

## **Draft Submittal**

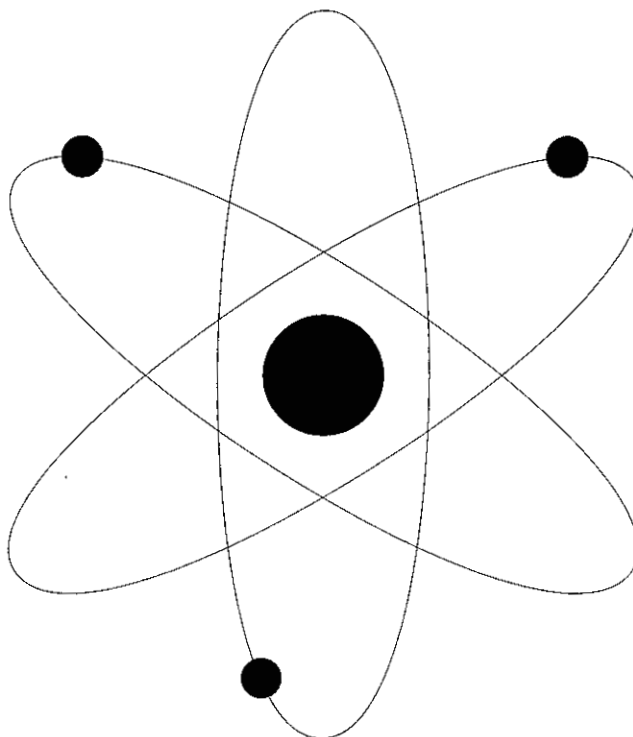
(Risk Review)

### **MCGUIRE JUNE 2003 EXAM 50-369/2003-301 AND 50-370/2003-301**

**JUNE 16 - 30, 2003**

1. Administrative Questions/JPMs
2. In-plant JPMs
3. Control Room JPMs (simulator JPMs)
4. Administrative Topics Outline ES-301-1
5. Control Room Systems and Facility Walk-Through  
Test Outline ES-301-2

**MASTER COPY**



**2003 NRC ADMIN  
RO/SRO EXAM SETS**

Facility: McGuire

Date of Examination: Weeks of June 16 and 23, 2003

Examination Level (circle one): **RO** / SRO

Operating Test Number: \_\_\_\_\_

Administrative Topic  
/Subject  
Description— (see Note)

Describe activity to be performed ~~method of evaluation:~~

1. ~~ONE Administrative JPM, OR~~
2. ~~TWO Administrative Questions~~

A.1

Conduct of Operations

Calculate QPTR with Technical Specification Evaluation

Conduct of Operations

Calculate Boron Change For Rod Change  
(Modified, Common)

A.2

Equipment Control

Identify Boundaries for Tagout  
(New)

A.3

Radiation Control

Determine Dress Requirements for RWP

A.4

Emergency Plan

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

Reviewed By 5th Hahn

Approved By CD Connel

TASK: **Calculate QPTR with an Inoperable Power Range Instrument**

POSITION: **RO**

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Operator's Name \_\_\_\_\_

Validation Time: 20 minutes

Location: **Control Room**

Method: **Perform**

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date    /    /   

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References: See Attachments

Attachments: PT/1/A/4600/021A Loss of Operator Aid Computer while in Mode 1  
MNS Unit #1 Data Book – Table 2.2

### INITIAL CONDITIONS

At 0000 the Unit 1 OAC failed and is not operating. Therefore, the QPTR alarm is inoperable. The vendor is being consulted concerning repairs. It is estimated it will take approximately 15 hours to complete repairs. Repairs should be complete at approximately 1500.

At 0600, Unit 1 Power Range N44 upper detector failed low.

In order to determine QPTR an attempt to use the Moveable Incore Detector System has failed due to a failure of the main incoming breaker. A breaker is on order and will not be on site for seven to ten days.

As a result power was reduced on the unit to 74%. Power Range N44 has been declared inoperable and removed from service by procedure.

**The Control Room SRO directs you to perform Step 12.12 of PT/1/A/4600/21A Loss of Operator Aid Computer while in Mode 1 for current plant conditions.**

JPM OVERALL STANDARD: Determines QPTR is out of limits and ensures Tech Spec compliance.

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator determines they need a copy of PT/1/A/4600/021A enclosure 13.5	Provide operator with a working copy of PT after they pull PT.		
2	Operator obtains Measured currents from NI cabinet's current meters.	<b>Cue candidate with each detector data:</b> <b>NI-41 detector:</b> A (left)        300 B (right)      320 <b>NI-42 detector:</b> A (left)        305 B (right)      310 <b>NI-43 detector:</b> A (left)        305 B (right)      310 <b>NI-44 detector:</b> A (left)        0 B (right)      0		
3	Operator obtains calibration data from Data Book Table 2.2	<b>Cue:</b> Provide operator with data book table after they locate table		
*4	Operator determines Average RF of A detectors	Operator correctly calculates average RF		
*5	Operator determines Average RF of B detectors	Operator correctly calculates average RF		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	Operator determines tilt for each detector	Operator correctly calculates tilt		
*7	Operator determines that a quadrant is $>1.02$ and <ul style="list-style-type: none"><li>• Refers to ITS</li></ul> OR <ul style="list-style-type: none"><li>• Informs the Control Room SRO of the condition.</li></ul>	Operator determines that a quadrant is $>1.02$ and <ul style="list-style-type: none"><li>• Refers to ITS</li></ul> OR <ul style="list-style-type: none"><li>• Informs the Control Room SRO of the condition.</li></ul>		

OP/1/A/6100/022

# Enclosure 4.3

Table 2.2

Excure Currents and Voltages Correlated to 100% Full Power at Various Axial Offsets

Unit = 1 Cycle = 16

Full Power Detector Currents (MicroAmps) Corresponding To Various Incore Axial Offsets

Incore Axial Offset	Detector N41		Detector N42		Detector N43		Detector N44	
	T	B	T	B	T	B	T	B
30	212.4	156.2	218.1	158.2	214.0	162.7	210.8	159.6
20	200.1	169.2	205.4	170.5	202.2	175.6	198.7	173.4
10	187.8	182.2	192.8	182.8	190.3	188.6	186.7	187.1
0	175.5	195.2	180.2	195.1	178.5	201.5	174.7	200.9
-10	163.2	208.2	167.5	207.4	166.6	214.4	162.7	214.7
-20	151.0	221.2	154.9	219.7	154.8	227.4	150.6	228.5
-30	138.7	234.2	142.2	232.0	143.0	240.3	138.6	242.3

Correlation Coef.= 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000 1.0000

Normalized Detector Voltages (Volts At Various Axial Offsets)

Incore Axial Offset	Detector N41			Detector N42			Detector N43			Detector N44		
	T	B	T-B	T	B	T-B	T	B	T-B	T	B	T-B
30	10.079	6.665	3.414	10.083	6.754	3.329	9.988	6.725	3.263	10.050	6.616	3.434
20	9.496	7.220	2.276	9.499	7.279	2.220	9.435	7.260	2.175	9.477	7.187	2.290
10	8.913	7.775	1.138	8.914	7.805	1.109	8.883	7.795	1.088	8.903	7.759	1.144
0	8.330	8.330	0.000	8.330	8.330	0.000	8.330	8.330	0.000	8.330	8.330	0.000
-10	7.747	8.885	-1.138	7.746	8.855	-1.109	7.777	8.865	-1.088	7.757	8.901	-1.144
-20	7.164	9.440	-2.276	7.161	9.381	-2.220	7.225	9.400	-2.175	7.183	9.473	-2.290
-30	6.581	9.995	-3.414	6.577	9.906	-3.329	6.672	9.935	-3.263	6.610	10.044	-3.434

AFD Incore/Excure Ratios For Quadrants 1 - 4

	Quad 4 N41	Quad 2 N42	Quad 1 N43	Quad 3 N44
M=	1.464	1.501	1.532	1.455

Prepared By: Ryan M. Jones W. A. Gust

Date: 1/7/2003 Time: 4:35 PM



# ANSWER KEY

Enclosure 13.5

PT/1/A/4600/021 A

## Calculation Sheet For Quadrant Power Tilt

Page 2 of 2

### Part B

Sheet 1 of 1

Date PRESENT

Time <sup>2</sup> PRESENT

Initials STUDENT

	PR-4 <u>1</u>		PR-4 <u>2</u>		PR-4 <u>3</u>	
	A	B	A	B	A	B
1) Measured Current	300	320	305	310	305	310
2) Calibration Current	175.5	195.2	180.2	195.1	178.5	201.5
3) Relative Flux (RF)	1.709	1.639	1.693	1.589	1.709	1.538

- 1) From NI cabinet's current meter (located on respective PR B Drawers). Ensure Detector Milliamp Range Switches are in "0.5" position and read 0-500 microamp scale.
- 2) From most recent calibration data using "0" Incore Axial Offset Current in Data Book, Table 2.2 ("I<sub>T</sub>" for detector "A", "I<sub>B</sub>" for detector "B").
- 3) Divide line 1 by line 2 to calculate Relative Flux (RF) for each upper (A) and lower (B) detector.

**Quadrant Power Tilts:** Calculate by dividing each upper relative flux by the average upper relative flux and dividing each lower relative flux by the average lower relative flux

$$\text{Avg RF of A Detectors} = \frac{1.709}{\text{RF of PR-4}_A} + \frac{1.693}{\text{RF of PR-4}_A} + \frac{1.709}{\text{RF of PR-4}_A} \times \frac{1}{3} = 1.704$$

(RFA)

$$\text{Avg RF of B Detectors} = \frac{1.639}{\text{RF of PR-4}_B} + \frac{1.589}{\text{RF of PR-4}_B} + \frac{1.538}{\text{RF of PR-4}_B} \times \frac{1}{3} = 1.589$$

(RFB)

$$\text{PR-4 } \underline{1} \text{ A Tilt} = \frac{\text{RF of PR-4 } \underline{1} \text{ A}}{\text{RFA}} = 1.003$$

$$\text{PR-4 } \underline{1} \text{ B Tilt} = \frac{\text{RF of PR-4 } \underline{1} \text{ B}}{\text{RFB}} = 1.031$$

$$\text{PR-4 } \underline{2} \text{ A Tilt} = \frac{\text{RF of PR-4 } \underline{2} \text{ A}}{\text{RFA}} = .994$$

$$\text{PR-4 } \underline{2} \text{ B Tilt} = \frac{\text{RF of PR-4 } \underline{2} \text{ B}}{\text{RFB}} = 1.00$$

$$\text{PR-4 } \underline{3} \text{ A Tilt} = \frac{\text{RF of PR-4 } \underline{3} \text{ A}}{\text{RFA}} = 1.003$$

$$\text{PR-4 } \underline{3} \text{ B Tilt} = \frac{\text{RF of PR-4 } \underline{3} \text{ B}}{\text{RFB}} = .968$$

End of Enclosure

<sup>2</sup> **WHEN** greater than 50% RTP but less than 75% RTP, calculation performed within 12 hours and every 12 hours thereafter while QPTR Alarm inoperable **AND** one PR channel input inoperable.

Unit 1

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## INITIAL CONDITIONS

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At 0600, Unit 1 Power Range N44 upper detector failed low.

In order to determine QPTR an attempt to use the Moveable Incore Detector System has failed due to a failure of the main incoming breaker. A breaker is on order and will not be on site for seven to ten days.

As a result power was reduced on the unit to 74%. Power Range N44 has been declared inoperable and removed from service by procedure.

**The Control Room SRO directs you to perform Step 12.12 of PT/1/A/4600/21A Loss of Operator Aid Computer while in Mode 1 for current plant conditions.**

<b>Duke Power Company</b> <b>McGuire Nuclear Station</b>  <b>Loss Of Operator Aid Computer While In Mode 1</b>   <b>Continuous Use</b>		Procedure No. <b>PT/ 1/A/4600/021 A</b>
		Revision No. <b>023</b>
		Electronic Reference No. <b>MC00483T</b>
<b>PERFORMANCE</b>	<b>***** UNCONTROLLED FOR PRINT *****</b>  <b>(ISSUED) - PDF Format</b>	

Revision History (significant issues, limited to one page)

- Rev 023 (10-30-02)  
Per PIP 4090, made changes to Step 12.6 (Electrical Surveillance Items) and Enclosure 13.1 to eliminate unnecessary recording of data if the opposite Unit's Switchboard Log is recording MWH data. If neither Unit is capable of obtaining electrical data, the Digital Counters must be used for recording in Enclosure 13.1.  
-Added OAC Points to Enclosure 13.7 to identify partial loss of OAC for RP's PI Data.
- Rev 022 (10/08/02)  
The following changes were made:
- Reworded Step 12.5 for recording Electrical Surveillance Items.
  - Changed Encl. 13.1 Hourly Dispatcher Report for ease of recording data.
- Rev 021 (6/10/02)
- Changed "IAE" to "Eng OAC Group" for group to notify when OAC out of service
  - Reformatted step on monitoring QPTR. (Step 12.12). When one power range out of service, deleted note and added information as a new step
- Rev 020 (3-20-02)
- Added Step 12.2.3 to notify RP Shift that OAC is OOS and that PI Data is unavailable.
  - Added Step 12.15 to notify RP Shift when OAC is returned to service. {PIP 01-4284
  - Deleted Steps 12.5.4 and 12.15 associated with IAE placing/removing Easterline Angus recorders to/from service. {PIPs 01-2645, 4176}
  - Added Step 12.5.4 for guidance to perform "Manual Trigger" of Analog Fault Recorder instead of having IAE operate Easterline Angus recorder.
  - Added new Enclosure 13.9 (Manual Trigger of Analog Fault Recorder).
  - Modified Enclosure 13.1 to record MW meter readings.
- Rev 019 (7/30/01)  
Added criteria (step 12.8) requiring containment ventilation temperatures if a containment fire watch is in affect also added to acceptance criteria.
- Rev 018 2/28/01:  
Made changes to support implementation of CA Storage Tank Mod NSM-MG-12518.
- Rev 017 9/12/2000  
Enclosure 13.4, Corrected footnotes for both upper and lower containment per PIP-0-M00-0552. Also converted to new template and brought procedure in line with Writer's Manual. A 10CFR50.59 Evaluation is not required for this change.

## Unit 1

## **Loss Of Operator Aid Computer While In Mode 1**

### **1. Purpose**

To document Tech Spec requirements in the event the Operator Aid Computer (OAC) is out of service (completely or partially) while in Mode 1.

### **2. References**

#### **2.1 Tech Specs:**

- ITS SR 3.1.4.1 (Rod Group Alignment Limits)
- ITS SR 3.1.6.2 (Control Bank Insertion Limits)
- ITS SR 3.2.3.1 (AFD)
- ITS SR 3.2.4.1 (QPTR)
- ITS SR 3.4.1.1 (NC Loop Flow)
- ITS 3.4.15 (NC System Leakage Detection Instrumentation)
- ITS SR 3.6.5.1 (VU) and ITS SR 3.6.5.2 (VL) (Containment Air Temperature)

#### **2.2 Core Operating Limits Report (COLR)**

### **3. Time Required**

- 3.1 One operator until OAC restored to service every time OAC out of service (completely or partially).

### **4. Prerequisite Tests**

None

### **5. Equipment Required**

- 5.1 Instrument capable of converting RTD resistance readings to temperature readings (Platinum 100 ohm) for Step 12.10.
- 5.2 Calibrated digital thermometer, capable of reading ambient air temperatures (Examples: Tegan 871, Keithley 871 or comparable instrument) for Step 12.13.

### **6. Limits and Precautions**

- 6.1 An evaluation should be made to determine if information is available elsewhere and effects of operation without this information for any Annunciator or recorder out of service which OAC was being used as a substitute monitor.

## **Unit 1**

## 7. Unit Status

\_\_\_ 7.1 Unit 1 in Mode 1.

## 8. Prerequisite System Conditions

\_\_\_ 8.1 Unit 1 OAC out of service (completely or partially).

## 9. Test Method

Control Room operator shall ensure all items listed in attached enclosures are checked while OAC out of service (completely or partially).

## 10. Data Required

10.1 Completed Enclosures 13.1 - 13.6, 13.8, 13.9 as required.

## 11. Acceptance Criteria

11.1 IF any Unit 1 MWH OAC Point out of service, Enclosure 13.1 (Hourly Dispatcher Report) performed with all MWH readings recorded.

11.2 IF greater than or equal to 50% RTP, Axial Flux Difference (AFD) monitored as follows:

11.2.1 AFD recorded per Enclosure 13.2 (Axial Flux Difference Monitoring) Part A (Using Control Board AFD Meters) within 1 hour and every hour there after until OAC AFD Monitor Alarm operable.

11.2.2 IF Main Control Board (MCB) AFD gauges inoperable, Enclosure 13.2 (Axial Flux Difference Monitoring) Part B (Manual AFD Calculations) performed within 1 hour and every hour thereafter until OAC AFD Monitor Alarm OR MCB AFD gauges operable.

11.3 For Control Rod Position:

- All full length rods (individual rod positions) have been checked within 4 hours and every 4 hours thereafter to be within 12 steps (indicated position) of their group demand position and operable.
- IF Annunciator 1AD-2, B9 (Control Rod Bank Lo-Lo Limit) out of service, each Control Bank has been checked within 4 hours and every 4 hours thereafter to be above rod insertion limits as specified in COLR.

# Unit 1

**NOTE:** Containment lower compartment temperature may be between 120 - 125°F for up to 90 cumulative days per calendar year provided lower compartment temperature average over previous 365 days is less than 120°F. Within this 90 cumulative day period, lower compartment temperature may be between 125 - 135°F for 72 cumulative hours.

- 11.4 Containment air temperatures have been checked once per hour after OAC has been out of service for 4 hours. Tech Spec Containment average air temperature shall be 75 - 100°F for containment upper compartment AND 100 - 120°F for containment lower compartment (See NOTE).
- 11.5 IF a Containment fire watch in affect AND containment air temperatures are being used to satisfy requirements, temperatures have been checked once per hour. (SLC 16.9.6)
- 11.6 WHEN above 50% RTP, Enclosure 13.5 (Calculation Sheet for Quadrant Power Tilt) has been calculated once within 12 hours and every 12 hours thereafter and Quadrant Power Tilt Ratio (QPTR) checked less than or equal to 1.02.
- 11.7 IF outside temperature less than 32°F, within 2 hours FWST Level Instrument Room heaters are checked energized AND every 12 hours temperature checked greater than 40°F.
- 11.8 Required data recorded in PT/1/A/4200/040 (Reactor Coolant Leakage Detection) to determine if reactor coolant leakage into Reactor Building has increased.
- 11.9 CA Storage Tank temperature 32 - 138°F.

## Unit 1

## 12. Procedure

**NOTE:** A magenta OAC point indicates "Failed" or "Bad Quality". Some of these also indicate a partial loss of OAC.

- \_\_\_\_\_ 12.1 **IF** this procedure is entered due to a "Failed" or "Bad Quality" OAC point, go to Enclosure 13.7 (OAC Point List For Partial Loss Of OAC) to determine applicable sections of procedure to perform. All other sections of procedure may be marked NA.
- \_\_\_\_\_ 12.2 Notify Eng OAC Group that OAC is out of service (completely or partially) and needs to be returned to service as soon as possible.
- \_\_\_\_\_ / \_\_\_\_\_  
Person Contacted                      Date    Time
- \_\_\_\_\_ 12.3 Notify RP Shift that OAC is out of service and PI data collection is unavailable.
- \_\_\_\_\_ / \_\_\_\_\_  
Person Contacted                      Date    Time
- 12.4 Perform the following:
- 12.4.1 Enter the following in TSAIL for tracking increased surveillance frequency:
- \_\_\_\_\_ • Rod Position Deviation Monitor (ITS SR 3.1.4.1)
  - \_\_\_\_\_ • AFD Monitor Alarm (ITS SR 3.2.3.1)
  - \_\_\_\_\_ • QPTR Alarm (ITS SR 3.2.4.1)
- \_\_\_\_\_ 12.4.2 **IF** Annunciator 1AD-2, B9 (Control rod Bank Lo-Lo Limit) unavailable, enter Rod Insertion Limit Monitor (ITS SR 3.1.6.2) in TSAIL for tracking increased surveillance frequency.
- ☐ 12.5 Reduce turbine generator load as required to maintain indicated Reactor Power level less than 100% as indicated on NI Power Range Meters. {PIP-1-M99-0578}

## Unit 1



12.6 Record Unit 1 Electrical Surveillance Items as follows:

- ☐ 12.6.1 Check the following Unit 1 MWH OAC Points by entering "Turn-on Code" "GD MWH":

- M1P1103 (Unit 1 Gross MWH Counter)
- M1P1109 (1A D/G Compensated MWH Hours)
- M1P1111 (1B D/G Compensated MWH Hours)
- M1P1104 (1ATA Auxiliary MWH Counter)
- M1P1105 (1ATB Auxiliary MWH Counter)
- M1P0407 (U1 Net MWH)

- \_\_\_\_\_ 12.6.2 **IF** all Unit 1 MWH OAC Points in service **AND** M1L1201 (U1 SOC External Gateway Link Status) in service, exit this procedure section.

**NOTE:**

- **IF** Unit 2 OAC in service, Unit 1 MWH data is available on Unit 2 Switchboard Log.
- System Operating Center (SOC) can be contacted using old Dispatcher Red Phone or 704-382-4413.

- \_\_\_\_\_ 12.6.3 **IF** all Unit 1 MWH OAC Points in service **AND** M1L1201 (U1 SOC External Gateway Link Status) out of service, perform the following:

- \_\_\_\_\_ 12.6.3.1 **IF** Unit 2 OAC Point M2L1201 (U2 SOC External Gateway Link Status) in service, notify SOC that Unit 1 MWH data must be obtained via Unit 2 OAC Switchboard Log.

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted      Date      Time

- ☐ A. Exit this procedure section.

**Unit 1**

\_\_\_\_\_ 12.6.3.2 **IF** Unit 2 OAC Point M2L1201 (U2 SOC External Gateway Link Status) out of service, perform the following:

\_\_\_\_\_ A. Notify SOC that Unit 1 MWH data unavailable.

\_\_\_\_\_  
Person Contacted                      Date / Time

\_\_\_\_\_ B. **IF** Unit 2 OAC Switchboard Log unavailable, record Unit 1 MWH readings on Enclosure 13.1 (Hourly Dispatcher Report) every hour on the hour using Digital Counters located in Control Room behind control board.

\_\_\_\_\_ 1. **WHEN** Enclosure 13.1 (Hourly Dispatcher Report) completed, place routing stamp in remarks section of cover sheet and check (✓) "Other" and fill in "Ops Test Group (MG01OP) (Enclosure 13.1 only)".

\_\_\_\_\_ 12.6.4 **IF** any Unit 1 MWH OAC Point out of service, perform the following:

\_\_\_\_\_ 12.6.4.1 Notify SOC that Unit 1 MWH data unavailable.

\_\_\_\_\_  
Person Contacted                      Date / Time

☐ 12.6.4.2 Record Unit 1 MWH readings on Enclosure 13.1 (Hourly Dispatcher Report) every hour on the hour using Digital Counters located in Control Room behind control board.

\_\_\_\_\_ 12.6.4.3 **WHEN** Enclosure 13.1 (Hourly Dispatcher Report) completed, place routing stamp in remarks section of cover sheet and check (✓) "Other" and fill in "Ops Test Group (MG01OP) (Enclosure 13.1 only)".

**Unit 1**

- \_\_\_\_\_ 12.7 **IF** OAC will be out of service for greater than 48 hours, perform Manual Trigger of Analog Fault Recorder as follows:
- \_\_\_\_\_ 12.7.1 **WHEN** OAC has been out of service for 48 hours, notify System Engineering.
- \_\_\_\_\_ / \_\_\_\_\_  
Person Contacted Date Time
- \_\_\_\_\_ 12.7.2 Depress "Manual Trigger" on Analog Fault Recorder (located on EB7) every hour until OAC is returned to service.
- ☐ 12.7.3 Record manual trigger of Analog Fault Recorder on Enclosure 13.9 (Manual Trigger of Analog Fault Recorder) every hour.
- \_\_\_\_\_ 12.8 **IF** AFD Monitor Alarm inoperable **AND** greater than or equal to 50% RTP, perform the following:
- \_\_\_\_\_ 12.8.1 **IF** MCB AFD gauges operable, record AFD within 1 hour and every hour thereafter on Enclosure 13.2 (Axial Flux Difference Monitoring) Part A until OAC AFD Monitor Alarm operable.
- \_\_\_\_\_ 12.8.2 **IF** MCB AFD gauges inoperable, check AFD by performing Enclosure 13.2 (Axial Flux Difference Monitoring) Part B within 1 hour and every hour thereafter until OAC AFD Monitor Alarm **OR** MCB AFD gauges operable.
- \_\_\_\_\_ 12.8.2.1 **IF** MCB AFD gauges restored operable **AND** AFD Monitor Alarm remains inoperable, perform Step 12.8.1.
- 12.9 For Control Rods, perform the following:
- \_\_\_\_\_ 12.9.1 Record within 4 hours and every 4 hours thereafter that the position of each full length rod to be within 12 steps of its group demand position and operable on Enclosure 13.3 (Full Length Rod Verification Data ) Part A.
- \_\_\_\_\_ 12.9.2 **IF** Annunciator 1AD-2, B9 (Control Rod Bank Lo-Lo Limit) unavailable, record within 4 hours and every 4 hours thereafter that each Control Bank of rods are above Rod Insertion Limit on Enclosure 13.3 (Full Length Rod Verification Data) Part B.

## Unit 1

\_\_\_\_\_ 12.10 **IF** a Containment Fire watch in affect **OR** OAC has been out of service for greater than four hours, perform the following for Containment Air Temperature:

- NOTE:**
- Instrument connection can be made to computer cabinet 1AT5, Terminal Block Location R1 (See MC-1790-17.01 for terminal location.) **OR** to applicable terminals in computer room, as desired.
  - **IF** using a Fluke 743, set it to read RTD (Pt 100 (3916)) and 3 wire hook up.

\_\_\_\_\_ 12.10.1 Notify IAE to obtain temperature readings, using an instrument capable of converting RTD resistance (Platinum 100 ohm) readings to temperature readings:

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted                      Date    Time

Ventilation Unit	1AT5 Terminals TB1 (R1)	Serial Number	Analog Number
VU 1A	13, 14, 15	M1AVU001	M1A1204
VU 1B	16, 17, 18	M1AVU003	M1A1210
VU 1C	19, 20, 21	M1AVU005	M1A1216
VU 1D	22, 23, 24	M1AVU007	M1A1222
VL 1A	25, 26, 27	M1AVL001	M1A1228
VL 1B	28, 29, 30	M1AVL003	M1A1234
VL 1C	31, 32, 33	M1AVL005	M1A1240
VL 1D	34, 35, 36	M1AVL007	M1A1246

\_\_\_\_\_ 12.10.2 Record temperatures on Enclosure 13.4 (Containment Air Temperatures) every hour.

## Unit 1

- \_\_\_\_\_ 12.11 **IF** OAC has been out of service for greater than four hours, perform the following for CA Storage Tank Temperature:

**NOTE:**

- Instrument connection can be made to computer cabinet 1AT4, Terminal Block Location R1 (See MC-1790-17.02 for terminal location.) **OR** to applicable terminals in computer room, as desired.
- **IF** using a Fluke 743, set it to read RTD (Pt 100 (3916)) and 3 wire hook up.

- \_\_\_\_\_ 12.11.1 Notify IAE to obtain temperature readings, using an instrument capable of converting RTD resistance (Platinum 100 ohm) readings to temperature readings:

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted      Date      Time

Description	1AT4 Terminals TB1 (R1)	Analog Number
Upper CAST Temp	64, 65, 66	M1A1377
Middle CAST Temp	67, 68, 69	M1A1371
Lower CAST Temp	70, 71, 72	M1A1342

- ☐ 12.11.2 Record temperatures on Enclosure 13.8 (CA Storage Tank Temperatures) every hour.

- \_\_\_\_\_ 12.12 **IF** QPTR Alarm inoperable **AND** greater than 50% RTP, perform the following:

- \_\_\_\_\_ 12.12.1 **IF** all Power Range (PR) channel inputs to QPTR operable, calculate QPTR on Enclosure 13.5 (Calculation Sheet For Quadrant Power Tilt) Part A within 12 hours and every 12 hours thereafter until QPTR Alarm operable.

- \_\_\_\_\_ 12.12.2 **IF** input from one PR channel is inoperable, perform the following:

- \_\_\_\_\_ 12.12.2.1 **IF** less than 75% RTP, calculate QPTR on Enclosure 13.5 (Calculation Sheet For Quadrant Power Tilt) Part B using other 3 PR channels.

- \_\_\_\_\_ A. Record PR channels used within 12 hours and every 12 hours thereafter until QPTR Alarm operable **OR** inoperable PR input operable.

## Unit 1

- \_\_\_\_\_ 12.12.2.2 **IF** greater than or equal to 75% RTP, have Reactor Engineering perform PT/0/A/4150/007 (Verification of QPTR Using Incore Detectors) every 12 hours until QPTR Alarm operable **OR** the inoperable PR input operable.
- \_\_\_\_\_ 12.12.2.3 **WHEN** PR channel restored, monitor QPTR per Step 12.12.1.
- \_\_\_\_\_ 12.12.3 **IF** QPTR is greater than 1.02, refer to ITS 3.2.4 for subsequent action.
- \_\_\_\_\_ 12.13 **IF** outside air temperature is less than 32°F, perform the following:

<p><b>NOTE:</b></p> <ul style="list-style-type: none"><li>• FWST Level Instrument Room located within FWST concrete enclosure.</li><li>• RWP, dosimetry and Security are required for access to FWST enclosure.</li></ul>
---

- 12.13.1 Within 2 hours, check power to FWST Level Instrument Room heaters by ensuring closed:
- \_\_\_\_\_ • Normal heater - Panel board 1KG, Bkr 17
  - \_\_\_\_\_ • Backup heater - Panel board 1KC, Bkr 13
- ☐ 12.13.2 Obtain a calibrated digital thermometer, capable of reading ambient air temperatures (Examples: Tegan 871, Keithley 871, or comparable instrument). Instrument can be obtained at tool issue point in Service Building truck corridor.
- ☐ 12.13.3 Every 12 hours, check Unit 1 FWST Level Instrument Room area temperature (in vicinity of FWST Level Instruments) greater than 40°F.
- ☐ 12.13.3.1 Record on Enclosure 13.6 (FWST Level Instrument Room Temperature).
- \_\_\_\_\_ 12.14 **IF** any of the following are out of service, perform PT/1/A/4200/040 (Reactor Coolant Leakage Detection) until all are returned to service:
- OAC
  - M1P0591 (1EMF39(L) Difference Last 60 Minutes)
  - M1P0592 (1EMF38(L) Containment Leakage Alarm)
  - M1P1069 (U1 Total Cont Floor & Equip Sump Lvl Rate)

## Unit 1

**NOTE:** Tech Spec Total NC Loop Flow calculation must be performed prior to 0700 or 1900 to comply with ITS 3.4.1. Data collection and manual calculations require 4 hours to complete for surveillance item.

\_\_\_\_\_ 12.15 **IF** between hours of 0400-0700 or 1600-1900, perform surveillance of Total NC Loop Flow for PT/1/A/4600/003 A (Semi-Daily Surveillance Items) as follows:

\_\_\_\_\_ 12.15.1 Notify NC System Engineer or designee.

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted                      Date    Time

\_\_\_\_\_ 12.15.2 **IF** valid PI data available, use PI data to meet surveillance requirement for Total NC Loop Flow as follows:

\_\_\_\_\_ 12.15.2.1 Obtain PI data for point M1P1085 and record Total NC Loop Flow:

\_\_\_\_\_ gpm.

\_\_\_\_\_ 12.15.2.2 Record Date/Time for valid Total NC Loop Flow data used from PI data (prior to OAC being out of service).

\_\_\_\_\_/\_\_\_\_\_  
Date      Time

**NOTE:** **IF** surveillance of Total NC Loop Flow performed prior to normal surveillance time period, surveillance must be performed an additional time to return surveillance period to the normal surveillance period of 0400-0700 or 1600-1900.

\_\_\_\_\_ 12.15.2.3 Ensure Total NC Loop Flow surveillance is performed within 12 hours from Date/Time surveillance was performed in Step 12.15.2.2 for which PI data was used.

\_\_\_\_\_ 12.15.2.4 Ensure Total NC Loop Flow is logged on Conditional Surveillance Board until returned to normal surveillance period with OAC operable.

## Unit 1

\_\_\_\_\_ 12.15.3 **IF** valid PI data unavailable, perform manual calculation as follows:

\_\_\_\_\_ 12.15.3.1 Notify Work Control SPOC to obtain 7300 voltage readings for NC Loop  $T_{hot}$ ,  $T_{cold}$ , and NC Loop Flow transmitters per PT/1/A/4150/013 B (Manual NC Flow Calculation).

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted      Date      Time

\_\_\_\_\_ 12.15.3.2 Notify NC System Engineer or designee to perform PT/1/A/4150/013 B (Manual NC Flow Calculation).

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted      Date      Time

Record Total NC Flow: \_\_\_\_\_ gpm

\_\_\_\_\_/\_\_\_\_\_  
Calculations Performed By      Date      Time

**NOTE:** Tech Spec Power Range/Heat Balance (Thermal Power) calculation must be performed prior to 0700. Data used for Manual NC Flow Calculation is required for calculation of Power Range/Heat Balance (Thermal Power) for PT/1/A/4600/003 B (Daily Surveillance Items).

\_\_\_\_\_ 12.16 **IF** between hours of 0100-0700, perform surveillance of Power Range/Heat Balance (Thermal Power) calculation for PT/1/A/4600/003 B (Daily Surveillance Items) as follows:

\_\_\_\_\_ 12.16.1 Notify Reactor Group Engineer or designee.

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted      Date      Time

## Unit 1



\_\_\_\_\_ 12.16.2 **IF** valid PI data available, use PI data to meet surveillance requirement for Power Range/Heat Balance (Thermal Power) as follows:

\_\_\_\_\_ 12.16.2.1 Obtain the following PI data:

Point	Description	Data (%)
M1P1385	U1 Reactor Thermal Power, Best (Estimate)	
M1P1407	U1 Quad 1 (PR43) Excore/Thermal Power Mismatch	
M1P1408	U1 Quad 2 (PR42) Excore/Thermal Power Mismatch	
M1P1409	U1 Quad 3 (PR44) Excore/Thermal Power Mismatch	
M1P1410	U1 Quad 4 (PR41) Excore/Thermal Power Mismatch	

\_\_\_\_\_ 12.16.2.2 Record Date/Time for valid Power Range/Heat Balance (Thermal Power) data used from APD Inspector (prior to OAC being out of service):

\_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_

\_\_\_\_\_ 12.16.2.3 Determine power mismatch as follows:

- \_\_\_\_\_ • Use M1P1407, M1P1408, M1P1409, and M1P1410 of Step 12.16.2.1.

**OR**

- \_\_\_\_\_ • Compare M1P1385 (U1 Reactor Thermal Power, Best) to Control Board Power Range gauges.

**NOTE:** **IF** surveillance of Power Range/Heat Balance (Thermal Power) performed prior to normal surveillance time period, surveillance must be performed an additional time to return surveillance period to normal surveillance period of 0100-0700.

\_\_\_\_\_ 12.16.2.4 Ensure Reactor Power/Heat Balance (Thermal Power) surveillance is performed within 24 hours from Date/Time surveillance was performed in Step 12.16.2.2 for which PI data was used.

\_\_\_\_\_ 12.16.2.5 Ensure Power Range/Heat Balance (Thermal Power) logged on Conditional Surveillance Board until returned to normal surveillance period with OAC operable.

## Unit 1

\_\_\_\_\_ 12.16.3 **IF** valid PI data is unavailable, notify Reactor Group Engineer or designee to perform PT/0/A/4150/039 (Manual Calculation of Thermal Power).

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted                      Date    Time

\_\_\_\_\_/\_\_\_\_\_  
Calculation Performed By                      Date    Time

\_\_\_\_\_ 12.17 **WHEN** OAC returned to service, update and check the following:

- ☐ Xenon Data
- ☐ Burnup
- ☐ Thermal Outputs
- ☐ 100% Target AFD Values

\_\_\_\_\_ 12.17.1 Notify Reactor Group Duty Engineer values have been updated.

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted                      Date    Time

\_\_\_\_\_ 12.18 **WHEN** OAC is returned to service, notify RP Shift that PI data collection is available.

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted                      Date    Time

**Unit 1**

### **13. Enclosures**

- 13.1 Hourly Dispatcher Report
- 13.2 Axial Flux Difference Monitoring
- 13.3 Full Length Rod Verification Data
- 13.4 Containment Air Temperatures
- 13.5 Calculation Sheet For Quadrant Power Tilt
- 13.6 FWST Level Instrument Room Temperature
- 13.7 OAC Point List For Partial Loss Of OAC
- 13.8 CA Storage Tank Temperatures
- 13.9 Manual Trigger of Analog Fault Recorder

**End of Body**

**Unit 1**

**Enclosure 13.5**  
**Calculation Sheet For Quadrant Power Tilt**

PT/1/A/4600/021 A

Page 1 of 2

**Part A**

Sheet \_\_\_\_ of \_\_\_\_

Date \_\_\_\_\_

Time <sup>1</sup> \_\_\_\_\_

Initials \_\_\_\_\_

	PR-41		PR-42		PR-43		PR-44	
	A	B	A	B	A	B	A	B
1) Measured Current								
2) Calibration Current								
3) Relative Flux (RF)								

- 1) From NI cabinet's current meter (located on respective PR B Drawers). Ensure Detector Milliamp Range Switches are in "0.5" position and read 0-500 microamp scale.
- 2) From most recent calibration data using "0" Incore Axial Offset Current in Data Book, Table 2.2 ("I<sub>T</sub>" for detector "A", "I<sub>B</sub>" for detector "B").
- 3) Divide line 1 by line 2 to calculate Relative Flux (RF) for each upper (A) and lower (B) detector.

**Quadrant Power Tilts:** Calculate by dividing each upper relative flux by the average upper relative flux and dividing each lower relative flux by the average lower relative flux

$$\text{Avg RF of A Detectors (RFA)} = \frac{\boxed{\text{RF of PR-41A}}}{\text{RF of PR-41A}} + \frac{\boxed{\text{RF of PR-42A}}}{\text{RF of PR-42A}} + \frac{\boxed{\text{RF of PR-43A}}}{\text{RF of PR-43A}} + \frac{\boxed{\text{RF of PR-44A}}}{\text{RF of PR-44A}} \times \frac{1}{4} = \underline{\hspace{2cm}}$$

$$\text{Avg RF of B Detectors (RFB)} = \frac{\boxed{\text{RF of PR-41B}}}{\text{RF of PR-41B}} + \frac{\boxed{\text{RF of PR-42B}}}{\text{RF of PR-42B}} + \frac{\boxed{\text{RF of PR-43B}}}{\text{RF of PR-43B}} + \frac{\boxed{\text{RF of PR-44B}}}{\text{RF of PR-44B}} \times \frac{1}{4} = \underline{\hspace{2cm}}$$

$$\text{PR-41A Tilt} = \frac{\text{RF of PR-41A}}{\text{RFA}} = \underline{\hspace{2cm}}$$

$$\text{PR-41B Tilt} = \frac{\text{RF of PR-41B}}{\text{RFB}} = \underline{\hspace{2cm}}$$

$$\text{PR-42A Tilt} = \frac{\text{RF of PR-42A}}{\text{RFA}} = \underline{\hspace{2cm}}$$

$$\text{PR-42B Tilt} = \frac{\text{RF of PR-42B}}{\text{RFB}} = \underline{\hspace{2cm}}$$

$$\text{PR-43A Tilt} = \frac{\text{RF of PR-43A}}{\text{RFA}} = \underline{\hspace{2cm}}$$

$$\text{PR-43B Tilt} = \frac{\text{RF of PR-43B}}{\text{RFB}} = \underline{\hspace{2cm}}$$

$$\text{PR-44A Tilt} = \frac{\text{RF of PR-44A}}{\text{RFA}} = \underline{\hspace{2cm}}$$

$$\text{PR-44B Tilt} = \frac{\text{RF of PR-44B}}{\text{RFB}} = \underline{\hspace{2cm}}$$

<sup>1</sup> **WHEN** above 50% RTP, calculation performed within 12 hours and every 12 hours thereafter until QPTR Alarm operable.

## Unit 1

**Enclosure 13.5**  
**Calculation Sheet For Quadrant Power Tilt**  
**Part B**

PT/1/A/4600/021 A  
 Page 2 of 2  
 Sheet \_\_\_\_ of \_\_\_\_

Date _____	<b>PR-4__</b>		<b>PR-4__</b>		<b>PR-4__</b>	
Time <sup>2</sup> _____	<b>A          B</b>		<b>A          B</b>		<b>A          B</b>	
Initials _____						
1) Measured Current						
2) Calibration Current						
3) Relative Flux (RF)						

- 1) From NI cabinet's current meter (located on respective PR B Drawers). Ensure Detector Milliamp Range Switches are in "0.5" position and read 0-500 microamp scale.
- 2) From most recent calibration data using "0" Incore Axial Offset Current in Data Book, Table 2.2 ("I<sub>T</sub>" for detector "A", "I<sub>B</sub>" for detector "B").
- 3) Divide line 1 by line 2 to calculate Relative Flux (RF) for each upper (A) and lower (B) detector.

**Quadrant Power Tilts:** Calculate by dividing each upper relative flux by the average upper relative flux and dividing each lower relative flux by the average lower relative flux

**Avg RF of A Detectors** =  $\frac{\boxed{\text{RF of PR-4\_A}}}{\text{RF of PR-4\_A}} + \frac{\boxed{\text{RF of PR-4\_A}}}{\text{RF of PR-4\_A}} + \frac{\boxed{\text{RF of PR-4\_A}}}{\text{RF of PR-4\_A}} \times \frac{1}{3} = \underline{\hspace{2cm}}$   
 (RFA)

**Avg RF of B Detectors** =  $\frac{\boxed{\text{RF of PR-4\_B}}}{\text{RF of PR-4\_B}} + \frac{\boxed{\text{RF of PR-4\_B}}}{\text{RF of PR-4\_B}} + \frac{\boxed{\text{RF of PR-4\_B}}}{\text{RF of PR-4\_B}} \times \frac{1}{3} = \underline{\hspace{2cm}}$   
 (RFB)

**PR-4\_\_A Tilt** =  $\frac{\text{RF of PR-4\_A}}{\text{RFA}} = \underline{\hspace{2cm}}$       **PR-4\_\_B Tilt** =  $\frac{\text{RF of PR-4\_B}}{\text{RFB}} = \underline{\hspace{2cm}}$

**PR-4\_\_A Tilt** =  $\frac{\text{RF of PR-4\_A}}{\text{RFA}} = \underline{\hspace{2cm}}$       **PR-4\_\_B Tilt** =  $\frac{\text{RF of PR-4\_B}}{\text{RFB}} = \underline{\hspace{2cm}}$

**PR-4\_\_A Tilt** =  $\frac{\text{RF of PR-4\_A}}{\text{RFA}} = \underline{\hspace{2cm}}$       **PR-4\_\_B Tilt** =  $\frac{\text{RF of PR-4\_B}}{\text{RFB}} = \underline{\hspace{2cm}}$

**End of Enclosure**

<sup>2</sup> **WHEN** greater than 50% RTP but less than 75% RTP, calculation performed within 12 hours and every 12 hours thereafter while QPTR Alarm inoperable **AND** one PR channel input inoperable.

**Unit 1**

Reviewed By

St. Hahn

Approved By

D. Connell

TASK: **Calculate the Boric Acid Change for a specified Rod Change**

POSITION: **RO/SRO**

Operator's Name \_\_\_\_\_

Validation Time: 20 minutes

Location: **Simulator/Plant**

Method: **Perform**

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_

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

References:

OP/1/A/6100/22 (Rev. 476)

Unit 1 Data Book

JPM verified current with references by \_\_\_\_\_

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

Rev. 01/03-31-03

### INITIAL CONDITIONS

The following conditions exist:

Unit 1 Reactor Power is at 90% with Xe at equilibrium conditions

Core burnup is 350 EFPD

NC Boron Concentration  $\approx$  1020 PPM

Present Control Rods Bank "D" at 195 steps

Desired Rod Height is Control Rods Bank "D" at 160 steps

**The Control Room SRO directs you to calculate the Desired NC Boron Concentration and the Boric Acid Change required for the change in rod position (utilizing the Data Book) while maintaining the present power level.**

JPM OVERALL STANDARD: Primary water addition of approximately 1334 gallons is calculated within  $\pm$  150 gallons.

NOTES: Unit 1 Data Book should be available for reference.

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Operator determines <b>195 steps</b> integral rod worth using the 350 EFPD column of Table 6.3.3 HFP, Equilibrium Xe	Initial inserted reactivity worth = <u><b>84 pcm</b></u>		
*2	Operator determines <b>160 steps</b> integral rod worth using the 350 EFPD column of Table 6.3.3 HFP, Equilibrium Xe	Desired Rod height inserted reactivity worth = <u><b>224 pcm</b></u>		
*3	Operator determines the change in reactivity required for the rod insertion	Change in reactivity to be compensated to rod withdrawal = <u><b>+ 140 pcm</b></u>		
4	Using Graph 6.8 Differential Boron Worth, determines the Differential Boron Worth for present conditions	Operator determines the Differential Boron Worth from the graph to be = <u><b>-7.28 pcm/ppm</b></u>		
5	Using the Differential Boron Worth and the Change in reactivity, determines the change in Boron Concentration of NCS.	Operator determines the change in Boron Concentration to be = <u><b>+140 / -7.28 pcm/ppm</b></u> = <u><b>- 19.23 ppm</b></u>		

\* DENOTES CRITICAL



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	Operator determines Boron Concentration change required	Change in Boron = <u>1020 – 19.23 ppm</u> <u>= 1000.77 ppm</u>		
*7	Using Enclosure 4.3 Section 5.1 Boron and Dilution Tables, determines the primary water addition	Using Present Boron Conc 1020 ppm and the Desired Boron Conc of 1000.77 ppm, determines the primary water addition = <u>~1334 gallons</u> <u>(+ or – 150 gallons)</u>		
8	Operator determines an addition of Primary water is necessary.	<div style="border: 1px solid black; padding: 5px;"> <p><b>Cue:</b></p> <p><b>The SRO has directed another operator to complete the Boric Acid change.</b></p> </div>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

The following conditions exist:

Unit 1 Reactor Power is at 90% with Xe at equilibrium conditions

Core burnup is 350 EFPD

NC Boron Concentration = 1020 PPM

Present Control Rods Bank "D" at 195 steps

Desired Rod Height is Control Rods Bank "D" at 160 steps

**The Control Room SRO directs you to calculate the Desired NC Boron Concentration and the Boric Acid Change required for the change in rod position (utilizing the Data Book) while maintaining the present power level.**

Reviewed By

*Stu Hoch*

Approved By

*D. Cowell*

TASK: **Initiate a Tagout**

POSITION: **USRO**

Operator's Name \_\_\_\_\_

Location: **Control Room**

Method: **Perform**

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_

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

References: MC-1554-03.00 Flow Diagram of NV System

KA 194 001 K102

Attachments:

Rev. 01/03-18-03

### INITIAL CONDITIONS

Unit 1 is operating at 100% power.

There is no PRE-PLAN available on the Red Tag Computer.

1NV-803 (PDP #1 Outlet Isol) has been found in the CLOSED position. In an attempt to correct this mispo, the OSM directed an operator to open the valve. When attempt to open the valve began, the valve stem broke off completely (valve still fully closed). Maintenance was notified and requested the valve be tagged out in order to work on the valve internals, as well as, the stem replacement.

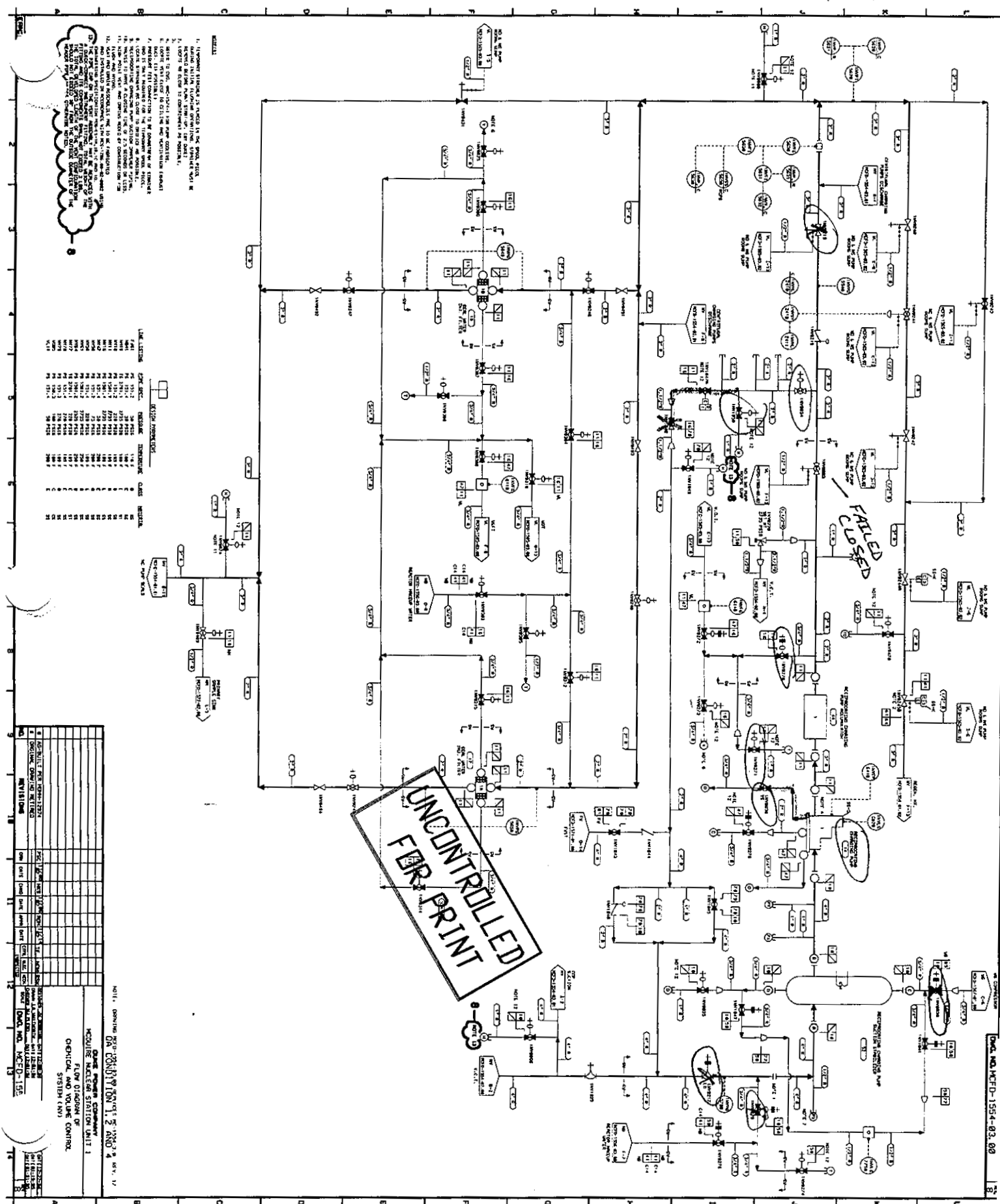
**You have been directed to generate a sequenced list to be used for development of a tagout to allow Maintenance to disassemble the valve and work on the valve internals/components.**

JPM OVERALL STANDARD: The list is generated with technical correctness.

NOTES: The operator should be given the associated flow diagram.

KA 194 001 K102

# ANSWER KEY



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Component verified to be completely isolated	Component verified isolated per attached flow diagram		
*2	Isolation valves, pump power supply, vents and drains are identified as boundaries	Same		
*3	<p>Sequence correctly identified:</p> <p>OPEN</p> <ul style="list-style-type: none"> <li>• PDP power supply</li> <li>• <u>OPTIONAL:</u> Suction Dampener Heater Breaker</li> </ul> <p>CLOSE</p> <ul style="list-style-type: none"> <li>• 1NV-219</li> <li>• 1NV-217</li> <li>• 1NV-278 <u>or</u> 1NV-279</li> <li>• 1NV-839</li> <li>• 1NV-1048 <u>or</u> 1NV-1047 &amp; supply breaker</li> </ul>	<p>Pump is sequenced to be electrically tagged prior to the hydraulic tagout. Hydraulic tagout boundaries are sequenced closed prior to vents/drains being sequenced open.</p> <p><b>NOTE:</b> As long as the pump breaker is racked out first, the isolation valves can be aligned in any sequence.</p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	<p>OPEN</p> <ul style="list-style-type: none"> <li>• 1NV-834 &amp; 1NV-1050</li> <li>• 1NV-270 &amp; 1NV-271 <u>or</u> 1NV-272 <u>or</u> 1NV-273</li> </ul> <p>OPTIONAL OPEN:</p> <ul style="list-style-type: none"> <li>• 1NV-830  or</li> <li>• 1NV-272 &amp; 1NV-278</li> </ul> <p>OPTIONAL LISTING: 1NV-803 placed on VAR</p>	<p>One vent or drain is required to be tagged open on <u>each side</u> of the valve to be worked.</p> <p>OR:</p> <p>Some contingency plan must be in place on how to vent/drain both sides of the valve.</p> <p>NOTE: For more info, Refer to OMP 7-1</p>		

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

Unit 1 is operating at 100% power.

There is no PRE-PLAN available on the Red Tag Computer.

1NV-803 (PDP #1 Outlet Isol) has been found in the CLOSED position. In an attempt to correct this mispo, the OSM directed an operator to open the valve. When attempt to open the valve began, the valve stem broke off completely (valve still fully closed). Maintenance was notified and requested the valve be tagged out in order to work on the valve internals, as well as, the stem replacement.

**You have been directed to generate a sequenced list to be used for development of a tagout to allow Maintenance to disassemble the valve and work on the valve internals/components.**



RO Admin A-3 JPM  
PAGE 1 OF 3

Reviewed By Steve Nelson

Approved By Charles Sany

**TASK:** Utilizing a Survey Map, calculate the maximum permissible Stay Time within the ALERT limit of the Duke Power Basic Administrative limits.

**POSITION:** RO

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Operator's Name \_\_\_\_\_

**Location:** Control Room

**Method:** Perform

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

---

References: Duke Power Company, Radiation Worker Training Student Guide

Attachments:

Rev. 01/06-10-03

**RO Admin A-3 JPM  
PAGE 2 OF 3**

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**INITIAL CONDITIONS**

A SGTR in conjunction with a LOCA has occurred. Due to previous amounts of failed fuel, the radiation levels in the Auxiliary Building are abnormally high.

An individual has been assigned the task of performing a valve lineup in the NM Lab (see attached Survey Map). Assume that all areas in the room must be accessed, but valves on the S/G lines are the only required manipulations.

The individual has previously received 1145 mrem total dose this year.

**Determine the maximum permissible time an individual can work in the area without violating the ALERT limit of the Duke Power Basic Administrative limit.**

**JPM OVERALL STANDARD:**

Stay Time is correctly calculated and the Duke Power Basic Administrative limit is not violated.

