

**JPM NO. 6  
EMERGENCY BORATION USING ONOP-CVCS-3  
(ALTERNATE PATH)**

**Job Performance Measure Exam**

**Submitted By** : Don Jackson\_

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

**JPM Tasks**

**Task ID:** 004\*017\*01\*01

**Description:** EMERGENCY BORATE THE RCS AS PER ONOP- CVCS-3 (ALTERNATE PATH)

Trainee: \_\_\_\_\_ Evaluator: \_\_\_\_\_

Evaluator Signature \_\_\_\_\_ Date \_\_\_\_\_

Trainee Performance: Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

Start Time \_\_\_\_\_ Stop Time: \_\_\_\_\_

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactory complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Actual Performance in the Simulator

**General Comments (For Evaluator Use):**

**Task Conditions:**

THE REACTOR HAS JUST TRIPPED. THE 31 BORIC ACID TRANSFER PUMP IS ALIGNED TO THE BLENDER. ALL ACTIONS IN E-0, STEPS 1-4 AND ES-0.1 STEPS 1 AND 2 HAVE BEEN COMPLETED.

**Task Standards :**

EMERGENCY BORATE IN ACCORDANCE WITH ONOP CVCS-3  
K&A #: SYSTEM 004 CHEMICAL AND VOLUME CONTROL; A 4.18 ABILITY TO OPERATE AND MONITOR IN THE CONTROL ROOM THE EMERGENCY BORATE VALVES  
IMPORTANCE FACTORS: RO=4.3 SRO=4.1  
Estimated Completion Time: 20 min

**Tools Needed:**

SIMULATOR: JPM SNAPSHOT #6

**Initiating Cues :**

YOU ARE DIRECTED TO COMPLETE STEP 3 OF ES-0.1, "REACTOR TRIP RESPONSE"

**Safety Considerations :**

NONE

**Consequences of Inadequate Performance:**

INADEQUATE SHUTDOWN MARGIN, POSSIBLE REACTOR RESTART

**Performance Checklist :**

**Element :**

0 OBTAIN AND REVIEW  
ES-0.1

**Standards :**

OBTAINS AND REVIEWS  
ES-0.1, DETERMINES  
THE NEED TO IMPLEMENT  
RNO ACTIONS AND  
EMERGENCY BORATE PER  
ONOP-CVCS-3

**Conditions :**

RCS Temp>500 deg F as read, RCS  
Temp >540 deg F as read, All Control  
Rods Are NOT < 20 Steps, 3  
Control Rods Are Stuck Out, Leads  
To RNO Actions To Emergency  
Borate

**Comments :**

**Critical Task?        Y**

**Satisfactory**

**Unsatisfactory**

**Element :**

1 OBTAIN AND REVIEW  
ONOP-CVCS-3

**Standards :**

OBTAINS AND REVIEWS  
ONOP-CVCS-3

**Conditions :**

**Comments :**

**Critical Task?        N**

**Satisfactory**

**Unsatisfactory**

**Element :**

2 CHECK CHARGING PUMP  
RUNNING

**Standards :**

OBSERVES CHARGING  
PUMP RUNNING

**Conditions :**

31 Charging Pump is Running

**Comments :**

**Critical Task?        N**

**Satisfactory**

**Unsatisfactory**

**Element :**

3 OPEN CH-MOV-333

**Standards :**

PLACES SWITCH TO OPEN  
FOR CH-MOV-333

**Conditions :**

MOV-333 DOES NOT OPEN  
TAKES RNO ACTIONS

**Comments :**

**Critical Task?        N**

**Satisfactory**

**Unsatisfactory**

4	<b>Element :</b> ATTEMPTS NORMAL BORATION VIA ATT 1	<b>Standards :</b> STARTS BOTH BA PUMPS IN FAST SPEED, TRIES TO PUT FCV-110A IN MAN/OPEN	<b>Conditions :</b> BOTH BA PUMPS START IN FAST FCV-110A WILL NOT OPEN, NEEDS TO RNO TO RWST
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**Comments :**

**Critical Task?**        N

**Satisfactory**

**Unsatisfactory**

5	<b>Element :</b> PLACE CH-LCV-112B IN OPEN	<b>Standards :</b> PUTS SWITCH CH-LCV-112B IN OPEN POSITION	<b>Conditions :</b> CH-LCV-112B OPENS
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**Comments :**

**Critical Task?**        Y

**Satisfactory**

**Unsatisfactory**

6	<b>Element :</b> WHEN CH-LCV-112B OPENS CLOSE CH-LCV-112C	<b>Standards :</b> CLOSES CH-LCV-112C WHEN CH-LCV-112B OPENS	<b>Conditions :</b> CH-LCV-112C CLOSES
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**Comments :**

**Critical Task?**        N

**Satisfactory**

**Unsatisfactory**

7	<b>Element :</b> CHECK M/U CONTROLS IN STOP	<b>Standards :</b> VERIFIES M/U CONTROL SWITCH IN STOP	<b>Conditions :</b> M/U IS STOPPED
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**Comments :**

**Critical Task?**        Y

**Satisfactory**

**Unsatisfactory**

- |    |  |   |  |
|----|--|---|--|
| 8  | <b>Element :</b><br>TRANSFER RUNNING CHG<br>PUMP TO MANUAL AND<br>RAISE SPEED TO MAX<br><b>Comments :</b><br><br><b>Critical Task?</b> Y | <b>Standards :</b><br>TAKES PUMP TO MANUAL<br>AND RAISES SPEED TO MAX   | <b>Conditions :</b><br>PUMP SPEED IS MAXIMIZED IN<br>MANUAL CONTROL On<br>Controller SC 141A |
|    | <b>Satisfactory</b>  | <b>Unsatisfactory</b>   |  |
| 9  | <b>Element :</b><br>CHECK PRESSURIZER<br>PRESSURE LESS THAN 2335<br><br><b>Comments :</b><br><br><b>Critical Task?</b> N                 | <b>Standards :</b><br>OBSERVE PRESSURIZER<br>PRESSURE LESS THAN<br>2335 | <b>Conditions :</b><br>AS READ- PRESS<2235   |
|    | <b>Satisfactory</b>  | <b>Unsatisfactory</b>   |  |
| 10 | <b>Element :</b><br>CHECK REACTOR CRITICAL<br><br><b>Comments :</b><br><br><b>Critical Task?</b> N                                       | <b>Standards :</b><br>OBSERVES REACTOR<br>SUBCRITICAL                   | <b>Conditions :</b><br>REACTOR IS NOT CRITICAL   |
|    | <b>Satisfactory</b>  | <b>Unsatisfactory</b>   |  |
| 11 | <b>Element :</b><br>CHECK RCS TEMPERATURE<br>GREATER THAN 500 DEG. F<br><b>Comments :</b><br><br><b>Critical Task?</b> N                 | <b>Standards :</b><br>OBSERVES RCS TEMP IS<br>GREATER THAN 500 DEG.     | <b>Conditions :</b><br>AS READ ON PANEL  |
|    | <b>Satisfactory</b>  | <b>Unsatisfactory</b>   |  |

12 **Element :** CHECK RCS TEMPERATURE GREATER THAN 540 DEG. F  
**Standards :** OBSERVES RCS TEMP IS GREATER THAN 540 DEG.  
**Conditions :** AS READ ON PANEL  
**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

13 **Element :** CHECK ALL RODS FULLY INSERTED  
**Standards :** OBSERVES 3 RODS STUCK OUT  
**Conditions :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

14 **Element :** IF MORE THAN ONE ROD IS GREATER THAN OR EQUAL TO 20 STEPS, THEN INCREASE RCS BORON CONCENTRATION 145 PPM/ROD FOR EACH ADDITIONAL STUCK ROD GREATER THAN ONE AS FOLLOWS:  
USING RWST - EXPECTED TIME OF 57 MINUTES/ROD  
**Standards :** FOR 3 STUCK RODS BORATION TIME IS 57MIN/ROD GREATER THAN ONE; BORATION TIME = 114 MIN  
**Conditions :** Equates To 145ppm Per Control Rod= 290ppm total  
**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

EMERGENCY BORATION IN PROGRESS, AND DETERMINATION THAT 114 MIN IS APPROPRIATE BORATION TIME (MAY REQUIRE A CLARIFYING QUESTION TO DETERMINE IF CANDIDATE UNDERSTANDS PROCEDURALLY DRIVEN BORATION CRITERIA)

## **Candidate Cue Sheet**

- THE REACTOR HAS JUST TRIPPED.
- THE 32 BORIC ACID TRANSFER PUMP IS ALIGNED TO THE BLENDER.
- ALL ACTIONS IN E-0, STEPS 1-4 AND ES-0.1 STEPS 1 AND 2 HAVE BEEN COMPLETED.

YOU ARE DIRECTED TO COMPLETE STEP 3 OF ES-0.1, "REACTOR TRIP RESPONSE"

Number:  ES-0.1	Title:  REACTOR TRIP RESPONSE	Revision Number:  16
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A. PURPOSE

This procedure provides instructions to stabilize and control the plant following a reactor trip without a safety injection.

B. ENTRY CONDITIONS

This procedure is entered from:

1. E-0, REACTOR TRIP OR SAFETY INJECTION, Step 4, WHEN SI is NEITHER actuated NOR required.



Number: ES-0.1	Title: REACTOR TRIP RESPONSE	Revision Number: 16
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 1 continued from previous page)

*	b. <u>IF</u> temperature is greater	*
*	than 547°F <u>AND</u> increasing.	*
*	<u>THEN</u> PERFORM the following:	*
*	• DUMP steam to condenser.	*
*	<u>OR</u>	*
*	• DUMP steam using SG	*
*	atmospherics.	*
*	*****	*

2. CHECK FW Status:

a. CHECK RCS average temperatures - LESS THAN 554°F

a. PERFORM the following:

- 1) Establish Main FW on bypass.
- 2) Continue with Step 3. WHEN temperature less than 554°F, THEN do Steps 2.b, .c, .d and .e

b. CHECK Main and Bypass FW FRVs - CLOSED

b. Manually CLOSE valve(s).

(STEP 2 CONTINUED ON NEXT PAGE)

Number:  ES-0.1	Title:  REACTOR TRIP RESPONSE	Revision Number:  16
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STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

(Step 2 continued from previous page)

c. Verify total AFW flow to SGs - GREATER THAN one of the following:

- IF either motor driven AFW pump auto started, THEN ENSURE total AFW flow is greater than or equal to 365 gpm

OR

- IF NO motor driven AFW pump auto started, THEN ENSURE total AFW flow is greater than or equal to 660 gpm

c. Establish AFW flow to the SGs greater than or equal to the required value.

d. CHECK SG blowdown isolation valves - CLOSED

- 1) PLACE control switches to CLOSE

d. IF SG blowdown not required for planned shutdown, THEN manually CLOSE valve(s).

e. ENSURE BOTH MBFPs - TRIPPED

e. IF any pump will NOT trip, THEN, PERFORM one of the following:

- Manually CLOSE MBFP HP&LP Stop V1vs

OR

- DISPATCH NPO to locally trip MBFP(s).

STEP

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3. CHECK If Emergency Boration Is Required:

a. Check RCS Temperature - GREATER THAN 500°F

a. Emergency BORATE per ONOP-CVCS-3, EMERGENCY BORATION.

b. Check RCS Temperature - GREATER THAN 540°F

b. IF any control rod is greater than or equal to 20 STEPS, THEN emergency BORATE per ONOP-CVCS-3, EMERGENCY BORATION.

c. All Control Rods - Less than 20 STEPS

c. IF more than one control rod is greater than or equal to 20 STEPS, THEN emergency BORATE per ONOP-CVCS-3, EMERGENCY BORATION.

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Procedure Use Is:

- Continuous
- Reference
- Information

Control Copy: \_\_\_\_\_

Effective Date: \_\_\_\_\_

*This procedure is*

**TSR**

Page 1 of 20

# ONOP-CVCS-3, Revision: 5

## EMERGENCY BORATION

Vince Mahoney / 1/3/03  
Writer Date

\_\_\_\_\_/\_\_\_\_\_  
Reviewer Date

**Approved By:**

\_\_\_\_\_/\_\_\_\_\_  
Procedure Sponsor, DM/Designee Date

Crew B  
\_\_\_\_\_  
Procedure Owner



**PARTIAL REVISION**

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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**REVISION SUMMARY**

(This procedure has NO Foldout Page)

(Page 1 of 1)

1.0 **REASONS FOR REVISION**

1.1. Incorporate DCP-01-3-050 CVCS

2.0 **SUMMARY OF CHANGES**

2.1. Revised the following steps to remove reference to the bottle openers and align the valves using the control switches.

- Step 1 RNO b.2)a) & b.2)b)
- Step 1 RNO e.1) & e.2)
- Step 4 RNO a. 2<sup>nd</sup> bullet 1)

## 1.0 PURPOSE

This off normal condition is caused by an uncontrolled addition of positive reactivity to the core from any of the following conditions:

- Rods below the Rod Insertion Limits
- Uncontrolled RCS cooldown
- Rods greater than or equal to 20 STEPS following a reactor trip

## 2.0 SYMPTOMS/ENTRY CONDITIONS

The following conditions require entry into this procedure:

- a. When the Reactor is Critical AND either of the following conditions occur:
  - Rod Insertion Low Low Level Alarm
  - Any rod bank below the Rod Insertion Limit
- b. When Emergency Operating Procedures are NOT in effect AND any of the following conditions occur:
  - Uncontrolled RCS cooldown to less than 500°F
  - Uncontrolled RCS cooldown to less than 540°F with any control rod greater than or equal to 20 STEPS with the Reactor trip breakers open
- c. As required by the following:
  - ES-0.1, Reactor Trip Response
  - ES-1.1, SI Termination
  - ONOP-TG-3, Rapid Shutdown
  - ONOP-TG-1, Excessive Load Increase Or Decrease
  - ONOP-NI-1, Nuclear Instrumentation Malfunction
  - ARP-3, Panel SAF Reactor Coolant System

## 3.0 AUTOMATIC ACTIONS

- a. None

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
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**4.0 INITIAL OPERATOR ACTIONS**

**1. INITIATE Emergency Boration of RCS:**

a. CHECK charging pump –  
RUNNING

a. PERFORM the following:

- 1) VERIFY adequate power to start one charging pump (150 KW/16 AMPS), IF necessary shed sufficient loads as directed by CRS or SM.
- 2) START one Charging pump at maximum speed.
- 3) IF Component Cooling Water for Charging Pump cooling is unavailable, THEN locally ALIGN City Water Back up supply to Charging Pumps per SOP-ESP-1, LOCAL OPERATION OF SAFE SHUTDOWN EQUIPMENT.

(STEP 1 CONTINUED ON NEXT PAGE)

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(STEP 1 continued from previous page)	
b. OPEN emergency boration valve CH-MOV-333	b. EMERGENCY BORATE using one of the following methods in order of preference: <ol style="list-style-type: none"> <li>1) Using Normal boration per ATTACHMENT 1, Emergency Boration Using Normal Boration.</li> <li>2) Using RWST as follows:               <ol style="list-style-type: none"> <li>a) PLACE CH-LCV-112B, RWST Makeup to Charging Pumps Suction Control Switch in OPEN.</li> <li>b) <u>WHEN</u> CH-LCV-112B is open, <u>THEN</u> PLACE CH-LCV-112C, VCT Outlet Valve Control Switch to CLOSE.</li> <li>c) GO TO Step 1.f. in this Section.</li> </ol> </li> <li>3) Failing air supply to FCV-110A per ATTACHMENT 2, Emergency Boration By Failing Air To FCV-110A.</li> </ol>	
c. CLOSE Boric Acid Storage Tank Recirculation Flow Controllers <ul style="list-style-type: none"> <li>• HCV-104</li> <li>• HCV-105</li> </ul> d. PLACE BOTH Boric Acid Transfer Pumps in high speed		
(STEP 1 CONTINUED ON NEXT PAGE)		

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(STEP 1 continued from previous page)		
e.	RESTART Boric Acid Transfer Pumps	e. PERFORM the following: <ol style="list-style-type: none"> <li>1) PLACE CH-LCV-112B, RWST Makeup to Charging Pumps Suction Control Switch in OPEN.</li> <li>2) <u>WHEN</u> CH-LCV-112B is open, <u>THEN</u> PLACE CH-LCV-112C, VCT Outlet Valve Control Switch to CLOSE.</li> </ol>
f.	CHECK Make-up controls in - STOP	f. PLACE Make-up controls in STOP.
g.	TRANSFER operating charging pump to manual control <u>AND</u> increase speed to maximum	
h.	CHECK PRZR pressure – LESS THAN 2335 PSIG.	h. PERFORM the following: <ol style="list-style-type: none"> <li>1) VERIFY PRZR PORVs and block valves are open. <u>IF NOT, THEN</u> OPEN PRZR PORVs and block valves as necessary until PRZR pressure less than 2335 psig.</li> </ol>

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<b>5.0</b>	<b><u>SUBSEQUENT STEPS</u></b>	
<b>2.</b>	<b>DETERMINE Required Emergency Boration Time:</b>	
a.	CHECK Reactor – CRITICAL	a.
		GO TO Step 2.d.
b.	CHECK the following conditions satisfied:	b.
	<ul style="list-style-type: none"> <li>• Rod Insertion Low Low Level alarm – CLEAR</li> </ul>	PERFORM the following:
	<ul style="list-style-type: none"> <li>• All rods above rod insertion limits</li> </ul>	1) EMERGENCY BORATE until the rods are above the rod insertion limit.
		2) <u>WHEN</u> rods are above the rod insertion limit, <u>THEN GO TO</u> Step 4.
c.	GO TO Step 4	
d.	CHECK RCS temperature – GREATER THAN 500°F	d.
		EMERGENCY BORATE per ATTACHMENT 3, Required Emergency Boration Times For RCS Cooldown.
(STEP 2 CONTINUED ON NEXT PAGE)		

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
(STEP 2 continued from previous page)		
e. CHECK RCS temperature – GREATER THAN 540°F	e. <u>IF</u> any rod is greater than or equal to 20 STEPS, <u>THEN</u> EMERGENCY BORATE per ATTACHMENT 3, REQUIRED EMERGENCY BORATION TIMES FOR RCS COOLDOWN.	
f. CHECK all rods – FULLY INSERTED	f. <u>IF</u> more than one rod is greater than or equal to 20 STEPS, <u>THEN</u> INCREASE RCS boron concentration 145 ppm/rod for each additional stuck rod greater than one as follows: <ul style="list-style-type: none"> <li>• Using CH-MOV-333 – EXPECTED TIME OF 11 MINUTES/ROD</li> </ul> <u>OR</u> <ul style="list-style-type: none"> <li>• Using normal boration <u>OR</u> failing air to FCV-110A – EXPECTED TIME OF 20 MINUTES/ROD</li> </ul> <u>OR</u> <ul style="list-style-type: none"> <li>• Using RWST – EXPECTED TIME OF 57 MINUTES/ROD</li> </ul>	

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	<p><b>DETERMINE IF Emergency Boration Can Be Secured:</b></p> <p>a. DIRECT Watch Chemist to sample RCS boron concentration</p> <p>b. CHECK EITHER of the following criteria – MET</p> <ul style="list-style-type: none"> <li>• Expected boration time – COMPLETED</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• Required RCS boron concentration change – ACHIEVED</li> </ul>	<p>b. PERFORM the following:</p> <ol style="list-style-type: none"> <li>1) CONTINUE emergency boration.</li> <li>2) <u>IF</u> EOPs are in effect, <u>THEN</u> RETURN to procedure and step in effect until EITHER criteria is met.</li> <li>3) <u>WHEN</u> EITHER criteria is met, <u>THEN</u> GO TO Step 4.</li> </ol>

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<b>4.</b>	<b>SECURE Emergency Boration As Follows:</b>	
	a. CHECK CH-MOV-333 – OPEN	a. DETERMINE Emergency boration method used:
	1) CLOSE CH-MOV-333	<ul style="list-style-type: none"> <li>Secure emergency boration from normal boration:</li> </ul>
	2) PLACE both boric acid transfer pumps to SLOW speed	1) PLACE both boric acid transfer pumps to SLOW speed.
		2) TURN Makeup Control Switch to Stop.
		<ul style="list-style-type: none"> <li>Secure emergency boration from RWST:</li> </ul>
		1) PLACE the following valve Control Switches to AUTO:
		<ul style="list-style-type: none"> <li>CH-LCV-112B, RWST Makeup to Charging Pumps Suction Isolation</li> </ul>
		<ul style="list-style-type: none"> <li>CH-LCV-112C, VCT Outlet Valve</li> </ul>
		<ul style="list-style-type: none"> <li>SECURE emergency boration from failing air supply to FCV-110A:</li> </ul>
		<ul style="list-style-type: none"> <li>Secure emergency boration per ATTACHMENT 2, EMERGENCY BORATION BY FAILING AIR TO FCV-110A, Step 5.0.</li> </ul>

(STEP 4 CONTINUED ON NEXT PAGE)

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	<p>(STEP 4 continued from previous page)</p> <ul style="list-style-type: none"><li>b. OPEN Boric Acid Storage Tank Recirculation Flow Controllers to approximately 25%<ul style="list-style-type: none"><li>• HCV-104</li><li>• HCV-105</li></ul></li><li>c. MAINTAIN Seal Injection flow between 6-12 GPM</li><li>d. ADJUST charging pump speed as necessary</li><li>e. TRANSFER the charging pump to auto per SOP-CVCS-2, CHARGING SEAL WATER AND LETDOWN CONTROL</li><li>f. RETURN RCS makeup control system as required for plant conditions per SOP-CVCS-3, REACTOR COOLANT SYSTEM BORON CONCENTRATION CONTROL<ul style="list-style-type: none"><li>1) ADJUST RCS makeup control to maintain required boron concentration</li></ul></li></ul>	

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	<p><b>VERIFY Required Boron Concentration Has Been Achieved:</b></p> <p>a. CHECK the applicable emergency boration criteria – MET</p> <ul style="list-style-type: none"> <li>• All rods – ABOVE ROD INSERTION LIMIT</li> </ul> <p style="text-align: center;"><u>OR</u></p> <ul style="list-style-type: none"> <li>• Required RCS boron concentration change - ACHIEVED</li> </ul>	<ul style="list-style-type: none"> <li>• RETURN To 4.0, INITIAL OPERATOR ACTIONS, Step 1.</li> </ul> <hr/> <ul style="list-style-type: none"> <li>• PERFORM the following: <ul style="list-style-type: none"> <li>1) <u>IF</u> RCS boron concentration has <u>NOT</u> been determined, <u>THEN</u>: <ul style="list-style-type: none"> <li>a) DIRECT Watch Chemist to sample RCS boron concentration.</li> <li>b) <u>IF</u> EOPs are in effect, <u>THEN</u> RETURN to procedure and step in effect while waiting for sample results.</li> </ul> </li> <li>2) <u>IF</u> RCS sample results indicate that the required concentration change has <u>NOT</u> been achieved, <u>THEN</u>: <ul style="list-style-type: none"> <li>a) RETURN To 4.0, INITIAL OPERATOR ACTIONS, Step 1. <ul style="list-style-type: none"> <li>• Continue emergency boration until required concentration change has been achieved.</li> </ul> </li> </ul> </li> </ul> </li> </ul>

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
6.	<b>CHECK For Cause of Reactivity Change:</b>	
	a. Check Reactor – TRIPPED	a. GO TO Step 12.
	b. Emergency Operating Procedures – IN USE	b. GO TO Step 8.
7.	<b>RETURN To Procedure In Effect</b>	
8.	<b>CHECK For Reactivity Insertion From Uncontrolled RCS Cooldown:</b>	Stop any controlled cooldown <u>AND</u> Go to Step 12.
	<ul style="list-style-type: none"> <li>• RCS temperature – DECREASING IN AN UNCONTROLLED MANNER</li> </ul>	
	<u>OR</u>	
	<ul style="list-style-type: none"> <li>• Any SG pressure – DECREASING IN AN UNCONTROLLED MANNER</li> </ul>	
9.	<b><u>CHECK Main Steamline Isolation AND Bypass Valves – CLOSED</u></b>	Manually CLOSE MSIVs <u>AND</u> , if necessary, dispatch NPO to locally close bypass valves. <u>IF</u> MSIVs can <u>NOT</u> be closed manually, <u>THEN</u> locally CLOSE valves per SOP-ESP-1, LOCAL OPERATION OF SAFE SHUTDOWN EQUIPMENT.

