Final Submittal

(Blue Paper)

MCGUIRE MARCH 2007 EXAM

EXAM NOS. 05000369, 370/2007301

MARCH 19 - 22, 2007

MARCH 29, 2007 - WRITTEN

1. Administrative JPMs
2. In-plant JPMs
3. Control Room JPMs (simulator JPMs)

SRO

ADMIN

JPMs

Reviewed By_____

Approved By_____

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

POSITION: **SRO**

Operator's Name_____

Location: **Classroom** Method: **Perform**

Validation time: 25 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: PT/1/A/4600/021A Loss of Operator Aid Computer
MNS Unit #1 Data Book – Table 2.2
ITS 3.2.4

KA: G2.1.25 (2.8/3.1)

JPM verified current with references by _____Date ___/___/

INITIAL CONDITIONS

At 0700 the Unit 1 OAC failed and is not operating. 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 2200.

On unit 1 at 1200 Power Range N42 upper detector failed.

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 N42 has been declared inoperable and removed from service by procedure.

The Control Room SRO directs you to calculate QPTR per Sect. 12.13 of PT/1/A/4600/021 A (*Loss of Operator Aid Computer while in Mode 1*) for current plant conditions.

The following are the present current values for the Power Range upper and lower detectors:

- PR-41 A = 312 MicroAmps PR-41 B = 308 MicroAmps
- PR-42 A = 0 MicroAmps PR-42 B = 0 MicroAmps
- PR-43 A = 313 MicroAmps PR-43 B = 308 MicroAmps
- PR-44 A = 302 MicroAmps PR-44 B = 320 MicroAmps

JPM OVERALL STANDARD:

Examinee determines that QPTR associated with detector PR-44B is (1.031 – 1.039) which exceeds the Tech Spec Limit of ($\leq$ 1.02) at 100% RTP (ITS 3.2.4). and determines that Reactor Power is required to be reduced at least 6% below 100% RTP.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator performs Step 12.13.1	From Initial Conditions Operator determines that this step should be **N/A**		
2	Per Step 12.13.2 the operator determines that Encl 13.2, Part B is to be used to perform manual calculations for QPTR.	**Operator should now proceed to Enc 13.5 Part B (Pg 2 of 2)**		
*2	Operator obtains Measured currents from NI cabinet's current meters.	**Values provided with initial conditions):** **NI-41 detector:** A 312 B 308 **NI-42 detector:** A 0 B 0 **NI-43 detector:** A 313 B 308 **NI-44 detector:** A 302 B 320 **Operator should complete Line 1 with the provided information.**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*3	Obtains calibration data from Data Book Table 2.2	The following information from the reference should be completed on **Line 2** for its respective Instrument. (per note 2) **NI-41 detector:** A 165.9 B 184.1 **NI-43 detector:** A 168.8 B 189.4 **NI-44 detector:** A 158.3 B 183.1 (No range given because this information is provided)		
*4	Operator determines Average RF of A detectors	Operator correctly calculates average RF (Note 3 below the table provides directions) Operator Calculates the following values for Relative Flux (RF) for each P/R Instr: **NI-41 detector:** A **1.881** B **1.673**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		NI-43 detector: A **1.854** B **1.626** **NI-44 detector:** A **1.908** B **1.748** Note: Ranges for the above values would only be valid if the operator chose to round to 1 or 2 decimal places i.e. The calculations are simple math problems therefore right or wrong.		
*5	Operator determines Average RF of B detectors	Operator correctly calculates Detector Avg RF values: **"A" Detectors = 1.881** (1.881 – 1.900) **"B" Detectors = 1.682** (1.682 – 1.700) **Ranges** = If the operator chose to round the individual detector RF values the average could vary by the amount shown.		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	Operator determines tilt for each detector	Operator correctly calculates tilt. PR-41A **1.000** (.99 – 1.00) PR-41B **0.995** (.984 - .995) PR-43A **0.986** (.975 - .986) PR-43B **0.967** (.957 - .967) PR-44A **1.014** (1.004 – 1.014) **PR-44B** **1.039** (1.031 – 1.039) **Ranges** = If the operator chose to round the individual detector RF values the individual tilts could vary by the amounts shown. **Operator identifies PR-44B QPTR exceeds the T.S. limit.** Cue if needed: **CUE:** **What are the Restrictions on Reactor Power due to QPTR being greater than the limits in ITS 3.2.4**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*7	Operator refers to T.S. 3.2.4.	Determines a power reduction of **at least 6% power** is required. (Per T.S., reduce thermal power ≥ 3% from RTP for each 1% of QPTR > 1.02.) **This JPM is Complete**		

STOP TIME_____

INITIAL CONDITIONS

At 0700 the Unit 1 OAC failed and is not operating. 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 2200.

On unit 1 at 1200 Power Range N42 upper detector failed.

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 N42 has been declared inoperable and removed from service by procedure.

The Control Room SRO directs you to calculate QPTR per Sect. 12.13 of PT/1/A/4600/021 A (*Loss of Operator Aid Computer while in Mode 1*) for current plant conditions.

The following are the present current values for the Power Range upper and lower detectors:

- PR-41 A = 312 MicroAmps PR-41 B = 308 MicroAmps
- PR-42 A = 0 MicroAmps PR-42 B = 0 MicroAmps
- PR-43 A = 313 MicroAmps PR-43 B = 308 MicroAmps
- PR-44 A = 302 MicroAmps PR-44 B = 320 MicroAmps

Chg T

OP/1/A/6100/022
Enclosure 4.3
Table 2.2

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

Unit = 1 Cycle = 18

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	202.7	141.2	210.5	142.6	204.8	145.2	193.3	138.0
20	190.4	155.5	197.7	156.7	192.8	160.0	181.6	153.0
10	178.1	169.8	184.9	170.8	180.8	174.7	169.9	168.1
0	165.9	184.1	172.1	184.9	168.8	189.4	158.3	183.1
-10	153.6	198.4	159.4	199.1	156.8	204.2	146.6	198.1
-20	141.3	212.7	146.6	213.2	144.8	218.9	134.9	213.1
-30	129.0	227.0	133.8	227.3	132.8	233.7	123.2	228.2
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	10.181	6.388	3.793	10.187	6.421	3.766	10.107	6.386	3.721	10.176	6.279	3.897
20	9.564	7.035	2.529	9.568	7.057	2.511	9.514	7.034	2.480	9.560	6.963	2.597
10	8.947	7.683	1.264	8.949	7.694	1.255	8.922	7.682	1.240	8.945	7.646	1.299
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	7.713	8.977	-1.264	7.711	8.966	-1.255	7.738	8.978	-1.240	7.715	9.014	-1.299
-20	7.096	9.625	-2.529	7.092	9.603	-2.511	7.146	9.626	-2.480	7.100	9.697	-2.597
-30	6.479	10.272	-3.793	6.473	10.239	-3.766	6.553	10.274	-3.721	6.484	10.381	-3.897

AFD Incore/Excore Ratios For Quadrants 1 - 4

	Quad 4 N41	Quad 2 N42	Quad 1 N43	Quad 3 N44
M=	1.318	1.327	1.343	1.283

Prepared By: Paul Guill Ryan M Davis

Date: 9/26/2006 Time: 12:13 PM

ANSWER KEY

Enclosure 13.5

Calculation Sheet For Quadrant Power Tilt

Part B

Sheet 1 of ____

Date TODAY
Time [2] PRESENT
Initials STUDENT

	PR-4 1		PR-4 3		PR-4 4	
	A	B	A	B	A	B
1) Measured Current	312	308	313	308	302	320
2) Calibration Current	165.9	184.1	168.8	189.4	158.3	183.1
3) Relative Flux (RF)	1.881	1.673	1.854	1.626	1.908	1.748

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_T" for detector "A", "I_B" 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 (RFA) = [1.881] (RF of PR-4__A) + [1.854] (RF of PR-4__A) + [1.908] (RF of PR-4__A) x ⅓ = 1.881

Avg RF of B Detectors (RFB) = [1.673] (RF of PR-4__B) + [1.626] (RF of PR-4__B) + [1.748] (RF of PR-4__B) x ⅓ = 1.682

PR-4__A Tilt = RF of PR-4__A / RFA = 1.000 **PR-4__B Tilt** = RF of PR-4__B / RFB = 0.995

PR-4__A Tilt = RF of PR-4__A / RFA = 0.986 **PR-4__B Tilt** = RF of PR-4__B / RFB = 0.967

PR-4__A Tilt = RF of PR-4__A / RFA = 1.014 **PR-4__B Tilt** = RF of PR-4__B / RFB = 1.039

End of Enclosure

[2] **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.

Reviewed By _____

Approved By _____

TASK: **Thermal Margin Calculation (Mode 5)**

POSITION: **SRO**

Operator's Name_____

Location: **Control Room** 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/6100/22 (Rev. 475) Unit 1 Data Book
OMP 5-8 Attachments 12.6 and 12.7

JPM verified current with references by _____

Date ___/___/

INITIAL CONDITIONS

The following conditions exist:

Unit #1 Reactor is in Mode 5 after being shutdown 9 days ago for a refueling outage. NC system is 114 degrees with "A" Train ND in service. NC System level is presently 140 inches. All S/G's have been drained for inspection. NC system sight glass has been placed in service and preparations are being made to lower NC system level to 55 inches to support reactor vessel head removal and entry into Mode 6 per OP/2/A/6100/SD-20 (Draining the NC System). LTOP requirements are being satisfied by removal of PZR Safety Valve 1NC-1. Containment Closure is in effect and Thermal Margin is 33 minutes.

You are the Control Room SRO on duty and as required by OP/1/A/6100/SD-20 (Draining the NC System) you are required to complete Attachment 12.6 of OMP 5-8 to determine the new thermal margin with NC system level at 55 inches and make the appropriate notifications.

JPM OVERALL STANDARD: OMP 5-8 Attachment 12.6 properly completed with new thermal margin calculated and documented on Attachment 12.7 and on MC-6. Proper notifications to the CCC and STA have been made.

For the conditions given, operator should use Unit 1 Data Book Enc. 4.3 Sect 2.10.1.A and determine the new Thermal Margin to be (22-24) Minutes.

NOTES: Unit #1 Data Book should be available for reference.
OMP 5-8 Attachment 12.6
OMP 5-8 Attachment 12.7 (Partially filled in to reflect present plant conditions not associated with the completion of this JPM).

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator is provided with a blank copy of OMP 5-8 Attachment 12.6, and a partially complete copy of Attachment 12.7.	Operator checks Unit One as the Applicable Unit on the top of Attachment 12.6		
2	Operator determines that in order to calculate the new Thermal Margin U-1 Data Book, Enc 4.3, Section 2.10 must be used.	Operator utilizes the provided Copy of the U-1 Data Book and refers to Enc 4.3 Section 2.10.		
3	Operator determines that from the Initial conditions given, Enclosure 4.3 Section 2.10.1 A Curve is to be used.	**U-1 Data Book Enc 4.3 – Section 2.10.1.A Loss of Decay Heat Removal with Water Level 9 inches above Hot Leg Centerline (Prior to Offload)**		
*4	Using Graph 2.10.1.A Operator determines the new thermal margin for the given conditions.	Operator determines the new Thermal margin from the graph to be = **(22-24) Minutes** **(9 Days after S/D)** **(120 Deg Curve)**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Operator Completes Step 1 of Attachment 12.6.	In Step 1 of Attach. 12.6 blank beside "Section/Curve Used" should be (**2.10.1.A**) and the performer's Initials filled in on the next line.		
6	Per Step 2 of Attach. 12.6, Operator documents the Thermal Margin time and Maximum NC temperature allowed in the table at the bottom of the attachment.	In the first two columns, operator records present Date and Time. In the 3rd and 4th Columns Operator records: **22-24 minutes for the Thermal Margin** and **120 Deg for Max NC Temp.**		
7	Operator performs Step 3 a. of Attach. 12.6 and records the new Thermal Margin time along with Support Conditions on Attach. 12.7.	Under the "Thermal Margin" Column operator records: **22-24** in the blank beside **TM Minutes**. Under "Support Conditions": **120** as the **Max NC Temp** **> 9** in the blank beside **NCS Level** **Note:** The rest of the blanks under "Support		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Conditions" can be either left blank or N/Aed.		
*8	Operator performs Step 3 b of Attach. 12.6 to Notify the (CCC) of the new Thermal Margin Time.	**Cue: The Containment Closure Coordinator has been notified.** The Operator should then initial the appropriate blank in the column at the bottom of Attach. 12.6		
*9	Operator performs Step 3 c of Attach 12.6 to Notify the (STA) of the new Thermal Margin Time.	**Cue: The Shift Technical Advisor (STA) has been notified** The Operator should then initial the appropriate blank in the column at the bottom of Attach. 12.6`		
10	Operator performs			

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	Step 3 d of Attach 12.6 to Notify the (STA) of the new Thermal Margin Time.	**Cue:** **The OATC will update the board on 1MC-6** The Operator should then initial the appropriate blank in the column at the bottom of Attach. 12.6		

STOP TIME_____

INITIAL CONDITIONS

The following conditions exist:

Unit #1 Reactor is in Mode 5 after being shutdown 9 days ago for a refueling outage. NC system is 114 degrees with "A" Train ND in service. NC System level is presently 140 inches. All S/G's have been drained for inspection. NC system sight glass has been placed in service and preparations are being made to lower NC system level to 55 inches to support reactor vessel head removal and entry into Mode 6 per OP/2/A/6100/SD-20 (Draining the NC System). LTOP requirements are being satisfied by removal of PZR Safety Valve 1NC-1. Containment Closure is in effect and Thermal Margin is 33 minutes.

You are the Control Room SRO on duty and as required by OP/1/A/6100/SD-20 (Draining the NC System) you are required to complete Attachment 12.6 of OMP 5-8 to determine the new thermal margin with NC system level at 55 inches and make the appropriate notifications.

* ANSWER KEY *

PS. 1

Attachment 12.6
Thermal Margin Determination

Applicable to Units: [✓] One
[ ] Two

PT/1(2)/A/4200/002 C (Containment Closure/Integrity) is required during outages for two purposes. One is to ensure any breached penetrations are closed within the time constraints of thermal margin (containment closure); the other is to ensure containment remains closed during core alterations (integrity). The purpose of this attachment is to provide guidance in determining the thermal margin time constraint and the communication of thermal margin time.

> **NOTE:** **IF** plant conditions are to be changed such that thermal margin will become less (i.e., decreasing NCS inventory), thermal margin shall be determined and communicated ahead of time (prior to decrease in thermal margin) to ensure containment closure requirements can be or will continue to be met.

WHEN containment closure is required (or thermal margin will change), determine and communicate thermal margin as follows:

1) Refer to OP/1(2)/A/6100/022, Unit 1(2) Databook, Enclosure 4.3, Section 2.10 "Thermal Margin Curves", to determine appropriate section and/or curve to use. SECTION/CURVE USED 2.10.1.A
INITIAL *

2) Document thermal margin time and maximum NC temperature allowed (for curve used) in the table below and initial.

3) Communicate thermal margin as follows:

   a) Write thermal margin time and max NC Temp on the "Shutdown Assessment/Status" (Attachment 12.7). Include any Data Book Enclosure 4.3 "Section" 2.10 support parameters (S/G Lvls, Pzr Lvl, etc.). Initial in table below.

   b) Notify the Containment Closure Coordinator (CCC) of the thermal margin time determined. Initial in table below.

   c) Notify the Shift Technical Advisor (STA) of the thermal margin determined. Initial in table below.

   d) Write thermal margin time on MC-6. Initial in table below.

				INITIAL COMPLETION OF ITEMS BELOW			
Date	Time	Thermal Margin MIN.	Max NC Temp °F	Thermal Margin Data Written on Shutdown Assessment/Status (Attachment 12.7)	Thermal Margin Time Written on MC-6	CCC Notified	STA Notified
PRESENT DATE	Present Time	23	120	*	*	*	*

End of Attachment

* → Initials of operator

SHUTDOWN ASSESSMENT/STATUS					
	Protected Train	Thermal Margin	Large Vent Path	LTOP Vent Path (Select 1)	Gravity Fill Vent Path (Select 1)
Desired NC Level 55 Date 3/6/07 Time 1030 OWPG Staff F. Kirk Desired NC Temp 115 Date 3/6/07 Time 1030 OWPG Staff F. Kirk	(Should include D/G, NV Pump, BAT Pump, NI Pump, ND Pump, KC Pumps, RN Pump, KF Pump) Circle selected Train: (A) (B)	(Notify CCC/STA when changed) TM Minutes 23 Support Conditions Max NC Temp 120°F S/G Level(s) N/A NCS Level > 9" Refuel Cavity Lvl N/A	Required prior to installing any S/G nozzle dam (N-D) Requirements (Select 1): • HL manway/diaphragm removed with HL N-D out (same S/G A,B,C,D) • CL manway/diaphragm removed with HL N-D out (same S/G A, B, D) • Rx Vessel Head removed S/G Location (circle): A B C D	• NC-32/34 operable • Pzr Safety out INC-1 • Pzr PORV Gagged • Pzr PORV out ____ • Other (specify)	• Same as Large Vent Path • Other per Data Book (specify) Pzr Safety Removed

Restoration of Available SSCs

SSC	Action	Responsibility	Communication

End of Attachment

* Answer key page 2 *

Prepared By: R. P. Weaver

Reviewed By: T K Poteat

Approved By: Alan Orton

TASK: **SLC determination of operable Fire Detection Zone 33**

POSITION: **SRO**

Operator's Name_____

Location: **Plant C/R** 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 __/__/__

References: OP/0/A/6400/002 C Fire Detection System
SLC Manual Section 16.9.6

JPM verified current with references by _____

Date ___/___/___

INITIAL CONDITIONS

A problem with the trouble alarms associated with two (2) fire detection circuits for Fire Zone 33 has been identified. A corrective action work request has been written. Through initial troubleshooting IAE has determined that the fire alarm associated with this circuit would still alarm even with the trouble alarm problem present.

The OSM would like for you to make the operability determination for Fire Zone 33 based on the information given. Also determine any required actions associated with this Zone if applicable.

JPM OVERALL STANDARD: Fire Zone 33 inoperable per SLC 16.9.6 Bases.
From Table 16.9.6-1 Fire Zone 33 is a function A instrument.
Fire Zone 33 has two detectors inoperable; therefore apply Condition B required action B.1 and B.2.1 or B.2.2 (which B.2.1 and B.2.2 do not apply)

NOTES:

KA: 2.2.25

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator obtains copy of SLC 16.9.6 which includes bases			
*2	Reference in the bases of SLC 16.9.6 the paragraph which determines OPERABILITY.	Operator determines that with Trouble Alarm that the Zone is inoperable.		
*3	Determines Condition B applies and Required Action B.1	**Determines that 2 detectors inoperable per SLC table for Zone 33.** Applies Condition B and required action B.1 **Establish fire watch patrol to inspect zone outside containment with inoperable instruments.**		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

A problem with the trouble alarms associated with two (2) fire instrumentation circuits for Fire Zone 33 has been identified. A corrective action work request has been written. Through initial troubleshooting IAE has demonstrated that the fire alarm associated with this circuit would still alarm even with the trouble alarm problem present.

The OSM would like for you to make the operability determination for Fire Zone 33 based on the information given. Also determine any required actions associated with this Zone if applicable.

16.9 AUXILIARY SYSTEMS

16.9.6 Fire Detection Instrumentation

COMMITMENT The fire detection instrumentation for each fire detection zone shown in Table 16.9.6-1 shall be OPERABLE.

APPLICABILITY Whenever equipment protected by fire detection instrument is required to be OPERABLE.