**NOTES:**

DPC Admin limit: 2000 mrem X 80% = ALERT Admin limit

ALERT Admin limit: 1600 mrem  
Dose history: -1145 mrem

**Maximum Permissible dose: 455 mrem**

---

**Maximum Stay Time: 455 mrem / 160 mrem/hr = 2.84 hours or less**

**ACCEPTABLE RANGE: 2.80 to 2.85 hours or less**

RO Admin A-3 JPM  
PAGE 3 OF 3

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Determines the remaining permissible dose within the DPC Basic limit.	Permissible dose is determined to be:  455 mrem		
*2	Determines the maximum permissible Stay Time within the DPC Basic limit.	Maximum Stay Time is determined to be:  <= 2.80 to 2.85 hours		

\* DENOTES CRITICAL

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### INITIAL CONDITIONS

A SGTR in conjunction with a LOCA has occurred. Due to previous amounts of failed fuel, the radiation levels in the Auxiliary Building are abnormally high.

An individual has been assigned the task of performing a valve lineup in the NM Lab (see attached Survey Map). Assume that all areas in the room must be accessed, but valves on the S/G lines are the only required manipulations.

The individual has previously received 1145 mrem total dose this year.

**Determine the maximum permissible time an individual can work in the area without violating the ALERT limit of the Duke Power Basic Administrative limit.**

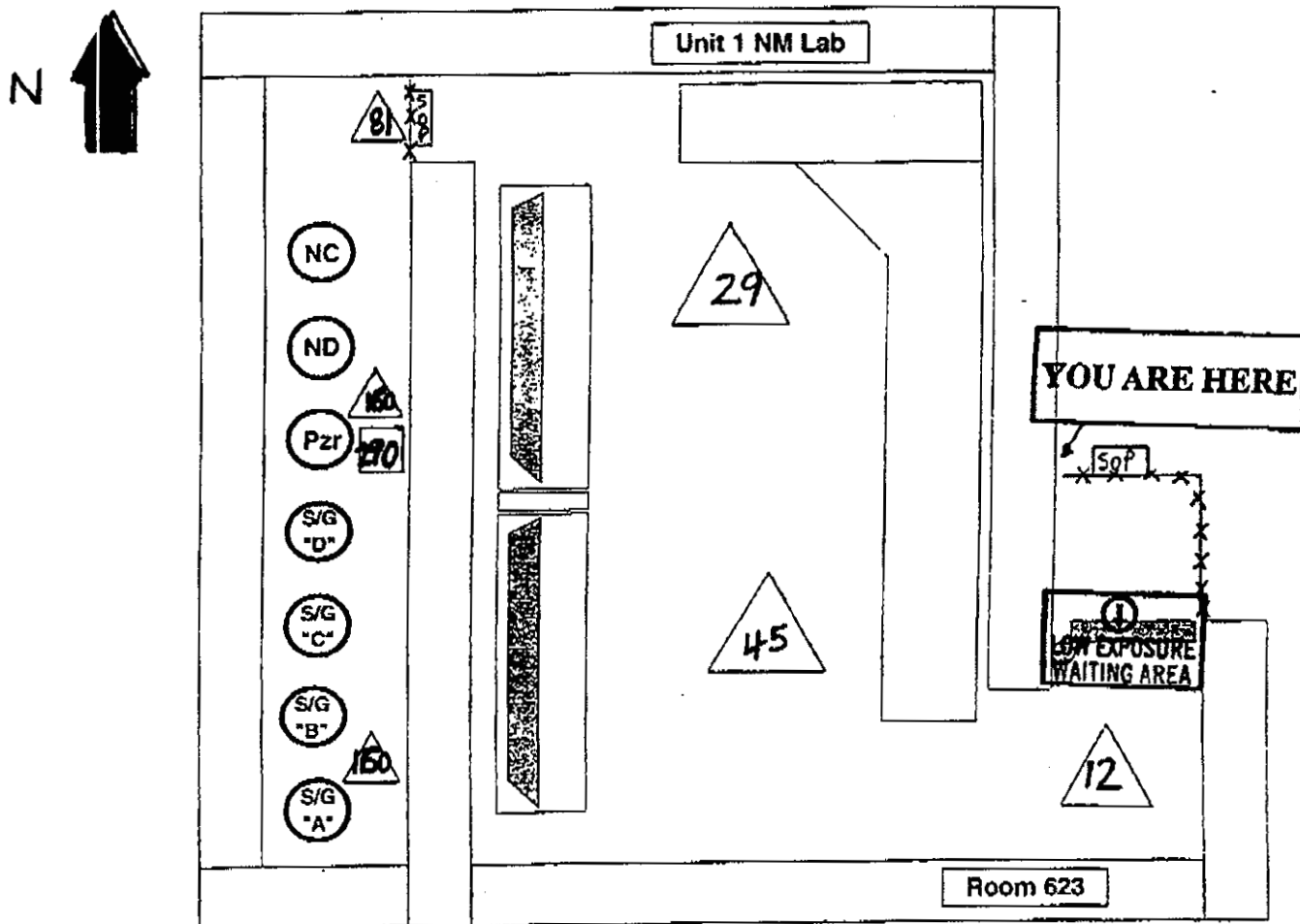
McGuire Nuclear Station  
Radiological Plan View  
Date: (PRESENT)

Location: Unit-1 NM Lab

Surveyed by: RP Tech

# CONTAMINATED AREA

Dress Out Required



290

Highest  
Contact

160

Highest  
General  
Area Dose  
Rate

\*Radiation readings in mrem/hour unless otherwise noted

\*\*"Contaminated Area" indicates the room/area is greater than  
1000dpm/100cm<sup>2</sup>

Reviewed By

Stu Helf

Approved By

TD Coul

TASK:

**Determine Requirements for Reactor Building Entry**

POSITION:

**RO**

Operator's Name \_\_\_\_\_

Location: **Plant/Simulator**

Method: **Perform**

Estimated JPM Completion Time:

10 Minutes

Actual JPM Completion Time:

\_\_\_\_ Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_

Date   /  /  

References: RWP #26

JPM verified current with references by \_\_\_\_\_

Date   /  /  

Rev. 04/03-31-03

INITIAL CONDITIONS

Unit 1 is in Mode 1.

**You have been directed to enter the Reactor Building Pipe Chase and perform a general inspection. Entry will be governed under the provisions of RWP #26. Determine the requirements of this RWP for a work in dry contaminated areas to perform light work.**

**JPM OVERALL STANDARD:** Operator determines the proper Dress requirements, Dosimetry requirements, Respiratory requirements, Dose Alarm setpoint, Dose Rate Alarm setpoint, any Special requirements.

**NOTES:** The examinee must be provided a copy of **RWP #26** and **RWP Dress Category Codes**.

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		<b>Cue:</b>  <b>Determine the required protective clothing necessary to perform work under this RWP as a "G" worker</b>		
*1	Determine the required protective clothing for RWP #26 G worker	Operator determines the following protective clothing required:  Cloth hood, disposable coveralls, cotton and rubber gloves, booties and shoecovers. (secured with tape)  <b>Cue:</b> <b>Determine the expected dose rates.</b>		
*2	Determine expected dose rates using RWP #26	Operator determines that expected dose rates 1 mrem/hr --> 2000 mrem/hr.		

\* DENOTES CRITICAL



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		<b>Cue:</b>  <b>Determine the Respiratory requirements for this RWP</b>		
3	Determines that RP must be notified to determine if respiratory requirements based on TEDE/ALARA evaluation using RWP #26	Operator determines that RP must be notified to determine if respiratory requirements based on TEDE/ALARA evaluation  <b>Cue:</b>  <b>Determine the Dose Alarm setpoint and the Dose Rate Alarm setpoint in effect for this RWP</b>		
*4	Determine the Dose Alarm and Dose Rate Alarm setpoints for RWP #26	Operator determines the following setpoints:  <u>Dose Alarm:</u> <b>25 MREM</b>  <u>Dose Rate Alarm:</u> <b>100 MREM/HR</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		<p><b>Cue:</b></p> <p><b>Under what conditions does RP need to be notified?</b></p>		
*5	Determine the times where RP needs to be notified per the requirements of RWP #26.	<p>Operator determines that RP needs to be notified <b>prior to the start of work.</b></p> <p><b>Cue:</b></p> <p><b>What, if any, Special Instructions must be met prior to entry</b></p>		
*6	Determine the Special Instructions necessary prior to entry per RWP #26	<p>Operator determines that a <b>Pre-Job Briefing</b> is required prior to entry</p> <p><b>Cue:</b></p> <p><b>What, if any, areas must be avoided during entry?</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	Determine the areas to be avoided per RWP #26	Operator determines that Extra High Radiation Areas (designated by yellow flashing lights) must not be entered without RP coverage.  Cue: <b>When is an Auxiliary ED Alarm required?</b>		
8	Determine when Auxiliary ED Alarm is required per RWP #26	Operator determines that an Auxiliary ED Alarm is required if any of the following conditions exists: <ul style="list-style-type: none"> <li>• Gen Area Rad levels are &gt; 5 mrem/hr</li> <li>• High noise level in the work area</li> <li>• Use of headphone</li> <li>• Hearing impaired</li> <li>• Other conditions that would impair hearing the ED alarm.</li> </ul>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

Unit 1 is in Mode 1.

**You have been directed to enter the Reactor Building Pipe Chase and perform a general inspection. Entry will be governed under the provisions of RWP #26. Determine the requirements of this RWP for a work in dry contaminated areas to perform light work.**

# MCGUIRE NUCLEAR STATION

Worker Version

12/09/02 13:18

Radiation Work Permit #: **26**

Revision #: **13**

Job Title: REACTOR BUILDING PIPE CHASE AND SEAL TABLE ENTRY DURING  
POWER OPERATIONS MNS/CNS ONLY

## ED (MG) Set Points

Dose Alarm: **25 mrem**

Dose Rate Alarm: **100 mrem/hr**

## Dress Category, Task Description, Special Dosimetry and Respiratory Requirements

Dress Category	Task Description	Special Dosimetry	Respiratory
A	WORKER IN A NON-CONTAMINATED AREA	NONE	NONE USED
B	WORK WITH POTENTIALLY CONTAMINATED MAT. WHERE THERE IS A LOWPOTENTIAL FOR CONTACT WITH MAT. OTHER THAN BY THE HAND.	NONE	NONE USED
E	WORK ASSOCIATED WITH A CONTAMINATED SYS AND/OR CONTAMINATED/RAD MATL WHERE POTENTIAL FOR PERSONNEL CONTAMINATION IS LOW.	NONE	NONE USED
G	WORKER IN DRY CONTAMINATED AREAS TO PERFORM LIGHT WORK	NONE	NONE USED
H	WORKER IN DRY CONTAMINATED AREA	NONE	NONE USED
K	WORKER IN CONTAMINATED AREA WHERE ADDITIONAL CONTROLS ARE NEEDED OR HOT PARTICLES ARE A CONCERN	NONE	NONE USED
	WORKER IN DRY CONTAMINATED AREA WHERE HEAVY WORK IS PERFORMED AND ADDITIONAL CONTROLS ARE NEEDED-RP APPROVAL REQ.	NONE	NONE USED
N	WORKER IN WET AREA (BOTTOMS ONLY WHEN CONCERNS ARE BELOW THE WAIST)	NONE	NONE USED

## Comments/Special Instructions

- \* RESPIRATORY REQUIREMENTS WILL BE BASED ON TEDE/ALARA EVALUATION
- \* EXPECTED DOSE RATES: 1 MREM/HR --> 2000 MREM/HR
- \* AUXILIARY ED ALARM REQUIREMENT ONLY APPLIES IN AREAS WHERE GENERAL AREA RADIATION LEVELS ARE GREATER THAN 5 MREM/HR
- \* NOTIFY RP PRIOR TO START OF WORK
- \* PRE-JOB BRIEFING REQUIRED
- \* DO NOT ENTER EXTRA HIGH RADIATION AREAS, DESIGNATED BY YELLOW FLASHING LIGHTS WITHOUT RP COVERAGE
- \* AN AUXILIARY ED ALARM IS REQUIRED IF ANY OF THE FOLLOWING CONDITIONS EXIST: HIGH NOISE LEVEL IN THE WORK AREA, USE OF HEADPHONES, HEARING IMPAIRMENT, OR ANY OTHER CONDITION THAT WOULD IMPAIR HEARING THE ED ALARM.

Activation Date & Time: 12/09/02 14:00  
Approval Date & Time: 12/09/02 13:18  
Approved By: JRL1101

Termination Date & Time:  
Terminated By:

### RWP Dress Category Codes

Dress Code	Dress Category Description
A	None.
B	Surgical Gloves.
C	Cotton And Rubber Gloves.
D	Cotton And Rubber Gloves, Booties And Shoe covers.
E	Labcoat, Cotton And Rubber Or Surgical Gloves.
F	Labcoat, Cotton And Rubber Gloves, Booties And Shoe covers.
G	Cloth Hood, Disposable Coveralls, Cotton And Rubber Gloves, Booties And Shoe covers, Tape.
H	Cloth Hood, Cloth Coverall, Cotton And Rubber Gloves, Booties and Shoe covers, Tape, No Personal Outer Clothing.
I	Cloth Hood, Cloth Coverall, Cotton Gloves, 2 Pair Rubber Gloves, Booties And Shoe covers, Tape, No Personal Outer Clothing.
J	Cloth Hood, Cloth Coverall, Cotton Gloves, 2 Pair Rubber Gloves, Booties, Shoe covers, Tape, No Personal Outer Clothing And Additional Outer Booties or Shoe covers.
K	Cloth Hood, Cloth Coverall, Disposable Coveralls, Cotton Gloves, Rubber Gloves, Booties And Shoe covers, Tape, No Personal Outer Clothing.
L	Cloth Hood, Cloth Coverall, Disposable Coveralls, Cotton Gloves, 2 Pair Rubber Gloves, Booties And Shoe covers, Tape, No Personal Outer Clothing And Additional Outer Booties Or Shoe covers.
M	Cloth Hood, 2 Pair Cloth Coveralls, Cotton Gloves, 2 Pair Rubber Gloves, 2 Pair Booties And Shoe covers, Tape, No Personal Outer Clothing.
N	Cloth Hood, Cloth Coverall, Wetsuit, Cotton Gloves, 2 Pair Rubber Gloves, Booties And Shoe covers, Tape, No Personal Outer Clothing.
O	Cloth Hood, Cloth Coverall, Bubble Suit, Cotton Gloves, 2 Pair Rubber Gloves, Booties, Shoe covers, Tape, No Personal Outer Clothing And Additional Shoe covers Or Jump Boots.
Z	Special Dress As Required By Radiation Protection.

Contact CSPOC for problems with this RM&C Display RWP Page.

Facility: McGuire      Date of Examination: Weeks of June 16 and 23, 2003  
 Examination Level (circle one): RO / **SRO**      Operating Test Number: \_\_\_\_\_

Administrative Topic /Subject Description— (see Note)	Describe <del>activity to be performed</del> method of evaluation: <del>1. ONE Administrative JPM, OR</del> <del>2. TWO Administrative Questions</del>
A.4 <u>Conduct of Operations</u>	Evaluate Overtime Eligibility (Modified)
<u>Conduct of Operations</u>	Calculated Boron Change for Rod Change (Modified, Common)
A.2 <u>Equipment Control</u>	Evaluate a Work Order for Clearance to do Work. (New)
A.3 <u>Radiation Control</u>	Evaluate Liquid Waste Release with Fault (New)
A.4 <u>Emergency Plan</u>	Evaluate Condition for PARS (Alternate if General Emergency Not Declared)

NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 5 are required.

Reviewed By Steve Haff  
Approved By TD Cowd

TASK: **Evaluate Overtime Eligibility**

POSITION: **SRO**

---

Operator's Name \_\_\_\_\_

Location: **Control Room**

Method: **Perform**

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date    /    /   

---

References: NSD-200

KA 2.1.5



INITIAL CONDITIONS

Due to plant startup activities, an Reactor Operator must be held over for the following shift for three (3) hours.

**Evaluate the following five Reactor Operators for availability to work 3 more hours without an Overtime Extension and determine if the hours worked has exceeded NSD-200 requirements. State all requirements that are violated, if applicable.**

The following is the work history (excluding shift turnover time) of the available Reactor Operators on shift (hours reflect those worked PRIOR to the 3 hour holdover). All operators began their shift schedule at the same time each day.

NOTE: A break of at least 8 hours occurred between all work periods.

DAY	1	2	3	4	5	6	7	8 (today)
RO #1	0	4	12	10	10	14	10	11
RO #2	8	0	12	10	10	8	10	11
RO #3	8	0	12	12	12	8	8	14
RO #4	0	0	15	14	10	9	13	10
RO #5	0	12	10	12	3	12	8	13

JPM OVERALL STANDARD: Determines that Reactor Operators #1, #3, #4, & #5 are not within guidelines. Determines that Reactor Operator #2 is within guidelines.

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Compare hours worked by RO#1 to NSD-200 guidelines	Determines that RO#1 would exceed 72 hours in a 7 day period and would require an overtime authorization.		
2	Compare hours worked by RO#2 to NSD-200 guidelines	Determines that RO#2 would not exceed any overtime restrictions and could be held over for the three hours.		
3	Compare hours worked by RO#3 to NSD-200 guidelines	Determines that RO#3 would exceed 16 hours straight and 16 hours in a 24 hour period (today) and would require overtime authorization.		
4	Compare hours worked by RO#4 to NSD-200 guidelines	Determines that RO#4 would exceed 28 hours in a 48 hour period between days 3 and 4 and 72 hours in a 7 day period and would require an overtime authorization.		
5	Compare hours worked by RO#5 to NSD-200 guidelines	Determines that RO#5 would exceed 72 hours in a 7 day period and would require an overtime authorization.		

### INITIAL CONDITIONS

Due to plant startup activities, an Reactor Operator must be held over for the following shift for three (3) hours.

**Evaluate the following five Reactor Operators for availability to work 3 more hours without an Overtime Extension and determine if the hours worked has exceeded NSD-200 requirements. State all requirements that are violated, if applicable.**

The following is the work history (excluding shift turnover time) of the available Reactor Operators on shift (hours reflect those worked PRIOR to the 3 hour holdover). All operators began their shift schedule at the same time each day.

NOTE: A break of at least 8 hours occurred between all work periods.

DAY	1	2	3	4	5	6	7	8 (today)
RO #1	0	4	12	10	10	14	10	11
RO #2	8	0	12	10	10	8	10	11
RO #3	8	0	12	12	12	8	8	14
RO #4	0	0	15	14	10	9	13	10
RO #5	0	12	10	12	3	12	8	13

## APPENDIX A.200. REQUEST FOR WORK HOURS EXTENSION

1. Permission is requested for the individuals listed below to exceed the guidelines of Tech Spec 5.2.2 for hours that will be worked on the date shown. (Fill out ALL columns including: Full name, actual date work hour extension will occur, the letter(s) of the limit(s) that will be exceeded, estimated hours that will be worked beyond guidelines, Emp. ID, department or vendor name and assigned supervisor's name.)

NAME (Print First, MI & Last Name)	DATE/TIME THE WORK HOUR EXT. BEGINS	LIMIT a, b, c, d, e	EST. HRS. EXCEEDING GUIDELINE	Emp. ID (Same as Badge Number)	DEPARTMENT/ VENDOR NAME	ASSIGNED SUPV NAME

- a. Working more than 16 hours straight (excluding shift turnover time)
- b. Working more than 16 hours in any 24 hour period (excluding shift turnover time)
- c. Working more than 24 hours (28 hours for MNS and ONS) in any 48 hour period (excluding shift turnover time)
- d. Working more than 72 hours in any 7 day period (excluding shift turnover time)
- e. Less than 8 hour break between scheduled work periods (excluding callouts, but including shift turnover time).  
Note: Call-outs are not considered scheduled work periods and do not require an Appendix A form unless limit(s) a, b, c, d is exceeded due to the call-out. FFD and Management Procedures provisions apply to call-outs).

2. Specific reasons describing the need for exceeding the work hour guidelines. (Brief description of work to be performed and why specific individuals are needed to complete task.

3. I have assessed the fitness for continued duty of the above named individual(s). The assessment included an evaluation of the working conditions, and the individual(s) mental and physical ability to complete the task safely. I find the individual(s) fitness satisfactory to safely complete the assignment. I will periodically re-assess their status as appropriate to determine their ability to continue. **NOTE:** The FFD assessment must be done within 4 hours prior to the beginning of the task date/time the work hour extension begins.

Signed: \_\_\_\_\_ Supv. ID: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_  
Supervisor/Temp. Supervisor/Designee of employee(s)/vendor(s)\*

**COMMON**

**JPM**

Reviewed By

Stan Hefley

Approved By

TD Connell

TASK: **Evaluate Work Order and provide Clearance to work.**

POSITION: **SRO**

---

Operator's Name

\_\_\_\_\_

Validation Time: 20 minutes

Location: **Simulator/Plant**

Method: **Perform**

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature

\_\_\_\_\_

Date    /    /   

References:

JPM verified current with references by

\_\_\_\_\_

Date    /    /

INITIAL CONDITIONS

Today is 06/16/03 at 0700.

WO # 98313609-01 is on the Work Schedule for 06/16/03 at 0700.

WO # 98313609-01 is a PM on the 1A CA Pump coupling.

ORAM/Sentinel will be in the Yellow condition due to WO # 98313609-01.

**As the WCC SRO you are to evaluate the Work Order and provide Clearance for work.**

JPM OVERALL STANDARD:      Work Order is evaluate and Clearance for work is given.

NOTES:      If requested by candidate, provide attached Job Aid (Flowpath to Sign On Work Orders).

Steps #2 through #6 of JPM can be performed in any order.

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	WCC SRO checks WO is on schedule.	Verify Time on WO against Schedule. <i>Given Initial Conditions</i>		
2	WCC SRO checks if WO is MOD related.	Verify that a MOD is not listed on WO if it is verify that MOD review sheet is signed <i>WO is not MOD related</i>		
*3	WCC SRO verifies PRA field is coded	If PRA field is coded with a code other than "No Code" ensure WO is in scheduled time slot <i>Given Initial Conditions</i>		
*4	WCC SRO checks if WO is for a T.S. component	Verifies component against T.S. Reference Manual Section 3 T.S. 3.7.5 Auxiliary Feedwater System, Condition B, Required Action B.1 <b>CUE:</b> <i>TSAIL entry made by night shift WCC SRO M1-03-01384 for 1A CA pump</i>		

\* DENOTES CRITICAL

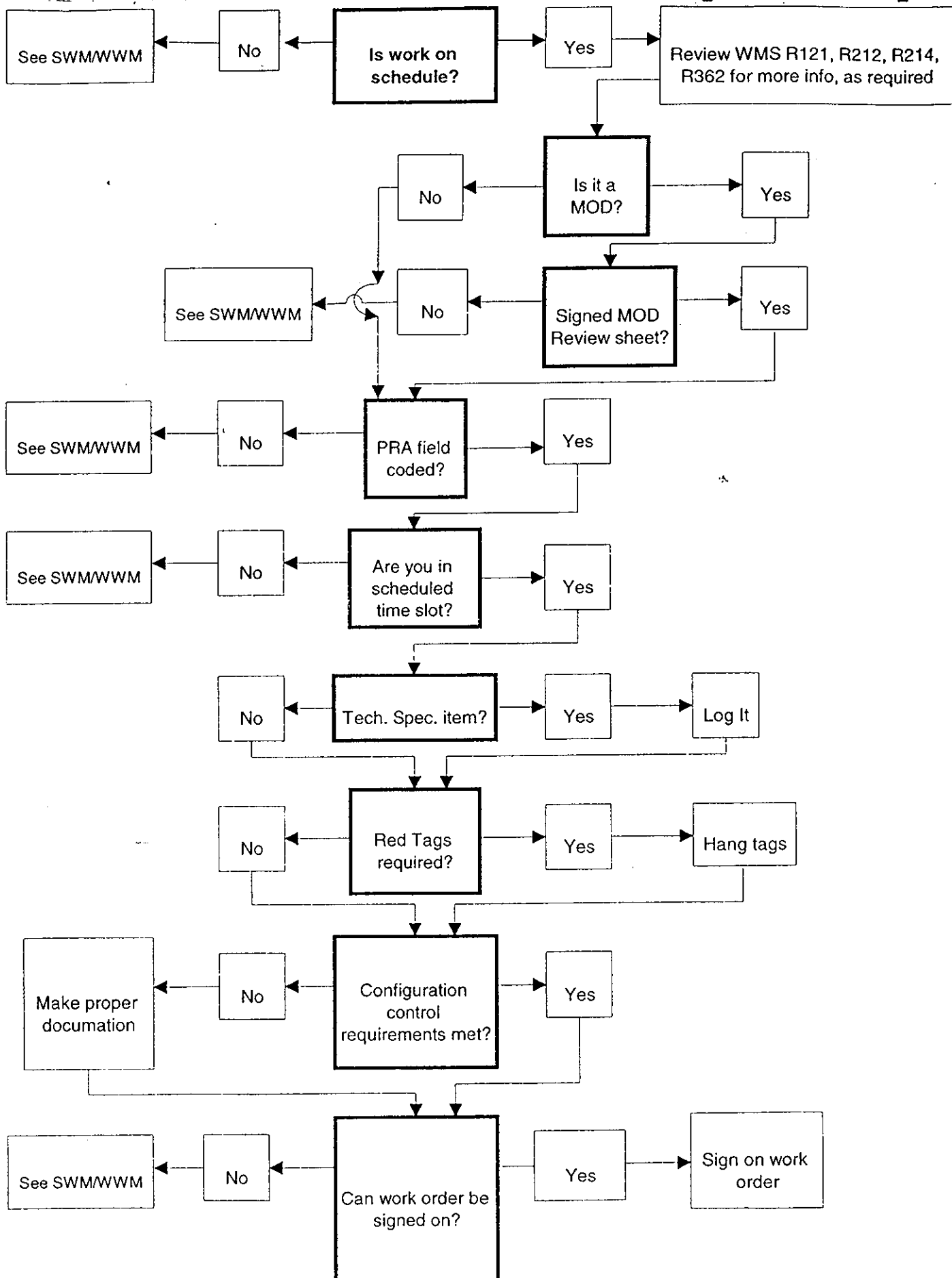


STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	WCC SRO checks if WO requires OPS Red Tags	Verifies RED TAG and R&R fields on WO state that red tags are required.  <b>CUE:</b> <i>R&amp;R 1-1119 placed by night shift WCC SRO</i>		
6	WCC SRO checks configuration control requirements are met.	Checks that configuration of components will be controlled by R&R or other paperwork <i>(R&amp;R is placed)</i>		
7	WCC SRO provides Clearance for work	WO is signed in Clearance field and TSAIL number is placed in TSAIL field.		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

# Flowpath To Sign On W/Os



---

## INITIAL CONDITIONS

Today is 06/16/03 at 0700.

WO # 98313609-01 is on the Work Schedule for 06/16/03 at 0700.

WO # 98313609-01 is a PM on the 1A CA Pump coupling.

ORAM/Sentinel will be in the Yellow condition due to WO # 98313609-01.

**As the WCC SRO you are to evaluate the Work Order and provide Clearance for work.**

UNIT: 1

03/26/03  
13:42:08  
98313609 01

MCGUIRE NUCLEAR STATION  
CREW COVER SHEET FOR WO#/TSK  
CREW NUMBER:416 FOR :( 2003/06/16/ 0700 )

1  
11  
1  
1  
11111

WORK ORDER TITLE : PM-1CAPU0001-(COUPLING)-1A MOTOR DRIVEN CA PUMP\_\_

WORK AGAINST : MC 1 CA PU0001

PREDEFINED  
98313609-01

EQUIPMENT DESC : 1A AUXILIARY FEEDWATER PUMP  
LOCATION - D030 : AUXCC 50 0600 716  
LOC NARR DESC : AUX 716 RM600 CC50, U1 CA PUMP ROOM  
EQUIPMENT LIST NUM: 85054446 EQUIP TAG: 1CAPU0001



TASK DESCRIPTION : PM-1CAPU0001-(COUPLING)-1A CA PUMP  
SAFETY INSTRUCTION: USE SAFE WORK PRACTICES, USE PROPER PPE  
SPECIAL INSTRUCTN :

CLEARANCE : OPS

DATE:

PRA: CA\_P001

TECH SPEC ITEM: TECH SPEC RELATED: Y EXP. DATE/TIME:  
TSAIL:

SPECIAL EMPHASIS: CC CONTINUOUS COVERAGE  
CE COMPLEX EVOLUTION  
PR PROBABILISTIC RISK ASSESSMENT INTERACTIO  
TS TECH SPEC

DETAILED TSK DESC : PM-1CAPU0001-(COUPLING)-1A CA PUMP\_\_\_\_\_  
A. DISASSEMBLE COUPLING, CLEAN OUT OLD GREASE\_\_\_\_\_  
B. GREASE/REASSEMBLE COUPLING\_\_\_\_\_  
C. ALIGN COUPLING\_\_\_\_\_

PROC/STD: \* MP/0/A/7300/056 Horizontal Rotating Equipment Coupling Alignment\_\_\_\_  
\* NSD104/FME REF PRE-JOB BRIEFING & FME EXEC STD PLN\_\_\_\_\_  
\* POWERCHEMISTRYMANUAL PCMG MAY APPLY TO THIS JOB, REFERENCE EWP 7.6\_\_\_\_\_

#### DETERMINATIONS

QA CONDITION : 1	QC REQ. : Y	RWP# : 20	RED TAG : OPS RED TAG
CONT CLOSURE : N	RETEST : N	RWP IND : Y	BT0# : N
CONTL RM IND : N	FUNC : N	ALARA : N	BT02# : N
CLEAN ZONE : 4	OOC :	NPRDS : Y	R & R : 1-1119
DUKE/ISI CLS : B /	SIZE :	ACTIVE :	CRIP : N

\*\*\* SDQA CAT E --- FOR CONTROL COPY, REFER TO ELECTRONIC DATA \*\*\*

UNIT: 1

03/26/03  
13:42:08  
98313609 01MCGUIRE NUCLEAR STATION  
CREW COVER SHEET FOR WO#/TSK  
CREW NUMBER:416 FOR :( 20010515 / 0700 )1  
11  
1  
1  
11111MODEL WO : 85054446 DUE DATE : 20010305 LATE DATE: 20020306 FREQ: 4Y  
ORIG WR : W/O PRI : I PROJ : \_\_\_\_\_  
WO/TSK TP: PM /PM CRAFT : MP R121 Y/N : Y  
JOB STAT : CLOSED TSK STAT : CLOSED DOC/PEND : \*DOCCNTL

## REFERENCE DRAWINGS :

LOC MC -1201-04.00  
DBD MCS-1154.00-00-0003  
DBD MCS-1465.00-00-0001  
DBD MCS-1465.00-00-0015  
DBD MCS-1563.NS-00-0001  
DBD MCS-1593.SA-00-0001FLW MCFD-1592-01.01  
DBD MCS-1399.03-RPS-0001  
DBD MCS-1465.00-00-0014  
DBD MCS-1554-NV-00-0001  
DBD MCS-1572.NM-00-0001  
DBD MCS-1599.RF-00-0001

G-4

TSK	CRAFT	SEQ	WORK ORDER	TASK LISTING	WORK AGAINST	TYPE	CREW	HOURS
01	MP	01	PM-1CAPU0001-(COUPLING)-1A	CA PUMP	MC1 CA PU0001	PM	416	27.0
02	MP	02	PM-1CAPU0001-FUNCTIONAL (PUMP RUN)		MC1 CA PU0001	FT	416	4.0
03	OP	03	PM-1CAPU0001-PERFORM OPS RETEST		MC1 CA PU0001	RT	RT	1.0

## - CORRECT COMPONENT VERIFICATION

IDENTIFIED BY: \_\_\_\_\_ UNIT: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

VERIFIED BY: \_\_\_\_\_ UNIT: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

## - VERIFICATION OF SAFE WORKING CONDITIONS

VERIFIED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

## - TASK COMPLETION

JOB SUPV: \_\_\_\_\_ DATE: \_\_\_\_\_

\*\*\* SDQA CAT E --- FOR CONTROL COPY, REFER TO ELECTRONIC DATA \*\*\*

UNIT: 1

03/26/03  
13:42:08

MCGUIRE NUCLEAR STATION

I-TSK: 98313609-01  
EQUIPMENT LIST # : 85054446 ----- ADDITIONAL EQUIP. NO. ASSOCIATED WITH 1MCAPU0001

STEP EQUIP NUM

LOCATION

MC 1 CA MR0001

CA PUMP ROOM N SIDE 1A CAP

UNIT \_\_\_\_\_ COMP VERIF ID: \_\_\_\_\_ COMP VERIFIED BY: \_\_\_\_\_

\*\*\* SDQA CAT E --- FOR CONTROL COPY, REFER TO ELECTRONIC DATA \*\*\*

Reviewed By

Approved By

TASK: **Evaluate LWR Paperwork**

POSITION: **SRO**

Operator's Name \_\_\_\_\_

Validation Time: 20 Minutes

Location: **Simulator/Plant**

Method: **Perform**

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date \_\_\_\_/\_\_\_\_/\_\_\_\_

References: OP/0/A/6200/106 Liquid Waste Release – WMT A with WMT Pump A

JPM verified current with references by \_\_\_\_\_

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

## INITIAL CONDITIONS

The following conditions exist:

Unit 1 is at 100% power with 3 RC pumps running

Unit 2 is in No Mode with all RC pumps tagged

LWR Number 2001182 for WMT A is scheduled to be performed

OP/0/A/B/6200/106 is complete up to step 3.15

The following are operable:

- 0EMF49
- WM Flow Loop
- 1WP-35
- 1WP-37

**RP brings the Liquid Waste Release Permit Report and OP/0/B/6200/106 Encl. 4.3 to the Control Room and ask the Control Room SRO to perform step 3.15**

**JPM OVERALL STANDARD:** Identifies errors in Liquid Waste Release Permit Report and directs RP to correct errors.

**NOTES:** N/A.



START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	CR SRO verifies <ul style="list-style-type: none"> <li>• 0EMF49</li> <li>• WM Flow Loop</li> <li>• 1WP-35</li> <li>• 1WP-37</li> </ul> are operable.	Given in Initial Conditions		
*2	CR SRO verifies LWR Number and Release ID on LWR Permit Report	Given in Initial Conditions		
*3	CR SRO verifies RC PUMP DATA on LWR Permit Report	Recognize the Total RC pumps required (4) <b>Should not be &gt;</b> RC pumps running (3)  <b><u>EVALUATOR NOTE:</u></b> If student stops here, ask them to continue their review of the LWR Permit Report.		
*4	CR SRO verifies RECOMMENDED RELEASE DATA on LWR Permit Report	Recognize the Recommended release rate (120 gpm) <b>Should not be &gt;</b> the Allowable release rate (100 gpm)		
*5	CR SRO verifies SETPOINT DATA on LWR Permit Report	Recognize the Expected CPM (4.56E+04) <b>Should not be &gt;</b> the Trip 2 set point		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

---

## INITIAL CONDITIONS

The following conditions exist:

Unit 1 is at 100% power with 3 RC pumps running

Unit 2 is in No Mode with all RC pumps tagged

LWR Number 2001182 for WMT A is scheduled to be performed

OP/0/A/B/6200/106 is complete up to step 3.15

The following are operable:

- OEMF49
- WM Flow Loop
- 1WP-35
- 1WP-37

**RP brings the Liquid Waste Release Permit Report and OP/0/B/6200/106 Encl. 4.3 to the Control Room and ask the Control Room SRO to perform step 3.15**

## LIQUID WASTE RELEASE PERMIT REPORT

LWR Number: 2001182  
Release ID: Waste Monitor Tank "A"

COPY

For TRAINING

=== RC PUMP DATA ===  
RC pumps running..... 3.00  
RC pumps assigned to RELEASE..... 2.00  
Total RC pumps required (all concurrent releases)..... 4.00  
=== RECOMMENDED RELEASE RATE ===  
Allowable release rate (gpm)..... 1.00E+02  
Recommended release rate (gpm)..... 1.20E+02

## === SETPOINT DATA ===

EMF49L in Service ..... Yes Source Checked By: [Signature]  
Monitor Background (cpm)..... 2.23E+03

Cs-137 Equivalence (uCi/ML)... 6.81E-06

Expected CPM..... 4.56E+04 EMF49L Trip 1 & 2

Trip 1 setpoint (cpm)..... 9.563E+03 Set by: [Signature]

Trip 2 setpoint (cpm)..... 1.201E+04

Performed by: [Signature]

IVed by: IS BLACK

## === Special Instructions For Release:

Initiate Release Prior to: \_\_\_\_\_

SRO Authorization: \_\_\_\_\_ Date/Time \_\_\_\_\_

## Release Initiation

## Release Completion

RP \_\_\_ RC Pump Permissive Set to \_\_\_\_\_ Chem \_\_\_ Rel. Stop \_\_\_\_\_  
Date Time

Chem \_\_\_ Rel. Start \_\_\_\_\_ Chem \_\_\_ Vol. Released \_\_\_\_\_ Gal  
Date Time

Chem \_\_\_ # RC Pumps Running \_\_\_\_\_ RC Pump Permissive As Found \_\_\_\_\_  
Chem

## Completion of Release Acknowledged

OPS SRO \_\_\_\_\_ Date/Time \_\_\_\_\_

RP Shift Review \_\_\_\_\_ Date/Time \_\_\_\_\_

Date/Time: 09/01/2001 10:10

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Duke Power Company McGuire Nuclear Station		Procedure No. <b>OP/ 0/B/6200/106</b>																		
<b>Liquid Waste Release - WMT A with WMT Pump A</b>		Revision No. <b>010</b>																		
		Electronic Reference No. <b>MC00471L</b>																		
<b>Continuous Use</b>																				
<b>PERFORMANCE</b>																				
This Procedure was printed on 03/26/03 at 13:54:46 from the electronic library as: <div style="text-align: center; font-weight: bold; font-size: 1.2em;">(ISSUED) - PDF Format</div> Compare with Control Copy every 14 calendar days while work is being performed. <div style="margin-top: 10px;">           Compared with Control Copy _____ Date _____         </div> <div style="margin-top: 10px;">           Compared with Control Copy _____ Date _____         </div> <div style="margin-top: 10px;">           Compared with Control Copy _____ Date _____         </div>																				
Date(s) Performed	Work Order/Task Number (WO#)																			
<b>COMPLETION</b>																				
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Verified By		Date																		
Procedure Completion Approved		Date																		
Remarks ( <i>attach additional pages, if necessary</i> )																				

## Continuous Use

LWR # \_\_\_\_\_ DATA TRANSFER # \_\_\_\_\_

### 1. Limits and Precautions

- 1.1 Discharge recorder 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) is normal instrument for verifying flow. WMT releases must be made with proper verification of release flow rate. Release may continue indefinitely provided SLC Section 16.11 (Radiological Effluent Controls), Action 4, Table 16.11-2 provisions are followed.
- 1.2 WMT pH range is greater than 2.0 and less than 12.5. A pH outside of 2.0 - 12.5 range constitutes Hazardous Waste and requires Chemistry Management notification.
- 1.3 0EMF49 (Liquid Waste Disch Radiation Monitor) must be operable with operable Alarm/Trip Setpoints to ensure SLC 16.11-1 limits are **NOT** exceeded. Release may continue indefinitely provided SLC Section 16.11 (Radiological Effluent Controls), Action 1, Table 16.11-2 provisions are met.
- 1.4 WMT A may be released using WMT Pump B per OP/0/B/6200/035 (Discharging A Waste Monitor Tank To The Environment). WMT Pump B must be used to obtain release sample if WMT A release to be performed using WMT Pump B and valve alignment must remain unaltered to prohibit unanalyzed waste being added to discharge stream because of additional piping use.
- 1.5 0WMPG5110 (A Waste Monitor Tank Pump Disch Press) must be operable to release using WMT Pump A. Release may be performed with WMT Pump B per OP/0/B/6200/035 (Discharging a Waste Monitor Tank to the Environment).
- 1.6 0WMLT5090 (A Waste Monitor Tank Level) must be operable to perform release.
- 1.7 **WHEN** 1WP-35 (Turbine Building Sump Pumps to RC Isol) **AND** 1WP-37 (Turbine Building Sump Pumps to RC Isol) inoperable, release to be performed using Enclosure 4.10 (WMT A Release Using WMT Pump A With 1WM-46).
- 1.8 **WHEN** 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) **OR** 0WMFT5130 (A Waste Monitor Tank Pump Disch Flow) inoperable, release to be performed per Enclosure 4.5 (WMT A Release With 0WMCR5130 Or 0WMFT5130 Inoperable).
- 1.9 **WHEN** 0EMF49 inoperable, release to be performed per Enclosure 4.4 (WMT A Release With 0EMF49 Inoperable).

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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- 1.10 Hydrazine ( $\text{N}_2\text{H}_4$ ) is a strong reducing agent and has been identified as a known carcinogen. MNS NPDES permit restricts discharge canal concentration to less than 0.06 ppm hydrazine. WMTs do **NOT** need to be monitored for hydrazine on a routine basis, only when process knowledge indicates an input of hydrazine to WMT. Enclosure 4.1 (Allowable Chemical Concentration at RC Discharge) must be adhered to in determining allowable concentration of hydrazine in a WMT.
- 1.11 Nitrite ( $\text{NO}_2^-$ ) is a reducing agent that has a mandated EPA release limit. The release limit or Reportable Quantity (RQ) is 100 pounds for any 24-hour period. Nitrite concentration shall be monitored anytime process knowledge indicates an input of nitrite into WM System. Nitrite analysis **NOT** required when known concentration of nitrite is 900 ppm or less. Enclosure 4.2 (Nitrite Poundage Calculation for a WMT) must be adhered to in determining nitrite poundage in WMT.
- 1.12 WMT Boron concentration only monitored when process knowledge indicates discharge canal concentration of greater than 0.75 ppm (administrative limit) will be exceeded. Enclosure 4.1 (Allowable Chemical Concentration at RC Discharge) must be adhered to in determining allowable release concentration based on number of RC Pumps in operation.
- 1.13 Release of ethylene glycol to the environment limited to 55 gallons of 50% glycol or 25 gallons of 100% glycol per WMT. The discharge canal concentration of less than 1.0 ppm (administrative limit) with two RC Pumps in operation will **NOT** be exceeded at these quantities.
- 1.14 **IF** releasing water, other than Laundry water, that has **NOT** been processed through appropriate demineralizers, (i.e., process train inoperable, all components or plant conditions are such that water **CANNOT** be processed) Chemistry Supervision must be notified. A decision will be made by Supervision as to whether or **NOT** RP Shift should be notified to perform PT/0/B/4600/020 (Thirty One (31) Day Offsite Dose Projection).

## 2. Initial Conditions

EB All of the following are operable and available for use:

- ☒ 0WMPG5110 (A Waste Monitor Tank Pump Disch Press)
- ☒ 0WMLT5090 (A Waste Monitor Tank Level)
- ☒ 0EMF49 (Liquid Waste Disch Radiation Monitor)
- ☒ WM Flow Loop (i.e., 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) or 0WMFT5130 (A Waste Monitor Tank Pump Disch Flow))
- ☒ 1WP-35 (Turbine Building Sump Pumps to RC Isol)
- ☒ 1WP-37 (Turbine Building Sump Pumps to RC Isol)
- ☒ 1WMPU0038 (A Waste Monitor Tank Pump)

## 3. Procedure

- ☒ 3.1 Evaluate all outstanding R&Rs and Special Orders that may impact performance of this procedure.

EB 3.2 Close 1WM-103 (A Waste Monitor Tank Inlet Isol).

EB 3.3 Start WMT Pump A.

EB 3.4 **IF** WMT A Flash Mixer operable, start Flash Mixer and recirc tank a minimum of 30 minutes.

EB 3.5 **IF** WMT A Flash Mixer inoperable, recirc tank a minimum of 60 minutes.

EB 3.6 Throttle 1WM-106 (A Waste Monitor Tank Pump Recirc Throttle) as necessary to maintain pump discharge pressure between 87 - 110 psig as indicated on 0WMPG5110 (A Waste Monitor Tank Pump Disch Press).

EB 3.7 **WHEN** recirc and mixing requirements met, sample WMT A per CP/0/B/8600/001 (Radwaste Sampling).

EB 3.8 **IF** in service, stop WMT A Flash Mixer.

EB 3.9 Stop WMT Pump A.

7070 3.10 Record WMT A level as indicated on 0WMPS5091 (Waste Monitor Tank A Level).  
LEVEL

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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<b>NOTE:</b> Acceptable pH range is 2.0 - 12.5.
---

46  
pH 3.11 Record WMT A sample pH result.

☒ 3.12 Record Target Activity Level in Step 3.14.1.

☒ 3.13 Record Data Transfer number on the following and take to Count Room:

- WMT A Sample
- Enclosure Working Copy

3.14 RP to perform the following:

46  
RP 3.14.1 Ensure WMT Beta/Gamma Results are below 5E-5  $\mu\text{Ci/ml}$  (Target Activity Level). {PIP M-98-01938}

$$\frac{2.5E-5 \mu\text{Ci/ml}}{\text{Beta/Gamma}} = \frac{2.5E-5 \mu\text{Ci/ml}}{\text{Grand Total Activity}} - \frac{0 \mu\text{Ci/ml}}{\text{Fission Gas Total Activity}}$$

MA  
RP 3.14.2 **IF** Beta/Gamma results are greater than Target Activity recorded in Step 3.14.1, notify Radwaste Chemistry prior to processing paperwork.

\_\_\_\_\_  
Radwaste Contact

☒ 3.14.3 Attach LWR Discharge Document and two copies of Liquid Waste Release (LWR) Permit Report, Page 1 (Nuclide Data) to this Enclosure, herein after referred to as LWR Document.

46  
RP 3.14.4 Set trip setpoints for 0EMF49 per HP/0/B/1003/008 (Determination of Radiation Monitor Setpoint [EMFs]).

☒ 3.14.5 Take LWR Document to CR SRO.



**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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3.15 CR SRO to perform the following:

**NOTE:** CR SRO to place signature in space provided after Step 3.15.5.

\_\_\_\_\_ 3.15.1 **IF** any of the following are inoperable, notify Radwaste Chemistry and return LWR Document.

- ☐ OEMF49 (Liquid Waste Disch Radiation Monitor)
- ☐ WM Flow Loop (i.e., 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) or 0WMFT5130 (A Waste Monitor Tank Pump Disch Flow))
- ☐ 1WP-35 (Turbine Building Sump Pumps to RC Isol)
- ☐ 1WP-37 (Turbine Building Sump Pumps to RC Isol)

\_\_\_\_\_ 3.15.2 Ensure applicable items on LWR Document complete and sign if approved for release.

\_\_\_\_\_ 3.15.3 Ensure OEMF49 source check performed.

\_\_\_\_\_ 3.15.4 **IF** desired place trace recorder EMFCR0020 in service for OEMF49.

☐ 3.15.5 Record LWR # on Page 1 of this Enclosure.

\_\_\_\_\_/\_\_\_\_\_  
CR SRO Contact                      Date    Time

☐ 3.16 RP to return LWR Document to Radwaste Chemistry.

\_\_\_\_\_ 3.17 **IF** LWR Document returned due to inoperability of OEMF49, close this Enclosure and perform release using Enclosure 4.4 (WMT A Release With OEMF49 Inoperable).

\_\_\_\_\_ 3.18 **IF** LWR Document returned due to inoperability of 1WP-35 (Turbine Building Sump Pumps to RC Isol) **OR** 1WP-37 (Turbine Building Sump Pumps to RC Isol), close this Enclosure and perform release using Enclosure 4.10 (WMT A Release Using WMT Pump A With 1WM-46).

\_\_\_\_\_ 3.19 **IF** LWR Document returned due to inoperability of WM Flow Loop, close this Enclosure and perform release using Enclosure 4.5 (WMT A Release With 0WMCR5130 Or 0WMFT5130 Inoperable).

☐ 3.20 Check "Initial Conditions" continue to be met since initiation of Enclosure.

☐ 3.21 Check required signatures appear on LWR Document.

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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\_\_\_\_\_ 3.22 Ensure required analyses are complete and within administrative limits as listed below:

- pH 2.0 - 12.5
- N<sub>2</sub>H<sub>4</sub> < 0.06 ppm
- NO<sub>2</sub><sup>-</sup> 100 pounds
- Ethylene Glycol 55 gallons of 50% or 25 gallons of 100%

\_\_\_\_\_ 3.23 Notify CR SRO Liquid Waste Release is ready to initiate.

\_\_\_\_\_  
CR SRO Contact

**NOTE:** Step 3.24 to be performed with CRO via phone. CRO name to be documented in space provided after Step 3.24.7.

☐ 3.24 Read the following steps to CRO and obtain required verifications: {PIP M-95-00985}

☐ 3.24.1 Check in "NORMAL" position "RC PUMPS BYPASS PERMISSIVE" switch.

\_\_\_\_\_ 3.24.2 **IF** "RC PUMPS BYPASS PERMISSIVE" inoperable **AND** switch **NOT** in "BYPASS" position, obtain CRO permission and place switch in "BYPASS" position. {PIP M-98-04262} {PIP M-95-00985}

☐ 3.24.3 Compare actual number of RC Pumps in-service to required number of RC Pumps in-service per LWR Document.

\_\_\_\_\_ 3.24.4 **IF** required number of RC Pumps **NOT** in-service, request CRO place required number of RC Pumps in-service.

☐ 3.24.5 Request CRO provide notification if required number of RC Pumps in-service **NOT** maintained during release.

**NOTE:** 1RC-21 (RC Crossover Disch Isol) and 1RC-22 (Unit 1 RC to Unit 2 RC Crossover Disch Isol) are closed to prevent pumping tank contents to WC System via Turbine Building (TB) Sump.

\_\_\_\_\_ 3.24.6 **IF** all Unit 1 RC Pumps off, request CRO check closed 1RC-21 (RC Crossover Disch Isol).

\_\_\_\_\_ 3.24.7 **IF** all Unit 2 RC Pumps off, request CRO check closed 1RC-22 (Unit 1 RC to Unit 2 RC Crossover Disch Isol).

\_\_\_\_\_/\_\_\_\_\_  
CRO Contact                      Date    Time

\_\_\_\_\_ 3.24.8 Obtain CRO permission and perform the following: {PIP M-95-00985}

\_\_\_\_\_ 3.24.8.1 Ensure open 1WP-35 (Turbine Building Sump Pumps to RC Isol)  
CHM      CRO SV and request CRO to Separately Verify position which will be documented via phone.

\_\_\_\_\_ 3.24.8.2 Ensure open 1WP-37 (Turbine Building Sump Pumps to RC Isol)  
CHM      CRO SV and request CRO to Separately Verify position which will be documented via phone.

\_\_\_\_\_ 3.25 Open 1WM-45 (0EMF49 Outlet Isol to RC Cond Disch).

\_\_\_\_\_ 3.26 Open 1WM-245 (0EMF49 Bypass).

3.27 Ensure open:

\_\_\_\_\_ • 1WM-294 (0EMF49 Outlet Isol)

\_\_\_\_\_ • 1WM-295 (0EMF49 Inlet Isol)

3.28 Ensure closed:

\_\_\_\_\_ • 1WM-117 (A Waste Monitor Tank Pump Recirc Through WM System)

\_\_\_\_\_ • 1WM-240 (A Waste Monitor Tank Outlet to B Waste Monitor Tank Pump Isol)

\_\_\_\_\_ 3.29 Unlock and open 1WM-116 (A Waste Monitor Tank Pump Disch to 0EMF49 Isol).  
CHM      DV {PIP M-99-05469}

\_\_\_\_\_ 3.30 Ensure 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) "ON".

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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- \_\_\_\_\_ 3.31 **IF** 0WMPS5091 (Waste Monitor Tank A Level) has **NOT** changed by more than 1% since initially recorded in Step 3.10, go to Step 3.34.
- \_\_\_\_\_ 3.32 **IF** 0WMPS5091 (Waste Monitor Tank A Level) indicates a greater than 1% tank volume increase, perform the following:
- \_\_\_\_\_ 3.32.1 Notify Radwaste Chemistry Staff of increase in tank volume.
- STAFF
- ☐ 3.32.2 Investigate change in tank volume.
- ☐ 3.32.3 Determine source of input and secure.
- ☐ 3.32.4 Attach explanation of increase in tank volume to this Enclosure, verified by Radwaste Chemistry Staff.
- ☐ 3.32.5 Close this Enclosure and initiate new Enclosure to release WMT A.
- \_\_\_\_\_ 3.33 **IF** 0WMPS5091 (Waste Monitor Tank A Level) indicates a decrease of more than 1% tank volume, perform the following:
- \_\_\_\_\_ 3.33.1 Notify Radwaste Chemistry Staff of decrease in tank volume.
- STAFF
- ☐ 3.33.2 Investigate change in tank volume.
- ☐ 3.33.3 Attach explanation of decrease in tank volume to this Enclosure, verified by Radwaste Chemistry Staff.
- \_\_\_\_\_ 3.34 Start WMT Pump A.
- \_\_\_\_\_ 3.35 **IF** operable, start WMT A Flash Mixer.
- \_\_\_\_\_ 3.36 Check 0WMFS5440 (0EMF49 Outlet Flow) indicates zero.
- \_\_\_\_\_ 3.37 Request CRO assistance to initiate release (via phone).

\_\_\_\_\_  
CRO Contact

**NOTE:** Discharge flow rate normally obtained at 100 - 110 psig as indicated on 0WMPG5110 (A Waste Monitor Tank Pump Disch Press).

3.38 Initiate discharge flow at or below flow rate specified on LWR Document:

\_\_\_\_\_ 3.38.1 Slightly throttle open 1WM-114 (A Waste Monitor Tank Pump Disch Throttle).

\_\_\_\_\_ 3.38.2 Close 1WM-106 (A Waste Monitor Tank Pump Recirc Throttle).

\_\_\_\_\_ 3.38.3 Throttle 1WM-114 (A Waste Monitor Tank Pump Disch Throttle) until required discharge flow obtained as indicated on 0WMPG5110 (A Waste Monitor Tank Pump Disch Press).

\_\_\_\_\_ 3.39 Throttle closed 1WM-245 (0EMF49 Bypass) until 3 - 6 gpm flow through 0EMF49 obtained as indicated on 0WMFS5440 (0EMF49 Outlet Flow).

\_\_\_\_\_ 3.40 IF flow through 0EMF49 acceptable AND 0EMF49 Low-Flow Alarm enables and clears, request CRO to notify Radwaste Chemistry of any 0EMF49 alarms received during LWR.

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_ 3.41 IF in-service, stop WMT A Flash Mixer.

\_\_\_\_\_ 3.42 IF required flow CANNOT be obtained through 0EMF49, perform the following:

\_\_\_\_\_ 3.42.1 Close 1WM-114 (A Waste Monitor Tank Pump Disch Throttle).

\_\_\_\_\_ 3.42.2 Throttle  $\approx 1\frac{1}{2}$  turns open 1WM-106 (A Waste Monitor Tank Pump Recirc Throttle) to maintain pump discharge pressure between 87 - 110 psig as indicated on 0WMPG5110 (A Waste Monitor Tank Pump Disch Press).

\_\_\_\_\_ 3.42.3 Open 1WM-245 (0EMF49 Bypass).

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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\_\_\_\_\_ 3.42.4 Notify CRO, Radwaste Chemistry Staff and RP that LWR terminated due to inability to meet OEMF49 flow requirement.

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_  
Radwaste Chemistry Staff Contact

\_\_\_\_\_  
RP Contact

☐ 3.42.5 Investigate inability to meet flow requirement through OEMF49.

\_\_\_\_\_ 3.42.6 **IF** LWR to be re-initiated, perform Enclosure 4.6 (Re-Initiation Of WMT A Release Using WMT Pump A).