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
<b>10.</b>	<p><b>IDENTIFY Faulted SG(s):</b></p> <ul style="list-style-type: none"> <li>• ANY SG PRESSURE DECREASING IN AN UNCONTROLLED MANNER</li> </ul> <p><u>OR</u></p> <ul style="list-style-type: none"> <li>• ANY SG COMPLETELY DEPRESSURIZED</li> </ul>	Go To Step 12.
<p><b><u>CAUTION</u></b></p> <ul style="list-style-type: none"> <li>• AT LEAST ONE SG MUST BE MAINTAINED AVAILABLE FOR RCS COOLDOWN.</li> <li>• <u>IF</u> ALL SGs ARE FAULTED, AT LEAST 100 GPM FEED FLOW SHOULD BE MAINTAINED TO EACH SG.</li> </ul>		
<b>11.</b>	<p><b>ISOLATE Faulted SG(s)</b></p> <ul style="list-style-type: none"> <li>• Isolate main <u>AND</u> low flow bypass feed reg. valves</li> <li>• Isolate AFW flow</li> <li>• Dispatch NPO to close steam supply valve(s) to turbine-driven AFW pump <ul style="list-style-type: none"> <li>• 32 SG – MS-41</li> <li>• 32 SG – MS-42</li> </ul> </li> <li>• Verify SG atmospherics – CLOSED</li> <li>• Close SG blowdown isolation valves</li> <li>• Close SG sample valves</li> </ul>	<p>Manually CLOSE valves. <u>IF</u> valves can <u>NOT</u> be closed, <u>THEN</u> dispatch operator to locally close valves <u>OR</u> block valves.</p>

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
12.	<b>VERIFY Dilution Paths Isolated:</b> a. Primary water to blender valve FCV-111A – CLOSED	IF FCV-111A can <u>NOT</u> be verified closed, <u>THEN</u> trip the primary water pumps if running.
13.	<b>RETURN TO Procedure And Step            In Effect</b>	
-END-		

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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**ATTACHMENT 1**  
**Emergency Boration Using Normal Boration**

(Attachment page 1 of 1)

- 1.0 PLACE both Boric Acid Trans Pump Speed switches in Fast.
- 2.0 RESTART Boric Acid Transfer Pumps.
- 3.0 PLACE FCV-110A, Boric Acid Flow Control Blender, controller in Manual.
- 4.0 ENSURE FCV-110A, Boric Acid Flow Control Blender, is fully open.
- 5.0 PLACE FCV-111A, Makeup H2O To Boric Acid Blender, in Manual.
- 6.0 ENSURE FCV-111A, Makeup H2O To Boric Acid Blender, is closed.
- 7.0 PLACE RCS Makeup Mode Selector switch in Manual.
- 8.0 TURN Makeup Control switch to Start, AND RETURN to Norm.
- 9.0 CLOSE Boric Acid Storage Tank Recirculation Valves.
  - CH-HCV-104, 32 Boric Acid Storage Tank Recirculation Flow Control Valve
  - CH-HCV-105, 31 Boric Acid Storage Tank Recirculation Flow Control Valve
- 10.0 RETURN To Section 4.0, INITIAL OPERATOR ACTIONS, Step 1.g.

-END OF ATTACHMENT-

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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**ATTACHMENT 2**  
**Emergency Boration By Failing Air To FCV-110A**

(Attachment page 1 of 1)

- 1.0 DIRECT NPO to PERFORM the following:
  - a. OPEN CH-FCV-110A, Boric Acid Blender Boric Acid Flow Control Valve, by locally removing air signal from valve. (73 ft PAB)
  - b. OPEN CH-293, Boric Acid Blender Boric Acid Bypass Isolation. (73 ft PAB)
- 2.0 PLACE both Boric Acid Transfer Pump Speed switches in fast.
- 3.0 RESTART Boric Acid Transfer Pumps.
- 4.0 CLOSE Boric Acid Storage Tank Recirculation valves:
  - CH-HCV-104, 32 Boric Acid Storage Tank Recirculation Flow Control Valve
  - CH-HCV-105, 31 Boric Acid Storage Tank Recirculation Flow Control Valve
- 5.0 WHEN directed to secure emergency boration, THEN PERFORM the following:
  - a. PLACE both Boric Acid Transfer Pump speed switches in slow.
  - b. DIRECT NPO to PERFORM the following:
    - 1) CLOSE CH-FCV-110A, Boric Acid Blender Boric Acid Flow Control Valve, by locally re-installing air signal to valve. (73 ft PAB)
    - 2) CLOSE CH-293, Boric Acid Blender Boric Acid Bypass Isolation. (73 ft PAB)
- 6.0 GO TO Section 4.0, INITIAL OPERATOR ACTIONS, Step 1.g.

-END OF ATTACHMENT-

**ATTACHMENT 3**  
**Required Emergency Boration Times For RCS Cooldown**

(Attachment page 1 of 3)

- 1.0 DETERMINE the expected boration time AND required RCS boron concentration as follows:
  - a. IDENTIFY the applicable Table (1, 2 or 3) below based on the method of emergency boration used.
  - b. For each 10°F decrease in Tavg below 500°F (or below 540°F with one stuck rod), DETERMINE the expected time AND required RCS boron concentration change.
- 2.0 RETURN to SUBSEQUENT ACTIONS section, Step 2.f

Table 1

Emergency Boration Using MOV-333

**NOTE**

Indicated boration times assume 45 gpm flow from one boric acid transfer pump in fast speed.

Initial RCS Boron Concentration	Boric Acid Required to be Added	Expected Boration Time	Required Change per Each 10°F Decrease
Greater than 1000 ppm	59 gals.	79 seconds	18 ppm
500-1000 ppm	80 gals.	107 seconds	25 ppm
0-500 ppm	100 gals.	133 seconds	32 ppm

Number: <b>ONOP-CVCS-3</b>	Title: <b>EMERGENCY BORATION</b>	Revision Number: <b>5</b>
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**ATTACHMENT 3**  
**Required Emergency Boration Times For RCS Cooldown**

(Attachment page 2 of 3)

Table 2  
Emergency Boration Using RWST

**NOTE**  
Indicated boration times assume 75 gpm flow from one charging pump.

Initial RCS Boron Concentration	Boric Acid Required to be Added	Expected Boration Time	Required Change per Each 10°F Decrease
Greater than 1000 ppm	493 gals.	395 seconds (6 min, 35 sec)	18 ppm
500-1000 ppm	668 gals.	535 seconds (8 min, 55 sec)	25 ppm
0-500 ppm	835 gals.	668 seconds (11 min 08 sec)	32 ppm

**ATTACHMENT 3**  
**Required Emergency Boration Times For RCS Cooldown**

(Attachment page 3 of 3)

Table 3  
Emergency Boration Using Normal Boration OR Failing Air to FCV-110A

**NOTE**

Indicated boration times assume 25 gpm flow from one boric acid transfer pump in fast speed.

Initial RCS Boron Concentration	Boric Acid Required to be Added	Expected Boration Time	Required Change per Each 10°F Decrease
Greater than 1000 ppm	59 gals.	142 seconds	18 ppm
500-1000 ppm	80 gals.	192 seconds	25 ppm
0-500 ppm	100 gals.	240 seconds	32 ppm

-END OF ATTACHMENT-

**JPM NO.7  
INITIATE A BLEED AND FEED OF THE RCS  
(ALTERNATE PATH)**

**Job Performance Measure Exam**

**Submitted By** Don Jackson

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

**JPM Tasks**

**Task ID:** 000\*013\*05\*01

**Description:** INITIATE A BLEED AND FEED OF THE RCS  
(alternate path)

Trainee: \_\_\_\_\_ Evaluator: \_\_\_\_\_

Evaluator Signature \_\_\_\_\_ Date \_\_\_\_\_

Trainee Performance: Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

**Start Time** \_\_\_\_\_ **Stop Time:** \_\_\_\_\_

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactorily complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Actual Performance in the Simulator

**General Comments (For Evaluator Use):**

**Task Conditions:**

A LOSS OF FEEDWATER HAS OCCURRED. STEPS 1-4 OF E-0 ARE COMPLETE. A LOSS OF OFFSITE POWER HAS OCCURRED. A TRANSITION TO ES-0.1 WAS MADE AT STEP 4. A TRANSITION TO FR-H.1 WAS THEN MADE DUE TO A RED PATH ON THE HEAT SINK CSF. THE FOLD OUT PAGE REQUIREMENTS FOR BLEED AND FEED ARE MET.

**Task Standards :**

K/A EPE05EA1.1 Ability To Operate and/or Monitor The Following As They Apply To Loss Of Secondary Heat Sink- Components and Functions of Control and Safety Systems Including Instrumentation, Signals, Interlocks, Failure Modes, and Auto and Man Features (4.0)

Applicability: RO & SRO

RCS BLEED AND FEED INITIATED AND VERIFIED PER FR-H.1

Estimated Completion Time: 20 minutes

**Tools Needed:**

SIMULATOR SET UP FOR SNAP: JPM 7

**Initiating Cues :**

YOU ARE DIRECTED TO ESTABLISH BLEED AND FEED COOLING OF THE RCS, USING FR-H.1 BEGINNING AT STEP 9.

**References :**

<b>ID</b>		<b>Description</b>	<b>Review Date</b>	<b>Ref Flag</b>
EOP	FR-H.1	RESPONSE TO LOSS OF SECONDARY HEAT SINK		X

**Safety Considerations :**

**Consequences of Inadequate Performance:**

**Performance Checklist :**

- |   |   |  |  |
|---|---|--|--|
| 1 | <b>Element :</b><br>OBTAIN AND REVIEW COPY<br>OF FR-H.1<br><b>Comments :</b><br><br><b>Critical Task?</b> N | <b>Standards :</b><br>OBTAINED AND REVIEW<br>COPY OF FR-H.1                          | <b>Conditions :</b>  |
|   | Satisfactory  | Unsatisfactory   |  |
| 2 | <b>Element :</b><br>MANUALLY ACTUATE SI<br><b>Comments :</b><br><br><b>Critical Task?</b> Y                 | <b>Standards :</b><br>BOTH SI PUSHBUTTONS<br>DEPRESSED                               | <b>Conditions :</b><br>SI Actuates                             |
|   | Satisfactory  | Unsatisfactory   |  |
| 3 | <b>Element :</b><br>CHECK ALL MSIV'S CLOSED<br><b>Comments :</b><br><br><b>Critical Task?</b> Y             | <b>Standards :</b><br>SWITCHES SET TO TRIP;<br>GREEN LIGHTS ON AND<br>RED LIGHTS OFF | <b>Conditions :</b><br>All MSIVs Close and Lockouts<br>Actuate |
|   | Satisfactory  | Unsatisfactory   |  |
| 4 | <b>Element :</b><br>STOP ALL RCPS<br><b>Comments :</b><br><br><b>Critical Task?</b> N                       | <b>Standards :</b><br>VERIFIES RCPS STOPPED  | <b>Conditions :</b><br>Note: RCPs Off Due To Loss<br>of Power  |
|   | Satisfactory  | Unsatisfactory   |  |

**Element :**  
5 **VERIFY RCS FEED PATH**  
**Comments :**

**Standards :**  
SEE STEPS 6 & 7 BELOW

**Conditions :**

**Critical Task?**      N

**Satisfactory**

**Unsatisfactory**

**Element :**  
6 **CHECK HHSI PUMPS - ANY  
RUNNING**

**Standards :**  
VERIFIED RUNNING;RED  
LIGHTS ON AND GREEN  
LIGHTS OFF

**Conditions :**  
All 3 Are Running

**Comments :**

**Critical Task?**      N

**Satisfactory**

**Unsatisfactory**

**Element :**  
7 **VERIFY SI VALVE  
ALIGNMENT**

**Standards :**  
1. VERIFY SAFEGUARDS  
VALVE OFF NORMAL  
ALARM CLEAR  
2.. ENSURE BIT  
DISCHARGE VALVES  
1835A & B OPEN  
3. ENSURE BIT INLET  
VALVES 1852A & B  
OPEN  
4. ENSURE 856J, 856H,  
856C, 856E OPEN

**Conditions :**  
Alarms are Clear, 1835 A&B  
Are Open 1852 A&B Are Open,  
856 J,H,C,and E are Open

**Comments :**

**Critical Task?**      N

**Satisfactory**

**Unsatisfactory**

- |    |   |   |   |
|----|---|---|---|
| 8  | <b>Element :</b><br>ESTABLISH RCS BLEED<br>PATH<br><b>Comments :</b><br><br><b>Critical Task?</b> N                               | <b>Standards :</b><br>SEE STEPS 9 THROUGH<br>11 BELOW   | <b>Conditions :</b>   |
|    | Satisfactory  | Unsatisfactory  |   |
| 9  | <b>Element :</b><br>CHECK BOTH PRZR PORV<br>BLOCK VALVES - POWER<br>AVAILABLE<br><b>Comments :</b><br><br><b>Critical Task?</b> N | <b>Standards :</b><br>OBSERVE INDICATING<br>LIGHTS PORV BLOCK<br>VALVES - ON                      | <b>Conditions :</b>   |
|    | Satisfactory  | Unsatisfactory  |   |
| 10 | <b>Element :</b><br>CHECK BOTH BLOCK<br>VALVES OPEN<br><br><b>Comments :</b><br><br><b>Critical Task?</b> N                       | <b>Standards :</b><br>OBSERVE RED LIGHTS -<br>PRZR PORV BLOCK VALVE<br>No. 535 IS CLOSED          | <b>Conditions :</b><br>Opens PORV Block 535                           |
|    | Satisfactory  | Unsatisfactory  |   |
| 11 | <b>Element :</b><br>OPEN BOTH PORVS<br><br><b>Comments :</b><br><br><b>Critical Task?</b> Y                                       | <b>Standards :</b><br>ROTATE SWITCHES TO<br>OPEN; OBSERVE ONE<br>PORV (PCV-455C)<br>DOES NOT OPEN | <b>Conditions :</b><br>Takes PCV-455C To Open<br>and It Does Not Open |
|    | Satisfactory  | Unsatisfactory  |   |

12 **Element :**  
VERIFY ADEQUATE RCS  
BLEED PATH  
**Comments :**

**Standards :**  
SEE STEPS 13 & 14  
BELOW

**Conditions :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

13 **Element :**  
ALL PRZR PORVS AND  
BLOCK VALVES - OPEN  
**Comments :**

**Standards :**  
OBSERVE ONE PORV  
DOES NOT OPEN

**Conditions :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

14 **Element :**  
INSTALL HEAD VENT  
VALVE FUSES AND OPEN  
ALL REACTOR HEAD VENT  
VALVES  
**Comments :**

**Standards :**  
INSTALL FUSES; OPEN  
HEAD VENT VALVES

**Conditions :**  
Installs 8 Fuses In Carriages, 2 Per  
Carriage (1-HV-4,1-HV-3,1-HV-1  
1-HV-2) Opens RCS SOV-652,653  
654,655)

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

BLEED AND FEED ESTABLISHED WITH REACTOR HEAD VENTS OPEN

## Candidate Cue Sheet

- A LOSS OF FEEDWATER AND OFFSITE POWER HAS OCCURRED.
- STEPS 1-4 OF E-0 ARE COMPLETE.
- A TRANSITION TO ES-0.1 WAS MADE AT STEP 4.
- A TRANSITION TO FR-H.1 WAS THEN MADE DUE TO A RED PATH ON THE HEAT SINK CSF.
- THE FOLD OUT PAGE REQUIREMENTS FOR BLEED AND FEED ARE MET.

YOU ARE DIRECTED TO ESTABLISH BLEED AND FEED COOLING OF THE RCS, USING FR-H.1 BEGINNING AT STEP 9.

Number:  FR-H.1	Title:  RESPONSE TO LOSS OF SECONDARY HEAT SINK	Revision Number:  17
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A. PURPOSE

This procedure provides actions to respond to a loss of secondary heat sink in all steam generators.

B. ENTRY CONDITIONS

This procedure is entered from:

1. E-0, REACTOR TRIP OR SAFETY INJECTION, Step 5, WHEN minimum AFW flow is NOT verified AND all SG NR levels are less than 9% [14%].
2. F-0.3, HEAT SINK, Critical Safety Function Status Tree, on a RED condition.



Number:  FR-H.1	Title:  RESPONSE TO LOSS OF SECONDARY HEAT SINK	Revision Number:  17
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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
11.	<u>VERIFY RCS Feed Path:</u>	
a.	CHECK HHSI pumps - ANY RUNNING	PERFORM the following:
		1) Manually START HHSI pumps.
		2) <u>IF</u> all HHSI pumps are unavailable, <u>THEN</u> PERFORM the following:
		a) CONTINUE attempts to start a HHSI pump.
		b) RETURN To Step 2, Page 3.
		=====
b.	VERIFY SI Valve Alignment - PROPER EMERGENCY ALIGNMENT	Perform the following, if required:
	1) VERIFY SAFEGUARD VALVE OFF NORMAL POSITION alarm on panel SBF-1 - CLEAR	• Refer to ARP-4, PANEL SBF-1 - SAFEGUARDS
	2) ENSURE BIT discharge valves 1835A, 1835B - OPEN	• Manually or Locally ALIGN valve(s)
	3) ENSURE BIT inlet valves 1852A, 1852B - OPEN	• Refer to ATTACHMENT 4, SI INJECTION PHASE VALVE ALIGNMENT, Page 45
	4) ENSURE High Head Stop valves 856J, 856H, 856C, 856E - OPEN	
		=====





**JPM NO. 8**

**DEPRESSURIZE THE RCS TO REFILL THE PRESSURIZER**

**Job Performance Measure Exam**

**Submitted By** Don Jackson

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

# ***NRC Operating Exam- JPM 8***

Indian Point 3

*Week of December 8, 2003*

## **JPM Tasks**

**Task ID:** 010\*010\*05\*01

**Description:** USE A PZR PORV VALVE TO  
DEPRESSURIZE THE RCS

Trainee: \_\_\_\_\_ Evaluator: \_\_\_\_\_

Evaluator Signature \_\_\_\_\_ Date \_\_\_\_\_

Trainee Performance:      Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

**Start Time** \_\_\_\_\_ **Stop Time:**

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactory complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Actual Performance in the Simulator

**General Comments (For Evaluator Use):**

### **Task Conditions:**

A STEAM GENERATOR TUBE RUPTURE HAS OCCURRED IN 32 SG. E-3 IS COMPLETED THROUGH STEP 15; 32 SG IS ISOLATED AND RAPID INITIAL RCS COOLDOWN IS COMPLETED.

### **Task Standards :**

K/A EPE038EA2.15 Ability To Determine or Interpret The Following As They Apply To A SGTR- Pressure At Which To Maintain The RCS During S/G Cooldown (4.4)

RCS STABLE AT REQUIRED PRESSURE.

Applicability: RO & SRO

Estimated Completion Time: 25 minutes

# ***NRC Operating Exam- JPM 8***

Indian Point 3

*Week of December 8, 2003*

**Tools Needed:**

SIMULATOR SET UP FOR SNAP: JPM 8

**Initiating Cues :**

YOU ARE DIRECTED TO DEPRESSURIZE THE RCS IN ACCORDANCE WITH E-3, "Steam Generator Tube Rupture", Steps 16-21.

**References :**

<b>ID</b>	<b>Description</b>	<b>Review Date</b>	<b>Ref Flag</b>
EOP	E-3	STEAM GENERATOR TUBE RUPTURE	X

**Safety Considerations :**

**Consequences of Inadequate Performance:**

PROLONGED RCS TO S/G INVENTORY LOSS, GREATER POSSIBILITY OF LIFTING A S/G SAFETY WITH RADIOACTIVITY IN THE S/G

**Performance Checklist :**

- |   |   |   |  |
|---|---|---|--|
| 1 | <b>Element :</b><br>OBTAIN AND REVIEW<br>PROCEDURE E-3.<br><b>Comments :</b><br><br><b>Critical Task?</b> N                                       | <b>Standards :</b><br>REVIEWED PROCEDURE<br>E-3.                      | <b>Conditions :</b>  |
|   | <b>Satisfactory</b>   | <b>Unsatisfactory</b>   |  |
| 2 | <b>Element :</b><br>CHECK RUPTURED SG<br>PRESSURE STABLE OR<br>INCREASING<br><b>Comments :</b><br><br><b>Critical Task?</b> N                     | <b>Standards :</b><br>OBSERVE RUPTURED SG<br>PRESSURE STABLE          | <b>Conditions :</b>  |
|   | <b>Satisfactory</b>   | <b>Unsatisfactory</b>   |  |
| 3 | <b>Element :</b><br>CHECK RCS SUBCOOLING<br>BASED ON CORE EXIT TCS<br>GREATER THAN 60 DEGREES<br><b>Comments :</b><br><br><b>Critical Task?</b> N | <b>Standards :</b><br>OBSERVE QSPDS FOR<br>SUBCOOLING > 60<br>DEGREES | <b>Conditions :</b>  |
|   | <b>Satisfactory</b>   | <b>Unsatisfactory</b>   |  |
| 4 | <b>Element :</b><br>* DEPRESSURIZE RCS TO<br>MINIMIZE BREAK FLOW AND<br>REFILL PRZR<br><b>Comments :</b><br><br><b>Critical Task?</b> N           | <b>Standards :</b><br>PERFORM STEPS 5-8<br>BELOW                      | <b>Conditions :</b><br>* STEPS INDICATE HIGH<br>LEVEL ACTION STEPS |
|   | <b>Satisfactory</b>   | <b>Unsatisfactory</b>   |  |

**Element :**  
5 DETERMINE AVAILABILITY  
OF NORMAL PZR SPRAY

**Standards :**  
OBSERVE THE  
FOLLOWING;- BOTH PZR  
SPRAY VALVES ARE  
CLOSED;- #33,34 RCP ARE  
RUNNING

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
6 INITIATE PRZR SPRAY  
WITH MAXIMUM  
ALLOWABLE SPRAY FLOW

**Standards :**  
ATTEMPT TO OPEN  
SPRAY VALVES USING  
PC-455G and PC-455H  
PRZR SPRAY VALVE  
CONTROLLERS

**Conditions :**  
SPRAY VALVES FAIL TO OPEN

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
7 GO TO STEP 20 OF E-3

**Standards :**  
EXITS STEP 18 AND  
PROCEEDS TO STEP 20 OF  
E-3.

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
8 \* DEPRESSURIZE RCS  
USING PRZR PORV TO  
MINIMIZE BREAK FLOW AND  
REFILL PRZR  
**Comments :**

**Standards :**  
PERFORM STEPS 9 & 10  
BELOW

**Conditions :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
9 PRESSURIZER PORVS AT  
LEAST ONE AVAILABLE

**Standards :**  
DETERMINES AT LEAST  
ONE PZR PORV BLOCK  
VALVE IS OPEN OR  
OPENS USING  
RED/GREEN INDICATING  
LIGHTS;DETERMINES AT  
LEAST ONE PZR PORV  
HAS POWER AVAILABLE  
USING RED/GREEN  
INDICATING LIGHTS

**Conditions :**  
Block Valve 536 is Open, and  
Block Valve 535 is Shut. May  
Elect To Open 535. Will Open  
PORV 456 (In Line With 536)

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Element :**  
10 OPEN ONE PZR PORV

**Standards :**  
1. CONTROL SWITCH SET  
TO OPEN POSITION 2.  
RED LIGHT ON GREEN  
LIGHT OFF 3. CHECKS  
RCS PRESSURE  
DECREASING

**Conditions :**

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

11 **Element :**  
CHECK IF CONDITIONS ARE  
MET TO STOP  
DEPRESSURIZATION  
**Comments :**

**Standards :**  
SEE STEPS 12 - 15

**Conditions :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

12 **Element :**  
RCS PRESSURE LESS THAN  
RUPTURED SG PRESSURE

**Standards :**  
CHECKS RCS PRESSURE  
IS LESS THAN  
RUPTURED SG PRESSURE  
NOTE: IT MAY BE  
POSSIBLE THE FIRST  
OR SECOND TIME  
THROUGH FOR PRESSURE  
TO BE STILL ABOVE  
THE SG PRESSURE BUT  
IT WILL COME BELOW  
SG PRESSURE

**Conditions :**  
THIS IS AN "AND" STATEMENT  
WITH ITEM 13 "OR" ITEM 14  
"OR" ITEM 15 "OR" ITEM 16

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

13 **Element :**  
CHECK PRESSURIZER LEVEL  
>14% OR

**Standards :**  
CHECKS PZR LEVEL  
>14% NOTE: IT MAY BE  
POSSIBLE THE FIRST  
OR SECOND TIME  
THROUGH FOR  
PRESSUREIZER LEVEL  
TO BE STILL LOW BUT  
IT WILL COME ABOVE  
14%

**Conditions :**  
THIS IS AN "AND" STATEMENT  
WITH ITEM 12. WILL MEET  
THIS REQUIREMENT IN  
CONJUNCTION WITH ABOVE

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**14 Element :**  
CHECK PPESSURIZER LEVEL  
>73%

**Standards :**  
CHECKS PRESSURIZER  
LEVEL >73% NOTE:  
PRESSURIZER LEVEL  
SHOULD REMAIN  
BELOW 73%

**Conditions :**  
THIS IS AN "OR" STATEMENT  
WITH ITEM 12

**Comments :**

**Critical Task?      Y**

**Satisfactory**

**Unsatisfactory**

**15 Element :**  
CHECK RCS SUBCOOLING  
<40 DEG F

**Standards :**  
CHECKS RCS  
SUBCOOLING <40 DEG F  
NOTE: RCS SUBCOOLING  
SHOULD REMAIN ABOVE  
40 DEG F

**Conditions :**  
THIS IS AN "OR" STATEMENT  
WITH ITEM 12

**Comments :**

**Critical Task?      Y**

**Satisfactory**

**Unsatisfactory**

**16 Element :**  
CLOSE PORV

**Standards :**  
CHECKS GREEN LIGHT  
ON AND RED LIGHT OFF  
CHECKS RCS PRESSURE  
INCREASING

**Conditions :**

**Comments :**

**Critical Task?      Y**

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

RCS PRESSURE < SG PRESSURE AND PRZR LEVEL >14% OR; PRZR LEVEL >73% OR; RCS  
SUBCOOLING BASED ON CETS <40F

## Candidate Cue Sheet

A STEAM GENERATOR TUBE RUPTURE HAS OCCURRED IN 32 SG. E-3, "Steam Generator Tube Rupture", HAS BEEN COMPLETED THROUGH STEP 15.