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more, but not more than half, of the Function A fire detectors in any zone inoperable.	A.1 Restore the inoperable instrument(s) to OPERABLE status.	14 days
B. More than half of the Function A fire detectors in any zone inoperable. OR One or more Function B fire detectors inoperable. OR Two or more adjacent fire detectors inoperable. OR Required Action and associated Completion Time of Condition A not met.	B.1 Establish fire watch patrol to inspect zones outside containment with inoperable instruments. AND B.2.1 Establish a fire watch patrol to inspect zones inside containment with inoperable instruments. OR B.2.2 Monitor containment air temperature at the locations given in ITS 3.6.5.1 or 3.6.5.2.	1 hour AND Once per hour thereafter 1 hour AND Once per 8 hours thereafter Once per hour

(continued)

REMEDIAL ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more annulus fire detectors inoperable.	C.1 Perform a fire watch patrol of the annulus.	1 hour
	AND	
	C.2.1 Verify at least one adjacent annulus fire detector zone is OPERABLE.	Once per hour thereafter
	OR	
	C.2.2 Perform a fire watch patrol of the annulus if no adjacent zone is OPERABLE.	Once per 8 hours thereafter

TESTING REQUIREMENTS

TEST		FREQUENCY
TR 16.9.6.1	Verify the non-supervised circuits associated with detector alarms between the instrument and the control room are OPERABLE.	31 days
TR 16.9.6.2	Verify the NFPA Standard 72D supervised circuits supervision associated with detector alarms are OPERABLE.	6 months
TR 16.9.6.3	Perform a TADOT on fire detectors which are accessible during plant operation.	6 months

(continued)

TESTING REQUIREMENTS (continued)

	TEST	FREQUENCY
TR 16.9.6.4	Perform a TADOT on fire detectors which are not accessible during plant operation.	Prior to entering MODE 4 when the unit has been in MODE 5 for 24 hours or more, if testing has not been performed in previous 6 months
TR 16.9.6.5	----------NOTE---------- Different detectors shall be selected for each test. ---------- Perform a TADOT on at least one detector on each signal initiating circuit for fixed temperature/rate of rise restorable spot type heat detectors which are accessible during plant operation.	6 months
TR 16.9.6.6	Perform a TADOT on fixed temperature/rate of rise restorable spot type heat detectors which are not accessible during plant operation.	Prior to entering MODE 4 when the unit has been in MODE 5 for 24 hours or more, if testing has not been performed in previous 6 months
TR 16.9.6.7	----------NOTE---------- For each failure that occurs, two additional detectors shall be removed and tested. ---------- Perform a functional test on at least 2% of the fixed temperature/rate of rise non-restorable spot type heat detectors.	5 years

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

Detector Zone	Description	Location	Number of Smoke Detectors	Number of Heat Detectors	Function[2]
1	Reactor Coolant Pump 1A	RCP-1A	0	1	A
2	Reactor Coolant Pump 1B	RCP-1B	0	1	A
3	Reactor Coolant Pump 1C	RCP-1C	0	1	A
4	Reactor Coolant Pump 1D	RCP-1D	0	1	A
5	Reactor Coolant Pump 2A	RCP-2A	0	1	A
6	Reactor Coolant Pump 2B	RCP-2B	0	1	A
7	Reactor Coolant Pump 2C	RCP-2C	0	1	A
8	Reactor Coolant Pump 2D	RCP-2D	0	1	A
29	Aux. Bldg. Vent Filter	KK52-53 EL. 767	2	0	A
30	Elec. Pen. Rm.	CC-51 EL. 767	9	0	A
31	Elec. Pen. Rm.	CC-51 EL. 750	10	0	A
32	Elec. Pen. Rm.	CC-51 EL. 733	11	0	A
33	Unit 2 Aux. Bldg. Vent. Filter	KK-59/60 EL. 767	2	0	A
34	Unit 2 Elec. Penetration Room	CC-61 EL. 767	9	0	A
35	Unit 2 Elec. Penetration Room	CC-61 EL. 750	10	0	A
36	Unit 2 Elec. Penetration Room	CC-61 EL. 733	11	0	A
37	Diesel Gen. 1A	CC-43 EL. 733	0(0)	8(4)	A(B)
38	Diesel Gen. 2A	CC-69 EL. 733	0(0)	8(4)	A(B)
39	Cable Room	CC-55 EL. 750	6	5	A
40	Control Room	CC-56 EL. 767	24	19	A
41	Swgr. Rm. IETA	AA-49 EL. 750	9	0	A
42	Swgr. Rm. IETB	AA-49 EL. 733	10	2	A
43	SWG. Room 2ETA	AA-62 EL. 750	9	0	A
44	SWG. Room 2ETB	AA-62 EL. 733	10	2	A
45A	Battery Room EVCA	CC-54 EL. 733	2	2	A
45B	Battery Room EVCB	CC-55 EL. 733	2	2	A

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

Detector Zone	Description	Location	Number of Smoke Detectors	Number of Heat Detectors	Function[2]
45C	Battery Room EVCC	CC-56 EL. 733	2	2	A
45D	Battery Room EVCD	CC-57 EL. 733	2	2	A
45G	Battery Chg. Equip. & Pnl EVCA, EVCC	CC-56 EL. 733	13	0	A
45H	Battery Chg. Equip. & Pnl EVCB, EVCD	BB-56 EL. 733	12	0	A
50	Diesel Gen. 1B	BB-43 EL. 733	0(0)	8(4)	A(B)
51	Diesel Gen. 2B	BB-69 EL. 733	0(0)	8(4)	A(B)
52	Unit 2 Cable Room	CC-57 EL. 750	6	5	A
61	Cont. Spray Pump 1A/Corridor	GG-55 EL. 695	2	2	A
62	Cont. Spray Pump 1B/Cooridor	GG-56 EL. 695	2	2	A
63	RHR Pump 1B	FF-54 EL. 695	1	1	A
64	RHR Pump 1A	GG-54 EL. 695	1	1	A
66	Cont. Spray Pump 2B/Corridor	GG-56 EL. 695	2	2	A
67	Cont. Spray Pump 2A/Cooridor	GG-57 EL. 695	2	2	A
68	RHR Pump 2A	GG-58 EL. 695	1	1	A
69	RHR Pump 2B	FF-58 EL. 695	1	1	A
70	Aux. FW Pumps	BB-51 EL. 716	10(0)	80)	A(B)
72	Mech. Pen. Rm./Cables	JJ-51 EL. 716	4	4	A
73	Corridor/Cables	HH-53 EL. 716	5	5	A
74	Sample Panel/Cables	EE-55 EL. 716	5	5	A
75	Cent. Chg. Pump 1B	JJ-55 EL. 716	2	2	A
76	Cent. Chg. Pump 1A	JJ-55 EL. 716	2	2	A
77	PD Pump #1	JJ-54 EL. 716	2	2	A
78	Safety Injection Pump 1A	HH-54 EL. 716	2	2	A
79	Safety Injection Pump 1B	GG-54 EL. 716	2	2	A
80	Aisle/Cables	GG-55 EL. 716	12	12	A
81	Aisle/Cables	GG-57 EL. 716	10	10	A

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

Detector Zone	Description	Location	Number of Smoke Detectors	Number of Heat Detectors	Function[2]
82	Cent. Chg. Pump 2B	JJ-57 EL. 716	2	2	A
83	Cent. Chg. Pump 2A	JJ-57 EL. 716	2	2	A
84	PD Pump #2	JJ-58 EL. 716	2	2	A
85	Safety Injection Pump 2A	HH-58 EL. 716	2	2	A
86	Safety Injection Pump 2B	GG-58 EL. 716	2	2	A
87	Aux. FW Pumps	CC-60 EL. 716	10(0)	8(1)	A(B)
88	Mech. Penetration Room/Cables	JJ-61 EL. 716	4	4	A
90	Corridor/Cables	NN-59 EL. 716	5	5	A
91	Corridor/Cables	EE-53 EL. 733	4	4	A
92	Corridor/Cables	JJ-51 EL. 733	6	6	A
93	Corridor/Cables	NN-52 EL. 733	11	11	A
94	Aisle/Cables	JJ-55 EL. 733	9	9	A
95	600V MCC 1EMXB - 1EMXB3	FF-55 EL. 733	1	1	A
96	Cable Tray Access	EE-55 EL. 733	1	1	A
97	Cable Tray Access	EE-57 EL. 733	1	1	A
98	600V MCC 2EMXB - 2EMXB3	FF-57 EL. 733	1	1	A
99	Aisle/Cables	JJ-57 EL. 733	9	9	A
100	Corridor/Cables	NN-58 EL. 733	12	12	A
101	Corridor/Cables	JJ-61 EL. 733	6	6	A
102	Corridor/Cables	EE-59 EL. 733	4	4	A
103	Corridor/Cables	MM-51 EL. 750	6	6	A
104	Hatch Area Cables	LL-53 EL. 750	7	7	A
106	600V MCC 1EMXA	FF-54 EL. 750	2	2	A
107	600V MCC 2EMXA	FF-57 EL. 750	3	3	A
108	Aisle/Cables	JJ-55 EL. 750	14	14	A
109	Hatch Area Cables	PP-57 EL. 750	15	15	A
110	Corridor/Cables	PP-60 EL. 750	8	8	A
111	Corridor/Cables	LL-59 EL. 750	6	6	A

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

Detector Zone	Description	Location	Number of Smoke Detectors	Number of Heat Detectors	Function[2]
112	Aisle/Cables	JJ-57 EL. 750	13	13	A
113	HVAC Equipment Area/Cables	FF-56 EL. 767	8	8	A
114	Respiratory Equipment Room	GG-54 EL. 767	1	1	A
115	Corridor/Cables	JJ-54 EL. 767	13	13	A
116	HVAC Equipment Area/Cables	NN-52 EL. 767	7	7	A
120	Environmental Lab	PP-55 EL. 767	1	1	A
122	HVAC Equipment Area	NN-59 EL. 767	7	7	A
123	Corridor/Cables	JJ-57 EL. 767	14	14	A
125	Fuel Pool Area	NN-62 EL. 778+10	19	14	A
127	Fuel Pool Area	NN-50 EL. 731+ 6	18	14	A
128	Aisle/Cable	EE-57 EL. 716	5	5	A
129	600V MCC 2EMXH	KK-56 EL. 733	1	1	A
130	Cables/KF Pumps	PP-52 EL. 750	4	4	A
131	Respiratory	HH-56 EL. 767	5	5	A
134	RB Pipe Corridor-Unit 1	215° - 270°	0	5	A
135	RB Pipe Corridor-Unit 1	270°- 315°	0	5	A
136	RB Pipe Corridor-Unit 1	315° - 0°	0	6	A
137	RB Pipe Corridor-Unit 1	0° - 44°	0	4	A
138	RB Pipe Corridor-Unit 1	44° - 90°	0	4	A
139	RB Pipe Corridor-Unit 1	90° - 126°	0	4	A
140	RB Pipe Corridor-Unit 1	126° - 173°	0	7	A
141	RB Below Oper. Floor-Unit 1	329° - 349°	0	7	A
142	RB Below Oper. Floor-Unit 1	13° - 29°	0	4	A
143	RB Below Oper. Floor-Unit 1	34° - 51°	0	3	A
144	RB Below Oper. Floor-Unit 1	51° - 124°	0	13	A
145	RB Below Oper. Floor-Unit 1	124° - 143°	0	3	A
146	RB Below Oper. Floor-Unit 1	143° - 167°	0	8	A

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

Detector Zone	Description	Location	Number of Smoke Detectors	Number of Heat Detectors	Function[2]
147	RB Below Oper. Floor-Unit I	RCP - 1A Motor	0	5	A
148	RB Below Oper, Floor-Unit 1	RCP - 1 B Motor	0	2	A
149	RB Below Oper. Floor-Unit 1	RCP - 1C Motor	0	4	A
150	RB Below Oper. Floor-Unit 1	RCP - 1D Motor	0	5	A
151	RB Below Oper. Floor-Unit 1	Purge Filter Bed	0	2	A
152	RB Below Oper. Floor-Unit 1	Purge Filter Bed	0	2	A
c153	RB Annulus - Unit 1	293° - 331°	10	10	B
c154	RB Annulus - Unit 1	324° - 0°	4	4	B
c155	RB Annulus - Unit 1	0° - 50°	5	5	B
c156	RB Annulus - Unit 1	50° - 88°	4	4	B
c157	RB Annulus - Unit 1	88° - 123°	24	24	B
c158	RB Annulus - Unit 1	123° - 165°	22	22	B
c159	RB Annulus - Unit I	333° - 16°	13	13	B
c160	RB Annulus - Unit I	16° - 54°	23	23	B
c161	RB Annulus - Unit 1	122° - 180°	16	16	B
c162	RB Annulus - Unit 1	180° - 256°	14	13	B
163	Unit 2 RB Pipe Corridor	215° - 270°	0	4	A
164	Unit 2 RB Pipe Corridor	270°- 315°	0	5	A
165	Unit 2 RB Pipe Corridor	315° - 0°	0	6	A
166	Unit 2 RB Pipe Corridor	0° - 44°	0	4	A
167	Unit 2 RB Pipe Corridor	44° - 90°	0	4	A
168	Unit 2 RB Pipe Corridor	90° - 126°	0	4	A
169	Unit 2 RB Pipe Corridor	126° - 173°	0	7	A
170	Unit 2 RB Below Oper. Floor	329° - 347°	0	7	A
171	Unit 2 RB Below Oper. Floor	13° - 29°	0	4	A
172	Unit 2 RB Below Oper. Floor	34° - 51°	0	3	A
173	Unit 2 RB Below Oper. Floor	51° - 124°	0	13	A

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

Detector Zone	Description	Location	Number of Smoke Detectors	Number of Heat Detectors	Function[2]
174	Unit 2 RB Below Oper. Floor	124° - 143°	0	3	A
175	Unit 2 RB Below Oper. Floor	143° - 167°	0	8	A
176	Unit 2 RB Below Oper. Floor	RCP - 2A Motor	0	4	A
177	Unit 2 RB Below Oper. Floor	RCP – 2B Motor	0	3	A
178	Unit 2 RB Below Oper. Floor	RCP – 2C Motor	0	3	A
179	Unit 2 RB Below Oper. Floor	RCP – 2D Motor	0	5	A
180	Unit 2 RB Below Oper. Floor	Purge Filter Bed	0	2	A
181	Unit 2 RB Below Oper. Floor	Purge Filter Bed	0	2	A
d182	Unit 2 RB Annulus	293° - 331°	10	10	B
d183	Unit 2 RB Annulus	324° - 0°	4	4	B
d184	Unit 2 RB Annulus	0° - 50°	5	5	B
d185	Unit 2 RB Annulus	50° - 88°	4	4	B
d186	Unit 2 RB Annulus	88° - 123°	24	24	B
d187	Unit 2 RB Annulus	123° - 165°	22	22	B
d188	Unit 2 RB Annulus	333° - 16°	13	13	B
d189	Unit 2 RB Annulus	16° - 54°	23	23	B
d190	Unit 2 RB Annulus	122° - 180°	16	16	B
d191	Unit 2 RB Annulus	180° - 256°	13	13	B
197	Mech. Pen. Rm./UHI Valves	JJ-52 EL. 750	5	5	A
198	Mech. Pen. Rm./UHI Valves	JJ-60 EL. 750	5	5	A
206	Control Room Control Board	AA-56 EL. 767	20	5	A
c153A	RB Annulus - Unit 1 (Note 3)	0°-360° EL. 745	0	Note 5	B
c153B	RB Annulus - Unit 1 (Note 3)	0°-360° EL. 765	0	Note 5	B
c153C	RB Annulus - Unit 1 (Note 3)	0°-360° EL. 785	0	Note 5	B
c153D	RB Annulus - Unit 1 (Note 3)	0°-360° EL. 805	0	Note 5	B
c153E	RB Annulus - Unit 1 (Note 3)	0°-360° EL. 820	0	Note 5	B
c153F	RB Annulus - Unit 1 (Note 3)	0°-360° EL. 835	0	Note 5	B

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

Detector Zone	Description	Location	Number of Smoke Detectors	Number of Heat Detectors	Function[2]
d182A	RB Annulus – Unit 2 (Note 4)	0°-360° EL. 745	0	Note 5	B
d182B	RB Annulus – Unit 2 (Note 4)	0°-360° EL. 765	0	Note 5	B
d182C	RB Annulus – Unit 2 (Note 4)	0°-360° EL. 785	0	Note 5	B
d182D	RB Annulus – Unit 2 (Note 4)	0°-360° EL. 805	0	Note 5	B
d182E	RB Annulus – Unit 2 (Note 4)	0°-360° EL. 820	0	Note 5	B
d182F	RB Annulus – Unit 2 (Note 4)	0°-360° EL. 835	0	Note 5	B
400A	Interior Doghouse - Unit 2	Int. Doghouse - U2	0	Note 6	A
400B	Exterior Doghouse - Unit 2	Ext. Doghouse - U2	0	Note 6	A

Deleted: 400A ... [1]

NOTES:

1. The fire detection instruments located within containment are not required to be OPERABLE during the performance of Type A containment leakage rate tests.

2. Function A: Early warning fire detection and notification only.
   Function B: Actuation of fire suppression system and early warning and notification.

3. Upon implementation of NSM MG-12106/00, zones 153 – 162 in RB Annulus – Unit 1 will be deleted and zones 153A – 153F will be active fire detection instrumentation.

4. Upon implementation of NSM MG-22106/00, zones 182 – 191 in RB Annulus – Unit 2 will be deleted and zones 182A – 182F will be active fire detection instrumentation.

5. The fire detection instruments located in the RB Annulus are restorable, cable-type sensors which cover the entire 360 degrees of the annulus at each subzone elevation.

6. The fire detection instruments in each doghouse consists of (9) heat detectors and (4) flame detectors.

Deleted: 6. The fire detection instruments in each doghouse consists of (9) heat detectors and (4) flame detectors.¶

BASES

Fire detection instrumentation is required to be operable at all times unless a complete evaluation has been made of the area protected by any particular instrument and all equipment in that area has been identified and determined not to be required operable. This evaluation would have to consider not only mechanical equipment in the area but all piping, tubing, and cables that transit through the area.

OPERABILITY of the detection instrumentation ensures that both adequate warning capability is available for prompt detection of fires and that fire suppression systems, that are actuated by fire detectors, will discharge the extinguishing agent in a timely manner. Prompt detection and suppression of fires will reduce the potential for damage to safety-related equipment and is an integral element in the overall facility fire protection program. An inoperable detector is defined as: a) a fire alarm with no actual fire or b) a trouble alarm.

Fire detectors that are used to actuate Fire Suppression Systems represent a more critically important component of a plant's fire protection program than detectors that are installed solely for early fire warning and notification. Consequently, the minimum number of OPERABLE fire detectors must be greater.

The loss of detection capability for the Fire Suppression Systems, actuated by fire detectors, represents a significant degradation of fire protection for any area. The establishment of frequent fire patrols in the affected areas is required to provide detection capability until the inoperable instrumentation is restored to OPERABLE status. If fire detection capability is monitored by a local or remote panel, the fire watch patrol needs only check the panel to verify no loss in fire detection capability. Note that the MNS Fire Protection Safe Shutdown Review considers the annulus to be part of the containment building.

This selected licensee commitment is part of the McGuire Fire Protection Program and therefore subject to the provisions of McGuire Facility Operating License Conditions C.4 (Unit 1) and C.7 (Unit 2).

REFERENCES

1. McGuire Nuclear Station UFSAR, Chapter 9.5.1

2. McGuire Nuclear Station SER Supplement 2, Chapter 9.5.1 and Appendix D

3. McGuire Nuclear Station SER Supplement 5, Chapter 9.5.1 and Appendix B

4. McGuire Fire Protection Review, as revised

5. McGuire Nuclear Station SER Supplement 6, Chapter 9.5.1 and Appendix C

6. NFPA Codes 72D and 72E

7. McGuire Nuclear Station Facility Operating Licenses, Unit 1 License Condition C.(4) and Unit 2 License Condition C.(7)

Page 10: [1] Deleted	bcb8007	01/25/2007 7:12:00 AM
400A	Interior Doghouse - Unit 2	0
400B	Exterior Doghouse - Unit 2	0

Reviewed By: _____

Approved By: _____

TASK: **Evaluate LWR Paperwork**

POSITION: **SRO**

Operator's Name_____

Validation Time: 20 minutes

Actual JPM completion time: _____

Location: **Classroom** 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/B/6200/107 Liquid Waste Release – WMT B with WMT Pump B

JPM verified current with references by _____

Date ___/___/

KA: G2.3.6 (2.1/3.1)

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 is at 75% power with 4 RC pumps running.
- Unit 2 is in No Mode with all RC pumps tagged.
- LWR Number 2007046 for WMT B is scheduled to be performed.
- OP/0/B/6200/107 is complete up to step 3.15.

The following components are operable:

- 0WMLP5140
- 1WP-35
- 1WP-37
- 0EMF-49(L)
- 0EMF-49(L) flow switch

RP brings the Liquid Waste Release Permit and OP/0/B/6200/107, Encl 4.3 to the Control Room and asks you, the Control Room SRO, to perform step 3.15.

JPM OVERALL STANDARD: Identifies 4 errors in the LWR and directs RP to correct the errors.