\_\_\_\_\_ 3.42.7 **IF** OEMF49 determined inoperable, perform the following:

\_\_\_\_\_ 3.42.7.1 Stop WMT Pump A.

\_\_\_\_\_ 3.42.7.2 Record WMT A level.

\_\_\_\_\_  
LEVEL

\_\_\_\_\_ 3.42.7.3 Record LWR stop time here and on LWR Document.

\_\_\_\_\_  
TIME

\_\_\_\_\_ 3.42.7.4 Lock closed 1WM-116 (A Waste Monitor Tank Pump Disch to  
OEMF49 Isol). {PIP M-99-05469}

CHM

DV

\_\_\_\_\_ 3.42.7.5 Notify CR SRO and declare OEMF49 inoperable.

\_\_\_\_\_  
CR SRO Contact

\_\_\_\_\_/\_\_\_\_\_  
Date Time

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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\_\_\_\_\_ 3.42.7.6     Notify CRO and RP of the following:

- LWR terminated due to OEMF49 failure.
- Total volume released prior to OEMF49 failure.
- OEMF49 declared inoperable.

Volume Released: \_\_\_\_\_ gallons

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_  
RP Contact

- ☐ 3.42.7.7     Prepare Special Order per Chemistry Manual Section 2.11 (Chemistry Special Orders and Equipment Operability Log) to document OEMF49 inoperability.

\_\_\_\_\_ 3.42.7.8     Close 1WM-45 (OEMF49 Outlet Isol to RC Cond Disch).

\_\_\_\_\_ 3.42.7.9     Close 1WM-245 (OEMF49 Bypass).

- ☐ 3.42.7.10     Stamp Chart Recorder and record required information.

- ☐ 3.42.7.11     Close this Enclosure and perform release using Enclosure 4.4 (WMT A Release With OEMF49 Inoperable).

<b>NOTE:</b> WMT A denoted by Pen #1 on 0WMCR5130 (Waste Mon Tank Pumps Disch Flow).
--

\_\_\_\_\_ 3.43     Ensure release flow rate less than or equal to that allowed by LWR Document.

- ☐ 3.44     Stamp Chart Recorder and record required information.

\_\_\_\_\_ 3.45     Record LWR start time here and on LWR Document.

TIME

\_\_\_\_\_ 3.46     Notify RP of LWR start time.

\_\_\_\_\_  
RP Contact

- ☐ 3.47     Update LWR Document.

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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3.48 Monitor LWR and perform the following as required:

\_\_\_\_\_ 3.48.1 **IF** High Rad Trip occurs during LWR, go to Step 3.50.

**NOTE:** • WM Flow Loop is comprised of the following:

0WMFE5130 (A Waste Monitor Tank Pump Disch Flow)  
0WMFT5130 (A Waste Monitor Tank Pump Disch Flow)  
0WMP5130 (A Waste Monitor Tank Pump Disch Flow)  
0WMPE5130 (A Waste Monitor Tank Pump Disch Flow)  
0WMPS5130 (A Waste Monitor Tank Pump Disch Flow)

- **WHEN** 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) **OR** 0WMFT5130 (A Waste Monitor Tank Pump Disch Flow) are inoperable **OR** removed from service for any reason, inoperability to be logged with CR SRO.

\_\_\_\_\_ 3.48.2 **IF** 0EMF49, 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) **OR** 0WMFT5130 (A Waste Monitor Tank Pump Disch Flow) fail during LWR, go to Step 3.51.

\_\_\_\_\_ 3.48.3 **IF** Site Assembly occurs during LWR, go to Step 3.52.

\_\_\_\_\_ 3.49 Stop WMT Pump A at  $\approx$  10% level in WMT A and go to Step 3.53.



- NOTE:**
1. **IF** for any reason 1WP-35 (Turbine Building Sump Pumps to RC Isol) **OR** 1WP-37 (Turbine Building Sump Pumps to RC Isol) trip closed during LWR, it shall be treated as a High Rad Trip.
  2. 1WP-35 (Turbine Building Sump Pumps to RC Isol) will trip closed if preset radiation level is exceeded on the following:
    - 0EMF49 (Liquid Waste Disch Radiation Monitor)
    - 1EMF44 (Unit 1 Cont VUCDT Disch EMF)
    - 2EMF44 (Unit 2 Cont VUCDT Disch EMF)
  3. 1WP-35 (Turbine Building Sump Pumps to RC Isol) or 1WP-37 (Turbine Building Sump Pumps to RC Isol) will trip closed if no RC Pump breakers are closed (i.e., at least one RC Pump must be running).

3.50 High Rad Trip:

- \_\_\_\_\_ 3.50.1 Close 1WM-114 (A Waste Monitor Tank Pump Disch Throttle).
- \_\_\_\_\_ 3.50.2 Throttle  $\approx 1\frac{1}{2}$  turns open 1WM-106 (A Waste Monitor Tank Pump Recirc Throttle) to maintain pump discharge pressure between 87 - 110 psig as indicated on 0WMPG5110 (A Waste Monitor Tank Pump Disch Press).
- \_\_\_\_\_ 3.50.3 Open 1WM-245 (0EMF49 Bypass).
- ☐ 3.50.4 Record WMT A level and time of High Rad Trip in appropriate space below:

	High Rad Trip #1	High Rad Trip #2	High Rad Trip #3
<b>Level:</b>			
<b>Time:</b>			
<b>Re-Initiation Time:</b>			

- \_\_\_\_\_ 3.50.5 Notify CRO and RP of High Rad Trip.

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_  
RP Contact

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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- ☐ 3.50.6 Document High Rad Trip in Autolog.
- \_\_\_\_\_ 3.50.7 **IF** 0EMF49 Control Room Alarm clears shortly after High Rad Trip **AND** prior to flushing, flush will **NOT** be necessary, go to Step 3.50.9.
- ☐ 3.50.8 Perform Enclosure 4.7 (0EMF49 Flush to Floor Drain Tank Sump).
- ☐ 3.50.9 Stamp Chart Recorder and record required information.

**NOTE:** A separate Working Copy of Enclosure 4.6 (Re-Initiation of WMT A Release Using WMT Pump A) shall be used for each re-initiation attempt and attached to this Enclosure.

3.50.10 After High Rad Trip(s), perform the following as appropriate:

- \_\_\_\_\_ • **IF** High Rad Trip #1, perform Enclosure 4.6 (Re-Initiation Of WMT A Release Using WMT Pump A).
- \_\_\_\_\_ • **IF** High Rad Trip #2, perform Enclosure 4.6 (Re-Initiation Of WMT A Release Using WMT Pump A).
- \_\_\_\_\_ • **IF** High Rad Trip #3, stop WMT Pump A and go to Step 3.53.

3.51 Failure of 0EMF49, 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) or 0WMFT5130 (A Waste Monitor Tank Pump Disch Flow):

- \_\_\_\_\_ 3.51.1 Close 1WM-114 (A Waste Monitor Tank Pump Disch Throttle).
- \_\_\_\_\_ 3.51.2 Throttle  $\approx 1\frac{1}{2}$  turns open 1WM-106 (A Waste Monitor Tank Pump Recirc Throttle) to maintain pump discharge pressure between 87 - 110 psig as indicated on 0WMPG5110 (A Waste Monitor Tank Pump Disch Press).
- \_\_\_\_\_ 3.51.3 Stop WMT Pump A.
- \_\_\_\_\_ 3.51.4 Record WMT A level.
- \_\_\_\_\_ 3.51.5 Record LWR stop time here and on LWR Document.
- \_\_\_\_\_ 3.51.6 Lock closed 1WM-116 (A Waste Monitor Tank Pump Disch to 0EMF49 Isol).  
{PIP M-99-05469}
- \_\_\_\_\_ 3.51.7 Close 1WM-45 (0EMF49 Outlet Isol to RC Cond Disch).
- \_\_\_\_\_ 3.51.8 Close 1WM-245 (0EMF49 Bypass).

CHM

LEVEL

TIME

DV

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

OP/0/B/6200/106  
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\_\_\_\_\_ 3.51.9 Notify CR SRO and declare inoperable 0EMF49 or WM Flow Loop (i.e., 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) or 0WMFT5130 (A Waste Monitor Tank Pump Disch Flow).

\_\_\_\_\_  
CR SRO Contact                      Date    Time

\_\_\_\_\_ 3.51.10 Notify CRO and RP of the following:

- LWR terminated due to failure of 0EMF49 or WM Flow Loop.
- Total volume released prior to failure.
- 0EMF49 or WM Flow Loop declared inoperable.

Volume Released: \_\_\_\_\_ gallons

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_  
RP Contact

- ☐ 3.51.11 Prepare Special Order per Chemistry Manual Section 2.11 (Chemistry Special Orders and Equipment Operability Log) to document 0EMF49 or WM Flow Loop inoperability.

\_\_\_\_\_ 3.51.12 **IF** 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) operable, stamp Chart Recorder and record required information.

- ☐ 3.51.13 Close this Enclosure and perform release using Enclosure 4.4 (WMT A Release With 0EMF49 Inoperable).

3.52 Site Assembly:

\_\_\_\_\_ 3.52.1 Close 1WM-114 (A Waste Monitor Tank Pump Disch Throttle).

\_\_\_\_\_ 3.52.2 Throttle  $\approx 1\frac{1}{2}$  turns open 1WM-106 (A Waste Monitor Tank Pump Recirc Throttle) to maintain pump discharge pressure between 87 - 110 psig as indicated on 0WMPG5110 (A Waste Monitor Tank Pump Disch Press).

\_\_\_\_\_ 3.52.3 Stop WMT Pump A.

\_\_\_\_\_ 3.52.4 Record WMT A level.

LEVEL

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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- \_\_\_\_\_ 3.52.5 **IF** 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) operable, stamp Chart Recorder and record required information.
- \_\_\_\_\_ 3.52.6 **IF** 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) **OR** 0WMFT5130 (A Waste Monitor Tank Pump Disch Flow) inoperable, document appropriate information on Table 4.3-1.
- \_\_\_\_\_ 3.52.7 Lock closed 1WM-116 (A Waste Monitor Tank Pump Disch to 0EMF49 Isol).  
CHM      DV      { PIP M-99-05469 }

- \_\_\_\_\_ 3.52.8 **WHEN** time permits, close:

- \_\_\_\_\_ • 1WM-45 (0EMF49 Outlet Isol to RC Cond Disch)
- \_\_\_\_\_ • 1WM-245 (0EMF49 Bypass)

- \_\_\_\_\_ 3.52.9 Notify CR SRO, CRO and RP that LWR terminated due to Site Assembly and  
TIME      report volume released (total gallons) and time. { PIP M-95-00985 }

Volume Released: \_\_\_\_\_gallons

\_\_\_\_\_  
CR SRO Contact

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_  
RP Contact

<b>NOTE:</b> Step 3.56.1 may be performed in conjunction with Step 3.53.
--

- \_\_\_\_\_ 3.53 Notify CR SRO, CRO and RP that LWR complete and report volume released (total  
TIME      gallons) and time. { PIP M-95-00985 }

Volume Released: \_\_\_\_\_gallons

\_\_\_\_\_  
CR SRO Contact

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_  
RP Contact

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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\_\_\_\_\_ 3.54 **IF** 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) operable, stamp Chart Recorder and record required information.

\_\_\_\_\_ 3.55 **IF** flush performed after High Rad Trip #3 per Enclosure 4.7 (0EMF49 Flush to Floor Drain Tank Sump), go to Step 3.57.

3.56 Flush 0EMF49 and discharge piping as follows:

\_\_\_\_\_ 3.56.1 Notify CR SRO and declare 0EMF49 inoperable. {PIP M-96-00764}

\_\_\_\_\_/\_\_\_\_\_  
CR SRO                      Date    Time

\_\_\_\_\_ 3.56.2 Notify RP 0EMF49 declared inoperable.

\_\_\_\_\_  
RP Contact

3.56.3 Close:

- \_\_\_\_\_ • 1WM-106 (A Waste Monitor Tank Pump Recirc Throttle)
- \_\_\_\_\_ • 1WM-239 (A Waste Monitor Tank Pump Suction Isol)

3.56.4 Open:

- \_\_\_\_\_ • 1WM-107 (A Waste Monitor Tank Pump Drn Isol)
- \_\_\_\_\_ • 1WM-111 (A Waste Monitor Tank Pump Tell-Tale)

3.56.5 Open:

- \_\_\_\_\_ • 1YM-140 (Demin Water Supply Isol to Col KK-56 Elev 716)
- \_\_\_\_\_ • 1YM-433 (A Waste Monitor Tank Pump Demin Water Flush Supply Isol)

<b>NOTE:</b> 0EMF49 flow indicated on 0WMFS5440 (0EMF49 Outlet Flow).
---

\_\_\_\_\_ 3.56.6 Close 1WM-245 (0EMF49 Bypass) to obtain maximum allowable flow through 0EMF49.

☐ 3.56.7 Flush 0EMF49 until counts reduced to  $\pm 500$  cpm of background counts recorded on LWR Document.

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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- \_\_\_\_\_ 3.56.8    **IF** additional flush required, open:
- \_\_\_\_\_ • 1YM-432 (0EMF49 Demin Water Flush Supply Isol)
- \_\_\_\_\_ • 1WM-291 (0EMF49 Inlet Sample Isol)
- \_\_\_\_\_ 3.56.9    **IF** additional flush used and is no longer required, close:
- \_\_\_\_\_ • 1YM-432 (0EMF49 Demin Water Flush Supply Isol)
- \_\_\_\_\_ • 1WM-291 (0EMF49 Inlet Sample Isol)
- \_\_\_\_\_ 3.56.10    **WHEN** flush complete, close:
- \_\_\_\_\_ • 1YM-433 (A Waste Monitor Tank Pump Demin Water Flush Supply Isol)
- \_\_\_\_\_ • 1WM-111 (A Waste Monitor Tank Pump Tell-Tale)
- \_\_\_\_\_ • 1WM-107 (A Waste Monitor Tank Pump Dm Isol)
- \_\_\_\_\_ 3.56.11    Open 1WM-239 (A Waste Monitor Tank Pump Suction Isol).
- \_\_\_\_\_ 3.56.12    **IF** 0EMF49 counts **CANNOT** be reduced to  $\pm 500$  cpm of background recorded on LWR Document, flush per one of the following enclosures:
- ☐ Enclosure 4.7 (0EMF49 Flush To Floor Drain Tank Sump)
- OR**
- ☐ Enclosure 4.8 (WMT Pump A Flush To Floor Drain Tank Sump)
- OR**
- ☐ Enclosure 4.9 (0EMF49 Direct Flush)

**NOTE:** RP will initiate Work Request to decon 0EMF49 as required. At RP discretion, 0EMF49 may be declared inoperable if Trip 2 Setpoint **CANNOT** be set.

- \_\_\_\_\_ 3.56.13    **IF** 0EMF49 counts **CANNOT** be reduced to  $\pm 500$  cpm of background recorded on LWR Document, notify RP.

\_\_\_\_\_  
RP Contact

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

OP/0/B/6200/106  
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\_\_\_\_\_ 3.56.14 **IF** OEMF49 remains inoperable after flush, prepare Special Order per Chemistry Manual Section 2.11 (Chemistry Special Orders and Equipment Operability Log) to document OEMF49 inoperability.

\_\_\_\_\_ 3.56.15 **IF** OEMF49 flush obtained desired results, notify CR SRO and declare OEMF49 operable.

\_\_\_\_\_/\_\_\_\_\_  
CR SRO Contact                      Date    Time

\_\_\_\_\_ 3.56.16 **IF** OEMF49 declared operable, notify RP.

\_\_\_\_\_  
RP Contact

3.57    Close:

\_\_\_\_\_ • 1WM-45 (OEMF49 Outlet Isol to RC Cond Disch)

\_\_\_\_\_ • 1WM-245 (OEMF49 Bypass)

\_\_\_\_\_ 3.58    Open 1WM-103 (A Waste Monitor Tank Inlet Isol).

\_\_\_\_\_ 3.59    Close 1WM-114 (A Waste Monitor Tank Pump Disch Throttle).

\_\_\_\_\_ 3.60    Throttle  $\approx$  1½ turns open 1WM-106 (A Waste Monitor Tank Pump Recirc Throttle).

\_\_\_\_\_ 3.61    Request the following information from CRO: {PIP M-99-04364}

☐ Unit 1 or Unit 2 TB Sump being released to RC                      (Yes/No)

☐ Unit 1 or Unit 2 VUCDT in Continuous Release                      (Yes/No)

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_ 3.62    **IF** Unit 1 **OR** Unit 2 VUCDT in Continuous Release, obtain CRO permission and perform the following: {PIP M-95-00985}

\_\_\_\_\_ 3.62.1    Ensure open 1WP-35 (Turbine Building Sump Pumps to RC Isol) and request  
CHM    CRO SV    CRO to Separately Verify position which will be documented via phone.

\_\_\_\_\_ 3.62.2    Ensure open 1WP-37 (Turbine Building Sump Pumps to RC Isol) and request  
CHM    CRO SV    CRO to Separately Verify position which will be documented via phone.

**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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\_\_\_\_\_ 3.63 **IF** Unit 1 or Unit 2 TB Sump being released to RC **AND** Unit 1 or Unit 2 VUCDT **NOT** in Continuous Release, obtain CRO permission and perform the following:  
{PIP M-95-00985}

\_\_\_\_\_ 3.63.1 Close 1WP-35 (Turbine Building Sump Pumps to RC Isol) per the following,  
CHM CRO SV and request CRO to Separately Verify position which will be documented via phone.

\_\_\_\_\_ • Place "CONTROL SWITCH" in "CLOSED" position and hold until valve indicates closed.

\_\_\_\_\_ • Release "CONTROL SWITCH" allowing return to "AUTO" position.

\_\_\_\_\_ 3.63.2 Ensure open 1WP-37 (Turbine Building Sump Pumps to RC Isol) and request  
CHM CRO SV CRO to Separately Verify position which will be documented via phone.

\_\_\_\_\_ 3.64 **IF** Unit 1 or Unit 2 TB Sump **NOT** being released to RC **AND** Unit 1 or Unit 2 VUCDT **NOT** in Continuous Release, obtain CRO permission and perform the following:  
{PIP M-95-00985}

\_\_\_\_\_ 3.64.1 Close 1WP-35 (Turbine Building Sump Pumps to RC Isol) per the following  
CHM CRO SV and request CRO to Separately Verify position which will be documented via phone.

\_\_\_\_\_ • Place "CONTROL SWITCH" in "CLOSED" position and hold until valve indicates closed.

\_\_\_\_\_ • Release "CONTROL SWITCH" allowing return to "AUTO" position.

\_\_\_\_\_ 3.64.2 Close 1WP-37 (Turbine Building Sump Pumps to RC Isol) per the following  
CHM CRO SV and request CRO to Separately Verify position which will be documented via phone.

\_\_\_\_\_ • Place "CONTROL SWITCH" in "CLOSED" position and hold until valve indicates closed.

\_\_\_\_\_ • Release "CONTROL SWITCH" allowing return to "AUTO" position.

\_\_\_\_\_ 3.65 **IF** "RC PUMPS BYPASS PERMISSIVE" switch placed in "BYPASS" per Step 3.24.2, obtain CRO permission and return switch to "NORMAL" position. {PIP M-98-04262}  
{PIP M-95-00985}

\_\_\_\_\_  
CRO Contact

\_\_\_\_\_/\_\_\_\_\_  
Date Time



**Enclosure 4.3**  
**WMT A Release Using WMT Pump A**

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- ☐ 3.66 Record "As Found" "RC PUMPS REQUIRED FOR DILUTION" switch position on LWR Document.
- CHM      DV      3.67 Lock closed 1WM-116 (A Waste Monitor Tank Pump Disch to 0EMF49 Isol).  
{PIP M-99-05469}
- ☐ 3.68 Complete LWR Document.
- ☐ 3.69 Take complete LWR Document to RP.
- ☐ 3.70 RP takes completed LWR Document to CR SRO.
- ☐ 3.71 CR SRO signs LWR Document.
- ☐ 3.72 RP keeps original LWR Discharge Document and forwards completed LWR Document to Radwaste Chemistry.
- ☐ 3.73 Verify receipt of completed LWR Document including LWR Permit Report.

**End of Enclosure**

Reviewed By

St. Helms

Approved By

ED Connel

TASK:

**Determine Protective Action Recommendations and  
perform the initial notifications.**

POSITION:

**SRO**

Operator's Name

Location: **Simulator**

Method: **Perform**

The JPM Operator's performance was evaluated against the standards of this JPM and is  
determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature

Date   /  /  

KA: 194 001 A1.16

References: RP/0/A/5700/000 Classification of an Emergency  
RP/0/A/5700/004 General Emergency

Attachments:

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INITIAL CONDITIONS

Assume: Today is Monday. It is now 0600 on MARCH 31<sup>st</sup>

- At 0545, the Reactor on Unit #1 was tripped and Safety Injection initiated due decreasing inventory and pressure.
- A SGTR has occurred with an unisolable secondary line break on 1C S/G inside containment.
- All CA pumps have just tripped off and due to inadequate S/G levels, a valid Heat Sink Red Path is in effect.
- The event has been announced over the plant PA System.
- Due to instrument 1EEBCR9100 being out of service, the National Weather Service was called and reported wind speed to be constant at 5 MPH.
- Wind direction was 85 degrees from North.
- Containment radiation levels are remaining normal (<5 R/hr)

**The OSM directs you to classify the event per RP/0/A/5700/000 (Classification of Emergency) AND complete the WCCSRO Immediate and Subsequent Actions enclosure of the applicable Response Procedure.**

**JPM OVERALL STANDARD:** The Initial Notification form is completed with the appropriate Protective Action Recommendations.

**NOTES:** This JPM is intended to be used with a blank "Emergency Notification Form" provided to the candidate. Also provide the student with a complete copy of RP/0/A/5700/004 General Emergency.

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Candidate implements procedure for General Emergency.	Event was classified as a <b>General Emergency</b> .  After event classified, log the Time Critical <b>Start Time</b> _____		
2	The Operations Shift Manager or delegate <b>SHALL ANNOUNCE</b> the event over the plant P.A. system by performing the following:	Operator determines from initial conditions that this has already been performed.		
3	Complete items 1 - 10, 15 and 16 on Enclosure 4.1 - Emergency Notification Form in accordance with Enclosure 4.3, section 1	Same		
4	<b><u>COMPLETION OF THE EMERGENCY NOTIFICATION FORM</u></b>  Complete Enclosure 4.1- Emergency Notification Form as follows:  Check A for Drill <b><u>OR</u></b> B for Emergency <b><u>AND</u></b>  Check INITIAL  <b><u>AND</u></b>	Same    Operator checks <b>B</b> for emergency   Same		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	Continued...  Write in message number.  Write in the unit(s)  <b>AND</b>  Communicator's name	Operator writes message number 1   Operator writes in Unit 1   Operator writes communicators name		
4	Write in the transmittal time <b>AND</b> date      Write in the appropriate number <b>AND</b> code word	Operator will <b>not</b> enter a time and date since he/she will not actually be making the transmission      Operator will <b>not</b> enter a number and code word since he/she will not actually be making the transmission		
4  *	<b>Continued</b>  Checks <b>D</b> for GENERAL EMERGENCY	Same		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	<p>Check <b>A</b> for Emergency Declaration At:</p> <p><b><u>AND</u></b></p> <p>Write the time <b><u>AND</u></b> date the classification is declared:</p> <p><b><u>0600 on MARCH 31<sup>st</sup></u></b>.</p>	<p>Same</p> <p>Same</p> <p>NOTE: The Declaration Time of 0600 and Date of January 31<sup>st</sup> is entered in space provided.</p>		
4	<p>Write the reason for declaring the classification</p>	Same		
*	<p>Check <b>C</b> for the appropriate plant condition</p>	Stable <u>or</u> Degrading		
*	<p>Check <b>A</b> SHUTDOWN</p> <p><b><u>AND</u></b></p> <p>write the time and date of Reactor Shutdown</p> <p><b><u>OR</u></b></p> <p>Check B <b><u>AND</u></b> write in the Reactor Power level</p>	<p>Same</p> <p>Reactor Shutdown: Time: <u>0545</u> Date: <u>03/31/03</u></p> <p>N/A</p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*          *  *	<p>Check <b>C</b> . a release is occurring due to the SG Tube Leak.</p> <p>Step #14 is <b>not required</b> but can be filled in with appropriate data.</p> <p>Check <b>B &amp; C</b>, EVACUATE &amp; SHELTER IN-PLACE.</p> <p>Also fills in appropriate zones.</p>	<p>Operator checks that a release is occurring due to the SG Tube Leak.</p> <p>If Step #14 is completed, it should be filled in with: Wind Direction of 85 deg from North and Wind Speed of 5 mph.</p> <p>Same</p> <p>Fills in zones for</p> <p><u>Evacuate:</u> <b>L, B, M, C, N, A, D, O, R.</b></p> <p><u>Shelter:</u> <b>E, F, G, H, I, J, K, P, Q, S</b></p>		
4	<p><b>Continued</b></p> <p>Have the Emergency Coordinator approve the message</p> <p><b><u>AND</u></b></p> <p>Write in the time <b><u>AND</u></b> date the message was approved</p>	<p><b>Cue:</b></p> <p><b>The Emergency Coordinator, John Doe, just approved the message. Please enter time and date for the present.</b></p> <p>Same</p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	<p>Make initial notification to State and County authorities using the Emergency Notification Form in accordance with Enclosure 4.3, section 2.</p> <p><b>Go to step 2.4 as soon as possible</b></p>	<p>NOTE: This step signifies the end of the Time Critical portion of this JPM. Enter the stop time below</p> <p><b>Cue: Another operator will make the transmission the State and Counties.</b></p> <p>Stop Time _____</p>		

\* DENOTES CRITICAL



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## INITIAL CONDITIONS

Assume: Today is Monday. It is now 0600 on MARCH 31<sup>st</sup>

- At 0545, the Reactor on Unit #1 was tripped and Safety Injection initiated due decreasing inventory and pressure.
- A SGTR has occurred with an unisolable secondary line break on 1C S/G inside containment.
- All CA pumps have just tripped off and due to inadequate S/G levels, a valid Heat Sink Red Path is in effect.
- The event has been announced over the plant PA System.
- Due to instrument 1EEBCR9100 being out of service, the National Weather Service was called and reported wind speed to be constant at 5 MPH.
- Wind direction was 85 degrees from North.
- Containment radiation levels are remaining normal (<5 R/hr)

**The OSM directs you to classify the event per RP/0/A/5700/000 (Classification of Emergency) AND complete the WCCSRO Immediate and Subsequent Actions enclosure of the applicable Response Procedure.**

Duke Power Company  
**PROCEDURE PROCESS RECORD**

(1) ID No. RP/0/A/5700/004

Revision No. 017

**PREPARATION**

(2) Station McGuire Nuclear Station

(3) Procedure Title General Emergency

(4) Prepared By J M Cooke Date 7-3-02

(5) Requires NSD 228 Applicability Determination?

☒ Yes (New procedure or revision with major changes)

☐ No (Revision with minor changes)

☐ No (To incorporate previously approved changes)

(6) Reviewed By [Signature] (QR) Date 7/24/02

Cross-Disciplinary Review By \_\_\_\_\_ (QR) NA 9/1 Date 7/24/02

Reactivity Mgmt. Review By \_\_\_\_\_ (QR) NA 9/1 Date 7/24/02

Mgmt. Involvement Review By \_\_\_\_\_ (Ops.Supt.) NA 9/1 Date 7/24/02

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

(8) Temporary Approval (if necessary)

By \_\_\_\_\_ (OSM/QR) Date \_\_\_\_\_

By \_\_\_\_\_ (QR) Date \_\_\_\_\_

(9) Approved By K.L. Murray Date 10-1-02

**PERFORMANCE** (Compare with Control Copy every 14 calendar days while work is being performed.)

(10) Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

(11) Date(s) Performed \_\_\_\_\_

Work Order Number (WO#) \_\_\_\_\_

**COMPLETION**

(12) Procedure Completion Verification

☐ Yes ☐ N/A Check lists and/or blanks initialed, signed, dated or filled in NA, as appropriate?

☐ Yes ☐ N/A Required enclosures attached?

☐ Yes ☐ N/A Data sheets attached, completed, dated and signed?

☐ Yes ☐ N/A Charts, graphs, etc. attached, dated, identified, and marked?

☐ Yes ☐ N/A Procedure requirements met?

Verified By \_\_\_\_\_ Date \_\_\_\_\_

Procedure Completion Approved \_\_\_\_\_ Date \_\_\_\_\_

(14) Remarks (attach additional pages, if necessary)

<p><b>Duke Power Company</b>  <b>McGuire Nuclear Station</b></p> <p><b>General Emergency</b></p> <p><b>Reference Use</b></p>	<p>Procedure No.</p> <p><b>RP/0/A/5700/004</b></p>
	<p>Revision No.</p> <p>017</p>
	<p>Electronic Reference No.</p> <p>MC0048M7</p>

## General Emergency

### 1. Symptoms

Events are in process or have occurred which involve actual or imminent substantial core degradation or melting with potential for loss of containment integrity.

### 2. Immediate Actions

**NOTE:** • The Immediate Actions and part of the Subsequent Actions have been separated into position specific enclosures to enhance timely completion and consistent execution.

2.1 The following Enclosures should be given to the appropriate personnel:

- The OSM should execute Enclosure 4.9 (OSM Immediate and Subsequent Actions) in a timely manner.
- The WCC SRO, or another SRO designated by the OSM should execute Enclosure 4.10 (WCC SRO Immediate and Subsequent Actions) in a timely manner.
- The STA should execute Enclosure 4.11 (STA Immediate and Subsequent Actions) in a timely manner.

### 3. Subsequent Actions

#### 3.1 Follow-up Notifications

**NOTE:** IF changes to the initial Protective Action Recommendations are recognized and approved by the Emergency Coordinator, these changes shall be transmitted to the offsite agencies within 15 minutes. {PIP-M-00-02138}

- \_\_\_\_\_ 3.1.1 Assess protective action recommendations made to the State and Counties in the previous notification. Refer to Enclosure 4.2, page 1 of 4.
- \_\_\_\_\_ 3.1.2 The Emergency Coordinator shall make follow-up notifications to State and County authorities utilizing Enclosure 4.1 (Emergency Notification Form):
  - Every hour until the emergency is terminated
  - OR**
  - If there is any significant change to the situation
  - OR**
  - As agreed upon with each individual agency. Documentation shall be maintained for any agreed upon schedule change and the interval shall not be greater than 2 hours to any agency.
- \_\_\_\_\_ 3.1.3 Complete Enclosure 4.1 (Emergency Notification Form) in accordance with Enclosure 4.5, Section 1.
- \_\_\_\_\_ 3.1.4 Make follow-up notification to State and County authorities using the Emergency Notification Form in accordance with Enclosure 4.5, Section 2.

- \_\_\_\_\_ 3.2 Ensure completion of Enclosure 4.7 (Emergency Coordinator / Emergency Operations Facility Director Turnover Checklist) prior to turnover of Emergency Coordinator responsibilities.

**NOTE:** A TSC preprogrammed fax button is available on the Control Room fax machine.

**IF** changes to the initial Protective Action Recommendations are recognized during the turnover, the turnover should not be completed until the Control Room transmits this notification to the offsite agencies. {PIP-M-0-00541}

- \_\_\_\_\_ 3.3 **WHEN** TSC Emergency Coordinator is ready to receive turnover **THEN** perform one of the following to facilitate turnover:
- \_\_\_\_\_ • Hand deliver turnover sheet to the TSC Emergency Coordinator.
  - OR**
  - \_\_\_\_\_ • Fax turnover sheet to the TSC
- \_\_\_\_\_ 3.4 In the event that a worker's behavior or actions contributed to an actual or potential substantial degradation of the level of safety of the plant (incidents resulting in an Alert or higher emergency declaration), the supervisor must consider and establish whether or not a for cause drug/alcohol screen is required. The FFD Program Administrator or designee is available to discuss/assist with the incident.
- \_\_\_\_\_ 3.5 Protective Actions Onsite
- \_\_\_\_\_ 3.5.1 Evacuate non-essential personnel from the site after all personnel have been accounted for via Site Assembly. Refer to RP/0/A/5700/011 (Conducting a Site Assembly, Site Evacuation or Containment Evacuation).
  - \_\_\_\_\_ 3.5.2 **IF** a situation which is immediately hazardous to life or valuable property exists, **THEN** evaluate potential dose rates by one of the following methods:
    - a. Contact RP Shift at Ext. 4282
    - b. Assess area monitors
  - \_\_\_\_\_ 3.5.3 Complete Enclosure 4.8 (Request for Emergency Exposure), prior to dispatch of emergency workers if emergency situation precludes documentation.

3.6 Using Section D of the Emergency Plan (EAL Basis), assess the emergency condition:

\_\_\_\_\_ 3.6.1 Remain in a General Emergency,

**OR**

\_\_\_\_\_ 3.6.2 Terminate the emergency. **REFER TO** RP/0/A/5700/012 (Activation of the Technical Support Center {TSC}), Enclosure 4.19 for termination criteria.

3.7 Termination Notifications

<b>NOTE:</b> Enclosure 4.6 has instructions for completion and transmission of termination notifications.
---

\_\_\_\_\_ 3.7.1 Complete Enclosure 4.1 (Emergency Notification Form) in accordance with Enclosure 4.6, Section 1.

\_\_\_\_\_ 3.7.2 Make termination notification to State and County authorities using the Emergency Notification Form in accordance with Enclosure 4.6, Section 2.

#### **4. Enclosures**

4.1 Emergency Notification Form.

4.2 Guidance for Offsite Protective Actions

4.3 Initial Notification Completion/Transmission

4.4 NRC Event Notification Worksheet

4.5 Follow-up Notification Completion/Transmission

4.6 Termination Notification Completion/Transmission

4.7 Emergency Coordinator / Emergency Operations Facility Director Turnover Checklist

4.8 Request for Emergency Exposure

4.9 OSM Immediate and Subsequent Actions {PIP 0-M97-4638}

4.10 WCC SRO Immediate and Subsequent Actions {PIP 0-M97-4638}

4.11 STA Immediate and Subsequent Actions {PIP 0-M97-4638}

## EMERGENCY NOTIFICATION

IS A DRILL ☒ ACTUAL EMERGENCY ☐ INITIAL ☐ FOLLOW-UP MESSAGE NUMBER \_\_\_\_\_

SITE: McGuire Nuclear Site

UNIT: \_\_\_\_\_

REPORTED BY: \_\_\_\_\_

3. TRANSMITTAL TIME/DATE: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ (Eastern) mm dd yy CONFIRMATION PHONE NUMBER: (704) 875-6044

4. AUTHENTICATION (If Required): \_\_\_\_\_

(Number)

(Codeword)

## 5. EMERGENCY CLASSIFICATION:

☒ NOTIFICATION OF UNUSUAL EVENT☒ ALERT☐ SITE AREA EMERGENCY☐ GENERAL EMERGENCY6. ☒ Emergency Declaration At: ☐ Termination At: TIME/DATE: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ (Eastern) mm dd yy (If B, go to item 16.)7. EMERGENCY DESCRIPTION/REMARKS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_8. PLANT CONDITION: ☒ IMPROVING ☒ STABLE ☐ DEGRADING9. REACTOR STATUS: ☒ SHUTDOWN: TIME/DATE: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ (Eastern) mm dd yy ☐ \_\_\_\_\_ % POWER

## 10. EMERGENCY RELEASE(S):

☒ NONE (Go to item 14.) ☐ POTENTIAL (GO TO ITEM 14.) ☐ IS OCCURRING ☐ HAS OCCURRED\*\*11. TYPE OF RELEASE: ☐ ELEVATED ☐ GROUND LEVEL☒ AIRBORNE: Started: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Time (Eastern) Date

Stopped: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Time (Eastern) Date

☐ LIQUID: Started: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Time (Eastern) Date

Stopped: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_ Time (Eastern) Date

\*\*12. RELEASE MAGNITUDE: ☐ CURIES PER SEC. ☐ CURIES NORMAL OPERATING LIMITS: ☐ BELOW ☐ ABOVE☒ NOBLE GASES \_\_\_\_\_☐ IODINES \_\_\_\_\_☐ PARTICULATES \_\_\_\_\_☐ OTHER \_\_\_\_\_\*\*13. ESTIMATE OF PROJECTED OFFSITE DOSE: ☐ NEW ☐ UNCHANGED

PROJECTION TIME: \_\_\_\_\_ (Eastern)

TEDE  
mremThyroid CDE  
mrem

ESTIMATED DURATION: \_\_\_\_\_ HRS.

SITE BOUNDARY  
2 MILES \_\_\_\_\_  
5 MILES \_\_\_\_\_  
10 MILES \_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_\*\*14. METEOROLOGICAL DATA: ☒ WIND DIRECTION (from) \_\_\_\_\_ °☐ SPEED (mph) \_\_\_\_\_☐ STABILITY CLASS \_\_\_\_\_☐ PRECIPITATION (type) \_\_\_\_\_

## 15. RECOMMENDED PROTECTIVE ACTIONS:

☒ NO RECOMMENDED PROTECTIVE ACTIONS☐ EVACUATE \_\_\_\_\_☐ SHELTER IN-PLACE \_\_\_\_\_☐ OTHER \_\_\_\_\_Emergency  
Coordinator

APPROVED BY: \_\_\_\_\_ (Name)

TIME/DATE: \_\_\_\_\_ (Eastern) mm dd yy

\* If items 8-14 have not changed, only items 1-7 and 15-16 are required to be completed.

\*\* Information may not be available on initial notifications.



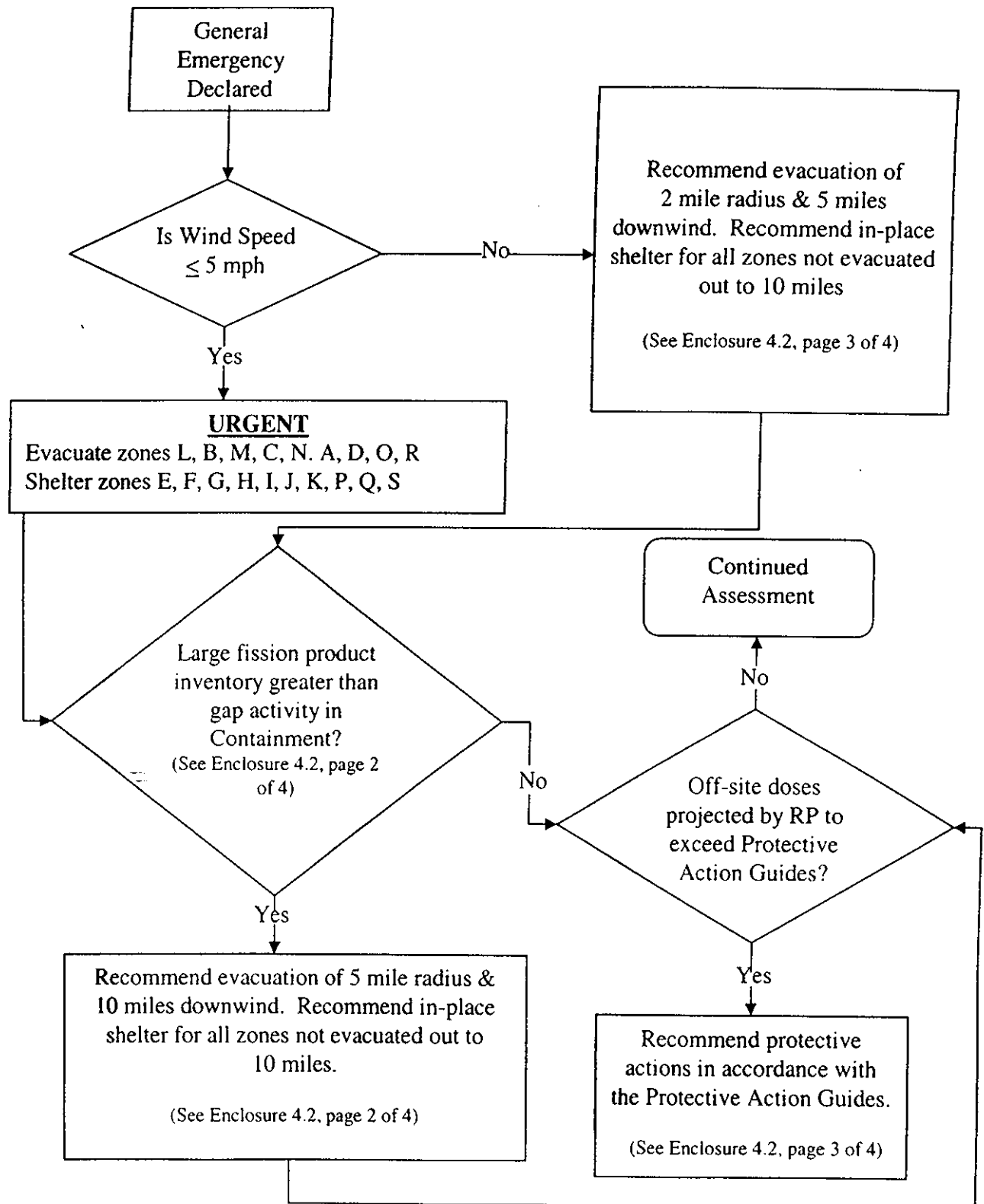
**GOVERNMENT AGENCIES NOTIFIED**

Record the name, date, time and agencies notified:

1. (name) \_\_\_\_\_  
(date) \_\_\_\_\_ (time) \_\_\_\_\_ (agency) **NC State**  
EOC Sel. Sig. 314  
EOC Bell Line (919) 733-3943
2. (name) \_\_\_\_\_  
(date) \_\_\_\_\_ (time) \_\_\_\_\_ (agency) **Mecklenburg County**  
WP Sel. Sig. 116  
WP Bell line 943-6200
3. (name) \_\_\_\_\_  
(date) \_\_\_\_\_ (time) \_\_\_\_\_ (agency) **Gaston County**  
WP Sel. Sig. 112  
WP Bell Line (704) 866-3300
4. (name) \_\_\_\_\_  
(date) \_\_\_\_\_ (time) \_\_\_\_\_ (agency) **Lincoln County**  
WP Sel. Sig. 113  
WP Bell line (704) 735-8202
5. (name) \_\_\_\_\_  
(date) \_\_\_\_\_ (time) \_\_\_\_\_ (agency) **Iredell County**  
WP Sel. Sig. 114  
WP Bell line (704) 878-3039
6. (name) \_\_\_\_\_  
(date) \_\_\_\_\_ (time) \_\_\_\_\_ (agency) **Catawba County**  
WP Sel. Sig. 118  
WP Bell line (828) 464-3112
7. (name) \_\_\_\_\_  
(date) \_\_\_\_\_ (time) \_\_\_\_\_ (agency) **Cabarrus County**  
WP Sel. Sig. 119  
WP Bell line (704) 788-3108

Enclosure 4.2  
Guidance for Off-site Protective Actions

RP/0/A/5700/004  
Page 1 of 4



# Enclosure 4.2

## Guidance for Off-site Protective Actions

RP/0/A/5700/004

Page 2 of 4

### GUIDANCE FOR DETERMINATION OF GAP ACTIVITY

**NOTE:** Fission product inventory inside containment is greater than gap activity if the containment radiation level exceeds the levels in the table below.

— If the OAC is available, call up the following computer points based on need:

Unit 1 OAC  
M1A0829 1EMF51A  
M1A0835 1EMF51B

Unit 2 OAC  
M2A0829 2EMF51A  
M2A0835 2EMF51B

TIME AFTER  
SHUTDOWN (HOURS)

CONTAINMENT MONITOR READING (R/HR)  
EMF 51A or 51B (100% GAP Activity Release)

0	2,340
0-2	864
2-4	624
4-8	450
> 8	265

### Protective Action Zones Determination

#### For Containment Radiation Levels Exceeding GAP Activity

Wind Direction (deg from N) Chart Recorder 1EEBCR9100 Point # 8 Average Upper Wind Direction	Evacuate 5 Mile Radius-10 Mile Downwind	Shelter
0 - 22.5	L,B,M,C,N,A,D,O,R,E,S,F	G,H,I,J,K,P,Q
22.6 - 45.0	L,B,M,C,N,A,D,O,R,E,Q,S	F,G,H,I,J,K,P
45.1 - 67.5	L,B,M,C,N,A,D,O,R,E,Q,S	F,G,H,I,J,K,P
67.6 - 90.0	L,B,M,C,N,A,D,O,R,P,Q,S	E,F,G,H,I,J,K
90.1 - 112.5	L,B,M,C,N,A,D,O,R,K,P,Q,S	E,F,G,H,I,J
112.6 - 135.0	L,B,M,C,N,A,D,O,R,I,K,P,Q,S	E,F,G,H,J
135.1 - 157.5	L,B,M,C,N,A,D,O,R,I,K,P,Q	E,F,G,H,J,S
157.6 - 180.0	L,B,M,C,N,A,D,O,R,I,J,K,P	E,F,G,H,Q,S
180.1 - 202.5	L,B,M,C,N,A,D,O,R,G,H,I,J,K,P	E,F,Q,S
202.6 - 225.0	L,B,M,C,N,A,D,O,R,G,H,I,J,K,P	E,F,Q,S
225.1 - 247.5	L,B,M,C,N,A,D,O,R,F,G,H,I,J	E,K,P,Q,S
247.6 - 270.0	L,B,M,C,N,A,D,O,R,F,G,H,I,J	E,K,P,Q,S
270.1 - 292.5	L,B,M,C,N,A,D,O,R,E,F,G,H,J	I,K,P,Q,S
292.6 - 315.0	L,B,M,C,N,A,D,O,R,E,F,G	H,I,J,K,P,Q,S
315.1 - 337.5	L,B,M,C,N,A,D,O,R,E,F,G	H,I,J,K,P,Q,S
337.6 - 359.9	L,B,M,C,N,A,D,O,R,E,F,S	G,H,I,J,K,P,Q

**Enclosure 4.2**  
**Guidance for Off-site Protective Actions**

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**Protective Action Zones Determination**

<b>Wind Speed Greater than 5 Miles per Hour</b>		
<b>Wind Direction (deg from N) Chart Recorder 1EEBCR9100 Point # 8 Average Upper Wind Direction</b>	<b>Evacuate 2 Mile Radius-5 Mile Downwind</b>	<b>Shelter</b>
0 - 22.5	L,B,M,C,D,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
22.6 - 45.0	L,B,M,C,D,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
45.1 - 67.5	L,B,M,C,D,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
67.6 - 90.0	L,B,M,C,D,O,R,N	A,E,F,G,H,I,J,K,P,Q,S
90.1 - 112.5	L,B,M,C,O,R,N	A,D,E,F,G,H,I,J,K,P,Q,S
112.6 - 135.0	L,B,M,C,O,N,R,A	D,E,F,G,H,I,J,K,P,Q,S
135.1 - 157.5	L,B,M,C,O,A,N	D,E,F,G,H,I,J,K,P,Q,R,S
157.6 - 180.0	L,B,M,C,A,N	D,E,F,G,H,I,J,K,O,P,Q,R,S
180.1 - 202.5	L,B,M,C,A,N	D,E,F,G,H,I,J,K,O,P,Q,R,S
202.6 - 225.0	L,B,M,C,A,N,D	E,F,G,H,I,J,K,O,P,Q,R,S
225.1 - 247.5	L,B,M,C,A,D	E,F,G,H,I,J,K,N,O,P,Q,R,S
247.6 - 270.0	L,B,M,C,A,D	E,F,G,H,I,J,K,N,O,P,Q,R,S
270.1 - 292.5	L,B,M,C,A,D	E,F,G,H,I,J,K,N,O,P,Q,R,S
292.6 - 315.0	L,B,M,C,A,D	E,F,G,H,I,J,K,N,O,P,Q,R,S
315.1 - 337.5	L,B,M,C,D,R	A,E,F,G,H,I,J,K,N,O,P,Q,S
337.6 - 359.9	L,B,M,C,D,R	A,E,F,G,H,I,J,K,N,O,P,Q,S

**GUIDANCE FOR OFFSITE PROTECTIVE ACTIONS**

PAGs  
(Projected Dose)

<b>Total Effective Dose Equivalent (TEDE)</b>	<b>Committed Dose Equivalent (CDE) Thyroid</b>	<b>Recommendation</b>
< 1 rem	< 5 rem	No Protective Action is required based on projected dose.
≥ 1 rem	≥ 5 rem	Evacuate affected zones and shelter the remainder of the 10 mile EPZ not evacuated.

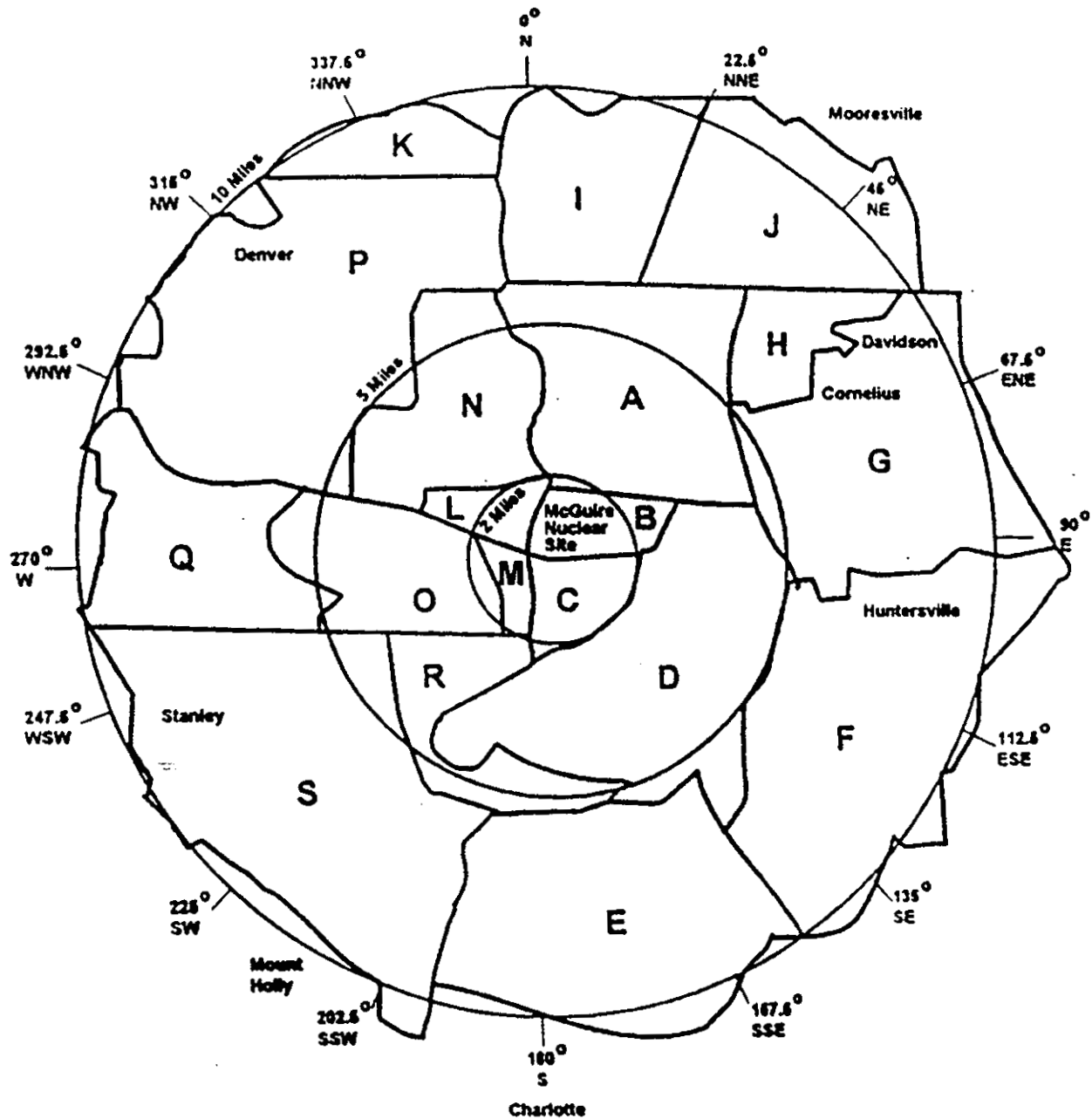
Protective Action Guides (PAGs) are levels of radiation dose at which prompt protective actions should be initiated and are based on EPA-400-R-92-001, Manual of Protective Action Guides and Protective Actions for Nuclear Incidents.

Enclosure 4.2  
Guidance for Off-site Protective Actions

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McGUIRE PROTECTIVE ACTION ZONES  
(2 and 5 mile radius, inner circles)

10 MILE EPZ



**Enclosure 4.3**  
**Initial Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 1 of 9

**1. Completion of the Emergency Notification Form**

**NOTE:** ONLY Items 1 - 10, 15 and 16 are required.  
Items 11 - 14 may be skipped.

1.1 Complete Enclosure 4.1 (Emergency Notification Form) as follows:

**NOTE:** Message #'s should be sequentially numbered throughout the drill/emergency.

—— Item 1 Check A for Drill OR B for Actual Emergency AND  
Check INITIAL AND  
Write in message number.

**NOTE:** Certain events could occur at the plant site such that both units are affected. These may include: Enclosure 4.3 (Abnormal Rad Levels/Radiological Effluent), Enclosure 4.6 (Fires/Explosions and Security Events) and Enclosure 4.7 (Natural Disasters, Hazards and Other Conditions Affecting Plant Safety) from RP/0/A/5700/000, (Classification of Emergency). Consider this when completing the "unit designation" on line 2 of the Emergency Notification Form. {PIP 0-M97-4638}

REPORTED BY: is the Communicator's name.

—— Item 2 Write in the unit(s) AND Communicator's name.

**NOTE:** Information for Items 3 and 4 will be completed during transmission of the Emergency Notification Form.

—— Item 3 Write in the transmittal time AND date.

—— Item 4 Write in appropriate number AND codeword.

—— Item 5 Check D for GENERAL EMERGENCY.

—— Item 6 Check A for Emergency Declaration At: AND  
Write the time AND date the classification was declared.

Enclosure 4.3  
Initial Notification  
Completion/Transmission

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**NOTE:** Reference RP/0/A/5700/000, (Classification of Emergency)

- \_\_\_\_ Item 7 Enter EAL Number and Emergency Description of the reason for declaring the emergency classification (in layman's terms, if possible). **DO NOT** use system abbreviations, acronyms or jargon which may cause confusion. Instead, write out the description in long hand. Be sensitive to the fact that certain descriptive technical terms may elicit unanticipated reactions from others. {PIP 0-M98-2065}
- \_\_\_\_ Item 8 Check the appropriate plant condition. {PIP 0-M97-4210 NRC-1}
- A **Improving:** Emergency conditions are improving in the direction of a lower classification or termination of the event.
  - B **Stable:** The emergency situation is under control. Emergency core cooling systems, equipment, plans, etc., are operating as designed.
  - C **Degrading:** Given current and projected plant conditions/equipment status, recovery efforts are not expected to prevent entry into a higher emergency classification or the need to upgrade offsite Protective Action Recommendations.
- \_\_\_\_ Item 9 Check A SHUTDOWN AND write the time and date of Reactor Shutdown
- OR
- \_\_\_\_ Check B AND write in the Reactor Power level.