32 SG IS ISOLATED AND RAPID INITIAL RCS COOLDOWN IS COMPLETED. YOU ARE DIRECTED TO DEPRESSURIZE THE RCS IN ACCORDANCE WITH E-3, "Steam Generator Tube Rupture", Steps 16-21.

Number:  E-3	Title:  STEAM GENERATOR TUBE RUPTURE	Revision Number:  17
--------------------	--	----------------------------

A. PURPOSE

This procedure provides actions to terminate leakage of Reactor coolant into the secondary system following a SG tube rupture.

B. ENTRY CONDITIONS

This procedure is entered from:

1. Any Foldout Page whenever any SG level increases in an uncontrolled manner or any SG has abnormal radiation.
2. E-0, REACTOR TRIP OR SAFETY INJECTION:
  - Step 16, when condenser air ejector radiation, SG blowdown radiation, or main steamline radiation is abnormal.
  - Step 21.b, when a SG narrow range level increases in an uncontrolled manner.
  - Step 22.e, when secondary radiation is abnormal.
3. E-1, LOSS OF REACTOR OR SECONDARY COOLANT:
  - Step 3, when a SG NR level increases in an uncontrolled manner.
  - Step 6, when secondary radiation is abnormal.
4. ES-1.2, POST-LOCA COOLDOWN AND DEPRESSURIZATION, Step 6, when a SG narrow range level increases in an uncontrolled manner.
5. E-2, FAULTED STEAM GENERATOR ISOLATION, Step 5.e, when secondary radiation is abnormal.
6. E-2, FAULTED STEAM GENERATOR ISOLATION, Step 5.f, when SG level is increasing in an uncontrolled manner.
7. ES-3.1, POST-SGTR COOLDOWN USING BACKFILL, Step 5, when a SG NR level increases in an uncontrolled manner.
8. ES-3.2, POST-SGTR COOLDOWN USING BLOWDOWN, Step 5, when a SG NR level increases in an uncontrolled manner.
9. ES-3.3, POST-SGTR COOLDOWN USING STEAM DUMP, Step 7, when a SG NR level increases in an uncontrolled manner.

(STEP 2 CONTINUED ON NEXT PAGE)







Number:  E-3	Title:  STEAM GENERATOR TUBE RUPTURE	Revision Number:  17
--------------------	--	----------------------------

STE  
D

ACTION/EXPECTED  
RESPONSE

RESPONSE NOT  
OBTAINED

CAUTION

- THE PRT MAY RUPTURE IF A PRZR PORV IS USED TO DEPRESSURIZE THE RCS. THIS MAY RESULT IN ABNORMAL CONTAINMENT CONDITIONS.
- CYCLING OF THE PRZR PORV SHOULD BE MINIMIZED.

NOTE

The upper head region may void during RCS depressurization if RCPS are NOT running. This may result in a rapidly increasing PRZR level.

20. DEPRESSURIZE RCS Using PRZR PORV To Minimize Break Flow And Refill PRZR:

a. CHECK PRZR PORVs - ANY AVAILABLE

a. PERFORM the following:

- 1) USE auxiliary spray:
  - REFER To SOP-CVCS-2.
- 2) IF auxiliary spray is established AND effective, THEN RETURN To Step 18.b, Page 22.
- 3) IF auxiliary spray can NOT be established OR is NOT effective, THEN GO To ECA-3.3, SGTR WITHOUT PRESSURIZER PRESSURE CONTROL.

b. OPEN one PRZR PORV

b. RETURN To Step 20.a.

c. CHECK RCS pressure - DECREASING

c. RETURN To Step 20.a.



**JPM NO. 9**

**START A REACTOR COOLANT PUMP AS PER SOP-RCS-1**

**Job Performance Measure Exam**

**Submitted By** Don Jackson

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

**JPM Tasks**

**Task ID:** 003\*006\*03\*01

**Description:** START A REACTOR COOLANT PUMP AS PER SOP-RCS-1

Trainee: \_\_\_\_\_ Evaluator: \_\_\_\_\_

Evaluator Signature \_\_\_\_\_ Date \_\_\_\_\_

Trainee Performance: Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

Start Time \_\_\_\_\_ Stop Time: \_\_\_\_\_

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactory complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Actual Performance in the Simulator

**General Comments (For Evaluator Use):**

**Task Conditions:**

THE PLANT IS IS HOT STANDBY AND PREPARATIONS ARE BEING MADE FOR PLANT STARTUP. #31 REACTOR COOLANT PUMP HAS BEEN RE-BALANCED AND THE PUMP IS ALIGNED TO BE STARTED. THE PUMP WAS STOPPED 4 HOURS AGO. #32,#33,#34 RCPs ARE IN SERVICE

**Task Standards :**

K&A #: SYSTEM 003 REACTOR COOLANT PUMP  
A4.06 MANUALLY OPERATE AND/OR MONITOR IN THE CONTROL ROOM RCP PARAMETERS;  
RO=2.9 SRO=2.9  
Applicability: RO & SRO  
START 31 RCP IN ACCORDANCE WITH SOP-RCS-1.  
Estimated Completion Time: 45 minutes

**Tools Needed:**

SIMULATOR: SET UP FOR SNAP: JPM 9

**Initiating Cues :**

YOU ARE DIRECTED TO START THE 31 RCP PER SOP-RCS-1. PROCEDURE PREREQUISITES ARE COMPLETE, AND UNIT LOG VERIFIED TO ENSURE RCP ROTATION REQUIREMENTS ARE SATISFIED.

**References :**

<b>ID</b>	<b>Description</b>	<b>Review Date</b>	<b>Ref Flag</b>
SOP RCS-1	REACTOR COOLANT PUMP OPERATION		X

**Safety Considerations :**

**Consequences of Inadequate Performance:**

DAMAGE TO RCP

**Performance Checklist :**

**Element :**

**Standards :**

**Conditions :**

1 OBTAIN AND REVIEW SOP  
RCS-01

OBTAIN AND REVIEW  
SOP RCS-01

Comments :

Critical Task? N

Satisfactory

Unsatisfactory

2 Element :  
REVIEW THE UNIT LOG  
FOR RCP ROTATING HISTORY

Standards :  
CANDIDATE ATTEMPTS  
TO REVIEW THE LOG

Conditions :  
Cue: RCP Bumping and Barring  
Is Not Required, Per Cue Sheet

Comments :

Critical Task? N

Satisfactory

Unsatisfactory

3 Element :  
VERIFY "31 RCP STANDPIPE  
LEVEL OFF NORMAL LIGHT"  
IS EXTINGUISHED. (PANEL  
SAF)

Standards :  
OBSERVE LIGHT NOT  
ILLUMINATED

Conditions :

Comments :

Critical Task? N

Satisfactory

Unsatisfactory

4 Element :  
VERIFY "31 RCP OIL LEVEL  
OFF NORMAL LIGHT" IS  
EXTINGUISHED. (PANEL  
SAF)

Standards :  
OBSERVE LIGHT NOT  
ILLUMINATED

Conditions :

Comments :

Critical Task? N

Satisfactory

Unsatisfactory

5 **Element :**  
VERIFY "31 RCP BEARING  
COOLANT LOW FLOW"  
ANNUNCIATOR  
EXTINGUISHED. (PANEL  
SGF)

**Standards :**  
OBSERVE ANNUNCIATOR  
NOT LIT

**Conditions :**  
If NPO Is Sent, Combined  
Flow Is 165 GPM, Lower  
Bearing Flow Is 5.5 GPM

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

6 **Element :**  
ENSURE "THERMAL  
BARRIER CCW HEADER  
LOW FLOW" ANNUNCIATOR  
EXTINGUISHED

**Standards :**  
OBSERVE ANNUNCIATOR  
NOT LIT

**Conditions :**  
If NPO Is Sent, CCW Flow  
To The Thermal Barrier  
Cooling Coil Is 30GPM To  
31 RCP; 115 GPM Total

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

7 **Element :**  
VERIFY "RCP THERMAL  
BARRIER COOLING RETURN  
HIGH TEMP" EXTINGUISHED

**Standards :**  
OBSERVE ANNUNCIATOR  
NOT LIT

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

8 **Element :**  
VERIFY "RCP BEARINGS  
COOLING WATER RETURN  
HIGH TEMP" ANNUNCIATOR  
EXTINGUISHED

**Standards :**  
OBSERVE ANNUNCIATOR  
NOT LIT

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
9 VERIFY "METAL IMPACT  
MONITOR SYSTEM"  
ANNUNCIATOR  
EXTINGUISHED (PANEL SGF)  
**Comments :**

**Standards :**  
OBSERVE ANNUNCIATOR  
NOT LIT

**Conditions :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
10 VERIFY SEAL INJECTION  
FLOW IS 6-12 GPM ON  
FI-144A.

**Standards :**  
OBSERVE SEAL  
INJECTION FLOW IS  
BETWEEN 6 AND 12 GPM  
ON 31 RCP

**Conditions :**  
As Read- 6.4 GPM

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
11 VERIFY SEAL INJECTION  
TEMPERATURE IS 60 TO 150  
DEG. AS READ ON TI-140,  
VCT OUTLET  
TEMPERATURE.

**Standards :**  
OBSERVE SEAL  
INJECTION TEMPERATURE  
IS BETWEEN 60-150 DEG  
F.

**Conditions :**  
As Read- 106 deg F

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
12 VERIFY VCT PRESSURE,  
PI-139, IS 15-60 PSIG  
**Comments :**

**Standards :**  
OBSERVE VCT PRESSURE  
BETWEEN 15-60 PSIG

**Conditions :**  
As Read- 22 psig

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
13 VERIFY SEAL RETURN FLOW  
IS IN ACCEPTABLE RANGE  
PER ATTACHMENT 1, RCP  
#1 SEAL NORMAL  
OPERATING RANGE

**Standards :**  
REFER TO ATTACHMENT  
1 OBSERVE LEAKOFF  
FLOW RATE IN NORMAL  
OPERATING RANGE  
FOR CURRENT  
PLANT CONDITIONS

**Conditions :**  
As Read- 2.37 GPM on 3 FR-159  
Differential- VCT Pressure PI-139  
to Charging Pressure PI- 142B

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
14 VERIFY RCS  
PRESSURE-TEMPERATURE  
LIMITS ARE MET PER  
GRAPH RCS-1C, REACTOR  
COOLANT PUMP OPERATING  
LIMITS CURVE.

**Standards :**  
COMPARE RCS  
PRESSURE AND  
TEMPERATURE TO  
GRAPH RCS-1C FOR  
ALLOWABLE RCP  
OPERATION

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
15 PERFORM STEPS 4.1.3-4.1.11

**Standards :**  
DETERMINES THESE STEPS  
ARE NOT APPLICABLE

**Conditions :**  
Cue- If Asked, on Step 4.1.8  
31 RCP Lower Oil Float Chamber  
Sight Glass Vent Valve Is 5 Turns  
Open Per COL-RCS-1

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

16 **Element :** ENSURE MOTOR START TIMES PER SOP-EL-004A ARE MET  
**Standards :** REVIEWS UNIT LOG  
**Conditions :** Cue: Motor Start Times Are Met per SOP-EL-004A As Stated On Cue Sheet

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

18 **Element :** SELECT NOISE MONITOR FOR 31 RCP. (ROS DESK)  
**Standards :** ROTATE SWITCH TO 31 RCP  
**Conditions :** Noise Monitor Not Functional In Simulator  
CUE: Noise Will Remain Well Within Expected Range During This Evolution

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

18 **Element :** SELECT SHAFT AND FRAME VIBRATION RECORDER FOR 31 RCP (RACK C-11)  
**Standards :** ROTATE BOTH SHAFT AND FRAME VIBRATION RECORDER SWITCHES TO 31 RCP  
**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**



23 **Element :**  
REVIEW ONOP-RCS-5 RCP  
MALFUNCTIONS

**Standards :**  
REVIEW ONOP-RCS-5  
FOR EMERGENCY TRIP  
CRITERIA.

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

24 **Element :**  
ADJUST 6.9KV VOLTAGE  
PRIOR TO RCP START AND  
AFTER STARTING CURRENT  
DECAYS, AS FOLLOWS:  
STATION OPERATOR AT STA  
AUX TR TAP CHANGER  
CONTROL SWITCH (FCR)

**Standards :**  
STATION AN OPERATOR  
AT TAP CHANGER

**Conditions :**

CUE: Operator Is  
Stationed At The Tap  
Changer  
Note: Voltage at High End of  
Range, May Not Take TAP  
Changer To Manual

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

25 **Element :**  
REVIEW BUS VOLTAGE  
REQUIREMENTS OF SOP  
EL-11

**Standards :**  
REVIEW SOP EL-11 AND  
STATE TARGET VOLTAGE  
(HIGH END OF RANGE -  
SAFEGUARDS BUS <  
498VAC; SAT < 7200V)

**Conditions :**

Determines TAP Changer Operation  
Not Required

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

26 **Element :**  
PLACE STA AUX TR TAP  
CHANGER CONTROL SWITCH  
IN MANUAL AND ADJUST  
BUS VOLTAGE TO HIGH  
END OF NORMAL RANGE  
**Comments :**

**Standards :**  
COORDINATE VOLTAGE  
ADJUSTMENT TO  
STATED TARGET

**Conditions :**  
CUE: Voltage Adjusted  
In Manual To The High  
End Of Normal Range  
May Stay In AUTO- 7300 Volts

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

27 **Element :**  
WHEN STARTING CURRENT  
HAS DECAYED TO NORMAL,  
RETURN BUS VOLTAGE TO  
NORMAL  
**Comments :**

**Standards :**  
DIRECT RETURN OF  
BUS VOLTAGE TO 6.9  
KV WHEN STARTING  
CURRENT DECAYS TO  
NORMAL

**Conditions :**  
(When Directed and  
Starting Current Decays  
To Normal After RCP  
Start) CUE: Bus Voltage  
Adjusted To Normal Value  
Of At Least 6.9 KV.

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

28 **Element :**  
START 31 RCP  
**Comments :**

**Standards :**  
SELECT START ON 31  
RCP SWITCH

**Conditions :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

29 **Element :**  
CHECK STARTING CURRENT  
DISSIPATES WITHIN 30  
SECONDS  
**Comments :**

**Standards :**  
OBSERVE STARTING  
CURRENT

**Conditions :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

30 **Element :**  
MONITOR EMERGENCY  
SHUTDOWN PARAMETERS  
LISTED IN REACTOR  
COOLANT PUMP EMERGENCY  
TRIP CRITERIA  
**Comments :**

**Standards :**  
OBSERVE EMERGENCY  
SHUTDOWN  
PARAMETERS

**Conditions :**  
No Trip Criteria Are Met

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

31 **Element :**  
ENSURE STATION  
AUXILIARY TRANSFORMER  
TAP CHANGER IN AUTO  
**Comments :**

**Standards :**  
DIRECTS TAP CHANGER  
TO BE RETURNED TO  
AUTO

**Conditions :**  
CUE: Tap Changer Is  
Returned To AUTO, If  
Previously Taken To Manual

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

32 **Element :** ADJUST CHARGING AND LETDOWN AS NECESSARY TO ENSURE RCS PRESSURE DOES NOT EXCEED LIMITATIONS OF ITS FIGURE 3.4-12.1, MAXIMUM ALLOWABLE NOMINAL PORV SETPOINT FOR LTOP

**Standards :** RCS PRESSURE DOES NOT EXCEED LIMITS OF ITS FIGURE 3.4-12.1, MAXIMUM ALLOWABLE NOMINAL PORV SETPOINT FOR LTOP

**Conditions :** This Will Only Be A Concern For Starting An RCP From Cold Conditions

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

33 **Element :** WHEN RCP HAS RUN FOR AT LEAST ONE MINUTE AFTER STARTING CURRENT HAS DISSIPATED, STOP BEARING LIFT PUMP

**Standards :** WAIT ONE MINUTE AFTER STARTING CURRENT HAS DISSIPATED, THEN SELECT STOP FOR 31 RCP BEARING LIFT PUMP

**Conditions :**

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

34 **Element :** CHECK WHETHER 31 RCP EXCEED ALERT VALUE FOR VIBRATION; 3 MILS FRAME, 15 MILS SHAFT

**Standards :** OBSERVES 31 RCP VIBRATION MONITOR

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

RCP HAS BEEN STARTED IN ACCORDANCE WITH SOP-RCS-1.

## **Candidate Cue Sheet**

THE PLANT IS IS HOT STANDBY AND PREPARATIONS ARE BEING MADE FOR PLANT STARTUP. #31 REACTOR COOLANT PUMP HAS BEEN RE-BALANCED AND THE PUMP IS ALIGNED TO BE STARTED. THE PUMP WAS STOPPED 4 HOURS AGO. #32,#33,#34 RCPs ARE IN SERVICE

YOU ARE DIRECTED TO START THE 31 RCP PER SOP-RCS-1. PROCEDURE PRECAUTIONS AND LIMITATIONS AS WELL AS THE PREREQUISITES ARE COMPLETE, AND UNIT LOG VERIFIED TO ENSURE RCP STARTING DUTY AND ROTATION REQUIREMENTS ARE SATISFIED.



**Entergy**

**Nuclear Northeast**

Procedure Use Is:

- Continuous
- Reference
- Information

Control Copy: \_\_\_\_\_

Effective Date: \_\_\_\_\_

Page 1 of 45

**This procedure is TSR**

**SOP-RCS-001, Revision 29**

**REACTOR COOLANT SYSTEM OPERATION**

Nick De Vries

1/04/27/03

Writer

Date

Reviewer

**Approved By:**

Procedure Sponsor, DM/Designee

Date

**Team 3E**  
Procedure Owner



**EDITORIAL REVISION**

**REVISION SUMMARY**

(Page 1 of 1)

**1.0 REASON FOR REVISION**

- 1.1 Incorporate TPC 03-0200, MOD (installed under WR IP3-19196).

**2.0 SUMMARY OF CHANGES**

- 2.1 Revision reflects the change to 32 RCP oil lift pump discharge which is now hard piped such that it is directed to the upper and lower thrust bearings simultaneously.
- 2.2 Deleted Attachment 4, referencing 32 RCP Wire Jumper Installation and Removal.
- 2.3 Deleted 32 RCP reference in step 4.1.8, step 4.1.9 caution, revised 1<sup>st</sup> bullet in step 4.1.9 note and deleted "old" steps 4.1.9.2, 4.1.9.7, 4.1.15.2 per TPC 03-0200.
- 2.4 Revised step 4.5.3, deleted steps to install jumper, position 32 RCP bearing lift pump discharge to lower shoes and ensure 32 RCP lower oil float chamber vent valve was throttled per TPC 03-0200.
- 2.5 Deleted step 4.5.12, deleted removal and record removal of jumper and deleted step to direct bearing lift pump discharge to upper shoes.
- 2.6 Deleted step 4.6.8.2 "IF RCP 32 is to be started, THEN ENSURE bearing lift pump discharge valve is positioned to upper shoes" per TPC 03-0200.
- 2.7 Revised step 4.7.9.3 to include correct reference step of '4.7.3.2' instead of "0" (TPC 03-0200).
- 2.8 Deleted references to 32 RCP in steps 4.7.12 (& associated note), 4.7.14.
- 2.9 Revised steps 4.7.13 and 4.7.15 to include 32 RCP (TPC 03-0200).
- 2.10 Deleted Attachment 4 from step 6.1.1, Records.
- 2.11 Revised Attachment 5 and renamed it Attachment 4.

**TABLE OF CONTENTS**

<b>Section Title</b>	<b>Page</b>
1.0 PURPOSE.....	4
2.0 PRECAUTIONS AND LIMITATIONS.....	4
3.0 PREREQUISITES.....	8
4.0 PROCEDURE.....	9
4.1 RCP Startup .....	9
4.2 Normal Operation .....	16
4.3 Normal Shutdown .....	17
4.4 Operation of RCP Seal Bypass Valve .....	18
4.5 Uncoupled RCP Motor Operation .....	19
4.6 Bumping RCPs with an RCP In Service .....	20
4.7 Adjusting Level in RCP Upper or Lower Oil Reservoir.....	24
4.8 Adjusting RCP Standpipe Levels.....	34
5.0 REFERENCES.....	36
6.0 RECORDS AND DOCUMENTATION.....	37

**Attachments:**

ATTACHMENT 1 - ALTERNATE MEANS OF VERIFYING PROPER SEAL RETURN FLOW	38
ATTACHMENT 2 - ALTERNATE MEANS OF VERIFYING PROPER SEAL RETURN FLOW	39
ATTACHMENT 3 - RCP START REQUIREMENT DETERMINATION.....	43
ATTACHMENT 4 - RCP OPERATING HISTORY.....	45

**1.0 PURPOSE**

- 1.1 This procedure establishes requirements for RCP operation.
- 1.2 This procedure applies to operation of Reactor Coolant Pumps(s).