1. RC pumps running is less than total RC pumps required (all concurrent releases)
2. Recommended Release Rate is greater than Allowable Release Rate
3. 0EMF-49(L) Trip 1 setpoint is less than Expected CPM
4. No Source Check signature

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Determine operability status of the following components and circle "Yes" or "No" to indicate: • WM Flow Loop • 1WP-35 • 1WP-37 • 0EMF-49(L) • 0EMF-49(L) flow switch	Given in Initial Conditions. SRO circles Yes for all components.		
2	**IF** any component listed in Step 3.5.1 is inoperable, notify Radwaste Chemistry and return LWR document.	All components are operable, so SRO N/As this step.		
3	Ensure the following items on LWR Document are complete:			
4	Number of "RC Pumps Running" is greater than or equal to "RC Pumps Assigned to this Release"	Number of RC pumps running (4) is greater than RC pumps assigned to release (3)		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	Number of "RC Pumps Running is greater than "Total RC Pumps Required (all concurrent Releases)"	SRO recognizes the following error: Number of RC pumps running (4) is **LESS THAN** Total RC Pumps Required (all concurrent releases) (6) **<u>EVALUATOR NOTE:</u>** **If student stops here, ask them to continue their review of the LWR.**		
*6	"Recommended Release Rate (gpm)" is less than "Allowable Release Rate (gpm)"	SRO recognizes the following error: Recommended release rate (120 gpm) should **NOT** be greater than the Allowable Release Rate (95 gpm)		
7	0EMF-49L is operable and in service	Per the Initial Conditions, 0EMF-49(L) is operable.		
*8	0EMF-49L source check performed.	SRO recognizes the following error: No signature for "Source Checked By"		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	"Expected CPM" is less than "Trip 1 Setpoint" and "Trip 2 Setpoint".	SRO recognizes the following error: The Trip 1 Setpoint is less than the Expected CPM.		
*10	**WHEN** approved for release, place signature, date, and time of SRO authorization on LWR document.	The SRO does NOT approve the release. 4 errors are identified.		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 is at 75% power with 4 RC pumps running.
- Unit 2 is in No Mode with all RC pumps tagged.
- LWR Number 2007046 for WMT B is scheduled to be performed.
- OP/0/B/6200/107, Encl 4.3 (*B WMT Release Using B WMT Pump*) is complete up to step 3.15.

The following components are operable:

- 0WMLP5140
- 1WP-35
- 1WP-37
- 0EMF-49(L)
- 0EMF-49(L) flow switch

RP brings the Liquid Waste Release Permit and OP/0/B/6200/107, Encl 4.3 to the Control Room and asks you, the Control Room SRO, to perform step 3.15.

LIQUID WASTE RELEASE PERMIT REPORT

LWR Number: 2007046
Release ID: Waste Monitor Tank "B"

Comments:

=== NUCLIDE DATA ==========

Nuclide	Undiluted uCi/ml	EC	EC Ratio
CS-137	7.23E-06	1.00E-06	2.50E-01
Gamma	7.23E-06		
H-3	2.00E+00	1.00E-03	2.00E+03
Beta	2.00E+00		
Total	2.00E+00		2.00E+03

=== MULTIPLE RELEASE CALCULATION ==========
Sum of recommended flowrate divided by
allowable flowrate for all concurrent releases
(Must be less than or equal to one)..... 7.92E-01

LIQUID WASTE RELEASE PERMIT REPORT

LWR Number: 2007046
Release ID: Waste Monitor Tank "B"

=== RC PUMP DATA ==========

RC pumps running..... 4.00
RC pumps assigned to RELEASE..... 3.00
Total RC pumps required (all concurrent releases)..... 6.00

=== RECOMMENDED RELEASE RATE ==========

Allowable release rate (gpm)..... 9.50E+01
Recommended release rate (gpm)..... 1.20E+02

=== SETPOINT DATA ==========

EMF49L in Service ..... Yes
Monitor Background (cpm)..... 4.00E+03

Source Checked By:_____

Cs-137 Equivalence (uCi/ML)... 7.23E-06

Expected CPM..... 4.09E+03

EMF49L Trip 1 & 2

Trip 1 setpoint (cpm)..... 3.99E+03

Set by:_____

Trip 2 setpoint (cpm)..... 1.38E+04

Performed by:_____

IVed by:_____

=== Special Instructions For Release:

_____

_____

SRO Authorization: _____ Date/Time _____

Release Initiation

RP _____ RC Pumps Required for Dilution Switch Set to _____

Chem _____ Rel. Start _____ _____
Date Time

Chem _____# RC Pumps Running _____

Release Completion

Chem _____ Rel. Stop _____ _____
Date Time

Chem _____ Vol. Released _____Gal

Chem _____ RC Pumps Required for Dilution Switch As Found___

Completion of Release Acknowledged

OPS SRO _____ Date/Time _____ _____

RP Shift Review _____ Date/Time _____ _____

ANSWER KEY
PS.1

3.15 CR SRO performs the following steps: {PIP M-03-01124} {PIP M-04-03470}

Initial SRO 3.15.1 Determine operability status of the following components and circle "Yes" or "No" to so indicate:

0WMLP5140 (B WMT Pump Disch Flow) [i.e., 0WMCR5130 (Waste Mon Tank Pumps Disch Flow) or 0WMFT5140 (B Waste Monitor Tank Pump Disch Flow)]	(Yes/No)
1WP-35 (WMT & VUCDT to RC Cntrl)	(Yes/No)
1WP-37 (Liquid Waste to RC Cntrl)	(Yes/No)
0EMF49 (Liquid Waste Disch Radiation Monitor)	(Yes/No)
0WMFS5440 (0EMF49 Outlet Flow) {PIP M-03-02673}	(Yes/No)

N/A SRO 3.15.2 **IF** any component listed in Step 3.15.1 is inoperable, notify Radwaste Chemistry and return LWR Document.

____ SRO 3.15.3 Ensure the following items on LWR Document are complete:

- Number of "RC Pumps Running" is greater than or equal to "RC Pumps Assigned to this Release".
- Number of "RC Pumps Running" is greater than "Total RC Pumps Required (all concurrent Releases)".
- "Recommended Release Rate (gpm)" is less than "Allowable Release Rate (gpm)".
- 0EMF49L is operable and in service.
- 0EMF49 source check performed.
- "Expected CPM" is less than "Trip 1 Setpoint" and "Trip 2 Setpoint".

____ SRO 3.15.4 **WHEN** approved for release, place signature, date, and time of SRO authorization on LWR Document.

ANSWER KEY

PJ. 2

LIQUID WASTE RELEASE PERMIT REPORT

LWR Number: 2007046
Release ID: Waste Monitor Tank "B"

=== RC PUMP DATA ==========

RC pumps running..... 4.00
RC pumps assigned to RELEASE..... 3.00
Total RC pumps required (all concurrent releases)..... 6.00

Error #1

=== RECOMMENDED RELEASE RATE ==========

Allowable release rate (gpm)..... 9.50E+01
Recommended release rate (gpm)..... 1.20E+02

Error #2

=== SETPOINT DATA ==========

EMF49L in Service ..... Yes
Monitor Background (cpm)..... 4.00E+03

Source Checked By: _____

Error #4

Cs-137 Equivalence (uCi/ML)... 7.23E-06

Expected CPM..... 4.09E+03

Error #3

EMF49L Trip 1 & 2

Trip 1 setpoint (cpm)..... 3.99E+03

Set by: PS Holt

Trip 2 setpoint (cpm)..... 1.38E+04

Performed by: PS Holt

IVed by: FB Kuk

=== Special Instructions For Release:

_____

_____

SRO Authorization: _____ Date/Time _____

Release Initiation

RP _____ RC Pumps Required for Dilution Switch Set to _____

Chem _____ Rel. Start _____ _____ (Date Time)

Chem _____# RC Pumps Running _____

Release Completion

Chem _____ Rel. Stop _____ _____ (Date Time)

Chem _____ Vol. Released _____Gal

Chem _____ RC Pumps Required for Dilution Switch As Found___

Completion of Release Acknowledged

OPS SRO _____ Date/Time _____ _____

RP Shift Review _____ Date/Time _____ _____

Reviewed By: _____

Approved By: _____

TASK: **Declare an Emergency Classification and Complete the ENS Notification Form**

POSITION: **SRO**

Operator's Name _____

Location: **Plant/Simulator** Method: **Perform**

Estimated JPM Completion Time: 20 Minutes

Actual JPM Completion Time: _____ Minutes

Required Time Critical Completion Time 15 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: RP/0/A/5700/000 Classification of an Emergency
RP/0/A/5700/003 Site Area Emergency
RP/0/A/5700/029 Notifications to Offsite Agencies From The Control Room

JPM verified current with references by _____

Date _____/_____/_____

INITIAL CONDITIONS

THIS IS A DRILL.....

You are the WCC SRO/Offsite Communicator.

- **Determine the appropriate emergency classification for the event based on the data provided to you.**
- **Complete the "Immediate Actions" of the appropriate response procedure.**

NOTE: TIME CRITICAL AFTER CLASSIFICATION OF EVENT IS DETERMINED.

.....THIS IS A DRILL

JPM OVERALL STANDARD: The Event is classified as a Site Area Emergency. The ENS Notification form is completed within 15 minutes.

NOTES: This JPM is intended to be used with a data sheet provided to the candidate from which to base the classification. See Attachment 1 for the data sheet.

The instructor shall enter the Reactor Shutdown Time and Date in the appropriate blanks of step 4 (page 5) of this JPM (based on the actual performance time of the JPM) and give this information in the form of a cue when this step is performed.

The Evaluator should have copies of all 4 RP procedures (01,02,03,04) available in case the examinee incorrectly classifies the event. RP/000 should also be provided.

KA 194 001 A1.16

TASK MO-9303

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Classify the event per RP/0/A/5700/000	Event is classified as a **Site Area Emergency** (5 points for loss of NCS Barrier plus 3 points for loss of Containment Barrier. Total of 8 points, EAL # 4.1.S.3 (Loss of Containment **AND** Loss **OR** Potential Loss of any other Barrier)) **NOTE:** Once Declaration is made, enter time below for start of time critical portion of JPM **Start Time For Time Critical:** ----------		
2	From RP/0/A/5700/003 • The following Enclosures should be given to the appropriate personnel..... • Have an SRO make offsite notifications PER RP/0/B/5700/029 (Notifications to Offsite Agencies from the Control Room)	Operator implements RP/0/A/5700/003 (Site Area Emergency) **Cue: The appropriate enclosures have been given to the OSM and STA.** **Operator implements RP/0/B/5700/029 (Notifications to Offsite Agencies from the Control Room)**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	Immediate Actions of RP/0/B/5700/029 For Initial Notifications, perform Enclosure 4.1 (Completion and Transmission of an Initial Notification).	Operator proceeds to Enc. 4.1 to perform an initial notification.		
4	IF an upgrade in classification occurs prior to transmitting the initial message..... Complete an Emergency Notification Form by one of the following: Obtain a preprinted ENF OR Obtain a blank ENF. Complete Line 1 as follows:	N/A Note: Evaluator should have the Pre-Printed ENF notebook available for use		
*	• Check A (Drill) OR B (Actual Event)	**<u>Operator checks "A" - Drill</u>**		
	• Record message number.	**<u>Operator writes message number 1</u>**		
	• On Line 2 check A (Initial)	Same		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	Continued			
	Complete Line 3 as follows:			
	• Record "McGuire Nuclear Site" as site	Same		
	• Record (704) 875-6044 as confirmation telephone number	Same		
	Complete Line 4 as follows:			
*	• Check correct emergency classification	**Operator checks "C" for SITE AREA EMERGENCY**		
*	• Record EAL number	**Operator enters "EAL # 4.1.S.3**		
*	• Record the EAL Description.	**Operator enters "Loss of Containment AND Loss OR Potential Loss of any other Barrier"**		
		OR		
*		**Selects correct pre-printed form.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	**Continued**			
	Complete Line 5 as follows:			
*	IF NOUE, Alert, OR Site Area Emergency, check A (None),	**Operators checks "A" - None**		
	GO TO Step 2.6.	Same		
	Complete Line 6 as follows:			
*	IF any of the following exists, check "B" (is occurring) OR "C" (has occurred) as appropriate:			
	• EMF 38, 39, or 40 readings indicate an increase and containment pressure greater than 0.3 psig	NA		
	• EMF 38, 39, or 40 readings indicate an increase and a known leak path exists from containment	NA		
	• EMF 35, 36 or 37 readings indicate an increase in activity.	NA		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	Continued			
	• EMF 33 or other alternate means indicate Steam Generator tube leakage.	**Operator checks "B"(is occurring) OR "C" (has occurred**)		
	• A known release path exists	NA		
	• Alternate method of release determination	NA		
	IF no emergency release exists, check A (None)	N/A		
	Complete Line 7 as follows:			
	IF no release in progress, check A (Not applicable), GO TO step 2.8	N/A		
	IF release significance is known, check B (Within normal operating limits) OR C (Above normal operating limits) as appropriate, GO TO Step 2.8	N/A		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	Continued			
	IF release significance is unknown, check D (Under Evaluation)	**Operator checks "D" – Under Evaluation**		
	Complete Line 8 by checking appropriate block:	**Operator checks "A" - Improving, or "B" - Stable**		
*	Complete Line 9 as follows…..:	**Operators determines completion of Line 9 is not required since this is an initial notification**		
	Complete Line 10 as follows:			
	Check A (Declaration)			
	Record declaration time and date.	Same Operator records time and date of declaration.		
*	Complete Line 11 as follows:			
	Evaluate for applicability to both units	N/A		
	IF event affects both units equally, check all.			

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	Continued	N/A		
*	IF event only affects one unit or one unit escalates, check appropriate unit.	**Operator checks Unit 1**		
	Complete Line 12 by checking affected unit(s) and recording unit status for Unit(s) affected by the event.	**Operator checks "A" – for Unit 1.** **Operator records 0% power.** **Operator records time and date of unit shutdown.**		
		CUE: Time is equal to present time minus 15 minutes		
	On Line 13, record any additional information directed by the Emergency Coordinator.	Cue: No additional information is required at this time.		
	Complete Line 17 as follows: Have the Emergency Coordinator approve.	Cue: The Emergency Coordinator, John Doe, just approved the message		
	Record time / date.	**Operator enters current time/date.**		
	Record your name on Notified By.	**Operator writes in his or her own name**.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Transmit the message to Offsite Agencies as follows:	Same		
	IF an upgrade in classification occurs while transmitting any message, perform the following.....	N/A		
	Establish communications with Offsite Agencies as follows:	**Operator dials *1, presses the push to talk button on the Mock Selective Signaling phone, as needed, in following steps.**		
*	• Use the Selective Signaling Telephone by depressing "* (star) 1".	Cue: *1 dialed on Selective Signaling telephone, the push to talk button is depressed.		
		NOTE: This step signifies the end of the Time Critical portion of this JPM. Enter the stop time below		
		Stop Time For Time Critical _____		
		Cue: Another operator will make the transmission to the State and Counties and complete the subsequent actions.		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

THIS IS A DRILL.....

You are the WCC SRO/Offsite Communicator.

- **Determine the appropriate emergency classification for the event based on the data provided to you.**
- **Complete the "Immediate Actions" of the appropriate response procedure.**
- **Weather information is not available at this time**

<u>NOTE</u>: TIME CRITICAL AFTER CLASSIFICATION OF EVENT IS DETERMINED.

.....THIS IS A DRILL

Attachment 1

DATA SHEET

SEQUENCE OF EVENTS (include parameters and time as necessary):

T_0	Determined Unit 1 has a 60 gpm steam generator tube leak on 1D steam generator.
T_0 + 10	A unit shutdown is commenced to take the unit off line.
T_0 + 20	1D SG leakage rate increases to 230 gpm
T_0 + 35	Unit 1 Reactor Trip and Safety Injection initiated
T_0 + 36	E-0 entered.
T_0 + 40	1D Steam Generator indicates decreasing steam pressure
T_0 + 50	Containment pressure peaks at 7 psig.
Present	**Event has not been classified and no notifications have been made.**

AP's and EP's used (in sequence):

AP/1/A/5500/10 NC System Leakage Within Capacity of NC Pumps Case 1(SG Tube Leakage)
AP/1A/5500/04 Rapid Downpower
EP/1/A/5000/E-0 Reactor Trip or Safety Injection
EP/1/A/5500/FR-Z-1 Response to High Containment Pressure
EP/1/A/5000/E-2 Faulted Steam Generator Isolation
EP/1/A/5000/E-3 Steam Generator Tube Rupture

MALFUNCTIONING/INOPERABLE EQUIPMENT:

None

OTHER INFORMATION:

None

* ANSWER KEY *

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

. [A] DRILL [B] ACTUAL EVENT MESSAGE # 1

. [A] INITIAL [B] FOLLOW-UP NOTIFICATION: TIME ____ DATE ____ / ____ / ____ AUTHENTICATION # ____

. SITE: McGuire Nuclear Site Confirmation Phone # (704) 875-6044

. EMERGENCY CLASSIFICATION: [A] UNUSUAL EVENT [B] ALERT [C] SITE AREA EMERGENCY [D] GENERAL EMERGENCY

BASED ON EAL# 4.1.S.3 EAL DESCRIPTION Loss of Containment AND Loss OR Potential Loss of Any Other Barrier. This EAL poses no threat to the safety of the general public.

. PROTECTIVE ACTION RECOMMENDATIONS: [A] NONE

[B] EVACUATE ____

[C] SHELTER ____

[D] CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.

[E] OTHER ____

. EMERGENCY RELEASE: [A] None [B] Is Occurring [C] Has Occurred

. RELEASE SIGNIFICANCE: [A] Not applicable [B] Within normal operating limits [C] Above normal operating limits [D] Under Evaluation

. EVENT PROGNOSIS: [A] Improving [B] Stable [C] Degrading

. METEOROLOGICAL DATA: Wind Direction* from ____ degrees Wind Speed* ____ mph

(* May not be available for Initial Notifications) Precipitation* ____ Stability Class* [A] [B] [C] [D] [E] [F] [G]

0 [A] DECLARATION [B] TERMINATION Time (TIME STEP 1 OF THE JPM IS COMPLETE) Date (PRESENT DATE)

1. AFFECTED UNIT(S): [1] [2] [3] [All]

2. Unit Status:
(Unaffected Unit(s) Status Not Required for Initial Notifications)

[A] U1 ____ % Power Shutdown at: Time (Present Time minus 15 min) Date (PRESENT DATE)

[B] U2 ____ % Power Shutdown at: Time ____ Date ____ / ____ / ____

[C] U3 ____ % Power Shutdown at: Time ____ Date ____ / ____ / ____

3. REMARKS: ____

FOLLOW-UP INFORMATION (Lines 14 through 16 Not Required for Initial Notifications)

EMERGENCY RELEASE DATA. NOT REQUIRED IF LINE 6A IS SELECTED.

4. RELEASE CHARACTERIZATION: TYPE: [A] Elevated [B] Mixed [C] Ground UNITS: [A] Ci [B] Ci/sec [C] µCi/sec

MAGNITUDE: Noble Gases: ____ Iodines: ____ Particulates: ____ Other: ____

FORM: [A] Airborne Start Time: ____ Date: ____ / ____ / ____ Stop Time: ____ Date ____ / ____ / ____

[B] Liquid Start Time: ____ Date: ____ / ____ / ____ Stop Time: ____ Date ____ / ____ / ____

5. PROJECTION PARAMETERS: Projection Period: ____ Hours Estimated Release Duration: ____ Hours

Projection performed: Time ____ Date ____ / ____ / ____

6. PROJECTED DOSE:

DISTANCE	TEDE (mrem)	Adult Thyroid CDE (mrem)
Site boundary		
2 Miles		
5 Miles		
10 Miles		

7. APPROVED BY: JOHN DOE Title: Emergency Coordinator Time: CURRENT Date: TIME, AND, DATE

NOTIFIED BY: OPERATORS OWN NAME RECEIVED BY: ____ Time: ____ Date: ____ / ____ / ____

Duke Energy McGuire Nuclear Station **NOTIFICATIONS TO OFFSITE AGENCIES FROM THE CONTROL ROOM** **Reference Use**	Procedure No. **RP/0/B/5700/029** Revision No. **004** Electronic Reference No. **MP0072VO**

PERFORMANCE

* * * * * * * * * * UNCONTROLLED FOR PRINT * * * * * * * * * *

(ISSUED) - PDF Format

Notifications to Offsite Agencies from the Control Room

1. Symptoms

Events are in progress or have occurred that require implementing the McGuire Emergency Plan and notification of offsite agencies. {PIP-M-02-2012}

2. Immediate Actions

☐ 2.1 For Initial Notifications, perform Enclosure 4.1 (Completion and Transmission of an Initial Notification Message).

3. Subsequent Actions

☐ 3.1 For Follow-up Notifications, perform Enclosure 4.2 (Completion and Transmission of a Follow-up Notification Message).

☐ 3.2 For Termination Messages, perform Enclosure 4.3 (Completion and Transmission of a Termination Notification Message).