**Enclosure 4.3**  
**Initial Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 3 of 9

- NOTE:**
1. **An emergency release is any unplanned, quantifiable discharge to the environment associated with a declared emergency event.** (This definition is based on an NRC commitment made on 11/30/90 following McGuire's Steam Generator Tube Rupture.) {PIP 0-M97-4256}
  2. Notify the OSM if box C or box D is checked.
  3. Base the determination of emergency release on:
    - EMF readings,
    - containment pressure and other indications,
    - field monitoring results,
    - knowledge of the event and its impact on systems operation and resultant release paths.
  4. **An emergency release is occurring if any one or more of the following bulleted conditions are met associated with a declared emergency:**
    - Either containment particulate, gaseous, iodine monitor (EMFs 38, 39 and/or 40) readings indicate an increase in activity,  

**OR**

Containment monitor (EMFs 51A and/or 51B) readings indicate greater than 1.5R/hr,  

**AND**

Either containment pressure is greater than 0.3 psig,  

**OR**

An actual containment breach is known to exist.
    - Unit vent particulate, gaseous, iodine monitor (EMFs 35, 36, and/or 37) readings indicate an increase in activity.
    - Condenser air ejector exhaust monitor (EMF 33) or other alternate means indicate Steam Generator tube leakage.
    - Confirmed activity in the environment reported by Field Monitoring Team(s).
    - Knowledge of the event and its impact on systems operation and resultant release paths.

- Item 10 Check the appropriate box for emergency release.
- **A NONE:** clearly no emergency release is occurring or has occurred.
  - **B POTENTIAL:** discretionary option for the EC or EOFD.
  - **C IS OCCURRING:** meets the specified conditions.
  - **D HAS OCCURRED:** previously met the specified conditions.



- \_\_\_\_\_ Item 15 Check B AND write affected zones for evacuation  
AND  
Check C AND write the letter designation for all other zones not evacuated.
- \_\_\_\_\_ Item 16 Have the Emergency Coordinator approve the message AND  
Write in the time AND date the message was approved.

## 2. TRANSMISSION OF THE EMERGENCY NOTIFICATION FORM

- NOTE:**
1. All initial notifications are **verbal**. Avoid using abbreviations or jargon likely to be unfamiliar to the State and Counties. If any information is not available or not applicable, write out "Not Available" or "Not Applicable" in the margin or other space as appropriate. Do not abbreviate "N.A.".
  2. The backup means of communications are the Bell line or County Emergency Response Radio. RP/0/A/5700/014, Enclosure 4.1 is available for needed backup numbers.
  3. Refer to page 6 of 9 of this Enclosure for instructions on how to use the County Emergency Response Radio if selective signaling or Bell line is not available.

- 2.1 Use the Selective Signaling telephone by dialing \*1 and depressing the push to talk button.
- 2.2 **IF** Selective Signaling Group Call fails, **THEN** go to RP/0/A/5700/014, Enclosure 4.1 for manual selective signaling numbers.

**NOTE:** The time when the first party is contacted should be recorded on Line 3.

- 2.3 As the State and Counties answer, check them off on the back of the notification form. At least one attempt using the individual selective signaling code must be made for any missing agencies. **Proceed with the notification promptly following an attempt to get missing agencies on the line.**
- 2.4 Check the State and Counties are on the line, document this time in item #3 on the form. This time should not exceed 15 minutes from the time of declaration (Item # 6).
- 2.5 Tell them you have an emergency notification from the McGuire Control Room and to get out the Emergency Notification Form.
- 2.6 Read the complete message slowly, line by line, beginning with Item # 1, allowing ample time to copy.

**Enclosure 4.3**  
**Initial Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
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<b>NOTE:</b> Refer to page 7 of 9 of this enclosure for the authentication codeword list.
---

- 2.7 When you reach item #4, ask the State or a County to authenticate the message. The agency should give you a number and you should provide the appropriate codeword. Write the number and codeword on the form.
- 2.8 After communicating the initial message, ask if there are any questions. Record individuals' names and times on the back of the form. This time is the same time as Item #3.
- 2.9 After verbally transmitting the message, FAX a copy (front page only) to the agencies. Refer to pages 8 of 9 and 9 of 9 of this Enclosure for FAX operation.
- 2.10 Continuous attempts to contact missing agencies must be made if unable to complete the notification per step 2.3. Document the time these agencies were contacted on the back of the notification form.

**Enclosure 4.3**  
**Initial Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
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**COUNTY EMERGENCY RESPONSE RADIO**

**NOTE:** This radio will only contact the County warning points. The State cannot be contacted on this radio. Have one of the Counties relay the message to the State.

**Group Call:**

- 1. Press **20** to activate **all** County radio units.
- 2. When the ready light comes on, press the bar on the transmitter microphone and say:  
  
"This is McGuire Control Room to all Counties, do you copy?"  
  
Once all Counties **respond**, begin transmitting the message using step 2.3 through 2.10 of this enclosure.

**Proceed with the notification promptly following an attempt to get missing agencies on the air.**

**NOTE:** RP/0/A/5700/014, Enclosure 4.1 is available for needed individual radio codes.

- 3. If a County fails to **respond** on the group call, press their individual code on the encoder and say:  
  
"This is McGuire Control Room to (Agency you are calling), do you copy?"  
  
Once the County **responds**, begin transmitting the message using step 2.3 through 2.10 of this enclosure.
- 4. After you have **finished** transmitting the message, conclude by saying:  
"This is WQC700 **base** clear."
- 5. Continuous attempts to contact missing agencies must be made if unable to complete the notification per step 2. Document the time these agencies were contacted on the back of the notification form.

**Enclosure 4.3**  
**Initial Notification**  
**Completion/Transmission**

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**AUTHENTICATION CODEWORD LIST**

This page is left intentionally blank.

**Enclosure 4.3**  
**Initial Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 8 of 9

**OPERATION OF THE FAX**

**A. GROUP FAX**

- NOTE:** 1. The FAX will dial each agency in sequence. If the FAX is busy, it will try again after completing the other calls.
2. This sends a FAX to all County Warning Points, State EOC, TSC, EOF, News Group and JIC.

- \_\_\_\_\_ 1. Insert the Emergency Notification Form face down into the FAX.
- \_\_\_\_\_ 2. Press GROUP FAX button.
- \_\_\_\_\_ 3. Press "SEND/RECEIVE" button.

**B. INDIVIDUAL FAX**

- \_\_\_\_\_ 1. Insert the Emergency Notification Form face down into the FAX.
- \_\_\_\_\_ 2. Select location(s) to receive the fax:
  - \_\_\_\_\_ • Press News Group.
  - \_\_\_\_\_ • Press TSC.
  - \_\_\_\_\_ • Press State of North Carolina EOC.
  - \_\_\_\_\_ • Press Mecklenburg County Warning Point.
  - \_\_\_\_\_ • Press Gaston County Warning Point.
  - \_\_\_\_\_ • Press Lincoln County Warning Point.
  - \_\_\_\_\_ • Press Iredell County Warning Point.
  - \_\_\_\_\_ • Press Catawba County Warning Point.
  - \_\_\_\_\_ • Press Cabarrus County Warning Point.
  - \_\_\_\_\_ • Press EOF.
  - \_\_\_\_\_ • Press JIC.
- \_\_\_\_\_ 3. **WHEN** the appropriate individual location is selected, **THEN** press the "SEND/RECEIVE" button.

**Enclosure 4.3**  
**Initial Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 9 of 9

**NOTE:** RP/0/A/5700/014, Enclosure 4.1 is available for needed manual FAX numbers.

C. To send a FAX to a single location dialing manually:

- \_\_\_\_\_ 1. Insert the document face down into the FAX.
- \_\_\_\_\_ 2. Using the keypad, dial the number that you wish to call.
- \_\_\_\_\_ 3. Press "SEND/RECEIVE" button.

## NRC Event Notification Worksheet

Page 1 of 2

CLASSIFICATION TIME/DATE	UNIT	CALLER'S NAME	CALLBACK TELEPHONE #: ENS 1-888-270-0173 or (704) - 875-6044	NRC OPERATIONS OFFICER CONTACTED
-----------------------------	------	---------------	--	----------------------------------

EVENT TIME & ZONE _____ <u>Region II</u> (time) (zone)	EVENT DATE	POWER/MODE BEFORE	POWER/MODE AFTER
--	------------	-------------------	------------------

[illegible]

Include: Systems affected, actuations & their initiating signals, causes, effect of event on plant, actions taken or planned, etc.

Continue on Enclosure 4.4 page 2 of 2 if necessary.

NOTIFICATIONS	YES	NO	WILL BE	ANYTHING UNUSUAL OR NOT UNDERSTOOD? <input type="checkbox"/> YES <input type="checkbox"/> NO		
NRC RESIDENT				(Explain above)		
STATE(s)				DID ALL SYSTEMS FUNCTION AS REQUIRED YES <input type="checkbox"/> NO <input type="checkbox"/>		
OTHER AGENCIES				(Explain above)		
PRESS RELEASE				MODE OF OPERATION UNTIL CORRECTED	EST. RESTART DATE:	ADDITIONAL INFO ON BACK <input type="checkbox"/> YES <input type="checkbox"/> NO

APPROVED BY: \_\_\_\_\_ TIME/DATE: \_\_\_\_\_ / \_\_\_\_\_ / \_\_\_\_\_  
Operations Shift Manager/Emergency Coordinator (eastern) mm dd yy

**Enclosure 4.4**  
**NRC Event Notification Worksheet**

RP/0/A/5700/004  
Page 2 of 2

**BIOLOGICAL RELEASES:** CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description)

LIQUID RELEASE	GASEOUS RELEASE	UNPLANNED RELEASE	PLANNED RELEASE	ONGOING	TERMINATED
MONITORED	UNMONITORED	OFFSITE RELEASE	T.S. EXCEEDED	RM ALARMS	AREAS EVACUATED
PERSONNEL EXPOSED OR CONTAMINATED		OFFSITE PROTECTIVE ACTIONS RECOMMENDED		State release path in description	

**NOTE:** Contact Radiation Protection Shift to obtain the following information.

**IF** the notification is due and the information is not available,  
**THEN** mark "Not Available" and complete the notification.

	Release Rate (Ci/sec)	% T.S. LIMIT	HOO GUIDE	Total Activity (Ci)	% T.S. LIMIT	HOO GUIDE
Noble Gas			0.1 Ci/sec			1000 Ci
Iodine			10 uCi/sec			0.01 Ci
Particulate			1 uCi/sec			1 mCi
Liquid (excluding tritium & dissolved noble gases)			10 uCi/min			0.1 Ci
Liquid (tritium)			0.2 Ci/min			5 Ci
Total Activity						

RECORD MONITORS IN ALARM	PLANT STACK (EMF 35, 36, 37)	CONDENSER/ AIR EJECTOR (EMF 33)	MAIN STEAM LINE (UNIT 1-EMF 24,25,26,27 UNIT 2-EMF 10, 11, 12,13)	SG BLOWDOWN (EMF 34)	OTHER
MONITOR READINGS:					
SETPOINTS: TRIP II					
T.S. LIMIT (If applicable)		NOT APPLICABLE		NOT APPLICABLE	

**RCS OR SG TUBE LEAKS:** CHECK OR FILL IN APPLICABLE ITEMS (specific details/explanations should be covered in event description)

LOCATION OF THE LEAK (e.g. SG#, valve, pipe, etc.):

LEAK RATE: gpm/gpd	T.S. LIMITS EXCEEDED:	SUDDEN OR LONG TERM DEVELOPMENT:
LEAK START DATE: TIME:	COOLANT ACTIVITY: PRIMARY (Last Sample) Xe eq. _____ mCi/ml	SECONDARY Xe eq. _____ mCi/ml
	Iodine eq. _____ mCi/ml	Iodine eq. _____ mCi/ml

LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL:

EVENT DESCRIPTION (Continued from Enclosure 4.4 page 1 of 2)



**Enclosure 4.5**  
**Follow-Up Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 1 of 6

**1. Completion of the Emergency Notification Form**

**NOTE:** If items 8 - 14 have not changed from the previous message, only items 1 - 7, 15 and 16 are required to be completed. Avoid using abbreviations or jargon likely to be unfamiliar to the State and Counties. If any information is not available or not applicable, write out "Not Available" or "Not Applicable" in the margin or other space as appropriate. Do not abbreviate "N.A.".

1.1 Complete Enclosure 4.1 (Emergency Notification Form as follows):

**NOTE:** Message #'s should be sequentially numbered throughout the drill/emergency.

—— Item 1      Check A for Drill OR B for Actual Emergency AND  
Check FOLLOW-UP AND  
Write in message number.

**NOTE:** Certain events could occur at the plant site such that both units are affected. These may include: Enclosure 4.3 (Abnormal Rad Levels/Radiological Effluent), Enclosure 4.6 (Fires/Explosions and Security Events) and Enclosure 4.7 (Natural Disasters, Hazards and Other Conditions Affecting Plant Safety) from RP/0/A/5700/000, (Classification of Emergency). Consider this when completing the "unit designation" on line 2 of the Emergency Notification Form. {PIP 0-M97-4638}

REPORTED BY: is the Communicator's name.

—— Item 2      Write in the unit(s) AND Communicator's name.

**NOTE:** Transmittal time is the time you FAX the form to the agencies.

—— Item 3      Write in the transmittal time AND date.

—— Item 4      Authentication is not required when faxing.

—— Item 5      Check D for GENERAL EMERGENCY.

—— Item 6      Check A for Emergency Declaration At: AND  
Write the time AND date the classification was declared.

**Enclosure 4.5**  
**Follow-Up Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 2 of 6

<b>NOTE:</b> Reference RP/0/A/5700/000, (Classification of Emergency)
---

\_\_\_\_\_ Item 7

Enter EAL Number and Emergency Description of the reason for declaring the emergency classification (in layman's terms, if possible). **DO NOT** use system abbreviations, acronyms or jargon which may cause confusion. Instead, write out the description in long hand. Be sensitive to the fact that certain descriptive technical terms may elicit unanticipated reactions from others. {PIP 0-M98-2065}

In addition, provide a description of changes in plant conditions since the last notification. Items to be considered for inclusion are as follows: {PIP 0-M98-2065}

- Other unrelated classifiable events (for example, during an Alert, an event which, by itself would meet the conditions for an Unusual Event)
- Major/Key Equipment Out of Service
- Emergency response actions underway
- Fire(s) onsite
- Flooding related to the emergency
- Explosions
- Loss of Offsite Power
- Core Uncovery
- Core Damage
- Medical Emergency Response Team activation related to the emergency
- Personnel injury related to the emergency or death
- Transport of injured individuals offsite - specify whether contaminated or not
- Site Evacuation/relocation of site personnel
- Saboteurs/Intruders/Suspicious devices/Threats
- Chemical or Hazardous Material Spills or Releases
- Extraordinary noises audible offsite
- Any event causing/requiring offsite agency response
- Any event causing increased media attention
- Remember to "close the loop" on items from previous notifications.

**Enclosure 4.5**  
**Follow-Up Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 3 of 6

\_\_\_\_\_ Item 8

Check the appropriate plant condition. {PIP M-097-4210 NRC-1}

- **A. Improving:** Emergency conditions are improving in the direction of a lower classification or termination of the event.
- **B. Stable:** The emergency situation is under control. Emergency core cooling systems, equipment, plans, etc., are operating as designed.
- **C. Degrading:** Given current and projected plant conditions/equipment status, recovery efforts are not expected to prevent entry into a higher emergency classification or the need to upgrade offsite Protective Action Recommendations.

\_\_\_\_\_ Item 9

Check A SHUTDOWN AND write the time and date of Reactor Shutdown

**OR**

Check B AND write in the Reactor Power level.

Enclosure 4.5  
Follow-Up Notification  
Completion/Transmission

RP/0/A/5700/004  
Page 4 of 6

- NOTE:**
1. An emergency release is any unplanned, quantifiable discharge to the environment associated with a declared emergency event. (This definition is based on an NRC commitment made on 11/30/90 following McGuire's Steam Generator Tube Rupture.) {PIP 0-M97-4256}
  2. Notify the OSM if box C or box D is checked.
  3. Base the determination of emergency release on:
    - EMF readings,
    - containment pressure and other indications,
    - field monitoring results,
    - knowledge of the event and its impact on systems operation and resultant release paths.
  4. An emergency release is occurring if any one or more of the following bulleted conditions are met associated with a declared emergency:
    - Either containment particulate, gaseous, iodine monitor (EMFs 38, 39 and/or 40) readings indicate an increase in activity,  

OR

Containment monitor (EMFs 51A and/or 51B) readings indicate greater than 1.5R/hr,  

AND

Either containment pressure is greater than 0.3 psig,  

OR

An actual containment breach is known to exist.
    - Unit vent particulate, gaseous, iodine monitor (EMFs 35, 36, and/or 37) readings indicate an increase in activity.
    - Condenser air ejector exhaust monitor (EMF 33) or other alternate means indicate Steam Generator tube leakage.
    - Confirmed activity in the environment reported by Field Monitoring Team(s).
    - Knowledge of the event and its impact on systems operation and resultant release paths.

- Item 10 Check the appropriate box for emergency release.
- **A NONE:** clearly no emergency release is occurring or has occurred.
  - **B POTENTIAL:** discretionary option for the EC or EOFD.
  - **C IS OCCURRING:** meets the specified conditions.
  - **D HAS OCCURRED:** previously met the specified conditions.

**Enclosure 4.5**  
**Follow-Up Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 5 of 6

\_\_\_ 1.2 **IF** follow-up notification is due and information for Items 11 through 14 cannot be obtained from RP shift, **THEN** mark each item "Not Available" and go to Item 15.

\_\_\_ Item 11 Check GROUND LEVEL **AND**  
Check A for AIRBORNE **OR** B for LIQUID **AND**  
Write in the time **AND** date the release started **AND** stopped if available.

\_\_\_ Item 12 Check CURIES PER SECOND **AND**  
Check BELOW **OR** ABOVE normal operating limits **AND**  
Check the appropriate blocks A, B, C, D **AND** write in the value(s).

**NOTE:** If unchanged from the previous notification, the information does not have to be repeated.

\_\_\_ Item 13 Check NEW **OR** UNCHANGED **AND**  
Write in the projection time **AND**  
Write in the estimated duration **AND**  
Write in the TEDE and Thyroid CDE values.

\_\_\_ Item 14 Check A, B, C, D **AND** provide values for each.

\_\_\_ Item 15 Check B **AND** write affected zones for evacuation

**AND**

Check C **AND** write the letter designation for all other zones not evacuated.

\_\_\_ Item 16 Have the Emergency Coordinator approve the message **AND**  
Write in the time **AND** date the message was approved.

**Enclosure 4.5**  
**Follow-Up Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 6 of 6

## 2. Transmission of the Emergency Notification Form

**NOTE:** For routine, follow-up notifications, FAX a copy of the notification form instead of verbally transmitting the message (front page only). This applies only if the message does not involve a change in the emergency classification or the protective action recommendations or a termination of the emergency. Call each agency to verify they received the message.

- 2.1 Insert the Emergency Notification Form (front page only) face down into the FAX.
- 2.2 Press "GROUP FAX" button.
- 2.3 Press "SEND/RECEIVE" button.
- 2.4 **IF** programmed functions fail, **THEN** go to RP/0/A/5700/014, Enclosure 4.1 for manual FAX numbers.
- 5 Ensure the State and Counties received the FAX by calling them.
- 2.6 Ask if there are any questions on the Emergency Notification Form, then record individuals' names and times on the back of the form.

**Enclosure 4.6**  
**Termination Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 1 of 6

**1. Completion of the Emergency Notification Form**

**NOTE:** A termination message should be marked as FOLLOW-UP on the Emergency Notification Form.

1.1 Complete Enclosure 4.1 (Emergency Notification Form) as follows:

- Item 1      Check A for Drill OR B for Actual Emergency AND  
Check FOLLOW-UP AND  
Write in message number.

**NOTE:** Certain events could occur at the plant site such that both units are affected. These may include: Enclosure 4.3 (Abnormal Rad Levels/Radiological Effluent), Enclosure 4.6 (Fires/Explosions and Security Events) and Enclosure 4.7 (Natural Disasters, Hazards and Other Conditions Affecting Plant Safety) from RP/0/A/5700/000, (Classification of Emergency). Consider this when completing the "unit designation" on line 2 of the Emergency Notification Form. {PIP 0-M97-4638}

REPORTED BY: is the Communicator's name.

- Item 2      Write in the unit(s) AND Communicator's name.

**NOTE:** Information for Items 3 and 4 will be completed during transmission of the Emergency Notification Form.

- Item 3—— Write in the transmittal time AND date.
- Item 4      Write in appropriate number AND codeword.
- Item 5      Check D for GENERAL EMERGENCY.
- Item 6      Check B for Termination At: AND  
Write the time AND date the classification was terminated.
- Item 16      Have the Emergency Coordinator approve the message AND  
Write in the time AND date the message was approved.

**Enclosure 4.6**  
**Termination Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 2 of 6

**2. Transmission of the Emergency Notification Form**

- NOTE:**
1. All termination notifications are verbal. Avoid using abbreviations or jargon likely to be unfamiliar to the State and Counties. If any information is not available or not applicable, write out "Not Available" or "Not Applicable" in the margin or other space as appropriate. Do not abbreviate "N.A.".
  2. The backup means of communications are the Bell line or County Emergency Response Radio. RP/0/A/5700/014, Enclosure 4.1 is available for needed backup numbers.
  3. Refer to page 3 of 6 of this enclosure for instructions on how to use the County Emergency Response Radio if selective signaling or Bell line is not available.

- 2.1 Use the Selective Signal telephone by dialing \*1 and depressing the push to talk button.
- 2.2 **IF** Selective Signaling Group Call fails, **THEN** go to RP/0/A/5700/014, Enclosure 4.1 for manual selective signaling numbers.
- 2.3 As the State and Counties answer, check them off on the back of the notification form. At least one attempt using the individual selective signaling code must be made for any missing agencies. **Proceed with the notification promptly following an attempt to get missing agencies on the line.**
- 2.4 Check the State and Counties are on the line, document this time in item #3 on the form.
- 2.5 Tell them you have an emergency notification from the McGuire Control Room and to get out the Emergency Notification Form.
- 2.6 Read the complete message slowly, line by line, beginning with Item # 1, allowing ample time to copy.

**NOTE:** Refer to page 4 of 6 of this Enclosure for the authentication codeword list.

- 2.7 When you reach item #4, ask the State or a County to authenticate the message. The agency should give you a number and you should provide the appropriate codeword. Write the number and codeword on the form.
- 2.8 After communicating the message, ask if there are any questions. Record individuals' names and times on the back of the form. This time is the same time as Item #3.
- 2.9 After verbally transmitting the message, FAX a copy (front page only) to the agencies. Refer to page 5 of 6 and 6 of 6 of this enclosure for FAX operation.



**Enclosure 4.6**  
**Termination Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
Page 3 of 6

- 2.10 Continuous attempts to contact missing agencies must be made if unable to complete the notification per step 2.3. Document the time these agencies were contacted on the back of the notification form.

**COUNTY EMERGENCY RESPONSE RADIO**

**NOTE:** This radio will only contact the County warning points. The State cannot be contacted on this radio. Have one of the Counties relay the message to the State.

**Group Call:**

- 1. Press **20** to activate all County radio units.
- 2. When the ready light comes on, press the bar on the transmitter microphone and say:

"This is McGuire Control Room to all Counties, do you copy?"

Once all Counties respond, begin transmitting the message using step 2.3 through 2.10 of this enclosure.

**Proceed with the notification promptly following an attempt to get missing agencies on the air.**

**NOTE:** RP/0/A/5700/014, Enclosure 4.1 is available for needed individual radio codes.

- 3. If a County fails to respond on the group call, press their individual code on the encoder and say:
- "This is McGuire Control Room to (Agency you are calling), do you copy?"
- Once the County responds, begin transmitting the message using step 2.3 through step 2.10 of this enclosure.
- 4. After you have finished transmitting the message, conclude by saying:
- "This is WQC700 base clear."
- 5. Continuous attempts to contact missing agencies must be made if unable to complete the notification per Step 2. Document the time these agencies were contacted on the back of the notification form.

**Enclosure 4.6**  
**Termination Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
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**AUTHENTICATION CODEWORD LIST**

This page is left intentionally blank.

**Enclosure 4.6**  
**Termination Notification**  
**Completion/Transmission**

RP/0/A/5700/004  
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**OPERATION OF THE FAX**

**A. GROUP FAX**

- NOTE:** 1. The FAX will dial each agency in sequence. If the FAX is busy, it will try again after completing the other calls.
2. This sends a FAX to all County Warning Points, State EOC, TSC, EOF, News Group and JIC.

- \_\_\_\_\_ 1. Insert the Emergency Notification Form face down into the FAX.
- \_\_\_\_\_ 2. Press "GROUP FAX" button.
- \_\_\_\_\_ 3. Press "SEND/RECEIVE" button.

**B. INDIVIDUAL FAX**

- \_\_\_\_\_ 1. Insert the Emergency Notification Form face down into the FAX.
- \_\_\_\_\_ 2. Select location(s) to receive the fax:
  - \_\_\_\_\_ • Press News Group.
  - \_\_\_\_\_ • Press TSC.
  - \_\_\_\_\_ • Press State of North Carolina EOC.
  - \_\_\_\_\_ • Press Mecklenburg County Warning Point.
  - \_\_\_\_\_ • Press Gaston County Warning Point.
  - \_\_\_\_\_ • Press Lincoln County Warning Point.
  - \_\_\_\_\_ • Press Iredell County Warning Point.
  - \_\_\_\_\_ • Press Catawba County Warning Point.
  - \_\_\_\_\_ • Press Cabarrus County Warning Point.
  - \_\_\_\_\_ • Press EOF.
  - \_\_\_\_\_ • Press JIC.
- \_\_\_\_\_ 3. **WHEN** the appropriate individual location is selected, **THEN** press the "SEND/RECEIVE" button.

**Enclosure 4.6**  
**Termination Notification**  
**Completion/Transmission**

**RP/0/A/5700/004**  
**Page 6 of 6**

**OPERATION OF THE FAX**

**NOTE:** RP/0/A/5700/014, Enclosure 4.1 is available for needed manual FAX numbers.

C. To send a FAX to a single location dialing manually:

- \_\_\_\_\_ 1. Insert the document face down in the FAX.
- \_\_\_\_\_ 2. Using the keypad, dial the number that you wish to call.
- \_\_\_\_\_ 3. Press "SEND/RECEIVE" button.

## Enclosure 4.7

# Emergency Coordinator / Emergency Operations Facility Director Turnover Checklist

RP/0/A/5700/004

Page 1 of 1

UNIT(S) AFFECTED:

U1 \_\_\_\_\_ U2 \_\_\_\_\_

(PIP-M-99-3800)

GENERAL	DATE: _____	POWER LEVEL		NCS TEMP	NCS PRESS
	TIME: _____	U-1 _____	_____	_____	_____
EMERGENCY CLASSIFICATION	NOUE DECLARED AT: _____	TSC ACTIVATED AT: _____			
	ALERT DECLARED AT: _____	EOF ACTIVATED AT: _____			
	SAE DECLARED AT: _____				
	G.E. DECLARED AT: _____				
	REASON FOR EMER CLASS: _____				
MBLEY CUATION		YES	NO	TIME	LOCATION OR COMMENTS
	SITE ASSEMBLY	_____	_____	_____	_____
	SITE EVAC. (NON-ESSEN.)	_____	_____	_____	_____
	SITE EVAC. (ESSENTIAL)	_____	_____	_____	_____
	OTHER OFFSITE AGENCY INVOLVEMENT	_____	_____	_____	_____
	MEDICAL	_____	_____	_____	_____
	FIRE	_____	_____	_____	_____
	POLICE	_____	_____	_____	_____
RADIOLOGICAL		NUMBER ASSEM.	NUMBER DEPLOYED		
	FIELD MON. TEAMS	_____	_____		
		ZONES EVAC		ZONES SHELTERED	
	PARS:	_____	_____	_____	
		YES	NO		
	RELEASE IN PROGRESS	_____	_____		
	RELEASE PATHWAY	_____			
	CONTAINMENT PRESSURE	_____	PSIG		
	WIND DIRECTION	_____	WIND SPEED	_____	
PSITE UNICATION		NUMBER	TIME		
	LAST MESSAGE SENT:	_____	_____		
	NEXT MESSAGE DUE:	_____	_____		
NOTE: EOF COMMUNICATION CHECKS SHOULD BE COMPLETED PRIOR TO ACTIVATING THE EOF.					

R NOTES RELATED TO THE ACCIDENT/EVENT/PLANT EQUIPMENT FAILED OR OUT OF SERVICE

**Enclosure 4.8**  
**Request for Emergency Exposure (a)**

RP/0/A/5700/004  
Page 1 of 1

<u>Activity</u>	<u>Total Effective Dose Equivalent (TEDE)</u>	<u>Lens of Eye</u>	<u>Other Organs (b)</u>
All	5 rem	15 rem	50 rem
Protecting Valuable Property	10 rem	30 rem	100 rem
Life saving or Protection of Large Populations	25 rem	75 rem	250 rem
Life saving or Protection of Large Populations (c)	> 25 rem	> 75 rem	> 250 rem

(a) Excludes declared pregnant women

(b) Includes skin and body extremities

(c) Only on a volunteer basis to persons fully aware of the risks involved. All factors being equal, select volunteers above the age of 45 and those who normally encounter little exposure.

RP Badge No.	Name	Age	Employer	Signature of Individual

My signature indicates my acknowledgement that I have been informed that I may be exposed to the levels of radiation indicated above. I have been fully briefed on the task to be accomplished and on the risks of this exposure.

I, \_\_\_\_\_ acknowledge this planned Emergency Exposure \_\_\_\_\_.  
(RPM or designee, signature or note of verbal authorization) Date/Time

I, \_\_\_\_\_ approve this planned Emergency Exposure at \_\_\_\_\_.  
(Emergency Coordinator or EOF Director, signature or note of verbal authorization) Date/Time

Subsequent Radiation Protection Action:

- Determine need for medical evaluation
- Initiate reporting requirements per 10CFR20
- Copy to Individual's Exposure History File

## OSM Immediate and Subsequent Actions

Page 1 of 4

**1. Immediate Actions**

Initial

\_\_\_\_\_ 1.1 The Operations Shift Manager or designee **SHALL ANNOUNCE** the event over the plant P.A. system by performing the following:

\_\_\_\_\_ 1.1.1 Turn on the outside page speakers.

**NOTE:**

- For drill purposes, state "This is a drill. This is a drill."
- Any plant phone in the Control Room horse shoe area or extension 4021 is programmed to access 710, site all call. { PIP 0-M98-2545 }

\_\_\_\_\_ 1.1.2 Dial 710; pause, dial 80. Following the beep, announce "a General Emergency has been declared". Provide a brief description of the event (may be written below) and announce "Activate the TSC/OSC and EOF".

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\_\_\_\_\_ 1.1.3 Repeat the preceding announcement one time.

\_\_\_\_\_ 1.1.4 Turn off the outside page speakers.

**Enclosure 4.9**  
**OSM Immediate and Subsequent Actions**

RP/0/A/5700/004  
Page 2 of 4

- NOTE:**
1. Initial notification to the State and Counties must be made within 15 minutes of the event declaration, using Enclosure 4.1.
  2. Enclosure 4.3 has instructions for completion/transmission of the Emergency Notification Form

\_\_\_\_\_ 1.2 The Emergency Coordinator shall recommend to offsite authorities in the initial notification the following:

- NOTE:**
1. To obtain the wind speed, use chart recorder 1EEBCR9100, point #5 (Average Lower Wind Speed).
  2. To obtain the wind direction, use chart recorder 1EEBCR9100, point #8 (Average Upper Wind Direction).
  3. If either point on 1EEBCR9100 is unavailable, obtain needed data from one of the following sources in order of sequence:
    - A. DPC Meteorological Lab (8-594-0341)
    - B. National Weather Service in Greer, S.C. (864-879-1085 or 1-800-268-7785)
    - C. Catawba Nuclear Station Control Room (8-831-5345).

**NOTE:** IF changes to the initial Protective Action Recommendations are recognized and approved by the Emergency Coordinator, these shall be transmitted to the offsite agencies within 15 minutes. {PIP-M-00-01238}

\_\_\_\_\_ 1.2.1 IF containment radiation levels exceed the levels on Enclosure 4.2, page 2 of 4, Guidance for Determination of Gap Activity, THEN:

- \_\_\_\_\_ • Evacuate the 5-mile radius AND 10 miles downwind as shown on Enclosure 4.2, page 2 of 4, Protective Action Zones Determination, using wind direction

AND

- \_\_\_\_\_ • Shelter remaining zones as shown on Enclosure 4.2, page 2 of 4, Protective Action Zones Determination, using wind direction.



**Enclosure 4.9**  
**OSM Immediate and Subsequent Actions**

RP/0/A/5700/004  
Page 3 of 4

1.2.2 **If** containment radiation levels **DO NOT** exceed the levels on Enclosure 4.2, page 2 of 4, Guidance for Determination of Gap Activity, **THEN** perform one of the following:

**If** wind speed less than or equal to 5 MPH, **THEN**:

- \_\_\_\_\_ • Evacuate zones L, B, M, C, N, A, D, O, R

**AND**

- \_\_\_\_\_ • Shelter zones E, F, G, H, I, J, K, P, Q, S.

**OR**

**If** wind speed greater than 5 MPH, **THEN**:

- \_\_\_\_\_ • Evacuate the 2-mile radius **AND** 5 miles downwind as shown on Enclosure 4.2, page 3 of 4, Protective Action Zones Determination, using wind direction

**AND**

- \_\_\_\_\_ • Shelter remaining zones as shown on Enclosure 4.2, page 3 of 4, Protective Action Zones Determination, using wind direction.

\_\_\_\_\_ 1.3 **If** valid trip II alarm occurs on any one of the following:

-1 **OR** 2 EMF36(L)

1 EMF24, 25, 26, 27

2 EMF10, 11, 12, 13

**THEN** immediately contact RP shift at 4282 to perform HP/0/B/1009/029 (Initial Response On-Shift Dose Assessment).

\_\_\_\_\_ 1.4 **If** box C (IS OCCURRING) or box D (HAS OCCURRED) from **Item 10** (EMERGENCY RELEASE) on Enclosure 4.1, (Emergency Notification Form) is checked, **THEN** immediately contact RP shift at 4282 to perform HP/0/B/1009/029 (Initial Response On-Shift Dose Assessment).

## 2. Subsequent Actions

<b>NOTE:</b> Site Assembly is a required on-site protective action in response to an Alert or higher declaration.
---

- 2.1 **IF** a site assembly has not already been initiated, **THEN** refer to RP/0/A/5700/011 (Conducting a Site Assembly, Site Evacuation or Containment Evacuation) to evaluate and initiate a site assembly.
- 2.2 Augment shift resources to assess and respond to the emergency situation as needed.
- 2.3 **GO TO** Step 3.1 in the body of this procedure and continue with the prescribed subsequent actions.

**Enclosure 4.10**  
**WCC SRO Immediate and Subsequent**  
**Actions**

RP/0/A/5700/004  
Page 1 of 2

**1. Immediate Actions**

Initial

- NOTE:**
1. Initial notification to the State and Counties must be made within 15 minutes of the event declaration, using Enclosure 4.1.
  2. Enclosure 4.3 has instructions for completion/transmission of the Emergency Notification Form.

- 1.1 The Emergency Coordinator shall recommend to offsite authorities in the initial notification the following:

- NOTE:**
1. To obtain the wind speed, use chart recorder 1EEBCR9100, point #5 (Average Lower Wind Speed).
  2. To obtain the wind direction, use chart recorder 1EEBCR9100, point #8 (Average Upper Wind Direction).
  3. If either point on 1EEBCR9100 is unavailable, obtain needed data from one of the following sources in order of sequence:
    - A. DPC Meteorological Lab (8-594-0341)
    - B. National Weather Service in Greer, S.C. (864-879-1085 or 1-800-268-7785).
    - C. Catawba Nuclear Station Control Room (8-831-5345).

- NOTE:** IF changes to the initial Protective Action Recommendations are recognized and approved by the Emergency Coordinator, these shall be transmitted to the offsite agencies within 15 minutes. {PIP-M-00-01238}

- 1.1.1 IF containment radiation levels exceed the levels on Enclosure 4.2, page 2 of 4, Guidance for Determination of Gap Activity, THEN:

- Evacuate the 5-mile radius AND 10 miles downwind as shown on Enclosure 4.2, page 2 of 4, Protective Action Zones Determination, using wind direction.

AND

- Shelter remaining zones as shown on Enclosure 4.2, page 2 of 4, Protective Action Zones Determination, using wind direction.

**Enclosure 4.10**  
**WCC SRO Immediate and Subsequent**  
**Actions**

RP/0/A/5700/004  
Page 2 of 2

- 1.1.2 **If** containment radiation levels **DO NOT** exceed the levels on Enclosure 4.2, page 2 of 4, Guidance for Determination of Gap Activity, **THEN** perform one of the following:

**If** wind speed less than or equal to 5 MPH, **THEN**:

- \_\_\_\_\_ • Evacuate zones L, B, M, C, N, A, D, O, R

**AND**

- \_\_\_\_\_ • Shelter zones E, F, G, H, I, J, K, P, Q, S.

**OR**

**If** wind speed greater than 5 MPH, **THEN**:

- \_\_\_\_\_ • Evacuate the 2-mile radius **AND** 5 miles downwind as shown on Enclosure 4.2, page 3 of 4, Protective Action Zones Determination, using wind direction

**AND**

- \_\_\_\_\_ • Shelter remaining zones as shown on Enclosure 4.2, page 3 of 4, Protective Action Zones Determination, using wind direction.

- \_\_\_\_\_ 1.2 Complete items 1 -10, 15 and 16 on Enclosure 4.1 (Emergency Notification Form) in accordance with Enclosure 4.3, Section 1.
- \_\_\_\_\_ 1.3 Make initial notification to State and County authorities using the Emergency Notification Form in accordance with Enclosure 4.3, Section 2.

## **2. Subsequent Actions**

- \_\_\_\_\_ 2.1 Notify the NRC Operations Center by completing Enclosure 4.4 and transmitting immediately but no later than 1 hour of the event declaration using RP/0/A/5700/014, Enclosure 4.2.
- \_\_\_\_\_ 2.2 Inform the OSM when this enclosure has been completed, reporting any deficiencies or problems encountered.

## 1. Immediate Actions

Initial

**NOTE:** For a Drill, the Community Alert Network (CAN) is not activated.

- \_\_\_\_ 1.1 For a security event, go to steps 1.4, 1.5, and 1.6.
- \_\_\_\_ 1.2 Activate the Emergency Response Organization by contacting Security via the ringdown phone to the CAS/SAS, or at extension 2688 or 4900 and issue the following message:
- \_\_\_\_ 1.2.1 For a Drill "Activate the TSC/OSC/EOF pagers, McGuire Delta, General Emergency declared at \_\_\_\_\_ (time)."
- \_\_\_\_ 1.2.2 For an Emergency "Activate the TSC/OSC/EOF pagers, McGuire Echo, General Emergency declared at \_\_\_\_\_ (time)."
- AND**
- "Activate the CAN system."

**NOTE:**

- For a Drill, the Emergency Response Data System (ERDS) is not activated.
- ERDS can only be activated / deactivated from designated computer terminals with SDS access. These are located in the Shift Work Manager's office, the Data Coordinators' room in the TSC and all within the Control Room horseshoe area.

- \_\_\_\_ 1.3 For an Emergency, activate the Emergency Response Data System (ERDS) as soon as possible, but not later than one hour after the emergency declaration per the following:
- \_\_\_\_ 1.3.1 Ensure SDS is running on the selected terminal.
- \_\_\_\_ 1.3.2 Click on MAIN.
- \_\_\_\_ 1.3.3 Click on GENERAL.
- \_\_\_\_ 1.3.4 Click on ERDS.
- \_\_\_\_ 1.3.5 Click on ACTIVATE.
- \_\_\_\_ 1.3.6 Record the time and date ERDS was activated. TIME/DATE \_\_\_\_/\_\_\_\_/\_\_\_\_  
Eastern mm dd yy
- \_\_\_\_ 1.3.7 Inform the OSM that ERDS was activated.
- \_\_\_\_ 1.3.8 **IF** ERDS failed to activate after five (5) attempts, **THEN** have an Offsite Agency Communicator notify the NRC via ENS or other available means.

## STA Immediate and Subsequent Actions

- \_\_\_\_\_ 1.4 For a drill, **IF** a security event exists and offsite ERO staging is desired before giving instructions to report to the TSC and OSC, **THEN** contact Security via the ringdown phone to the CAS/SAS, or at extension 2688 or 4900, and give instructions to activate the TSC/OSC, according to the Emergency Response Pager Instructions for a security event drill.
- \_\_\_\_\_ 1.5 For an actual emergency, **IF** a security event exists and offsite ERO staging is desired before giving instructions to report to the TSC/OSC, **THEN** contact Security via the ringdown phone to the CAS/SAS, or at extension 2688 or 4900, and give instructions to activate the TSC/OSC, according to the Emergency Response Pager Instructions for a security event emergency.
- \_\_\_\_\_ 1.6 When the security event is stabilized to the point that ERO members can come on site, go to step 1.2.

**2. Subsequent Actions**

- \_\_\_\_\_ 2.1 Notify one of the NRC Resident Inspectors using RP/0/A/5700/014, Enclosure 4.2.
- \_\_\_\_\_ 2.2 Contact Duke Management using RP/0/A/5700/014, Enclosure 4.3 as soon as possible following event declaration.
- \_\_\_\_\_ 2.3 Inform the OSM when this enclosure has been completed, reporting any deficiencies or problems.

**NRC EXAM**

**2003**

**JPMs**

Facility: McGuire		Date of examination:
Examination Level (circle one): <input checked="" type="checkbox"/> RO / <input type="checkbox"/> SRO		Operating Test : _____
Control Room Systems (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)		
System / JPM Title	Type Codes*	Safety Function
a. Respond to a Leak on RHR While in Mid-loop (SROU)	N,A,S,L	4p
b. Calculate Boric Acid Pot and Perform Manual Makeup	N,A,S	1
c. Synchronize Main Generator (New Voltage Regulator) (SROU)	N,S,A,L	4s
d. Align for Cold Leg Recirculation	D,A	2
e. Isolate Stuck Open PORV (Immediate Action JPM)	D,A	3
f. Respond to a Failure of Power Range N-42	D,A	7
g. RN Alignment after a Loss of AC Power on Unit 2 (SROU)	D,C	8
h. Start Up Unit 2 Lower Containment Ventilation Systems	D,C	5
In-Plant Systems (3 for RO, 3 for SRO-I; 3 or 2 for SRO-U)		
a. Establish Reactor Coolant Pump Seal Injection from SSF (SRO)	D	2
b. Start 2A Hydrogen Analyzer (SROU)	N,R	5
c. Bypass VI Dryer	D,A	8
* Type Codes: (D)irect from bank, (M)odified from bank, (N)ew, (A)lternate path, (C)ontrol room, (S)imulator, (L)ow-Power, (R)CA,		



Prepared By: Rob Dill  
Reviewed By: Chris Sawyer  
Approved By: \_\_\_\_\_

TASK: **Respond To A Leak On The ND System While At Mid Loop**

POSITION: **RO**

---

Operator's Name \_\_\_\_\_

Location: **Simulator**

Method: **Perform**

Estimated JPM Completion Time : 30 Minutes

Actual JPM Completion Time:        Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date    /    /   

---

References: AP/1/A/5500/19

LOSS OF ND OR ND SYSTEM LEAKAGE

JPM verified current with references by \_\_\_\_\_

Date    /    /   

Rev. 00/04-14-03

**FOR TRAINING PURPOSES ONLY**

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### INITIAL CONDITIONS

- Unit 1 is in mode 5 with the NC System drained to midloop.
- 1A ND Pump in service.
- The hot leg manway on 'B' S/G is removed
- Cavity seals and S/G Nozzle Dams are not in service.
- NCS level is at approximately 9 inches and going down.
- NLO's dispatched to locate possible leak paths report that a leak exists on the suction of B ND Pump, between 1ND-4B and the B ND Pump.
- There are no draining activities in progress at this time.
- Per the Control Room SRO turnover the Preferred Makeup Flow path is 1FW-27
- The desired level in the NC System is 10.5 inches.
- PT/1/A/4200/002 C (Containment Closure/Integrity) is in effect
- There are no operations in progress that would reduce boron concentration.

**The SRO directs you to implement AP/1/A/5500/19 (Loss of ND or ND System Leakage) and isolate the leak.**

JPM OVERALL STANDARD:     B ND Train is isolated from A ND Train and NC system cooling maintained.

NOTES:

KA    025    AA2.4    3.3/3.6

**FOR TRAINING PURPOSES ONLY**

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Check any ND pumps running.	Same  Cue:  Red lights lit on 1A and 1B ND pumps.		
2	<p>Check if ND pumps should be stopped:</p> <p>NC level -GREATER THAN 4 INCHES</p> <p>Checks NC Subcooling based on Core exit T/C Greater than 0 degrees.</p> <p>Check the following valves open:</p> <ul style="list-style-type: none"> <li>• 1ND-1B</li> <li>• 1ND-2AC</li> </ul> <p><b><u>IF AT ANY TIME</u></b> NC level goes below 4 inches or NC Subcooling based on core exit T/Cs goes below 0 degrees, <b><u>THEN</u></b>.....</p>	<p>Same</p> <p>Cue:</p> <p>NCS level indicates 9 inches</p> <p>Cue:</p> <p>Subcooling indicates 70 degrees</p> <p>Verifies position using OAC.</p> <p>Cue:</p> <p>Both valves indicate OPEN on OAC</p> <p>Operator marks "IF AT ANY TIME" step and continues in the procedure.</p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<p>Check ND system flow greater than 3000 gpm</p> <p><b>GO TO</b> Step 3.c.</p> <p>Check ND pumps cavitating</p> <p><b>GO TO</b> Step4.</p>	<p>Verifies flow less than 3000 gpm. Goes to RNO.</p> <p><b>Cue:</b></p> <p><b>ND flow indicates 2900 GPM.</b></p> <p>Same</p> <p>Verifies there are no signs of cavitation. Goes to RNO.</p> <p><b>Cue:</b></p> <p><b>ND system flow and ND pumps amps are steady.</b></p> <p>Same</p>		
4	<p><b>Isolate containment as follows:</b></p> <p>Announce the following on page</p> <ul style="list-style-type: none"> <li>• Description of event</li> <li>• All personnel evacuate Unit 1 containment</li> </ul>	<p>Makes announcement</p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<b>CONTINUED</b>			
*	<ul style="list-style-type: none"> <li>• Actuate containment evacuation alarm</li> </ul>	<b>Cue:</b> <b>Switch rotated.</b>		
	<ul style="list-style-type: none"> <li>• Refer to RP/0/A/5700/011</li> </ul>	<b>Cue:</b> <b>The Control Room SRO will refer to RP/11.</b>		
	<ul style="list-style-type: none"> <li>• Check PT/1/A/4200/002 C in effect</li> </ul>	Determines from initial conditions that PT is in effect		
	<ul style="list-style-type: none"> <li>• Notify Containment Closure Coordinator to initiate containment closure</li> </ul>	<b>Cue:</b> <b>The Control Room SRO will notify CCC.</b>		
5	<b>Check if makeup should be initiated as follows:</b>  Check NC temperature - GREATER THAN 200 DEGREES F.	Checks NC temperature and determines it is NOT greater than 200 degrees F. Goes to RNO.  <b>Cue:</b>  NC temperature indicates 120 <sup>0</sup> F.		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	<p><b>CONTINUED</b></p> <p>Perform the following:</p> <p><b><u>IF</u></b> NC level going down, <b><u>THEN:</u></b></p> <p>Reduce or isolate Letdown</p> <p>Initiates makeup as required <b><u>PER</u></b> Encl.3 (NC System Makeup During Loss of ND).</p>	<p>Verifies NC level is still going down.</p> <p><b>Cue:</b></p> <p><b>Level is still going down.</b></p> <p>Operator determines that letdown is isolated.</p> <p><b>Cue:</b></p> <p><b>All Letdown flow paths are isolated.</b></p> <p>Goes to Encl.3.</p>		
6	<p><b>From AP/19, Enclosure 3 (NC System Makeup During Loss of ND).</b></p> <p>Select Desired Makeup Flow Path from Table 1 and initiate makeup <b><u>PER</u></b> indicated enclosure.</p>	<p>Determines from initial conditions that 1FW-27 is the desired Makeup Flow Path. <b>Goes to Encl. 4.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	<p><b>From AP/19, Enclosure 4 (Makeup By Gravity Through 1FW-27A)</b></p> <p>Throttle 1FW-27A or dispatch operator to throttle as follows:</p> <p><u>If</u> power available to 1FW-27A, <b><u>THEN</u></b></p> <ul style="list-style-type: none"> <li>• Place disconnect switch for 1FW-27A to Enable</li> <li>• Depress 1FW-27A open pushbutton 2-3 seconds at a time.</li> <li>• When desired amount of makeup is achieved, then close 1FW-27A</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• <b><u>IF</u></b> power lost to 1FW-27A</li> </ul> <p><b><u>When</u></b> FWST gravity flow lost due to one of the following, then ensure 1FW-27A closed</p> <ul style="list-style-type: none"> <li>• Low FWST inventory</li> <li>• NC pressure going up</li> </ul>	<p><b>Cue:</b></p> <p><b>Power is available</b></p> <p><b>Cue:</b></p> <p><b>Disconnect switch in enable</b></p> <p><b>Cue:</b></p> <p><b>1FW-27A indicates intermediate</b></p> <p><b>Cue:</b></p> <p><b>NC System level at approximately 10 inches. 1FW-27A closed</b></p> <p>N/A</p> <p>Operator proceeds to next step.</p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	<b>CONTINUED</b> <b>IF</b> required to maintain NC temperature and level, <b>THEN</b> use different or multiple makeup options. <i>End 4 step 3</i>	Determines another Makeup option is not needed  Returns to body of AP-19 and goes to RNO 5.a.2.		
8	<b>GO TO</b> Step 6.	Same		
9	Refer to RP/0/A/5700/000	Cue: Control Room SRO will refer to RP/000		
10	Check PZR level less than 76%	Same  Cue:  NCS level indicates 11 inches		

\* DENOTES CRITICAL



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	<p><b>Isolate Letdown and known drain paths as follows:</b></p> <p>Stop any NC System draining in progress</p> <p>Close the following:</p> <ul style="list-style-type: none"> <li>• 1NV-458A</li> <li>• 1NV-457A</li> <li>• 1NV-35A</li> <li>• 1NV-1A</li> <li>• 1NV-2A</li> <li>• 1NV-7B</li> </ul>	<p>Determines from Initial conditions no draining in progress</p> <p>Same</p> <p><b>Cue:</b> <b>Green light lit</b></p> <p><b>Cue:</b> <b>Green light lit</b></p> <p><b>Cue:</b> <b>Green light lit</b></p> <p><b>Cue:</b> <b>Green light lit</b></p> <p><b>Cue:</b> <b>Green light lit</b></p> <p>Closes 1NV-7B</p> <p><b>Cue:</b> <b>Pushbutton depressed, green light lit</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	<b>CONTINUED</b>  Close the following ND letdown valves: <ul style="list-style-type: none"> <li>• 1NV-121</li> <li>• 1ND-32</li> <li>* • 1ND-17</li> </ul>	Same  <b>Cue:</b> <b>Controller output at 0%</b>  <b>Cue:</b> <b>Green light lit</b>  <b>Cue:</b> <b>Pushbutton depressed,</b> <b>green light lit</b>		
12	<b>Perform the following to comply with Tech Specs:</b>  Suspend loading irradiated fuel assemblies in core.....  Suspend operations that will reduce NC boron concentration	Determines NC system at midloop, fuel loading would not be in progress.  Determines from Initial Conditions there are no operations in progress that will reduce boron concentration		
13	<b>Check NC temperature prior to event - less than 200 degrees F.</b>	Same  <b>Cue:</b> <b>NC temperature indicates 120° F.</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	<p><b>Check ND flow - Lost</b></p> <p><u>If</u> leak on ND system suspected, <b><u>THEN</u></b> perform one of the following:</p> <p><u>If</u> makeup to NC system is maintaining NC inventory <b><u>THEN GO TO</u></b> Encl. 19 (Isolation of Leak on ND)</p> <p><b>OR</b></p> <p><u>IF</u> loss of NC inventory imminent, <b><u>THEN</u></b> stop ND pumps.</p>	<p>Determines ND flow was not lost. Goes to RNO</p> <p>Determines from initial conditions that leak is on ND.</p> <p>Determines makeup to NC system using 1FW-27A is maintaining inventory. Proceeds to Encl. 19 (Isolation of Leak on ND).</p> <p>N/A</p>		
15	<p><b>From AP/19, Enclosure 19 (Isolation of Leak on ND)</b></p> <p><b>Check all NC pumps off</b></p>	<p>Same</p> <p><b>Cue:</b></p> <p><b>All NC pumps are OFF.</b></p>		
16	<p><b>Check NC level - STABLE OR GOING UP</b></p>	<p>Determines makeup to NC system using 1FW-27A is maintaining inventory.</p> <p><b>Cue:</b></p> <p><b>NCS level indicates 11 inches and is stable</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
17	<b>Check location of leak known</b>	Given in initial conditions, leak is on suction of B ND Pump.		
18	Check PRT conditions normal	Determines PRT temperature, level and pressure are normal.  <b>Cue:</b>  <b>PRT temperature, level and pressure are normal.</b>		
19	<b><u>IF</u></b> leak is known to be between 1ND-1B and 1ND-4B and 1ND-19A, <b><u>THEN GO TO</u></b> step 10	Given in initial conditions. The leak is between 1ND-4B and the B ND Pump. Operator will N/A and continue to Step 6.		
20	<b>Check ND pump(s) - ON</b>	Same  <b>Cue:</b> <b>Red light lit for 1A ND pump.</b>		
21	<b>Check if leak is on running ND train suspected</b>	Leak is on B ND train. Operator proceeds to RNO.		
22	<b>Observe note prior to Step 9 and <u>GO TO</u> Step 9.</b>	Same		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
23	<p><b>Isolate train with leak, or both trains if affected train cannot be determined, as follows:</b></p> <p>To isolate 1A ND Train:</p> <p>To isolate 1B ND Train:</p> <p>Check 1B ND Pump – off</p>	<p>RO determines from initial conditions that train B ND has the leak and proceeds to isolate B train only.</p> <p>Operator determines that A train does not need to be isolated and proceeds to isolate B train.</p> <p>Same</p>		
*	<p>Close 1ND-4B</p> <p>Isolate 1B ND pump discharge as follows:</p> <ul style="list-style-type: none"> <li>close 1ND-18</li> </ul>	<p><b>Cue:</b> <b>Green light lit</b></p> <p><b>Cue:</b> <b>Pushbutton depressed, green light lit</b></p>		
*	<ul style="list-style-type: none"> <li>close 1ND-17</li> </ul>	<p><b>Cue:</b> <b>Green light lit</b></p>		
*	<ul style="list-style-type: none"> <li>close 1ND-15B</li> </ul>	<p><b>Cue:</b> <b>Pushbutton depressed, green light lit</b></p>		
*	<ul style="list-style-type: none"> <li>close 1NI-178B</li> </ul>	<p><b>Cue:</b> <b>Pushbutton depressed, green light lit</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
23	<b>CONTINUED</b> <ul style="list-style-type: none"> <li>close 1NI-183B</li> <li>close 1NV-840A</li> </ul>	<b>Cue:</b> <b>Green light lit</b>  <b>Cue:</b> <b>Green light lit</b>		
24	<b>Determine if 1ND-1B and 1ND-2AC (C NC Loops To ND Pumps) must be closed as follows:</b>  Check the following open: <ul style="list-style-type: none"> <li>1ND-1B (C NC Loop to ND Pumps)</li> <li>1ND-2AC (C NC Loop To ND Pumps).</li> </ul> Check leak - STILL EXISTS	Operator checked these valves open earlier. May check the OAC again to verify they are still open.  <b>Cue:</b> <b>Both valves indicate OPEN on OAC</b>  Operator determines leak is isolated and proceeds to RNO.  <b>Cue:</b> <b>NC system level is stable and NLO reports leak has stopped.</b>		
25	<b>GO TO</b> step 12	Same		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
26	<b>Check feed and bleed has been initiated per step 19 of this enclosure.</b>	Operator receives cue, then proceeds to RNO.		
		<b>Cue:</b> <b>Feed and bleed has <u>NOT</u> been initiated</b>		
27	<b><u>GO TO</u></b> step 14	Same		
28	<b><u>WHEN</u></b> the following conditions met, <b><u>THEN</u></b> stop or reduce makeup flow as required <b><u>PER</u></b> applicable enclosure.....	Terminate JPM with cue:		
		<b>Cue:</b> <b>Another operator has been directed to continue in this procedure.</b>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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### INITIAL CONDITIONS

- Unit 1 is in mode 5 with the NC System drained to midloop.
- 1A ND Pump in service.
- The hot leg manway on 'B' S/G is removed
- Cavity seals and S/G Nozzle Dams are not in service.
- NCS level is at approximately 9 inches and going down.
- NLO's dispatched to locate possible leak paths report that a leak exists on the suction of B ND Pump, between 1ND-4B and the B ND Pump.
- There are no draining activities in progress at this time.
- Per the Control Room SRO turnover the Preferred Makeup Flow path is 1FW-27
- The desired level in the NC System is 10.5 inches.
- PT/1/A/4200/002 C (Containment Closure/Integrity) is in effect
- There are no operations in progress that would reduce boron concentration.