**2.0 PRECAUTIONS AND LIMITATIONS**

- 2.1 Minimum RCS pressure for RCP operation is per Graph RCS-1C, Reactor Coolant Pump Operating Limits Curve.
- 2.2 No.1 seal return flow SHALL be within limits of Attachment 1, RCP No. 1 Seal Normal Operating Range, for RCP starting and continuous operation.
- 2.3 WHEN RCS pressure is greater than 100 psig,  
THEN Seal Injection flow SHALL be maintained at 6 to 12 GPM.
- 2.4 Seal injection temp SHALL NOT exceed 150°F, as read on TI-140, VCT Outlet Temp (Reference 5.2.12).
- 2.5 Prior to starting additional RCPs, all running RCPs SHALL be up to speed.
- 2.6 WHEN power is being supplied via GT-35 and GT-36,  
THEN operation of more than 1 RCP is NOT allowed.
- 2.7 IF power is being supplied to GT-35 and GT-36 via GT-BT, THEN IP-2 loads being supplied by GT-25 and GT-26 SHALL be considered prior to starting any RCPs.
- 2.8 RCPs SHALL NOT be started while any EDG is operating paralleled with respective 480 VAC bus to prevent exceeding EDG load limit.
- 2.9 Minimum RCS temp required for RCP operation is as follows **{Reference 5.1.1}**:
  - 1 RCP - 90°F
  - 2 RCPs - 100°F
  - 3 RCPs - 110°F
  - 4 RCPs - 120°F
- 2.10 Motor starting requirements of SOP-EL-004A, Electric Motor Operation, SHALL be observed.
- 2.11 An RCP SHALL NOT be barred over with another RCP in service.
- 2.12 An RCP which remains idle for greater than 30 days SHALL be barred over prior to start.

2.13 RCP vibration limits:

2.13.1 Vibration at pump shaft should be considered primary indication of pump vibration conditions:

- Motor frame vibration should be considered a secondary indicator.

2.13.2 Limits for RCP motor frame and shaft vibration, as indicated by RCP vibration monitors, are as follows:

FRAME	
<b>Alert</b>	3 mils
<b>Shutdown</b>	5 mils

SHAFT	
<b>Alert</b>	15 mils
<b>Shutdown</b>	20 mils

2.13.3 IF an RCP exceeds an alert limit, THEN that RCP should be selected on Shaft and Frame vibration trend recorders (Rack C-11).

2.13.4 WHEN an RCP has exceeded an alert limit, THEN the RCP vibration trend (rate of increase) should be observed for the following limits and the RCP stopped if the limits are exceeded:

- Frame vibration increasing at greater than 0.2 mils/hour.
- Shaft vibration increasing at greater than 1.0 mil/hr.

2.14 WHEN RCS boration or dilution is performed, THEN 1 RCP or 1 RHR pump should be operating to preclude unexpected changes in RCS boron concentration and loss of required shutdown margin:

- WHEN only RHR is operating, THEN changes to RCS boron concentration require extended mixing times and should be evaluated by Reactor Engineering.

2.15 RCP thermal barrier  $\Delta P$  measurement is a redundant and less accurate indication of RCP seal injection flow:

- IF seal injection flow is greater than seal return flow, THEN RCP THERMAL BARRIER LOW DELTA P alarm is NOT required for pump starting or continued operation.
- IF actuated with above condition met, THEN corrective action should be initiated to investigate / troubleshoot alarm.

2.16 The following require immediate shutdown of an RCP per ONOP-RCS-5 [AOP-RCP-1, Reactor Coolant Pump Malfuction] (Reference 5.2.12):

- RCP Seal  $\Delta P$  less than 200 psid:
  - PI-188
  - PI-187
  - PI-186
  - PI-183
- RCP Seal return flow less than 0.84 gpm (at NOT/NOP) (Ref 5.2.13):
  - 3FR-158- RCP 31 and 32
  - 3FR-156- RCP 33 and 34
- RCP Seal inlet temps greater than 225°F:
  - TI-155
  - TI-154
  - TI-153
  - TI-152
- RCP Seal outlet temps greater than 235°F:
  - TI-148
  - TI-146
  - TI-132
  - TI-125
- RCP vibration greater than:
  - 5 mils – Frame
  - 20 mils – Shaft

- IF RCS temp is greater than 540°F, AND RCP Motor Winding (stator) Temperature 4 Point Recorder is greater than 250°F (FBR).
- RCP Motor Winding (stator) Temperature 4 Point Recorder increases to 300°F (FBR).
- RCP Motor Winding (stator) Temperature 4 Point Recorder exceeds 250°F for greater than 50 hours (FBR).
- RCP upper or lower motor bearing temps greater than 200°F:
  - RCP 31 Upper Brg, T0413A
  - RCP 31 Lower Brg, T0415A
  - RCP 32 Upper Brg, T0433A
  - RCP 32 Lower Brg, T0435A
  - RCP 33 Upper Brg, T0453A
  - RCP 33 Lower Brg, T0455A
  - RCP 34 Upper Brg, T0473A
  - RCP 34 Lower Brg, T0475A

2.17 Normal RCP motor running current may vary from 340 amps minimum to 580 amps maximum:

- Normal running current during plant startup and operation varies depending on combination of pumps running and RCS temp.
- Hot -RCS at normal operating pressure and temperature with 4 RCPs running, approximately 400 amps.
- Cold -RCS less than normal operating temperature with any combination of RCPs running, approximately 450 to 500 amps

2.18 IF any RCP is in operation in Mode 4 or 5, THEN:

- SG wide range level in applicable loop SHALL be maintained greater than 70% to minimize potential damage to SG tubes.
- WHEN performing initial RCP bumps and runs, THEN this SG level requirement may be excluded.

2.19 IF operating RCPs for fill and vent, THEN Chemist SHALL be notified prior to RCP runs to coordinate O<sub>2</sub> sampling after RCP runs.

**3.0 PREREQUISITES**

3.1 RCS filled per one of the following:

- SOP-RCS-009, Reactor Coolant System Fill, Vent And Pressurization
- SOP-RCS-017, Reactor Vessel Vacuum And Mansell Level Monitoring System Operation

3.2 CCW in service to support RCP operation per SOP-CC-001B, Component Cooling Water System Operation.

3.3 CVCS in service to support RCP operation per SOP-CVCS-002, Charging, Seal Water and Letdown Control.

3.4 RCP stator temp recorder TR-407 in service.

3.5 RCP vibration monitors in service (Rack C-11).

3.6 Metal Impact Monitor System (MIMS) in service per SOP-RCS-016, Operation Of The Metal Impact Monitor System.

3.7 RCP motor bearing temps are being trended on CFMS per Emergency Response Facility Data Acquisition and Display System Users Guide and Address Listing.

**4.0 PROCEDURE****4.1 RCP Startup**

4.1.1 REVIEW Unit Log, or Attachment 5, RCP Rotating History, for idle RCPs to ensure that RCP bumping and barring over requirements are maintained: (see Step 4.1.9)

4.1.1.1 IF RCP bump is required, THEN:

a) REFER TO Section 4.5 or Section 4.6, as applicable.

b) UPDATE Attachment 5 for bumped RCPs.

4.1.1.2 WHEN all RCPs are in service, THEN STOP logging RCP Rotating History on Attachment 5 until RCP shutdown.

4.1.2 VERIFY the following conditions are satisfied:

- Selected RCP Standpipe Level Off Normal light is extinguished. (Panel SAF)
- Selected RCP Oil Level Off Normal light is extinguished (Panel SAF).
- Selected RCP annunciators are extinguished (Panel SGF):
  - RCP #31 BEARING COOLANT LOW FLOW
  - RCP #32 BEARING COOLANT LOW FLOW
  - RCP #33 BEARING COOLANT LOW FLOW
  - RCP #34 BEARING COOLANT LOW FLOW
  - THERMAL BARRIER CCW HEADER LOW FLOW
  - RCP THERMAL BARRIER COOLING RETURN HIGH TEMP.
  - RCP BEARINGS COOLING WATER RETURN HIGH TEMP.
- METAL IMPACT MONITORING SYSTEM annunciator is extinguished. (Panel SGF)

- \_\_\_\_\_ • Selected RCP seal injection flow as indicated on the following applicable indicator is 6 to 12 gpm (Ref. 5.2.12):
  - \_\_\_\_\_ ◦ FI-144A
  - \_\_\_\_\_ ◦ FI-143A
  - \_\_\_\_\_ ◦ FI-116A
  - \_\_\_\_\_ ◦ FI-115A
- \_\_\_\_\_ • Seal injection temp as indicated on TI-140, VCT Outlet Temp, is 60° to 150°F (Ref. 5.2.12).
- \_\_\_\_\_ • VCT pressure as indicated on PI-139 is 15 to 60 psig.
- \_\_\_\_\_ • Seal return flow is in normal operating range per Attachment 1, RCP No.1 Seal Normal Operating Range:
- \_\_\_\_\_ • RCS pressure-temp requirements for RCP operation are met per Graph RCS-1C, Reactor Coolant Pump Operating Limits Curve.

\_\_\_\_\_ 4.1.3 IF seal injection is NOT 6 to 12 gpm, THEN ADJUST seal injection flow per SOP-CVCS-002, Charging, Seal Water and Letdown Control.

\_\_\_\_\_ 4.1.4 IF seal return flow is NOT in normal operating range, THEN:

\_\_\_\_\_ 4.1.4.1 PERFORM any of the following:

- \_\_\_\_\_ • VENT VCT pressure PI-139 to 15 psig per SOP-CVCS-002, Charging Seal Water and Letdown Control.
- \_\_\_\_\_ • CONTACT System Engineer to evaluate seal condition.
- \_\_\_\_\_ • PERFORM Attachment 2, Alternate Means Of Verifying Proper Seal Return Flow.

\_\_\_\_\_ 4.1.4.2 IF seal return flow can NOT be established in normal operating range, THEN ENSURE pump is NOT started and CONSULT System Engineering for additional guidance.

\_\_\_\_\_ 4.1.5 IF NO RCPs are in service, THEN DETERMINE whether an RCP start will cause a boron dilution from a stagnant loop. **{Reference 5.1.2}**

- IF necessary, consult with Reactor Engineering.

4.1.6 IF it is determined that a rapid boron dilution event would occur during startup of RCPs, THEN PERFORM the following:

\_\_\_\_\_ 4.1.6.1 Direct Chemistry to sample the Reactor Coolant System, as appropriate:

- Intermediate Leg
- Pressurizer
- Other areas where potential dilute pockets might exist

\_\_\_\_\_ 4.1.6.2 CONSULT with Reactor Engineering to CALCULATE the volume of the dilution pocket AND DETERMINE the RCS boron concentration required such that mixing will result in maintaining adequate shutdown boron concentration.

\_\_\_\_\_ 4.1.6.3 BORATE per SOP-CVCS-003, Reactor Coolant System Boron Concentration Control to the required RCS boron concentration.

\_\_\_\_\_ 4.1.7 IF all operating pumps are removed from service AND a delay of greater than 8 hours occurs, THEN REQUEST Reactor Engineering to re-evaluate loop conditions prior to pump restart. {Reference 5.1.2}

\_\_\_\_\_ 4.1.8 Prior to starting 31 RCP for motor run, ensure 31\_RCP lower oil float chamber/sight glass vent valve is set per COL-RCS-1 (throttled OPEN 5 turns).

**NOTE**

- Bearing lift oil for all RCPs is hard piped directly to both upper and lower thrust shoes.
- An RCP can NOT be barred over with another RCP running.
- IF RCP maintenance was performed OR RCP has been idle for greater than 30 days, THEN applicable RCPs SHALL be barred over prior to starting first RCP for continuous operation, unless requirement is waived by Operations Manager (OM) (Ref. 5.2.12).

\_\_\_\_\_ 4.1.9 IF any RCP is required to be barred over, THEN:

\_\_\_\_\_ 4.1.9.1 DISPATCH operator to VC to inspect Bearing Lift Oil System prior to and during initial run.

\_\_\_\_\_ 4.1.9.2 START selected RCP bearing lift pump (Panel SAF).

**NOTE**

- RCP 31, 33 and 34 bearing lift oil minimum pressure of 500 psig is verified by applicable RCP Bearing Lift Press white permissive light illumination on Panel SAF.
- RCP 32 minimum bearing lift oil pressure of 500 psig is checked locally (Ref 5.2.12).

\_\_\_\_\_ 4.1.9.3 VERIFY minimum bearing lift oil discharge pressure of 500 psig.

**CAUTION**

**WHEN torque of 750 ft-lbs is exceeded, THEN RCP SHALL NOT be started.**

\_\_\_\_\_ 4.1.9.4 REQUEST Maintenance to bar over selected RCP(s).

\_\_\_\_\_ 4.1.9.5 **WHEN** RCP has been barred over,  
**THEN** STOP bearing lift pump. (Panel SAF)

\_\_\_\_\_ 4.1.9.6 REPEAT Step 4.1.9 as necessary for additional RCPs.

\_\_\_\_\_ 4.1.10 **IF** RCS cold leg temp (TCOLD) is equal to or less than 332°F,  
**THEN ENSURE** at least 1 of the sub-steps in Attachment 3,  
RCP Start Requirement Determination, is satisfied to meet requirements  
of SR 3.4.12.8 and SR 3.4.12.9.

**CAUTION**

**Do NOT bump or start RCPs with any SG temp greater than any RCS loop temp (THOT or TCOLD), unless Reactor Engineering has evaluated potential RCS heatup effects {Reference 5.1.3}.**

\_\_\_\_\_ 4.1.11 **IF** any SG secondary side temp needs to be lowered to less than RCS temp, **THEN** DRAIN and FILL applicable SG(s) as necessary using either of the following:

- \_\_\_\_\_ • SOP-SG-002B, Steam Generator Draining And Dry Layup
- \_\_\_\_\_ • SOP-SG-002C, Steam Generator Filling, Chemical Addition, And Wet Layup

- \_\_\_\_\_ 4.1.12 ENSURE motor starting times of SOP-EL-004A are met by reviewing Unit Log.
- \_\_\_\_\_ 4.1.13 SELECT noise monitor for RCP to be started (RO's Desk).
- \_\_\_\_\_ 4.1.14 SELECT Shaft and Frame vibration trend recorders for RCP to be started (Rack C-11).
- \_\_\_\_\_ 4.1.15 START applicable RCP bearing lift pump as follows:
  - \_\_\_\_\_ 4.1.15.1 DISPATCH operator to VC to inspect Bearing Lift Oil System prior to and during initial run.
  - \_\_\_\_\_ 4.1.15.2 START bearing lift pump for RCP to be started.

**NOTE**

- RCP 31, 33 and 34 bearing lift oil minimum pressure of 500 psig is verified by applicable RCP Bearing Lift Press white permissive light illumination on Panel SAF.
- RCP 32 minimum bearing lift oil pressure of 500 psig is checked locally.

- \_\_\_\_\_ 4.1.15.3 VERIFY minimum bearing lift oil discharge pressure of 500 psig.
- \_\_\_\_\_ 4.1.15.4 WAIT 2 minutes or longer prior to starting RCP.
- \_\_\_\_\_ 4.1.16 REVIEW ONOP-RCS-5 [AOP-RCP-1] Reactor Coolant Pump Malfunctions.
- \_\_\_\_\_ 4.1.17 IF starting 33 or 34 RCP with Aux Spray in service, THEN SECURE Aux Spray per SOP-CVCS-002, Charging Seal Water And Letdown Control, to prevent a pressure decrease.
- \_\_\_\_\_ 4.1.18 ENSURE the following are closed and in AUTO for start of first RCP:
  - \_\_\_\_\_ • PC-455G PRZR Spray Vlv Loop 34 (PCV-455A)
  - \_\_\_\_\_ • PC-455H PRZR Spray Vlv Loop 33 (PCV-455B)
- \_\_\_\_\_ 4.1.19 ADJUST 6.9 KV bus voltage prior to RCP start, and after starting current surge decays, as follows:

- \_\_\_\_\_ 4.1.19.1 IF power is being supplied via Station Aux Xfmr,  
THEN STATION operator at STA AUX TR Tap Changer control switch (Panel FCR) and COORDINATE voltage adjustment as required:
- \_\_\_\_\_ a) REVIEW bus voltage requirements of SOP-EL-011, Operation Of The Station And Auxiliary Transformers.
  - \_\_\_\_\_ b) PLACE STA AUX TR Tap Changer control switch in MANUAL and ADJUST bus voltage to high end of normal range.
  - \_\_\_\_\_ c) WHEN starting current surge has decayed to normal running value for existing RCS conditions, THEN RETURN bus voltage to normal value of at least 6.9 KV.
- \_\_\_\_\_ 4.1.19.2 IF power is being supplied via GT-35 and GT-36, THEN ENSURE bus section voltage is at least 6.9 KV prior to starting any RCP.

**NOTE**

- An RCP takes 18 to 20 seconds to come up to speed
- Normal RCP motor running current may vary from 340 amps minimum to 580 amps maximum, varying due to combination of pumps running and RCS temp. Normal running current is (Reference 5.2.12):
  - Hot -RCS at NOP/NOT with 4 RCPs running, approximately 400 amps
  - Cold -RCS less than NOT with any combination of RCPs running, approximately 450 to 500 amps
- Vibration values are higher during cold starting conditions than during normal operation temp conditions.

- \_\_\_\_\_ 4.1.20 START RCP.
- \_\_\_\_\_ 4.1.21 IF starting current does NOT dissipate within 30 seconds, THEN TRIP applicable RCP.
- \_\_\_\_\_ 4.1.22 IF any emergency shutdown parameters of P&L 2.16 are exceeded, THEN STOP applicable RCP and GO TO ONOP-RCS-1 [AOP-RCP-1] Reactor Coolant Pump Malfunctions.

- \_\_\_\_\_ 4.1.23 ENSURE Station Aux Transformer Tap Changer is in AUTO.
- \_\_\_\_\_ 4.1.24 ADJUST letdown/charging as necessary per SOP-CVCS-002, Charging Seal Water And Letdown Control, to ensure RCS pressure does NOT exceed limitations of ITS figure 3.4-12.1, Maximum Allowable Nominal PORV Setpoint for LTOP (OPS).
- \_\_\_\_\_ 4.1.25 WHEN RCP has run for at least 1 minute after starting current has dissipated, THEN STOP bearing lift pump (Ref. 5.2.12).

**NOTE**

- RCP vibration at pump shaft should be considered primary indication of pump vibration conditions and motor frame vibration considered a secondary indicator.
- Limits for RCP motor frame and shaft vibration, as indicated by RCP Vibration Monitors, are as follows (Ref. 5.2.12):

	<u>Frame</u>	<u>SHAFT</u>
<b>Alert</b>	3 mils	15 mils
<b>Shutdown</b>	5 mils	20 mils

- \_\_\_\_\_ 4.1.26 IF any RCP exceeds alert value for vibration, THEN:
  - \_\_\_\_\_ 4.1.26.1 SELECT applicable RCP on Shaft and Frame vibration trend recorders. (Rack C-11)
  - \_\_\_\_\_ 4.1.26.2 OBSERVE RCP vibration trend for the following limits:
    - \_\_\_\_\_ • Frame vibration increasing at greater than 0.2 mils/hr
    - \_\_\_\_\_ • Shaft vibration increasing at greater than 1.0 mil/hr
  - \_\_\_\_\_ 4.1.26.3 IF any RCP vibration exceeds the rate of increase limit, OR exceeds shutdown limit, THEN STOP applicable RCP and GO TO ONOP-RCS-5 [AOP-RCP-1], Reactor Coolant Pump Malfunctions.

**JPM NO. 10**

**INITIATE CONTAINMENT SPRAY  
(ALTERNATE PATH)**

**Job Performance Measure Exam**

**Submitted By** Don Jackson

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

# ***NRC Operating Exam- JPM 10***

Indian Point 3

*Week of December 8, 2003*

## **JPM Tasks**

**Task ID:** 026\*A\*004\*001

**Description:** INITIATE CONTAINMENT SPRAY

Trainee: \_\_\_\_\_ Evaluator: \_\_\_\_\_

Evaluator Signature \_\_\_\_\_ Date \_\_\_\_\_

Trainee Performance:      Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

**Start Time** \_\_\_\_\_ **Stop Time:**

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactorily complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Actual Performance in the Simulator

**General Comments (For Evaluator Use):**

## **Task Conditions:**

THE PLANT HAS EXPERIENCED A LARGE LOSS OF COOLANT ACCIDENT, A PLANT TRIP AND SAFETY INJECTION

## **Task Standards :**

CONTAINMENT SPRAY HAS BEEN MANUALLY INITIATED VIA RESPONSE NOT OBTAINED ACTIONS IN STEP 9 OF E-0

K/A 026A4.01 Ability To Manually Operate and/or Monitor In The Control Room- CSS Controls (4.3)

Applicability: RO & SRO

Estimated Completion Time: 15 minutes

# ***NRC Operating Exam- JPM 10***

Indian Point 3

*Week of December 8, 2003*

**Tools Needed:**

SIMULATOR SET UP FOR SNAP: JPM 10

**Initiating Cues :**

YOU ARE DIRECTED BY THE CRS TO COMPLETE STEP 9 OF E-0, "REACTOR TRIP OR SAFETY INJECTION"

**References :**

<b>ID</b>	<b>Description</b>	<b>Review Date</b>	<b>Ref Flag</b>
EOP E-0	REACTOR TRIP OR SAFETY INJECTION		X

**Safety Considerations :**

NONE

**Consequences of Inadequate Performance:**

OVERPRESSURIZATION AND FAILURE OF CONTAINMENT, LEADING TO INCREASED DOSE TO THE PUBLIC

**Performance Checklist :**

- |          |  |   |   |
|----------|--|---|---|
| <b>1</b> | <b>Element :</b><br>OBTAIN AND REVIEW<br>EOP E-0   | <b>Standards :</b><br>OBTAIN A COPY OF E-0  | <b>Conditions :</b>                     |
|          | <b>Comments :</b>  |   |   |
|          | <b>Critical Task?</b> N  |   |   |
|          | <b>Satisfactory</b>  | <b>Unsatisfactory</b>   |   |
| <b>2</b> | <b>Element :</b><br>CHECK THAT CONTAINMENT<br>PRESSURE HAS REMAINED<br>LESS THAN 22 PSIG | <b>Standards :</b><br>MONITORS CONTAINMENT<br>PRESSURE AND DETERMINES<br>THAT RESPONSE NOT OBTAINED<br>ACTIONS ARE REQUIRED | <b>Conditions :</b><br>As Read- 43 psig |
|          | <b>Comments :</b>  |   |   |
|          | <b>Critical Task?</b> N  |   |   |
|          | <b>Satisfactory</b>  | <b>Unsatisfactory</b>   |   |
| <b>3</b> | <b>Element :</b><br>ENSURE CONTAINMENT<br>SPRAY HAS STARTED                              | <b>Standards :</b><br>RECOGNIZES CONTAINMENT<br>SPRAY HAS NOT INITIATED   | <b>Conditions :</b>                     |
|          | <b>Comments :</b>  |   |   |
|          | <b>Critical Task?</b> N  |   |   |
|          | <b>Satisfactory</b>  | <b>Unsatisfactory</b>   |   |
| <b>4</b> | <b>Element :</b><br>MANUALLY INITIATE<br>CONTAINMENT SPRAY                               | <b>Standards :</b><br>ATTEMPTS TO MANUALLY<br>INITIATE CONTAINMENT<br>SPRAY- RECOGNIZES IT DOES<br>NOT START                | <b>Conditions :</b>                     |
|          | <b>Comments :</b>  |   |   |
|          | <b>Critical Task?</b> N  |   |   |
|          | <b>Satisfactory</b>  | <b>Unsatisfactory</b>   |   |

**Element :**  
5 MANUALLY STARTS CONTAINMENT SPRAY PUMPS AND ALIGNS VALVES

**Standards :**  
MANUALLY STARTS 31 AND 32 CONTAINMENT SPRAY PUMPS AND OPENS VALVES 866-A&B, (CS DISCH ISOL) AND 876 A&B (NAOH EDUCTORS)

**Conditions :**

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Element :**  
6 VERIFY CONTAINMENT ISOLATION PHASE B VALVES ARE CLOSED

**Standards :**  
MANUALLY CLOSES THE SEVEN PHASE B VALVES

**Conditions :**  
Note: The CCW Phase B Valves are- AC-FCV-625, CH-MOV-222, AC-MOV-789, AC-MOV--797, AC-MOV-784, AC-MOV-786, AC-MOV-769

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Element :**  
7 STOP ALL RCPS

**Standards :**  
STOPS 31,32,33,34 RCPS

**Conditions :**

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

CONTAINMENT SPRAY AND PHASE B ARE COMPLETED AND RCPS ARE STOPPED

## **Candidate Cue Sheet**

THE PLANT HAS EXPERIENCED A LARGE BREAK LOSS OF COOLANT ACCIDENT, AND SUBSEQUENT REACTOR TRIP AND SAFETY INJECTION.