4. Enclosures

4.1 Completion and Transmission of an Initial Notification Message

4.2 Completion and Transmission of a Follow-up Notification Message

4.3 Completion and Transmission of a Termination Notification Message

4.4 Offsite Protective Action Recommendations

4.5 NRC Event Notification Worksheet

4.6 County Emergency Response Radio

Enclosure 4.1
Completion and Transmission of an Initial Notification Message

NOTE:	Initial notification to the State and Counties must be made within 15 minutes of the event declaration.

_____ 1. **IF** an upgrade in classification occurs prior to transmitting the initial message, perform the following:

☐ 1.1 Discard ENF paper work.

☐ 1.2 Begin a new initial message for the higher classification. {PIP-M-01-3711}

2. Complete an Emergency Notification Form by one of the following:

☐ Obtain a preprinted ENF.

OR

☐ Obtain a blank ENF.

NOTE:	Messages are sequentially numbered throughout the drill/event beginning with message number 1, and continues until termination of the drill/event.

2.1 Complete Line 1 as follows:

☐ 2.1.1 Check A (Drill) **OR** B (Actual Event).

☐ 2.1.2 Record message number.

NOTE:	Notification Time, Date, and Authentication will be completed during message transmission.

☐2.2 On Line 2 check A (Initial).

2.3 Complete Line 3 as follows:

☐ 2.3.1 Record "McGuire Nuclear Site" as Site.

☐ 2.3.2 Record (704) 875-6044 as confirmation telephone number.

2.4 Complete Line 4 as follows:

☐ 2.4.1 Check correct emergency classification.

☐ 2.4.2 Record EAL (IC) number.

☐ 2.4.3 Record the EAL (IC) Description.

2.5 Complete Line 5 as follows:

_____ 2.5.1 **IF** Notification of Unusual Event, Alert, **OR** Site Area Emergency check A (None), **GO TO** Step 2.6.

_____ 2.5.2 **IF** General Emergency perform the following:

☐ A. Determine Protective Action Recommendations per Enclosure 4.4 (Offsite Protective Action Recommendations).

☐ B. Check B (Evacuate) and record affected zones for evacuation.

☐ C. Check C (Shelter) and record affected zones for sheltering.

_____ D. **IF** notified by RP Dose Assessment that dose projections or field measurements indicate Thyroid dose will be equal to or greater than 5 Rem, check D. {PIP-G-03-606}

☐ E. For any other Protective Action Recommendations, check E (Other) and record information.

NOTE:	An Emergency Release is an unplanned, quantifiable radiological release to the environment during an emergency event. The release does not have to be related to the declared emergency. {PIP-M-97-4256} {FAM Sect. 3.7, rev. 7}

2.6 Complete Line 6 as follows:

_____ 2.6.1 **IF** any of the following exists, check B (is occurring) **OR** C (has occurred) as appropriate: {PIP-M-03-2358}

- EMF 38, 39 or 40 readings indicate an increase **AND** containment pressure greater than 0.3 psig
- EMF 38, 39 or 40 readings indicate an increase **AND** a known leak path exists from containment
- EMF 35, 36 or 37 readings indicate an increase in activity
- EMF 33 or other alternate means indicate Steam Generator tube leakage
- A known release path exists
- Alternate method of release determination.

_____ 2.6.2 **IF** no emergency release exists, check A (None).

2.7 Complete Line 7 as follows:

_____ 2.7.1 **IF** no release in progress, check A (Not applicable), **GO TO** Step 2.8.

NOTE:	Release significance is determined by RP.

_____ 2.7.2 **IF** release significance is known, check B (Within normal operating limits) **OR** C (Above normal operating limits) as appropriate, **GO TO** Step 2.8.

_____ 2.7.3 **IF** release significance is unknown, check D (Under Evaluation).

☐ 2.8 Complete Line 8 by checking appropriate block:

A (IMPROVING): Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage frequency) are trending favorably toward expected or desired values **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.

- Site conditions (ex. wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire, security events) have become less of a threat to plant operations or personnel safety **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.

B (STABLE): Plant conditions are neither DEGRADING nor IMPROVING.

C (DEGRADING): Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage, frequency) are trending unfavorably away from expected or desired values **AND** plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.

- Site conditions (ex. wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire, security events) impacting plant operations or personnel safety are worsening **AND** plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.

NOTE: Information for Line 9 may not be available and is not required for initial notifications.

2.9 Complete Line 9 as follows:

☐ 2.9.1 Record wind direction. (1EEBCR9100, point 8, or OAC point, M1P0847)

☐ 2.9.2 Record wind speed. (1EEBCR9100, point 5, or OAC point, M1P0848)

_____ 2.9.3 **IF** time allows, record precipitation type.

NOTE: Stability class is determined by RP.

_____ 2.9.4 **IF** time allows, check appropriate stability class.

2.10 Complete Line 10 as follows:

☐ 2.10.1 Check A (Declaration).

☐ 2.10.2 Record declaration time and date.

2.11 Complete Line 11 as follows:

NOTE: The following step may not be all inclusive of all events that may affect all units.

☐ 2.11.1 Evaluate the following for applicability to both units. {PIP-0-M-97-4638, PIP M-03-3294}

- Security event
- Seismic event
- Tornado on site
- Hurricane force winds on site
- Loss of both switch yards
- Fire in SSF
- Fire affecting shared safety related equipment.

_____ 2.11.2 **IF** event affects the emergency class on both units equally, check All.

_____ 2.11.3 **IF** event only affects one (1) unit **OR** one (1) unit has a higher emergency class, check appropriate unit.

☐ 2.12 Complete Line 12 by checking affected unit(s) **AND** recording unit status for both units.

☐ 2.13 On Line 13, record any additional information as directed by the Emergency Coordinator.

2.14 Complete Line 17 as follows:

☐ 2.14.1 Have the Emergency Coordinator approve.

☐ 2.14.2 Record time/date.

NOTE: Received By and Time/Date is for State and County use.

☐ 2.14.3 Record your name on Notified By.

3. Transmit the message to Offsite Agencies as follows:

_____ 3.1 **IF** an upgrade in classification occurs while transmitting any message, perform the following:

☐ 3.1.1 Notify agencies that an upgrade has occurred and that new information will be supplied within 15 minutes.

☐ 3.1.2 Suspend any further transmission of the message that was being transmitted. {PIP-M-01-3711}

3.2 Establish communications with Offsite Agencies as follows:

☐ 3.2.1 Use the Selective Signaling Telephone by depressing "* (star) 1".

_____ 3.2.2 **IF** the Selective Signaling Telephone fails, notify the Offsite Agencies via bell lines in the order listed:

☐	A.	Iredell County:	1-704-878-3039
☐	B.	Mecklenburg County:	9-704-943-6200
☐	C.	Gaston County:	1-704-866-3300
☐	D.	Lincoln County:	1-704-735-8202
☐	E.	Catawba County:	1-828-464-3112
☐	F.	NC EOC:	1-919-733-3943
☐	G.	Cabarrus County:	1-704-920-3000

NOTE:	State of NC does not have a County Emergency Response Radio. If necessary, request Mecklenburg to contact NC EOC.

_____ 3.2.3 **IF** unable to contact the counties via Selective Signaling or Bell line, use Enclosure 4.6 for the County Emergency Response Radio.

NOTE:	Notification Time is the time the first agency is contacted.

☐ 3.3 Record Notification Time and Date on Line 2.

☐ 3.4 Place a check mark by the state and counties listed on back of form as they come on line.

☐ 3.5 Advise the state and counties you have an emergency notification from the McGuire Control Room and to get out an Emergency Notification Form.

_____ 3.6 **IF** message is being transmitted on Selective Signaling, **GO TO** Step 3.8.

NOTE:	Message authentication is only required if message transmittal is other than via Selective Signaling.

_____ 3.7 **WHEN** you reach Line 2, perform the following:

☐ 3.7.1 **REFER TO** Authentication Codeword List.

☐ 3.7.2 Ask the State or a County to authenticate the message.

☐ 3.7.3 You provide appropriate Codeword.

☐ 3.7.4 Record the Number on Line 2.

☐ 3.8 Beginning with Line 1, slowly read the complete message line by line, allowing the receivers ample time to copy.

☐ 3.9 After communicating the message, ask if there are any questions.

☐ 3.10 Record each individual's name, date and time on the back of the form. (This time is the same time as Line 2.)

_____ 3.11 **IF** unable to contact any agency, continuous attempts must be made to contact the missing agency (agencies).

_____ 3.12 **WHEN** the missing agency is contacted, record the name, date and time the agency was contacted on the back of the form.

3.13 FAX a copy (front page only) to the agencies as follows:

☐ 3.13.1 Insert the Emergency Notification Form face down in the FAX.

☐ 3.13.2 Press "GROUP FAX" button.

☐ 3.13.3 Press "SEND/RECEIVE" button.

_____ 3.14 **IF** any programmed fax button fails, **REFER TO** RP/0/A/5700/014 (Emergency Telephone Directory), Enclosure 4.1 (Emergency Response Numbers) for manual FAX numbers.

☐ 4. The Emergency Coordinator shall make follow-up notifications to State and County authorities utilizing Enclosure 4.2 (Completion and Transmission of a Follow up Notification) as follows:

Unusual Event	**Alert, Site Area and General**
Every **4 hours** until the emergency is closed out OR If there is any significant change to the situation OR As agreed upon with each individual agency and documentation shall be maintained for any agreed upon schedule change.	Every **hour** until the emergency is closed out OR If there is any significant change to the situation OR As agreed upon with each individual agency and the interval shall not be greater than 2 hours to any agency.

☐ 5. Notify the NRC Operations Center by completing Enclosure 4.5 (NRC Event Notification Worksheet).

☐ 6. Transmit Enclosure 4.5 (NRC Event Notification Worksheet) (fax, then verbally call the NRC Operations Center) immediately but no later than 1 hour of the event declaration using RP/0/A/5700/014 (Emergency Telephone Directory), Enclosure 4.2 (NRC Telephone Numbers).

_____ 7. **WHEN** this enclosure has been completed, inform the OSM, reporting any deficiencies or problems encountered.

Enclosure 4.2
Completion and Transmission of a Follow-up Message

_____1. **IF** an upgrade in classification occurs prior to transmitting the follow-up message, perform the following:

☐ 1.1 Discard ENF paperwork.

☐ 1.2 Begin a new initial message for the higher classification **PER** Enclosure 4.1 (Completion and Transmission of an Initial Notification Message). {PIP-M-01-3711}

2. Complete an Emergency Notification Form by one of the following:

☐ Obtain a preprinted ENF.

OR

☐ Obtain a blank ENF.

NOTE:	Messages are sequentially numbered throughout the drill/event.

2.1 Complete Line 1 as follows:

☐ 2.1.1 Check A (Drill) **OR** B (Actual Event).

☐ 2.1.2 Record message number.

NOTE:	Notification Time and Date will be completed during message transmission.

☐ 2.2 On Line 2 check B (Follow-up).

2.3 Complete Line 3 as follows:

☐ 2.3.1 Record "McGuire Nuclear Site" as Site.

☐ 2.3.2 Record (704) 875-6044 as confirmation telephone number.

2.4 Complete Line 4 as follows:

☐ 2.4.1 Check correct emergency classification.

☐ 2.4.2 Record EAL (IC) number.

☐ 2.4.3 Record EAL (IC) Description.

2.5 Complete Line 5 as follows:

_____ 2.5.1 **IF** Notification of Unusual Event, Alert, **OR** Site Area Emergency check A (None), **GO TO** Step 2.6.

_____ 2.5.2 **IF** General Emergency perform the following:

☐ A. Determine Protective Action Recommendations per Enclosure 4.4 (Protective Action Recommendations).

CAUTION: Once a zone is selected for evacuation, it may never be removed. {PIP-M-03-3483}

☐ B. Check B (Evacuate) and record affected zones for evacuation.

☐ C. Check C (Shelter) and record affected zones for sheltering.

_____ D. **IF** notified by RP Dose Assessment that dose projections or field measurements indicate Thyroid dose will be equal to or greater than 5 Rem, check D. {PIP-G-03-606}

☐ E. For any other Protective Action Recommendation, check E (Other) and record information.

NOTE:	An Emergency Release is an unplanned, quantifiable radiological release to the environment during an emergency event. The release does not have to be related to the declared emergency. {PIP-M-97-4256} {FAM Sect. 3.7, rev. 7}

2.6 Complete Line 6 as follows:

_____ 2.6.1 **IF** any of the following exists, check B (Is occurring) or C (Has occurred) as appropriate: {PIP-M-03-2358}

- EMF 38, 39 or 40 readings indicate an increase **AND** containment pressure greater than 0.3 psig
- EMF 38, 39 or 40 readings indicate an increase **AND** a known leak path exists from containment
- EMF 35, 36 or 37 readings indicate an increase in activity
- EMF 33 or other alternate means indicate Steam Generator tube leakage.
- A known release path exists
- Alternate method of release determination.

_____ 2.6.2 **IF** no emergency release exists, check A (None).

2.7 Complete Line 7 as follows:

_____ 2.7.1 **IF** no release in progress, check A (Not applicable), **GO TO** Step 2.8.

NOTE:	Release significance is determined by RP.

_____ 2.7.2 **IF** release significance is known, check B (Within normal operating limits) **OR** C (Above normal operating limits) as appropriate, **GO TO** Step 2.8.

_____ 2.7.3 **IF** release significance is unknown, check D (Under evaluation).

☐ 2.8 Complete Line 8 by checking appropriate block:

A (IMPROVING): Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage frequency) are trending favorably toward expected or desired values **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.

- Site conditions (ex. wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire, security events) have become less of a threat to plant operations or personnel safety **AND** plant conditions could result in a lower classification or emergency termination before the next follow-up notification.

B (STABLE): Plant conditions are neither DEGRADING nor IMPROVING.

C (DEGRADING): Plant conditions involve at least one of the following:

- Plant parameters (ex. temperature, pressure, level, voltage, frequency) are trending unfavorably away from expected or desired values **AND** plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.

- Site conditions (ex. wind, ice/snow, ground tremors, hazardous/toxic/radioactive material leak, fire, security events) impacting plant operations or personnel safety are worsening **AND** plant conditions could result in a higher classification or Protective Action Recommendation (PAR) before the next follow-up notification.

2.9 Complete Line 9 as follows:

☐ 2.9.1 Record wind direction. (1EEBCR9100, point 8, or OAC point, M1P0847)

☐ 2.9.2 Record wind speed. (1EEBCR9100, point 5, or OAC point, M1P0848)

☐ 2.9.3 Record precipitation type.

NOTE: Stability class is determined by RP.

☐ 2.9.4 Check appropriate stability class.

2.10 Complete Line 10 as follows:

☐ 2.10.1 Check A (Declaration).

☐ 2.10.2 Record declaration time and date.

2.11 Complete Line 11 as follows:

NOTE: The following step may not be all inclusive of all events that may affect all units.

☐ 2.11.1 Evaluate the following for classification for both units. {PIP-0-M-97-4638, M-03-3294}

- Security event
- Seismic event
- Tornado on site
- Hurricane force winds on site
- Loss of both switch yards.
- Fire in SSF
- Fire affecting shared safety related equipment.

_____ 2.11.2 **IF** event affects the emergency class on both units equally, check All.

_____ 2.11.3 **IF** event only affects one (1) unit **OR** one (1) unit has a higher emergency class, check appropriate unit.

☐ 2.12 Complete Line 12 by checking affected unit(s) **AND** recording unit status for both units.

☐ 2.13 On Line 13, record any additional information as directed by the Emergency Coordinator.

_____ **2.14** **IF** the follow-up notification is due to a change in Protective Action Recommendations, perform the following.

A. Complete Line 17 as follows:

☐ a) Have the Emergency Coordinator approve.

☐ b) Record time/date.

NOTE:	Received By and Time/Date is for State and County use.

☐ c) Record your name on Notified By.

☐ d) Transmit the message per Enclosure 4.1 (Completion and Transmission of an Initial Notification), Step 3.

_____ 2.15 **IF** A (NONE) was checked on Line 6, **GO TO** Step 2.20.

2.16 **IF** a copy of HP/0/B/1009/029 (Initial Response On-Shift Dose Assessment), Enclosure 5.3 (Completing Radiological Portion of Emergency Notification Form), page 4 of 4, is available perform the following:

_____ 2.16.1 Write SEE ATTACHED, across the lines 14, 15 and 16 on the ENF.

_____ 2.16.2 Fax this page with the ENF.

_____ 2.16.3 **GO TO** Step 2.20

NOTE:	The following information is obtained from RP.

2.17 Complete Line 14 as follows:

☐ 2.17.1 For release type, check C (Ground).

☐ 2.17.2 For Units check B (Ci/sec).

☐ 2.17.3 Complete magnitude for type of release.

☐ 2.17.4 Check A (Airborne), **OR** B (Liquid) as appropriate and record release start and/or stop times as appropriate.

2.18 Complete Line 15 by recording the following:

☐ 2.18.1 Projection period (hours).

☐ 2.18.2 Estimated Release Duration (hours).

☐ 2.18.3 Projection performed (Time/Date).

☐ 2.19 Complete Line 16 by recording projected doses.

2.20 Complete Line 17 as follows:

☐ 2.20.1 Have the Emergency Coordinator approve.

☐ 2.20.2 Record time/date.

NOTE: Received By and Time/Date is for State and County use.

☐ 2.20.3 Record your name on Notified By.

_____ 2.21 **WHEN** message is ready to be transmitted, record notification Time/Date on Line 2.

2.22 Fax a copy (front page only) of the ENF and if available, HP/0/B/1009/021 (Initial Response On-Shift Dose Assessment), Enclosure 5.3 (Completing Radiological Portion of Emergency Notification Form), page 3 of 3 to the Agencies as follows:

☐ 2.22.1 Insert Emergency Notification Form face down in the FAX.

☐ 2.22.2 Press "GROUP FAX" button.

☐ 2.22.3 Press "SEND/RECEIVE" button.

_____ 2.23 **IF** any programmed fax button fails, **REFER TO** RP/0/A/5700/014 (Emergency Telephone Directory), Enclosure 4.1 (Emergency Response Numbers) for manual FAX numbers.

2.24 Establish communications with Offsite Agencies as follows:

☐ 2.24.1 Use the Selective Signaling Telephone by depressing "* (star) 1".

_____ 2.24.2 **IF** the Selective Signaling Telephone fails, notify the Offsite Agencies via bell lines in the order listed:

☐	A.	Iredell County:	1-704-878-3039
☐	B.	Mecklenburg County:	9-704-943-6200
☐	C.	Gaston County:	1-704-866-3300
☐	D.	Lincoln County:	1-704-735-8202
☐	E.	Catawba County:	1-828-464-3112
☐	F.	NC EOC:	1-919-733-3943
☐	G.	Cabarrus County:	1-704-920-3000.

NOTE: State of NC does not have a County Emergency Response Radio. If necessary, request Mecklenburg to contact NC EOC.

_____ 2.24.3 **IF** unable to contact the counties via Selective Signaling or Bell line, use Enclosure 4.6 for the County Emergency Response Radio.

2.25 Ensure the following {PIP-M-04-735}:

☐ 2.25.1 FAX was received.

☐ 2.25.2 Answer any questions.

☐ 2.25.3 Record the individuals' name, date and time on the back of the notification form. (This time is the same time as Line 2.)

Enclosure 4.3
Completion and Transmission of a Termination Message

NOTE:	Messages are sequentially numbered throughout the drill/event.

1. Obtain and complete a copy of a blank Emergency Notification Form as follows:

1.1 Complete Line 1 as follows:

☐ 1.1.1 Check if A (Drill) **OR** B (Actual Event).

☐ 1.1.2 Record message number.

NOTE:	Notification Time and Date on Line 2 will be completed during message transmission.

1.2 Complete Line 3 as follows:

☐ 1.2.1 Record "McGuire Nuclear Station" as Site.

☐ 1.2.2 Record (704) 875-6044 as confirmation telephone number.

1.3 Complete Line 10 as follows:

☐ 1.3.1 Check B (Termination).

☐ 1.3.2 Record time/date event terminated.

☐ 1.4 On Line 13, record any additional information as directed by the Emergency Coordinator.

1.5 Complete Line 17 as follows:

☐ 1.5.1 Have Emergency Coordinator approve.

☐ 1.5.2 Record date/time.

NOTE:	Received By and Time and Date is for State and County use.

☐ 1.5.3 Record your name on Notified By.

2. Transmit the message to offsite agencies as follows:

2.1 Establish communication with offsite agencies as follows:

☐ 2.1.1 Use the Selective Signaling Telephone by depressing "* (star) 1".