**The SRO directs you to implement AP/1/A/5500/19 (Loss of ND or ND System Leakage) and isolate the leak.**



## **SIMULATOR OPERATORS GUIDELINES (ND:206A)**

1. Reset to IC-121
2. Freeze Simulator
3. Remove Red Tag stickers from the following:

1NI-173A

1NI-183B

Duke Power Company  
**PROCEDURE PROCESS RECORD**

(1) ID No. AP/1/A/5500/019Revision No. 015**PREPARATION****INFORMATION ONLY**

(2) Station McGuire Nuclear Station  
(3) Procedure Title Loss of ND or ND System Leakage

(4) Prepared By Hackney, Joseph S S Hackney Date September 4, 2002

(5) Requires NSD 228 Applicability Determination? If Applicability Determination is required, attach NSD 228 documentation.

☒ Yes (New procedure or revision with major changes)

☐ No (Revision with minor changes)

☐ No (To incorporate previously approved changes)

(6) Reviewed By [Signature] (QR) Date 9-11-02

Cross-Disciplinary Review By \_\_\_\_\_ (QR) NA [Signature] Date 9-11-02

Reactivity Mgmt. Review By \_\_\_\_\_ (QR) NA [Signature] Date 9-11-02

Mgmt. Involvement Review By \_\_\_\_\_ (OPS Supt.) NA \_\_\_\_\_ Date \_\_\_\_\_

**(7) Additional Reviews**

Reviewed By [Signature] Date 9-10-02

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

**(8) Temporary Approval (if necessary)**

By \_\_\_\_\_ (OSM/QR) Date \_\_\_\_\_

By \_\_\_\_\_ (QR) Date \_\_\_\_\_

(9) Approved By [Signature] Date 9-11-02

**PERFORMANCE (Compare with Control Copy every 14 calendar days while work is being performed.)**

(10) Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

(11) Date(s) Performed \_\_\_\_\_

Work Order Number (WO#) \_\_\_\_\_

**COMPLETION****(12) Procedure Completion Verification**

☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?

☐ Yes ☐ NA Required enclosures attached?

☐ Yes ☐ NA Data sheets attached, completed, dated and signed?

☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?

☐ Yes ☐ NA Procedure requirements met?

Verified By \_\_\_\_\_ Date \_\_\_\_\_

(13) Procedure Completion Approved \_\_\_\_\_ Date \_\_\_\_\_

(14) Remarks (Attach additional pages, if necessary.)

MNS  
AP/1/A/5500/19  
UNIT 1

LOSS OF ND OR ND SYSTEM LEAKAGE

PAGE NO.  
1 of 152  
Rev. 15

A. Purpose

To identify the appropriate actions in the event of a loss of the ND System or a leak on the ND System.

MNS  
AP/1/A/5500/19  
UNIT 1

LOSS OF ND OR ND SYSTEM LEAKAGE

PAGE NO.  
2 of 152  
Rev. 15

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**B** Symptoms

"A (B) ND PUMP LO FLOW TO COLD LEGS" Alarm

"A (B) ND PUMP DISCHARGE HI PRESS" Alarm

ND pump tripped

ND pump low discharge pressure OAC alarm

Core exit T/Cs high temperature OAC alarm

"NC SYSTEM LO LEVEL" OAC alarm

ND flow low OAC alarm.

Containment Sump level going up

Refueling Cavity level going down

ND Pump flow going up

NC System level going down

NC System pressure going down

Known ND System leak.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

C. Operator Actions

**CAUTION** Changes in NC pressure could result in inaccuracies in NC Level indications.

- |   |  |
|---|--|
| <p>___ 1. Check ND pumps - ANY RUNNING.</p> <p>___ 2. Check if ND pumps should be stopped:</p> <p>___ a. NC Level - GREATER THAN 4 INCHES.</p> <p>___ b. Check NC subcooling based on core exit T/Cs - GREATER THAN 0° F.</p> | <p>___ <u>GO TO</u> Step 4.</p> <p>___ a. Perform the following:</p> <p>___ 1) Stop ND pumps.</p> <p>___ 2) Close the following:</p> <ul style="list-style-type: none"><li>___ • 1ND-30A (Train A ND To Hot Leg Isol)</li><li>___ • 1ND-33 (A ND Hx Bypass)</li><li>___ • 1ND-18 (B ND Hx Bypass)</li><li>___ • 1ND-15B (Train B ND To Hot Leg Isol).</li></ul> <p>___ 3) <u>GO TO</u> Step 4.</p> <p>___ b. Perform the following:</p> <p>___ 1) Stop ND pump(s).</p> <p>___ 2) Ensure all NC pumps off.</p> <p>___ 3) Close the following:</p> <ul style="list-style-type: none"><li>___ • 1ND-30A (Train A ND To Hot Leg Isol)</li><li>___ • 1ND-33 (A ND Hx Bypass)</li><li>___ • 1ND-18 (B ND Hx Bypass)</li><li>___ • 1ND-15B (Train B ND To Hot Leg Isol).</li></ul> <p>___ 4) <u>GO TO</u> Step 4.</p> |
|---|--|

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

2. (Continued)

c. Check the following valves - OPEN:

- \_\_\_ • 1ND-1B (C NC Loop to ND Pumps)
- \_\_\_ • 1ND-2AC (C NC Loop To ND Pumps).

d. IF AT ANY TIME NC level goes below 4 inches OR NC subcooling based on core exit T/Cs goes below 0° F, THEN:

- \_\_\_ 1) Stop ND pump(s).
- \_\_\_ 2) Close the following:
  - \_\_\_ • 1ND-30A (Train A ND To Hot Leg Isol)
  - \_\_\_ • 1ND-33 (A ND Hx Bypass)
  - \_\_\_ • 1ND-18 (B ND Hx Bypass)
  - \_\_\_ • 1ND-15B (Train B ND To Hot Leg Isol).

c. Perform the following:

- \_\_\_ 1) Stop ND pump(s).
- \_\_\_ 2) GO TO Step 4.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**NOTE** ND flow control valves fail open on a loss of air.

3. Check ND flow control:

- \_\_\_ a. Check total ND System flow -  
GREATER THAN 3000 GPM.
- b. Throttle as necessary to reduce ND  
System to less than 3000 GPM:
  - \_\_\_ • 1ND-14 (B ND Hx Outlet)
  - \_\_\_ • 1ND-29 (A ND Hx Outlet)
  - \_\_\_ • 1ND-34 (A & B ND Hx Bypass).

- \_\_\_ a. GO TO Step 3.c.

- b. Perform the following:

**NOTE** If ND flow through any cold leg flowpath is throttled to less than approximately 2000 GPM in next step, the associated valve will seal in and fully close. If the valve closes, it can be pulsed in the open direction to any desired flow.

- 1) Throttle as necessary to reduce ND System to less than 3000 GPM:

- \_\_\_ • 1NI-173A (Train A ND To A & B CL)
- \_\_\_ • 1NI-178B (Train B ND To C & D CL).

- 2) IF ND pump(s) cavitating, THEN:

- \_\_\_ a) Stop ND pump(s)
- \_\_\_ b) GO TO Step 4.

- 3) Place the following manual loaders in the full open position:

- \_\_\_ • 1ND-29 (A ND Hx Outlet)
- \_\_\_ • 1ND-14 (B ND Hx Outlet).

- \_\_\_ 4) GO TO Step 3.f.

- \_\_\_ c. Check ND pump(s) - CAVITATING.

- \_\_\_ c. GO TO Step 4.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3. (Continued)

- ☐ d. Stop ND pump(s).
- ☐ e. GO TO Step 4.
- ☐ f. Throttle 1ND-34 (A & B ND Hx Bypass) as necessary to control ND Hx bypass flow.

f. Perform the following:

**NOTE** 1ND-33 and 1ND-18 can be throttled in open direction only (seals in on closed direction).

- 1) Throttle the following as necessary to control ND Hx bypass flow:

- ☐ • 1ND-33 (A ND Hx Bypass)
- ☐ • 1ND-18 (B ND Hx Bypass).

- 2) IF necessary to isolate ND Hx bypass flow AND valve(s) above will not close, THEN close the following:

- ☐ • 1ND-30A (Train A ND To Hot Leg Isol)
- ☐ • 1ND-15B (Train B ND To Hot Leg Isol).

- ☐ 3) Place the manual loader for 1ND-34 (A & B ND Hx Bypass) in the full open position.



ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4. **Isolate containment as follows:**

a. Announce the following on page:

- ☐ 1) Description of event.
- ☐ 2) "All personnel evacuate Unit 1 containment."

☐ b. Actuate containment evacuation alarm.

☐ c. **REFER TO** RP/0/A/5700/011  
(Conducting a Site Assembly, Site Evacuation, or Containment Evacuation) while continuing with this procedure.

☐ d. Check PT/1/A/4200/002 C  
(Containment Closure/Integrity) - IN EFFECT.

☐ d. **GO TO** Step 5.

☐ e. Notify Containment Closure Coordinator to initiate containment closure.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. Check if makeup should be initiated as follows:

- \_\_\_ a. Check NC temperature - GREATER THAN 200° F.

b. Check NC parameters:

- \_\_\_ • Pzr level - GREATER THAN 11% (29% ACC)
- \_\_\_ • Pzr level - STABLE OR GOING UP
- \_\_\_ • NC subcooling based on core exit T/Cs - GREATER THAN 0° F.

a. Perform the following:

- 1) IF NC level going down, THEN:

- \_\_\_ • Reduce or isolate letdown.
- \_\_\_ • Initiate makeup as required PER Enclosure 3 (NC System Makeup During Loss of ND).

- \_\_\_ 2) GO TO Step 6.

b. Perform the following as required to maintain Pzr level and subcooling:

- \_\_\_ 1) Maintain charging flow less than 175 GPM at all times in subsequent steps.
- \_\_\_ 2) Ensure 1NV-238 (Charging Line Flow Control) opening.
- \_\_\_ 3) Open 1NV-241 (Seal Inj Flow Control) while maintaining NC pump seal flow greater than 6 GPM.
- \_\_\_ 4) Reduce or isolate letdown.
- \_\_\_ 5) IF subcooling or Pzr level cannot be restored, THEN:
  - \_\_\_ a) Initiate makeup through 1NI-9A or 1NI-10B PER Enclosure 5 (Makeup Via NV Pumps Through S/I Flow Path).
  - \_\_\_ b) IF AT ANY TIME additional flow required to restore subcooling and Pzr level, THEN start one NI pump aligned to cold legs PER Enclosure 6 (Makeup Via NI Pumps).

- \_\_\_ 6. REFER TO RP/0/A/5700/000 (Classification of Emergency).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\_\_\_ 7. Check Pzr level - LESS THAN 76%.

Perform the following:

- \_\_\_ a. IF level has gone down in an uncontrolled manner, OR NC subcooling based on core exit T/Cs less than 0° F, THEN GO TO Step 8.
- \_\_\_ b. IF level stable or going up, THEN GO TO Step 9.

8. Isolate letdown and known drain paths as follows:

- \_\_\_ a. Stop any NC System draining in progress.
- b. Close the following NV letdown isolation valves:
  - \_\_\_ 1) 1NV-458A (75 GPM L/D Orifice Outlet Cont Isol).
  - \_\_\_ 2) 1NV-457A (45 GPM L/D Orifice Outlet Cont Isol).
  - \_\_\_ 3) 1NV-35A (Variable L/D Orifice Outlet Cont Isol).
  - \_\_\_ 4) 1NV-1A (NC L/D Isol To Regen Hx).
  - \_\_\_ 5) 1NV-2A (NC L/D Isol To Regen Hx).
  - \_\_\_ 6) 1NV-7B (Letdown Cont Outside Isol).
- c. Close the following ND letdown valves:
  - \_\_\_ 1) 1NV-121 (ND Letdown Control).
  - \_\_\_ 2) 1ND-32 (A ND Hx To Letdown Hx).
  - \_\_\_ 3) 1ND-17 (B ND Hx To Letdown Hx).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9. Perform the following to comply with Tech Specs:

- • Suspend loading irradiated fuel assemblies in the core (unless required by AP/1/A/5500/40 (Loss Of Refueling Cavity Level)).
- • Suspend operations that will reduce NC boron concentration.

— 10. Check NC temperature prior to event - LESS THAN 200° F.

Perform the following:

- a. Dump steam as required to stabilize core exit T/C's.
- b. IF leak exists inside containment AND leak size is greater than capacity of normal charging, THEN close the following:
  - • 1KC-430A (Rx Bldg Drain Hdr Cont Outside Isol)
  - • 1KC-429B (Rx Bldg Drain Hdr Cont Inside Isol)
  - • 1WL-64A (RB Sump Pumps Disch Cont Inside Isol)
  - • 1WL-321A (Cont Vent Unit Drn Cont Inside Isol)
  - • 1WL-65B (RB Sump Pumps Disch Cont Outside Isol)
  - • 1WL-322B (Cont Vent Unit Drn Cont Outside Isol).
- c. IF leak on ND suspected, THEN GO TO Enclosure 19 (Isolation of Leak On ND).
- d. IF LOCA exists inside containment, THEN GO TO AP/1/A/5500/34 (Shutdown LOCA).
- e. GO TO Step 32.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\_\_\_ 11. Check ND flow - LOST.

**IF leak on ND suspected, THEN perform one of the following:**

- \_\_\_ • **IF** makeup to the NC system is maintaining NC inventory, **THEN GO TO** Enclosure 19 (Isolation of Leak On ND).

OR

- \_\_\_ • **IF** loss of NC inventory imminent, **THEN** stop ND pumps.

\_\_\_ 12. Check "THERMAL MARGIN" (on 1MC-6) - GREATER THAN 30 MINUTES.

\_\_\_ **GO TO** Step 15.

13. Check if immediate restart of ND is available as follows:

a. Check the following:

\_\_\_ a. **GO TO** Step 14.

- \_\_\_ • NC subcooling based on core exit T/Cs - GREATER THAN 0° F
- \_\_\_ • NC level - STABLE OR GOING UP
- \_\_\_ • Suction flowpath for ND pump - ALIGNED
- \_\_\_ • Train of ND - IMMEDIATELY AVAILABLE TO RESTART.

\_\_\_ b. Check if air entrainment - KNOWN TO HAVE OCCURRED.

\_\_\_ b. **GO TO** Step 13.d.

\_\_\_ c. **GO TO** Step 14.

\_\_\_ d. **IF AT ANY TIME** it appears that NC subcooling based on core exit T/Cs may be lost prior to restarting ND pump, **THEN GO TO** Step 14.

\_\_\_ e. Restart ND **PER** Enclosure 14 (Startup of ND Pumps).

\_\_\_ e. **GO TO** Step 14.

\_\_\_ f. **RETURN TO** procedure and step in effect.

**CAUTION**

- Use of a makeup path which contains a known NC System opening such as Cold Leg Accumulator check valve removed or S/G primary manway/nozzle dam removed, may reduce flow through the core.
- If NC System intact and level on scale, then cold leg flow path may be preferable for purposes of removing decay heat.
- ND pumps must be off to use 1ND-35 (ND To FWST Isol) as a makeup flowpath.

**NOTE**

Makeup flow paths are not listed in any order of preference. Options used may be dictated by NC System pressure, flow rate desired, or by availability as noted in the Shift Supervisor checklist.

1. Select Desired Makeup Flow Path from Table 1 and initiate makeup PER indicated enclosure.

**TABLE 1**  
**MAKEUP FLOW PATHS**

FLOW PATH	FLOW	PRESSURE	INJECT TO	NOTE	Enclosure
1FW-27A	High	Low	C Hot Leg		4
NV Pumps-S/I Path	High	High	Cold Legs		5
NI Pumps	High	High	Hot or Cold Leg		6
NV Pumps - Charging Flowpath	Low-Medium	High	A or D Cold Leg		7
1ND-35, 1NI-173A	High	Low	A & B Cold Leg	Local	8
1ND-35, 1NI-178B	High	Low	C & D Cold Leg	Local	9
1ND-35, 1NI-183B	High	Low	B & C Hot Leg	Local	10
VCT Overpressure	Low	Low	A or D Cold Leg		11
FWST - Charging	Low	Low	A or D Cold Leg		12
PD Pump	Low	High	A or D Cold Leg		13

**NOTE**

- Flowpath is through 1FW-27A (FWST Supply To ND) back through 1ND-1B (C NC Loop to ND Pumps) and 1ND-2AC (C NC Loop To ND Pumps).
- 1FW-27A (FWST Supply To ND) can be throttled in the open direction only (seals in on closed direction).

1. **Throttle 1FW-27A (FWST Supply To ND) or dispatch operator to throttle as follows:**

- IF power available to 1FW-27A, THEN perform the following:

- \_\_\_ • Place power disconnect switch for 1FW-27A to enable.
- \_\_\_ • Depress 1FW-27A open pushbutton 2-3 seconds at a time.
- \_\_\_ • WHEN desired amount of makeup is achieved, THEN close 1FW-27A.

OR

- \_\_\_ • IF power lost to 1FW-27A, THEN dispatch operator to throttle open 1FW-27A (aux bldg, 695 pipechase, GG-52, 5 ft from north wall) as necessary to obtain desired level.

**CAUTION**

With 1FW-27A (FWST Supply To ND) open, only one check valve is available to prevent back flow from NC to FWST (if NC pressure goes above FWST head).

2. **WHEN FWST gravity flow lost due one of the following, THEN ensure 1FW-27A (FWST Supply To ND) closed:**

- \_\_\_ • Low FWST inventory
- \_\_\_ • NC pressure going up.

\_\_\_ 3. **IF required to maintain NC temperature or level, THEN use different or multiple makeup options.**

MNS  
AP/1/A/5500/19  
UNIT 1

LOSS OF ND OR ND SYSTEM LEAKAGE

Enclosure 19 - Page 1 of 14  
Isolation of Leak On ND

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ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\_\_\_ 1. Check all NC pumps - OFF.

IF AT ANY TIME NC pump number 1 seal D/P goes below 200 PSID OR number seal leakoff flow goes below 0.2 GPM, THEN:

- \_\_\_ a. Stop affected NC pump(s).
- \_\_\_ b. Place Pzr spray valve in manual and close for stopped NC pump.

\_\_\_ 2. Check NC level - STABLE OR GOING UP.

\_\_\_ Initiate makeup PER Enclosure 3 (NC System Makeup During Loss of ND) while continuing in this enclosure.

\_\_\_ 3. Check location of leak - KNOWN.

Try to locate leak while continuing in this enclosure:

- \_\_\_ • Check containment floor and equipment sump levels.
- \_\_\_ • Check ND/NS sump level.
- \_\_\_ • Check ND Hx room.
- \_\_\_ • Check air pressure to cavity seals and nozzle dams.
- \_\_\_ • Check KC surge tank level.



ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\_\_\_ 4. Check PRT conditions - NORMAL.

IF open relief valve suspected, THEN perform the following:

- \_\_\_ a. Evaluate lowering NC pressure to reseal valve.
- \_\_\_ b. IF desired to lower NC pressure, THEN:
  - \_\_\_ • Trip NC pump(s) prior to reducing number 1 seal D/P less than 200 PSID.
  - \_\_\_ • Reduce NC pressure.
  - \_\_\_ • Initiate cooldown of NC system as necessary to maintain NC subcooling greater than 0° F.
- \_\_\_ c. IF AT ANY TIME containment pressure reaches 1 PSIG, THEN observe notes prior to Step 9 and GO TO Step 9 to isolate leak.
- \_\_\_ d. Dispatch operator to check the following valves for input to the PRT:
  - \_\_\_ • IF containment conditions allow, THEN dispatch operator to check 1ND-3 (NC Loop 3 Discharge to ND System Safety Relief) (Unit 1 reactor bldg, 738+3, 184 degrees, B and C Fan room)
  - \_\_\_ • 1ND-56 (A ND HX Outlet to NI System Cold Leg Relief) (aux bldg, 733+9, GG-52, midget hole)
  - \_\_\_ • 1ND-61 (ND HX Outlet To NI System Hot Leg Injection Safety Relief) (aux bldg, 733+11, JJ-52, rathole)
  - \_\_\_ • 1ND-64 (B ND HX Outlet To NI System Cold Leg Injection Safety Relief) (aux bldg, 733+6, HH-52, room 730, mechanical penetration room).
- \_\_\_ e. IF leak stopped, THEN GO TO Step 12.

- \_\_\_ 5. IF leak known to be between 1ND-1B (C NC Loop to ND Pumps) and ND pump suction valves (1ND-19A and 1ND-4B), THEN GO TO Step 10.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\_\_\_ 6. Check ND pump(s) - ON.

\_\_\_ Observe notes prior to Step 9 and GO TO Step 9.

\_\_\_ 7. Check if leak on running ND train - SUSPECTED.

\_\_\_ Observe notes prior to Step 9 and GO TO Step 9.

8. Swap operating trains of ND as follows:

\_\_\_ a. IF both ND pumps running in RHR, THEN observe notes prior to Step 9 and GO TO Step 9.

b. Obtain the following procedures while continuing with Step 8.c:

\_\_\_ • OP/1/A/6100/SO-6 (Placing The Second ND Train In Service)

\_\_\_ • OP/1/A/6100/SU-14 (Removing ND From Service)

\_\_\_ • OP/1/A/6100/SO-7 (Swapping ND Injection Paths).

\_\_\_ c. IF AT ANY TIME it is necessary to secure running ND pump(s) prior to completing train swap, THEN observe notes prior to Step 9 and GO TO Step 9.

d. On running ND pumps, check normal discharge flowpath - ALIGNED:

\_\_\_ • 1A ND pump: 1NI-173A (Train A ND To A & B CL) - OPEN.

\_\_\_ • 1B ND pump: 1NI-178B (Train B ND To C & D CL) - OPEN.

e. Establish KC flow to ND Hx to be placed in service as follows:

\_\_\_ • To establish KC flow to 1A ND Hx, GO TO Step 8.f.

\_\_\_ • To establish KC flow to 1B ND Hx, GO TO Step 8.g.

\_\_\_ d. Realign discharge flowpath to normal PER OP/1/A/6100/SO-7 (Swapping ND Injection Paths).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. (Continued)

f. Establish KC flow to 1A ND Hx as follows:

- ☐ 1) Check 1A RN pump - AVAILABLE. ☐ 1) GO TO Step 8.f.4).
- ☐ 2) Start 1A RN pump.
- ☐ 3) Start 1A KC pumps as follows:
  - ☐ a) Select "AUTO" on 1KC-51A (Train A Recirc Isol).
  - ☐ b) Start 1A1 and 1A2 KC pumps.
- ☐ 4) Ensure RN flow established to KC Hx in operation.
- ☐ 5) IF AT ANY TIME adequate KC flow to 1A ND Hx cannot be established, THEN throttle closed the following valves as required:
  - ☐ • 1KC-149 (A KF Hx Outlet Flow)
  - OR
  - ☐ • 1KC-156 (B KF Hx Outlet Flow).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. (Continued)

- 6) Throttle open 1KC-56A (KC To A ND Hx) to establish 2000 GPM to 5000 GPM KC flow to 1A ND Hx, while limiting each KC pump flow to 4000 GPM.

- 6) Evaluate opening KC cross-tie valves to establish flow from other train as follows:

a) Open:

- • 1KC-1A (Tm A Aux Bldg Non Ess Ret Isol)  
— • 1KC-2B (Tm B Aux Bldg Non Ess Ret Isol).

b) Open:

- • 1KC-50A (Tm A Aux Bldg Non Ess Sup Isol)  
— • 1KC-53B (Tm B Aux Bldg Non Ess Sup Isol).

- 7) Observe note prior to Step 8.h and GO TO Step 8.h.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. (Continued)

- g. Establish KC flow to 1B ND Hx as follows:

- \_\_\_ 1) Check 1B RN Pump - AVAILABLE.      \_\_\_ 1) GO TO Step 8.g.4).
- \_\_\_ 2) Start 1B RN Pump.
- 3) Start KC pumps as follows:
- \_\_\_ a) Select "AUTO" on 1KC-54B  
(Train B Recirc Isol).
- \_\_\_ b) Start 1B1 and 1B2 KC Pumps.
- \_\_\_ 4) Ensure RN flow established to KC  
Hx in operation.
- 5) IF AT ANY TIME adequate KC flow  
to 1B ND Hx cannot be established,  
THEN throttle closed the following  
valves as required:
- \_\_\_ • 1KC-149 (A KF Hx Outlet Flow)
- OR
- \_\_\_ • 1KC-156 (B KF Hx Outlet Flow).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. (Continued)

- 6) Throttle open 1KC-81B (KC To B ND Hx) to establish 2000 GPM to 5000 GPM KC flow to 1B ND Hx, while limiting each KC pump flow to 4000 GPM.

- 6) Evaluate opening KC cross-tie valves to establish flow from other train as follows:

a) Open:

- • 1KC-1A (Trn A Aux Bldg Non Ess Ret Isol)  
— • 1KC-2B (Trn B Aux Bldg Non Ess Ret Isol).

b) Open:

- • 1KC-50A (Trn A Aux Bldg Non Ess Sup Isol)  
— • 1KC-53B (Trn B Aux Bldg Non Ess Sup Isol).

**NOTE** • If NC temperature is greater than 200° F, OP/1/A/6100/SU-14 (Removing ND From Service) requires cooling down ND discharge header to 180 ° F prior to securing pump. This requirement may be waived if isolating leak is time critical.

- • Reading Limits and Precautions section of the following OPs may be waived if isolating leak is time critical.

- h. Start opposite train ND PER OP/1/A/6100/SO-6 (Placing The Second ND Train In Service).  
— i. Shutdown train with leak PER OP/1/A/6100/SU-14 (Removing ND From Service).  
— j. Do not continue until train swap complete.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**NOTE**

- If location of leak unknown, isolating trains one at a time may identify which train is leaking.
- If ND pump running and location of leak unknown, isolating idle train first may avoid loss of ND.

**9. Isolate train with leak, or both trains if affected train cannot be determined, as follows:**

- To isolate 1A ND Train:

\_\_\_ a. Check 1A ND Pump - OFF.

a. Perform the following:

\_\_\_ 1) Stop 1A ND pump.

2) IF both ND pumps off, THEN:

\_\_\_ a) Have another licensed operator continue with this enclosure.

\_\_\_ b) RETURN TO Step 12 in body of this procedure.

\_\_\_ -b. Close 1ND-19A (A ND Pump Suct From FWST or NC).

b. IF 1ND-19A still open, THEN evaluate performing the following:

\_\_\_ 1) Stop 1B ND Pump.

2) Dispatch operator to close the following breakers:

\_\_\_ • 1EMXD - 08D (C NC Loop To ND Pumps 1ND-1B) (1ETB Room)

\_\_\_ • 1EMXA4 - 03C (C NC Loop To ND Pumps 1ND-2A) (1ETA Room).

(RNO continued on next page)

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9. (Continued)

3) Close the following valves:

- • 1ND-1B (C NC Loop to ND Pumps)
- • 1ND-2AC (C NC Loop To ND Pumps).

— 4) Close 1ND-19A.

c. Isolate 1A ND pump discharge as follows:

- • Close 1ND-33 (A ND Hx Bypass)
- • Close 1ND-32 (A ND Hx To Letdown Hx)
- • Close 1ND-30A (Train A ND To Hot Leg Isol)
- • Close 1NI-173A (Train A ND To A & B CL)
- • Close 1NI-183B (ND To B & C Hot Legs Isol)
- • Close 1NV-840A (ND To Pzr Aux Spray Control).

c. Dispatch operator to close affected valve(s):

- • 1ND-33 (aux bldg, 733+8, LL-52, room 732, ND heat exchanger room 1B)
- • 1ND-32 (aux bldg, 733+6, 1A ND Hx Room, 3 feet from west wall and 1 foot from south wall)
- • 1ND-30A (aux bldg, 733+4, LL-52, room 733, ND heat exchanger room 1A, 1 ft from east, 8 ft from south)
- • 1NI-173A (aux bldg, 716+21, GG-52, room 602, midget hole near reactor bldg wall above ledge, 4 ft south of GG-52 near VCT area)
- • 1NI-183B (aux bldg, 733+10, FF-52, room 602, midget hole, enter from electrical penetration room, 4 ft from reactor bldg wall, 3 ft from ceiling)
- • 1NV-840A (aux bldg, 733+8, KK-53, room 732, west of NS heat exchanger room 1B).



ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9. (Continued)

- To isolate 1B ND Train:

\_\_\_ a. Check 1B ND Pump - OFF.

a. Perform the following:

\_\_\_ 1) Stop 1B ND pump.

2) IF both ND pumps off, THEN:

\_\_\_ a) Have another licensed operator continue with this enclosure.

\_\_\_ b) RETURN TO Step 12 in body of this procedure.

\_\_\_ b. Close 1ND-4B (B ND Pump Suct From FWST or NC).

b. IF 1ND-4B still open, THEN evaluate performing the following:

\_\_\_ 1) Stop 1A ND Pump.

2) Dispatch operator to close the following breakers:

\_\_\_ • 1EMXD-08D (C NC Loop To ND Pumps 1ND-1B) (1ETB Room)

\_\_\_ • 1EMXA4-03C (C NC Loop To ND Pumps 1ND-2A) (1ETA Room).

3) Close the following valves:

\_\_\_ • 1ND-1B (C NC Loop to ND Pumps)

\_\_\_ • 1ND-2AC (C NC Loop To ND Pumps).

\_\_\_ 4) Close 1ND-4B.

**ACTION/EXPECTED RESPONSE**

**RESPONSE NOT OBTAINED**

9. (Continued)

c. Isolate 1B ND pump discharge as follows:

- \_\_\_ • Close 1ND-18 (B ND Hx Bypass)
- \_\_\_ • Close 1ND-17 (B ND Hx To Letdown Hx)
- \_\_\_ • Close 1ND-15B (Train B ND To Hot Leg Isol)
- \_\_\_ • Close 1NI-178B (Train B ND To C & D CL)
- \_\_\_ • Close 1NI-183B (ND To B & C Hot Legs Isol)
- \_\_\_ • Close 1NV-840A (ND To Pzr Aux Spray Control).

c. Dispatch operator to close affected valve(s):

- \_\_\_ • 1ND-18 (aux bldg, 733+8, LL-52, room 732, ND heat exchanger room 1B)
- \_\_\_ • 1ND-17 (aux bldg, 733+12, 1B ND Hx Room, 3 feet from west wall and 10 feet from south wall)
- \_\_\_ • 1ND-15B (aux bldg, 733+8, LL-51, room 732, ND Hx room 1B)
- \_\_\_ • 1NI-178B (aux bldg, 733+6, HH-52, room 730, BIT room 6 ft west of HH-52, 3 ft from reactor bldg wall)
- \_\_\_ • 1NI-183B (aux bldg, 733+10, FF-52, room 602, midget hole, enter from electrical penetration room, 4 ft from reactor bldg wall, 3 ft from ceiling)
- \_\_\_ • 1NV-840A (aux bldg, 733+8, KK-53, room 732, west of NS heat exchanger room 1B).

10. Determine if 1ND-1B and 1ND-2AC (C NC Loop To ND Pumps) must be closed as follows:

a. Check the following open:

- \_\_\_ • 1ND-1B (C NC Loop to ND Pumps)
- \_\_\_ • 1ND-2AC (C NC Loop To ND Pumps).

\_\_\_ a. GO TO Step 11.

\_\_\_ b. Check leak - STILL EXISTS.

\_\_\_ b. GO TO Step 12.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

10. (Continued)

- \_\_\_ c. Check NC temperature prior to event -  
LESS THAN 200° F.

- \_\_\_ c. IF AT ANY TIME containment pressure  
reaches 1 PSIG AND leak still exists,  
THEN GO TO Step 10.f to immediately  
isolate ND leak.

**NOTE** If core cooling can be maintained, it may be desirable to delay closing  
1ND-1B and 1ND-2AC while trying alternative methods to isolate leak.

- \_\_\_ d. Evaluate closing 1ND-1B and 1ND-2AC  
based on leak size and location.

- \_\_\_ e. Check closure of 1ND-1B and 1ND-2AC  
- REQUIRED.

- \_\_\_ e. GO TO Step 11.

- f. Close the following breakers:

- \_\_\_ • 1EMXD - 08D (C NC Loop To ND  
Pumps 1ND-1B) (1ETB Room)

- \_\_\_ • 1EMXA4 - 03C (C NC Loop To ND  
Pumps 1ND-2A) (1ETA Room).

- \_\_\_ g. Stop all ND pumps.

- h. Close the following valves:

- \_\_\_ • 1ND-1B

- \_\_\_ • 1ND-2AC.

- i. Check the following valves - CLOSED.

- \_\_\_ • 1ND-19A (A ND Pump Suct From  
FWST or NC)

- \_\_\_ • 1ND-4B (B ND Pump Suct From  
FWST or NC).

- \_\_\_ i. Evaluate closing valves to complete  
leak isolation.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\_\_\_ 11. Check leak - ISOLATED.

Perform the following:

- \_\_\_ a. REFER TO AP/1/A/5500/10 (NC System Leakage Within The Capacity Of Both NV Pumps), for additional guidance in locating the leak.
- \_\_\_ b. IF refueling canal level going down, THEN REFER TO AP/1/A/5500/40 (Loss Of Refueling Cavity Level).

\_\_\_ 12. Check Feed and Bleed - HAS BEEN INITIATED PER STEP 19 IN BODY OF THIS PROCEDURE.

\_\_\_ GO TO Step 14.

\_\_\_ 13. GO TO Step 15.

14. WHEN the following conditions met, THEN stop or reduce makeup flow as required PER applicable enclosure:

- \_\_\_ • NC subcooling based on core exit T/Cs - GREATER THAN 0° F
- \_\_\_ • NC level is greater than one of the following:
  - \_\_\_ • IF Pzr level on scale prior to event, THEN check Pzr level - GREATER THAN 11%

OR

- \_\_\_ • IF NC System drained prior to event, THEN check NC level - GREATER THAN 10 INCHES.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

15. IF tube leak on letdown HX identified, THEN:
- \_\_\_ a. Ensure letdown flowpaths have been isolated.
  - \_\_\_ b. Close 1NV-124 (Letdown Pressure Control).
  - \_\_\_ c. Place 1NV-137A (NC Filters Otl 3-Way Cntrl) to "HUT".
- \_\_\_ 16. IF tube leak on ND HX identified, THEN evaluate isolating KC to affected HX.
- \_\_\_ 17. Check ND pump - RUNNING.      \_\_\_ RETURN TO step in effect in body of this procedure.
- \_\_\_ 18. Check leak - STOPPED.      **Perform the following:**
- \_\_\_ a. Continue efforts to isolate leak.
  - \_\_\_ b. Continue monitoring makeup source levels (FWST, VCT).
  - \_\_\_ c. IF AT ANY TIME ND train needs to be isolated to stop leak, THEN RETURN TO Step 1.
  - \_\_\_ d. Do not continue until leak isolated.
- \_\_\_ 19. Notify station management to arrange for inspection of temporary thimble seals or other equipment that may have been affected by this event.
- \_\_\_ 20. RETURN TO procedure and step in effect.

Prepared By:

Rob Billy

Reviewed By:

Chad Lawton

Approved By: \_\_\_\_\_

TASK: **Calculate Boric Acid Potentiometer Setting and begin Manual Makeup to VCT**

POSITION: **RO**

Operator's Name \_\_\_\_\_

Location: **Simulator**

Method: **Perform**

Estimated JPM Completion Time: 20 Minutes

Actual JPM Completion Time: \_\_\_\_\_ Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_

Date      /      /     

References: OP/1/A/6150/009 Boron Concentration Control  
OP/1/A/6100/22 Unit 1 Data Book

JPM verified current with references by \_\_\_\_\_

Date      /      /     

Rev. 00/04-16-03

**FOR TRAINING PURPOSES ONLY**

### INITIAL CONDITIONS

- IAE testing has the automatic portion of the NC SYS M/U Controller out of service.
- NC SYS M/U Controller is in the OFF position
- VCT level - 42%
- BAT Boron Concentration 7000 ppm
- NC System Boron Concentration 950 ppm
- Blender Flow Rate 90 gpm
- All Initial Conditions have been satisfied for OP/1/A/6150/009 Encl. 4.5 (Manual Makeup to VCT using "NC System Makeup" Controller).
- NV System is in normal operation per OP/1/A/6200/001A
- There are no outstanding R&R's that will impact the performance of OP/1/A/6150/009 Encl. 4.5 (Manual Makeup to VCT using "NC System Makeup" Controller).

**The Control Room SRO directs you raise VCT level to 54% using OP/1/A/6150/009 Encl. 4.5 (Manual Makeup to VCT using "NC System Makeup" Controller).**

**JPM OVERALL STANDARD:** A set point of approximately 3.1 is calculated for the BA Flow Control potentiometer. Manual make up is terminated when actual Boric acid flow is observed to be greater than calculated.

**NOTES:** When makeup is started, a malfunction that causes Boric Acid flow to increase from 12 to 20 GPM will be ramped in over 30 seconds.

KA 004 A4.02 3.8/3.9

**FOR TRAINING PURPOSES ONLY**

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<u>If</u> two boric acid pumps required to achieve desired NC system boron concentration, go to Encl. 4.15	Determines NC system Boron concentration is less than 2200ppm and will not need both pumps		
2	Evaluate all outstanding R&Rs that may impact the performance of this procedure	Determines from initial conditions that R&Rs have already been evaluated		
3	Check NV System is in normal operation per OP/1/A/6200/001 A (Chemical and Volume Control System Letdown)	Determines from initial conditions that NV system is aligned normally.		
4	When changing NC system boron concentration, evaluate energizing additional PZR heaters to enhance mixing.	Determine from initial conditions NC system boron concentration will not be changed		
5	Set Total Make Up Flow Counter to desired value	Same		
		<b>Cue:</b>		
		<b>Set Total Make Up Flow Counter to 500.</b>		

\* DENOTES CRITICAL



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	When Total Make Up Flow Counter cover closed, check counter at desired value	Value does not change when cover closed		
7	Set Boric Acid Flow Counter at desired value	Same <b>Cue:</b> <b>Set Boric Acid Flow Counter to 50.</b>		
8	When Boric Acid Flow Counter cover closed, check counter at desired value	Value does not change when cover closed		
*9	Determine "BA Flow Control" potentiometer setpoint for desired Boron Concentration using the McGuire Data Book or OAC	Calculates BA Flow Control Pot setting to be 3.05 +/- 0.1. Using the formula from Data Book Table 5.2 as follows:  $\frac{950 \text{ PPM} \times 90 \text{ GPM}}{7000 \text{ PPM}} =$  $\frac{12.2 \text{ GPM Acid}}{4} = 3.05$  <b>Potentiometer Setting of 2.95 - 3.15 is acceptable.</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*10	Set BA Flow Control potentiometer	BA Flow Control potentiometer set at approx. 3.1 <b>(2.95 - 3.15 is acceptable)</b>  <b>Cue:</b>  <b>Potentiometer set as calculated.</b>		
*11	Select "MANUAL" on "NC SYS M/U Controller"	Same  <b>Cue:</b>  <b>Switch placed in Manual</b>		
*12	Open 1NV-175A (BA Blender to VCT Outlet)	Same  <b>Cue:</b>  <b>Switch rotated to Open</b>		
13	Ensure in Auto <ul style="list-style-type: none"> <li>• BA Blend Disch CNTRL</li> <li>• BA Flow Control</li> </ul>	Same  <b>Cue:</b>  <b>Controllers in Auto</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	<p><b>If</b> both BA Trans Pumps off, Ensure in AUTO</p> <ul style="list-style-type: none"> <li>• 1A BA Trans Pump</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• 1B BA Trans Pump</li> </ul>	<p>Same</p> <p><b>Cue:</b></p> <p><b>1B BA Trans pump is in the start position and on for recirc</b></p>		
15	<p>Ensure in AUTO one of the following:</p> <ul style="list-style-type: none"> <li>• 1A RX M/U Water Pump</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• 1B RX M/U Water Pump</li> </ul>	<p>Same</p> <p><b>Cue:</b></p> <p><b>One of the RX M/U Water Pumps is in AUTO</b></p>		
*16	<p>Momentarily select START on "NC System Make Up"</p>	<p>Same</p> <p><b>Cue:</b></p> <p><b>Switch rotated to START</b></p>		
17	<p>Check lit NC System Make Up red light</p>	<p>Same</p> <p><b>Cue:</b></p> <p><b>Red light is lit</b></p>		
18	<p>Ensure throttled</p> <ul style="list-style-type: none"> <li>• 1NV-252A</li> <li>• 1NV-267A</li> </ul>	<p>Same</p> <p><b>Cue:</b></p> <p><b>Valves indicate intermediate position</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
19	Ensure RX M/U Water Pump starts	Same  <b>Cue:</b>  <b>RX M/U Water Pump selected to AUTO starts</b>		
20	If in AUTO, Ensure BA Trans Pump starts	Operator will N/A step and continue.  <b>Cue:</b>  <b>1B BA Trans pump is in the start position and on for recirc</b>		
*21	Ensure acceptable Reactor Makeup Water and Boric Acid flow.	Operator checks chart recorder to verify adequate flow. ( <b>Boric acid flow should</b> be approx. 12.2 GPM, Total blend flow = 90 GPM.)  <b>Cue:</b>  <b>Boric Acid flow is approx. 20 gpm.</b>		
*22	Per note in procedure, operator terminates makeup to VCT by placing NC Make Up Control to STOP.	Same  <b>Cue:</b>  <b>Switch rotated to STOP</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
23	Inform SRO that make up was terminated.	Terminate JPM with:		
		<b>Cue:</b>  <b>The Control Room SRO will investigate problem and have another RO complete makeup.</b>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

- IAE testing has the automatic portion of the NC SYS M/U Controller out of service.
- NC SYS M/U Controller is in the OFF position
- VCT level 42%
- BAT Boron Concentration 7000 ppm
- NC System Boron Concentration 950 ppm
- Blender Flow Rate 90 gpm
- All Initial Conditions have been satisfied for OP/1/A/6150/009 Encl. 4.5 (Manual Makeup to VCT using "NC System Makeup" Controller).
- NV System is in normal operation per OP/1/A/6200/001A
- There are no outstanding R&R's that will impact the performance of OP/1/A/6150/009 Encl. 4.5 (Manual Makeup to VCT using "NC System Makeup" Controller).

**The Control Room SRO directs you raise VCT level to 54% using OP/1/A/6150/009 Encl. 4.5 (Manual Makeup to VCT using "NC System Makeup" Controller).**

## **SIMULATOR OPERATIONAL GUIDELINES (NV-207A)**

1.     Reset the Simulator to IC-122
2.     Insert: OVR NV088B, Set = 50, Ramp = 30
3.     Freeze the simulator
4.     Insert malfunction when make up is started.

**Duke Power Company**  
**PROCEDURE PROCESS RECORD**

(1) ID No. OP/1/A/6150/009  
 Revision No. 066

# INFORMATION ONLY

**REPARATION**

(2) Station McGuire Nuclear Station

(3) Procedure Title Boron Concentration Control

(4) Prepared By Penon, Rhonda A *[Signature]* Date March 3, 2003

(5) Requires NSD 228 Applicability Determination? If Applicability Determination is required, attach NSD 228 documentation.

- ☒ Yes (New procedure or revision with major changes)  
☐ No (Revision with minor changes)  
☐ No (To incorporate previously approved changes)

(6) Reviewed By *[Signature]* (QR) Date 3/4/03

Cross-Disciplinary Review By *[Signature]* (QR) NA ReB Date 3/4/03

Reactivity Mgmt. Review By *[Signature]* (QR) NA ReB Date 3/4/03

Mgmt. Involvement Review By *[Signature]* (OPS Supt.) NA ReB Date 3/4/03

**(7) Additional Reviews**

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

**(8) Temporary Approval (if necessary)**

By \_\_\_\_\_ (OSM/QR) Date \_\_\_\_\_

By *[Signature]* (QR) Date \_\_\_\_\_

(9) Approved By *[Signature]* Date 3/4/03

**PERFORMANCE** (Compare with Control Copy every 14 calendar days while work is being performed.)

(10) Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

(11) Date(s) Performed \_\_\_\_\_

Work Order Number (WO#) \_\_\_\_\_

**COMPLETION****(12) Procedure Completion Verification**

☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?

☐ Yes ☐ NA Required enclosures attached?

☐ Yes ☐ NA Data sheets attached, completed, dated and signed?

☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?

☐ Yes ☐ NA Procedure requirements met?

Verified By \_\_\_\_\_ Date \_\_\_\_\_

(13) Procedure Completion Approved \_\_\_\_\_ Date \_\_\_\_\_

(14) Remarks (Attach additional pages, if necessary.)



Enclosure 4.5  
Manual Makeup to VCT Using "NC System  
Makeup" Controller

OP/1/A/6150/009  
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## 1. Limits and Precautions

- 1.1 **WHEN** changing NC System boron concentration, a minimum of one NC Pump shall be in operation to ensure adequate mixing of NC loops, with the following exceptions:  
{SOER 94-2} {PIP-M99-2915}
- Boration per Abnormal or Emergency Procedures
  - Both the NC System and makeup source greater than required boron concentration (Shutdown Margin, refueling concentration)
- 1.2 **WHEN** reactor subcritical and count rate on either Source Range Channel increases by a factor of two or more during a Boron Concentration change, the operation must be immediately stopped until a satisfactory evaluation of the situation has been made.
- 1.3 Dilution operations are limited by available capacity in RHT.
- 1.4 Piping downstream of Blender will contain 20 - 35 gallons of fluid at previous makeup concentration.
- 1.5 Dual Boric Acid Tank Pump operation is minimized due to potential to deadhead weaker pump.
- 1.6 During dilution of NC System with Shutdown Banks A and B withdrawn, at least two NC Pumps shall be operating, one of which in NC Loop to which charging is aligned.  
{PIP-M02-3372}

## 2. Initial Conditions

None

## 3. Procedure

**NOTE:** Operation of two Boric Acid pumps may be required with high NC System boron concentration.

- ☐ 3.1 **IF** two boric acid pumps required to achieve desired NC System boron concentration, go to Enclosure 4.15 (VCT Makeup With High NC System Boron Concentration).
- ☐ 3.2 Evaluate all outstanding R&Rs that may impact performance of this procedure.

# Unit 1

Enclosure 4.5  
Manual Makeup to VCT Using "NC System  
Makeup" Controller

OP/1/A/6150/009

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**CAUTION:** NSD 304 (Reactivity Management), states that Operations shall be responsible for control of reactivity and taking conservative actions to safeguard integrity of reactor fuel.

**NOTE:** Comparison of Total Make Up Flow Counter to Boric Acid Flow Counter ratio can be used as alternate indication of boron concentration in makeup.

- ☐ 3.3 Check NV System in normal operation per OP/1/A/6200/001 A (Chemical and Volume Control System Letdown).
- ☐ 3.4 **WHEN** changing NC System boron concentration, evaluate energizing additional pressurizer heaters to enhance system mixing.

**CAUTION:** **IF** Total Makeup and Boric Acid Flow integrator thumbwheels are set too low, boric acid flow or reactor makeup water flow may be automatically terminated, resulting in inadvertent dilution or boration of NC System.

**NOTE:**

- Integrator Thumbwheel covers should **NOT** be opened unless associated counter reset pushbutton depressed.
- Excessive operation of Integrator Thumbwheel covers should be avoided.
- Integrator Thumbwheel covers must be closed for NC Makeup System to operate.

- ☐ 3.5 Set Total Make Up Flow Counter to desired value.
- ☐ 3.6 **WHEN** Total Make Up Flow Counter cover closed, check counter at desired value.
- ☐ 3.7 Set Boric Acid Flow Counter to desired value.
- ☐ 3.8 **WHEN** Boric Acid Flow Counter cover closed, check counter at desired value.
- ☐ 3.9 Determine "BA Flow Control" potentiometer setpoint for desired Boron Concentration using McGuire Data Book or OAC.
- ☐ 3.10 Set "BA Flow Control" potentiometer.
- ☐ 3.11 Select "MANUAL" on "NC SYS M/U Controller".
- ☐ 3.12 Open INV-175A (BA Blender To VCT Outlet).

## Unit 1

Enclosure 4.5  
Manual Makeup to VCT Using "NC System  
Makeup" Controller

OP/1/A/6150/009  
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- 3.13 Ensure in "AUTO":
- ☐ "BA Blend Disch CNTRL"
  - ☐ "BA Flow Control"
- ☐ 3.14 **IF** both BA Trans Pumps off, ensure in "AUTO" one of the following:
- ☐ 1A BA Trans Pump
  - OR**
  - ☐ 1B BA Trans Pump
- 3.15 Ensure in "AUTO" one of the following:
- ☐ 1A Rx M/U Water Pump
  - OR**
  - ☐ 1B Rx M/U Water Pump

**NOTE:**

- The following step initiates blended flow to VCT.
- "NC Make Up Control" can be placed in "STOP" to terminate makeup at anytime.
- Steps 3.16 - 3.25 may be completed **AND** then checked off as time allows.

- ☐ 3.16 Momentarily select "START" on "NC System Make Up".
- ☐ 3.17 Check lit "NC System Make Up" red light.
- 3.18 Ensure throttled:
- ☐ INV-252A (RX M/U Water To Blender Control)
  - ☐ INV-267A (Boric Acid To Blender Control)
- ☐ 3.19 Ensure Rx M/U Water Pump starts.
- ☐ 3.20 **IF** in "AUTO", ensure BA Trans Pump starts.
- 3.21 Ensure acceptable:
- ☐ Reactor makeup water flow
  - ☐ Boric acid flow

**Unit 1**

Enclosure 4.5  
Manual Makeup to VCT Using "NC System  
Makeup" Controller

OP/1/A/6150/009  
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- ☐ 3.22 Monitor the following parameters:
  - SM Pressure
  - Reactor Power
  - Tavg
  - Rod motion
- ☐ 3.23 **IF** plant parameters indicate other than expected response, perform the following:
  - ☐ Select "STOP" on "NC System Make Up"
  - ☐ Check lit "NC System Make Up" green light
  - ☐ Notify CR SRO
- ☐ 3.24 **IF** "NC System Make Up" placed in "STOP" to terminate makeup **AND** it is desired to re-initiate makeup, go to Step 3.5.
- ☐ 3.25 **WHEN** VCT at desired level, select "STOP" on "NC System Make Up".
- ☐ 3.26 Check lit "NC System Make Up" green light.
- ☐ 3.27 **IF** in "AUTO", ensure off:
  - ☐ 1A BA Trans Pump
  - ☐ 1B BA Trans Pump
  - ☐ 1A Rx M/U Water Pump
  - ☐ 1B Rx M/U Water Pump
- 3.28 Ensure closed:
  - ☐ 1NV-252A (RX M/U Water To Blender Control)
  - ☐ 1NV-267A (Boric Acid To Blender Control)
- ☐ 3.29 Ensure in "AUTO" 1NV-175A (BA Blender To VCT Outlet).

## Unit 1

Enclosure 4.5  
Manual Makeup to VCT Using "NC System  
Makeup" Controller

OP/1/A/6150/009  
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<b>NOTE:</b> CR SRO concurrence required if flush of blender <b>NOT</b> performed.
--

- ☐ 3.30 **IF** desired to flush blender, perform the following:
  - ☐ Go to Enclosure 4.4 (Alternate Dilute) and flush with 20 - 35 gallons reactor makeup water through 1NV-175A (BA Blender to VCT Outlet).
  - OR**
  - ☐ Go to Enclosure 4.2 (Borate) and flush with 20 - 35 gallons boric acid through 1NV-175A (BA Blender to VCT Outlet).
- ☐ 3.31 Record in Auto Log final blender contents:
  - ☐ Rx Makeup Water
  - OR**
  - ☐ Blend
  - OR**
  - ☐ Boric Acid
- ☐ 3.32 **IF** automatic makeup alignment desired, perform the following:
  - ☐ 3.32.1 Determine "BA Flow Control" potentiometer setpoint for desired boron concentration using McGuire Data Book or OAC.
  - ☐ 3.32.2 Set "BA Flow Control" potentiometer.
  - ☐ 3.32.3 Ensure set for 90 gpm ( $\approx 5.6$ ) "BA Blend Disch Cntrl" potentiometer.
  - ☐ 3.32.4 Ensure in "AUTO":
    - ☐ 1NV-171A (BA Blender to VCT Inlet)
    - ☐ 1NV-175A (BA Blender To VCT Outlet)
    - ☐ 1NV-267A (Boric Acid To Blender Control)
    - ☐ 1NV-252A (RX M/U Water To Blender Control)
    - ☐ "BA Blend Disch Cntrl" Man/Auto Station
    - ☐ "BA Flow Control" Man/Auto Station
    - ☐ "NC Sys M/U Controller"

## Unit 1

Enclosure 4.5  
Manual Makeup to VCT Using "NC System  
Makeup" Controller

OP/1/A/6150/009  
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3.32.5 Select "AUTO" on one of the following:

☐ 1A Rx M/U Water Pump

OR

☐ 1B Rx M/U Water Pump

☐ 3.32.6 IF both BA Trans Pumps off, select "AUTO" on one of the following:

☐ 1A BA Trans Pump

OR

☐ 1B BA Trans Pump

**NOTE:** The following step arms auto makeup.

☐ 3.32.7 Momentarily select "START" on "NC System Make Up".

☐ 3.32.8 Check lit "NC System Make Up" red light.