YOU ARE DIRECTED BY THE CRS TO COMPLETE STEP 9 OF E-0, "REACTOR TRIP OR SAFETY INJECTION".

Number:  E-0	Title:  REACTOR TRIP OR SAFETY INJECTION	Revision Number:  19
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A. PURPOSE

This procedure provides actions to verify proper response of the automatic protection systems following manual or automatic activation of a Reactor trip or Safety Injection, to assess plant conditions, and to identify the appropriate recovery procedure.

B. ENTRY CONDITIONS

This procedure is entered from:

1. Indication that a Reactor Trip has occurred OR is required:

- Any Reactor Trip annunciator lit.
- Rapid decrease in neutron level indicated on neutron instrumentation.
- All shutdown and control rods are fully inserted.
- Rod bottom lights are lit.
- Reactor trip breakers are open.

2. Indication that a Reactor Trip AND Safety Injection has occurred OR is required:

- Any SI annunciator lit.
- Safety Injection pumps running.

3. ECA-0.0, LOSS OF ALL AC POWER, Step 6.g, when power is restored to any Safeguards bus.



**JPM NO. 11**

**TRANSFER 6.9KV BUSES 1 THRU 4 TO THE UNIT AUX**

**Job Performance Measure Exam**

<b>Submitted By</b>	Don Jackson	9/20/2003
		<b>Date</b>
<b>Reviewed By</b>		<b>Date</b>
<b>SME Review/Validation By</b>		<b>Date</b>
<b>Approved By</b>		<b>Date</b>

# NRC Operating Exam- JPM 11

Indian Point 3

Week of December 8, 2003

## JPM Tasks

Task ID: 080\*001\*03\*01

Description: TRANSFER 6.9KV BUSES 1 THRU 4 TO THE UNIT AUX

Trainee: \_\_\_\_\_ Evaluator: \_\_\_\_\_

Evaluator Signature \_\_\_\_\_ Date \_\_\_\_\_

Trainee Performance: Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

Start Time \_\_\_\_\_ Stop Time: \_\_\_\_\_

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactory complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

Testing Method: Actual Performance on the Simulator

General Comments (For Evaluator Use):

### Task Conditions:

THE MAIN GENERATOR HAS BEEN SYNCHRONIZED TO THE GRID AND LESS THAN 40 MWS HAVE BEEN PICKED UP.

### Task Standards :

K/A 062A4.01 Ability To Manually Operate and/or Monitor In The Control Room All Breakers (Including Available Switch yard) (3.1)

Applicability: RO & SRO

6900V BUS NO.1, 2, 3, 4 NORMAL FEED BREAKERS ARE CLOSED.;6900V BUS NO 1-5, 2-5, 3-6, 4-6TIE BREAKERS ARE OPENED.; MW/VAR LOADING CAUTION OBSERVED.

Estimated Completion Time: 30 minutes

# ***NRC Operating Exam- JPM 11***

Indian Point 3

*Week of December 8, 2003*

## **Tools Needed:**

SIMULATOR SET UP FOR SNAP: JPM 11

## **Initiating Cues :**

YOU ARE DIRECTED TO TRANSFER 6.9KV BUSES 1, 2, 3 & 4 TO THE UNIT AUXILIARY TRANSFORMER PER SOP-EL-5.

## **References :**

<b>ID</b>	<b>Description</b>	<b>Review Date</b>	<b>Ref Flag</b>
SOP EL-5	OPERATION OF ON-SITE POWER SOURCES		X

## **Safety Considerations :**

**Consequences of Inadequate Performance:**  
LOSS OF THE APPLICABLE ELECTRICAL BUS





**Element :**  
8 IF 480V BUS 2A & 3A  
NORMAL FEED BREAKERS  
ARE CLOSED THEN ENSURE  
480V BUS 2A-3A TIE  
BREAKER IS OPEN

**Standards :**  
VERIFIES BUS 2A  
NORMAL FEED CLOSED;  
VERIFIES BUS 3A  
NORMAL FEED CLOSED;  
VERIFIES BUS 2A-3A  
TIE BREAKER OPENED

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
9 ENSURE <100 VOLTS  
DIFFERENCE BETWEEN  
STATION AND UNIT  
AUXILIARY  
TRANSFORMERS

**Standards :**  
AS NECESSARY ADJUST  
MTG VOLTAGE OR; AS  
NECESSARY ADJUST  
UNIT AUXILIARY  
TRANSFORMER TAP  
CHANGER IN MANUAL

**Conditions :**  
Should Not Require TAP Changer  
Adjustment

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
10 PLACE 6900 BUS NO 2  
SYNCHROSCOPE IN BUS  
2-UNIT.

**Standards :**  
ROTATE SYNCHROSCOPE  
TO BUS 2- UNIT  
POSITION

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

11 **Element :** IF SYNCHROSCOPE IS AT 12:00 POSITION, THEN CLOSE 6900V BUS 2 NORMAL FEED BREAKER.

**Standards :** OBSERVE SYNCHROSCOPE AT 12:00 POSITION ROTATE BUS 2 NORMAL FEED BREAKER TO CLOSE, RED LIGHT ON; GREEN LIGHT OFF

**Conditions :**

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

12 **Element :** OPEN 6900V BUS 2-5 TIE BREAKER

**Standards :** ROTATE 6900 BUS 2-5 TIE BREAKER SWITCH TO TRIP; GREEN LIGHT ON; RED LIGHT OFF

**Conditions :**

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

13 **Element :** PLACE BUS NO 2 SYNCHROSCOPE IN OFF

**Standards :** ROTATE SYNCHROSCOPE SWITCH TO OFF

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

14 **Element :** IF 480V BUS 2A & 3A NORMAL FEED BREAKERS ARE CLOSED THEN ENSURE 480V BUS 2A-3A TIE BREAKER IS OPEN

**Standards :** VERIFIES BUS 2A NORMAL FEED CLOSED; VERIFIES BUS 3A NORMAL FEED CLOSED; VERIFIES BUS 2A-3A TIE BREAKER OPEN

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**



**18**    **Element :**  
OPEN 6900V BUS 3-6 TIE  
BREAKER

**Standards :**  
ROTATE 6900 BUS 3-6  
TIE BREAKER SWITCH TO  
TRIP; GREEN LIGHT ON,  
RED LIGHT OFF

**Conditions :**

**Comments :**

**Critical Task?**        Y

**Satisfactory**

**Unsatisfactory**

**19**    **Element :**  
PLACE BUS NO 3  
SYNCHROSCOPE IN OFF

**Standards :**  
ROTATE SYNCHROSCOPE  
TO OFF

**Conditions :**

**Comments :**

**Critical Task?**        N

**Satisfactory**

**Unsatisfactory**

**20**    **Element :**  
ENSURE <100 VOLTS  
DIFFERENCE BETWEEN  
STATION AND UNIT  
AUXILIARY  
TRANSFORMERS

**Standards :**  
AS NECESSARY ADJUST  
MTG VOLTAGE OR; AS  
NECESSARY ADJUST  
UNIT AUXILIARY  
TRANSFORMER TAP  
CHANGER IN MANUAL

**Conditions :**  
Need To Raise STA Aux TAP  
Changer In Manual To Adjust  
Voltage Per SOP-EL-11 Sect 4.8  
May Do As Skill of Craft Per  
OP-OD-10.1  
Pulls Switch Out To Place In Manual  
Adjusts TAPs Upward By 2 or 3

**Comments :**

**Critical Task?**        N

**Satisfactory**

**Unsatisfactory**



***NRC Operating Exam- JPM 11***

Indian Point 3

*Week of December 8, 2003*

**Element :**  
25 WHEN TRANSFER IS  
COMPLETE, ENSURE UNIT  
AND STATION AUXILIARY  
TRANSFORMER TAP  
CHANGERS IN AUTO  
**Comments :**

**Standards :**  
OBSERVE TAP  
CHANGERS IN AUTO

**Conditions :**

**Critical Task?**        N

**Satisfactory**  
**Terminating Cues :**

**Unsatisfactory**

BUSES 1, 2, 3 & 4 TRANSFERRED TO UNIT AUXILIARY TRANSFORMER.

**Candidate Cue Sheet**

THE MAIN GENERATOR HAS BEEN SYNCHRONIZED TO THE GRID AND LESS THAN 40 MWe HAVE BEEN PICKED UP.

YOU ARE DIRECTED TO TRANSFER 6.9KV BUSES 1, 2, 3 & 4 TO THE UNIT AUXILIARY TRANSFORMER PER SOP-EL-5.



**Entergy**

Nuclear Northeast

Procedure Use Is:

- Continuous
- Reference
- Information

Control Copy: \_\_\_\_\_

Effective Date: \_\_\_\_\_

Page 1 of 67

EL-005, Revision 4

# OPERATION OF ON-SITE POINT SOURCES

*Don Dewey*

/ 02/04/03

Writer

Date

Reviewer

/

Date

**Approved By:**

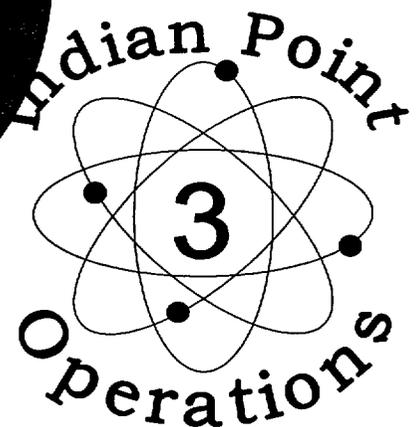
/

Procedure Sponsor, DM/Designee

Date

**Team 3B**

Procedure Owner



**PARTIAL REVISION**

**REVISION SUMMARY**

(Page 1 of 1)

**1.0 REASONS FOR REVISION**

1.1 Incorporated Operator feedback (**IP3-6335**).

**2.0 SUMMARY OF CHANGES**

2.1 Added a step to restore load breakers and control switches on restoration of an electrical bus in the following steps: (Ref **IP3-6335**)

4.1.17.9

4.1.18.9

4.7.3.7

4.7.4.8

4.7.5.9

4.7.6.6

4.7.7.6

2.2 Changed the title of section 4.8 to include buses 5 and 6.

**TABLE OF CONTENTS**

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	PURPOSE.....	4
2.0	PRECAUTIONS AND LIMITATIONS.....	4
3.0	PREREQUISITES .....	5
4.0	PROCEDURE.....	5
4.1	Energizing Buses 5 and 6 from 138 KV Power.....	5
4.2	Energizing 13.8 KV Substation and/or 6.9 KV Buses 5, 6 from 13.8 KV Feed.....	10
4.3	Transferring Buses 1, 2, 3 or 4 to Unit Auxiliary Transformer .....	15
4.4	Transferring Buses 1, 2, 3 or 4 to Station Auxiliary Transformer .....	18
4.5	Transferring Buses 5 and 6 from 138 KV Feed to 13.8 KV Substation while Maintaining 480V Safeguard Buses.....	21
4.6	Transferring Buses 5 and 6 From 13.8 KV Substation to 138 KV Feed while Maintaining 480V Safeguard Buses .....	27
4.7	Energizing 6.9 KV Buses 1-4 and/or 3NBY01 (CP) .....	33
4.8	De-energizing 6.9 KV Buses 1-6 and/or 3NBY01 (CP).....	36
4.9	Aligning 13W93 to Feed Unit 2 .....	43
4.10	Securing 13W93 Electrical Alignment to Unit 2.....	44
4.11	Supplying 13.8KV Substation From Feeder 13W92 While Feeder 13W93 is in Service (Live Bus Transfer).....	45
4.12	Supplying 13.8KV Substation From Feeder 13W93 While Feeder 13W92 Is In Service (Live Bus Transfer) .....	47
4.13	Live Transfer of Bus 5 from 138KV to 13.8KV .....	49
4.14	Return of Bus 5 from 13.8KV to 138KV by Live Transfer.....	52
4.15	Live Transfer of Bus 6 from 138KV to 13.8KV .....	54
4.16	Return of Bus 6 from 13.8KV to 138KV by Live Transfer.....	57
5.0	REFERENCES .....	59
6.0	RECORDS AND DOCUMENTATION .....	60

**Attachments**

ATTACHMENT 1 - 6900 VOLT LOAD BREAKERS .....	61
ATTACHMENT 2 - POWER RESTORATION FROM 13.8 K. V. ....	62

# OPERATION OF ON-SITE POWER SOURCES

No: SOP-EL-005

Rev:34

Page 4 of 67

## 1.0 PURPOSE

Provide instructions for operation of on-site power sources and operation of power supplies to 6.9KV buses.

## 2.0 PRECAUTIONS AND LIMITATIONS

### 2.1 Precautions and Limitations

- 2.1.1 Maximum rated current for Buses 5 and 6 is 2000 amps.
- 2.1.2 Maximum rated current for Buses 1, 2, 3 and 4 is 1200 amps.
- 2.1.3 Maximum rated current for Buses 312 and 313 is 200 amps.
- 2.1.4 6.9 KV auxiliary bus duct heaters SHALL be energized at all times to prevent moisture formation within bus duct.
- 2.1.5 Normal operating current of 480V buses as indicated on 6.9 KV side of station service transformers SHALL be limited to 220 Amps.
- 2.1.6 During steady state operations, maximum allowable voltage on any 480V bus is 498 volts.
- 2.1.7 Technical Specification LCOs 3.8.1 and 3.8.2 applies during performance of this procedure.

### 2.2 General Information

- 2.2.1 All phone conversations with the District Operator SHALL be logged in the Unit Log book and should detail the specifics of the conversation and the District Operator's name.
- 2.2.2 Refer to Memorandum of Understanding No. 1 for equipment operations under the jurisdiction of the Con Edison's System Operator.
- 2.2.3 The expected location to perform a switch operation is identified by brackets (i.e., (CCR)).
- 2.2.4 The use of Attachment 2 is at the direction of the Shift Manager when directed from ONOP-EL-4 [AOP-138KV-1], Loss of Offsite Power OR the EOP network.

# OPERATION OF ON-SITE POWER SOURCES

No: SOP-EL-005

Rev:34

Page 5 of 67

## 3.0 PREREQUISITES

- 3.1 The Electrical Distribution System is aligned per COL-EL-1, 6900 and 480 Volt AC Distribution.
- 3.2 Instrument buses and distribution panels are aligned per COL-EL-3, Instrument Buses and Distribution Panels.

## 4.0 PROCEDURE

### 4.1 Energizing Buses 5 and 6 from 138 KV Power

- \_\_\_\_\_ 4.1.1 IF Station Aux. Transformer energized, THEN GO TO 4.1.12 (Page 7)
- \_\_\_\_\_ 4.1.2 REQUEST District Operator to open the following breakers:
- \_\_\_\_\_ • BT2-6 at Buchanan Substation
  - \_\_\_\_\_ • BT5-6 in Unit 3 138 KV switchyard
- \_\_\_\_\_ 4.1.3 ENSURE the following breakers are open:
- \_\_\_\_\_ • 6900V Bus No. 5 Normal Feed
  - \_\_\_\_\_ • 6900V Bus No. 6 Normal Feed
- \_\_\_\_\_ 4.1.4 VERIFY 138 KV pilot wire in service per SOP-EL-010, Operation of 138 KV and 345 KV Pilot Wire Protection.

### NOTE

White supervisory light above lockout relay is illuminated when relay reset.

- \_\_\_\_\_ 4.1.5 VERIFY the following 138 KV primary and backup lockout relays on rear of flight panel are reset:
- \_\_\_\_\_ • Sta. Lockout Relay 86 STP
  - \_\_\_\_\_ • Relay 86/STBU
  - \_\_\_\_\_ • Relay 86/STPA
  - \_\_\_\_\_ • Relay 86/STBUA
  - \_\_\_\_\_ • 345/138 86-1/138
  - \_\_\_\_\_ • 345/138 86-2/138
  - \_\_\_\_\_ • 345/138 86-3/138

**NOTE**

When paralleling the Station Auxiliary Transformer to the Unit Auxiliary Transformer maintaining generator load below 40 MW and at zero VARs will minimize voltage transients.

**4.3 Transferring Buses 1, 2, 3 or 4 to Unit Auxiliary Transformer**

- \_\_\_\_\_ 4.3.1 ENSURE less than 100 volt difference between Station and Unit Auxiliary Transformers by performing either of the following:
- \_\_\_\_\_ • ADJUST MTG voltage.
  - \_\_\_\_\_ • PLACE Station or Unit Auxiliary Transformers Tap Changers in manual and ADJUST voltage.
- \_\_\_\_\_ 4.3.2 IF desired to transfer 6.9KV Bus 1 to Unit Auxiliary Transformer, THEN PERFORM the following:
- \_\_\_\_\_ 4.3.2.1 PERFORM Voltage check per step 4.3.1.
  - \_\_\_\_\_ 4.3.2.2 PLACE 6900V Bus No. 1 Synchroscope in Bus 1 Unit.
  - \_\_\_\_\_ 4.3.2.3 IF Synchroscope is at 12 o'clock, THEN PERFORM the following: (CCR)
    - \_\_\_\_\_ a) CLOSE 6900V Bus No. 1 Normal Feed breaker.
    - \_\_\_\_\_ b) OPEN 6900V Bus No. 1-5 Tie breaker.
  - \_\_\_\_\_ 4.3.2.4 PLACE 6900V Bus No. 1 Synchroscope in Off.
  - \_\_\_\_\_ 4.3.2.5 IF transfer can **NOT** be completed, THEN CONTACT I&C to investigate.
- \_\_\_\_\_ 4.3.3 IF desired to transfer 6.9KV Bus 2 to Unit Auxiliary Transformer, THEN PERFORM the following:
- \_\_\_\_\_ 4.3.3.1 IF both of the following breakers are closed, THEN ENSURE 480V Bus No. 2A-3A Tie breaker is open:
    - \_\_\_\_\_ • 480V Bus No. 2A Normal Feed
    - \_\_\_\_\_ • 480V Bus No. 3A Normal Feed
  - \_\_\_\_\_ 4.3.3.2 PERFORM Voltage check per step 4.3.1.
  - \_\_\_\_\_ 4.3.3.3 PLACE 6900V Bus No. 2 Synchroscope in Bus 2 Unit.

# OPERATION OF ON-SITE POWER SOURCES

No: SOP-EL-005

Rev:34

Page 16 of 67

- \_\_\_\_\_ 4.3.3.4 IF Synchroscope is at 12 o'clock,  
THEN PERFORM the following: (CCR)
- \_\_\_\_\_ a) CLOSE 6900V Bus No. 2 Normal Feed breaker.
- \_\_\_\_\_ b) OPEN 6900V Bus No. 2-5 Tie breaker.
- \_\_\_\_\_ 4.3.3.5 PLACE 6900V Bus No. 2 Synchroscope in Off.
- \_\_\_\_\_ 4.3.3.6 IF transfer can NOT be completed,  
THEN CONTACT I&C to investigate.
- \_\_\_\_\_ 4.3.4 IF desired to transfer 6.9KV Bus 3 to Unit Auxiliary Transformer,  
THEN PERFORM the following:
- \_\_\_\_\_ 4.3.4.1 IF both of the following breakers are closed,  
THEN ENSURE 480V Bus No. 2A-3A Tie breaker is open:
- \_\_\_\_\_ • 480V Bus No. 2A Normal Feed
  - \_\_\_\_\_ • 480V Bus No. 3A Normal Feed
- \_\_\_\_\_ 4.3.4.2 PERFORM Voltage check per step 4.3.1.
- \_\_\_\_\_ 4.3.4.3 PLACE 6900V Bus No. 3 Synchroscope in Bus 3 Unit.
- \_\_\_\_\_ 4.3.4.4 IF Synchroscope is at 12 o'clock,  
THEN PERFORM the following:(CCR)
- \_\_\_\_\_ a) CLOSE 6900V Bus No. 3 Normal Feed breaker.
- \_\_\_\_\_ b) OPEN 6900V Bus No. 3-6 Tie breaker.
- \_\_\_\_\_ 4.3.4.5 PLACE 6900V Bus No. 3 Synchroscope in Off.
- \_\_\_\_\_ 4.3.4.6 IF transfer can NOT be completed,  
THEN CONTACT I&C to investigate.
- \_\_\_\_\_ 4.3.5 IF desired to transfer 6.9KV Bus 4 to Unit Auxiliary Transformer,  
THEN PERFORM the following:
- \_\_\_\_\_ 4.3.5.1 PERFORM Voltage check per step 4.3.1.
- \_\_\_\_\_ 4.3.5.2 PLACE 6900V Bus No. 4 Synchroscope in Bus 4 Unit.

# OPERATION OF ON-SITE POWER SOURCES

No: SOP-EL-005

Rev:34

Page 17 of 67

- \_\_\_\_\_ 4.3.5.3 IF Synchroscope is at 12 o'clock,  
THEN PERFORM the following:(CCR)
  - \_\_\_\_\_ a) CLOSE 6900V Bus No. 4 Normal Feed breaker.
  - \_\_\_\_\_ b) OPEN 6900V Bus No. 4-6 Tie breaker.
- \_\_\_\_\_ 4.3.5.4 PLACE 6900V Bus No. 4 Synchroscope in Off.
- \_\_\_\_\_ 4.3.5.5 IF transfer can NOT be completed,  
THEN CONTACT I&C to investigate.
- \_\_\_\_\_ 4.3.6 WHEN transfer is complete, THEN ENSURE the Unit AND Station Auxiliary Transformer Tap Changers are in Auto.