_____ 2.1.2 **IF** the Selective Signaling Telephone fails, notify the Offsite Agencies via bell lines in the order listed:

☐	A.	Iredell County:	1-704-878-3039
☐	B.	Mecklenburg County:	9-704-943-6200
☐	C.	Gaston County:	1-704-866-3300
☐	D.	Lincoln County:	1-704-735-8202
☐	E.	Catawba County:	1-828-464-3112
☐	F.	NC EOC:	1-919-733-3943
☐	G.	Cabarrus County:	1-704-920-3000

NOTE: State of NC does not have a County Emergency Response Radio. If necessary, request Mecklenburg to contact NC EOC.

_____ 2.25.4 **IF** unable to contact the counties via Selective Signaling or Bell line, use Enclosure 4.6 for the County Emergency Response Radio.

NOTE: Notification time is the time the first agency is contacted.

☐ 2.2 Record Notification Time and date on Line 2.

☐ 2.3 Place a check mark by the state and counties listed on back of form as they come on line.

☐ 2.4 Advise the state and counties you have an emergency notification from the McGuire Control Room and to get out an Emergency Notification Form.

_____ 2.5 **IF** message is being transmitted on Selective Signaling, **GO TO** Step 2.7.

NOTE:	Message authentication is only required if message transmittal is other than via Selective Signaling.

_____ 2.6 **WHEN** you reach Line 2, perform the following:

- ☐ 2.6.1 **REFER TO** Authentication Codeword List.
- ☐ 2.6.2 Ask the State or a County to authenticate the message.
- ☐ 2.6.3 You provide appropriate Codeword.
- ☐ 2.6.4 Record the Number on Line 2.

☐ 2.7 Beginning with Line 1, slowly read the complete message line by line, allowing the receivers ample time to copy.

☐ 2.8 After communicating the message, ask if there are any questions.

☐ 2.9 Record individuals' names, date and times on the back of the form. (This time is the same time as Line 2.)

_____ 2.10 **IF** unable to contact any agency, continuous attempts must be made to contact the missing agency (agencies).

_____ 2.11 **WHEN** the missing agency is contacted, record the name, date and time the agency was contacted on the back of the form.

2.12 FAX a copy (front page only) to the agencies as follows:

- ☐ 2.12.1 Insert the Emergency Notification Form face down in the FAX.
- ☐ 2.12.2 Press "GROUP FAX" button.
- ☐ 2.12.3 Press "SEND/RECEIVE" button.

_____ 2.13 **IF** any programmed fax button fails **REFER TO** RP/0/A/5700/014 (Emergency Telephone Directory), Enclosure 4.1 (Emergency Response Numbers) for manual FAX number.

NOTE: Protective Action Recommendations (PARS) are based on the following:

GUIDANCE FOR OFFSITE PROTECTIVE ACTIONS (PAGs)

Total Effective Dose Equivalent (TEDE) (Projected Dose)	Committed Dose Equivalent (CDE) Thyroid (Projected Dose)	Recommendation
< 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.
N/A	≥ 5 Rem	Consider the use of KI (potassium iodine) in accordance with State Plans and Policy.

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. PAG for KI taken from Potassium Iodine as a Thyroid Blocking Agent in Radiation Emergencies, FDA Guidance, November 2001, and Guidance for Industry KI in Radiation Emergencies, Questions and Answers, FDA Guidance, December 2002. {PIP-G-03-606}

_____ 1. **IF** a General Emergency is declared, determine Initial Protective Action Recommendations as follows (PIP-M-02-6163):

☐ 1.1 Obtain the wind speed and direction, use chart recorder 1EEBCR9100, point #5 (Average Lower Wind Speed) and point #8 (Average Upper Wind Direction).

Wind Direction (Point 8):_____

Wind Speed (Point 5):_____

_____ 1.2 **IF** Chart Recorder unavailable, obtain wind direction from one of the following sources, preferred sequence:

☐ A. Unit 1 OAC:

- Average Upper Wind Direction - M1P0847
- Average Lower Wind Speed - M1P0848.

☐ B. DPC Meteorological Lab (8-382-0139).

☐ C. National Weather Service in Greer, S.C. (1-864-879-1085 or 1-800-268-7785).

_____ 2. **IF** wind speed less than or equal to 5 MPH, recommend the following:

> **CAUTION:** 1. Once a zone is selected for evacuation, it may never be removed. {PIP-M-03-3483}
> 2. A short term release is any release that can be projected to be 3 hours or less in duration. An example would be a "puff release". A controlled release is one that can be started and stopped at the licensee's discretion, such as the venting of Containment for pressure control. **IF** a release is short term and controlled, **THEN** sheltering in lieu of evacuation should be considered. {PIP-M-05-3631}

☐ 2.1 Evacuate zones A, B, C, D, L, M, N, O, R. (See Caution 2 above)

☐ 2.2 Shelter zones E, F, G, H, I, J, K, P, Q, S.

_____ 3. **IF** wind speed is greater than 5 MPH, evacuate and shelter zones as shown in the table below based on wind direction:

Protective Action Zones Determination

Wind Speed Greater than 5 Miles per Hour		
Wind Direction (deg from N) Chart Recorder 1EEBCR9100 Point # 8 Average Upper Wind Direction	**Evacuate*** 2 Mile Radius-5 Mile Downwind	**Shelter**
.1 - 22.5	B,C,D,L,M,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
22.6 – 45.0	B,C,D,L,M,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
45.1 – 67.5	B,C,D,L,M,O,R	A,E,F,G,H,I,J,K,N,P,Q,S
67.6 – 90.0	B,C,D,L,M,N,O,R	A,E,F,G,H,I,J,K,P,Q,S
90.1 – 112.5	B,C,L,M,N,O,R	A,D,E,F,G,H,I,J,K,P,Q,S
112.6 – 135.0	A,B,C,L,M,N,O,R	D,E,F,G,H,I,J,K,P,Q,S
135.1 – 157.5	A,B,C,L,M,N,O	D,E,F,G,H,I,J,K,P,Q,R,S
157.6 – 180.0	A,B,C,L,M,N	D,E,F,G,H,I,J,K,O,P,Q,R,S
180.1 – 202.5	A,B,C,L,M,N	D,E,F,G,H,I,J,K,O,P,Q,R,S
202.6 – 225.0	A,B,C,D,L,M,N	E,F,G,H,I,J,K,O,P,Q,R,S
225.1 – 247.5	A,B,C,D,L,M	E,F,G,H,I,J,K,N,O,P,Q,R,S
247.6 – 270.0	A,B,C,D,L,M	E,F,G,H,I,J,K,N,O,P,Q,R,S
270.1 – 292.5	A,B,C,D,L,M	E,F,G,H,I,J,K,N,O,P,Q,R,S
292.6 – 315.0	A,B,C,D,L,M	E,F,G,H,I,J,K,N,O,P,Q,R,S
315.1 – 337.5	B,C,D,L,M,R	A,E,F,G,H,I,J,K,N,O,P,Q,S
337.6 – 360.0	B,C,D,L,M,R	A,E,F,G,H,I,J,K,N,O,P,Q,S

* See Cautions 1 and 2 above under Step 2.

_____ 4. **IF** notified by RP Dose Assessment that dose projections or field measurements indicate that Thyroid dose will be ≥ 5 Rem, KI use by the General Public must be recommended in accordance with State Plans and Policy. {PIP-G-03-606}

_____ 5. For any other Protective Action Recommendation, check E (Other) and record informtion.

6. After the Initial PARS are transmitted to offsite agencies, check for large fission product inventory in containment as follows:

_____ 6.1 **IF** the OAC is available, call up the following computer points based on need:

Unit 1 OAC	Unit 2 OAC
M1A0829	M2A0829
M1A0835	M2A0835.

_____ 6.2 **IF** the OAC is unavailable, use the following EMF's:

Unit 1	Unit 2
1EMF51A	2EMF51A
1EMF51B	2EMF51B.

☐ 6.3 Check if containment radiation level exceeds the following limits based on time after shutdown:

TIME AFTER SHUTDOWN (hours)	EMF51A(B) reading(R/HR)
0-2	864
2-4	624
4-8	450
>8	265

_____ 7. **IF** containment radiation level exceeds limits in Step 6.3, perform the following:

☐ 7.1 Evacuate and shelter zones in the table below based on wind direction:

CAUTION: Once a zone is selected for evacuation, it may never be removed. {PIP-M-03-3483}

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**
.1 - 22.5	A,B,C,D,E,F,L,M,N,O,R,S	G,H,I,J,K,P,Q
22.6 – 45.0	A,B,C,D,E,L,M,N,O,Q,R,S	F,G,H,I,J,K,P
45.1 – 67.5	A,B,C,D,E,L,M,N,O,Q,R,S	F,G,H,I,J,K,P
67.6 – 90.0	A,B,C,D,L,M,N,O,P,Q,R,S	E,F,G,H,I,J,K
90.1 – 112.5	A,B,C,D,K,L,M,N,O,P,Q,R,S	E,F,G,H,I,J
112.6 – 135.0	A,B,C,D,I,K,L,M,N,O,P,Q,R,S	E,F,G,H,J
135.1 – 157.5	A,B,C,D,I,K,L,M,N,O,P,Q,R	E,F,G,H,J,S
157.6 – 180.0	A,B,C,D,I,J,K,L,M,N,O,P,R	E,F,G,H,Q,S
180.1 – 202.5	A,B,C,D,G,H,I,J,K,L,M,N,O,P,R	E,F,Q,S
202.6 – 225.0	A,B,C,D,G,H,I,J,K,L,M,N,O,P,R	E,F,Q,S
225.1 – 247.5	A,B,C,D,F,G,H,I,J,L,M,N,O,R	E,K,P,Q,S
247.6 – 270.0	A,B,C,D,F,G,H,I,J,L,M,N,O,R	E,K,P,Q,S
270.1 – 292.5	A,B,C,D,E,F,G,H,J,L,M,N,O,R	I,K,P,Q,S
292.6 – 315.0	A,B,C,D,E,F,G,L,M,N,O,R	H,I,J,K,P,Q,S
315.1 – 337.5	A,B,C,D,E,F,G,L,M,N,O,R	H,I,J,K,P,Q,S
337.6 – 360.0	A,B,C,D,E,F,L,M,N,O,R,S	G,H,I,J,K,P,Q

☐ 8. A McGuire EPZ map is located on page 5 of 5, if it is desired to visually see zones evacuated or sheltered.

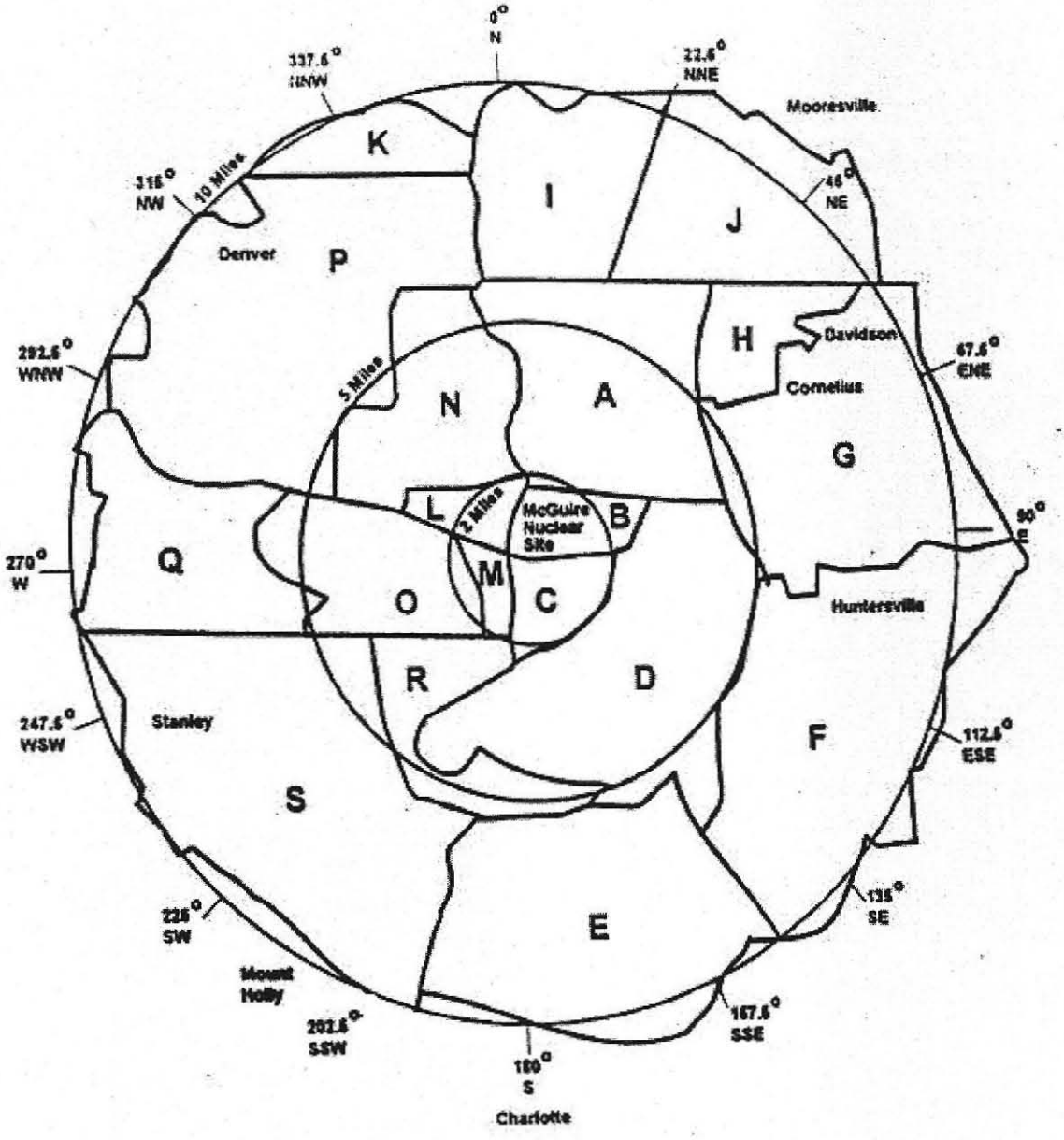
_____ 9. **IF** notified by RP Dose Assessment that dose projections or field measurements indicate that Thyroid dose will be ≥ 5 Rem, KI use by the General Public must be recommended in accordance with State Plans and Policy. {PIP-G-03-606}

☐ 10. On a continuing basis, evaluate plant conditions for the need to update PARS. This evaluation should include EMF51A/B readings, wind speed and direction.

McGUIRE PROTECTIVE ACTION ZONES

(2 and 5 mile radius, inner circles)

10-MILE EPZ



Enclosure 4.5
NRC Event Notification Worksheet

STATE: "THIS IS THE McGUIRE NUCLEAR SITE IN NRC REGION 2 MAKING AN EVENT NOTIFICATION REPORT"

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

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

EVENT CLASSIFICATIONS	
	GENERAL EMERGENCY
	SITE AREA EMERGENCY
	ALERT
	UNUSUAL EVENT
	TRANSPORTATION (10 CFR 20)
	MATERIAL/EXPOSURE (10 CFR 20)
	OTHER

1-Hr Non-Emergency		
	(50.72 b1(a)	TS Deviation
	(70.52) (a) and (b)	Accidental Criticality OR
	(72.74) (a)	Loss or theft of SNM

4-Hr Non-Emergency		
	(50.72 b2 (I))	TS Required S/D
	(50.72 b2 (IV)(A))	ECCS Discharge to RCS
	(50.72 b2 (IV)(B))	RPS Actuation - critical scram
	(50.72 b2 (XI))	Offsite Notification
	(72.75)(b1	Deviation from ISFSI T.S.
	[70.50(a)]	SNM Protective action(s)
	PHYSICAL SECURITY (73.71)	

8-Hr Non-Emergency 10CFR 50.72(b)3		
	(72.75)(c1)	Spent Fuel Storage SSC defect.
	(72.75)(c2)	Spent Fuel Storage degradation.
	(72.75)(c3)	Fuel Storage related offsite medical.
	(50.72 b3 (XII))	Offsite Medical
	(50.72 b3 (II)(A))	Degraded Condition
	(50.72 b3 (II)(B))	Unanalyzed Condition
	(50.72 b3 (IV)(A))	Valid Actuation of System listed in Encl. 4.3.
	(50.72 b3 (V)(A))	Safe S/D Capability
	(50.72 b3 (V)(B))	RHR Capability
	(50.72 b3 (V)(C))	Control of Rad Release
	(50.72 b3 (V)(D))	Accident Mitigation
	(50.72 b3 (X)(III))	Lost ENS
	(50.72 b3 (X)(III))	Lost Other Assess./Comms
	(50.72 b3 (X)(III))	Emergency Siren INOP

24-Hr. Non-Emergency	
	Material/Exposure (10CFR20)
	(72.75)(d1) Fuel Storage equipment failure.
	(73 App G) safeguards vulnerabilities
	26.73 Significant events involving fitness for duty.
	(70.50(b1)) Contamination event restrictions.
	(70.50(b2)) Equipment failure
	(70.50(b3)) Unplanned medical treatment
	(70.50(b4)) Fire/explosion damage to licensed material
	ISFI Certificate of Compliance

EVENT DESCRIPTION

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

Continue on Enclosure 4.2 page 2 of 2 if necessary.

NOTIFICATIONS	YES	NO	WILL BE	ANYTHING UNUSUAL OR NOT UNDERSTOOD? ☐ YES ☐ NO
NRC RESIDENT				(Explain above)
STATE(s)				DID ALL SYSTEMS FUNCTION AS REQUIRED YES ☐ ☐ NO
LOCAL				(Explain above)
OTHER GOV AGENCIES				MODE OF OPERATION EST. RESTART ADDITIONAL INFOR ON BACK
MEDIA/PRESS RELEASE				UNTIL CORRECTED DATE: ☐ YES ☐ NO

Enclosure 4.5
NRC Event Notification Worksheet

RADIOLOGICAL 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
RAD MONITOR READINGS:					
ALARM 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: (Last Sample) PRIMARY Xe eq_____mCi/ml Iodine eq. _____mCi/ml SECONDARY Xe eq_____mCi/ml Iodine eq. _____mCi/ml

LIST OF SAFETY RELATED EQUIPMENT NOT OPERATIONAL:

EVENT DESCRIPTION (Continued from Enclosure 4.5 Page 1 of 2)

Enclosure 4.6

County Emergency Response Radio
CPI Remote Instructions

When to Use: To contact the county Warning Point(s) (WP) when the Selective Signaling Network and Bell system are out of service and during monthly or other scheduled radio checkouts with the desired locations.

Volume Control: Adjusts the volume of the speaker and also adjusts the volume of the "beep tone", which indicates incoming call.

Keypad: Used to enter code to call the Individual County WP or group call to all County WPs.

County	Encoder Tone
Mecklenburg	21*
Gaston	26*
Lincoln	25*
Iredell	23*
Catawba	27*
Cabarrus	28*
Group Call for all Counties	**20***

Making a Call

NOTE: Before each voice transmission, depress the PTT (push-to-talk) bar on handset for one second and then begin to speak. Transmit (TX) light on bottom of the remote face will be on when PTT bar is depressed. To listen, release the PTT bar.

1. Lift the hand set.
2. Enter the desired 2-digit county code (or 20 for group call) and press the * key.
3. After hearing the activate tone (~3 sec.), depress the PTT bar and begin to speak. Await a response from the called party or parties.
4. If desired, use Duke Energy radio code signals in your transmissions.
5. After the call is complete, sign off by identifying your station (WQC700) as clear.
6. Return radio to the ready state by the following: replace the handset; set the volume at mid scale so the beep tone can be heard.

Answering a Call

1. If a new incoming call is received, a beep tone pulse will be heard and the transmit (TX) light will blink. (TX light is on bottom of remote face.)
2. Lift the handset and depress the PTT bar.
3. Wait approximately one second and speak to answer the call
4. To listen, release the PTT bar.
5. After the call is complete, sign off by identifying your station (WQC700) as clear.
6. Return radio to the ready state by the following: replace the handset; set the volume at mid scale so the beep tone can be heard.

