays be initiated with RHR-P-2B
	BOP	Using quick card, verifies within DSIL and opens RHR-V-17B and attempts to open RHR-V-16B  Notes and reports that RHR-V-16B will not open with C/S was turned to start
	SRO	May contact Production/Work Control/OPS1/OPS2 to manually open RHR-V-16B
<b>ROLEPLAY: If asked to manually open RHR-V-16B wait 10 minutes and inform the Control Room that it will not open</b>		
	SRO	Sets Drywell Temperature as a KEY parameters due to inability to spray drywell
	ATC/BOP	Reports Drywell temperature as it rises towards 330°F  Reports trend of parameters as it approaches PSP limits
<b>COMMENTS:</b>		

<b>Event No. 9</b>		
<p><b>Description:</b> EMERGENCY DEPRESSURIZATION when Drywell Temperature reaches 330°F (It takes 10 minutes to get to 330°F from trigger 3 initiation)</p> <p>This event is initiated when it is determined that Drywell Temperature cannot be restored and maintained LT 330°F</p>		
<b>Time</b>	<b>Position</b>	<b>Applicants Actions or Behavior</b>
<p><b>Critical step is to initiate an EMERGENCY DEPRESSURIZATION when drywell Temperature cannot be restored and maintained LT 330°F</b></p>		
T = 60	BOP	Reports Drywell Temperature as it approaches 330°F
	SRO	When Drywell Temperature cannot be restored and maintained below 330°F, determines that an Emergency Depressurization is required:  Takes PPM 5.1.1 override to PPM 5.1.3, Emergency RPV Depressurization
	ATC/BOP	Stops ECCS injection as necessary to maintain RPV level  Directs ECCS pumps not required for adequate core cooling be stopped from injecting
	SRO	Requests Wetwell Level and when reported GT 17 foot, directs seven SRVs, ADS preferred, be opened
	ATC/BOP	Opens seven ADS SRVs as directed and reports completion to CRS



	SRO	Directs RPV/L maintenance +13 inches to +54 inches.
<b>Termination Cue: The scenario can be terminated when the reactor has been Emergency Depressurized and RPV level is under control in the band of +13 inches to +54 inches or as directed by the scenario coordinator</b>		
<b>COMMENTS:</b>		

## **TURNOVER INFORMATION**

Initial conditions: Reactor Power is 90%. Power was reduced due to CW-P-1C not being available. The work on CW-P-1C has just been completed. SGT-FN-1A-1 is tagged out due to a failed shaft coupling.

Turnover: BOP - Start CW-P-1C.

The following tasks are to be performed concurrently:

ATC - After the pump start, raise reactor power with Flow to 95% power. The reactivity brief has been performed.

ATC – After the power increase has been stopped, perform OSP-CRD-W701, Control Rod Exercise of Fully Withdrawn Rods (MODE 1) starting with rod 18-59 and working across from left to right and then from top to bottom until all fully withdrawn control rods have been exercised.

BOP - After CW-P-1C has been started perform the Standby Gas Treatment B System Monthly Operability surveillance, OSP-SGT-M702.

## **SIMULATOR SETUP INSTRUCTIONS**

Reset to IC 219

Ensure components are de-energized and hang tags on: SGT-V-3A2, SGT-V-4A-1,

SGT-V-5A-1 and SGT-EHC-1A-1

Set up earthquake machine on lowest volume and paused

Ensure all events and schedules windows are closed

Place Simulator in Run

**SCHEDULE**

```
<!-- This file contains a Thunder Simulations Schedule -->  
<SCHEDULE>
```

```
<ITEM row = 1>  
  <TIME>0</TIME>  
  <ACTION>Insert malfunction MAL-RMC006-2259</ACTION>  
  <DESCRIPTION>ROD 2259 UNCOUPLED</DESCRIPTION>  
</ITEM>  
  
<ITEM row = 2>  
  <TIME>0</TIME>  
  <ACTION>Insert malfunction BKR-RHR001 to FA_AS_IS</ACTION>  
  <DESCRIPTION>RHR-P-2A Breaker Fails As Is</DESCRIPTION>  
</ITEM>  
  
<ITEM row = 3>  
  <TIME>0</TIME>  
  <ACTION>Insert malfunction MOV-RHR009F to FAIL_AS_IS</ACTION>  
  <DESCRIPTION>RHR-V-16B Fails closed</DESCRIPTION>  
</ITEM>  
  
<ITEM row = 5>  
  <TIME>0</TIME>  
  <EVENT>1</EVENT>  
  <ACTION>Insert malfunction CNH-SCN007A on event 1</ACTION>  
  <DESCRIPTION>SGT-DPIC-1B2 FAN 1B-2 FLOW CONTROLLER FAIL AS IS</DESCRIPTION>  
</ITEM>  
  
<ITEM row = 7>  
  <TIME>0</TIME>  
  <EVENT>2</EVENT>  
  <ACTION>Insert malfunction MAL-RWB001 to 0.1 on event 2</ACTION>  
  <DESCRIPTION>Minimum Seismic EQ</DESCRIPTION>  
</ITEM>  
  
<ITEM row = 8>  
  <TIME>0</TIME>  
  <EVENT>2</EVENT>  
  <ACTION>Insert malfunction MAL-CFW003 to 2400 in 600 on event 2</ACTION>  
  <DESCRIPTION>CONDENSER AIR LEAK</DESCRIPTION>  
</ITEM>  
  
<ITEM row = 10>  
  <TIME>0</TIME>  
  <EVENT>3</EVENT>  
  <ACTION>Insert malfunction MAL-RWB001 to 0.2 on event 3</ACTION>  
  <DESCRIPTION>EARTHQUAKE</DESCRIPTION>  
</ITEM>  
  
<ITEM row = 11>  
  <TIME>0</TIME>  
  <EVENT>3</EVENT>  
  <ACTION>Insert malfunction MAL-OED001 after 10 on event 3</ACTION>  
  <DESCRIPTION>LOCKOUT TR-S 10 seconds after OBE</DESCRIPTION>  
</ITEM>
```

```
<ITEM row = 12>
  <TIME>0</TIME>
  <EVENT>3</EVENT>
  <ACTION>Insert malfunction MAL-OED003 after 120 on event 3</ACTION>
  <DESCRIPTION>LOCKOUT TR-B 120 seconds after OBE</DESCRIPTION>
</ITEM>

<ITEM row = 13>
  <TIME>0</TIME>
  <EVENT>3</EVENT>
  <ACTION>Insert malfunction MAL-PCN006 on event 3</ACTION>
  <DESCRIPTION>Drywell Floor Failure</DESCRIPTION>
</ITEM>

<ITEM row = 14>
  <TIME>0</TIME>
  <EVENT>3</EVENT>
  <ACTION>Insert malfunction MAL-RRS009A after 240 to 500000 in 1200 on event
3</ACTION>
  <DESCRIPTION>Steam Line break in Drywell 2 minutes after OBE</DESCRIPTION>
</ITEM>

</SCHEDULE>
```