**JPM NO. 12**

**REMOVE AN INTERMEDIATE RANGE CHANNEL FROM  
SERVICE**

**Job Performance Measure Exam**

**Submitted By** Don Jackson

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

**JPM Tasks**

**Task ID:** 015\*005\*01\*01

**Description:** REMOVE AN INTERMEDIATE RANGE CHANNEL FROM SERVICE

Trainee: \_\_\_\_\_ Evaluator: \_\_\_\_\_

Evaluator Signature \_\_\_\_\_ Date \_\_\_\_\_

Trainee Performance:        Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

**Start Time** \_\_\_\_\_ **Stop Time:**

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactory complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Actual Performance on the Simulator

**General Comments (For Evaluator Use):**

**Task Conditions:**

THE REACTOR IS SHUTDOWN. INTERMEDIATE RANGE CHANNEL N-35 (N-36) NEEDS TO BE TAKEN OUT OF SERVICE FOR MAINTENANCE

**Task Standards :**

K&A #: System 015 Nuclear Instrumentation System: A4.02 Ability to operate and / or monitor in the Control Room; NIS indicators RO 3.9 SRO 3.9

Applicability: RO & SRO

THE INTERMEDIATE RANGE CHANNEL WAS REMOVED FROM SERVICE WITHOUT A REACTOR TRIP OR UNNECESSARY ALARMS. INSTRUMENT AND CONTROL POWER FUSES REMOVED

Estimated Completion Time: 20 minutes

**Tools Needed:**

SIMULATOR SET UP FOR SNAP: JPM 12

**Initiating Cues :**

YOU ARE DIRECTED TO REMOVE INTERMEDIATE RANGE CHANNEL N-35 (N-36) FROM SERVICE IN ACCORDANCE WITH SOP-NI-1, ATTACHMENT 5

**References :**

<b>ID</b>	<b>Description</b>	<b>Review Date</b>	<b>Ref Flag</b>
SOP	NI-1 EXCORE NUCLEAR INSTRUMENTATION SYSTEM OPERATION		X

**Safety Considerations :**

None

**Consequences of Inadequate Performance:**

WILL NOT ENSURE REACTOR PROTECTION SYSTEM FUNCTION

**Performance Checklist :**

# ***NRC Operating Exam- JPM 12***

Indian Point 3

*Week of December 8, 2003*

**Element :**  
1 OBTAIN & REVIEW SOP-NI-1

**Standards :**  
SOP-NI-1 IS REVIEWED

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
2 PLACE THE LEVEL TRIP SWITCH FOR THE AFFECTED CHANNEL IN BYPASS

**Standards :**  
LEVEL TRIP IS BYPASSED

**Conditions :**

Lamps On The NIS Drawers Will Not Illuminate Unless Control Power Is Available

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Element :**  
3 CHECK THE FOLLOWING:  
LEVEL TRIP BYP LAMP-ON  
IR TRIP BYP LAMP- ON  
NIS TRIP BYP ALARM- ANNC

**Standards :**  
LEVEL TRIP BYP LAMP- ON  
IR TRIP BYP LAMP- ON  
NIS TRIP BYP ALARM- ANNC

**Conditions :**

FOR IR TRIP BYP LAMP CIRCLES 1 OR 2 AS APPLICABLE

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
IF REACTOR TRIP BKRS CLOSED, BLOCK IR HIGH FLUX TRIP AND ROD STOP

**Standards :**  
DETERMINES STEP IS NOT APPLICABLE

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
5 DE-ENERGIZE THE  
AFFECTED CHANNEL BY  
REMOVING THE  
INSTRUMENT AND  
CONTROL POWER FUSES  
**Standards :**  
REMOVES INSTRUMENT  
AND CONTROL POWER FUSES  
**Conditions :**  
**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Element :**  
6 CHECK THE FOLLOWING:  
"NIS IR ALARM" ON PANEL FDF  
"IR HIGH FLUX ROD STOP"  
ALARM ON PANEL SBF-1  
**Standards :**  
CHECKS "NIS IR ALARM"  
"IR HIGH FLUX ROD STOP ALARM"  
**Conditions :**  
**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
CHECK THE FOLLOWING  
"IR LOSS OF COMPENSATING  
VOLTAGE", CIRCLES 1 OR 2  
"IR LOSS OF DETECTOR  
VOLTAGE"  
**Standards :**  
CHECKS THE FOLLOWING ON SBF-1:  
"IR LOSS OF COMPENSATING VOLTAGE"  
"IR LOSS OF DETECTOR VOLTAGE"  
**Conditions :**  
**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

INTERMEDIATE RANGE N-35 (36) WAS REMOVED FROM SERVICE IN ACCORDANCE WITH SOP-NI-1 ATTACHMENT 5

## **Candidate Cue Sheet**

THE REACTOR IS SHUTDOWN. INTERMEDIATE RANGE CHANNEL N-35 NEEDS BE TAKEN OUT OF SERVICE FOR MAINTENANCE.

YOU ARE DIRECTED TO REMOVE INTERMEDIATE RANGE CHANNEL N-35 FROM SERVICE IN ACCORDANCE WITH SOP-NI-1, ATTACHMENT 5.



**Entergy**

**Nuclear Northeast**

Procedure Use Is:

- Continuous
- Reference
- Information

Control Copy: \_\_\_\_\_

Effective Date: \_\_\_\_\_

Page 1 of 39

**This procedure is TSR**

SP-001, Rev. 19

# EXCORE NUCLEAR INSTRUMENTATION SYSTEM OPERA

*Nick De Vries*

/ 02/14/03

Writer

Date

Reviewer

Date

**Approved By:**

Procedure Sponsor, DM/Designee

Date

**Team 3E**

Procedure Owner



**EDITORIAL REVISION**

**REVISION SUMMARY**  
(Page 1 of 1)

**1.0 REASON FOR REVISION**

- 1.1 Incorporate Operator feedback (IP3-6333).
- 1.2 Procedure upgrade.

**2.0 SUMMARY OF CHANGES**

- 2.1 Incorporated Unit 3 designator onto the cover page.
- 2.2 Upgraded procedure by incorporating place keeping lines throughout the procedure, no rev bars.
- 2.3 Replace Control Room abbreviation "CR" with "CCR" in step 4.3.4 note, no rev bar.
- 2.4 Switched steps 4.3.5 and 4.3.6 to ensure the Audio Multiplier switch is selected for the correct frequency, so the volume can be adjusted as desired IP3-6333.

**TABLE OF CONTENTS**

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	PURPOSE.....	4
2.0	PRECAUTIONS AND LIMITATIONS.....	4
3.0	PREREQUISITES .....	4
4.0	PROCEDURE.....	5
4.1	NIS Channel Startup And Shutdown .....	5
4.2	Operation Of The Scaler Timer.....	5
	4.2.1 Display-Preset Check .....	5
	4.2.2 Display Time-Preset Count Mode .....	6
	4.2.3 Display Count-Preset Time Mode .....	8
	4.2.4 Display - Preset Manual Mode .....	9
	4.2.5 Removing The Scaler Timer From Service .....	10
4.3	Placing The Audio Count Rate Drawer In Service.....	11
4.4	Removing The Audio Count Rate Drawer From Service .....	12
5.0	REFERENCES.....	13
6.0	RECORDS AND DOCUMENTATION .....	13

**Attachments**

ATTACHMENT 1 – Power Range Channel Shutdown.....	14
ATTACHMENT 2 – Power Range Channel Startup.....	21
ATTACHMENT 3 – Source Range Channel Shutdown .....	27
ATTACHMENT 4 – Source Range Channel Startup.....	30
ATTACHMENT 5 – Intermediate Range Channel Shutdown.....	33
ATTACHMENT 6 – Intermediate Range Channel Startup.....	36
ATTACHMENT 7 – Users Guide To ERFDADS .....	38

## 1.0 PURPOSE

- 1.1 This procedure establishes requirements for Nuclear Instrumentation System (NIS) operation.

## 2.0 PRECAUTIONS AND LIMITATIONS

### 2.1 Precautions and Limitations

- 2.1.1 LCOs 3.2.3, 3.2.4, 3.3.1 (including NI Channel & RX Trip System Interlocks), 3.3.3, 3.9.2, TRO 3.3.D.1 and 3.3.D.2 apply during the performance of this procedure.
- 2.1.2 At least 3 PR channels SHALL be in service at all times to prevent the following:
- Inadvertent reactor trip at power
  - Automatic de-energization of both source range channels when Shutdown
- 2.1.3 WHEN RX is operating above  $10^{-9}$  amps on either IR channel THEN SR high voltage SHALL NOT be energized as detector damage and Reactor Trip could result.

### 2.2 General Information

- 2.2.1 Installation of blocking strip across the back of relays is NOT a Temporary Modification.

## 3.0 PREREQUISITES

- 3.1 NIS has been aligned for normal operation per COL-NI-1, Nuclear Instrumentation System.

## 4.0 PROCEDURE

### 4.1 NIS Channel Startup And Shutdown

\_\_\_\_\_ 4.1.1 WHEN it is required to startup or shutdown an NIS channel  
THEN GO TO the applicable attachment:

- \_\_\_\_\_ • Attachment 1, Power Range Channel Shutdown
- \_\_\_\_\_ • Attachment 2, Power Range Channel Startup
- \_\_\_\_\_ • Attachment 3, Source Range Channel Shutdown
- \_\_\_\_\_ • Attachment 4, Source Range Channel Startup
- \_\_\_\_\_ • Attachment 5, Intermediate Range Channel Shutdown
- \_\_\_\_\_ • Attachment 6, Intermediate Range Channel Startup

### 4.2 Operation Of The Scaler Timer

**NOTE**

31 Scaler Timer is placed in service by I&C under a work package.

\_\_\_\_\_ 4.2.1 **Display-Preset Check**

**NOTE**

In the Display-Preset Check Mode, the Scaler Timer totalizes and displays a preset number of counts with the input pulses produced by a check oscillator, providing a Scaler Timer operational check. The thumbwheel switches set the preset number of counts.

\_\_\_\_\_ 4.2.1.1 PLACE Power toggle switch in up (ON) position.

\_\_\_\_\_ 4.2.1.2 SET Display-Preset selector to CHECK.

Date: \_\_\_\_\_

Initials

**ATTACHMENT 5 –  
Intermediate Range Channel Shutdown**  
(Page 1 of 3)

**CAUTION**

- Testing SHALL NOT be performed on more than one channel at a time.
- IF in Modes 1 or 2, THEN LCO 3.3.1 Action Statement SHALL be reviewed prior to performing this attachment.

1.0 PLACE the Level Trip switch for the affected channel in BYPASS. \_\_\_\_\_

**NOTE**

Lamps on the NIS drawers will NOT illuminate unless control power is available.

2.0 CHECK the following: \_\_\_\_\_

- Level Trip Bypass lamp is illuminated. \_\_\_\_\_
- Intermed Range \* Trip Bypass lamp on Panel FBF is illuminated. \_\_\_\_\_

\* 1 or 2 as applicable (CIRCLE illuminated lamp.) \_\_\_\_\_

- NIS TRIP BYPASS alarm on Panel SBF-1 is annunciated. \_\_\_\_\_

Initials

**ATTACHMENT 5 –  
Intermediate Range Channel Shutdown**  
(Page 2 of 3)

3.0 IF Reactor Trip Breakers are closed, THEN BLOCK the Intermediate Range High Flux Trip and Rod Stop for the affected channel, listed in the table below, by placing a blocking strip across the back of the relays (N/A initial and IV lines for the non-affected channel).

**CAUTION**

Only the 3 relays for the affected channel SHALL be blocked.

CHANNEL	RELAYS BLOCKED *	RELAY FUNCTION	RELAY LOCATION	RELAY BLOCKED (o)	INITIAL	I.V.
N-35	NC 35F-X	Reactor Trip	Rx Protection Train A Channel I (Rack E2)			
	NC 35F-X	Reactor Trip	Rx Protection Train B Channel I (Rack F2)			
	NC 35E-X	Rod Stop	Rack G1			
N-36	NC 36F-X	Reactor Trip	Rx Protection Train A Channel II (Rack E3)			
	NC 36F-X	Reactor Trip	Rx Protection Train B Channel II (Rack F3)			
	NC 36E-X	Rod Stop	Rack G1			

\*These relays are shown on Westinghouse Drawings 113E301 Sh. 3 and 113E302 Sh. 4.

4.0 DE-ENERGIZE the affected channel by removing the instrument and control power fuses. \_\_\_\_\_

5.0 IF relays are not blocked, THEN CHECK the following: \_\_\_\_\_

- NIS Intermediate Range alarm on panel FDF \_\_\_\_\_
- Intermediate Range High Flux Level Rod Stop Alarm on Panel SBF-1 \_\_\_\_\_

Initials

**ATTACHMENT 5 –  
Intermediate Range Channel Shutdown**  
(Page 3 of 3)

6.0 CHECK the following alarms on Panel SBF-1 are annunciated:

- INTERMEDIATE RANGE NO. \* LOSS OF COMPENSATE VOLTAGE \_\_\_\_\_  
\* 1 or 2 as applicable (CIRCLE annunciated alarm.) \_\_\_\_\_
- INTERMEDIATE RANGE LOSS OF DETECTOR VOLTAGE \_\_\_\_\_

**JPM NO. 13**

**LOCAL OPERATION OF ATMOSPHERIC STEAM DUMP  
VALVES (ALTERNATE PATH)**

**Job Performance Measure Exam**

**Submitted By** Don Jackson

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

**JPM Tasks**

**Task ID:** 039\*004\*04\*04

**Description:** LOCAL OPERATION OF ATMOSPHERIC STEAM DUMP VALVES (ALTERNATE PATH)

**Trainee:** \_\_\_\_\_ **Evaluator:** \_\_\_\_\_

**Evaluator Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Trainee Performance:** Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

**Start Time** \_\_\_\_\_ **Stop Time:** \_\_\_\_\_

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactory complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Simulated Performance in the Plant Setting

**General Comments (For Evaluator Use):**

**Task Conditions:**

A FIRE OCCURRED IN THE CONTROL BUILDING RESULTING IN A CONTROL ROOM EVACUATION.

COMMUNICATION IS ESTABLISHED WITH THE CRS VIA RADIO.

33 AND 34 S/G PRESSURES ARE 1040 PSIG.

**Task Standards :**

ESTABLISH LOCAL CONTROL OF 33 AND 34 ATMOSPHERIC STEAM DUMP VALVES AND DECREASE 33 AND 34 S/G PRESSURES TO 1005 PSIG IN ACCORDANCE WITH SOP-ESP-1.

K&A #: APE 068 CONTROL ROOM EVACUATION; AA1.01 S/G ATMOSPHERIC RELIEF VALVE OPERATION

IMPORTANCE FACTOR: RO=4.3 SRO=4.5

Applicability: NPO, RO & SRO

Estimated Completion Time: 30 minutes

**Tools Needed:**

ADJUSTABLE WRENCH  
FLASHLIGHT  
SAFETY SHOES, HARDHAT, SAFETY GLASSES, HEARING PROTECTION

**Initiating Cues :**

YOU ARE DIRECTED BY THE CRS TO ESTABLISH LOCAL CONTROL OF 33 AND 34 S/G ATMOSPHERICS AND LOWER S/G PRESSURE TO 1005 PSIG AT MAINTAIN IT THERE IN ACCORDANCE WITH SOP-ESP-1. NO S/G ATMOSPHERICS HAVE FAILED OPEN. 31 AND 32 S/Gs ARE BEING CONTROLLED BY ANOTHER OPERATOR.

**References :**

<b>ID</b>	<b>Description</b>	<b>Review Date</b>	<b>Ref Flag</b>
SOP      ESP-1	LOCAL OPERATION OF SAFE SHUTDOWN EQUIPMENT		

**Safety Considerations :**

OBSERVE SAFETY PRECAUTIONS AND USE SAFETY PROTECTIVE CLOTHING AND EQUIPMENT

**Consequences of Inadequate Performance:**

DELTA P SI  
HIGH RCS TEMPERATURE  
UNCONTROLLED COOLDOWN

**Performance Checklist :**

- |          |   |   |   |
|----------|---|---|---|
| <b>1</b> | <b>Element :</b><br>OBTAIN AND REVIEW<br>PROCEDURE SOP-ESP-01<br><b>Comments :</b>  | <b>Standards :</b><br>OBTAIN AND REVIEW<br>PROCEDURE SOP-ESP-001                                    | <b>Conditions :</b>   |
|          | <b>Critical Task?</b> N   |   |   |
|          | Satisfactory  | Unsatisfactory  |   |
| <b>2</b> | <b>Element :</b><br>CLOSE VALVE NO.1, AIR<br>BOOSTER RELAY VALVE<br><b>Comments :</b>   | <b>Standards :</b><br>TURN VALVE #1 90 DEG.<br>CLOCKWISE  | <b>Conditions :</b><br>Cue: Valve No. 1 Handle Is<br>Perpendicular To Pipe      |
|          | <b>Critical Task?</b> Y   |   |   |
|          | Satisfactory  | Unsatisfactory  |   |
| <b>3</b> | <b>Element :</b><br>VERIFY VALVE NO.2, VENT,<br>IS CLOSED<br><b>Comments :</b>  | <b>Standards :</b><br>VERIFIES VALVE #2 IS<br>CLOSED  | <b>Conditions :</b><br>Cue: Valve is Perpendicular To Pipe                      |
|          | <b>Critical Task?</b> N   |   |   |
|          | Satisfactory  | Unsatisfactory  |   |
| <b>4</b> | <b>Element :</b><br>VERIFY VALVE NO.3, N2<br>SUPPLY HEADER PRESSURE<br>GAUGE ISOLATION VALVE,<br>IS OPEN<br><b>Comments :</b> | <b>Standards :</b><br>ROTATE HANDWHEEL<br>CLOCKWISE, VERIFY<br>MOVEMENT THEN RETURN<br>TO FULL OPEN | <b>Conditions :</b><br>Cue: Valve Handle Moves Freely In<br>Clockwise Direction |
|          | <b>Critical Task?</b> N   |   |   |
|          | Satisfactory  | Unsatisfactory  |   |

**Element :**  
5 BACK VALVE NO.7,  
MANUAL REGULATOR USED  
FOR CONTROLLING 33/34 S/G  
ATMOSPHERICs, ALL THE  
WAY OUT

**Standards :**  
TURN MAN PRESS REG  
KNOB COUNTER CLOCKWISE  
UNTIL IT STOPS

**Conditions :**  
Cue: Manual Pressure Regulator  
Stops Turning in the  
Counter-Clockwise Direction  
on 33 and 34 S/G Atmospheric  
Controller

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Element :**  
5a NOTE N2 SUPPLY  
PRESSURE

**Standards :**  
NOTES PRESSURE ON THE  
BOTTLE

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
6 OPEN VALVE NO.4, N2  
SUPPLY HEADER TO SG  
MANUAL REGULATOR FOR  
ATMOSPHERIC

**Standards :**  
TURN VALVE FOR N2  
SUPPLY COUNTER  
CLOCKWISE UNTIL IT  
STOPS

**Conditions :**  
Cue: N2 Supply Valve # 4 Stops  
Turning in the Counter-Clockwise  
Direction

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**



**10**    **Element :**  
CLOSE VALVE NO.4, N2  
SUPPLY HEADER TO SG  
MANUAL REGULATOR FOR  
ATMOSPHERIC  
**Comments :**

**Standards :**  
TURN VALVE CLOCKWISE  
UNTIL CLOSED

**Conditions :**  
Cue: N2 Supply Valve #4 Stops  
Turning in the Clockwise Direction

**Critical Task?        Y**

**Satisfactory**

**Unsatisfactory**

**11**    **Element :**  
CONNECT BACK-UP N2  
BOTTLE TO QUICK  
DISCONNECT AT VALVE  
NO.4  
**Comments :**

**Standards :**  
SHOWS HOW TO CONNECT  
BACKUP N2 BOTTLE

**Conditions :**  
Cue: Quick Disconnect is Connected

**Critical Task?        Y**

**Satisfactory**

**Unsatisfactory**

**Element :**

ALIGN BACK-UP N2 BOTTLE  
FOR USE;  
-OPEN N2 BOTTLE  
ISOLATION  
-ADJUST N2 BOTTLE  
REGULATOR TO 50 PSIG  
-OPEN MANUAL VALVE  
DOWNSTREAM OF  
REGULATOR

**Standards :**  
B/U N2 BOTTLE VALVE IS  
OPENED & ADJUSTED TO  
50 PSIG, MANUAL VALVE  
DOWNSTREAM OF  
REGULATOR IS OPENED

**Conditions :**  
Cue: Back-Up N2 Bottle Isolation  
Valve Stops Rotating  
Counter-Clockwise  
Cue: Regulator Indicator Reads 50  
psig  
Cue: Manual Valve Downstream of  
Regulator Rotated Counter-Clockwise  
Until Valve Stops Turning

**Comments :**

**Critical Task?        Y**

**Satisfactory**

**Unsatisfactory**



**Element :**

**Standards :**

**Conditions :**

IF DESIRED TO CLOSE OR THROTTLE SG ATMOSPHERIC, THEN: ADJUST VALVE NO. 7, MANUAL REGULATOR USED FOR CONTROLLING ATMOSPHERIC.  
- IF NECESSARY, OPEN VALVE NO.2, VENT, UNTIL DESIRED POSITION IS OBTAINED.

VALVE #7 (33/34) IS ADJUSTED IN THE COUNTER CLOCKWISE DIRECTION TO ACHIEVE DESIRED VALVE POSITION

Cue: 33 and 34 S/G Pressures Decrease  
Slows and Stabilizes at 1005 Psig , along with 31,32 S/Gs

**Comments :**

**Critical Task?**        Y

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

BACKUP N2 IS IN USE AND 33 and 34 S/Gs IS BEING MAINTAINED AT 1005 PSIG IN ACCORDANCE WITH SOP-ESP-1.

## **Candidate Cue Sheet**

THE FOLLOWING SITUATION EXISTS:

- A FIRE HAS OCCURRED IN THE CONTROL BUILDING RESULTING IN A CONTROL ROOM EVACUATION.
- COMMUNICATION IS ESTABLISHED WITH THE CRS VIA RADIO.
- 33 AND 34 S/G PRESSURES ARE 1040 PSIG.

YOU ARE DIRECTED BY THE CRS TO ESTABLISH LOCAL CONTROL OF 33 AND 34 S/G ATMOSPHERICS AND LOWER S/G PRESSURE TO 1005 PSIG AND MAINTAIN THAT PRESSURE IN ACCORDANCE WITH SOP-ESP-1. NO S/G ATMOSPHERICS HAVE FAILED OPEN. 31 AND 32 S/G ATMOSPHERICS ARE BEING CONTROLLED BY ANOTHER OPERATOR.



**Entergy**

Nuclear Northeast

Procedure Use Is:

- Continuous
- Reference
- Information

Control Copy: \_\_\_\_\_

Effective Date: \_\_\_\_\_

Page 1 of 31

**This procedure is TSR**

SRP-001, Revision: 10

**LOCAL OPERATION  
OF  
SAFE SHUTDOWN ELEMENT**

Greg Weaver / 04/18/0

Writer Date

Reviewer / Date

**Approved By:**

Procedure Sponsor, DM/Designee Date

**Team 3C**

Procedure Owner



**PARTIAL REVISION**

**REVISION SUMMARY**

(Page 1 of 1)

**1.0 REASON FOR REVISION**

Incorporated the changes to MS-PCV-1310A/B resulting from DCP-02-3-023 (IP3-6566).