RO

ADMIN

JPMs

Reviewed By _____

Approved By _____

TASK: **Perform a Manual AFD Calculation per PT/1/A/4600/021 A (Loss of Operator Aid Computer While in Mode 1)**

POSITION: **RO**

Operator's Name_____

Validation time: 20 Minutes

Actual JPM Completion Time: _____ Minutes

Location: **Classroom** 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: G2.1.25 (2.8/3.1)

JPM verified current with references by _____Date __/__/

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 is at 100% power
- Unit 1 OAC has been out of service for 30 minutes.
- PT/1/A/4600/021 A (*Loss of Operator Aid Computer While in Mode 1*) is being performed.
- The Main Control Board AFD meters are **INOPERABLE.**

The following are the present current values for the Power Range upper and lower detectors:

- PR-41 A = 347 MicroAmps
  PR-41 B = 431 MicroAmps

- PR-42 A = 352 MicroAmps
  PR-42 B = 425 MicroAmps

- PR-43 A = 345 MicroAmps
  PR-43 B = 441 MicroAmps

- PR-44 A = 330 MicroAmps
  PR-44 B = 425 MicroAmps

The Control Room SRO directs you to calculate AFD per PT/1/A/4600/021A (*Loss of Operator Aid Computer while in Mode 1*), Section 12.9 for current plant conditions and verify AFD is within the limits specified in the COLR.

JPM OVERALL STANDARD: AFD is determined to be within (±) 0.5% of the Following values:

PR-41	-16.442%
PR-42	-16.801%
PR-43	-19.109%
PR-44	-15.171%

Examinee determines the AFD associated with PR-43 exceeds the COLR limit of (-18%) at 100% RTP and informs the C/R SRO.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator should be provided with a copy of PT/1/A/4600/021 A complete to Step 12.9 on Pg 9 of 19.			
2	Operator Evaluates Step 12.9.1	Operator should determine from Initial Conditions that the AFD gages are in operable and therefore **<u>This step should be N/Aed</u>**		
3	Per Step 12.9.2.1 Operator determines that Encl 13.2, Part B is used to perform manual calculation.	Operator refers to PT/1/A/4600/021 A Enc. 13.2 Part B		
*4	Obtains values for Column A from the Data Book, Table 2.2.	See Answer Key for obtained currents (Column A Values).		
*5	Obtains Measured currents (Column B) values for Upper and Lower Detectors of all Power Range channels.	**Cue (Provided With Initial Conditions):** **NI-41 detector:** A – 347 MicroAmps B – 431 MicroAmps **NI-42 detector:** A – 352 MicroAmps B – 425 MicroAmps **NI-43 detector:** A – 345 MicroAmps B – 441 MicroAmps		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		NI-44 detector: A – 330 MicroAmps B – 425 MicroAmps		
*6	Performs calculation required for Columns (C) and (D)	Refer to Answer Key (Enclosure 13.2 Part B) for values.		
*7	Obtains "M Factor" values for Column E from the Data Book, Table 2.2.	Uses Table obtained in Step 4 (See Answer Key Enclosure 13.2 Part B Column (E).		
*8	Performs calculation required for Column (F) to determine AFD.	Operator correctly calculates AFD for each Power Range channel. PR-41: -16.442 % PR-42:: -16.801 % **PR-43: -19.109 %** PR-44: -15.171 %		
9	Operator should be provided with a copy of the U-1 COLR.			
*10	Verify calculated AFD is within limits specified in COLR.	Operator determines that AFD for **PR-43 exceeds the COLR limit of (-18%)**		

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	Operator informs the CR SRO that PR-43 exceeds the COLR limit for AFD.	**Cue: The C/R SRO has been informed** This JPM is Complete.		

STOP TIME_____

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 is at 100% power
- Unit 1 OAC has been out of service for 30 minutes.
- PT/1/A/4600/021 A (*Loss of Operator Aid Computer While in Mode 1*) is being performed.
- The Main Control Board AFD meters are **INOPERABLE.**

The following are the present current values for the Power Range upper and lower detectors:

- PR-41 A = 347 MicroAmps
  PR-41 B = 431 MicroAmps

- PR-42 A = 352 MicroAmps
  PR-42 B = 425 MicroAmps

- PR-43 A = 345 MicroAmps
  PR-43 B = 441 MicroAmps

- PR-44 A = 330 MicroAmps
  PR-44 B = 425 MicroAmps

The Control Room SRO directs you to calculate AFD per PT/1/A/4600/021A (*Loss of Operator Aid Computer while in Mode 1*), Section 12.9 for current plant conditions and verify AFD is within the limits specified in the COLR.

JPM OVERALL STANDARD: AFD is determined to be within (±) 0.5% of the Following values:

PR-41	-16.442%
PR-42	-16.801%
PR-43	-19.109%
PR-44	-15.171%

Examinee determines the AFD associated with PR-43 exceeds the COLR limit of (-18%) at 100% RTP and informs the C/R SRO.

ANSWER KEY

_____ 12.7.4 **IF** any Unit 1 MWH OAC Point out of service, perform the following:

_____ 12.7.4.1 Notify SOC that Unit 1 MWH data unavailable.

_____ _____/_____
Person Notified Date Time

☐ 12.7.4.2 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.

_____ 12.7.4.3 **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)".

_____ 12.8 **IF** OAC will be out of service for greater than 48 hours, perform Manual Trigger of Analog Fault Recorder as follows:

_____ 12.8.1 **WHEN** OAC has been out of service for 48 hours, notify System Engineering.

_____ _____/_____
Person Notified Date Time

_____ 12.8.2 Depress "Manual Trigger" on Analog Fault Recorder (located on EB7) every hour until OAC is returned to service.

☐ 12.8.3 Record manual trigger of Analog Fault Recorder on Enclosure 13.9 (Manual Trigger of Analog Fault Recorder) every hour.

Init. 12.9 **IF** AFD Monitor Alarm inoperable **AND** greater than or equal to 50% RTP, perform the following:

N/A 12.9.1 **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.

Init 12.9.2 **IF** MCB AFD gauges inoperable, perform the following:

☑ 12.9.2.1 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.

_____ 12.9.2.2 **IF** MCB AFD gauges restored operable **AND** AFD Monitor Alarm remains inoperable, perform Step 12.9.1.

ANSWER KEY

Enclosure 13.2

Axial Flux Difference Monitoring

Part B

Sheet ____ of ____
Date: Today Time:[2] Present

NOTE:

- Manual AFD calculations using PR detector currents will provide a means to check AFD is within limits as specified in COLR. A difference may exist between manual AFD calculations and functioning OAC calculated values and functioning Control Board AFD gauges due to accuracy of readings and calibration of PR current meters.
- IF more accurate Power Range (PR) detector current readings are desired or required, SPOC should be contacted to obtain PR detector current readings with a Fluke 8600A digital voltmeter (DVM) per Reactor Engineering procedure PT/0/A/4600/002 G (Incore and NIS Recalibration).

Detectors	(A) **0% Axial Offset Currents**	(B) **Measured Currents**	(C) **(Col B / Col A) x 100**	(D) **(Det A – Det B) / 2**	(E) **M Factor**	(F) **AFD** (Col D x Col E)
PR-41 A	165.9	347	209.162			
				-12.475	1.318	-16.442
PR-41 B	184.1	431	234.112			
PR-42 A	172.1	352	204.532			
				-12.661	1.327	-16.801
PR-42 B	184.9	425	229.854			
PR-43 A	168.8	345	204.383			
				-14.229	1.343	-19.109
PR-43 B	189.4	441	232.841			
PR-44 A	158.3	330	208.464			
				-11.825	1.283	-15.171
PR-44 B	183.1	425	232.114			

(A) From most recent calibration data using "0" Incore Axial Offset current in Data Book, Table 2.2 ("T" for Detector "A" and "B" for Detector "B").

(B) From NI cabinets' current meters (located on respective PR A and B Drawers). Ensure Detector Milliamp range switches are in "0.5" position and read from 0-500 microamp scale. Readings should be to nearest microamp for accuracy.

(C) Column B "Measured Current" divided by Column A "Axial Offset Current" for each detector multiplied by 100.

(D) Column C Detector A minus Column C Detector B for each PR channel divided by 2.

(E) "M" Factor from Data Book Table 2.2 "AFD Incore/Excore Ratios for Quadrants 1-4".

(F) Column D multiplied by Column E will provide AFD value for each PR channel.

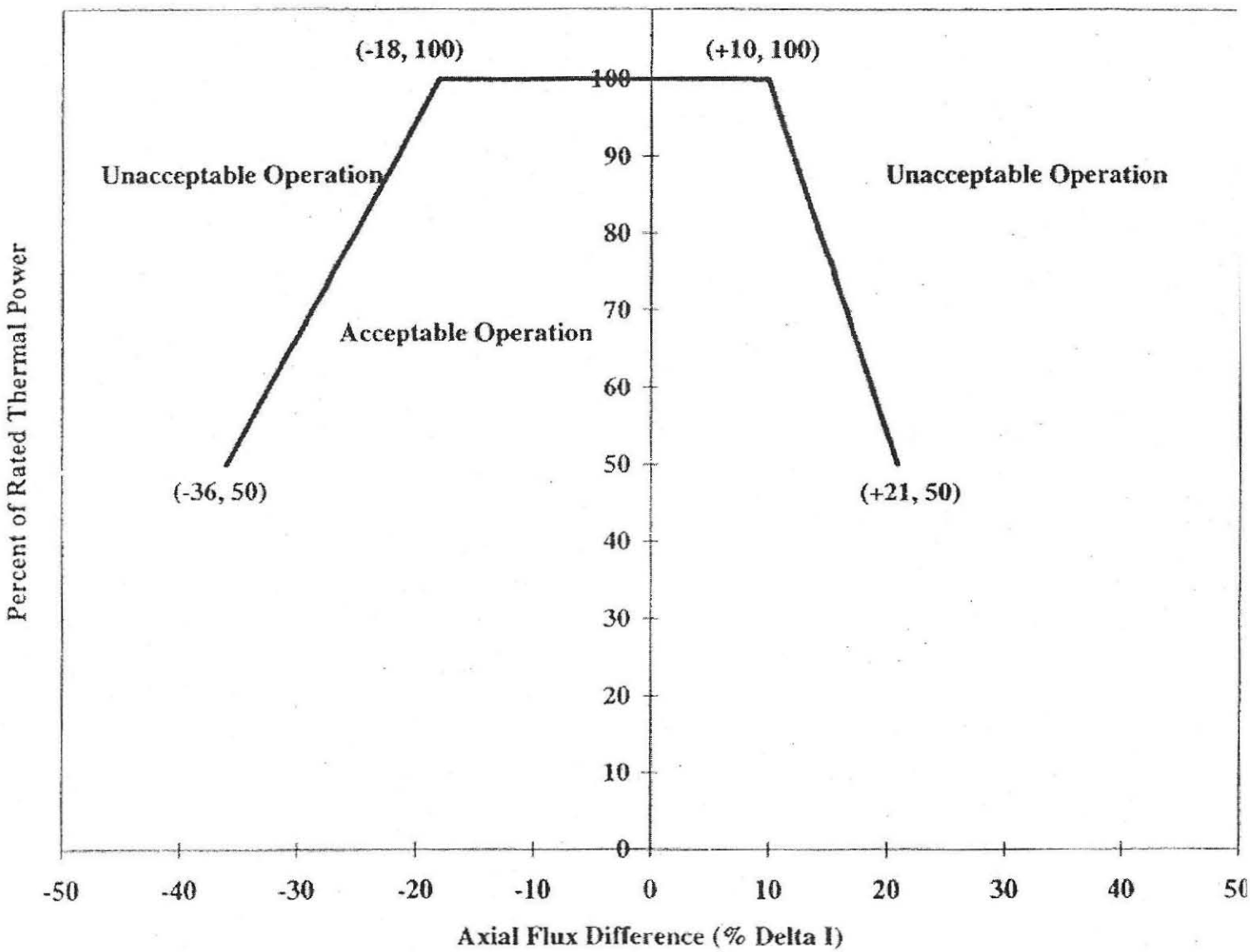
End of Enclosure

[2] WHEN greater than or equal to 50% RTP AND MCB AFD gauges inoperable, within 1 hour and every hour thereafter until MCB AFD gauges or OAC AFD Monitor Alarm operable.

McGuire 1 Cycle 18 Core Operating Limits Report

Figure 5

Percent of Rated Thermal Power Versus Percent Axial Flux Difference Limits



NOTE: Compliance with Technical Specification 3.2.1 may require more restrictive AFD limits. Refer to OP/1/A/6100/22 Unit 1 Data Book of more details.

Chg T

OP/1/A/6100/022
Enclosure 4.3
Table 2.2

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

Unit = 1 Cycle = 18

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

	Detector N41		Detector N42		Detector N43		Detector N44	
Incore Axial Offset	T	B	T	B	T	B	T	B
30	202.7	141.2	210.5	142.6	204.8	145.2	193.3	138.0
20	190.4	155.5	197.7	156.7	192.8	160.0	181.6	153.0
10	178.1	169.8	184.9	170.8	180.8	174.7	169.9	168.1
0	165.9	184.1	172.1	184.9	168.8	189.4	158.3	183.1
-10	153.6	198.4	159.4	199.1	156.8	204.2	146.6	198.1
-20	141.3	212.7	146.6	213.2	144.8	218.9	134.9	213.1
-30	129.0	227.0	133.8	227.3	132.8	233.7	123.2	228.2
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

	Detector N41			Detector N42			Detector N43			Detector N44		
Incore Axial Offset	T	B	T-B	T	B	T-B	T	B	T-B	T	B	T-B
30	10.181	6.388	3.793	10.187	6.421	3.766	10.107	6.386	3.721	10.176	6.279	3.897
20	9.564	7.035	2.529	9.568	7.057	2.511	9.514	7.034	2.480	9.560	6.963	2.597
10	8.947	7.683	1.264	8.949	7.694	1.255	8.922	7.682	1.240	8.945	7.646	1.299
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	7.713	8.977	-1.264	7.711	8.966	-1.255	7.738	8.978	-1.240	7.715	9.014	-1.299
-20	7.096	9.625	-2.529	7.092	9.603	-2.511	7.146	9.626	-2.480	7.100	9.697	-2.597
-30	6.479	10.272	-3.793	6.473	10.239	-3.766	6.553	10.274	-3.721	6.484	10.381	-3.897

AFD Incore/Excore Ratios For Quadrants 1 - 4

	Quad 4 N41	Quad 2 N42	Quad 1 N43	Quad 3 N44
M=	1.318	1.327	1.343	1.283

Prepared By: Paul Guill Ryan M Davis

Date: 9/26/2006 Time: 12:13 PM

Reviewed By _____

Approved By _____

TASK: **Monitor Critical Safety Function Status Trees**

POSITION: **RO**

Operator's Name_____

Validation time: 20 Minutes

Actual JPM Completion Time: _____ Minutes

Location: **Classroom** 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 __/__/

K/A: 2.1.19 (3.0/3.0)

References: EP/1/A/5000/F-0 Critical Safety Function Status Trees

JPM verified current with references by _____Date __/__/

INITIAL CONDITIONS

- A reactor trip and SI from 100% has occurred on Unit 1 due to a LOCA inside containment.
- The team has transitioned to E-1, Loss of Reactor or Secondary Coolant.

The STA is needed to confirm the proper EAL and classification. The Control Room SRO directs you to validate the Critical Safety Function Status Trees (CSFST) per EP/1/A/5000/F-0.

JPM OVERALL STANDARD:	Operator determines from the observed parameters that there is a VALID ORANGE Path on Core Cooling and an INVALID RED Path on Containment Integrity. The RO should recommend to the C/R SRO that the crew transition to FRP C-2 "Response to Degraded Core Cooling" **The trainee is only required to validate JPM elements #3 and #6 but may choose to validate all elements.**
References:	Copy of EP/1/A/5000/F-0 (Critical Safety Function Status Trees) will be provided.

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Operator evaluates the **REACTOR COOLANT INTEGRITY** Critical Safety Function.	**1st Block** "TEMPERATURE DECREASE IN ALL COLD LEGS LESS THAN 100 Deg. " **Cue: The Temperature decrease in All cold legs is approx. 40 deg F in the last 60 Minutes.** Operator should determine the Flow Path to be **YES.** **Next Decision Block:** is "ALL NC T-COLDS GREATER THAN 300 deg F" As read on chart recorders on 1MC-5 or the OAC**, Loop T-Colds are reading approx. 532 deg F** therefore the Flow Path is **YES**. Operator now determines that the **REACTOR COOLANT INTREGRITY CSF is satisfied and therefore GREEN.**		

* DENOTES CRITICAL

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	The Operator obtains a copy of EP/1/A/5000/F-0 (Critical Safety Function Status Trees)	Using either the F-0 Procedure or the OAC, the Operator should validate each CSF.		
2	Operator evaluates the **SUBCRITICALITY** Critical Safety Function.	**1st Block** "REACTOR TRIP REQUIRED" Operator should determine **YES** **Next Decision Block:** is "POWER LESS THAN 5% On: ---P/R **(<10e-6 %)** ---W/R **(5 10e-7%)** Operator should then determine **YES** for this block. **Next Decision Block:** "SUR ZERO OR NEGATIVE ON: --I/R **(Reading 0)** --W/R **(Trend Down)** Operator Determines **YES** for this Flow Path.		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Next Decision Block: "S/R ENERGIZED" Operator determines from meter observations that the S/R Instruments are energized therefore the flow path is **YES**. **Next Decision Block**: "S/R SUR ZERO OR NEGATIVE" Operator determines from meter indications that the S/R SUR is Negative and therefore the Flow Path is **YES**. Operator now determines that the **Subcriticality CSF is satisfied and therefore GREEN.**		
*3	Operator evaluates the **CORE COOLNG** Critical Safety Function.	**1st Block** "CORE EXIT T/C's LESS THAN 1200 F" From either train of ICCM the 5 highest incore T/C's Ave is approx **693 Deg F** Operator should determine YES for this Flow Path.		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Next Decision Block: is "NC SUBCOOLING BASED ON CORE EXIT T/C's GREATER THAN 0 Deg F" NC System Subcooling as read on either train of ICCM is Approx. **-35 Deg F.** Operator should then determine **NO** for this block.		
		Next Decision block "AT LEAST ONE NC PUMP ON" From NC Pump Amps, Breaker Position or Loop Flow" Operator Determines **NO** for this Block.		
		Next Decision Block: "CORE EXIT T/C's LESS THAN 700 Deg F" ICCM Reading **691 Deg F.** Operator determines the flow path is **YES**.		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Next Decision Block: " REACTOR VESSEL LOWER RANGE LEVEL GREATER THAN 39%" Operator determines from ICCM monitors that the Lower Range Level is approx. 34% Therefore the flow path is **NO**. Operator now determines the. **Core Cooling CSF is NOT satisfied and is presently in an ORANGE condition.** Operator should now continue with F-0 validation.		
4	Operator evaluates the **HEAT SINK** Critical Safety Function.	**1st Block** "N/R LEVEL IN AT LEAST ONE S/G GREATER THAN 11% (32% ACC) **ON 1MC-2** **A and B S/G's are indicating approx. 44 %** **C and D S/G's are indicating approx. 28%**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Operator should determine Flow Path to be **YES.** **Next Decision Block**: "PRESSURE IN ALL S/G 's LESS THAN 1225 PSIG" **All individual S/G pressure gages on 1MC-2 read approx. 950 PSIG** Operator should then determine Flow Path to be **YES** for this block. **Next Decision Block:** "N/R LEVEL IN ALL S/G's LESS THAN 83%: **All 4 S/G level are indicating LESS than 83% on 1MC-2**. Operator should then determine Flow Path to be **YES** for this block.		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Next Decision Block: "PRESSURE IN ALL S/G 's LESS THAN 1170 PSIG" **Operator determines from information previously obtained that all S/G pressures are Less than 1170 PSIG.** Operator should then determine Flow Path to be **YES** for this block. **Next Decision Block:** "N/R LEVEL IN ALL S/G's GREATER THAN 11% (32% ACC) **Operator determines from information previously obtained that two S/G's are less than 32%** Therefore the Flow Path is **NO**. Operator now determines that the **HEAT SINK CSF is NOT satisfied and in a Yellow condition.**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*6	Operator evaluates the **CONTAINMENT** Critical Safety Function.	**1st Block** "CONTAINMENT PRESSURE LESS THAN 15 PSIG" Operator observes WR Containment Pressure gages on 1MC-11:, **ALL 4 Channels read approx. (5) PSIG** The operator should determine **YES** for flow path. **Next Decision Block:** "CONTAINMENT PRESSURE LESS THAN 3 PSIG" From information previously obtained, present containment pressure is approx **5 PSIG** Operator should then determine **NO** for this block. Operator now determines that the **Containment CSF is Not satisfied and in an Orange condition** The OAC SPDS		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Monitor is indicating the Containment CSF as a RED Path. This indication should be determined to be **INVALID**. Note: The cause of the red path is due to the Train A Containment WR Pressure gage located on 1MC-7 failed high at 60 PSIG .		
7	Operator evaluates the **REACTOR COOLANT INVENTORY** Critical Safety Function	**1st Block** "PZR LEVEL LESS THAN 92%" As read on 1MC-10, **Indicated PZR level is OFF SCALE LOW.** Operator should determine the Flow Path to be **YES** **Next Decision Block** is "PZR LEVEL GREATER THAN 17%" From information previously obtained, present PZR Level is: **OFF SCALE LOW.** Operator should then		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		determine **NO** for this Flow Path. Operator now determines that the **REACTOR COOLANT INVENTORY CSF is NOT satisfied and in a YELLOW condition.**		
*8	Inform C/R SRO that a Valid **Orange** path exists on **CORE COOLING** and on the **CONTAINMENT** Critical Safety functions. Valid Yellow paths exist on the **HEAT SINK** and **REACTOR COOLANT INVENTORY** Critical Safety Functions. Based on Validated information in F-0 the Crew should transition to **FRP C-2 (Response to Degraded Core Cooling)**	**Cue: C/R SRO has been notified.**		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

- A reactor trip and SI from 100% has occurred on Unit 1 due to a LOCA inside containment.
- The team has transitioned to E-1, Loss of Reactor or Secondary Coolant.