3.32.9 Ensure the following reset to zero:

☐ Total Make Up Flow Counter

☐ Boric Acid Flow Counter

**End of Enclosure**

**Unit 1**

Prepared By:

Rob Bilk

Reviewed By:

Chris Lewis

Approved By: \_\_\_\_\_

TASK: **Place Main Generator Voltage Regulator in service and Synchronize to Grid**

POSITION: **RO**

Operator's Name \_\_\_\_\_

Location: **Simulator**

Method: **Perform**

Estimated JPM Completion Time: 30 Minutes

Actual JPM Completion Time: \_\_\_\_\_ Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_

Date    /    /   

References: OP/1/A/6300/001

Turbine Generator Startup/Shutdown

JPM verified current with references by \_\_\_\_\_

Date    /    /   

Rev. 00/04-14-03

**FOR TRAINING PURPOSES ONLY**

### INITIAL CONDITIONS

- You are the Unit 1 Balance of Plant (BOP).
- Unit 1 is being maintained between 12% and 15% RTP per OP/1/A/6100/003 (Controlling Procedure for Unit Operation) Encl. 4.1 (Power Increase) by another Reactor Operator.
- All Initial Conditions and steps in OP/1/A/6300/001 (Turbine Generator Startup/Shutdown) Encl. 4.1 (Automatic Mode Startup) have been completed up through step 3.10.
- System Engineer has requested an auto sync of generator be performed.

**The Control Room SRO directs you to Place Unit 1 Main Generator Voltage Regulator in service and Synchronize to the Grid per OP/1/A/6300/001 (Turbine Generator Startup/Shutdown) Encl. 4.1 (Automatic Mode Startup)**

**JPM OVERALL STANDARD:** Unit 1 Main Generator Voltage Regulator in service and Synchronized to the Grid.

**NOTES:** Auto sync will not work, Manual sync will be required.

KA 062 A4.07 3.1/3.1

**FOR TRAINING PURPOSES ONLY**



START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Check Turbine speed greater than 1710 rpm	Verifies turbine speed is greater than 1710 rpm.  <b>Cue:</b> <b>Turbine speed indicates 1800 RPM</b>		
2	Check Voltage Regulator aligned for Control Room operation per one of the Following <ul style="list-style-type: none"> <li>• OAC graphic MAINGEN</li> <li>• U1 Gen Voltage Reg Local Control Panel</li> <li>• M1D2342 (U1 Gen Voltage Reg in Local Cabinet Control )</li> </ul>	Verifies Voltage Regulator aligned for control room.  <b>Cue:</b> <b>Voltage Regulator is aligned for Control Room control.</b>		
3	Locally check closed:	Operator dispatches NLO to locally check contactors closed.		
	<ul style="list-style-type: none"> <li>• 1EQB-SX-Q701</li> <li>• 1EQB-SX-Q702</li> </ul>	<b>Cue:</b> <b>The NLO reports that 1EQB-SX-Q701 and 1EQB-SX-Q702 are closed</b>		

OW

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	Check PMG voltage 120-130 VAC	Same  <b>Cue:</b>  <b>PMG voltage indicates 128 VAC</b>		
5	Check one of the following: <ul style="list-style-type: none"> <li>• M1D2348 (U1 Voltage Regulator System) is normal</li> <li>• Trouble alarms or faults have been reviewed on U1 Gen Voltage Reg Local Control Panel, on U1 Gen Voltage Reg CH 1 Panel and U1 Gen Voltage Reg CH 2 Panel</li> </ul>	Same  <b>Cue:</b>  <b>M1D2348 (U1 Voltage Regulator System) indicates "normal"</b>		
6	Ensure Voltage Regulator in "MAN"	Same  <b>Cue:</b>  <b>Switch selected to "MAN" and "MAN" light is lit</b>		
*7	Depress "ON" for Excitation	Same  <b>Cue:</b>  <b>Excitation ON light Lit and Exciter trip annunciator cleared</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	Check Generator voltage 22.4 - 23.2 KV	Operator checks OAC or main control board indications.  <b>Cue:</b>  <b>Generator voltage indicates 22.8 KV</b>		
9	<b>Note:</b> "READY" may take 15 – 90 seconds to illuminate after excitation breakers are closed.  Check lit "Ready" on Voltage Regulator	Same   <b>Cue:</b>  <b>"READY" light lit</b>		
*10	<u>If</u> auto Voltage Regulator operation is desired, ensure Voltage Regulator in AUTO	Recognize from the Initial Conditions that Auto sync of Generator was requested. Voltage Regulator must be in <b>AUTO</b> for Auto sync capability (per <b>Caution</b> prior to step).  <b>Cue:</b>  <b>AUTO selected and AUTO light LIT</b>		
11	<u>If</u> manual Voltage Regulator operation is desired.....	Operator N/A's step and proceeds.		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	Depress and hold "SYNC" on either "Generator Breaker 1A" or "Generator Breaker 1B"	Same  <b>Cue:</b> <b>Pushbutton depressed and held</b>		
*12	Adjust "Station Run Volts" slightly higher than "Generator Incoming Volts" Using Voltage Adjust	Same  <b><u>Note to evaluator:</u></b>  This step is only critical if adjustments are required.  <b>Cue:</b>  "Station Run Volts" is indicating slightly higher than "Generator Incoming Volts"		
13	Release "SYNC"	Same  <b>Cue:</b> <b>"SYNC" released</b>		
14	Notify System Engineer Exciter Field is flashed	Same  <b>Cue:</b> <b>Engineer notified</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	<p>Close Generator MODs as follows</p> <ul style="list-style-type: none"> <li>• Ensure Generator Frequency is greater than 59.6 HZ</li> <li>• If local operation of MODs required, perform Encl.4.5</li> </ul> <p>If Control Room operation of MODs required, perform the following:</p> <ul style="list-style-type: none"> <li>• Close <ul style="list-style-type: none"> <li>○ MODs for Generator Breaker 1A</li> <li>○ MODs for Generator Breaker 1B</li> </ul> </li> <li>• Dispatch operator to locally check MODs closed and condensation in the IPB enclosures</li> </ul>	<p><b>Cue:</b> <b>Frequency indicates 60 Hz</b></p> <p><b>Cue:</b> <b>Local operation is not required.</b></p> <p><b>Cue:</b> <b>Pushbutton depressed, red light lit</b></p> <p><b>Cue:</b> <b>Pushbutton depressed, red light lit</b></p> <p><b>Cue:</b> <b>NLO reports MODs closed and no condensation present.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
16	Notify SOC unit to be paralleled.	Phone call made		
*17	Ensure Lit "Valve Position Limit Display"	Same <b>Cue:</b> "Valve Position Limit Display" Button depressed and lit		
*18	Lower limit to 17% using "Valve Position Limit Lower"	Same <b>Cue:</b> Valve position limit lowered to 17% on Variable Display window		
19	If auto sync required, perform the following <ul style="list-style-type: none"> <li>Place "Gen Auto/Man Sync Select" to "Auto 1A" or "Auto 1B"</li> </ul>	Recognize per Initial Conditions that Auto sync is required  Switch placed in "Auto 1A" or "Auto 1B".  <b>Cue:</b> Switch placed to "AUTO 1A (1B)".		

OW

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
19	<b>CONTINUED</b> <ul style="list-style-type: none"> <li>If selected generator breaker fails to close, depress "Auto Sync" on DEH panel.</li> <li>If selected breaker does not close in 5 minutes Repeats steps 3.13.4.1 – 3.13.4.2 for opposite breaker.</li> <li>If any Generator breaker fails to close in 5 minutes, notify System Engineer</li> </ul>	<p>Selected breaker will not close, proceeds to next step.</p> <p><b>Cue:</b> <b>Breaker did not close.</b> "Auto Sync" depressed on DEH panel. Breaker does not close.</p> <p><b>Cue:</b> <b>"Auto Sync" depressed on DEH panel. Breaker does not close.</b></p> <p><b>Cue:</b> <b>Five minutes have elapsed.</b></p> <p><b>Cue:</b> <b>Steps 3.13.4.1 – 3.13.4.2 repeated for opposite breaker. It does not close</b></p> <p><b>Cue:</b> <b>System Engineer has been informed.</b></p>		
*20	Place "Gen Auto/Man Sync Select" in "MAN"	<p><b>Cue:</b> <b>Switch placed to "MAN"</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21	If manual sync of generator is required, perform the following:	<b>Cue:</b> <b>SRO directs manual sync</b>		
*	• Obtain permission from system Engineer for manual sync	<b>Cue:</b> <b>System Engineer has given permission</b>		
*	• Depress and hold "SYNC" for breaker to be closed	<b>Cue:</b> <b>"SYNC" depressed and held</b>		
*	• Adjust Generator speed until Synchroscope hand moves slowly in "FAST" direction.	Synchroscope moving slowly in the "FAST" direction. If not Turbine Generator speed adjusted to obtain condition. <b>Cue:</b> <b>Synchroscope moving slowly in the fast direction</b>		
	• Ensure "Station Run Volts" slightly higher than "Generator Incoming Volts" Using Voltage Adjust	<b>Cue:</b> <b>"Station Run Volts" is indicating slightly higher than "Generator Incoming Volts"</b>		
* DENOTES CRITICAL				

\*b0W



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
21  *	<b>CONTINUED</b> <ul style="list-style-type: none"> <li>When Synchroscope indicates within 5 minutes before 12 o'clock position depress "CLOSE" for selected breaker until "CLSD" is lit.</li> <li>Release "SYNC"</li> </ul>	<p>Selected breaker closed at 5 minutes before 12 o'clock on the Synchroscope.</p> <p><b>Cue:</b> <b>Pushbutton depressed, red light lit</b></p> <p><b>Cue:</b> <b>"SYNC" released.</b></p>		
22	<b>WHEN</b> Generator paralleled to Grid, load Generator as follows....	<p><b>Cue:</b></p> <p><b>The SRO has directed another operator to load the Generator and continue in this procedure.</b></p>		

STOP TIME\_\_\_\_\_

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

- You are the Unit 1 Balance of Plant (BOP).
- Unit 1 is being maintained between 12% and 15% RTP per OP/1/A/6100/003 (Controlling Procedure for Unit Operation) Encl. 4.1 (Power Increase) by another Reactor Operator.
- All Initial Conditions and steps in OP/1/A/6300/001 (Turbine Generator Startup/Shutdown) Encl. 4.1 (Automatic Mode Startup) have been completed up to step 3.11
- System Engineer has requested an auto sync of generator be performed.

**The Control Room SRO directs you to Place Unit 1 Main Generator Voltage Regulator in service and Synchronize to the Grid per OP/1/A/6300/001 (Turbine Generator Startup/Shutdown) Encl. 4.1 (Automatic Mode Startup)**

## **SIMULATOR OPERATIONAL GUIDELINES**

1. Reset to IC-123
2. Insert OVR-MG017A
3. Insert OVR-MG017B
4. Acknowledge all alarms
5. Freeze Simulator

## **1. Limits and Precautions**

- 1.1 Turbine shall be rotating prior to admitting steam.
- 1.2 Vacuum should be maintained during shutdown, except in an emergency.
- 1.3 Operate within startup, loading, or capability curves except in an emergency.
- 1.4 **WHEN** Turbine load less than 10%, maximum Low Pressure Turbine Steam Inlet Temperature is 400°F.
- 1.5 **WHEN** Turbine load greater than 10%, maximum Low Pressure Turbine Steam Inlet Temperature is 550°F.
- 1.6 Maximum condenser backpressure is 3.5 inches Hg when below 354 MWE (30%).
- 1.7 *Maximum Bearing Oil Discharge Temperature* is 180°F.
- 1.8 Minimum Bearing Oil Temperature is 70°F.
- 1.9 Maximum bearing metal temperatures is 225°F.
- 1.10 Maximum Delta T between the base and cover metals of High Pressure Turbine is 100°F.
- 1.11 Maximum allowed Turbine Vibration is 14.0 mils (16.0 mils for #11 Bearing).
- 1.12 Maximum allowed Turbine shaft eccentricity is 3 mils.
- 1.13 Maximum Generator Cold Gas Temperature is 48°C (118.4°F).
- 1.14 Concurrent operation of Bearing Oil/Seal Oil Backup Pump and Emergency Bearing Oil Pump is prohibited.
- 1.15 Maximum H<sub>2</sub> cooler warm gas temperature is 176°F (80°C).
- 1.16 **IF** MODs are manually operated in wrong direction or past normal open / closed position, damage can occur to limit switches.

## **Unit 1**

## 2. Initial Conditions

**NOTE:** Either Initial Condition 2.1 OR Initial Conditions 2.2 - 2.17 must be met.

\_\_\_\_\_ 2.1 Entering procedure from PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test).

### OR

2.2 The following valve checklists have been completed:

- \_\_\_\_\_ • OP/1/A/6250/006 (Main Steam System)  
Date \_\_\_\_\_
- \_\_\_\_\_ • OP/1/B/6250/004 (Feedwater Heater Vents, Drain and Bleed System)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Valves have been opened in Enclosure 4.4 (Startup Vent Valve Checklist) of  
Date \_\_\_\_\_ OP/1/B/6250/004 (Feedwater Heater Vents, Drain and Bleed System)

2.3 The following support systems are in service:

- \_\_\_\_\_ • Turbine Lube Oil System (OP/1/B/6300/007)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Main Turbine Hydraulic Oil System (OP/1/B/6300/008)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Condensate and Feedwater Systems (OP/1/A/6250/001)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Generator Stator Cooling Water System (OP/1/B/6300/002)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Generator Seal Oil System (OP/1/B/6300/004)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Generator Hydrogen System (OP/1/B/6300/003)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Steam Seal System (OP/1/B/6300/005)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Main Vacuum & Vacuum Priming System (OP/1/B/6300/006)  
Date \_\_\_\_\_
- \_\_\_\_\_ • Isolated Phase Bus Cooling System (OP/1/B/6300/010)  
Date \_\_\_\_\_

\_\_\_\_\_ 2.4 IAE has completed PT/0/A/4250/004G (Turbine Trip Reactor Trip Operational Test)  
Date \_\_\_\_\_ prior to rolling turbine.

\_\_\_\_\_ 2.5 Both Generator MODs open.  
Date \_\_\_\_\_

# Unit 1

**Enclosure 4.1**  
**Automatic Mode Startup**

OP/1/A/6300/001  
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- |       |       |           |  |
|-------|-------|-----------|--|
| _____ | _____ | 2.6       | Both Generator Breakers are open.  |
| Date  | _____ | 2.7       | One of the following:  |
|       | _____ | 2.7.1     | M1S0121 (Gen Reg Supply Brkr) indicates open.  |
|       | Date  | <b>OR</b> |  |
|       | _____ | 2.7.2     | "FCB OFF" is lit on U1 Gen Voltage Reg Local Control Panel.                          |
|       | Date  |           |  |
| _____ | _____ | 2.8       | "Gen Auto/Man Sync Select" in "MAN".   |
| Date  | _____ | 2.9       | Turbine Drain Valves in "AUTO".  |
| _____ | _____ | 2.10      | Generator Neutral Disconnects locked closed.   |
| Date  | _____ | 2.11      | Turbine Supervisory Instruments in Control Room and at Turbine Panel are in service. |
| _____ | _____ | 2.12      | Turbine Rotor-to-Casing differential expansion is within limits per recorder.        |
| Date  | _____ | 2.13      | "Exh Hood Spray" in "AUTO".  |
| _____ | _____ | 2.14      | Governor Valves in "Single Valve" mode.  |
| Date  | _____ | 2.15      | "EXCITATION" is "OFF".   |
| _____ | _____ | 2.16      | Ensure all Generator Lockouts are reset.   |
| Date  | _____ | 2.17      | Turbine Generator has been rotating 4 continuous hours.                              |
| _____ | _____ |           |  |
| Date  | _____ |           |  |

**3. Procedure**

- ☐ 3.1 Evaluate all outstanding R&Rs that may impact performance of this procedure.
- \_\_\_\_\_ 3.2 **IF** entering this procedure after performing PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test), go to Section 3.10.
- ☐ 3.3 Record highest reading LP Turbine inlet metal temperature from OAC Points M1A0389, M1A0395, and M1A0401. \_\_\_\_\_ °F
- \_\_\_\_\_ 3.4 **IF** any Governor Valve or Throttle Valve position indicates less than -0.8% or more than 2%, notify System Engineer.

\_\_\_\_\_/\_\_\_\_\_  
Person Contacted      Date      Time

**Unit 1**

**Enclosure 4.1**  
**Automatic Mode Startup**

OP/1/A/6300/001  
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☐ 3.5 Maintain LT lube oil temperature per OP/1/B/6300/007 (Turbine Lube Oil System).

3.6 Latch Main Turbine as follows:

3.6.1 Check:

- ☐ "Turbine Tripped"
- ☐ "Megawatt Xducer" - Good
- ☐ "OPC Press Xducer" - Good
- ☐ "IMP Press Xducer" - Good
- ☐ "Impulse Loop" - Out
- ☐ "Megawatt Loop" - Out

3.6.2 Check:

- ☐ Intercept and Reheat Stop Valve lights indicate closed
- ☐ Throttle Valve positions indicate -0.8 - 2%
- ☐ Governor Valve positions indicate -0.8 - 2%

IAE 3.6.3 **IF** Zero Power Physics Test to be performed, isolate LH to Throttle Valves.

IAE 3.6.3.1 Ensure Throttle Valves will remain closed during Zero Power Physics Test.

**Unit 1**

**Enclosure 4.1**  
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- \_\_\_\_\_ 3.6.4      Ensure lit "Valve Position Limit Display".
- \_\_\_\_\_ 3.6.5      Depress "Valve Position Limit Lower" until "Variable Display" indicates 0%.
- ☐ 3.6.6      Check "0000" in both "Reference" and "Demand".
- \_\_\_\_\_ 3.6.7      Page plant personnel to stand clear of Turbine while latching.

**NOTE**      Turbine latching may take up to 30 seconds following long shutdown periods.

- \_\_\_\_\_ 3.6.8      Depress and hold "Latch" until lit.
- \_\_\_\_\_ 3.6.9      Depress "Operator Auto".
- 3.6.10      Check:
  - ☐ Intercept and Reheat Stop Valves open
  - ☐ Throttle and Governor Valves closed
- \_\_\_\_\_ 3.6.11      Ensure lit "Valve Position Limit Display".
- \_\_\_\_\_ 3.6.12      Depress "Valve Position Limit Raise" until "Variable Display" indicates 120%.
- ☐ 3.6.13      Check Governor Valves full open.
- 3.6.14      Test trip mechanism of Governor, Intercept, and Reheat Stop Valves as follows:
  - \_\_\_\_\_ 3.6.14.1      Operate trip mechanism manually or with solenoid.
  - ☐ 3.6.14.2      Check all valves close freely.
  - \_\_\_\_\_ 3.6.14.3      Depress and hold "Latch" until lit.
  - ☐ 3.6.14.4      Check valves return to full open.
- \_\_\_\_\_ 3.6.15      **IF** greater than 7 days since last test of "Overspeed Protection Control", perform "Overspeed Protection Control (OPC) Test" per PT/1/A/4250/004I (Pre-Startup Turbine Testing).
- ☐ 3.6.16      Perform PT/1/B/4250/004B (Turbine Trip Device Test).
- ☐ 3.6.17      Return to Power Increase per OP/1/A/6100/003 (Controlling Procedure For Unit Operation).

## Unit 1



3.7 Reset Main Turbine as follows:

- ☐ 3.7.1 Check IAE has performed TV/GV hot calibrations.
- \_\_\_\_ 3.7.2 Station NLO to place Turbine on Turning Gear within 5 minutes in event  
SRO Turbine trips off of Turning Gear.
- \_\_\_\_ 3.7.3 Trip Main turbine.
- \_\_\_\_ 3.7.4 Ensure lit "Valve Position Limit Display".
- \_\_\_\_ 3.7.5 Depress "Valve Position Limit Lower" until "Variable Display" indicates 0%.
- ☐ 3.7.6 Check "0000" in both "Reference" and "Demand".
- ☐ 3.7.7 Page plant personnel to stand clear of Turbine while latching.
- \_\_\_\_ 3.7.8 Depress and hold "Latch" until lit.
- \_\_\_\_ 3.7.9 Depress "Operator Auto".
- 3.7.10 Check:
  - ☐ Intercept and Reheat Stop Valves open
  - ☐ Throttle and Governor Valves closed
- \_\_\_\_ 3.7.11 Ensure lit "Valve Position Limit Display".
- \_\_\_\_ 3.7.12 Depress "Valve Position Limit Raise" until "Variable Display" indicates  
120%.
- ☐ 3.7.13 Check Governor Valves full open.
- ☐ 3.7.14 Return to Power Increase per OP/1/A/6100/003 (Controlling Procedure For  
Unit Operation).

**Enclosure 4.1**  
**Automatic Mode Startup**

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- NOTE:**
- This note applies any time Turbine is being accelerated.
  - Acceleration rate should be changed in stages when starting and approaching desired speeds.
  - Cold Start maximum acceleration rate is 75 rpm/min except in critical range. (Greater than 48 hours post trip)
  - Hot Start maximum acceleration rate is 100 rpm/min except in critical range. (Less than 48 hours post trip)
  - Shaft critical occurs at 900 - 1300 rpm.
  - Blade critical occurs 1650 - 1750 rpm.
  - Acceleration rate should be increased in critical ranges to 120 rpm/min.
  - Maximum acceleration rate is 120 rpm/min.

3.8 Roll Turbine to 680 rpm as follows:

- \_\_\_\_ 3.8.1 **IF** MSRs to be operated in manual, begin startup of MSRs per OP/1/B/6250/011 (Moisture Separator Reheater Operation).
- ☐ 3.8.2 Record HP Turbine 1st stage Temperature (M1A0303). \_\_\_\_\_ °F
- \_\_\_\_ 3.8.3 Determine following per OP/1/A/6100/022 (Unit 1 Data Book):  
SRO  
Acceleration Rate \_\_\_\_\_ rpm/min  
Loading Rate \_\_\_\_\_ MW/min
- \_\_\_\_ 3.8.4 Ensure Turbine Generator rolling on turning gear 4 continuous hours prior to rolling turbine.
- \_\_\_\_ 3.8.4.1 **IF** Turbine shaft at zero speed greater than 5 minutes during 4 hour period, notify System Engineer.
- \_\_\_\_\_  
Person Contacted      Date    Time
- \_\_\_\_ 3.8.5 Ensure LH restored to Throttle Valves.  
IAE
- \_\_\_\_ 3.8.6 Place "Turning Gear" in "MAN".

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- ☐ 3.8.7 Begin accelerating to 680 rpm per OP/1/A/6300/001A (Turbine-Generator Load Change).
- ☐ 3.8.8 Check Turning Gear disengages and stops.
- ☐ 3.8.9 Check for unusual noises, rubs, and vibrations as Turbine accelerates.
- \_\_\_\_\_ 3.8.10 Prior to turbine reaching 600 rpm, ensure "Bearing Lift Pump" in "AUTO".
- \_\_\_\_\_ 3.8.11 **WHEN** Turbine reaches 600 rpm, ensure the following:
  - \_\_\_\_\_ • Exhaust Hood Spray commences
  - \_\_\_\_\_ • "Bearing Lift Pump" stops
- \_\_\_\_\_ 3.8.12 **WHEN** Turbine rolling at 680 rpm, check:
  - ☐ All supervisory instruments in Control Room
  - ☐ Locally for unusual noises and vibrations
  - ☐ Oil flow to all bearings
- ☐ 3.9 Accelerate Turbine to 1800 rpm per OP/1/A/6300/001A (Turbine-Generator Load Change).
  - ☐ 3.9.1 Check for unusual noises, rubs, and vibrations as Turbine accelerates.
- \_\_\_\_\_ 3.10 **WHEN** Turbine at 1800 rpm, perform the following:
  - \_\_\_\_\_ 3.10.1 **IF** greater than 7 days since performing PT/1/A/4250/004I (Pre-Startup Turbine Testing), perform the following:
    - ☐ 3.10.1.1 Test "Overspeed Trip Device Test" per PT/1/A/4250/004I (Pre-Startup Turbine Testing) (SLC 16.7.5).
    - ☐ 3.10.1.2 Test "Manual Turbine Trip Test" per PT/1/A/4250/004I (Pre-Startup Turbine Testing) (SLC 16.7.5).
  - \_\_\_\_\_ 3.10.2 Ensure Turbine at 1800 rpm.
  - 3.10.3 Ensure only one of the following running:
    - \_\_\_\_\_ • 1A LH Pump
    - OR**
    - \_\_\_\_\_ • 1B LH Pump

**Unit 1**

**Enclosure 4.1**  
**Automatic Mode Startup**

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- 3.10.4    Ensure in "AUTO":
- \_\_\_\_\_ • 1A LH Pump
  - \_\_\_\_\_ • 1B LH Pump
- \_\_\_\_\_ 3.10.5    **WHEN** displays match actual Turbine speed and Turbine speed has stabilized at 1800 rpm, depress "TRANSFER TV-GV".
- ☐ 3.10.5.1    Check transfer occurs by observing valve position indicators.
- \_\_\_\_\_ 3.10.6    Stop Bearing Oil Pump/GSOB Pump.
- \_\_\_\_\_ 3.10.7    Place "Bearing Oil Pump/GSOB Pump" in "AUTO".
- ☐ 3.10.8    Check M1A0874 (Unit 1 Seal Oil Hydrogen D/P) is 12 -14 psid.
- ☐ 3.10.9    Adjust LG temperature per OP/1/B/6300/004 (Generator Seal Oil System).
- 3.11    Place Voltage Regulator in service as follows:
- ☐ 3.11.1    Check Turbine speed greater than 1710 rpm.
- ☐ 3.11.2    Check Voltage Regulator aligned for Control Room operation per one of the following:
- OAC Graphic "MAINGEN"
  - U1 Gen Voltage Reg Local Control Panel
  - M1D2342 (U1 Gen Volt Reg In Local Cabinet Control)
- 3.11.3    Locally check closed:
- \_\_\_\_\_ ☐ 1EGB-SX-Q701 (U1 Gen Voltage Reg Ch 1 Discon)
  - \_\_\_\_\_ ☐ 1EGB-SX-Q702 (U1 Gen Voltage Reg Ch 2 Discon)
- ☐ 3.11.4    Check PMG voltage 120 - 130 VAC.
- 3.11.5    Check one of the following:
- ☐ M1D2348 (U1 Gen Voltage Regulator System) is normal
  - OR**
  - ☐ Trouble alarms or faults have been reviewed on the following:
- U1 Gen Voltage Reg Local Control Panel
  - U1 Gen Voltage Reg Ch 1 Panel
  - U1 Gen Voltage Reg Ch 2 Panel

**Unit 1**

**Enclosure 4.1**  
**Automatic Mode Startup**

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- \_\_\_\_\_ 3.11.6    Ensure Voltage Regulator in "MAN".
- \_\_\_\_\_ 3.11.7    Depress "ON" for Excitation.
- ☐ 3.11.8    Check Generator Voltage 22.4 - 23.2 KV.

<b>NOTE:</b> "READY" may take 15 - 90 seconds to illuminate after Excitation Breakers are closed.
---

- ☐ 3.11.9    Check lit "READY" on Voltage Regulator.

<b>CAUTION:</b> Gen Voltage Reg Control must be in "AUTO" for Autosync capability.
--

- \_\_\_\_\_ 3.11.10    **IF** auto Voltage Regulator operation is desired, ensure Voltage Regulator in "AUTO".
- \_\_\_\_\_ 3.11.11    **IF** manual Voltage Regulator operation is desired, perform the following:
  - ☐ 3.11.11.1    Maintain Generator parameters within Capability Curve 3.1.1 or Capability Curve 3.1.2 of OP/1/A/6100/022 (Unit 1 Data Book).
  - \_\_\_\_\_ 3.11.11.2    Ensure "MAN" on Voltage Regulator.
  - \_\_\_\_\_ 3.11.11.3    **IF** unit online or will be placed online, notify SOC that Voltage Regulator is in manual. (Dispatcher Phone or 704-382-4413)

_____	_____/_____ Date    Time
Person Contacted	

- \_\_\_\_\_ 3.11.12    Depress and hold "SYNC" on either "Generator Breaker 1A" or "Generator Breaker 1B".
- \_\_\_\_\_ 3.11.13    Adjust "Station Run Volts" slightly higher than "Generator Incoming Volts" using Voltage Adjust.
- \_\_\_\_\_ 3.11.14    Release "SYNC".
- \_\_\_\_\_ 3.11.15    Notify System Engineer that Exciter field has been flashed.

SRO

_____	_____/_____ Date    Time
Person Contacted	

**Unit 1**

**Enclosure 4.1**  
**Automatic Mode Startup**

OP/1/A/6300/001  
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3.12 Close Generator MODs as follows:

- \_\_\_\_\_ 3.12.1 Ensure Generator Frequency greater than or equal to 59.6 Hz.
- \_\_\_\_\_ 3.12.2 **IF** local operation of MODs is required, perform Enclosure 4.5 (Local Operation Of Generator Breaker MODs).
- \_\_\_\_\_ 3.12.3 **IF** Control Room operation of MODs is required, perform the following:
  - 3.12.3.1 Close:
    - \_\_\_\_\_ • MODs for Generator Breaker 1A
    - \_\_\_\_\_ • MODs for Generator Breaker 1B
  - 3.12.3.2 Dispatch operator to locally check:
    - ☐ MODs closed for Generator Breaker 1A
    - ☐ MODs closed for Generator Breaker 1B
    - ☐ No condensation in IPB enclosures through windows at MODs

**Unit 1**

**Enclosure 4.1**  
**Automatic Mode Startup**

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3.13 Synchronize Generator to grid as follows:

- \_\_\_\_\_ 3.13.1 Notify SOC (System Operation Center) unit to be paralleled. (382-4413 or dispatcher phone)
- \_\_\_\_\_ 3.13.2 Ensure lit "Valve Position Limit Display".
- \_\_\_\_\_ 3.13.3 Lower limit to 17% using "Valve Position Limit Lower".

<b>NOTE:</b> <u>IF</u> Voltage Regulator in "MAN", manual sync of generator is required.
--

- \_\_\_\_\_ 3.13.4 IF auto sync of generator is required, perform the following:

<b>NOTE:</b> <u>WHEN</u> "Gen Auto/Man Sync Select" in "Auto 1A" or "Auto 1B", the selected generator breaker will close if generator frequency and voltage match system without "Auto Sync" being depressed.
---

- \_\_\_\_\_ 3.13.4.1 Place "Gen Auto/Man Sync Select" to "Auto 1A" or "Auto 1B".
- \_\_\_\_\_ 3.13.4.2 IF selected generator breaker failed to close, depress "Auto Sync" on DEH panel.
- \_\_\_\_\_ 3.13.4.3 IF selected generator breaker fails to close in 5 minutes, repeat Steps 3.13.4.1 – 3.13.4.2 for opposite breaker.
- \_\_\_\_\_ 3.13.4.4 IF any generator breaker failed to close in 5 minutes, notify System Engineer.

_____	_____ / _____
Person Contacted	Date Time

- \_\_\_\_\_ 3.13.4.5 Place "Gen Auto/Man Sync Select" in "Man".

**Unit 1**

**Enclosure 4.1**  
**Automatic Mode Startup**

OP/1/A/6300/001  
Page 13 of 15

- \_\_\_\_ 3.13.5 **IF** manual sync of generator is required, perform the following:
- \_\_\_\_ 3.13.5.1 Obtain permission from System Engineer to perform manual sync of generator breakers.
- \_\_\_\_\_/\_\_\_\_\_  
Person Contacted                      Date    Time
- \_\_\_\_ 3.13.5.2 Depress and hold "SYNC" for breaker to be closed.

<b>NOTE:</b> Synchroscope should be moving less than 1 revolution in 20 seconds.
--

- \_\_\_\_ 3.13.5.3 Adjust Generator speed until Synchroscope hand moves slowly in "FAST" direction.
- \_\_\_\_ 3.13.5.4 Ensure "Station Run Voltage" is slightly higher than "Gen Incoming Voltage" using "Voltage Adjust".
- \_\_\_\_ 3.13.5.5 **WHEN** synchroscope indicates within 5 minutes before 12 o'clock position, depress "CLOSE" for selected breaker until "CLSD" is lit.
- \_\_\_\_ 3.13.5.6 Release "SYNC".
- \_\_\_\_ 3.13.6 **WHEN** Generator paralleled to grid, load Generator as follows:
- ☐ 3.13.6.1 Maintain Pwr Fact to 0.90 - 0.95 Lag using "Voltage Adjust".
- \_\_\_\_ 3.13.6.2 Depress "MW IN".
- \_\_\_\_ 3.13.6.3 Ensure lit "Valve Position Limit Display".
- \_\_\_\_ 3.13.6.4 Raise limit to 120% using "Valve Position Limit Raise".
- \_\_\_\_ 3.13.6.5 Check "Demand" and "Reference" windows match actual load.
- ☐ 3.13.6.6 Load Turbine to 25 MWE per OP/1/A/6300/001A (Turbine-Generator Load Change).

**Unit 1**



**Enclosure 4.1**  
**Automatic Mode Startup**

OP/1/A/6300/001  
Page 14 of 15

- 3.13.7 Place other Generator Breaker in service as follows:
- \_\_\_\_\_ 3.13.7.1 Depress and hold "SYNC" for selected breaker.
  - \_\_\_\_\_ 3.13.7.2 **WHEN** Synchroscope for selected breaker in 12 o'clock position, depress "CLOSE" for selected breaker until "CLSD" light is lit.
  - \_\_\_\_\_ 3.13.7.3 Release "SYNC".
- ☐ 3.14 Load Turbine to 120 MWE per OP/1/A/6300/001A (Turbine-Generator Load Change).
- 3.15 Perform the following while continuing with unit startup:
- ☐ 3.15.1 Maintain air temperature out of Exciter Air Cooler at 90 - 115°F by throttling 1KR-178 (Exciter Air Cooler Throttle). {PIP 00-0867}
  - \_\_\_\_\_ 3.15.2 Place "Turb Drn Vlvs Cntrl" in "AUTO".
  - 3.15.3 Place in "AUTO":
    - \_\_\_\_\_ • 1SM-78 (A SM line Drain)
    - \_\_\_\_\_ • 1SM-84 (B SM Line Drain)
    - \_\_\_\_\_ • 1SM-90 (C SM Line Drain)
    - \_\_\_\_\_ • 1SM-96 (D SM Line Drain)
  - ☐ 3.15.4 Check open all piston operated check valves per Enclosure 4.4 (Valve Checklist).
  - \_\_\_\_\_ 3.15.5 **IF** MSR Control System is in "SYSTEM MANUAL", open all piston operated check valves using red "OPEN" pushbutton.
  - \_\_\_\_\_ 3.15.6 Reset Generator Core Monitor alarm.

**Unit 1**

3.15.7 Adjust Generator Core Monitor flow to obtain a 90% output current reading on Core Monitor chart and local meter as follows:

\_\_\_\_\_ 3.15.7.1 Adjust flow on Generator Core Monitor to establish local meter indication of 90% using valve at bottom of flow meter (5000 cc/min).

**NOTE:** Generator speed, internal temperature, and pressure affect flow rate.

☐ 3.15.7.2 Check flow rate and meter indication after one hour and adjust flow to 90% on local meter.

\_\_\_\_\_ 3.15.7.3 **IF** meter indication drifts to less than 90%, adjust flow rate per Step 3.15.7.1 to return meter indication to 90%.

3.15.8 Check following level controllers in "A" with setpoint of "0":

- ☐ 1HW-16 (1A1 CM/CF HP Htr Norm Drn Cntrl)
- ☐ 1HW-17 (1A2 CM/CF HP Htr Norm Drn Cntrl)
- ☐ 1HW-18 (1A3 CM/CF HP Htr Norm Drn Cntrl)
- ☐ 1HW-31 (1B1 CM/CF HP Htr Norm Drn Cntrl)
- ☐ 1HW-32 (1B2 CM/CF HP Htr Norm Drn Cntrl)
- ☐ 1HW-33 (1B3 CM/CF HP Htr Norm Drn Cntrl)
- ☐ 1HW-100 (1D1 CM/CF LP Htr Norm Drn Cntrl)
- ☐ 1HW-101 (1D2 CM/CF LP Htr Norm Drn Cntrl)
- ☐ 1HW-102 (1D3 CM/CF LP Htr Norm Drn Cntrl)
- ☐ 1HW-115 (1E1 CM/CF LP Htr Norm Drn Cntrl)
- ☐ 1HW-116 (1E2 CM/CF LP Htr Norm Drn Cntrl)
- ☐ 1HW-117 (1E3 CM/CF LP Htr Norm Drn Cntrl)
- ☐ 1HW-130 (1F1 CM/CF LP Htr Norm Drn Cntrl)
- ☐ 1HW-131 (1F2 CM/CF LP Htr Norm Drn Cntrl)
- ☐ 1HW-132 (1F3 CM/CF LP Htr Norm Drn Cntrl)

\_\_\_\_\_ 3.15.9 **IF** Dual Tower H2 Dryer in service, place in "OFF".

- \_\_\_\_\_ • Tower 1 Adsorb Blwr
- \_\_\_\_\_ • Tower 2 Adsorb Blwr

**End of Enclosure**

**Unit 1**

Prepared By: Bob Bilk

Reviewed By: Charles Sawyer

Approved By: \_\_\_\_\_

TASK: **Align the ND, NI, and NV Systems to Cold Leg Recirculation**

POSITION: **RO**

---

Operator's Name \_\_\_\_\_

Location: **Simulator**

Method: **Perform**

Estimated JPM Completion Time: 15 Minutes

Actual JPM Completion Time: \_\_\_\_\_ Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date    /    /   

---

References: EP/1/A/5000/ES-1.3  
EP/1/A/5000/E-1

Transfer to Cold Leg Recirc  
Loss of Reactor or Secondary Coolant

JPM verified current with references by \_\_\_\_\_

Date    /    /   

Rev. 13/04-14-03

**FOR TRAINING PURPOSES ONLY**

### INITIAL CONDITIONS

- You are the Unit 1 Balance of Plant (BOP) Operator.
- Unit 1 has experienced a large break LOCA inside containment.
- EP/1/A/5000/E-0 has been completed.
- EP/1/A/5000/FR-P.1 (Response to Imminent Pressurized Thermal Shock) and EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure) *have* been implemented to address existing CSF orange paths.
- EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant) is currently in effect and has been completed through Step # 14.

The SRO directs you to continue in EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant), beginning with Step #15.

JPM OVERALL STANDARD: Upon receiving the "FWST Level Lo" annunciators, the operator transitions to EP/1/A/5000/ES-1.3 (Transfer to Cold Leg Recirc) per foldout page of E-1 or Step 15.b RNO. "A" train of ND and both trains of NI and NV are then aligned to Cold Leg Recirc.

NOTES:	This JPM is designed to be performed as a <b>SIMULATION</b> or as a <b>WALKTHROUGH</b> . <u>Cues found in shaded boxes should be given to the trainee for either setting.</u>
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KA 006 A4.07 4.4/4.4

**FOR TRAINING PURPOSES ONLY**

START TIME \_\_\_\_\_

[illegible]

**\* DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	<p><b>Initiate evaluation of plant status:</b></p> <p>Check Cold Leg Recirc capability:</p> <p>Any ND pump - AVAILABLE</p> <p>Power to following valves - AVAILABLE</p> <p>1ND-19A (A ND Pump Suct From FWST or NC)</p> <p>1NI-185A (RB SUMP To Train A ND &amp; NS)</p> <p>1ND-58A (Train A ND to NV &amp; NI Pumps)</p> <p>1ND-4B (B ND Pump Suct From FWST or NC)</p>	<p>Same</p> <p><b>Cue:</b> <b>Both ND pumps have indication of power and flow</b></p> <p><b>Cue:</b> <b>Power is available.</b></p> <p><b>Cue:</b> <b>Power is available.</b></p> <p><b>Cue:</b> <b>Power is available.</b></p> <p><b>Cue:</b> <b>Power is available.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	<b>CONTINUED</b>  1NI-184B (RB SUMP To Train B ND & NS)  1NI-136B (B NI Pump Suction From ND)  1NI-332A (NV & NI Pumps Suction X- over)  1NI-333B (NV & NI Pumps Suction X- over)  1NI-334B (NV & NI Pumps Suction X- over Blk)  1NI-147A (NI Pumps Miniflow Hdr Isol)  1NI-115B (A NI Pump Miniflow)  1NI-144B (B NI Pump Miniflow)	Same  <b>Cue:</b> <b>Power is available.</b>   <b>Cue:</b> <b>Power is available.</b>   <b>Cue:</b> <b>Power is available.</b>   <b>Cue:</b> <b>Power is available.</b>   <b>Cue:</b> <b>Power is available.</b>   <b>Cue:</b> <b>Power is available.</b>   <b>Cue:</b> <b>Power is available.</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	<b>CONTINUED</b> "S LATCHED" on following switches - LIT 1NI-184B control permissive for recirc mode  1NI-185A control permissive for recirc mode Check aux bldg radiation:  All area monitor EMF's - NORMAL  EMF-41 (Aux Bldg Ventilation) - NORMAL	Same  <b>Cue:</b> <b>Switch is LIT</b>  <b>Cue:</b> <b>Switch is LIT</b>  Operator checks EMF's for Trip1/Trip2 lights or checks associated EMF Annunciators - dark.  <b>Cue:</b> <b>All area monitor EMF's            indicate - NORMAL</b>  <b>Cue:</b> <b>EMF-41 (Aux Bldg            Ventilation) indicates -            NORMAL</b>		
	<u>WHEN</u> the TSC is staffed, <u>THEN</u> ...  Consult station management to start additional plant equipment to assist in recovery as necessary.	<b>Cue:</b> <b>TSC is not staffed yet.</b>  <b>Cue:</b> <b>The OSM is consulting            station management.</b>		

\* DENOTES CRITICAL



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<p>Check if NC System cooldown and depressurization is required:</p> <p>NC pressure - GREATER THAN 286 PSIG</p> <p><u>IF</u> ND flow to cold legs greater than 500 GPM, <b><u>THEN GO TO</u></b> Step 15.</p>	<p>Operator determines NC pressure is not greater than 286 PSIG and proceeds to the RNO.</p> <p><b>Cue:</b> <b>NC pressure indicates 15 PSIG</b></p> <p><b>Cue:</b> <b>ND flow to cold legs is greater than 500 GPM.</b></p>		
*4	Respond to "FWST LEVEL LO" annunciators.	<p>Operator transitions to EP/1/A/5000/1.3 (Transfer To Cold Leg Recirc.) per the foldout page of E-1 or Step 15. b RNO.</p> <p><b>Cue:</b> <b>"FWST LEVEL LO" annunciators have just illuminated</b></p>		
5	Have STA monitor foldout page	<p>Same</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>Cue:</b> <b>The STA will monitor the foldout page</b></p> </div>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	Perform this EP without delay. CSF procedures should not be implemented until directed by this procedure.	Same		
7	Check containment sump level - GREATER THAN 3 FT.	Operator checks sump level indications (behind ND section of main control boards) to verify level is greater than 3 ft.  <b>Cue:</b> <b>Containment sump level indications read 8 feet.</b>		
8	Check KC flow to ND heat exchangers - GREATER THAN 5000 GPM.	Operator checks KC to ND heat exchanger flow indications (behind ND section of main control boards) to verify flow is greater than 5000 GPM to each heat exchanger.  <b>Cue:</b> <b>KC to ND heat exchanger flow indications both read greater than 5000 GPM.</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
9	Reset the following:  S/I   Sequencers	Operator ensures S/I and Sequencers reset for both trains. <b>Cue:</b> <b>RESET light illuminated</b>  <b>Cue:</b> <b>RESET light illuminated</b>  <b>Cue:</b> <b>RESET light illuminated</b>  <b>Cue:</b> <b>RESET light illuminated</b>		
10	Align ND System for recirc:  Check 1NI-185A (RB Sump To Train A ND & NS) - OPEN  Check 1A ND Pump - ON	Same <b>Cue:</b> <b>Red light is lit</b>  Same <b>Cue:</b> <b>Red light is lit</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	<p><b>CONTINUED</b></p> <p>Check 1NI-184B (RB Sump To Train B ND &amp; NS) - OPEN</p> <p>Perform the following:</p> <p>Place control permissive in "Bypass" and open 1NI-184B</p> <p><u>IF</u> 1NI-184B is opening, <b><u>THEN</u></b> <b><u>GO TO</u></b> Step 6.d</p> <p><u>IF</u> 1NI-184B is closed, <b><u>THEN</u></b></p>	<p>Operator determines that 1NI-184 is closed and proceeds to the RNO</p> <p><b>Cue:</b></p> <p><u>Green</u> light is lit</p> <p>Same</p> <p><b>Cue:</b></p> <p><b>"Bypass" selected on 1NI-184B. Pushbutton depressed. Green light is lit. Red light is dark.</b></p> <p>Operator determines that valve is not opening and proceeds to RNO 6.C.3</p> <p><b>Cue:</b></p> <p><b>Green light is lit. Red light is dark.</b></p> <p><b>Cue:</b></p> <p><b>Green light is lit. Red light is dark.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10 *	<b>CONTINUED</b> Stop 1B ND Pump	Same  <b>Cue:</b>  <b>Pushbutton depressed, green light is lit</b>		
	<b>GO TO</b> Step 6.e.	Same		
*	Enable power disconnect and close 1FW-27A (FWST Supply To ND)	Same  <b>Cue:</b>  <b>Switch rotated Clockwise</b>  <b>Pushbutton depressed, green light is lit</b>		
	Check any ND pump - ON.	Same  <b>Cue:</b>  <b>1A ND pump is ON</b>		
11	Align NV and NI Systems for recirc:  Check NC pressure - LESS THAN 1600 PSIG	Same  <b>Cue:</b>  <b>Gage indicates 15 PSIG</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	<b>CONTINUED</b>	<b>NOTE:</b> It is critical to close <u>either</u> 1NI-147A <u>or</u> both 1NI-115B <u>and</u> 1NI-144B in the following steps.		
*	Close the following:  1NI-115B (A NI Pump Miniflow)	<b>Cue:</b>  <b>Pushbutton depressed, green light is lit</b>		
*	1NI-144B (B NI Pump Miniflow)	<b>Cue:</b>  <b>Pushbutton depressed, green light is lit</b>		
*	Enable power disconnect and close 1NI-147A (NI Pumps Miniflow Hdr Isol)	Same  <b>Cue:</b>  <b>Switch rotated clockwise</b>  <b>Pushbutton depressed, green light is lit</b>		
*	Close the following valves:  1ND-30A (Train A ND To Hot Leg Isol)	Same  <b>Cue:</b>  <b>Pushbutton depressed, green light is lit</b>		
	1ND-15B (Train B ND To Hot Leg Isol)	<b>Cue:</b>  <b>Pushbutton depressed, green light is lit</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	<b>CONTINUED</b> Align ND train discharges to NI and NV pump suctions:  Check 1NI-334B (NV & NI Pumps Suct X-Over Blk) - OPEN  Open the following:	Same  <b>Cue:</b> <b>Red light is illuminated</b>  Opening <b>either</b> 1NI-332A <b>or</b> 1NI-333B satisfies the critical part of this step.  <b>Cue:</b> <b>Pushbutton depressed, red light is lit</b>  <b>Cue:</b> <b>Pushbutton depressed, red light is lit</b>  Same  <b>Cue:</b> <b>Pushbutton depressed, red light is lit</b>  <u>Note:</u> 1NI-136B will not open due to being interlocked with 1NI-184B.  <b>Cue:</b> <b>Pushbutton depressed, green light is lit</b>		
*	1NI-332A (NV & NI Pumps Suction X-Over)			
*	1NI-333B (NV & NI Pumps Suction X-Over)			
*	1ND-58A (Train A ND To NV & NI Pumps)			
	1NI-136B (B NI Pump Suction From ND)			

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	<b>CONTINUED</b>			
	Isolate FWST from NV and NI pumps:	Same		
*	Enable power disconnect and close 1NI-100B (FWST To NI Pumps)	<b>Cue:</b>  <b>Switch rotated clockwise</b>  <b>Pushbutton depressed, green light is lit</b>		
	Close the following:	Same		
*	1NV-221A (NV Pumps Suct From FWST)	<b>Cue:</b>  <b>Pushbutton depressed, green light is lit</b>		
*	1NV-222B (NV Pumps Suct From FWST)	<b>Cue:</b>  <b>Pushbutton depressed, green light is lit</b>		
12	Check if NS should be aligned for recirc as follows...	<b>Terminate JPM with Cue:</b> <b>Another operator has been directed to continue in this procedure.</b>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL



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## INITIAL CONDITIONS

- You are the Unit 1 Balance of Plant (BOP) Operator.
- Unit 1 has experienced a large break LOCA inside containment.
- EP/1/A/5000/E-0 has been completed.
- EP/1/A/5000/FR-P.1 (Response to Imminent Pressurized Thermal Shock) and EP/1/A/5000/FR-Z.1 (Response to High Containment Pressure) has been implemented to address existing CSF orange paths.
- EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant) is currently in effect and has been completed through Step # 14.

**The SRO directs you to continue in EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant), beginning with Step #15.**

## **SIMULATOR OPERATIONAL GUIDELINES (NI:116A)**

1. Reset Simulator to IC-124
2. Insert LOA –NI024 Racked in
3. Insert LOA-NI025 Racked in
4. Insert LOA-DG003 Stop D/G
5. Insert LOA-DG004 Stop D/G
6. Freeze the Simulator
7. Go to RUN when operator is ready to begin.

Duke Power Company  
PROCEDURE PROCESS RECORD(1) ID No. EP/1/A/5000/ES-1.3Revision No. 016

## PREPARATION

## INFORMATION ONLY

(2) Station McGuire Nuclear Station(3) Procedure Title Transfer To Cold Leg Recirc(4) Prepared By Weiner, Michael R *Michael Weiner*Date October 3, 2002

(5) Requires NSD 228 Applicability Determination? If Applicability Determination is required, attach NSD 228 documentation

- ☒ Yes (New procedure or revision with major changes)  
☐ No (Revision with minor changes)  
☐ No (To incorporate previously approved changes)

(6) Reviewed By S. Hickey (QR) Date 10/31/02Cross-Disciplinary Review By \_\_\_\_\_ (QR) NA JSK Date 10/31/02Reactivity Mgmt. Review By \_\_\_\_\_ (QR) NA JSK Date 10/31/02Mgmt. Involvement Review By \_\_\_\_\_ (OPS Supt.) NA JSK Date 10/31/02

(7) Additional Reviews

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

(8) Temporary Approval (if necessary)

By \_\_\_\_\_ (OSM/QR) Date \_\_\_\_\_

By \_\_\_\_\_ (QR) Date \_\_\_\_\_

(9) Approved By *[Signature]* Date 12/12/02

## PERFORMANCE (Compare with Control Copy every 14 calendar days while work is being performed.)

(10) Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

(11) Date(s) Performed \_\_\_\_\_

Work Order Number (WO#) \_\_\_\_\_

## COMPLETION

(12) Procedure Completion Verification

- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?  
☐ Yes ☐ NA Required enclosures attached?  
☐ Yes ☐ NA Data sheets attached, completed, dated and signed?  
☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?  
☐ Yes ☐ NA Procedure requirements met?

Verified By \_\_\_\_\_ Date \_\_\_\_\_

(13) Procedure Completion Approved \_\_\_\_\_ Date \_\_\_\_\_

(14) Remarks (Attach additional pages, if necessary.)

**A. Purpose**

This procedure provides the necessary instructions for transferring the Safety Injection System and Containment Spray System to the recirculation mode.

**B. Symptoms or Entry Conditions**

This procedure is entered from:

- EP/1/A/5000/E-1 (Loss Of Reactor Or Secondary Coolant), Step 15, on low FWST level.
- EP/1/A/5000/ECA-2.1 (Uncontrolled Depressurization Of All Steam Generators), Step 12, on low FWST level.
- Other procedures whenever FWST level reaches the switchover setpoint.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**C. Operator Actions**

- ☐ 1. Have STA monitor foldout page.
- ☐ 2. Perform this EP without delay. CSF procedures should not be implemented until directed by this procedure.
- ☐ 3. Check containment sump level -  
GREATER THAN 3 FT.
- ☐ 4. Check KC flow to each ND heat  
exchanger - GREATER THAN 5000 GPM.

**Perform the following:**

- ☐ a. IF NS has actuated during this event,  
THEN GO TO Step 4.
- ☐ b. IF a tornado OR LOCA outside  
containment is known to have occurred,  
THEN GO TO Enclosure 2 (Loss of  
NC or FWST Inventory Outside  
Containment).

**Perform the following:**

- a. Close:
  - ☐ • 1KC-50A (Trn A Aux Bldg Non Ess  
Sup Isol)
  - ☐ • 1KC-53B (Trn B Aux Bldg Non Ess  
Sup Isol).
- b. Open:
  - ☐ • 1KC-56A (KC To A ND Hx)
  - ☐ • 1KC-81B (KC To B ND Hx).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

5. **Reset the following:**

\_\_\_ a. S/I.

a. Perform the following:

\_\_\_ 1) Dispatch operator to open reactor trip breakers.

\_\_\_ 2) Reset S/I.

\_\_\_ b. Sequencers.

b. Dispatch operator to open breaker for affected sequencer DC control power:

\_\_\_ • A Train - 1EVDA Breaker 6

\_\_\_ • B Train - 1EVDD Breaker 8.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6. **Align ND System for recirc:**

- \_\_\_ a. Check 1NI-185A (RB Sump To Train A ND & NS) - OPEN.

- a. Perform the following:

- \_\_\_ 1) Place control permissive in "Bypass" and open 1NI-185A.

- \_\_\_ 2) **IF** 1NI-185A is opening, **THEN GO TO** Step 6.b.

- 3) **IF** 1NI-185A is closed, **THEN:**

- \_\_\_ a) Stop 1A ND Pump.

- \_\_\_ b) **GO TO** Step 6.c.

- \_\_\_ b. Check 1A ND Pump - ON.

- \_\_\_ b. Start 1A ND Pump.

- \_\_\_ c. Check 1NI-184B (RB Sump To Train B ND & NS) - OPEN.

- c. Perform the following:

- \_\_\_ 1) Place control permissive in "Bypass" and open 1NI-184B.

- \_\_\_ 2) **IF** 1NI-184B is opening, **THEN GO TO** Step 6.d.

- 3) **IF** 1NI-184B is closed, **THEN:**

- \_\_\_ a) Stop 1B ND Pump.

- \_\_\_ b) **GO TO** Step 6.e.

- \_\_\_ d. Check 1B ND Pump - ON.

- \_\_\_ d. Start 1B ND Pump.

- \_\_\_ e. Enable power disconnect and close 1FW-27A (FWST Supply To ND).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

6. (Continued)

\_\_\_ f. Check any ND pump - ON.

f. IF both ND pumps are off, THEN perform the following:

1) IF both NS pumps are on, AND containment pressure is less than 15 PSIG, THEN stop one NS pump as follows:

\_\_\_ a) On train to be stopped, reset Containment Spray.

\_\_\_ b) Stop one NS pump.

NOTE

If  
EP/1/A/5000/FR-Z.1  
(Response To High  
Containment  
Pressure) is required,  
it may be completed  
as time allows.

\_\_\_ 2) EP/1/A/5000/F-0 (Critical Safety Function Status Trees) may now be implemented.

\_\_\_ 3) GO TO EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirc).

7. Align NV and NI Systems for recirc:

\_\_\_ a. Check NC pressure - LESS THAN 1600 PSIG.

\_\_\_ a. Stop NI pumps.

b. Close the following:

\_\_\_ • 1NI-115B (A NI Pump Miniflow)

\_\_\_ • 1NI-144B (B NI Pump Miniflow).

\_\_\_ c. Enable power disconnect and close 1NI-147A (NI Pumps Miniflow Hdr Isol).



ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

7. (Continued)

d. Close the following valves:

- \_\_\_ • 1ND-30A (Train A ND To Hot Leg Isol)
- \_\_\_ • 1ND-15B (Train B ND To Hot Leg Isol).

e. Align ND train discharges to NI and NV pump suctions:

- \_\_\_ 1) Check 1NI-334B (NV & NI Pumps Suct X-Over Blk) - OPEN.
- \_\_\_ 1) Open valve.

2) Open the following:

- \_\_\_ • 1NI-332A (NV & NI Pumps Suction X-Over)
- \_\_\_ • 1NI-333B (NV & NI Pumps Suction X-over).

3) Open the following:

- \_\_\_ • 1ND-58A (Train A ND To NV & NI Pumps)
- \_\_\_ • 1NI-136B (B NI Pump Suction From ND).

f. Isolate FWST from NV and NI pumps:

- \_\_\_ 1) Enable power disconnect and close 1NI-100B (FWST To NI Pumps).

2) Close the following:

- \_\_\_ • 1NV-221A (NV Pumps Suct From FWST)
- \_\_\_ • 1NV-222B (NV Pumps Suct From FWST).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. Check if NS should be aligned for recirc as follows:

- \_\_\_ a. Check "FWST LEVEL LO-LO" alarm - LIT.

- a. Perform the following:

**CAUTION**

- Steps to reset Containment Spray and stop NS pumps must be completed within 45 seconds of receiving "FWST Level LO-LO" alarm.
- This step applies even after leaving this EP.

- 1) **WHEN** "FWST LEVEL LO-LO" alarm setpoint (33 inches) is reached, **THEN** immediately perform the following:

- \_\_\_ a) Reset Containment Spray.  
\_\_\_ b) Stop 1A NS Pump.  
\_\_\_ c) Stop 1B NS Pump.  
\_\_\_ d) Perform Steps 8.e through 8.h.

- \_\_\_ 2) Ensure this step is flagged and crew prepared to perform it immediately upon receiving alarm.

- \_\_\_ 3) **GO TO** Step 9.

- \_\_\_ b. Reset Containment Spray.  
\_\_\_ c. Stop 1A NS Pump.  
\_\_\_ d. Stop 1B NS Pump.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. (Continued)

\_\_\_ e. Check 1A NS Pump - AVAILABLE TO RUN.

\_\_\_ e. GO TO Step 8.g.

f. Align A Train NS to containment sump as follows:

\_\_\_ 1) Check 1NI-185A (RB Sump To Train A ND & NS) - OPEN.

\_\_\_ 1) GO TO Step 8.g.

\_\_\_ 2) Close 1NS-20A (A NS Pump Suct From FWST).

\_\_\_ 2) GO TO Step 8.g.

\_\_\_ 3) Wait for 1NS-20A to close.

\_\_\_ 3) IF 1NS-20A remains open or intermediate for over 30 seconds, THEN GO TO Step 8.g.

\_\_\_ 4) Open 1NS-18A (A NS Pump Suct From Cont Sump).

\_\_\_ 4) GO TO Step 8.g.

\_\_\_ 5) Check "NS SYS CPCS TRAIN A INHIBIT" status light (1SI-12) - DARK.

\_\_\_ 5) GO TO Step 8.g.

\_\_\_ 6) Start 1A NS Pump.

\_\_\_ 6) GO TO Step 8.g.

\_\_\_ 7) Open 1RN-134A (A NS Hx Inlet Isol).

\_\_\_ 7) GO TO Step 8.g.

\_\_\_ 8) Throttle open 1RN-137A (A NS Hx Outlet Isol) to establish 3800 GPM to 1A NS Hx.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. (Continued)

g. Align B Train NS to containment sump as follows:

- \_\_\_ 1) Check 1NI-184B (RB Sump To Train B ND & NS) - OPEN.
- \_\_\_ 2) Close 1NS-3B (B NS Pump Suct From FWST).
- \_\_\_ 3) Wait for 1NS-3B to close.
- \_\_\_ 4) Open 1NS-1B (B NS Pump Suct From Cont Sump).
- \_\_\_ 5) Check "NS SYS CPCS TRAIN B INHIBIT" status light (1SI-12) - DARK.
- \_\_\_ 6) Start 1B NS Pump.
- \_\_\_ 7) Open 1RN-235B (B NS HX Inlet Isol).
- \_\_\_ 8) Throttle open 1RN-238B (B NS Hx Outlet Isol) to establish 3100 GPM to 1B NS Hx.

\_\_\_ h. Check both NS pumps - ON.

- \_\_\_ 1) **GO TO** Step 8.h.
- \_\_\_ 2) **GO TO** Step 8.h.
- \_\_\_ 3) **IF** 1NS-3B remains open or intermediate for over 30 seconds, **THEN GO TO** Step 8.h.
- \_\_\_ 4) **GO TO** Step 8.h.
- \_\_\_ 5) **GO TO** Step 8.h
- \_\_\_ 6) **GO TO** Step 8.h.
- \_\_\_ 7) **GO TO** Step 8.h.

h. Perform the following:

- \_\_\_ 1) **IF** any NS pump is isolated from containment sump, **THEN** dispatch operator to pull control power fuses on affected NS pump to prevent it from starting with inadequate suction.
- \_\_\_ 2) **IF AT ANY TIME** the idle NS pump(s) can be started, **THEN** ensure proper alignment **PER** Step 8.f or 8.g as required.

**UNIT 1**

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9. Check if ND aux spray is required:

- \_\_\_ a. Containment pressure - GREATER THAN 3 PSIG.

b. Check the following:

- \_\_\_ • Time after reactor trip - GREATER THAN 50 MINUTES
- \_\_\_ • At least one of the following - ENERGIZED:
  - \_\_\_ • 1NI-173A (Train A ND To A & B CL)
  - \_\_\_ OR
  - \_\_\_ • 1NI-178B (Train B ND To C & D CL).

a. Perform the following:

- \_\_\_ 1) IF AT ANY TIME containment pressure goes above 3 PSIG, AND both trains of ND aux spray are closed, THEN perform Step 9.
- \_\_\_ 2) GO TO Step 10.

b. Perform the following:

- 1) Ensure operator has been dispatched to remove tags and close breakers for the following valves:
  - \_\_\_ • 1EMXA-R2A (1A ND To A&B Cold Legs Cont Outside Isol Motor (1NI-173A)) (aux bldg, 750, FF-54, FF-55)
  - \_\_\_ • 1EMXB1-6B (1B ND To C&D NC Cold Leg Cont Outside Isol Motor (1NI-178B)) (aux bldg, 733, GG-55, GG-56).
- \_\_\_ 2) Designate someone to notify crew when 50 minutes from reactor trip have elapsed.

**CAUTION** This step applies even after leaving this EP.

- \_\_\_ 3) WHEN at least one valve energized, AND time after reactor trip is greater than 50 minutes, THEN perform Step 9.
- \_\_\_ 4) GO TO Step 10.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9. (Continued)

c. Check if core cooling can be maintained with minimum S/I flow:

- ☐ • At least one NV pump - ON
- ☐ • At least one NI pump - ON
- ☐ • At least one of the following valves - OPEN:
  - ☐ • 1NI-9A (NC Cold Leg Inj From NV)
- OR
- ☐ • 1NI-10B (NC Cold Leg Inj From NV).

d. Establish ND aux spray from one train that is in Cold Leg Recirc mode:

- For A train:
  - ☐ 1) Close 1NI-173A (Train A ND To A & B CL).
  - ☐ 2) Open 1NS-43A (A ND To NS Cont Outside Isol).
- OR
- For B train:
  - ☐ 1) Close 1NI-178B (Train B ND To C & D CL).
  - ☐ 2) Open 1NS-38B (B ND To NS Cont Outside Isol).

c. Check ND train status:

- ☐ 1) IF both ND trains are aligned AND operating in Cold Leg Recirc, THEN GO TO Step 9.d.
- ☐ 2) GO TO Step 10.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

9. (Continued)

**CAUTION** If an ND pump aligned to aux spray ever stops with its spray valve open, the associated spray line will void. If this were to occur, Enclosure 3 (ND Pump Restart Requirement If Aux Spray Is Open) will prevent a water hammer and potential pipe failure in the Annulus.

- \_\_\_ e. **WHEN** time allows, **THEN** place INFO tag on ND pump control switch **PER** Enclosure 3 (ND Pump Restart Requirement If Aux Spray Is Open).

**CAUTION** Failure to stop ND aux spray when required may result in a negative containment pressure.

- \_\_\_ f. **WHEN** containment pressure less than 1 PSIG, **THEN** stop ND aux spray **PER** Enclosure 4 (Securing ND Aux Containment Spray).

- \_\_\_ 10. **IF AT ANY TIME** a B/O signal occurs, **THEN** restart S/I equipment previously on.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**CAUTION**

- S/I recirculation flow to NC System must be maintained at all times.
- Aux Bldg radiation may be higher due to Cold Leg Recirc alignment.

11. Check proper Cold Leg Recirc flow and valve alignment as follows:

a. Check the following - CLOSED:

\_\_\_ • 1ND-19A (A ND Pump Suct From FWST or NC)

\_\_\_ • 1ND-4B (B ND Pump Suct From FWST or NC).

b. Check either NV pumps miniflow valve - CLOSED:

\_\_\_ • 1NV-150B (NV Pumps Recirculation)

OR

\_\_\_ • 1NV-151A (NV Pumps Recirculation).

\_\_\_ a. Close valves.

b. Perform the following:

\_\_\_ 1) **IF** 1NI-9A (NC Cold Leg Inj From NV) **AND** 1NI-10B (NC Cold Leg Inj From NV) closed, **THEN** raise charging flow to 175 GPM (to reduce D/P across the NV pump miniflow valves).

2) Close the following valves:

\_\_\_ • 1NV-150B (NV Pumps Recirculation)

\_\_\_ • 1NV-151A (NV Pumps Recirculation).

3) **IF** 1NI-9A **AND** 1NI-10B closed, **THEN**:

\_\_\_ • Control charging flow between 60 GPM and 175 GPM.

\_\_\_ • Maintain charging flow above 60 GPM in all subsequent EPs to ensure NV pump miniflow.

\_\_\_ 4) **IF** NV recirc path still open, **THEN** contact station management to evaluate sump water being pumped to aux bldg tanks.



## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 11. (Continued)

## c. Check the following valves - CLOSED:

- \_\_\_ • 1NI-100B (FWST To NI Pumps)
- \_\_\_ • 1NV-221A (NV Pumps Suct From FWST)
- \_\_\_ • 1NV-222B (NV Pumps Suct From FWST).

## d. Check S/I flow:

- \_\_\_ • Check "NV PMPS TO COLD LEG FLOW" - FLOW INDICATED
- \_\_\_ • Check NI pumps - FLOW INDICATED
- \_\_\_ • Check ND pumps - FLOW INDICATED.

c. IF accessible, THEN dispatch operator to close valve(s):

- \_\_\_ • 1NI-100B (Unit 1 midget hole, 716+2, HH-53, 10 ft north of the end of grating)
- \_\_\_ • 1NV-221A (aux bldg, 716+3, JJ-52, wall 20 ft north of BW pumps)
- \_\_\_ • 1NV-222B (aux bldg, 716+7, JJ-52, wall 20 ft north of BW pumps).

## d. Perform the following:

- 1) IF at least one flow path from the sump to the NC System can not be established, THEN perform the following:

NOTE

If EP/1/A/5000/FR-Z.1 (Response To High Containment Pressure) is required, it may be completed as time allows.

- \_\_\_ a) EP/1/A/5000/F-0 (Critical Safety Function Status Trees) may now be implemented.
- \_\_\_ b) GO TO EP/1/A/5000/ECA-1.1 (Loss Of Emergency Coolant Recirc).

- \_\_\_ 2) Evaluate local actions to establish maximum Cold Leg Recirc capability.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

11. (Continued)

e. Check the following - CLOSED:

- \_\_\_ • 1KC-50A (Trn A Aux Bldg Non Ess Sup Isol)
- \_\_\_ • 1KC-1A (Trn A Aux Bldg Non Ess Ret Isol)
- \_\_\_ • 1KC-53B (Trn B Aux Bldg Non Ess Sup Isol)
- \_\_\_ • 1KC-2B (Trn B Aux Bldg Non Ess Ret Isol).

- \_\_\_ f. Check KC flow to ND Hxs - ESTABLISHED.

\_\_\_ 12. EP/1/A/5000/F-0 (Critical Safety Function Status Trees) may now be implemented.

\_\_\_ 13. RETURN TO procedure and step in effect.

e. Perform the following:

- \_\_\_ 1) Ensure normal letdown is isolated.

2) Close valves:

- \_\_\_ a) 1KC-50A.
- \_\_\_ b) 1KC-1A.
- \_\_\_ c) 1KC-53B.
- \_\_\_ d) 1KC-2B.

3) **IF** normal letdown was in service at time transfer to Cold Leg Recirc was initiated, **THEN** notify station management to evaluate the following prior to aligning KC back to aux bldg non-essential header:

- \_\_\_ • Potential for KC voiding in letdown heat exchanger
- \_\_\_ • Locally isolating KC to letdown heat exchanger.

- \_\_\_ f. Evaluate local actions to establish KC flow to ND train(s) in service.

END

Prepared By: Bob Biff

Reviewed By: Charles Sarge

Approved By: \_\_\_\_\_

TASK: **Respond to a Pressurizer Pressure Instrument Failure**

POSITION: **RO/SRO**

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Operator's Name \_\_\_\_\_

Location: **Simulator**

Method: **Perform**

Estimated JPM Completion Time : 5 Minutes

Actual JPM Completion Time:        Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date    /    /   

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References: AP/1/A/5500/11

Pressurizer Pressure Anomalies

JPM verified current with references by \_\_\_\_\_

Date    /    /   

Rev. 01/04-14-03

**FOR TRAINING PURPOSES ONLY**

## INITIAL CONDITIONS

- You are the Unit 1 Operator at the Controls (OATC).
- The Unit 1 Balance of Plant Operator (BOP) is in the Work Control Center attending a 91-01 briefing.
- Unit 1 is operating at 100% power.
- All systems and controls are in their normal configuration for this power level.

**The Control Room SRO directs you to respond to any changing plant conditions.**

**JPM OVERALL STANDARD:** Operator recognizes NC System pressure is decreasing and performs the Immediate Actions of AP/11. "BACKUP" control channel 3/2 is selected and affected PZR PORV block valve is isolated prior to getting a LOW PZR PRESSURE RX trip.

**NOTES:** The Instrument failure will be actuated per examiner's signal to simulator runner.

KA 027 AA1.01 4.0/3.9

**FOR TRAINING PURPOSES ONLY**

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Multiple annunciators actuate indicating a PORV has opened and Pzr. Pressure is rapidly decreasing.  <b>Check actual Pzr pressure – HAS GONE DOWN.</b>	Operator responds by performing the Immediate Actions of AP/11 (Pressurizer Pressure Anomalies)  <b>Cue:</b>  <b>Actual Pzr Pressure is 2100 PSIG and going down</b>		
2	<b>Check all Pzr. Pressure channels - INDICATING THE SAME.</b>	Operator determines Pzr pressure Channel 1 has failed <u>HIGH</u> and proceeds to the RNO.  <b>Cue:</b>  <b>Pzr pressure Channel 1 (one) indicates 2500 PSIG.</b>		
*3	<b><u>IF</u> either controlling channel is malfunctioning, <u>THEN</u> place "PZR PRESS CTRL SELECT" switch to backup channel.</b>	Operator places "PZR PRESS CTRL SELECT" switch to Channel 3/2 position.  <b>Cue:</b>  <b>Switch rotated clockwise two (2) positions.</b>		

\* DENOTES CRITICAL

[illegible]

**\* DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	<b>Check Pzr spray valves - CLOSED</b>	<p>Operator verifies both spray valves closed.</p> <p><b>Note:</b> Due to system dynamics and the amount of time it takes to reach this step, the spray valves may still be open. If they are, the operator should proceed to the RNO and manually close both spray valves.</p> <p><b>Cue:</b></p> <p><b>Green lights are LIT.</b></p> <p><b>Note:</b> When satisfied that all Immediate Actions have been performed, the evaluator will terminate this JPM by giving the following cue:</p> <p><b>Cue:</b></p> <p><b>Another Operator will continue in this AP.</b></p>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

- You are the Unit 1 Operator at the Controls (OATC).
- The Unit 1 Balance of Plant Operator (BOP) is in the Work Control Center attending a 91-01 briefing.
- Unit 1 is operating at 100% power.
- All systems and controls are in their normal configuration for this power level.

**The Control Room SRO directs you to respond to any changing plant conditions.**



## **SIMULATOR OPERATIONAL GUIDELINES (NC-167-IA)**

1. Reset the Simulator to IC-125
2. Ensure Pzr Pressure select switch is in the Channel "1-2" position.
3. Freeze the Simulator
4. Insert the following malfunctions:
  - XMT-NC038 PNC\_5160 Pzr PRESS CH-1  
Severity = 2500, Ramp = 5, Trigger = 1
  - MAL-NC012B PZR PORV or SAFETY VALVE 1NC-34A,  
Severity = 30, Ramp = 5, Trigger = 1
5. Go to run
6. When directed by Examiner, activate the malfunctions.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

B. Symptoms

- Pzr pressure channel failed
- Pzr pressure going down in an uncontrolled manner
- Pzr pressure going up in an uncontrolled manner
- Any Pzr PORV or spray valve failed open
- "PZR PORV DISCH HI TEMP" alarm
- "PRT HI TEMP" alarm.

C. Operator Actions

1. Check actual Pzr pressure - HAS GONE DOWN. GO TO Step 15.
2. Check all Pzr pressure channels - INDICATING THE SAME. IF either controlling channel is malfunctioning, THEN place "PZR PRESS CNTRL SELECT" switch to backup channel.
3. Check Pzr PORVs - CLOSED. Perform the following:
  - a. Close PORVs.
  - b. IF PORV will not close, THEN close PORV isolation valve.
4. Check Pzr spray valves - CLOSED. Perform the following:
  - a. Close Pzr spray valve(s).
  - b. IF AT ANY TIME a reactor trip occurs AND spray valve still open, THEN stop 1A and 1B NC pumps.

Prepared By: Rob Bellis

Reviewed By: Chuck Sawyer

Approved By: \_\_\_\_\_

TASK: **Respond to a Failure of Power Range Channel N-42**

POSITION: **RO**

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Operator's Name \_\_\_\_\_

Location: **Simulator**

Method: **Perform**

Estimated JPM Completion Time: 15 Minutes

Actual JPM Completion Time: \_\_\_\_\_ Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date    /    /   

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References: AP/1/A/5500/16      Malfunction of Nuclear Instrumentation  
                 AP/1/A/5500/14      Rod Control Malfunction

JPM verified current with references by \_\_\_\_\_

Date    /    /   

Rev. 02/04-10-03

**FOR TRAINING PURPOSES ONLY**

### INITIAL CONDITIONS

- You are the Unit 1 Balance of Plant Operator (BOP).
- Unit 1 was operating at 55% power with control rods at 120 steps Bank "D", when PR N42 failed high causing rods to step in approximately 6 steps.
- AP/1/A/5500/16 (Malfunction of Nuclear Instrumentation) Case III (Power Range Malfunction) has been entered and completed through step 5.

The SRO directs you to perform steps 6 through 18 of AP/1/A/5500/16 (Malfunction of Nuclear Instrumentation, Case III (Power Range Malfunction)).

JPM OVERALL STANDARD: Power Range Channel NI-42 is removed from service with control power fuses removed. Tavg is restored to within 1 degree of Tref by adjusting control rods. Continuous rod motion is recognized and the Immediate Actions of AP-14 (Rod Control Malfunctions) are properly performed from memory. The Reactor is manually tripped.

NOTES:	This JPM is designed to be performed as a <b>SIMULATION</b> or as a <b>WALKTHROUGH</b> . <u>Cues found in shaded boxes should be given to the trainee for either setting.</u>
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START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Secure any power increase in progress	Same  <b>Cue:</b>  <b>No power increase is in progress</b>		
2	<p>Perform the following actions at the "MISCELLANEOUS CONTROL AND INDICATION PANEL" drawer:</p> <p>Place the appropriate "ROD STOP BYPASS" switch to the failed channel position</p> <p>Place the "POWER MISMATCH BYPASS" switch to the failed channel position</p>	<p>Same</p> <p><b>Cue:</b>  <b>Switch is rotated counterclockwise one position</b></p> <p><b>Cue:</b>  <b>Switch is rotated counterclockwise one position</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<p>Perform the following actions at the "DETECTOR CURRENT COMPARATOR" drawer:</p> <p>Place "UPPER SECTION" defeat switch to the failed channel position.</p> <p>Check the "CHANNEL DEFEAT" light for the upper section - LIT.</p> <p>Place the "LOWER SECTION" defeat switch to the failed channel position.</p> <p>Check the "CHANNEL DEFEAT" light for the lower section - LIT.</p>	<p>Same</p> <p><b>Cue:</b></p> <p><b>Switch is rotated counterclockwise one position</b></p> <p><b>Cue:</b></p> <p><b>Light is lit.</b></p> <p><b>Cue:</b></p> <p><b>Switch is rotated counterclockwise one position</b></p> <p><b>Cue:</b></p> <p><b>Light is lit.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<p>Perform the following actions at the "COMPARATOR AND RATE" drawer:</p> <p>Place the "COMPARATOR CHANNEL DEFEAT" switch to the failed channel position.</p> <p>Check the "COMPARATOR DEFEAT" light - LIT.</p>	<p>Same</p> <p><b>Cue:</b></p> <p><b>Switch is rotated counterclockwise one position</b></p> <p><b>Cue:</b></p> <p><b>Light is lit.</b></p>		
5	<p><b>NOTE:</b> Removing fuses from power range drawers may cause associated NIS annunciators to alarm.</p> <p>Trip Bistables of failed channel as follows:</p> <p>* Remove Control power fuses from "POWER RANGE A" drawer</p> <p><b>IF</b> Power Range Cabinet shows evidence of damage (i.e. visual smoke or abnormal smell), <b>THEN</b> remove Instrument power fuses from "POWER RANGE B" drawer</p>	<p>Operator removes the Control Power fuses for N42, but <u>does not</u> remove the Instrument Power fuses for N-42.</p> <p>Same</p> <p><b>Cue:</b></p> <p><b>Fuses are rotated 1/8 turn counterclockwise and removed</b></p> <p><b>Cue:</b></p> <p><b>No smoke or abnormal smell is apparent at the Power-Range Cabinet.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	<p>Check the following status lights for the failed channel - LIT</p> <p>"NUC OVERPOWER ROD STOP CH I(II,III,IV) BYP" (1SI-19)</p> <p>"P/R HI FLUX LO STPT" (1SI-2)</p> <p>"P/R HI FLUX HI STPT" (1SI-2)</p> <p>"P/R HI FLUX RATE" (1SI-3)</p>	<p>Same</p> <p><b>Cue:</b> <b>Light is illuminated</b></p> <p><b>Cue:</b> <b>Light is illuminated</b></p> <p><b>Cue:</b> <b>Light is illuminated</b></p> <p><b>Cue:</b> <b>Light is illuminated</b></p>		
7	<p>Check the following annunciator lights - LIT:</p> <p>"P/R HI VOLTAGE FAILURE" (1AD-2, F-3)</p> <p>"P/R HI FLUX HI STPT ALERT" (1AD-2, A-3 )</p> <p>"P/R HI FLUX RATE ALERT" (1AD-2, A-1).</p>	<p><b>Cue:</b> <b>Light is illuminated</b></p> <p><b>Cue:</b> <b>Light is illuminated</b></p> <p><b>Cue:</b> <b>Light is illuminated</b></p>		

\* DENOTES CRITICAL



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
8	<p>Check the following status lights on 1SI-18 - LIT</p> <p>P/R LO SETPOINT TRAIN A TRIP BLOCKED</p> <p>P/R LO SETPOINT TRAIN B TRIP BLOCKED</p>	<p>Same</p> <p><b>Cue:</b> <b>Light is illuminated</b></p> <p><b>Cue:</b> <b>Light is illuminated</b></p>		
9	<p><b>IF</b> desired to control S/G levels in auto, <b>THEN</b> return affected S/G CF control valves to auto.</p>	<p>Same</p> <p><b>Cue:</b> <b>S/G CF control valves are in "AUTO"</b></p>		
10	<p>Ensure operable P/R channel selected to record on Nuclear Power recorder</p>	<p>Same</p> <p><b>Cue:</b> <b>Switch positioned to P-1(3,4)</b></p>		
*11	<p>Adjust control rods to maintain T-Ave at T-Ref.</p>	<p><b>Note to evaluator:</b> Respond as C/R SRO if permission to move rods is requested. This step is critical only if &gt;1 degree deviation between Tavg and Tref.</p> <p><b>Cue:</b> <b>Rods are being moved in "MANUAL" and T-Ave is approaching T-Ref.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*12	<b>WHEN</b> T-Avg within 1°F of T-Ref <b>AND</b> auto rod control is desired, <b>THEN</b> return rods to auto	<p>The Operator positions rods until T-Avg is within 1°F of T-Ref, then returns rods to "AUTO" <b><u>after the first cue is given.</u></b></p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p><b>Cue:</b> Automatic rod control is desired.</p> </div> <p>When rod control switch is placed in AUTO, the rods will begin stepping out at 72 steps/minute. The Operator should recognize this as an entry condition of AP/14 (Rod Control Malfunction) and perform the Immediate Actions from memory.</p> <p><b>Cue:</b> Rods placed to AUTO, rods are stepping out at 72 steps per minute,</p> <p><b>Turbine/generator output is stable</b></p> <p><b>Turbine impulse pressure, Tref, Power Range NI's, T-hot and T-cold indications are stable.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	<p><b>AP/1/A/5500/14 Rod Control Malfunction (Immediate Actions)</b></p> <p><b><u>IF</u> more than one rod dropped, <u>THEN</u>:</b></p> <ul style="list-style-type: none"> <li>• Trip reactor</li> <li>• <b><u>GO TO</u></b> EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)</li> </ul> <p><b>Place control rods in manual.</b></p> <p><b>Check rod movement – STOPPED</b></p>	<p>Operator determines no rods are dropped and proceeds to Step 2. Operator places rods to MANUAL. Rods continue to step out. The Reactor should be manually tripped.</p> <p><b>Cue:</b></p> <p><b>No indications of a dropped rod are present on DRPI screen</b></p> <p><b>Cue:</b></p> <p><b>Switch rotated clockwise one position.</b></p> <p>Operator recognizes rods are not stopped and proceeds to RNO.</p> <p><b>Cue:</b></p> <p><b>Rods are stepping out.</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	<p><b>Continued</b></p> <p><b><u>IF</u> rod movement continues, <u>THEN</u> perform the following:</b></p> <p><b>*</b></p> <ul style="list-style-type: none"> <li>• Trip reactor</li> <li>• <b><u>GO TO</u></b> EP/1/A/5000/E-0 (Reactor Trip or Safety Injection)</li> </ul>	<p>Operator manually trips Reactor and begins to perform Immediate Actions of E-0.</p> <p><b>Cue:</b></p> <p>Reactor trip switches rotated counter clockwise. All rod bottom lights are lit. Green lights lit on both Reactor trip breakers. I/R amps going down.</p> <p>Terminate JPM with the following cue:</p> <p><b>Cue:</b></p> <p>The CR SRO has directed another operator to continue in E-0.</p>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

- You are the Unit 1 Balance of Plant Operator (BOP).
- Unit 1 was operating at 55% power with control rods at 120 steps Bank "D", when PR N42 failed high causing rods to step in approximately 6 steps.
- AP/1/A/5500/16 (Malfunction of Nuclear Instrumentation) Case III (Power Range Malfunction) has been entered and completed through step 5.

**The SRO directs you to perform steps 6 through 18 of AP/1/A/5500/16 (Malfunction of Nuclear Instrumentation, Case III (Power Range Malfunction)).**

## **SIMULATOR OPERATOR GUIDELINES (ENB-181A)**

- 1 Reset to IC-34, place Simulator to RUN and allow the plant to stabilize.
- 2 Insert Malfunction ENB013C set = 200%.
- 3 Allow rods to step in approximately ten steps, then place Rods in MANUAL
- 4 Place "PR To S/G Program Level Channel Defeat" switch to "Defeat PR 42 & 44"
- 5 Acknowledge alarms, then FREEZE simulator
- 6 Insert Override OVR-IRE002A (CRD Bank Sel Sw Auto Pos) = OFF, set to trigger 1.
- 7 Insert Override OVR-IRE002B (CRD Bank Sel Sw Man Pos) = ON, set to trigger 1.
- 8 Insert Override OVR-IRE003B (Full Length Rod Motion Sw Out Pos) = ON, set to trigger 1.
- 9 Insert Malfunction MAL-IRE016A (Control Rod Speed Selection) = 72 Severity Value and set to trigger 1.

## **TEMP SNAP RESET TO IC-126**

- 10 Place simulator in RUN when examinee is ready to begin JPM.
- 11 \* **When examinee places Rod Control back to AUTO per step 17 of the procedure, Activate trigger 1.**

Duke Power Company  
PROCEDURE PROCESS RECORD(1) ID No. AP/1/A/5500/16  
Revision No. 7

## INFORMATION ONLY

## PREPARATION

(2) Station McGuire Nuclear Station  
(3) Procedure Title Malfunction Of Nuclear Instrumentation(4) Prepared By S. Hackney Date July 15, 1999

(5) Requires 10CFR50.59 evaluation?

- ☒ Yes (New procedure or revision with major changes)  
☐ No (Revision with minor changes)  
☐ No (To incorporate previously approved changes)

(6) Reviewed By Mike Wallin (QR) Date 8/11/99Cross-Disciplinary Review By NA MW (QR) Date 8/18/99Reactivity Mgmt. Review By NA MW (QR) Date 8/11/99

(7) Additional Reviews

Reviewed By Shirley A. Kelly Date 8/15/99

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

(8) Temporary Approval (if necessary)

By \_\_\_\_\_ (SRO/QR) Date \_\_\_\_\_

By \_\_\_\_\_ (QR) Date \_\_\_\_\_

(9) Approved By Peter J. Schunger Date 8-18-99

## PERFORMANCE (Compare with Control Copy every 14 calendar days while work is being performed.)

(10) Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

(11) Date(s) Performed \_\_\_\_\_

Work Order Number (WO#) \_\_\_\_\_

## COMPLETION

(12) Procedure Completion Verification

- ☐ Yes ☐ N/A Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?  
☐ Yes ☐ N/A Listed enclosures attached?  
☐ Yes ☐ N/A Data sheets attached, completed, dated and signed?  
☐ Yes ☐ N/A Charts, graphs, etc. attached, dated, identified, and marked?  
☐ Yes ☐ N/A Procedure requirements met?

Verified By \_\_\_\_\_ Date \_\_\_\_\_

(13) Procedure Completion Approved \_\_\_\_\_ Date \_\_\_\_\_

(14) Remarks (attach additional pages, if necessary.)

MNS  
AP/1/A/5500/16  
**UNIT 1**

**MALFUNCTION OF NUCLEAR INSTRUMENTATION**

Case III  
Power Range Malfunction

PAGE NO.  
12 of 18  
Rev. 7

ACTION/EXPECTED RESPONSE.

RESPONSE NOT OBTAINED

**B. Symptoms**

- Erratic or loss of P/R indication
- "P/R HI VOLTAGE FAILURE" alarm
- "P/R HI FLUX RATE ALERT" alarm
- "P/R HI FLUX LO STPT ALERT" alarm
- "P/R HI FLUX HI STPT ALERT" alarm
- "P/R CHANNEL DEVIATION" alarm
- "P/R UPPER DET HI FLUX DEV OR AUTO DEFEAT" alarm
- "P/R OVER POWER ROD STOP" alarm
- "P/R LOWER DET HI FLUX DEV OR AUTO DEFEAT" alarm
- Loss of "INSTRUMENT POWER ON" or "CONTROL POWER ON" lights.

**C. Operator Actions**

- ① Place rods in manual.
- 2. Check S/G levels - AT PROGRAMMED LEVEL.
- 3. Announce occurrence on paging system.

— Place affected S/G CF control valves in manual and return level to programmed level.



ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- \_\_\_ 4. Check P/R channels - **ONLY ONE CHANNEL FAILED.**

**Perform the following:**

- \_\_\_ a. Initiate unit shutdown to Mode 3 within one hour, as required by Tech Spec 3.0.3.
- \_\_\_ b. **REFER TO** RP/0/A/5700/010 (NRC Immediate Notification Requirements).
- \_\_\_ c. Ensure the following interlocks in proper condition for existing plant conditions:
- \_\_\_ • P-10 Nuclear at Power
  - \_\_\_ • P-7 Lo Power Rx Trips Blocked
  - \_\_\_ • P-8 Hi Pwr Lo Flo Rx Trip Blocked.
- \_\_\_ d. **RETURN TO** procedure in effect.
- \_\_\_ 5. Position "PR TO S/G PROGRAM LEVEL CHANNEL DEFEAT" switch to defeat inoperable channel.
- \_\_\_ 6. Secure any power increase in progress.
- \_\_\_ 7. Perform the following actions at the "MISCELLANEOUS CONTROL AND INDICATION PANEL" drawer:
- \_\_\_ a. Place the appropriate "ROD STOP BYPASS" switch to the failed channel position.
  - \_\_\_ b. Place the "POWER MISMATCH BYPASS" switch to the failed channel position.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. Perform the following actions at the "DETECTOR CURRENT COMPARATOR" drawer: ☐ Notify IAE.

- ☐ a. Place "UPPER SECTION" defeat switch to the failed channel position.
- ☐ b. Check the "CHANNEL DEFEAT" light for the upper section - LIT.
- ☐ c. Place the "LOWER SECTION" defeat switch to the failed channel position.
- ☐ d. Check the "CHANNEL DEFEAT" light for the lower section - LIT.

9. Perform the following actions at the "COMPARATOR AND RATE" drawer: ☐ Notify IAE.

- ☐ a. Place the "COMPARATOR CHANNEL DEFEAT" switch to the failed channel position.
- ☐ b. Check the "COMPARATOR DEFEAT" light - LIT.

**NOTE** Removing fuses from power range drawers may cause associated NIS annunciators to alarm.

10. Trip bistables of failed channel as follows:

- ☐ a. Remove Control Power fuses from "POWER RANGE A" drawer.
- ☐ b. **IF** Power Range Cabinet shows evidence of damage (i.e. visual smoke or abnormal smell), **THEN** remove Instrument Power fuses from "POWER RANGE B" drawer.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

11. Check the following status lights for the failed channel - LIT:

\_\_\_ Notify IAE.

- \_\_\_ • "NUC OVERPOWER ROD STOP CH I(II,III,IV) BYP" (1SI-19)
- \_\_\_ • "P/R HI FLUX LO STPT" (1SI-2)
- \_\_\_ • "P/R HI FLUX HI STPT" (1SI-2)
- \_\_\_ • "P/R HI FLUX RATE" (1SI-3).

12. Check the following annunciator lights - LIT:

\_\_\_ Notify IAE.

- \_\_\_ • "P/R HI VOLTAGE FAILURE" (1AD-2, F-3)
- \_\_\_ • "P/R HI FLUX HI STPT ALERT" (1AD-2, A-3)
- \_\_\_ • "P/R HI FLUX RATE ALERT" (1AD-2, A-1).

13. Check the following status lights on 1SI-18 - LIT:

Perform the following:

- \_\_\_ • "P/R LO SETPOINT TRAIN A TRIP BLOCKED"
- \_\_\_ • "P/R LO SETPOINT TRAIN B TRIP BLOCKED".

- \_\_\_ a. Check "P/R HI FLUX LO STPT ALERT" alarm (1AD-2, A-2) - LIT.
- \_\_\_ b. **IF** alarm is dark, **THEN** notify IAE to investigate.

- \_\_\_ 14. **IF** desired to control S/G levels in auto, **THEN** return affected S/G CF control valves to auto.

- \_\_\_ 15. Ensure operable P/R channel selected to record on NIS Recorder.

- \_\_\_ 16. Adjust control rods to maintain T-Ave at T-Ref.

\_\_\_ **IF** rods will not move in manual, **THEN** adjust turbine load to maintain T-Ave at T-Ref.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

- \_\_\_ 17. WHEN T-ave within 1° F of T-Ref, AND auto rod control desired, THEN return rods to auto.
18. Instruct IAE to trip bistables associated with failed P/R channel within 6 hours of failure PER IP/0/A/3090/014 (Tripping Inoperable Protection Channels):
- \_\_\_ • OPDT
  - \_\_\_ • OTDT.
19. IF AT ANY TIME failed P/R channel is repaired prior to IAE tripping bistables, THEN:
- \_\_\_ a. Inform IAE that bistables are no longer required to be tripped.
  - \_\_\_ b. GO TO Step 21.
20. WHEN IAE completes Step 18, THEN check status lights for affected P/R - LIT: \_\_\_ Notify IAE.
- For P/R N-41:
    - \_\_\_ • "NC LOOP A OPDT RX TRIP" (1SI-7)
    - \_\_\_ • "NC LOOP A OTDT RX TRIP" (1SI-7).
  - For P/R N-42:
    - \_\_\_ • "NC LOOP B OPDT RX TRIP" (1SI-7)
    - \_\_\_ • "NC LOOP B OTDT RX TRIP" (1SI-7).
  - For P/R N-43:
    - \_\_\_ • "NC LOOP C OPDT RX TRIP" (1SI-7)
    - \_\_\_ • "NC LOOP C OTDT RX TRIP" (1SI-7).
  - For P/R N-44:
    - \_\_\_ • "NC LOOP D OPDT RX TRIP" (1SI-7)
    - \_\_\_ • "NC LOOP D OTDT RX TRIP" (1SI-7).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

21. **WHEN malfunctioning P/R channel repaired, THEN perform the following:**

- ☐ a. Ensure instrument power fuses in "POWER RANGE B" drawer installed.
- ☐ b. Install control power fuses in "POWER RANGE A" drawer.
- ☐ c. Select "RESET" on the "RATE MODE SWITCH".
- ☐ d. Check reactor power - GREATER THAN 25%.

d. Perform the following:

- 1) Check the following bistable - DARK:

☐ • "P/R HI FLUX LO STPT" (1SI-2).

☐ 2) **IF** bistable lit, **THEN** notify IAE.

☐ 3) **GO TO** Step 21.f.

e. Check the following bistable - LIT:

☐ • "P/R HI FLUX LO STPT" (1SI-2).

☐ e. Notify IAE.

f. Check the following bistables - DARK:

☐ • "P/R HI FLUX HI STPT" (1SI-2)

☐ • "P/R HI FLUX RATE" (1SI-3).

☐ f. Notify IAE.

☐ g. Place "COMPARATOR CHANNEL DEFEAT" switch to "NORMAL".

☐ h. Place "POWER MISMATCH BYPASS" switch to "OPERATE".

☐ i. Place "UPPER SECTION" switch to "NORMAL".

☐ j. Place "LOWER SECTION" switch to "NORMAL".

☐ k. Place "ROD STOP BYPASS" switch to "OPERATE".

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

21. (Continued)

— l. Place "P/R TO S/G PROGRAM LEVEL CHANNEL DEFEAT" switch to "NORM".

m. IF IAE tripped bistables PER Step 18, THEN perform the following:

1) Instruct IAE to place the following bistables for failed channel back in service:

— • OPDT

— • OTDT.

2) WHEN IAE has placed bistables back in service, THEN check status lights for failed P/R - DARK:

— 2) Notify IAE.

• For P/R N-41:

— • "NC LOOP A OPDT RX TRIP" (1SI-7)

— • "NC LOOP A OTDT RX TRIP" (1SI-7).

• For P/R N-42:

— • "NC LOOP B OPDT RX TRIP" (1SI-7)

— • "NC LOOP B OTDT RX TRIP" (1SI-7).

• For P/R N-43:

— • "NC LOOP C OPDT RX TRIP" (1SI-7)

— • "NC LOOP C OTDT RX TRIP" (1SI-7).

• For P/R N-44:

— • "NC LOOP D OPDT RX TRIP" (1SI-7)

— • "NC LOOP D OTDT RX TRIP" (1SI-7).

END

Prepared By: Bob Bily

Reviewed By: Charles Taylor

Approved By: \_\_\_\_\_

TASK: **RN Emergency Alignment after a Loss of All AC on Unit 2**

POSITION: **RO**

---

Operator's Name \_\_\_\_\_

Location: **Control Room**

Method: **Walkthrough**

Estimated JPM Completion Time: 30 Minutes

Actual JPM Completion Time: \_\_\_\_\_ Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date      /      /     

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References: EP/2/A/5000/ECA-0.0      Loss of All AC Power

JPM verified current with references by \_\_\_\_\_

Date      /      /     

Rev. 02/04-16-03

**FOR TRAINING PURPOSES ONLY**

### INITIAL CONDITIONS

- You are the Unit 2 Balance of Plant Operator (BOP).
- Unit 2 is operating at 100% power with 'A' train in service, when a loss of all AC power occurs.
- The Control Room SRO has implemented EP/2/A/5000/ECA-0.0 (Loss of All AC Power).
- Unit 2 ETA is de-energized.
- The "2B" D/G has just been started and the essential bus (2ETB) energized and loaded per EP/2/A/5000/ECA-0.0, Enclosure 8 (Energizing 4160 V Bus with D/G).
- Unit 1 is at 100% power with 1ETA and 1ETB energized from their normal power source.

**The Control Room SRO directs you to perform EP/2/A/5000/ECA-0.0 Enclosure 21(RN Emergency Alignment).**

**JPM OVERALL STANDARD:** B Train RN is aligned to the SNSWP per Enclosure 21.

**NOTES:** The evaluator shall provide a copy of EP/2/A/5000/ECA-0.0, Enclosure 21 (RN Emergency Alignment) upon request.

KA 008 A4.01 3.3/3.1

**\* DENOTES CRITICAL**



START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<b>Check 2ETA - ENERGIZED</b>  <b>GO TO</b> step 5	Operator determines from Initial Conditions that 2ETA is not energized. Cue as appropriate.  <b>Cue:</b> <b>Undervoltage Status lights are lit</b>  Same		
2	<b>Check 2ETB - ENERGIZED</b>	Operator determines from Initial Conditions that 2ETB is energized.  Cue as appropriate.  <b>Cue:</b> <b>Volt meter indicates 4160 volts, Undervoltage Status lights are dark</b>		
3	<b>Open the following B Train valves:</b>  * 2RN-204B (B NV Pump Cooler Sup Isol)  * 0RN-9B (Train 1B & 2B SNSWP Supply)	<b>Cue:</b> <b>Pushbutton depressed, red light lit</b>  <b>Cue:</b> <b>Pushbutton depressed, red light lit</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<b>CONTINUED</b>  2RN-18B (B RN Pump Suction Isol)  2RN-297B (Train B Ess Hdr Ret Isol)  * 0RN-152B (Train 1B & 2B Disch to SNSWP)  2RN-171B (B D/G Hx Inlet Isol)	<b>Cue:</b> <b>Red light lit</b>    <b>Cue:</b> <b>Red light lit</b>    <b>Cue:</b> <b>Pushbutton depressed, red light is lit</b>   <b>Cue:</b> <b>Red light is lit</b>		
4	<b>Place 2RN-187B (B KC Hx Inlet Isol) Mode Select in auto</b>	<b>Cue:</b>  <b>Switch is in "Auto" position</b>		
5	<b>Close the following B Train valves:</b>  0RN-2B (Train 1A & 2A RC Supply)	<b>Cue:</b>  <b>Green light is lit</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	<b>CONTINUED</b> 2RN-63B (AB Non Ess Return Isol)	<b>Cue:</b> <b>Pushbutton depressed, green light is lit</b>		
	2RN-41B (Train B To Non Ess Hdr Isol)	<b>Cue:</b> <b>Green light is lit</b>		
*	2RN-279B (AB Vent Sys Return Isol)	<b>Cue:</b> <b>Pushbutton depressed, green light is lit</b>		
*	0RN-11B (Train 1B & 2B LLI Supply)	<b>Cue:</b> <b>Pushbutton depressed, green light is lit</b>		
	0RN-15B (Train 1B & 2B Supply X-Connect)	<b>Cue:</b> <b>Green light is lit</b>		
	0RN-151B (Train 1B & 2B Disch X-Connect)	<b>Cue:</b> <b>Green light is lit</b>		
	0RN-5B (Train 1B & 2B RC Supply)	<b>Cue:</b> <b>Green light is lit</b>		
*	0RN-284B (Train 1B & 2B Disch To RC)	<b>Cue:</b> <b>Pushbutton depressed, green light is lit</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	<b><u>RETURN TO</u></b> step in effect in body of procedure	Operator terminates JPM.		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

- You are the Unit 2 Balance of Plant Operator (BOP).
- Unit 2 is operating at 100% power with 'A' train in service, when a loss of all AC power occurs.
- The Control Room SRO has implemented EP/2/A/5000/ECA-0.0 (Loss of All AC Power).
- Unit 2 ETA is de-energized.
- The "2B" D/G has just been started and the essential bus (2ETB) energized and loaded per EP/2/A/5000/ECA-0.0, Enclosure 8 (Energizing 4160 V Bus with D/G).
- Unit 1 is at 100% power with 1ETA and 1ETB energized from their normal power source.

**The Control Room SRO directs you to perform EP/2/A/5000/ECA-0.0 Enclosure 20 (RN Emergency Alignment).**

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\_\_\_ 1. **Check 2ETA - ENERGIZED.**

\_\_\_ **GO TO Step 5.**

2. **Open the following A train valves:**

- \_\_\_ • 2RN-103A (A NV Pump Cooler Sup Isol) - OPEN
- \_\_\_ • 0RN-148AC (Train 1A & 2A Disch To RC) - OPEN
- \_\_\_ • 2RN-296A (Train A ESS Hdr Ret Isol) - OPEN
- \_\_\_ • 0RN-147AC (Train 1A & 2A Disch To RC) - OPEN
- \_\_\_ • 0RN-13A (Train 1A & 2A LLI Supply) - OPEN
- \_\_\_ • 2RN-16A (A RN Pump Suction Isol) - OPEN
- \_\_\_ • 2RN-70A (A D/G Hx Inlet Isol) - OPEN
- \_\_\_ • 0RN-12AC (Train 1A & 2A LLI Supply) - OPEN.

\_\_\_ 3. **Place 2RN-86A (A KC Hx Inlet Isol) Mode Select in auto.**

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**4. Close the following A train valves:**

- • 0RN-3A (Train 1A & 2A RC Supply) -  
CLOSED
- • 0RN-7A (Train 1A & 2A SNSWP Supply)  
- CLOSED
- • 0RN-149A (Train 1A & 2A Disch to  
SNSWP) - CLOSED
- • 0RN-150A (Train 1A & 2A Disch  
X-Connect) - CLOSED
- • 0RN-14A (Train 1A & 2A Supply  
X-Connect) - CLOSED
- • 2RN-64A (AB Non Ess Return Isol) -  
CLOSED
- • 2RN-43A (Train B To Non Ess Hdr Isol) -  
CLOSED
- • 2RN-299A (AB Vent Sys Return Isol) -  
CLOSED.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

\_\_\_ 5. **Check 2ETB - ENERGIZED.**

\_\_\_ **RETURN TO Step in effect in body of this procedure.**

6. **Open the following B train valves:**

- \_\_\_ • 2RN-204B (B NV Pump Cooler Sup Isol)  
- OPEN
- \_\_\_ • 0RN-9B (Train 1B & 2B SNSWP Supply)  
- OPEN
- \_\_\_ • 2RN-18B (B RN Pump Suction Isol) -  
OPEN
- \_\_\_ • 2RN-297B (Train B Ess Hdr Ret Isol) -  
OPEN
- \_\_\_ • 0RN-152B (Train 1B & 2B Disch to  
SNSWP) - OPEN
- \_\_\_ • 2RN-171B (B D/G Hx Inlet Isol) - OPEN.

\_\_\_ 7. **Place 2RN-187B (B KC Hx Inlet Isol)  
Mode Select in auto.**



ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**8. Close the following B train valves:**

- \_\_\_ • 0RN-2B (Train 1A & 2A RC Supply) -  
CLOSED
- \_\_\_ • 2RN-63B (AB Non Ess Return Isol) -  
CLOSED
- \_\_\_ • 2RN-41B (Train B To Non Ess Hdr Isol) -  
CLOSED
- \_\_\_ • 2RN-279B (AB Vent Sys Return Isol) -  
CLOSED
- \_\_\_ • 0RN-11B (Train 1B & 2B LLI Supply) -  
CLOSED
- \_\_\_ • 0RN-15B (Train 1B & 2B Supply  
X-Connect) - CLOSED
- \_\_\_ • 0RN-151B (Train 1B & 2B Disch  
X-Connect) - CLOSED
- \_\_\_ • 0RN-5B (Train 1B & 2B RC Supply) -  
CLOSED
- \_\_\_ • 0RN-284B (Train 1B & 2B Disch To RC) -  
CLOSED.

\_\_\_ 9. **RETURN TO step in effect in body of this  
procedure.**

Prepared By: Rob Biff  
Reviewed By: Charles Lundy  
Approved By: \_\_\_\_\_

TASK: **Startup the Unit 2 Lower Containment Ventilation System**

POSITION: **RO**

---

Operator's Name \_\_\_\_\_

Location: **Control Room**

Method: **Walkthrough**

Estimated JPM Completion Time: 10 Minutes

Actual JPM Completion Time: \_\_\_\_\_ Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date     /     /    

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References: OP/2/A/6450/001

Containment Ventilation System

JPM verified current with references by \_\_\_\_\_

Date     /     /    

Rev. 01/04-14-03

**FOR TRAINING PURPOSES ONLY**

### INITIAL CONDITIONS

- A Unit 2 NC system heat-up is in progress following a short outage.
- The Lower Containment Ventilation System had been shutdown during the outage.
- All initial conditions have been satisfied for OP/2/A/6450/001, Enclosure 4.2.
- There are no outstanding R&Rs that will impact the performance of OP/2/A/6450/001, Enclosure 4.2.

**The SRO instructs the RO (YOU) to start the Unit 2 Lower Containment Ventilation System per OP/2/A/6450/001, Enclosure 4.2. The SRO desires the following alignment:**

- Three (3) VL Fans(A, B, and C) in **HIGH** speed
- One (1) Pipe Tunnel Booster Fan (A) in **HIGH** speed
- All four (4) S/G Booster Fans (A, B, C, and D) **ON**
- One (1) Pressurizer Booster Fan (A) **ON**

**JPM OVERALL STANDARD:** A, B, and C VL AHU's and the A Pipe Tunnel Booster Fan are running in "**High**" speed, all S/G Booster Fans **ON** and Pressurizer Booster Fan A **ON**.

NOTES:

KA022000 A4.01 3.6/3.6

TASK:MO-3334

**FOR TRAINING PURPOSES ONLY**

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<b>IF</b> the unit 2 in Modes 1- 5, cooling water is available to VL units per OP/0/A/6400/009 (Containment Ventilation Cooling Water System)	Operator determines from the initial conditions of the JPM that all procedure initial conditions are satisfied.		
2	Evaluate all outstanding R&Rs that may impact performance of this procedure.	Operator determines from the initial conditions of the JPM that R&Rs have been evaluated.		
3	Perform the following sections as applicable: Section 3.3, Starting VL AHU's	Operator proceeds to Section 3.3.		
4	Starting VL AHU's  Ensure in "AUTO"  2LCVU-D-1 (2A VL AHU Suction Damper Cntrl)  2LCVU-D-2 (2B VL AHU Suction Damper Cntrl)  2LCVU-D-3 (2C VL AHU Suction Damper Cntrl)	Same  <b>Cue:</b> <b>Pushbutton depressed</b>  <b>Cue:</b> <b>Pushbutton depressed</b>  <b>Cue:</b> <b>Pushbutton depressed</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<b>CONTINUED</b>  2LCVU-D-4 (2D VL AHU Suction Damper Cntrl)  <b>NOTE:</b> "LOW" speed light should be lit 7 seconds after starting VL AHU.  Select "LOW" for desired VL AHU(s)	<b>Cue:</b>  <b>Pushbutton depressed</b>		
*	"2A VL AHU Mode Select"	<b>Cue:</b>  <b>Switch is rotated clockwise, red light lit</b>		
*	"2B VL AHU Mode Select"	<b>Cue:</b>  <b>Switch is rotated clockwise, red light lit</b>		
*	"2C VL AHU Mode Select"	<b>Cue:</b>  <b>Switch is rotated clockwise, red light lit</b>		
	"2D VL AHU Mode Select"	N/A		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<b>CONTINUED</b> Check "OPEN" on operating VL AHU(s): <ul style="list-style-type: none"> <li>• 2LCVU-D-5 (2A VL AHU Disch Damper)</li> <li>• 2LCVU-D-6 (2B VL AHU Disch Damper)</li> <li>• 2LCVU-D-7 (2C VL AHU Disch Damper)</li> <li>• 2LCVU-D-8 (2D VL AHU Disch Damper)</li> </ul> <p><b>NOTE:</b> VL AHU should be allowed to operate in "LOW" for 1 minute minimum prior to selecting "HIGH"</p> <p><b>IF</b> desired to operate in high speed, select "HIGH" for operating VL AHU(s):</p>	Same  <b>Cue:</b> <b>Lamp is illuminated</b>  <b>Cue:</b> <b>Lamp is illuminated</b>  <b>Cue:</b> <b>Lamp is illuminated</b>  N/A  <b>Cue:</b> <b>One minute has elapsed.</b>  Same  <b>Cue:</b> <b>Switch is rotated clockwise, red light lit</b>		
*	<ul style="list-style-type: none"> <li>• 2AVL AHU Mode Select</li> </ul>	<b>Cue:</b> <b>Switch is rotated clockwise, red light lit</b>		
*	<ul style="list-style-type: none"> <li>• 2B VL AHU Mode Select</li> </ul>	<b>Cue:</b> <b>Switch is rotated clockwise, red light lit</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4  *	<b>CONTINUED</b> <ul style="list-style-type: none"> <li>2C VL AHU Mode Select</li> <li>2D VL AHU Mode Select</li> </ul>	<b>Cue:</b>  <b>Switch is rotated clockwise, red light lit</b>  N/A		
5  *	<p>Starting Pipe Tunnel Booster Fan.</p> <p>Place one of the following in "HIGH":</p> <ul style="list-style-type: none"> <li>"2A Pipe Tunnel Booster Fan</li> </ul> <p><b><u>OR</u></b></p> <ul style="list-style-type: none"> <li>"2B Pipe Tunnel Booster Fan</li> </ul> <p><b><u>IF</u></b> neither fan is available for high speed operation.....</p> <p>Check "OPEN" for operating fan:</p> <ul style="list-style-type: none"> <li>2PTBF-D-1(2A Pipe Tunnel Bstr Fan Disch)</li> <li>2PTBF-D-2 (2B Pipe Tunnel Bstr Fan Disch)</li> </ul>	<p>Operator starts the "A" Pipe Tunnel Booster Fan in "HIGH" speed, per the JPM Initial Conditions.</p> <p><b>Cue:</b>   <b>Switch is rotated clockwise, red light lit</b></p> <p>N/A</p> <p>Operator N/A's step and proceeds.</p> <p><b>Cue:</b>   <b>Lamp is illuminated</b></p> <p>N/A</p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	Starting S/G Booster Fans Select "ON" for desired fan(s):	Operator starts all 4 S/G Booster Fans per initial conditions of JPM.		
*	• "A" S/G Booster Fan	Cue: Pushbutton depressed, red light is illuminated		
*	• "B" S/G Booster Fan	Cue: Pushbutton depressed, red light is illuminated		
*	• "C" S/G Booster Fan	Cue: Pushbutton depressed, red light is illuminated		
*	• "D" S/G Booster Fan	Cue: Pushbutton depressed, red light is illuminated		
7	Starting Pressurizer Booster Fans Position "Press Booster" to desired fan:	Operator selects "A" "PRESS BOOSTER" Fan to be started.		
*	• Fan A  <u>OR</u>  • Fan B	Cue:  Switch rotated counterclockwise, red light lit		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL



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### INITIAL CONDITIONS

- A Unit 2 NC system heat-up is in progress following a short outage.
- The Lower Containment Ventilation System had been shutdown during the outage.
- All initial conditions have been satisfied for OP/2/A/6450/001, Enclosure 4.2.
- There are no outstanding R&Rs that will impact the performance of OP/2/A/6450/001, Enclosure 4.2.