**2.0 SUMMARY OF CHANGES**

2.1 Editorial corrections for clarity and consistency without revision bars:

2.1.1 Reworded Purpose and P/L sections to remove superfluous vernacular.

2.1.2 Deleted previous P/L 2.1 as industrial safety precautions are governed by higher-tier documents, no rev bar.

2.1.3 Changed numerous switch positions to ALL CAPS per OD-10, no rev bars.

2.2 Changed Steps 4.1.3.3, 4.1.3.4, and 4.1.3.10c) per feedback IP3-6566.

**TABLE OF CONTENTS**

<b>Section</b>	<b>Title</b>	<b>Page</b>
1.0	PURPOSE.....	4
2.0	PRECAUTIONS AND LIMITATIONS.....	4
3.0	PREREQUISITES .....	5
4.0	PROCEDURE.....	5
4.1	ABFP Local Operation.....	5
4.2	ABFP Regulator Control Valve Local Operation.....	11
4.3	Resetting 32 ABFP Overspeed Trip .....	11
4.4	31 PZR Backup Heater Local Operation .....	13
4.5	FCU Local Operation.....	13
4.6	SWP Local Operation.....	14
4.7	SWP Zurn Strainer Local Operation .....	16
4.8	MSIV Local Operation .....	19
4.9	SG Atmospheric Steam Dump Valve Local Operation .....	20
4.10	Charging Pump Local Operation .....	23
4.11	Charging Pump Cooling Using City Water.....	25
4.12	31 RHR Pump Cooling Using City Water .....	27
5.0	REFERENCES.....	29
6.0	RECORDS AND DOCUMENTATION .....	30

**Attachments:**

ATTACHMENT 1	SG ATMOSPHERIC DUMP VALVE.....	31
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## 1.0 PURPOSE

- 1.1 This procedure establishes requirements for standardizing local operator actions common to various EOPs and ONOPs, and provides a focal point such that changes to a single activity do not require changes to a multitude of procedures:
- Each sub-section to Section 4.0, Procedure, is written to be a stand alone "mini-procedure."
- 1.2 This procedure applies to equipment listed the Table Of Contents.
- 1.3 This procedure SHALL ONLY be used as directed by any of the following:
- EOPs
  - ONOPs/AOPs
  - CRS/SM

## 2.0 PRECAUTIONS AND LIMITATIONS

- 2.1 WHEN placing remote/local transfer switches to LOCAL during performance of this procedure, THEN CONTROL TRANSFERRED TO LOCAL alarm on panel SAF is expected AND entry into ARP-3 is NOT required.
- 2.2 Equipment operability may be impacted by actions in this procedure.  
[Reference LCOs 3.5.2, 3.5.3, 3.6.6, 3.7.2, 3.7.4, 3.7.5, 3.7.9 & 3.8.1]
- 2.3 CCR indications for controls being transferred to LOCAL could be lost.
- 2.4 IF placed in LOCAL, THEN safe shutdown equipment having auto start capability SHALL be declared inoperable as LOCAL defeats the auto start feature.
- 2.5 IF 2 or more pieces of safe shutdown equipment are powered from the same EDG AND the equipment is placed in LOCAL, THEN the associated EDG SHALL be declared inoperable as LOCAL defeats SI/Blackout breaker stripping.
- 2.6 Sub-sections of this procedure SHALL ONLY be performed at the specific direction of the CRS/SM.
- 2.7 Operators dispatched to perform local operations SHALL remain in contact with the CCR and should remain in the affected equipment vicinity until CRS or SM permission to leave the area is obtained.
- 2.8 Steps 4.7.1, 4.7.2, and 4.9.1 address Appendix R issues.

### 3.0 PREREQUISITES

None

### 4.0 PROCEDURE

#### **CAUTION**

- IF discharge flow is excessive, THEN the M-DABFPs may experience a delayed trip after several minutes of operation.
- M-DABFPs should be operated with greater than 1350 psig discharge as read on either:
  - PI-1260, 31 ABFP Discharge Pressure Indicator
  - PI-1262, 33 ABFP Discharge Pressure Indicator

#### **4.1 ABFP Local Operation**

\_\_\_\_\_ 4.1.1 IF desired to operate M-DABFPs from ABFP Room (PT-2), THEN:

\_\_\_\_\_ 4.1.1.1 PLACE applicable ABFP Local/Remote transfer switch(es) in LOCAL.

\_\_\_\_\_ 4.1.1.2 DEPRESS applicable Start pushbutton(s) to start selected ABFP.

\_\_\_\_\_ 4.1.1.3 IF flow to SGs must be manipulated, THEN GO TO Section 4.2 to perform adjustments.

\_\_\_\_\_ 4.1.1.4 WHEN 31 or 33 ABFP is NOT needed to maintain SG levels (e.g., 32 ABFP is available), THEN:

\_\_\_\_\_ a) SECURE affected desired pump(s).

\_\_\_\_\_ b) PLACE applicable ABFP Local/Remote transfer switch(es) in REMOTE.

\_\_\_\_\_ c) NOTIFY CCR of status of both M-DABFPs.

**4.9 SG Atmospheric Steam Dump Valve Local Operation**

**NOTE**

- Each SG atmospheric may be operated from local panels on ABFP Bldg 43'. 31/32 control station is at South end and 33/34 control station is at North end.
- Attachment 1, SG Atmospheric Dump Valve, provides a schematic of the control system, including relative valve locations (i.e., Valve Numbers 1 through 7 of each SG).

- \_\_\_ 4.9.1 IF any SG atmospheric has failed open, THEN:
- \_\_\_ 4.9.1.1 NOTIFY CRS and RO.
- \_\_\_ 4.9.1.2 Manually ISOLATE affected SG atmospheric by closing its associated isolation valve:
- \_\_\_ • MS-3-1, 31 Atmospheric MS-PCV-1134 Isolation
  - \_\_\_ • MS-3-2, 32 Atmospheric MS-PCV-1135 Isolation
  - \_\_\_ • MS-3-3, 33 Atmospheric MS-PCV-1136 Isolation
  - \_\_\_ • MS-3-4, 34 Atmospheric MS-PCV-1137 Isolation
- \_\_\_ 4.9.1.3 IF unable to isolate failed SG Atmospheric, THEN ISOLATE faulted SG as follows:
- \_\_\_ a) VERIFY MSIV is closed.
  - \_\_\_ b) VERIFY Main Feedline is isolated.
  - \_\_\_ c) VERIFY AFW flow is isolated.
  - \_\_\_ d) IF 32 OR 33 SG is faulted THEN VERIFY respective steam supply valve to T-DABFP is closed:
    - 32 SG MS-41, 32 ABFP Steam Supply From 32 Main Steam Line Isolation
    - 33 SG MS-42, 32 ABFP Steam Supply From 33 Main Steam Line Isolation
- \_\_\_ 4.9.2 CLOSE valve No. 1, Air Booster Relay Valve.
- \_\_\_ 4.9.3 VERIFY valve No. 2, Vent, closed.
- \_\_\_ 4.9.4 VERIFY valve No. 3, N<sub>2</sub> Supply Header Pressure Gauge Isolation, open.

\_\_\_\_\_ 4.9.5 POSITION valve No. 7, Manual Regulator Used For Controlling Atmospheric, all the way out.

**NOTE**

- N<sub>2</sub> supply pressure should be greater than 50 psig on pressure gauge at valve No. 3.
- N<sub>2</sub> supply (valve 4), and B/U N<sub>2</sub> bottle will supply 2 SG atmospherics: (31/32) or (33/34)

\_\_\_\_\_ 4.9.6 OPEN the following valves:

- \_\_\_\_\_ • Valve No. 4, N<sub>2</sub> Supply Header To SG # Manual Regulator For Atmospheric
- \_\_\_\_\_ • Valve No. 5, Manual Regulator For Atmospheric N<sub>2</sub> Supply Isolation
- \_\_\_\_\_ • Valve No. 6, Manual Regulator For Atmospheric N<sub>2</sub> Outlet Isolation

\_\_\_\_\_ 4.9.7 IF N<sub>2</sub> supply pressure decreases to less than 45 psig, THEN:

\_\_\_\_\_ 4.9.7.1 CLOSE valve No. 4, N<sub>2</sub> Supply Header To SG # Manual Regulator For Atmospheric.

\_\_\_\_\_ 4.9.7.2 CONNECT B/U N<sub>2</sub> bottle to quick disconnect at valve No. 4.

\_\_\_\_\_ 4.9.7.3 ALIGN back-up N<sub>2</sub> bottle as follows:

- \_\_\_\_\_ a) OPEN N<sub>2</sub> bottle isolation.
- \_\_\_\_\_ b) ADJUST N<sub>2</sub> bottle regulator to 50 psig.
- \_\_\_\_\_ c) OPEN manual valve downstream of regulator.

**CAUTION**

- IF SG  $\Delta P$  is greater than 125 psid, THEN an SI signal will be initiated.
- Use of valve No. 2, Vent, should be avoided to preserve N<sub>2</sub> supply.

\_\_\_\_\_ 4.9.8 MAINTAIN each SG at desired pressure as follows:

\_\_\_\_\_ 4.9.8.1 MAINTAIN all 4 SGs at approximately the same pressure.

\_\_\_\_\_ 4.9.8.2 IF desired to open or throttle open SG atmospheric, THEN slowly INCREASE diaphragm pressure using valve No. 7, Manual Regulator Used For Controlling Atmospheric, until desired valve position is obtained.

\_\_\_\_\_ 4.9.8.3 IF desired to close or throttle SG atmospheric, THEN:

- \_\_\_\_\_ • ADJUST valve no 7, Manual Regulator Used For Controlling Atmospheric
- \_\_\_\_\_ • IF necessary, THEN OPEN valve No. 2, Vent, until desired valve position is obtained.

**NOTE**

IA should be re-aligned to only 1 atmospheric at a time. Remaining operable atmospherics may be used to control RCS temperature.

\_\_\_\_\_ 4.9.9 WHEN normal Instrument Air supply has been restored, THEN:

\_\_\_\_\_ 4.9.9.1 POSITION valve No. 7, Manual Regulator Used For Controlling Atmospheric, all the way out.

\_\_\_\_\_ 4.9.9.2 CLOSE the following valves:

- \_\_\_\_\_ • Valve No. 5 Manual Regulator For Atmospheric N<sub>2</sub> Supply Isolation
- \_\_\_\_\_ • Valve No. 6 Manual Regulator For Atmospheric N<sub>2</sub> Outlet Isolation

\_\_\_\_\_ 4.9.9.3 VERIFY valve No. 2, Vent, is closed.

\_\_\_\_\_ 4.9.9.4 VERIFY Flight Panel pressure controller in MANUAL AND 0 demand.

\_\_\_\_\_ 4.9.9.5 Slowly OPEN valve No. 1, Air Booster Relay Valve.

\_\_\_\_\_ 4.9.9.6 IF the SG atmospheric fails OPEN, THEN:

- \_\_\_\_\_ a) CLOSE valve No. 1, Air Booster Relay Valve.
- \_\_\_\_\_ b) OPEN valve No. 2, Vent.
- \_\_\_\_\_ c) Manually ISOLATE affected SG atmospheric by closing associated isolation valve:
  - MS-3-1, 31 Atmospheric MS-PCV-1134 Isolation
  - MS-3-2, 32 Atmospheric MS-PCV-1135 Isolation
  - MS-3-3, 33 Atmospheric MS-PCV-1136 Isolation
  - MS-3-4, 34 Atmospheric MS-PCV-1137 Isolation
- \_\_\_\_\_ d) INFORM CCR of status of the failed valve.

- \_\_\_\_\_ 4.9.9.7 IF Atmospheric control has been successfully returned to normal Instrument Air supply, THEN INFORM the CCR.

**NOTE**

N<sub>2</sub> supply (valve 4), and B/U N<sub>2</sub> bottle will supply 2 SG atmospherics: (31/32) or (33/34)

- \_\_\_\_\_ 4.9.9.8 WHEN all atmospherics have been isolated from N<sub>2</sub>, THEN:
- \_\_\_\_\_ a) CLOSE Valve No. 4, N<sub>2</sub> Supply Header To SG # Manual Regulator For Atmospheric (31 & 32 side)
  - \_\_\_\_\_ b) IF a temporary N<sub>2</sub> bottle was used, THEN CLOSE the N<sub>2</sub> bottle isolation (31 & 32 side)
  - \_\_\_\_\_ c) Slowly REMOVE quick disconnect from N<sub>2</sub> bottle (31 & 32 side)
  - \_\_\_\_\_ d) CLOSE Valve No. 4, N<sub>2</sub> Supply Header To SG # Manual Regulator For Atmospheric (33 & 34 side)
  - \_\_\_\_\_ e) IF a temporary N<sub>2</sub> bottle was used, THEN CLOSE the N<sub>2</sub> bottle isolation (33 & 34 side)
  - \_\_\_\_\_ f) Slowly REMOVE quick disconnect from N<sub>2</sub> bottle (33 & 34 side)

**4.10 Charging Pump Local Operation**

- \_\_\_\_\_ 4.10.1 ENSURE suction supply is available from VCT or RWST.
- \_\_\_\_\_ 4.10.2 ENSURE CCW is in service to support charging pump operation:
- \_\_\_\_\_ • IF NOT available, THEN ALIGN City Water per Section 4.11.
- \_\_\_\_\_ 4.10.3 PLACE speed control of pump(s) to be run to MAN.  
(Chg Pmp Speed Control Station PL-6)
- \_\_\_\_\_ 4.10.4 ADJUST speed controller to approximately 20%.  
(Chg Pmp Speed Control Station PL-6)
- \_\_\_\_\_ 4.10.5 PLACE charging pump(s) emergency control switch to LOCAL.  
(Charging, Letdown, and 31 PZR Heater Local Control Panel on PL-2)
- \_\_\_\_\_ 4.10.6 START desired pump(s) via local Start pushbutton.  
(Charging, Letdown, and 31 PZR Heater Local Control Panel on PL-2)

**JPM NO. 14**

**ALIGN CITY WATER TO 31 RHR PUMP**

**Job Performance Measure Exam**

**Submitted By** Don Jackson

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

**JPM Tasks**

**Task ID:** 005\*001\*04\*04

**Description:** ALIGN CITY WATER TO 31 RHR PUMP

**Trainee:** \_\_\_\_\_ **Evaluator:** \_\_\_\_\_

**Evaluator Signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Trainee Performance:**      **Satisfactory** \_\_\_\_\_ **Unsatisfactory** \_\_\_\_\_

**Start Time** \_\_\_\_\_ **Stop Time:** \_\_\_\_\_

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactory complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Simulated Performance in the Plant

**General Comments (For Evaluator Use):**

**Task Conditions:**

THE FOLLOWING PLANT CONDITIONS EXIST:

- THE UNIT IS IN COLD SHUTDOWN ON RHR
- 31 RHR PUMP IS IN SERVICE
- THE CCW SUPPLY TO THE RHR PUMPS HAS FAILED AND THE CR HAS ENTERED ONOP-CC-01

YOU ARE DIRECTED BY THE CRS TO ALIGN CITY WATER TO #31 RHR PUMP IN ACCORDANCE WITH SOP-ESP-01, DO NOT CROSS INTO CONTAMINATED AREAS, POINT OUT VALVES OF INTEREST AND HOW THEY WILL BE OPERATED.

**Task Standards :**

CITY WATER HAS BEEN ALIGNED TO 31 RHR PUMP IN ACCORDANCE WITH SOP-ESP-01  
K&A #: APE 026 LOSS OF COMPONENT COOLING WATER (CCW); AA1.03 BACKUP TO CCW  
IMPORTANCE FACTORS: RO=3.6 SRO=3.6  
Applicability: NPO, RO & SRO  
Estimated Completion Time: 20 minutes

**Tools Needed:**

ADJUSTABLE WRENCH  
FLASHLIGHT  
HOSES NEAR SPARE RHR PUMP ROOM  
HARD HAT, SAFETY GLASSES, SAFETY SHOES, HEARING PROTECTION  
DOSIMETRY

**Initiating Cues :**

YOU ARE DIRECTED BY THE CR TO ALIGN CITY WATER TO #31 RHR PUMP IN ACCORDANCE WITH SOP-ESP-01, DO NOT CROSS INTO CONTAMINATED AREAS, POINT OUT VALVES OF INTEREST AND HOW THEY WILL BE OPERATED.

**References :**

ID	Description	Review Date	Ref Flag
SOP ESP-1	LOCAL OPERATION OF SAFE SHUTDOWN EQUIPMENT		X

**Safety Considerations :**

OBSERVE RWP: RADIOLOGICAL HAZARDS CAN EXIST AT 31 RHR PUMP AND ITS ASSOCIATED SYSTEMS

**Consequences of Inadequate Performance:**

31 RHR PUMP DAMAGE OR POSSIBLE FAILURE

OVERHEATING OF PUMP AFTER 24 HOUR PERIOD

**Performance Checklist :**

<b>Element :</b> 1 OBTAIN AND REVIEW SOP-ESP-1	<b>Standards :</b> OBTAIN AND REVIEW PROCEDURE SOP-ESP-001, DETERMINES STEP 4.12 IS APPLICABLE	<b>Conditions :</b> Only 31# RHR Pump is Capable of Being Supplied With City Water
--	--	--

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

<b>Element :</b> 2 CLOSE AC-736A, CC SUPPLY TO 31 RHR PUMP THERMAL BARRIER INLET ISOLATION	<b>Standards :</b> ROTATE VALVE CLOCKWISE UNTIL CLOSED	<b>Conditions :</b> Cue: Valve AC-736A Stopped Rotating Clockwise
---	--	---

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

<b>Element :</b> 3 CLOSE AC-737A CC RETURN FROM 31 RHR PUMP THERMAL BARRIER AND SEAL HX OUTLET ISOLATION.	<b>Standards :</b> ROTATE VALVE CLOCKWISE UNTIL CLOSED	<b>Conditions :</b> Cue: Valve AC-737A Stopped Rotating Clockwise
--	--	---

**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

# NRC Operating Exam- JPM 14

Indian Point 3

Week of December 8, 2003

4 **Element :**  
CLOSE AC-1871D, CC  
SUPPLY TO 31 RHR PUMP  
SEAL HX INLET ISOLATION  
**Comments :**

**Standards :**  
ROTATE VALVE CLOCKWISE  
UNTIL IT IS CLOSED

**Conditions :**  
Cue: Valve AC-1871D Stopped  
Rotating Clockwise

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

5 **Element :**  
INSTALL THE EMERGENCY  
CITY WATER SUPPLY  
JUMPER (E.G. HOSE)  
BETWEEN MW-18-16 HOSE  
CONNECTION ISOLATION  
(LOCATED ACROSS FROM  
FILTER ROOM ON COLUMN)  
AND ONE INCH TEE  
LOCATED IMMEDIATELY  
DOWNSTREAM OF AC-736A,  
CC SUPPLY TO 31 RHR  
PUMP THERMAL BARRIER  
INLET ISOLATION  
**Comments :**

**Standards :**  
INSTALLS THE JUMPER  
BETWEEN CITY WATER  
CONNECTION AND  
RHR TIE

**Conditions :**  
Cue: The Jumper Is Connected Per The Step  
Instructions

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

6 **Element :**  
INSTALL THE DRAIN HOSE  
ON THE 3/4 TEE LOCATED  
IMMEDIATELY DOWN STREAM  
OF AC-1871D, CC SUPPLY  
TO 31 RHR PUMP SEAL HX  
INLET ISOLATION (31 RHR  
PUMP ROOM)  
**Comments :**

**Standards :**  
DRAIN HOSE IS INSTALLED  
AT THE RHR DRAIN TEE  
CONNECTION

**Conditions :**  
Cue: Drain Hose Is Installed

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Element :**  
7 ROUTE DRAIN HOSE TO A SUITABLE DRAIN (EG 31 RHR PUMP FLOOR DRAIN).  
**Standards :**  
DRAIN HOSE IS ROUTED TO AN APPROPRIATE FLOOR DRAIN  
**Conditions :**  
Cue: Hose Installed In Last Step Is Positioned Where You Have Said It Should Go  
**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Element :**  
8 OPEN AC-1871C, CC RETURN FROM 31 RHR PUMP SEAL HX OUTLET ISOLATION (31 RHR PUMP ROOM).  
**Standards :**  
ROTATE COUNTER CLOCKWISE UNTIL VALVE STOPS MOVING AND IS FULLY OPEN  
**Conditions :**  
Cue: The Valve Has Stopped Turning Counter Clockwise  
**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Element :**  
9 OPEN MW-18-16 HOSE CONNECTION ISOLATION. (ACROSS FROM FILTER ROOM ON COLUMN).  
**Standards :**  
ROTATE VALVE COUNTER CLOCKWISE UNTIL FULL OPEN  
**Conditions :**  
Cue: Valve has Stopped Moving Counter Clockwise  
**Comments :**

**Critical Task?** Y

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

CITY WATER IS ALIGNED TO 31 RHR PUMP AND IS DRAINING TO THE FLOOR

## **Candidate Cue Sheet**

THE FOLLOWING PLANT CONDITIONS EXIST:

- THE UNIT IS IN COLD SHUTDOWN ON RHR
- 31 RHR PUMP IS IN SERVICE
- THE CCW SUPPLY TO THE RHR PUMPS HAS FAILED AND THE CR HAS ENTERED ONOP-CC-01

YOU ARE DIRECTED BY THE CRS TO ALIGN CITY WATER TO #31 RHR PUMP IN ACCORDANCE WITH SOP-ESP-01, DO NOT CROSS INTO CONTAMINATED AREAS, POINT OUT VALVES OF INTEREST AND HOW THEY WILL BE OPERATED.



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Procedure Use Is:

- Continuous
- Reference
- Information

Control Copy: \_\_\_\_\_

Effective Date: \_\_\_\_\_

Page 1 of 31

**This procedure is TSR**

SC-001, Revision: 10

# LOCAL OPERATION OF SAFE SHUTDOWN ELEMENT

Greg Weaver / 04/18/0

Writer Date

Reviewer / Date

**Approved By:**

Procedure Sponsor, DM/Designee / Date

**Team 3C**

Procedure Owner



**PARTIAL REVISION**

**REVISION SUMMARY**

(Page 1 of 1)

**1.0 REASON FOR REVISION**

Incorporated the changes to MS-PCV-1310A/B resulting from DCP-02-3-023 (IP3-6566).

**2.0 SUMMARY OF CHANGES**

2.1 Editorial corrections for clarity and consistency without revision bars:

2.1.1 Reworded Purpose and P/L sections to remove superfluous vernacular.

2.1.2 Deleted previous P/L 2.1 as industrial safety precautions are governed by higher-tier documents, no rev bar.

2.1.3 Changed numerous switch positions to ALL CAPS per OD-10, no rev bars.

2.2 Changed Steps 4.1.3.3, 4.1.3.4, and 4.1.3.10c) per feedback IP3-6566.

## TABLE OF CONTENTS

<u>Section</u>	<u>Title</u>	<u>Page</u>
1.0	PURPOSE.....	4
2.0	PRECAUTIONS AND LIMITATIONS.....	4
3.0	PREREQUISITES .....	5
4.0	PROCEDURE.....	5
4.1	ABFP Local Operation.....	5
4.2	ABFP Regulator Control Valve Local Operation.....	11
4.3	Resetting 32 ABFP Overspeed Trip .....	11
4.4	31 PZR Backup Heater Local Operation .....	13
4.5	FCU Local Operation.....	13
4.6	SWP Local Operation.....	14
4.7	SWP Zurn Strainer Local Operation .....	16
4.8	MSIV Local Operation .....	19
4.9	SG Atmospheric Steam Dump Valve Local Operation .....	20
4.10	Charging Pump Local Operation .....	23
4.11	Charging Pump Cooling Using City Water.....	25
4.12	31 RHR Pump Cooling Using City Water .....	27
5.0	REFERENCES .....	29
6.0	RECORDS AND DOCUMENTATION .....	30

**Attachments:**

ATTACHMENT 1	SG ATMOSPHERIC DUMP VALVE.....	31
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## 1.0 PURPOSE

- 1.1 This procedure establishes requirements for standardizing local operator actions common to various EOPs and ONOPs, and provides a focal point such that changes to a single activity do not require changes to a multitude of procedures:
  - Each sub-section to Section 4.0, Procedure, is written to be a stand alone "mini-procedure."
- 1.2 This procedure applies to equipment listed the Table Of Contents.
- 1.3 This procedure SHALL ONLY be used as directed by any of the following:
  - EOPs
  - ONOPs/AOPs
  - CRS/SM

## 2.0 PRECAUTIONS AND LIMITATIONS

- 2.1 WHEN placing remote/local transfer switches to LOCAL during performance of this procedure, THEN CONTROL TRANSFERRED TO LOCAL alarm on panel SAF is expected AND entry into ARP-3 is NOT required.
- 2.2 Equipment operability may be impacted by actions in this procedure. [Reference LCOs 3.5.2, 3.5.3, 3.6.6, 3.7.2, 3.7.4, 3.7.5, 3.7.9 & 3.8.1]
- 2.3 CCR indications for controls being transferred to LOCAL could be lost.
- 2.4 IF placed in LOCAL, THEN safe shutdown equipment having auto start capability SHALL be declared inoperable as LOCAL defeats the auto start feature.
- 2.5 IF 2 or more pieces of safe shutdown equipment are powered from the same EDG AND the equipment is placed in LOCAL, THEN the associated EDG SHALL be declared inoperable as LOCAL defeats SI/Blackout breaker stripping.
- 2.6 Sub-sections of this procedure SHALL ONLY be performed at the specific direction of the CRS/SM.
- 2.7 Operators dispatched to perform local operations SHALL remain in contact with the CCR and should remain in the affected equipment vicinity until CRS or SM permission to leave the area is obtained.
- 2.8 Steps 4.7.1, 4.7.2, and 4.9.1 address Appendix R issues.