The STA is needed to confirm the proper EAL and classification. The Control Room SRO directs you to validate the Critical Safety Function Status Trees (CSFST) per EP/1/A/5000/F-0.

Simulator Operators Guidelines (F-0)

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1. Reset to I/C – 18
2. Insert XMT-NS002 = 60
3. Freeze the simulator.

TEMPORARY SNAP IC-151
March, 2007

(R04-01)

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. EP/1/A/5000/F-0
Revision No. 004

INFORMATION ONLY

PREPARATION

(2) Station McGuire Nuclear Station

(3) Procedure Title Critical Safety Function Status Trees

(4) Prepared By Weiner,Michael R Date September 26, 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 S Hartney (QR) Date 10/13/03

Cross-Disciplinary Review By _____ (QR) NA JSH Date 10/13/03

Reactivity Mgmt. Review By _____ (QR) NA JSH Date 10/13/03

Mgmt. Involvement Review By _____ (OPS Supt.) NA JSH Date 10/13/03

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Temporary Approval (*if necessary*)

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

(9) Approved By _____ Date 10/24/03

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.*)

Form based on NSD 703 App D (Procedure Process Record

Reviewed By: _____

Approved By: _____

TASK: **Perform a Manual NC Leakage Detection Calculation per PT/1/A/4200/040 (Reactor Coolant Leakage Detection)**

POSITION: **RO**

Operator's Name_____

Location: **Classroom** Method: **Perform**

Validation 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 __/__/

KA: G2.2.12 (3.0/3.4)

INITIAL CONDITIONS

The following conditions exist:

Unit 1 is at 100% power
Unit 1 OAC point **M1L4554** has been out of service since 0850 :
1EMF- 38L and all other required OAC points are Operable.

- Time = 0900
  - OAC Point **M1A1417** (1A CF&E Sump Level) indicates **8.308** inches
  - OAC Point **M1A1423** (1B CF&E Sump Level) indicates **8.466** inches

- Time = 0930
  - OAC Point **M1A1417** (1A CF&E Sump Level) indicates **8.875** inches
  - OAC Point **M1A1423** (1B CF&E Sump Level) indicates **9.158** inches

You are instructed to perform PT/1/A/4200/040 (*Reactor Coolant Leakage Detection*) because of the above conditions using the data that has been collected.

JPM OVERALL STANDARD: The manual NC leakage detection calculation is performed per Step 12.5.6 of PT/1/A/4200/040. (Reactor Coolant Leakage Detection), Operator determines that the Sum of Input has increased by greater than 1 GPM and the required actions per Step 12.5.8 are addressed.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator determines required status is met in Step 7.1	Per Initial Conditions, **U1 is in Mode 1.**		
	NOTE: Leak Detection Tech Specs for 1EMF-38L is applicable in Mode 1 only.	Operator reads NOTE and continues.		
2	Per Step 8.1 Operator determines prerequisite system conditions are met: (M1L4554 OOS per turnover)	In Step 8.1, **Box beside M1L4554 should be checked.**		
3	**Procedure:** **IF** 1EMF-38L is Inoperable in Mode 1, refer to Leak Detection Tech Spec and exit this procedure.	1 EMF-38L is Operable per the Initial Conditions therefore **step 12.1 is N/Aed**		
4	Operator evaluates Step 12.2: Perform the following sections, as applicable: Section 12.5 (M1L4554 Inoperable)	**Operator proceeds to Section 12.5 on Pg 8 of 10.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Per Step 12.5.1 and 12.5.2: Operator records initial set of data on: Enclosure 13.1 • Date • Time • Initials • Sump Level A (OAC Point M1A1417) • Sump Level B (OAC Point M1A1423)	**Today's Date** **0900** **Operators Initials** **8.308 inches** (8.3 to 8.4) (Per Turnover Data) **8.466 inches** (8.4 to 8.5) (Per Turnover Data) **Operator mark steps 12.5.1 and 12.5.5 as complete.**		
6	Per Step 12.5.4: • N/A's columns in Enc. 13.1 for: • Level Change A • Level Change B • Total level Change (inches)	**Operator N/A's associated Box'es**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	• Total Volume Change (Gal) • Sum of Input (GPM) • Greater than 1 gpm Increase	**Operator N/A's associated Box'es**		
7	Per Step 12.5.5 Record 30 Min Data on Enclosure 13.1: • Date • Time • Initials • • Sump Level A (OAC Point M1A1417) • Sump Level B (OAC Point M1A1423)	**Today's Date** **0930** **Operators Initials** **8.875 inches** (8.8-8.9) (Per Turnover Data) **9.158 inches** (9.1-9.2) (Per Turnover Data)		
8	Operator performs required calculations on Enc. 13.1 per step 12.5.6. • Level Change (inches) for A Sump • Level Change (inches) for B Sump	**0.567 inches** (0.4 - 0.6) **0.692 inches** (0.6 – 0.8)		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	• Total Level Change (Inches) • Total Volume Change (Gal) • Sum of Input (gpm) • Greater than 1 gpm (yes/no)	**1.259 inches (1.0 – 1.4)** **45.324 Gal (36 – 50.4)** **1.51 gpm (1.2 – 1.7)** **YES**		
9	Operator determines Step 12.5.8 must be performed: • Notify OSM • Refer to T.S.'s • Perform Leakage Calc. PT	**Cue: The OSM has been informed and another operator will refer to Tech Spec's and perform the NC leakage PT.** This JPM is Complete.		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

The following conditions exist:

Unit 1 is at 100% power
Unit 1 OAC point **M1L4554** has been out of service since 0850 :
1EMF- 38L and all other required OAC points are Operable.

- Time = 0900
  - OAC Point **M1A1417** (1A CF&E Sump Level) indicates **8.308** inches
  - OAC Point **M1A1423** (1B CF&E Sump Level) indicates **8.466** inches

- Time = 0930
  - OAC Point **M1A1417** (1A CF&E Sump Level) indicates **8.875** inches
  - OAC Point **M1A1423** (1B CF&E Sump Level) indicates **9.158** inches

You are instructed to perform PT/1/A/4200/040 (*Reactor Coolant Leakage Detection*) because of the above conditions using the data that has been collected.

* KEY *

Enclosure 1

PT/1/A/4200/040
Page 1 of 1 040

Date TODAY'S DATE

Reactor Coolant Leakage Data

Sheet ____ of ____

		CFAE Parameters								1EMF 38L Trip 1 Light		VUCDT Parameters				
		Sump Level (inches)		Level Change (inches)												
Date/Time	Initials	A	B	A	B	Total Level Change (inches)	Total Volume Change (gal)	Sum of Input (gpm)	Greater than 1 gpm Increase (Yes/No/NA)	ON	OFF	VUCDT Level (%)	VUCDT Volume (gal)	Volume Change (gal)	Rate of Input (gpm)	Greater than 1 gpm Increase (Yes/No/NA)
1 0900	2K	8.308	8.466	N/A 2K	N/A 2K	N/A 2K	N/A 2K	N/A 2K	N/A 2K							
1 0930	2K	8.875	9.158	0.567	0.692	1.259	45.324	1.51	YES							

End of Enclosure

Unit 1

Reviewed By: _____

Approved By: _____

TASK: **Perform a Unit Vent Flow Calculation of a Containment Air Release**

POSITION:

Operator's Name_____

Location: **Classroom** Method: **Perform**

Validation 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 __/__/

KA: G2.3.11 (2.7/3.2)

JPM verified current with references by _____Date __/__/

INITIAL CONDITIONS

A Gaseous Waste Release permit for a Unit 1 Containment Air Release is currently in use. The Unit 1 VQ Monitor is out of service and has been declared inoperable. The operators have been performing VQ releases using OP/1/A/6450/017 (*Containment Air Addition and Release*), Encl 4.3 (*Air Release Mode with VQ Flow Monitor Inoperable*).

At 1300, containment pressure was 0.18 PSIG and a VQ release was initiated to reduce pressure to 0.12 PSIG per Step 3.9. The release was secured at 1345 and the procedure was completed through step 3.8.2 for this release.

The U1 VQ Flow Monitor has been declared operable and the C/R SRO directs you to complete step 3.9 for this release. Calculate the cubic feet released at 1300 per step 3.8.3 and then complete this enclosure. It is not desired to close out existing GWR paperwork.

JPM OVERALL STANDARD: The VQ Total Cubic Feet released is calculated to within ± **29965 ± 1 ft3**.

NOTES: A working copy of OP/1/A/6450/017, Encl 4.3 should be provided to the operator and signed off through Step 3.9. The evaluator should fill in the START TIME / CONTAINMENT PRESSURE and the STOP TIME / CONTAINMENT PRESSURE on the GWR permit (total time duration of the release should equal to 45 minutes).

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Per Step 3.8.3 calculate volume released using the following as described on page 3 of 6 and record on Attachment 1: CU. FT. RELEASED = X + (Y x Z) where: X and Y are from Table 1 and Z is actual release duration in minutes from Attachment 1	Operator calculates **9196.86 ft^3** and records this volume on Attachment 1. Note: Due to values given directly from a table and the release duration provided, there is no range other than rounding the final value.		
*2	Due to the VQ Flow Totalizer having been declared Operable the operator should now proceed to **Step 3.7:** **IF** VQ Flow Monitor becomes operable, perform the following: • Ensure 1VQ-2B (Cont Air Rel Outside Iso) closed per Attachment 1 • Ensure release stop date / time recorded on Attachment 1.	**CUE: 1VQ-2B has been verified to be closed.** (Already done)		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	• Record Total Cu. Ft. Released on Attachment 1.	Operator calculates Total Cu Ft Released is **29965.46** and records on Attachment 1. (Note: Due to values given directly from the enclosure there is no range other than rounding the final value().		
	Continued • Exit this enclosure and go to Enclosure 4.2 (Air Release Mode with VQ Flow Monitor Operable).	**CUE:** **Another operator will implement Enclosure 4.2.** **This JPM is complete.**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

A Gaseous Waste Release permit for a Unit 1 Containment Air Release is currently in use. The Unit 1 VQ Monitor is out of service and has been declared inoperable. The operators have been performing VQ releases using OP/1/A/6450/017 (*Containment Air Addition and Release*), Encl 4.3 (*Air Release Mode with VQ Flow Monitor Inoperable*).

At 1300, containment pressure was 0.18 PSIG and a VQ release was initiated to reduce pressure to 0.12 PSIG per Step 3.9. The release was secured at 1345 and the procedure was completed through step 3.8.2 for this release.

The U1 VQ Flow Monitor has been declared operable and the C/R SRO directs you to complete step 3.9 for this release. Calculate the cubic feet released at 1300 per step 3.8.3 and then complete this enclosure. It is not desired to close out existing GWR paperwork.

GASEOUS RELEASE PERMIT REPORT

GWR Number: 2006035
Release ID: Unit 1 Cont Air Release & Addition

Comments:

=== RELEASE DATA ==========
EMF39L Monitor In Service ..... YES

=== NUCLIDE DATA - INITIAL SAMPLE ==========

Nuclide	uCi/cc	EC	EC Ratio
XE-133	2.50E-07	5.00E-07	5.00E-01
TOTAL NOBLE GASES	2.50E-07		5.00E-01
TOTAL ACTIVITY:	2.50E-07		5.00E-01

=== MULTIPLE RELEASE CALCULATION ==========
Sum of calculated release rate divided by
allowable release rate for all concurrent releases..... 9.55E-04
(Must be less than one)

GASEOUS RELEASE PERMIT REPORT

GWR Number: 2006035
Release ID: Unit 1 Cont Air Release & Addition

=== ALLOWABLE RELEASE RATE ==========

Total body dose release rate (cfm)	1.89E+08
Skin and Gamma air dose release rate (cfm)	4.81E+08
Food, Ground, Inhalation dose release rate (cfm)	NA
Most restrictive release rate (cfm)	1.89E+08
Recommended release rate (cfm)	3.00E+02

=== SETPOINT DATA ==========

EMF39L Monitor Operable?	Yes
EMF39L Entered Background (cpm)	3.50E+02
EMF39L Expected CPM	3.50E+02
Xe-133 Equivalence (uCi/cc)	2.50E-07
Trip 1 Setpoint (cpm)	7.000E+02
Trip 2 Setpoint (cpm)	2.900E+04

Performed by:_____

IVed by:_____

=== SPECIAL INSTRUCTIONS ==========

_____

_____

_____

CR SRO Authorization:_____ Date/Time:_____

Release Initiation..... Release Completion.....
Unit____ EMF39L Trip 1&2
Set/Verified by:_____
DVed by:_____

OPS_____ Release Start _____/_____ OPS_____ Release Stop _____/_____
Date Time Date Time

OPS_____ _____
DV
Total Vol. Rel _____ ft3

Completion of Release Acknowledged

CR SRO_____ Date/Time: _____/_____

RP Review_____ Date/Time: _____/_____

Attachment 1

Sheet 1 of ____

1VQ-2B Open				1VQ-2B Closed				
Doer	DV	Date/Time	Start Pressure (psig)	Doer	DV	Date/Time	Stop Pressure (psig)	Cubic Ft Released
2K	2PG	3-19/0100	0.17	LPG	2K	3-19/0130	0.12	6043.51
2PG	2K	3-19/1200	0.15	2K	LPG	3-19/1245	0.12	8776.49
2K	2PG	3-20/0230	0.16	LPG	2K	3-20/0300	0.12	5948.60
2PG	2K	3-20/1300	0.18	2K	LPG	3-20/1345	0.12	9196.86
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							0.12	
							Total Cu. Ft Released	29965.46

End of Enclosure

Unit 1

INPLANT

JPMs

Reviewed By: _____

Approved By: _____

TASK: **Start the Hydrogen Recombiner**

POSITION: **NLO**

Operator's Name_____

Location: **Plant** 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 _____/_____/_____

References: EP/1(2)/A/5000/G-1 Generic Enclosures
Unit 1(2) Data Book Curve 1.8

JPM verified current with references by _____

Date _____/_____/_____

INITIAL CONDITIONS **(for Unit 1 JPM)**

- You are the Unit 1 Turbine Building Rounds person.
- A LOCA has occurred on Unit 1 and EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant) has been implemented. The procedure is complete through Subsequent Step 12.d.

- **The C/R SRO dispatches you to place the "1 Alpha" Hydrogen Recombiner in service per EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 4 (Placing H_2 Recombiners in Service).**
- **Another operator will place "1 Bravo" Hydrogen Recombiner in service.**
- **Containment Pressure is 5.25 PSIG.**

INITIAL CONDITIONS **(for Unit 2 JPM)**

- You are the Unit 2 Turbine Building Rounds person.
- A LOCA has occurred on Unit 2 and EP/2/A/5000/E-1 (Loss of Reactor or Secondary Coolant) has been implemented. The procedure is complete through Subsequent Step 12.d.

- **The C/R SRO dispatches you to place the "2 Alpha" Hydrogen Recombiner in service per EP/2/A/5000/G-1 (Generic Enclosures), Enclosure 4 (Placing H_2 Recombiners in Service).**
- **Another operator will place "2 Bravo" Hydrogen Recombiner in service.**
- **Containment Pressure is 5.25 PSIG.**

JPM OVERALL STANDARD: 1(2)A Hydrogen Recombiner is started and loaded to the appropriate KW value in accordance with EP/1(2)/A/5000/G-1, Enclosure 4.

Unit 1: 50 ± 1 KW
Unit 2: 54 ± 1 KW

NOTES: Evaluator shall provide EP/1(2)/A/5000/G-1, Enclosure 4, Unit 1(2) Unit 1(2) Data Book curve 1.8 and a calculator upon request.

KA 028 000 A4.01 4.0/4.0

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	**Select one train of H2 Recombiner to be placed in service:** • To start 1(2)A H2 Recombiner, **GO TO** Step 2. OR • To start 1(2)B H2 Recombiner, **GO TO** Step 5.	Operator goes to Step 2 to start 1(2)A H2 Recombiner, per JPM initial conditions		
2	**Determine 1(2)A H2 Recombiner power setting as follows:** Determine "PRESSURE FACTOR CP" from Data Book Curve 1.8.	**NOTE TO EXAMINER**: Evaluator should provide Data Book curve 1.8 upon request. Operator uses curve 1.8 to determine the CP for "A" and "B" Recombiner to be **1.4** **Acceptable Range:** **1.39 - 1.41** Based on candidate rounding containment pressure to 5.0 or 5.5 on the X-axis		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	**Continued** Multiply "1(2)A REFERENCE POWER" listed on Data Book Curve 1.8 by "PRESSURE FACTOR, CP" to determine 1(2)A Hydrogen Recombiner Power Setting 1(2)A: "1(2)A REFERENCE POWER" X "PRESSURE FACTOR, CP" = 1(2)A Power Setting * Record "1(2)A POWER SETTING"	Operator determines the power setting for "A" Recombiner to be: **50 KW (Unit 1)** **54 KW (Unit 2)** ********** **Unit 1** *(POWER SETTING for 1A = 35.670 X 1.4 = 49.938)* Acceptable range is: 49.5 - 50.3 KW Value calculated from step above is recorded. *49.938 (round to **50**)* **Acceptable range is: 49 - 51 KW** ********** **Unit 2** (POWER SETTING for 2A = 38.41 x 1.4 = 53.774) Acceptable range is: 53.4 – 54.2 KW Value calculated from step above is recorded. 53.774 (round to **54**) **Acceptable range is:** **53 - 55 KW** **********		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	**At "1(2)A ELECTRICAL HYDROGEN RECOMBINER CONTROL PANEL: (MG set room, BB-__), place 1(2)A Hydrogen Recombiner in service as follows:**	SAME		
	Check "POWER AVAILABLE" light - ON	**Cue: Light is illuminated**		
	Check "POWER OUT SWITCH" position - OFF	**Cue: Switch is in the down position**		
*	Ensure "POWER ADJUST" is set to zero (000)	Operator simulates adjusting control knob to (000) **after** receiving the following cue.		
		Cue: "POWER ADJUST" dial indicates 20 KW		
		Cue: Control Knob rotated counterclockwise and dial indicates 000		
*	Place "POWER OUT SWITCH" in the "ON" position	**Cue: Switch is moved up**		
	Check the "POWER OUT SWITCH" red light - ON	**Cue: Red light is illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	**CONTINUED**	**NOTE TO EXAMINER:** When making power adjustments in the following steps, the operator is directed to look at the POWER OUT meter for the results. The digital indication on the POWER ADJUST dial may not match the actual power indicated on the POWER OUT meter.		
*	Turn "POWER ADJUST" dial until 5 KW is obtained on the "POWER OUT" meter	**Cue: Control knob rotated clockwise and meter indicates 5 KW**		
	Hold this setting for 10 minutes	**Cue: 10 minutes have elapsed**		
*	Turn "POWER ADJUST" dial until 10 KW is obtained on the "POWER OUT" meter	**Cue: Control knob rotated clockwise and meter indicates 10KW**		
	Hold this setting for 10 minutes	**Cue: 10 minutes have elapsed**		
*	Turn "POWER ADJUST" dial until 20 KW is obtained on the "POWER OUT" meter	**Cue: Control knob rotated clockwise and meter indicates 20KW**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	**CONTINUED** Hold this setting for 5 minutes	**Cue:** **5 minutes have elapsed**		
*	Turn "POWER ADJUST" dial until the 1(2)A power setting recorded in Step 2.c is obtained on the "POWER OUT" meter	**NOTE TO EXAMINER:** To successfully complete this critical step, "Power Adjust" dial should be adjusted until Power Out meter reads: **50 ± 1 KW (Unit 1)** **54 ± 1 KW (Unit 2)** **Cue:** **Control knob rotated clockwise and meter indication is at value recorded in step 2.c**		
4	**GO TO Step 7.**	Same		
5	**WHEN TSC activated, THEN notify TSC to perform the following....**	**Cue:** **Another operator will continue in this procedure and notify the TSC when it is activated.**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS **(for Unit 1 JPM)**

- You are the Unit 1 Turbine Building Rounds person.
- A LOCA has occurred on Unit 1 and EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant) has been implemented. The procedure is complete through Subsequent Step 12.d.