**The SRO instructs the RO (YOU) to start the Unit 2 Lower Containment Ventilation System per OP/2/A/6450/001, Enclosure 4.2. The SRO desires the following alignment:**

- Three (3) VL Fans(A, B, and C) in **HIGH** speed
- One (1) Pipe Tunnel Booster Fan (A) in **HIGH** speed
- All four (4) S/G Booster Fans (A, B, C, and D) **ON**
- One (1) Pressurizer Booster Fan (A) **ON**

## 1. Limits and Precautions

- 1.1 All VL AHUs should be operated in the same speed.
- 1.2 Only one Pipe Tunnel Booster Fan should be operated at a time.
- 1.3 **IF** three VL AHUs operating in "HIGH", "A", "B", and "C" should be in operation.
- 1.4 **WHEN** two VL AHUs operating, VL AHUs on opposite sides of Containment Building should be in operation.

## 2. Initial Conditions

- 2.1 **IF** Unit 2 in Modes 1 - 5, cooling water is available to VL AHUs per OP/0/A/6400/009 (Containment Ventilation Cooling Water System).

## 3. Procedure

- ☐ 3.1 Evaluate all outstanding R&Rs that may impact performance of this procedure.
- 3.2 Perform the following sections as applicable:
  - ☐ Section 3.3, Starting VL AHUs
  - ☐ Section 3.4, Starting Pipe Tunnel Booster Fan
  - ☐ Section 3.5, Starting S/G Booster Fans
  - ☐ Section 3.6, Starting Pressurizer Booster Fan
  - ☐ Section 3.7, Optimizing VL System Configuration During Normal Operation
  - ☐ Section 3.8, Stopping VL AHUs
  - ☐ Section 3.9, Stopping Pipe Tunnel Booster Fan
  - ☐ Section 3.10, Stopping S/G Booster Fans
  - ☐ Section 3.11, Stopping Pressurizer Booster Fan

### 3.3 Starting VL AHUs

#### 3.3.1 Ensure in "AUTO":

- \_\_\_\_\_ • 2LCVU-D-1 (2A VL AHU Suction Damper Cntrl)
- \_\_\_\_\_ • 2LCVU-D-2 (2B VL AHU Suction Damper Cntrl)
- \_\_\_\_\_ • 2LCVU-D-3 (2C VL AHU Suction Damper Cntrl)
- \_\_\_\_\_ • 2LCVU-D-4 (2D VL AHU Suction Damper Cntrl)

# Unit 2

**Enclosure 4.2**  
**Lower Containment Ventilation Operation**

OP/2/A/6450/001  
Page 2 of 5

**NOTE:** "LOW" speed light should be lit 7 seconds after starting VL AHU.

3.3.2 Select "LOW" for desired VL AHU(s):

- \_\_\_\_\_ • 2A VL AHU Mode Select
- \_\_\_\_\_ • 2B VL AHU Mode Select
- \_\_\_\_\_ • 2C VL AHU Mode Select
- \_\_\_\_\_ • 2D VL AHU Mode Select

3.3.3 Check "OPEN" on operating VL AHU(s):

- ☐ 2LCVU-D-5 (2A VL AHU Disch Damper)
- ☐ 2LCVU-D-6 (2B VL AHU Disch Damper)
- ☐ 2LCVU-D-7 (2C VL AHU Disch Damper)
- ☐ 2LCVU-D-8 (2D VL AHU Disch Damper)

**NOTE:** VL AHU should be allowed to operate in "LOW" for 1 minute minimum prior to selecting "HIGH".

\_\_\_\_\_ 3.3.4 **IF** desired to operate in high speed, select "HIGH" for operating VL AHU(s):

- \_\_\_\_\_ • 2A VL AHU Mode Select
- \_\_\_\_\_ • 2B VL AHU Mode Select
- \_\_\_\_\_ • 2C VL AHU Mode Select
- \_\_\_\_\_ • 2D VL AHU Mode Select

**NOTE:** Pipe Tunnel Booster Fans may be operated at different speed from VL AHUs.

3.4 - Starting Pipe Tunnel Booster Fan

3.4.1 Place one of the following in "HIGH":

- \_\_\_\_\_ • 2A Pipe Tunnel Booster Fan
- OR**
- \_\_\_\_\_ • 2B Pipe Tunnel Booster Fan

\_\_\_\_\_ 3.4.2 **IF** neither fan is available for high speed operation, place one of the following in "LOW":

- \_\_\_\_\_ • 2A Pipe Tunnel Booster Fan
- OR**
- \_\_\_\_\_ • 2B Pipe Tunnel Booster Fan

## Unit 2

**Enclosure 4.2**  
**Lower Containment Ventilation Operation**

OP/2/A/6450/001  
Page 3 of 5

3.4.3 Check "OPEN" for operating fan:

- ☐ 2PTBF-D-1 (2A Pipe Tunnel Bstr Fan Disch)  
**OR**  
☐ 2PTBF-D-2 (2B Pipe Tunnel Bstr Fan Disch)

3.5 Starting S/G Booster Fans

3.5.1 Select "ON" for desired fan(s):

- \_\_\_\_\_ • A S/G Booster Fan  
\_\_\_\_\_ • B S/G Booster Fan  
\_\_\_\_\_ • C S/G Booster Fan  
\_\_\_\_\_ • D S/G Booster Fan

3.6 Starting Pressurizer Booster Fans

3.6.1 Position "Press Booster" to desired fan:

- \_\_\_\_\_ • Fan A  
**OR**  
\_\_\_\_\_ • Fan B

3.7 Optimizing VL System Configuration During Normal Operation

**NOTE:**

- VL System may be operated in other than "optimized configuration" when conditions warrant. Some examples of warranted conditions are as follows:
  - Minimizing Lower Containment temperature for personnel entry
  - Minimizing Lower Containment temperature during shutdown
  - Minimizing Lower Containment temperature to alleviate stress on equipment
  - VL configuration to allow for equipment maintenance
- A minimum of 2 VL AHUs should be in operation when 3 VR fans are operating to ensure proper VR system flow.

☐ 3.7.1 Record Lower Containment Weighted Average Temperature (LCWAT) via OAC point M2P0755. \_\_\_\_\_ °F

\_\_\_\_\_ 3.7.2 **IF** LCWAT indicates less than 115 °F, evaluate securing any operating RV pumps per OP/0/A/6400/009 (Containment Ventilation Cooling Water System).  
SRO

## Unit 2

## Lower Containment Ventilation Operation

- \_\_\_\_\_ 3.7.3 **IF** LCWAT indicates less than 110 °F, perform one of the following:
- \_\_\_\_\_ 3.7.3.1 **IF** four VL AHUs operating in "HIGH", stop one VL AHU per Section 3.8.
- \_\_\_\_\_ 3.7.3.2 **IF** three VL AHUs operating in "HIGH", place all VL AHUs in "LOW" per Section 3.3.
- \_\_\_\_\_ 3.7.3.3 **IF** four VL AHUs operating in "LOW", stop one VL AHU per Section 3.8.
- \_\_\_\_\_ 3.7.3.4 **IF** three VL AHUs operating in "LOW", stop one VL AHU per Section 3.8.
- \_\_\_\_\_ 3.7.4 **IF** LCWAT indicates 115 - 120°F, evaluate placing RV pumps in service per OP/0/A/6400/009 (Containment Ventilation Cooling Water System).
- \_\_\_\_\_ 3.7.5 **IF** LCWAT indicates greater than 120 °F, perform one of the following:
- \_\_\_\_\_ 3.7.5.1 **IF** four VL AHUs operating in "HIGH", place RV pumps in service per OP/0/A/6400/009 (Containment Ventilation Cooling Water System).
- \_\_\_\_\_ 3.7.5.2 **IF** three VL AHUs operating in "HIGH", place remaining VL AHU in "HIGH" per Section 3.3.
- \_\_\_\_\_ 3.7.5.3 **IF** four VL AHUs operating in "LOW", perform the following:
- \_\_\_\_\_ A. Stop one VL AHU per Section 3.8.
- \_\_\_\_\_ B. Place three VL AHUs in "HIGH" per Step 3.3.4.
- \_\_\_\_\_ 3.7.5.4 **IF** three VL AHUs operating in "LOW", start remaining VL AHU in "LOW" per Section 3.3.
- \_\_\_\_\_ 3.7.5.5 **IF** two VL AHUs operating in "LOW", start third VL AHU in "LOW" per Section 3.3.

## 3.8 Stopping VL AHUs

## 3.8.1 Select "OFF" for desired VL AHU(s):

- \_\_\_\_\_ • 2A VL AHU Mode Select
- \_\_\_\_\_ • 2B VL AHU Mode Select
- \_\_\_\_\_ • 2C VL AHU Mode Select
- \_\_\_\_\_ • 2D VL AHU Mode Select

## Unit 2

## Enclosure 4.2

OP/2/A/6450/001

### Lower Containment Ventilation Operation

Page 5 of 5

3.8.2 Check "CLOSED" for secured VL AHU(s):

- ☐ 2LCVU-D-5 (2A VL AHU Disch Damper)
- ☐ 2LCVU-D-6 (2B VL AHU Disch Damper)
- ☐ 2LCVU-D-7 (2C VL AHU Disch Damper)
- ☐ 2LCVU-D-8 (2D VL AHU Disch Damper)

3.9 Stopping Pipe Tunnel Booster Fan

3.9.1 Ensure in "OFF":

- \_\_\_\_\_ • 2A Pipe Tunnel Booster Fan
- \_\_\_\_\_ • 2B Pipe Tunnel Booster Fan

3.10 Stopping S/G Booster Fans

3.10.1 Place in "OFF":

- \_\_\_\_\_ • S/G A Booster Fan
- \_\_\_\_\_ • S/G B Booster Fan
- \_\_\_\_\_ • S/G C Booster Fan
- \_\_\_\_\_ • S/G D Booster Fan

3.11 Stopping Pressurizer Booster Fan

\_\_\_\_\_ 3.11.1 Place "Press Booster" in "OFF".

**End Of Enclosure**

**Unit 2**

Prepared By

Reviewed By

Approved By

TASK: Establish NC Pump Seal Injection from the SSF

POSITION: NLO

Operator's Name

Location: Plant

Method: Walkthrough

Estimated JPM Completion Time: 15 Minutes

Actual JPM Completion Time: Minutes

Required Time Critical Completion Time 8 Minutes

Actual Time Critical Completion Time Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature

Date / /

References: EP/1/A/5000/ECA-0.0

Loss of All AC Power

JPM verified current with references by

Date / /

Rev. 25/04-17-03

FOR TRAINING PURPOSES ONLY

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INITIAL CONDITIONS

A Loss of All AC has occurred on Unit 1. EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented. The SRO has dispatched one (1) operator to 1ETA to swap 1EMXA4.

He then dispatches you to obtain the Green Folder at SSF and complete Enclosure 1 (Unit 1 SSF ECA-0.0 Actions)

**This is a TIME CRITICAL JPM.**

JPM OVERALL STANDARD: SSF Diesel in operation and supplying power to 1SLXG. 1SLXG is supplying power to SMXG and SMXG-1. Battery Chargers SDSP-1 and SDSP-2 supply breakers are closed. Standby makeup pump is supplying NCP seal injection within 8 minutes.

NOTES: This JPM should be timed starting from the OPS Kitchen. Once flow from the standby makeup pump is verified, the "critical time" stops.

The examiner shall provide a copy of EP/1/A/5000/ECA-0.0 (Loss of All AC Power), Enclosure 1 (SSF Actions) to allow proper place keeping, **after the enclosure is located at the SSF.**

KA000068 G.06 4.1/4.3

ASK:MO-8308.1

FOR TRAINING PURPOSES ONLY



START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<p><b>At SSF D/G Control Panel:</b></p> <p>Check "LINE VOLTS" – APPROXIMATELY 600V.</p> <p><b><u>GO TO</u></b> Step 1.c</p> <p>Place the "SSF DIESEL TEST/EMERG" switch to "EMER"</p> <p>Check the "SSF DIESEL START CONTROL" switch - "OFF"</p> <p>Place the "SSF DIESEL START CONTROL" switch to "ON"</p> <p>Check D/G starts within 30 seconds</p>	<p>Operator receives cue and proceeds to RNO.</p> <p><b>Cue:</b> <b>Meter reads "0" Volts.</b></p> <p>Same</p> <p><b>Cue:</b> <b>Switch rotated clockwise</b></p> <p><b>Cue:</b> <b>Switch is in "OFF" position</b></p> <p><b>Cue:</b> <b>Switch rotated clockwise</b></p> <p><b>Cue:</b> <b>Background noise level has increased, various gage indications are up</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1  *	<b>CONTINUED</b>  Depress "TRIP" for "NORMAL INCOMING BREAKER CONTROL"	<b>Cue:</b>  <b>Pushbutton depressed, green lamp is illuminated</b>		
2     * * * *	<b>At 1SLXG:</b>  Open all 600 V load center breakers:	Operator proceeds to Load Center 1SLXG and opens any breakers that are closed. Repeat cue as necessary.  <b>Note:</b> The BMXA feeder breaker is normally open and is <u>not</u> a critical step.  600V MCC BMXA NORMAL INCOMING FEEDER 600V MCC SMXG 600V MCC SMXG-1 MOTOR CONTROL CENTER 1EMXH-1 ALTERNATE FEEDER SSF STDBY BATTERY CHARGER SDSS  <b>Cue (as applicable):</b>  <b>Switches rotated counterclockwise or trip pushbuttons depressed, green lamps are illuminated</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<b>At SMXG-1:</b> Open the following breakers:			
*	SMXG-1, FAE (Battery Charger No. SDSP1)	Same  <b>Cue:</b>  <b>Breaker handle is down</b>		
*	SMXG-1, RAD (Battery Charger No. SDSP2)	Same  <b>Cue:</b>  <b>Breaker handle is down</b>		
4	<b>At 1SLXG:</b> Depress "CLOSE" on 600 V load center breaker 1SLXG-5B (Diesel Generator No. 5) (on breaker)	Same  <b>Cue:</b>  <b>Pushbutton depressed and breaker indicates closed</b>		
	Using pistol grip switches, close the following breakers			
*	Close "1SLXG-5C CS" (SMXG1 MCC (Normal) Feed Cntrl Switch).	Same  <b>Cue:</b>  <b>Pistol grip rotated clockwise, red light is illuminated</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<b>CONTINUED</b>			
	Wait 10 Seconds	<b>Cue:</b>  10 seconds have elapsed		
*	Close "1SLXG-4C CS" (SMXG MCC (Normal) Feeder Cntrl Switch).	Same  <b>Cue:</b>  Pistol grip rotated clockwise, red light is illuminated		
5	<b>At SSF Control Panel:</b>			
	Open the following valves:			
*	1NV-842AC (Standby M/U Pump Suction Isol)	Same  <b>Cue:</b>  Pushbutton depressed, red light is illuminated		
*	1NV-849AC (Standby M/U Pump Cont Outside Isol)	Same  <b>Cue:</b>  Pushbutton depressed, red light is illuminated		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	<b>CONTINUED</b> Check the following valves - OPEN  1NV-1013C (Standby M/U Pump to NC Pump Seals Isol)  1NV-842AC (Standby M/U Pump Suction Isol)  1NV-849AC (Standby M/U Pump Cont Outside Isol)  Start Unit 1 Standby Makeup Pump  Check Unit 1 Standby Makeup Pump flow – (1NVP6420) GREATER THAN OR EQUAL TO 26 GPM	Same  <b>Cue:</b>  <b>Red light is illuminated</b>  Same  <b>Cue:</b>  <b>Red light is illuminated</b>  Same  <b>Cue:</b>  <b>Red light is illuminated</b>  Same  <b>Cue:</b>  <b>Pushbutton depressed,  red light is illuminated</b>  Same  <b>Cue:</b>  <b>Meter indicates 28 GPM</b>  Stop Time for Time Critical Task		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	<b>CONTINUED</b>			
	Check 1NV-1012C (Standby M/U Pump to Cont Sump) - CLOSED	Same  <b>Cue:</b>  <b>Green lamp is illuminated</b>		
	Check SSF D/G - RUNNING	Same  <b>Cue:</b>  <b>SSF D/G is RUNNING</b>		
	Check SSF D/G "FREQUENCY" - AT 60 Hz	Same  <b>Cue:</b>  <b>Meter indicates 60 Hz</b>		
	Check SSF D/G "VOLTAGE" - AT 600V.	Same  <b>Cue:</b>  <b>Meter indicates 600 volts</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	<b>At SMXG-1:</b>			
*	Close SMXG-1, FAE (BATTERY CHARGER NO. SDSP1)	Same  <b>Cue:</b>  Breaker handle pulled into the UP position		
	Wait 10 Seconds	Same  <b>Cue:</b>  10 seconds have elapsed		
*	Close SMXG-1, RAD (BATTERY CHARGER NO. SDSP2)	Same  <b>Cue:</b>  Breaker handle pulled into the UP position		
	Wait 10 Seconds	Same  <b>Cue:</b>  10 seconds have elapsed		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	<b>At 1SLXG:</b>  Using pistol grip switch, close "1SLXG-5D CS" (SDSS Battery Charger Cntrl Switch)  Wait 10 Seconds	Same  <b>Cue:</b>  <b>Pistol grip rotated clockwise, red light is illuminated</b>  <b>10 seconds have elapsed</b>		
8	<b>At SMXG:</b> Ensure SMXG-F5A (Unit 1 Pzr Heater Group #28, #55, #56 Fdr) is closed.	Same  <b>Cue:</b>  <b>Breaker is closed</b>		
9	<b>At SSF Control Panel:</b>  Check SSF D/G "FREQUENCY" - AT 60 Hz  Check SSF D/G "VOLTAGE" - AT 600V.  Check SSF Generator Load - LESS THAN OR EQUAL TO 700 KW	<b>Note:</b> Examiner should point to these values on each respective meter  Same <b>Cue:</b> <b>Meter indicates 60 Hz</b>  Same <b>Cue:</b> <b>Meter indicates 600 volts</b>  Same <b>Cue:</b> <b>Meter indicates 500 KW</b>		

\* DENOTES CRITICAL



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	Ensure SSF D/G room intake louvers are open (located above rollup doors in D/G room)	Same  Cue:  Intake louvers are open		
11	<p><u>IF AT ANY TIME</u> SSF D/G trips without apparent cause, <u>OR</u> is unable to be started without apparent cause, <u>THEN</u>:</p> <p>Ensure "GEN BREAKER CONTROL" indicates "OPEN"</p> <p>Ensure the "SSF DIESEL START CONTROL" switch is in "OFF"</p> <p>Turn the manual knob on the "FUEL OIL SOLENOID BYPASS" (located on the SSF control room side of D/G, 3 ft from floor) fully clockwise</p> <p><u>RETURN TO</u> Step 1.e.</p>	<p>Same</p> <p>Cue:  The SSF D/G is running</p>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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### INITIAL CONDITIONS

A Loss of All AC has occurred on Unit 1. EP/1/A/5000/ECA-0.0 (Loss of All AC Power) has been implemented. The SRO has dispatched one (1) operator to 1ETA to swap 1EMXA4.

He then dispatches you to obtain the Green Folder at SSF and complete Enclosure 1 (Unit 1 SSF ECA-0.0 Actions)

**This is a TIME CRITICAL JPM.**

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

1. At SSF D/G Control Panel:

- ☐ a. Check "LINE VOLTAGE" - APPROXIMATELY 600V.
- ☐ b. GO TO Step 5.
- ☐ c. Place "SSF DIESEL TEST/EMERGENCY" switch to "EMER".
- ☐ d. Check "SSF DIESEL START CONTROL" switch - "OFF".

☐ a. GO TO Step 1.c.

d. Perform the following at SSF D/G Control Panel:

1) IF "GENERATOR BREAKER CONTROL" switch is closed, THEN:

☐ a) Ensure "1SLXG-6A FEEDER TO BMXA" (on control panel) is open.

☐ b) GO TO Step 5.

☐ 2) Depress "ALARM RELAY RESET" pushbutton (on control panel, upper right corner of relay board).

3) IF SSF D/G running, THEN:

☐ a) Adjust "SSF DIESEL GOVERNOR CONTROL" until frequency is 60 Hz.

☐ b) GO TO Step 1.g.

☐ 4) IF SSF D/G not running, THEN GO TO RNO for Step 1.f.

☐ e. Place "SSF DIESEL START CONTROL" switch to "ON".

Change # 15A  
Initials/Date  
Page 3 of 8

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

1. (Continued)

\_\_\_ f. Check D/G starts within 30 seconds.

f. Perform the following:

- \_\_\_ 1) Place the "SSF DIESEL START CONTROL" switch to "OFF".
- \_\_\_ 2) **IF** 2 D/G start attempts have been performed, **THEN** observe Notes prior to Step 11 and **GO TO** Step 11.
- \_\_\_ 3) Wait 20 seconds and **RETURN TO** Step 1.e.

\_\_\_ g. Depress "TRIP" for "NORMAL INCOMING BREAKER CONTROL".

2. At 1SLXG:

\_\_\_ a. Open all 600 V load center breakers.

3. At SMXG1:

a. Open the following breakers:

- \_\_\_ • SMXG1 - FAE (SDSP1 Battery Charger)
- \_\_\_ • SMXG1 - RAD (SDSP2 Battery Charger).

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

**NOTE** Yellow "TIME CRITICAL" tags are located next to switches used in Steps 4 through 5.c.

4. At 1SLXG:

- \_\_\_ a. Depress "CLOSE" on 600 V load center breaker 1SLXG-5B (SSF D/G) (on breaker).
- b. Using pistol grip switches, close the following breakers:
  - \_\_\_ 1) Close "1SLXG-5C CS" (SMXG1 MCC (Normal) Feeder Cntrl Switch).
  - \_\_\_ 2) Wait 10 seconds.
  - \_\_\_ 3) Close "1SLXG-4C CS" (SMXG MCC (Normal) Feeder Cntrl Switch).

5. At SSF Control Panel:

- a. Open the following valves:
  - \_\_\_ • 1NV-842AC (Standby M/U Pump Suction Isol)
  - \_\_\_ • 1NV-849AC (Standby M/U Pump Cont Outside Isol).

a. Perform the following:

- \_\_\_ 1) Call Control Room or operator in 1ETA room to ensure 1EMXA4 has been swapped to alternate power.

**NOTE** Indicating lights on 1NV-842AC and 1NV-849AC switches will light when 1EMXA4 is swapped.

- \_\_\_ 2) WHEN 1EMXA4 is swapped, THEN open valves.
- \_\_\_ 3) Do not continue until 1EMXA4 is swapped to alternate power.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

## 5. (Continued)

- b. Check the following valves - OPEN: \_\_\_ b. Open valve(s).
- \_\_\_ • 1NV-1013C (Standby M/U Pump to NC Pmp Seals Isol)
  - \_\_\_ • 1NV-842AC (Standby M/U Pump Suction Isol)
  - \_\_\_ • 1NV-849AC (Standby M/U Pump Cont Outside Isol).
- \_\_\_ c. Start Unit 1 Standby Makeup Pump.
- \_\_\_ d. Check Unit 1 Standby Makeup Pump flow (1NVP6420) - GREATER THAN OR EQUAL TO 26 GPM. \_\_\_ d. Ensure valves in Step 5.b are properly aligned.

**NOTE** Remaining steps in this enclosure are not time critical, but must be completed in a timely manner.

- \_\_\_ e. Check 1NV-1012C (Standby M/U Pump Disch to Cont Sump) - CLOSED. e. Perform the following:
- \_\_\_ 1) Stop Unit 1 Standby Makeup Pump.
  - \_\_\_ 2) Close 1NV-1012C (Standby M/U Pump Disch to Cont Sump).
  - \_\_\_ 3) Do not continue until 1NV-1012C is closed.
  - \_\_\_ 4) **RETURN TO** Step 5.c.

## ACTION/EXPECTED RESPONSE

## RESPONSE NOT OBTAINED

## 5. (Continued)

\_\_\_ f. Check SSF D/G - RUNNING.

f. Perform the following:

\_\_\_ 1) Ensure SMXG-F5A (Unit 1 Pressurizer Heaters 28/55/56 Feeder) is closed.

2) Notify OSM of the following:

\_\_\_ • **IF AT ANY TIME** Unit 1 offsite power is lost to 1SLXG (powered from 6900 V switchgear 1TC), **THEN** Enclosure 1 (Unit 1 SSF - ECA-0.0 Actions) must be performed again.

\_\_\_ 3) **RETURN TO** step in effect in body of this procedure.

\_\_\_ g. Check SSF D/G "FREQUENCY" - AT 60 Hz.

\_\_\_ g. Adjust the "SSF DIESEL GOVERNOR CONTROL" to obtain 60 Hz.

\_\_\_ h. Check SSF D/G "VOLTAGE" - AT 600V.

\_\_\_ h. Adjust "SSF DIESEL VOLTAGE CONTROL" to obtain 600V.

## 6. At SMXG1:

\_\_\_ a. Close SMXG1 - FAE (SDSP1 BATTERY CHARGER).

\_\_\_ b. Wait 10 seconds.

\_\_\_ c. Close SMXG1 - RAD (SDSP2 BATTERY CHARGER).

\_\_\_ d. Wait 10 seconds.

## 7. At 1SLXG:

\_\_\_ a. Using pistol grip switch, close "1SLXG-5D CS" (SDSS Battery Charger Cntrl Switch).

\_\_\_ b. Wait 10 seconds.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

8. At SMXG:

- \_\_\_ a. Ensure SMXG-F5A (Unit 1 Pressurizer Heaters 28/55/56 Feeder) is closed.

9. At SSF Control Panel:

- \_\_\_ a. Check SSF D/G "FREQUENCY" - AT 60 Hz.

- \_\_\_ a. Adjust the "SSF DIESEL GOVERNOR CONTROL" to obtain 60 Hz.

- \_\_\_ b. Check SSF D/G "VOLTAGE" - AT 600V.

- \_\_\_ b. Adjust "SSF DIESEL VOLTAGE CONTROL" to obtain 600V.

- \_\_\_ c. Check SSF Generator Load - LESS THAN OR EQUAL TO 700 KW.

- \_\_\_ c. Contact station management to evaluate reducing load.

- \_\_\_ 10. Ensure SSF D/G room intake louvers are open (located above rollup door in D/G room).



ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

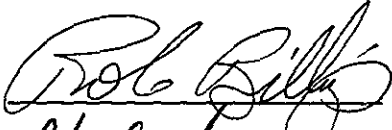
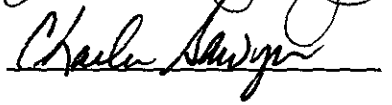
**NOTE**

- Inability to start D/G or a D/G trip without apparent cause may indicate an electrical failure of the Fuel Oil Solenoid valve.
- Opening the "FUEL OIL SOLENOID BYPASS" valve bypasses all trips (including manual).

11. **IF AT ANY TIME SSF D/G trips without apparent cause, OR is unable to be started without apparent cause, THEN:**

- \_\_\_ a. Ensure "GENERATOR BREAKER CONTROL" indicates "OPEN".
- \_\_\_ b. Ensure the "SSF DIESEL START CONTROL" switch is in "OFF".
- \_\_\_ c. Turn the manual knob on the "FUEL OIL SOLENOID BYPASS" (located on the SSF control room side of D/G, 3 ft from floor) fully clockwise.
- \_\_\_ d. **RETURN TO** Step 1.e.

Prepared By:

  
Reviewed By: 

Approved By: \_\_\_\_\_

TASK: **Start the 2A Hydrogen Analyzer**POSITION: **NLO**

Operator's Name \_\_\_\_\_

Location: **Plant**Method: **Walkthrough**Estimated JPM Completion Time: 20 Minutes

Actual JPM Completion Time: \_\_\_\_\_ Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_

Date    /    /   References: EP/2/A/5000/FR-I.3  
EP/2/A/5000/G-1Response to Voids in Reactor Vessel  
Generic Enclosures

JPM verified current with references by \_\_\_\_\_

Date    /    /   

Rev. 00/04-08-03

**FOR TRAINING PURPOSES ONLY**

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### INITIAL CONDITIONS

You are the Unit 2 Auxiliary Building Rounds person.

A Steam Generator Tube Rupture has occurred on Unit 2. The procedure currently in use is EP/2/A/5000/FR-I.3, Response to Void in Reactor Vessel. It is complete to Step 15.b and now directs starting the Hydrogen Analyzers.

**The C/R SRO dispatches you to place the 2A Hydrogen Analyzer in service per EP/2/A/5000/G-1 Enclosure 5 (Placing the Hydrogen Analyzers in Service). Safety Injection and the Diesel Generator Load Sequencers have been reset.**

JPM OVERALL STANDARD: "2A" Hydrogen Analyzer in service.

### NOTES:

The evaluator may desire to check out key # 172 prior to beginning this JPM to reduce examination length. If so, provide the key on step #2 and cue accordingly.

***Ensure any keys used in the performance of this JPM are returned to WCC prior to leaving the site.***

KA 028 A4.03 3.1/3.3

TASK: MO-8004

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	<b>Ensure the following:</b> <ul style="list-style-type: none"> <li>• SI reset</li> <li>• D/G Load Sequencers reset</li> </ul>	Operator verifies from initial conditions of JPM that these items have been reset		
2	Obtain one key 172 and two keys 178 from the Control Room black box of keys.	<div style="border: 1px solid black; padding: 5px;"> <b>Note to evaluator:</b>             After receiving the cue below, the operator proceeds to the Work Control Center and checks out key # 172. Use of key # 178 will be simulated during this JPM.         </div> <b>Cue:</b>  <b>Key # 172 is missing from the Control Room black box. Obtain key # 172 using an alternate method.</b>  <b>Cue:</b>  <b>Simulate the use of key # 178.</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	Close 2EMXA-R7D (H <sub>2</sub> Analyzer and PAMS Panel Heat Trace) (aux bldg, 750, FF-57)	Same  <b>Cue:</b>  <b>Breaker rotated clockwise</b>		
4	<b>Start 2A H<sub>2</sub> Analyzer as follows:</b>  Proceed to "2MMIMT 6850 H <sub>2</sub> ANALYZER TRAIN A" PANEL (750' elevation in cable spreading room)	Same		
*5	Use key 172 to access remote panel	Same		
*6	Inside remote panel, use key 178 to place "ISOLATION VALVES OPEN" switch to "ON"	<b><u>Note to evaluator:</u></b> Use of key #178 will be simulated.		
		<b>Cue:</b>  <b>Key inserted, switch rotated clockwise</b>		
7	Check "POWER ON" light above "ISOLATION VALVES OPEN" switch-LIT	Same  <b>Cue:</b>  <b>Light is illuminated</b>		
*8	Place "HYDROGEN ANALYZER SAMPLE ENABLE SWITCH" to "SAMPLE".	Same  <b>Cue:</b>  <b>Switch rotated clockwise</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
9	Select sample location as follows:			
*	<ul style="list-style-type: none"> <li>Place "HYDROGEN ANALYZER SAMPLE SELECT" switch to "UPPER CONT"</li> <li>Check "POWER ON" light for selected location - OFF</li> <li><b><u>IF AT ANY TIME</u></b> station management <i>desires sample</i> from alternate location, <b><u>THEN</u></b> place "HYDROGEN ANALYZER SAMPLE SELECT" switch to desired location:</li> <li>"OPER LEVEL"</li> <li><b>OR</b></li> <li>"S/G CAVITY"</li> </ul>	<p>Same</p> <p><b>Cue:</b></p> <p><b>Switch rotated counterclockwise</b></p> <p>Same</p> <p><b>Cue:</b></p> <p><b>Light is off</b></p> <p>Same</p> <p><b>Cue:</b></p> <p><b>Station management does not desire to sample another location</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*10	Depress "OFF" pushbutton on "SAMPLE ROUTED TO PAMS PANEL" switch	Same  <b>Cue:</b>  <b>Switch is depressed</b>		
*11	Place "OFF-STANDBY- ANALYZE" switch to "ANALYZE"	Same  <b>Cue:</b>  <b>Switch rotated clockwise</b>		
*12	Depress "LOCAL/REMOTE SELECTOR" pushbutton	Same  <b>Cue:</b>  <b>Pushbutton depressed</b>		
13	Ensure "H2 DUAL RANGE SW" is in 0-30% range	Same  <b>Cue:</b>  <b>Switch is in the "0-30%" range position</b>		
4	Place "FUNCTION SELECTOR" to "SAMPLE"	Same  <b>Cue:</b>  <b>Switch rotated counterclockwise</b>		

**TES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	Do not continue until 5 minutes have elapsed	<b>Cue:</b>  <b>Five minutes have elapsed.</b>		
16	<b>IF</b> a "COMMON ALARM" is lit, <b>THEN</b> perform the following:	<b>Cue:</b>  <b>The COMMON ALARM light is LIT.</b>		
*	<ul style="list-style-type: none"> <li>Depress "ALARM RESET"</li> </ul>	Operator resets the alarm.		
	<ul style="list-style-type: none"> <li><b>IF</b> "COMMON ALARM" clears, <b>THEN GO TO</b> Step 4.n.</li> </ul>	<b>Cue:</b>  <b>The COMMON ALARM light is DARK.</b>		
		Operator proceeds to Step 4.n.		
*	Notify control room that 2A H2 Analyzer is in service	<b>Cue:</b>  <b>Control room SRO acknowledges your communication.</b>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL



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## INITIAL CONDITIONS

You are the Unit 2 Auxiliary Building Rounds person.

A Steam Generator Tube Rupture has occurred on Unit 2. The procedure currently in use is EP/2/A/5000/FR-1.3, Response to Void in Reactor Vessel. It is complete to Step 15.b and now directs starting the Hydrogen Analyzers.

**The C/R SRO dispatches you to place the 2A Hydrogen Analyzer in service per EP/2/A/5000/G-1 Enclosure 5 (Placing the Hydrogen Analyzers in Service). Safety Injection and the Diesel Generator Load Sequencers have been reset.**

1. **Ensure the following:**

- ☐ a. S/I reset.
- ☐ b. D/G Load sequencers reset.

☐ 2. **Obtain one key 172 and two keys 178 from Control Room black box of keys.**

☐ 3. **Close 2EMXA, R7D (H<sub>2</sub> Analyzer and PAMS Panel Heat Trace) (aux bldg, 750, FF-57).**

4. **Start 2A H<sub>2</sub> Analyzer as follows:**

- ☐ a. Proceed to "2MMIMT 6850 H<sub>2</sub> ANALYZER TR A" panel (750' elevation in cable spreading room).
- ☐ b. Use key 172 to access remote panel.
- ☐ c. Inside remote panel, use key 178 to place "ISOLATION VALVES OPEN" switch to "ON".
- ☐ d. Check "POWER ON" light above "ISOLATION VALVES OPEN" switch - LIT.
- ☐ e. Place "HYDROGEN ANALYZER SAMPLE ENABLE" switch to "SAMPLE".

f. Select sample location as follows:

- ☐ 1) Place "HYDROGEN ANALYZER SAMPLE SELECT" switch to "UPPER CONT".
- ☐ 2) Check "POWER ON" light for selected location - OFF.

3) **IF AT ANY TIME** station management desires sample from alternate location, **THEN** place "HYDROGEN ANALYZER SAMPLE SELECT" switch to desired location:

- ☐ • "OPER LEVEL"

OR

- ☐ • "S/G CAVITY".

- ☐ g. Depress "OFF" pushbutton on "SAMPLE ROUTED TO PAMS PANEL" switch.
- ☐ h. Place "OFF/STANDBY/ANALYZE" switch to "ANALYZE".
- ☐ i. Depress "LOCAL/REMOTE SELECTOR" pushbutton.
- ☐ j. Ensure "H<sub>2</sub> DUAL RANGE SW" in 0-30% range.

4. (Continued)

- \_\_\_ k. Place "FUNCTION SELECTOR" to "SAMPLE".
- \_\_\_ l. Do not continue until 5 minutes have elapsed.
- m. **IF** "COMMON ALARM" lit, **THEN** perform the following:

**NOTE** A low gas flow condition may be causing the "COMMON ALARM" and may clear itself once condensation is removed from the sample line.

- \_\_\_ 1) Depress "ALARM RESET".
- \_\_\_ 2) **IF** "COMMON ALARM" clears, **THEN GO TO** Step 4.n.
- \_\_\_ 3) **IF** "COMMON ALARM" will not clear, **THEN** perform the following:
  - \_\_\_ a) Notify IAE to investigate alarm.
  - \_\_\_ b) Notify control room to disregard 2A H<sub>2</sub> Analyzer reading until IAE clears alarm.
  - \_\_\_ c) **GO TO** Step 5.
- \_\_\_ n. Notify control room that 2A H<sub>2</sub> Analyzer is in service.

5. **Start 2B H<sub>2</sub> Analyzer as follows:**

- \_\_\_ a. Proceed to "2MMIMT 6860 H<sub>2</sub> ANALYZER TRAIN B" panel (733' elevation in vital battery area).
- \_\_\_ b. Use key 172 to access remote panel.
- \_\_\_ c. Inside remote panel, use key 178 to place "ISOLATION VALVES OPEN" switch to "ON".
- \_\_\_ d. Check "POWER ON" light above "ISOLATION VALVES OPEN" switch - LIT.
- \_\_\_ e. Place "HYDROGEN ANALYZER SAMPLE ENABLE" switch to "SAMPLE".

5. (Continued)

f. Select sample location as follows:

- \_\_\_ 1) Place "HYDROGEN ANALYZER SAMPLE SELECT" switch to "UPPER CONT".
- \_\_\_ 2) Check "POWER ON" light for selected location - OFF.
- 3) **IF AT ANY TIME** station management desires sample from alternate location, **THEN** place "HYDROGEN ANALYZER SAMPLE SELECT" switch to desired location:

\_\_\_ • "OPER LEVEL"

OR

\_\_\_ • "S/G CAVITY".

- \_\_\_ g. Depress "OFF" pushbutton on "SAMPLE ROUTED TO PAMS PANEL" switch.
- \_\_\_ h. Place "OFF/STANDBY/ANALYZE" switch to "ANALYZE".
- \_\_\_ i. Depress "LOCAL/REMOTE SELECTOR" pushbutton.
- \_\_\_ j. Ensure "H<sub>2</sub> DUAL RANGE SW" is in 0-30% range.
- \_\_\_ k. Place "FUNCTION SELECTOR" to "SAMPLE".
- \_\_\_ l. Do not continue until 5 minutes have elapsed.
- m. **IF** "COMMON ALARM" lit, **THEN** perform the following:

**NOTE** A low gas flow condition may be causing the "COMMON ALARM" and may clear itself once condensation is removed from the sample line.

- \_\_\_ 1) Depress "ALARM RESET".
- \_\_\_ 2) **IF** "COMMON ALARM" clears, **THEN GO TO** Step 5.n.
- 3) **IF** "COMMON ALARM" will not clear, **THEN** perform the following:
  - \_\_\_ a) Notify IAE to investigate alarm.
  - \_\_\_ b) Notify control room to disregard 2B H<sub>2</sub> Analyzer reading until IAE clears alarm.
  - \_\_\_ c) **GO TO** Step 6.
- \_\_\_ n. Notify control room that 2B H<sub>2</sub> Analyzer is in service.

- \_\_\_ 6. **IF neither H<sub>2</sub> Analyzer can be placed in service, THEN contact station management to evaluate having Chemistry determine containment H<sub>2</sub> concentration PER OP/2/A/6200/116 (Unit 2 Primary Local Sampling).**
  
- 7. **WHEN station management desires to shutdown 2A H<sub>2</sub> Analyzer, THEN perform the following:**
  - \_\_\_ a. Proceed to "2MMIMT 6850 H<sub>2</sub> ANALYZER TRAIN A" panel (750' elevation in cable spreading room).
  - \_\_\_ b. Place "OFF/STANDBY/ANALYZE" switch to "STANDBY".
  - \_\_\_ c. Ensure "POWER ON" light above "ISOLATION VALVES OPEN" switch is lit.
  - \_\_\_ d. Place "ISOLATION VALVES OPEN" switch to "OFF".
  - \_\_\_ e. Check "POWER ON" light above "ISOLATION VALVES OPEN" switch goes from lit to dark to ensure valves close.
  - \_\_\_ f. Remove key 178.
  
- 8. **WHEN station management desires to shutdown 2B H<sub>2</sub> Analyzer, THEN perform the following:**
  - \_\_\_ a. Proceed to "2MMIMT 6860 H<sub>2</sub> ANALYZER TRAIN B" panel (733' elevation in vital battery area).
  - \_\_\_ b. Place "OFF/STANDBY/ANALYZE" switch to "STANDBY".
  - \_\_\_ c. Ensure "POWER ON" light above "ISOLATION VALVES OPEN" switch is lit.
  - \_\_\_ d. Place "ISOLATION VALVES OPEN" switch to "OFF".
  - \_\_\_ e. Check "POWER ON" light above "ISOLATION VALVES OPEN" switch goes from lit to dark to ensure valves close.
  - \_\_\_ f. Remove key 178.
  
- \_\_\_ 9. **WHEN both analyzers are shutdown AND are no longer required during event, THEN open 2EMXA, R7D (H<sub>2</sub> Analyzer and PAMS Panel Heat Trace) (aux bldg, 750, FF-57).**

Prepared By: Rob BillingsReviewed By: Gary GrahamApproved By: R M PopeTASK: **Bypass A, B, and C VI Dryers following a Loss of Instrument Air**POSITION: **NLO**

Operator's Name \_\_\_\_\_

Location: **Plant**Method: **Walkthrough**Estimated JPM Completion Time: 10 MinutesActual JPM Completion Time:        Minutes

The JPM Operator's performance was evaluated against the standards of this JPM and is determined to be:

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature \_\_\_\_\_ Date        /        /       

References: AP/1/A/5500/22

Loss of VI

JPM verified current with references by \_\_\_\_\_

Date        /        /       

Rev. 20/12-09-02

**FOR TRAINING PURPOSES ONLY**

### INITIAL CONDITIONS

You are the Service Building Rounds person.

AP/1/A/5500/22 (Loss of VI) has been implemented due to decreasing VI Pressure. VI Pressure is holding at 75 PSIG but the leak has not been isolated.

**The C/R SRO instructs you to bypass the VI dryers and isolate VS PER Enclosure 5 (VI Dryer and VI to VS System Isolation) of AP/1/A/5500/22 (Loss of VI) using the copy of procedure located beside Service Bldg Lube Oil Station door.**

JPM OVERALL STANDARD:      A, B, and C VI Dryers Inlet and Outlet Isolation valves closed and the Dryer Bypass Valves open.

NOTES:                              Once the remote procedure has been located, give the examinee a copy of AP/22, Enclosure 5, to use during this JPM.

KA-APE-065-AA1.02      2.6/2.8

TASK:MO-5012

START TIME \_\_\_\_\_

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	At "TB-681 VI AIR DRYERS REFLASH MODULE" (service bldg, 733+4, opposite A VI air dryer), check "VI PURGE EXH VALVES-CLOSED" light - LIT	Same  Cue:  Light is LIT		
2	<p>Check the following valves - CLOSED:</p> <ul style="list-style-type: none"> <li>• 1VI-1838 (A VI Dryer Blowdown Auto Isol) (service bldg, 733+10, between A &amp; B VI dryers)</li> <li>• 1VI-1839 (B VI Dryer Blowdown Auto Isol) (service bldg, 733+10, above B VI dryer)</li> <li>• 1VI-1840 (C VI Dryer Blowdown Auto Isol) (service bldg, 733+10, above C VI dryer).</li> </ul>	<p>Same</p> <p>Cue:</p> <p>Valve indicates closed</p> <p>Cue:</p> <p>Valve indicates closed</p> <p>Cue:</p> <p>Valve indicates closed</p>		

\* DENOTES CRITICAL



STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<p><b>Ensure VI dryers bypassed as follows:</b></p> <ul style="list-style-type: none"> <li>At "TB-681 VI AIR DRYERS REFLASH MODULE" (service bldg, 733+4, opposite A VI air dryer), check "VI DRYER BYPASS VALVE OPEN 1VI1812" light - LIT.</li> <li>On "OVERRIDE-OPENS VI DRYER BYPASS VALVE 1VI1812", depress "OVERRIDE" pushbutton to open VI dryer bypass valve.</li> <li>Check 1VI-1812 (VI Air Dryer Bypass Filter Isol) (service bldg, 733+5, V-34, northeast corner of Shared Load Center Room, behind "A" VI Dryer) - OPEN.</li> <li>* Fail air to 1VI-1812 to open valve.</li> </ul>	<p>Operator receives cue then proceeds to RNO.</p> <p><b>Cue:</b></p> <p><b>Lamp is dark</b></p> <p>Same</p> <p><b>Cue:</b></p> <p><b>Pushbutton depressed</b></p> <p>Operator receives cue then proceeds to RNO.</p> <p><b>Cue:</b></p> <p><b>Valve indicates closed</b></p> <p>After operator simulates failing the air supply, give the following cue:</p> <p><b>Cue:</b></p> <p><b>Air supply failed, 1VI-1812 indicates OPEN</b></p>		

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\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<p><b>Continued</b></p> <ul style="list-style-type: none"> <li>Ensure the following valves open: <ul style="list-style-type: none"> <li>1VI-93 (VI Dryer Bypass) (service bldg, 733+8, V-34, Northeast corner of Shared Load Center Room, behind "A" VI Dryer)</li> <li>1VI-94 (VI Dryer Bypass) (service bldg, 733+8, V-34, Northeast corner of Shared Load Center Room, behind "A" VI Dryer)</li> </ul> </li> </ul> <p><b>WHEN</b> VI dryers are bypassed <b>PER</b> Step 3.a through 3.c, <b>THEN</b> close:</p>	<p>Same</p> <p><b>Cue:</b> <b>Valve indicates open</b></p> <p><b>Cue:</b> <b>Valve indicates open</b></p> <p><b>Note:</b> Valves may be aligned in any order.</p>		
*	<ul style="list-style-type: none"> <li>1VI-98 (A VI Dryer Inlet Isolation) (service bldg, 733+5, V-33, between "A" VI Dryer Prefilter and west wall)</li> </ul>	<p>Same</p> <p><b>Cue:</b> <b>Valve handle rotated clockwise and valve indicates closed</b></p>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	<b>Continued</b>			
*	<ul style="list-style-type: none"> <li>1VI-99 (A VI Dryer Outlet Isolation) (service bldg, 733+8, V-34, north of "A" VI Dryer)</li> </ul>	<b>Cue:</b>  <b>Handwheel rotated clockwise, stem is in</b>		
*	<ul style="list-style-type: none"> <li>1VI-22 (B VI Dryer Inlet Isolation) (service bldg, 733+6, V-33, north of "B" VI Dryer)</li> </ul>	<b>Cue:</b>  <b>Valve handle rotated clockwise and valve indicates closed</b>		
*	<ul style="list-style-type: none"> <li>1VI-23 (B VI Dryer Outlet Isolation) (service bldg, 733+8, V-33, above "B" VI Dryer Prefilter and Afterfilter)</li> </ul>	<b>Cue:</b>  <b>Handwheel rotated clockwise, stem is in</b>		
*	<ul style="list-style-type: none"> <li>1VI-24 (C VI Dryer Inlet Isolation) (service bldg, 733+5, V-33, north of "C" VI)</li> </ul>	<b>Cue:</b>  <b>Valve handle rotated clockwise and valve indicates closed</b>		
*	<ul style="list-style-type: none"> <li>1VI-25 (C VI Dryer Outlet Isolation) (service bldg, 733+9, V-33, above C VI Dryer Prefilter and Afterfilter)</li> </ul>	<b>Cue:</b>  <b>Handwheel rotated clockwise, stem is in</b>		

\* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	<p><b>Isolate VI supply to VS as follows:</b></p> <p>At the VI Sequencer Panel check 1VI-820 (VI to VS Isolation Valve)- CLOSED</p> <p><b>IF</b> D or E VI compressors aligned to supply VS, <b>THEN</b> align compressor back to VI...</p>	<p>Same</p> <p><b>Cue:</b></p> <p><b>Green lamp is lit.</b></p> <p>Same</p> <p><b>Cue:</b></p> <p><b>No VI compressors are aligned to supply the VS system at this time.</b></p>		

STOP TIME \_\_\_\_\_

\* DENOTES CRITICAL

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## INITIAL CONDITIONS

You are the Service Building Rounds person.

AP/1/A/5500/22 (Loss of VI) has been implemented due to decreasing VI Pressure. VI Pressure is holding at 75 PSIG but the leak has not been isolated.

The C/R SRO instructs you to bypass the VI dryers and isolate VS PER Enclosure 5

(VI Dryer and VI to VS System Isolation) of AP/1/A/5500/22 (Loss of VI) using the copy of procedure located beside Service Bldg Lube Oil Station door.

**Duke Power Company**  
**PROCEDURE PROCESS RECORD**

(1) ID No. AP/1/A/5500/022  
 Revision No. 021

**INFORMATION ONLY**

**PREPARATION**

(2) Station McGuire Nuclear Station

(3) Procedure Title Loss of VI

(4) Prepared By Hackney, Joseph S *J Hackney* Date February 8, 2003

(5) Requires NSD 228 Applicability Determination? If Applicability Determination is required, attach NSD 228 documentation.

- ☒ Yes (New procedure or revision with major changes)  
☐ No (Revision with minor changes)  
☐ No (To incorporate previously approved changes)

(6) Reviewed By *M. W. [Signature]* (QR) Date 2/25/03

Cross-Disciplinary Review By *[Signature]* (QR) NA Date 2-26-03

Reactivity Mgmt. Review By *[Signature]* (QR) NA *[Signature]* Date 2/25/03

Mgmt. Involvement Review By \_\_\_\_\_ (OPS Supt.) NA *[Signature]* Date 2/25/03

**(7) Additional Reviews**

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

Reviewed By \_\_\_\_\_ Date \_\_\_\_\_

**(8) Temporary Approval (if necessary)**

By \_\_\_\_\_ (OSM/QR) Date \_\_\_\_\_

By \_\_\_\_\_ (QR) Date \_\_\_\_\_

(9) Approved By *[Signature]* Date 3/4/03

**PERFORMANCE (Compare with Control Copy every 14 calendar days while work is being performed.)**

(10) Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

Compared with Control Copy \_\_\_\_\_ Date \_\_\_\_\_

(11) Date(s) Performed \_\_\_\_\_

Work Order Number (WO#) \_\_\_\_\_

**COMPLETION****(12) Procedure Completion Verification**

- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?  
☐ Yes ☐ NA Required enclosures attached?  
☐ Yes ☐ NA Data sheets attached, completed, dated and signed?  
☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?  
☐ Yes ☐ NA Procedure requirements met?

Verified By \_\_\_\_\_ Date \_\_\_\_\_

(13) Procedure Completion Approved \_\_\_\_\_ Date \_\_\_\_\_

(14) Remarks (Attach additional pages, if necessary.)

**ACTION/EXPECTED RESPONSE**

**RESPONSE NOT OBTAINED**

- 1. At "TB-681 VI AIR DRYERS REFLASH MODULE" (service bldg, 733+4, opposite A VI air dryer), check "VI PURGE EXH VALVES - CLOSED" light - LIT.

— On "OVERRIDE-CLOSES VI PURGE EXH. VLVS.", depress "OVERRIDE" pushbutton to close VI purge exhaust valves.

2. Check the following valves - CLOSED:

— IF any valve open, THEN notify system engineering.

- • 1VI-1838 (A VI Dryer Blowdown Auto Isol) (service bldg, 733+10, between A & B VI dryers)
- • 1VI-1839 (B VI Dryer Blowdown Auto Isol) (service bldg, 733+10, above B VI dryer)
- • 1VI-1840 (C VI Dryer Blowdown Auto Isol) (service bldg, 733+10, above C VI dryer).

3. Ensure VI dryers bypassed as follows:

- a. At "TB-681 VI AIR DRYERS REFLASH MODULE" (service bldg, 733+4, opposite A VI air dryer), check "VI DRYER BYPASS VALVE OPEN 1VI1812" light - LIT.
- b. Check 1VI-1812 (VI Air Dryer Bypass Filter Isol) (service bldg, 733+5, V-34, northeast corner of Shared Load Center Room, behind "A" VI Dryer) - OPEN.
- c. Ensure the following valves open:
  - • 1VI-93 (A VI Dryer Bypass) (service bldg, 733+8, V-34, Northeast corner of Shared Load Center Room, behind "A" VI Dryer)
  - • 1VI-94 (A VI Dryer Bypass) (service bldg, 733+8, V-34, Northeast corner of Shared Load Center Room, behind "A" VI Dryer).

— a. On "OVERRIDE-OPENS VI DRYER BYPASS VALVE 1VI1812", depress "OVERRIDE" pushbutton to open VI dryer bypass valve.

— b. Fail air to 1VI-1812 to open valve.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

3. (Continued)

d. WHEN VI dryers are bypassed PER  
Steps 3.a through 3.c, THEN close:

- • 1VI-98 (A VI Dryer Inlet Isolation)  
(service bldg, 733+5, V-33, between  
"A" VI Dryer Prefilter and east wall)
- • 1VI-99 (A VI Dryer Outlet Isolation)  
(service bldg, 733+8, V-34, north of  
"A" VI Dryer)
- • 1VI-22 (B VI Dryer Inlet Isolation)  
(service bldg, 733+6, V-33, north of  
"B" VI Dryer)
- • 1VI-23 (B VI Dryer Outlet Isolation)  
(service bldg, 733+8, V-33, above "B"  
VI Dryer Prefilter and Afterfilter )
- • 1VI-24 (C VI Dryer Inlet Isolation)  
(service bldg, 733+5, V-33, north of  
"C" VI Dryer)
- • 1VI-25 (C VI Dryer Outlet Isolation)  
(service bldg, 733+9, V-33, above C  
VI Dryer Prefilter and Afterfilter).



ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4. Isolate VI supply to VS as follows:

— a. At the VI Sequencer Panel check  
1VI-820 (VI to VS Isolation Valve) -  
CLOSED.

— a. Close 1VI-820.

b. IF D or E VI Compressors aligned to  
supply VS, THEN align compressor  
back to VI:

1) Close and lock the compressor  
supply to VS:

— • 1VI-819 (VI compressor D Supply  
To VS) (service bldg, 739+9,  
above KR Pump B)

— • 1VI-817 (VI Compressor E Supply  
To VS) (service bldg, 739+8,  
West side of KR Tank).

2) Open the discharge valve on the VI  
compressor supplying VS:

— • 1VI-450 (VI Compressor D Disch)  
(service bldg, 739+10, 12 Ft west  
of B KR Pump)

— • 1VI-816 (VI Compressor E Disch)  
(service bldg, 739+8, between B  
and C KR Pumps).

— 3) IF any compressor tripped, THEN  
restart compressor PER Enclosure  
2 (Startup of D, E and F VI  
Compressors).