### 3.0 PREREQUISITES

None

### 4.0 PROCEDURE

#### **CAUTION**

- IF discharge flow is excessive, THEN the M-DABFPs may experience a delayed trip after several minutes of operation.
- M-DABFPs should be operated with greater than 1350 psig discharge as read on either:
  - PI-1260, 31 ABFP Discharge Pressure Indicator
  - PI-1262, 33 ABFP Discharge Pressure Indicator

#### **4.1 ABFP Local Operation**

\_\_\_\_\_ 4.1.1 IF desired to operate M-DABFPs from ABFP Room (PT-2), THEN:

\_\_\_\_\_ 4.1.1.1 PLACE applicable ABFP Local/Remote transfer switch(es) in LOCAL.

\_\_\_\_\_ 4.1.1.2 DEPRESS applicable Start pushbutton(s) to start selected ABFP.

\_\_\_\_\_ 4.1.1.3 IF flow to SGs must be manipulated, THEN GO TO Section 4.2 to perform adjustments.

\_\_\_\_\_ 4.1.1.4 WHEN 31 or 33 ABFP is NOT needed to maintain SG levels (e.g., 32 ABFP is available), THEN:

\_\_\_\_\_ a) SECURE affected desired pump(s).

\_\_\_\_\_ b) PLACE applicable ABFP Local/Remote transfer switch(es) in REMOTE.

\_\_\_\_\_ c) NOTIFY CCR of status of both M-DABFPs.

- \_\_\_\_\_ 4.11.3.4 CLOSE AC-701B, Emergency City Water Cooling Return from Charging Pumps Outlet Drain.
- \_\_\_\_\_ 4.11.3.5 REPLACE flange next to AC-701B.
- \_\_\_\_\_ 4.11.3.6 IF Alternate Backup City Water cooling was used, THEN CLOSE MW-17-1 & 17-2, City Water Containment Isolations, and DISCONNECT hoses.
- \_\_\_\_\_ 4.11.3.7 DRAIN and RETURN fire hoses to CAF Annex "Operations Contingency Hose Cabinet."
- \_\_\_\_\_ 4.11.3.8 Re-INSTALL cap at elbow downstream from MW-783, City Water Emergency Cooling Supply to Charging Pumps Backflow Preventer Downstream Isolation Valve.
- \_\_\_\_\_ 4.11.3.9 OPEN AC-756A, CC Supply Header to Charging Pumps Inlet Isolation.
- \_\_\_\_\_ 4.11.3.10 OPEN AC-756B, CC Return Header from Charging Pumps Outlet Isolation.

**4.12 31 RHR Pump Cooling Using City Water**

- \_\_\_\_\_ 4.12.1 IF CCW can NOT be established AND 31 RHR Pump operation is desired, THEN PROVIDE B/U City Water supply as follows:

**CAUTION**

- RHR pumps may only be operated for 24 hours without CCW.
- Only 31 RHR pump is capable of being emergency-cooled by City Water.

- \_\_\_\_\_ 4.12.1.1 CLOSE AC-736A, CC Supply to 31 RHR Pump Thermal Barrier Inlet Isolation.
- \_\_\_\_\_ 4.12.1.2 CLOSE AC-737A, CC Return from 31 RHR Pump Thermal Barrier and Seal Hx Outlet Isolation.
- \_\_\_\_\_ 4.12.1.3 CLOSE AC-1871D, CC Supply to 31 RHR Pump Seal Hx Inlet Isolation.
- \_\_\_\_\_ 4.12.1.4 INSTALL emergency City Water supply jumper hose between MW-18-16, Hose Connection Isolation, (across from filter room on column) and 1" tee (immediately downstream of AC-736A).

<b>LOCAL OPERATION OF SAFE SHUTDOWN EQUIPMENT</b>	No: SOP-ESP-001	Rev: 10
	Page 28 of 31	

- \_\_\_\_\_ 4.12.1.5 INSTALL drain hose on 3/4" tee (immediately downstream of AC-1871D, CC Supply to 31 RHR Pump Seal Hx Inlet Isolation). (31 RHR pump room)
- \_\_\_\_\_ 4.12.1.6 ROUTE hose to a suitable drain (e.g., RHR Room floor drain).
- \_\_\_\_\_ 4.12.1.7 OPEN AC-1871C, CC Return from 31 RHR Pump Seal Hx Outlet Isolation. (31 RHR pump room)
- \_\_\_\_\_ 4.12.1.8 OPEN MW-18-16, Hose Connection Isolation. (Across from filter room on column)
- \_\_\_\_\_ 4.12.2 WHEN 31 RHR Pump City Water cooling is no longer required, THEN:
  - \_\_\_\_\_ 4.12.2.1 CLOSE MW-18-16, Hose Connection Isolation (across from filter room on column).
  - \_\_\_\_\_ 4.12.2.2 REMOVE jumper hose installed between MW-18-16, Hose Connection Isolation, and 1" tee downstream of AC-736A, CC Supply to 31 RHR Pump Thermal Barrier Inlet Isolation, and REPLACE cap on tee.
  - \_\_\_\_\_ 4.12.2.3 REMOVE jumper hose installed downstream of AC-1871D, CC Supply to 31 RHR Pump Seal Hx Inlet Isolation, and REPLACE cap on tee.
  - \_\_\_\_\_ 4.12.2.4 OPEN AC-1871D, CC Supply to 31 RHR Pump Seal Hx Inlet Isolation.
  - \_\_\_\_\_ 4.12.2.5 OPEN AC-737A, CC Return from 31 RHR Pump Thermal Barrier and Seal Hx Outlet.
  - \_\_\_\_\_ 4.12.2.6 THROTTLE AC-1871C to achieve 7.5 gpm on FIC-646.
  - \_\_\_\_\_ 4.12.2.7 THROTTLE AC-736A, CC Supply to 31 RHR Pump Thermal Barrier Inlet Isolation, to obtain 15 gpm total flow on FIC-646.

**JPM NO. 15**

**Terminate A Waste Gas Decay Tank Release**

**Job Performance Measure Exam**

**Submitted By : Don Jackson\_**

9/20/2003

**Date**

**Reviewed By**

**Date**

**SME Review/Validation By**

**Date**

**Approved By**

**Date**

**JPM Tasks**

**Task ID:** 071\*A4.27

**Description:** TERMINATE A WASTE GAS DECAY TANK RELEASE

Trainee: \_\_\_\_\_ Evaluator: \_\_\_\_\_

Evaluator Signature \_\_\_\_\_ Date \_\_\_\_\_

Trainee Performance: Satisfactory \_\_\_\_\_ Unsatisfactory \_\_\_\_\_

Start Time \_\_\_\_\_ Stop Time: \_\_\_\_\_

When I tell you to begin, you are to perform the task listed above. I will describe general conditions standard(s), initiating cue(s), and answer any questions you have. I will provide access to any tools necessary to perform the task. You may use any approved reference material normally available. To satisfactorily complete this task, you must perform or simulate each critical element correctly. You are to inform the examiner when you have completed the task.

**Testing Method:** Simulated Performance in the Plant Setting

**General Comments (For Evaluator Use):**

**Task Conditions:**

AN APPROVED RELEASE OF 31 SMALL GAS DECAY TANK (SGDT) HAS BEEN IN PROGRESS FOR 2 HOURS, THE CONTROL ROOM SUPERVISOR HAS DIRECTED THAT THE RELEASE OF 31 SGDT BE TERMINATED IN ACCORDANCE WITH STEP 4.2.25 OF SOP-WDS-013.

**Task Standards :**

TERMINATE A WASTE GAS DECAY TANK RELEASE  
K&A #: SYSTEM 071 WASTE GAS DISPOSAL SYSTEM ; A 4.27 OPENING AND CLOSING OF THE DECAY TANK DISCHARGE CONTROL VALVE  
IMPORTANCE FACTORS: SRO=2.7  
Estimated Completion Time: 20 minutes

**Tools Needed:**

Hard Hat, Safety Glasses, Hearing Protection, Safety Shoes

**Initiating Cues :**

YOU HAVE BEEN DIRECTED TO TERMINATE THE APPROVED RELEASE OF THE 31 SGDT IN ACCORDANCE WITH STEP 4.2.25 OF SOP-WDS-013

**Safety Considerations :**

WEAR REQUIRED PERSONNEL PROTECTIVE EQUIPMENT

**Consequences of Inadequate Performance:**

IMPROPER VALVE ALIGNMENT, POTENTIAL UNCONTROLLED SGDT RELEASE

**Performance Checklist :**

- |   |   |  |   |
|---|---|--|---|
| 1 | <b>Element :</b><br>OBTAIN AND REVIEW<br>SOP-WDS-013<br><b>Comments :</b><br><br><b>Critical Task?</b> N                            | <b>Standards :</b><br>OBTAINS AND REVIEWS<br>SOP-WDS-013   | <b>Conditions :</b>   |
|   | <b>Satisfactory</b>   | <b>Unsatisfactory</b>                                      |   |
| 2 | <b>Element :</b><br>CLOSE RCV-014, PLANT<br>VENT RADIATION CONTROL<br>VALVE<br><br><b>Comments :</b><br><br><b>Critical Task?</b> Y | <b>Standards :</b><br>CLOSES RCV-014                       | <b>Conditions :</b><br>Cue: RCV-014 Is Closed<br>Gauge reads "0", and indicator<br>light is "Green" |
|   | <b>Satisfactory</b>   | <b>Unsatisfactory</b>                                      |   |
| 3 | <b>Element :</b><br>CLOSE WD-PCV-1040, GAS<br>DECAY TANKS RELEASE<br>HEADER PCV, BY SETTING TO<br>LESS THAN "0"                     | <b>Standards :</b><br>SETS WD-PCV-1040 TO<br>LESS THAN "0" | <b>Conditions :</b><br>Cue: WD-PCV-1040 is set<br>to < "0"  |
|   | <b>Satisfactory</b>   | <b>Unsatisfactory</b>                                      |   |

# NRC Operating Exam- JPM 15

Indian Point 3

Week of December 8, 2003

4 **Element :**  
PERFORM RESTORATION  
SECTION OF ATTACHMENT  
10 FOR 31 SGDT

**Standards :**  
LOCATES AND SIMULATES  
WD-1652A CLOSED

**Conditions :**  
Cue: WD-1652A Is Closed

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

5 **Element :**  
RECORD RELEASE STOP  
DATE AND TIME , AND  
FINAL PRESSURE IN ATT. 1

**Standards :**  
RECORDS TERMINATION  
TIME AND DATE , AND FINAL  
PRESSURE IN ATT. 1

**Conditions :**

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

6 **Element :**  
PLACE PERMISSIVE SWITCH  
FOR RCV- 014 IN BLOCK  
AND REMOVE THE KEY

**Standards :**  
CONTACTS CONTROL ROOM  
TO BLOCK RCV-014

**Conditions :**  
Cue: RCV-014 Is In Block  
and The Key Is Removed

**Comments :**

**Critical Task?** N

**Satisfactory**

**Unsatisfactory**

**Terminating Cues :**

THE DECAY TANK RELEASE IS TERMINATED, THIS JPM IS COMPLETE

## **Candidate Cue Sheet**

AN APPROVED RELEASE OF 31 SMALL GAS DECAY TANK (SGDT) HAS BEEN IN PROGRESS FOR 2 HOURS, THE CONTROL ROOM SUPERVISOR HAS DIRECTED THAT THE RELEASE OF 31 SGDT BE TERMINATED IN ACCORDANCE WITH STEP 4.2.25 OF SOP-WDS-013.

YOU HAVE BEEN DIRECTED TO TERMINATE THE APPROVED RELEASE OF THE 31 SGDT IN ACCORDANCE WITH STEP 4.2.25 OF SOP-WDS-013



**Entergy**  
Nuclear Northeast

Procedure Use Is:

- Continuous
- Reference
- Information

Control Copy: \_\_\_\_\_

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Page 1 of 57

**This procedure is TSR**

**SOP-WDS-013, Revision: 18**

**GASEOUS WASTE RELEASES**

Nick De Vries

/

7/25/02

Writer

Date

/

Reviewer

Date

**Approved By:**

/

Procedure Sponsor, DM/Designee

Date

**Crew E**

Procedure Owner



**PARTIAL REVISION**

**REVISION SUMMARY**

(Page 1 of 1)

**1.0 REASON FOR REVISION**

1.1 Incorporated feedback (IP3-5347, 5649, 5813, 5816).

1.2 Procedure Upgrade.

**2.0 SUMMARY OF CHANGES**

2.1 Upgraded procedure by incorporating place keeping lines, no rev bars.

2.2 Step 2.5 corrected Con Edison IP2 Shift Supervisor to Unit 2 Shift Manager (IP3-5649).

2.3 Steps 2.5, 2.6 and 4.7.1 changed Chemistry General Supervisor to Chemistry Management.

2.4 Step 2.8.3 corrected Performance Group to Programs and Components Engineering.

2.5 Deleted step 4.2.1 note, requirement of the tracking sheets no longer applies (IP3-5813).

2.6 Corrected typo in step 4.2.12 bullet (IP3-5816)

2.7 Revised step 4.4.4 per chemist comment (IP3-5347).

2.8 Step 4.4.20.5 added sub step b) per Chemist feedback (IP3-5347).

2.9 Step 4.4.20.7 added sub step a) per Chemist feedback (IP3-5347).

2.10 Revised step 4.4.7 per Chemist feedback (IP3-5347).

**TABLE OF CONTENTS**

<b><u>Section</u></b>	<b><u>Title</u></b>	<b><u>Page</u></b>
1.0	PURPOSE.....	4
2.0	PRECAUTIONS AND LIMITATIONS.....	4
3.0	PREREQUISITES .....	6
4.0	PROCEDURE.....	7
	4.1 VC Pressure Relief Release Permits.....	7
	4.2 Large And Small Gas Decay Tank Release Permits .....	11
	4.3 VC Purge Release Permits.....	18
	4.4 RCS And SG Primary Side Maintenance .....	23
	4.5 Building Ventilation With Monitors OOS .....	29
	4.6 Computer Generated Airborne Release Permits .....	33
	4.7 Unplanned Gaseous Releases.....	34
5.0	REFERENCES .....	35
6.0	RECORDS AND DOCUMENTATION .....	36
 <b><u>Attachments</u></b>		
	ATTACHMENT 1, Gaseous Waste Release Permit Form.....	37
	ATTACHMENT 2, Example of VC Pressure Release Permit.....	38
	ATTACHMENT 3, Example of LGDT Release Permit .....	39
	ATTACHMENT 4, Example of VC Purge Release Permit.....	40
	ATTACHMENT 5, Example of RCS Eductor or S/G Manway Release Permit.....	41
	ATTACHMENT 6, Example of Continuous Release Permit with Discharge Monitors OOS .....	42
	ATTACHMENT 7, Example of Batch Release Permit With Discharge MONITORS OOS .....	43
	ATTACHMENT 8, Calculations for R-14 in Place of R-27.....	44
	ATTACHMENT 9, LGDT Release Verification Alignments .....	45
	ATTACHMENT 10, SGDT Release Alignment .....	49
	ATTACHMENT 11, Evaluation of Unplanned Gaseous Release .....	55
	ATTACHMENT 12, RCV-014 Valve Position Table .....	57

**1.0 PURPOSE**

- 1.1 This procedure establishes requirements for completion of radioactive gaseous release permits per AP-11, Radioactive Effluents Control Program.
- 1.2 This procedure applies to the following gaseous releases:
- VC pressure relief
  - Large and small gas decay tanks
  - VC purge
  - RCS and SG primary side maintenance
  - Bldg ventilation with monitors OOS

**2.0 PRECAUTIONS AND LIMITATIONS**

- 2.1 Alarm setpoints specified in this procedure refer to Alarm value on channel initiating any automatic isolation function.
- 2.2 Use of a particular release rate depends on expected evolution and rate of release:
- IF release rate is less than or equal to annual release rate, THEN Shift Manager (SM) or CRS authorization is required.
  - IF release rate is greater than annual release rate AND less than or equal to quarterly release rate, THEN Manager of Operations or Assistant Operations Manager (AOM) authorization is required.
  - IF release rate is greater than quarterly release rate AND less than or equal to instantaneous release rate, THEN Vice President Operations IP3 authorization is required.
- 2.3 WHEN instantaneous or quarterly release limits are authorized, THEN authorization SHALL be documented on release permit or appropriate SOP-RM-010 Table in CRS Waste Permit Book.

- 2.4 WHEN instantaneous release rate limit is used to perform a release, THEN a review of calculations SHALL be performed by Radiological Engineering or Chemistry:
- IF possible, THEN this review should be performed prior to release.
  - Allowable release rate may be adjusted following review based on ODCM allowed methodology.
- 2.5 By mutual agreement with Unit 2 Shift Manager, one unit can reduce or eliminate gaseous discharges to allow other unit to use full site permissible discharge rate:
- WHEN option is exercised, THEN SM SHALL document and Chemistry Management SHALL be informed.
- 2.6 WHEN a release is expected to continue greater than 2 days, THEN a new release permit SHALL be issued each day:
- VC purge release permits may be terminated at discretion of Chemistry Management and be considered as a continuous release until purge is terminated.
  - WHEN plant conditions change such that activity in VC may significantly change, THEN a new permit SHALL be issued.
- 2.7 Concurrent releases are evaluated using remaining available release rate (D):
- This method assumes all currently approved releases are occurring simultaneously.
  - In this case, the table in Step 4.5.8 provides authorized release rate for each pathway.
- 2.8 Preferred order of methods to obtain plant vent flow rate are as follows:
- 2.8.1 Flow instrument read out associated with R-27, on RM-23A module.
- 2.8.2 Flow instrument associated with CFMS display 255.
- 2.8.3 Programs and Components Engineering flow measurement for associated fan/ventilation configuration or rated fan flow rate.

- 2.9 R-27, Plant Vent Noble Gas Monitor, is the final effluent release monitor used in calculations throughout this procedure:
- IF R-27 is OOS, THEN R-14 may be used provided setpoint is adjusted to current authorized value.
  - Method to substitute R-14 in release calculations is described in Attachment 8.
- 2.10 Quarterly radiation monitor (RM) conversion factors are supplied by Chemistry and maintained in Waste Permit Book in Control Room.
- 2.11 Digital RMs are equipped with an ALERT alarm:
- With the exception of R-11 and R-12, the Alert setpoint may be set (as per SOP-RM-010) at CRS discretion to provide early indication of approaching High Alarm setpoint.
  - R-11 and R-12 Alert setpoint changes require concurrence from Chemistry or HP due to VAPOR CONTAINMENT EVACUATION alarm, which occurs at Alert setpoint.
- 2.12 WHEN this procedure is revised or changed per Temporary Procedure Change (TPC), THEN a review SHALL be performed for impact on associated Control Room Computer program.
- 2.13 Gaseous waste in gas decay tanks is evaluated prior to release for potential impact on effluent limits. Further decay may be necessary based on ODCM calculations performed by Chemistry.
- 2.14 IF a release has NOT been started within 24 hours after associated sample has been obtained, THEN a new sample should be obtained and analyzed prior to starting release **{Reference 5.1.4}**.
- 2.15 Release permits can be electronically generated from the Control Room (CR) menu system, which prepares the permit per existing procedural instructions.

### 3.0 PREREQUISITES

- 3.1 Requirements of AP-11, Radioactive Effluents Control Program, for gaseous releases have been reviewed.

- \_\_\_ 4.2.21 ENSURE IV of gas decay tank release path per applicable attachment is complete:
- \_\_\_ • Attachment 9 LGDT Release Verification Alignments
  - \_\_\_ • Attachment 10 SGDT Release Verification Alignments
- \_\_\_ 4.2.22 WHEN valve alignment has been verified, THEN:
- \_\_\_ 4.2.22.1 REQUEST CRS/SM sign for verification of release alignment on Attachment 1. (23)
- \_\_\_ 4.2.22.2 REQUEST CRS/SM authorize release on Attachment 1. (24)
- \_\_\_ 4.2.22.3 OBTAIN key to permissive switch for RCV-014 and PLACE switch in UNBLOCK (on Radiation Monitoring Control Panel).
- \_\_\_ 4.2.22.4 OPEN WD-PCV-1040, Gas Decay Tanks Release Header Pressure Control Valve, to maintain approximately 20-psig downstream pressure.

**CAUTION**

- The following step initiates release to environment.
- Conservative setting SHALL NOT be exceeded.

- \_\_\_ 4.2.22.5 Slowly OPEN RCV-014, Plant Vent Radiation control valve, to lift setting recorded on Attachment 1. (31)
- \_\_\_ 4.2.23 RECORD Release Start date and time on Attachment 1. (25)
- \_\_\_ 4.2.24 Periodically MONITOR plant vent activity.
- \_\_\_ 4.2.25 WHEN tank is empty OR release is to be terminated, THEN:
- \_\_\_ 4.2.25.1 CLOSE RCV-014, Plant Vent Radiation control valve.
- \_\_\_ 4.2.25.2 CLOSE WD-PCV-1040, Gas Decay Tanks Release Header Pressure Control Valve, by setting to less than 0.
- \_\_\_ 4.2.25.3 PERFORM restoration section of applicable Attachment 9 or 10 for released gas decay tank.
- \_\_\_ 4.2.25.4 RECORD Release Stop date and time and Final Pressure in tank on Attachment 1. (27) (26).
- \_\_\_ 4.2.25.5 PLACE permissive switch for RCV-014 in BLOCK and REMOVE key.

**ATTACHMENT 10,  
SGDT RELEASE ALIGNMENT**  
(Page 1 of 6)

**31 SMALL GAS DECAY TANK**

Date: \_\_\_\_\_

<b>RELEASE ALIGNMENT</b>				
<b>VALVE NUMBER</b>	<b>VALVE DESCRIPTION</b>	<b>REQUIRED POSITION</b>	<b>ALIGNED BY</b>	<b>VERIFIED BY</b>
WD-1641A	N <sub>2</sub> Supply to 31 SGDT Isolation	CLOSED		
WD-1642A	31 SGDT Drain (1)	CLOSED		
WD-1651A	31 SGDT Fill Isolation (1)	CLOSED		
WD-1676A	PT-1052 Root Isolation	OPEN		
WD-1652A	31 SGDT to Release Header Isolation	OPEN		
WD-1652B	32 SGDT to Release Header Isolation	CLOSED		
WD-1652C	33 SGDT to Release Header Isolation	CLOSED		
WD-1652D	34 SGDT to Release Header Isolation	CLOSED		
WD-1652E	35 SGDT to Release Header Isolation	CLOSED		
WD-1652F	36 SGDT to Release Header Isolation	CLOSED		
WD-1617	31 LGDT to Release Header Isolation	CLOSED		
WD-1618	32 LGDT to Release Header Isolation	CLOSED		
WD-1619	33 LGDT to Release Header Isolation	CLOSED		
WD-1620	34 LGDT to Release Header Isolation	CLOSED		

(1) Actual nomenclature for these valves on label is Small Gas Decay Tank.

The above valve alignment has been verified correct \_\_\_\_\_ **{Reference 5.1.2}**  
CRS/SM

<b>RESTORATION ALIGNMENT</b>				
<b>VALVE NUMBER</b>	<b>VALVE DESCRIPTION</b>	<b>REQUIRED POSITION</b>	<b>ALIGNED BY</b>	<b>VERIFIED BY</b>
WD-1652A	31 SGDT to Release Header Isolation	CLOSED		