- **The C/R SRO dispatches you to place the 1A Hydrogen Recombiner in service per EP/1/A/5000/G-1 (Generic Enclosures), Enclosure 4 (Placing H_2 Recombiners in Service).**
- **Another operator will place 1B Hydrogen Recombiner in service.**
- **Containment Pressure is 5.25 PSIG.**

INITIAL CONDITIONS **(for Unit 2 JPM)**

- You are the Unit 2 Turbine Building Rounds person.
- A LOCA has occurred on Unit 2 and EP/2/A/5000/E-1 (Loss of Reactor or Secondary Coolant) has been implemented. The procedure is complete through Subsequent Step 12.d.

- **The C/R SRO dispatches you to place the 2A Hydrogen Recombiner in service per EP/2/A/5000/G-1 (Generic Enclosures), Enclosure 4 (Placing H_2 Recombiners in Service).**
- **Another operator will place 2B Hydrogen Recombiner in service.**
- **Containment Pressure is 5.25 PSIG.**

Reviewed By: _____

Approved By: _____

TASK: **Start and Stop # 1(2) Turbine Driven CA Pump**

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: OP/1(2)/A/6250/002 Auxiliary Feedwater System

JPM verified current with references by _____

Date ___/___/

INITIAL CONDITIONS **(for Unit 1 JPM)**

Unit 1 is at 100% power when the OAC alarm M1A1276 (U1 CA Temp at Chk Vlv 1CA-37) is received. The RO reports that the temperature in the Turbine Driven CA Pump discharge to "Delta" S/G is 223°F. The SRO has determined the #1 Turbine Driven CA Pump should be started to cool the piping to "Delta" S/G.

The SRO directs you to locally start Unit 1 Turbine Driven CA Pump per OP/1/A/6250/002, Enclosure 4.4. The Initial Conditions have been met and all R&Rs have been evaluated. A Pre-job Brief discussing reactivity management concerns has been performed.

INITIAL CONDITIONS **(for Unit 2 JPM)**

Unit 2 is at 100% power when the OAC alarm M2A1276 (U2 CA Temp at Chk Vlv 2CA-37) is received. The RO reports that the temperature in the TD CA Pump discharge to "Delta" S/G is 223°F. The SRO has determined the #2 Turbine Driven CA Pump should be started to cool the piping to "Delta" S/G.

The SRO directs you to locally start Unit 2 Turbine Driven CA Pump per OP/2/A/6250/002, Enclosure 4.4. The Initial Conditions have been met and all R&Rs have been evaluated. A Pre-job Brief discussing reactivity management concerns has been performed.

JPM OVERALL STANDARD: #1(2) TD CA Pump started and valves aligned to provide cooling. #1(2) TD CA Pump secured and ready to be placed in Standby Readiness.

NOTES: Provide student with a copy of Enclosure 4.4 of OP/1(2)/A/6250/002, with the Initial Conditions, step 3.1, and step 3.2 signed off.

KA: 061 A2.04 (3.4/3.8)

:

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	**IF** #1(2) TD CA Pump to be operated locally, obtain key #172.	Operator should go to the Work Control Center to obtain a key, or will describe where to obtain the key. Then provide the following cue: **CUE:** **Key 172 has been obtained.** Key 172 will not be needed to complete this JPM due the clear plexiglass cover on the Control Panel.		
4	Perform the following sections as applicable: • Section 3.5, Starting #1(2) TD CA Pump. • Section 3.6, Stopping #1(2) TD CA Pump.	Same. Operator proceeds to Section 3.5 N/A		
5	**Starting #1(2) TD CA Pump** Notify RP of #1(2) TD CA Pump start.	Operator documents the current date & time. Provide the following cue: **CUE:** **John Frazier of RP has been contacted.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	**IF** in Modes 1-3, declare #1(2) TD CA Pump inoperable.	Operator calls the CR or WCC to inform the SRO of TD CA Pump inoperability. **CUE:** **SRO Don Jones has been notified.**		
7	**IF** operating #1(2) TD CA Pump locally, perform the following at "Turbine Driven CA Pump Control Panel": • Place "#1(2) TD CA Pump" in "LOCAL". • Place the following in "M-Local": ○ 1(2)CA-64 (TD CA Pump to S/G A) ○ 1(2)CA-52 (TD CA Pump to S/G B) ○ 1(2)CA-48 (TD CA Pump to S/G C ○ 1(2)CA-36 (TD CA Pump to S/G D)	Same. **CUE:** **Switch rotated clockwise. "LOCAL" light lit.** Same. Provide the following cue for each manual loader: **CUE:** **Switch moved to the down position.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
* 8	Close the following: • 1(2)CA-64 (TD CA Pump to S/G A) • 1(2)CA-52 (TD CA Pump to S/G B) • 1(2)CA-48 (TD CA Pump to S/G C • 1(2)CA-36 (TD CA Pump to S/G D)	Same. Provide the following cue for each valve: **CUE:** **Control knob rotated counterclockwise. Needle indicates at 0%. Green light lit.**		
9	Drain moisture from #1(2) CA Pump Turbine stop valve as follows: Slowly open the following: • 1(2)SA-39 (Unit 1(2) TD CA Pump Turb Stop Valve Above Seat Drn) • 1(2)SA-40 (Unit 1(2) TD CA Pump Turb Stop Valve Below Seat Drn) **WHEN** 30 seconds have elapsed, close the following:	Same. **CUE:** **Handle turned counterclockwise.** **CUE:** **Handle turned counterclockwise** **Sounds of steam flow evident.** **CUE:** **30 seconds have elapsed.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
9	**Continued** • 1(2)SA-39 (Unit 1(2) TD CA Pump Turb Stop Valve Above Seat Drn) • 1(2)SA-40 (Unit 1(2) TD CA Pump Turb Stop Valve Below Seat Drn) **IF** water hammer occurred while draining moisture from #1(2) CA Pump Turbine Stop Valve, notify System Engineer.	**CUE:** **Handle rotated clockwise.** **CUE:** **Handle rotated clockwise.** N/A **CUE:** **Water hammer did not occur.**		
10	Check the following open: • 1(2)CA-2 (Unit 1(2) CA Pumps Suct From CA Storage Tank Isol) • 1(2)CA-7A (Unit 1(2) TD CA Pump Suction Isol)	Same. **CUE:** **Red light lit.** **CUE:** **Red light lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	CAUTION Starting the TD CA Pump will increase Rx Power due to increased steam flow. Reducing turbine generator load may be required to maintain power level.			
	NOTE: • It is preferred to perform a normal start of the TD CA Pump. • **IF** a slow start of the TD CA Pump is to be performed, Engineering should be available to provide guidance.			
11	Start #1(2) TD CA Pump per Step 3.5.7.1 or 3.5.7.2 (N/A step **NOT** performed)	Operator proceeds to step 3.5.7.1 after receiving the following cue: **CUE:** **A normal start is desired.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	**IF** normal start desired, perform the following:			
*	• Place "#1(2) TD CA Pump" in "START".	Same. **CUE:** **Switch rotated clockwise.**		
	• Check the following open:	Same.		
	○ 1(2)SA-48ABC (1(2)C S/G SM Supply to Unit 1(2) TD CA Pump Turb Isol)	**CUE:** **Red light is lit.**		
	○ 1(2)SA-49AB (1(2)B S/G SM Supply to Unit 1(2) TD CA Pump Turb Isol)	**CUE:** **Red light is lit.**		
	• Check recirc valve opens by "FLOW" lit.	**CUE:** **Red light is lit.**		
	• **IF** operating CA Pump to cool piping, allow pump to run for at least 10 minutes	Cue if needed: **CUE:** **10 minutes have elapsed.**		
13	**IF** slow start desired, perform the following:	N/A		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	NOTE: Steps 3.5.8 – 3.5.11 feed cold water to S/Gs which could result in cooldown of the NC System (Rx Mgmt concerns)	Operator understands note and continues in procedure. **IF** operator calls the Control Room to inform them he's preparing to feed the S/G, cue as follows: **CUE:** **Control Room has been notified.**		
14	**IF** desired to feed 1(2)A S/G, perform the following:	N/A		
	IF desired to feed 1(2)B S/G, perform the following:	N/A		
	IF desired to feed 1(2)C S/G, perform the following:	N/A		
	IF desired to feed 1(2)D S/G, perform the following:	Same.		
	• Check M1(2)A1276 (U1(2) CA Temp At Chk Vlv 1(2)CA-37) < 280 °F	**CUE:** **Temperature is 224 °F**		
	• Ensure 1(2)CA-38B (TD CA Pump to S/G D Isol) open.	**CUE:** **Red light lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14 *	**Continued** • Maintain desired level in 1(2)D S/G using 1(2)CA-36 (TD CA Pump to S/G D)	Operator throttles 1(2)CA-36 after receiving the following cue: **CUE:** **The SRO directs you to maintain 50 gpm flow to "D" S/G.** **CUE:** **1(2)CA-36 throttled. 50 gpm flow to "D" S/G.**		
		NOTE TO EXAMINER: This JPM may be terminated at this time at the discretion of the examiner. **IF** this JPM is stopped here, N/A the remaining steps and give the following cue: **CUE:** **Another operator will monitor operation of the Turbine Driven CA Pump and complete this enclosure.** **This JPM is complete.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	IF #1(2) TD CA Pump will be feeding S/Gs for greater than 2 hours, perform EP/1(2)/A/5000/G-1 (Generic Enclosures), Enclosure 21 (CA Storage Tank (Water Tower) Makeup)	Operator will only operate TD CA Pump for 10 minutes, so this step is N/A.		
16	**Stopping #1(2) TD CA Pump**	Operator continues with this step after receiving the following cue: **CUE:** **10 minutes have elapsed. The CA piping has cooled and the SRO directs you to shut down the TD CA Pump.**		
	IF stopping pump following EP/AP, check "TURB" depressed on the following: • CA Modulating Valves Reset Train A • CA Modulating Valves Reset Train B	N/A		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
17	**IF** operating #1(2) TD CA Pump locally, perform the following at "Turbine Driven CA Pump Control Panel": • Ensure "#1(2) TD CA Pump" in "LOCAL". • Ensure the following in "M-Local": ○ 1(2)CA-64 (TD CA Pump to S/G A) ○ 1(2)CA-52 (TD CA Pump to S/G B) ○ 1(2)CA-48 (TD CA Pump to S/G C) ○ 1(2)CA-36 (TD CA Pump to S/G D)	Same. Cue if needed: **CUE:** **Switch is still in local.** Same. Provide the following cue for each valve: **CUE:** **Switch is in the down position.**		
18	Ensure the following closed: • 1(2)CA-64AB (TD CA Pump to S/G A) • 1(2)CA-52AB (TD CA Pump to S/G B) • 1(2)CA-48AB (TD CA Pump to S/G C) • 1(2)CA-36AB (TD CA Pump to S/G D)	Operator closes 1(2)CA-36AB after receiving the following cue: **CUE:** **1(2)CA-36B is 10% open. The other three valves are closed. (Green lights lit.)**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
19	Ensure "RESET" lit on "TD CA Pump Auto Start Reset".	Operator calls the Control Room to ensure "RESET" lit. **CUE:** **"Reset" light is lit.**		
	NOTE: 1(2) TD CA Pump should operate at least 10 minutes after pump start to minimize wear on CA Pump Turbine and associated piping			
* 20	Place "#1(2) TD CA Pump" in "STOP".	Same. **CUE:** **Switch rotated counterclockwise.**		
21	Check the following closed: • 1(2)SA-48ABC (1(2)C S/G SM Supply to Unit 1(2) TD CA Pump Turb Isol) • 1(2)SA-49AB (1(2)B S/G SM Supply to Unit 1(2) TD CA Pump Turb Isol)	Same. **CUE:** **Green light lit.** **CUE:** **Green light lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
22	**IF** operating #1(2) TD CA Pump for troubleshooting with CA **NOT** aligned for standby readiness, exit this procedure.	N/A		
23	Ensure "TURB" released on the following: CA Modulating Valves Reset Train A CA Modulating Valves Reset Train B	Operator calls the Control Room to ensure the Modulating Valves Reset pushbuttons have been released. **CUE:** **"TURB" is released on Modulating Valves Resets.**		
24	Monitor #1(2) TD CA Pump suction pressure.	Same. **CUE:** **Suction pressure is 60 psig and stable.**		
* 25	Slowly open the following one at a time: • 1(2)CA-64 (TD CA Pump to S/G A) • 1(2)CA-52 (TD CA Pump to S/G B) • 1(2)CA-48 (TD CA Pump to S/G C) • 1(2)CA-36 (TD CA Pump to S/G D)	Same. Provide the following cue for each valve: **CUE:** **Controller knob rotated clockwise. Needle indicates 100%. Red lights are lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
26	**IF** suction pressure increases indicating check valve leakage, perform the following:	The operator N/As this step after receiving the following cue: **CUE:** **Suction pressure is 60 psig and stable.**		
27	Check the following stable: • S/G A – M1(2)A1439 (U1(2) CA Temp at Chk Vlv 1(2)CA-65) • S/G B – M1(2)A1421 (U1(2) CA Temp at Chk Vlv 1(2)CA-53) • S/G C – M1(2)A1294 (U1(2) CA Temp at Chk Vlv 1(2)CA-49) • S/G D – M1(2)A1276 (U1(2) CA Temp at Chk Vlv 1(2)CA-37)	Operator calls the Control Room to obtain temperatures. **CUE:** **All 4 temperatures are stable.**		
28	**IF** increasing temperatures indicates check valve leak-by, notify System Engineer.	Same. **CUE:** **Another operator will call the System Engineer if needed.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
29	**IF** temperature approaching 280 °F while aligned to CA Storage Tank, perform the following…	N/A **CUE:** **Temperature is stable at 120 °F.**		
30	Perform Enclosure 4.1 (Alignment for Standby Readiness)	**CUE:** **Another operator will perform Enclosure 4.1 and complete this task.** **This JPM is complete.**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS **(for Unit 1 JPM)**

Unit 1 is at 100% power when the OAC alarm M1A1276 (U1 CA Temp at Chk Vlv 1CA-37) is received. The RO reports that the temperature in the TD CA Pump discharge to "D" S/G is 223°F. The SRO has determined the #1 TD CA Pump should be started to cool the piping to "D" S/G.

The SRO directs you to locally start Unit 1 TDCAP per OP/1/A/6250/002, Enclosure 4.4. The Initial Conditions have been met and all R&Rs have been evaluated. A Pre-job Brief discussing reactivity management concerns has been performed.

INITIAL CONDITIONS **(for Unit 2 JPM)**

Unit 2 is at 100% power when the OAC alarm M2A1276 (U2 CA Temp at Chk Vlv 2CA-37) is received. The RO reports that the temperature in the TD CA Pump discharge to "D" S/G is 223°F. The SRO has determined the #2 TD CA Pump should be started to cool the piping.

The SRO directs you to locally start Unit 2 TDCAP per OP/2/A/6250/002, Enclosure 4.4. The Initial Conditions have been met and all R&Rs have been evaluated.

Reviewed By: _____

Approved By: _____

TASK: **Restore Normal Power to 1(2)ETA and Shutdown D/G 1(2)A**

POSITION: **NLO**

Operator's Name_____

Location: **Plant** Method: **Walkthrough/ 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: OP/1(2)/A/6350/002 Diesel Generator

JPM verified current with references by _____

Date ____/____/____

Rev. 06 / 3-2-07

KA 064 A4.01 (4.0/4.3)

INITIAL CONDITIONS **(Unit 1 JPM)**

- Unit 1 is recovering from a loss of power to 1ETA due to an inadvertent Normal breaker trip.
- Power has been restored to 1ETA from "1 Alpha" D/G per AP/1/A/5500/07, Case II (Loss of Normal Power to Either 1ETA or 1ETB).
- All steps have been completed up to step 73.
- "1 Alpha" D/G output is approximately 2100 KW.

  - **The SRO directs you to return the 4160V Bus (1ETA) to normal power supply (Normal Breaker Closed) and shutdown the D/G locally PER OP/1/A/6350/002, DIESEL GENERATOR, Enclosure 4.3 (D/G "1 Alpha" Shutdown).**
  - **All initial conditions of the Operating Procedure have been satisfied.**
  - **The Control Room D/G Mode Select Switch has been placed to Local.**
  - **All R&R's have been evaluated.**

INITIAL CONDITIONS **(Unit 2 JPM)**

- Unit 2 is recovering from a loss of power to 2ETA due to an inadvertent Normal breaker trip.
- Power has been restored to 2ETA from "2 Alpha" D/G per AP/2/A/5500/07, Case II (Loss of Normal Power to Either 2ETA or 2ETB).
- All steps have been completed up to step 73.
- "2 Alpha" D/G output is approximately 2100 KW.

  - **The SRO directs you to return the 4160V Bus (2ETA) to normal power supply (Normal Breaker Closed) and shutdown the D/G locally PER OP/2/A/6350/002, DIESEL GENERATOR, Enclosure 4.3 (D/G "2 Alpha" Shutdown).**
  - **All initial conditions of the Operating Procedure have been satisfied.**
  - **The Control Room D/G Mode Select Switch has been placed to Local.**
  - **All R&R's have been evaluated.**

JPM OVERALL STANDARD: Power to 4160V Bus 1(2) ETA is being supplied from 1(2) ATC and D/G 1(2) A is shutdown.

NOTE: Provide copy of OP/1(2)/A/6350/002, Enclosure 4.3 when the student requests it. **Enclosure should be signed off up through Step 3.2 prior to handing to student.**

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	**If** D/G is operating unloaded, go to Step 3.6.	Operator will N/A and proceed to next step. **Cue:** **D/G output is 2100 KW**		
2	**If** D/G is carrying 1(2)ETA separated from Duke grid, parallel D/G to grid as follows:	Operator determines that the D/G is carrying 1(2) ETA separated from Duke grid then proceeds to step 3.4.1. **Cue:** **The red light is lit for the D/G Emerg Breaker and the green light is lit for the Normal Breaker.**		
	• Check "Line Volts" 3960 - 4360 volts.	Same **Cue:** **"Line Volts" Meter indicates 4000 V**		
	• Match D/G voltage with line voltage using "1(2)A D/G Voltage Adjust".	**Cue:** **"D/G Volts" Meter indicates 4050 V** Operator adjusts D/G voltage. **Switch rotated counterclockwise and meters indicate the same** (4000 V)		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	**Continued**			
*	• Place "1(2) A D/G Sync" switch to "ON".	Same **Cue:** **Switch rotated clockwise to the "ON" position and meter dial is moving slowly in the counterclockwise direction**		
	NOTE As a guide, have synchroscope traveling no faster than one revolution in 20 seconds.			
*	• Using "1(2) A D/G Gov Control", adjust D/G speed to allow synchroscope to move slowly and smoothly in "FAST" direction.	Operator depresses the RAISE pushbutton causing the synchroscope to move slowly in the "FAST" direction **Cue:** **Pushbutton depressed, Meter needle is moving slowly in the clockwise direction**		
	If desired to align 1(2) ETA to normal supply (1(2) ATC), perform the following:	Operator determines from initial conditions that it is desired to close the normal breaker		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	**Continued:**			
	NOTE: • D/G load will drop to 0 amps when bus is paralleled to Duke grid. • Increase D/G load quickly after closing breaker to prevent reverse power condition. • Steps 3.4.5.1 and 3.4.5.2 may be completed and then signed off as time allows.			
*	**WHEN** synchroscope pointer is within 3 minutes before 12 o'clock position, firmly depress and release "CLOSE" on "1(2) ETA Normal Breaker".	**Cue:** **Pointer is 3 minutes before vertical, Pushbutton is depressed, "Normal Breaker" red lamp is lit, KW meter reads 0 KW.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	**Continued** Perform concurrently:	Load is raised to approximately 800-1000 KW **within 60 seconds** of closing the Normal breaker and PF is adjusted to approximately 0.90 - 0.92 lagging once load is stabilized.		
*	Quickly raise D/G output to 800 - 1000 KW using "1(2) A D/G Gov Control"	**Cue:** **Raise pushbutton has been depressed and meter indicates between 800-1000KW**		
	Adjust power factor to 0.90 - 0.92 lagging using "1(2) A D/G Voltage Adjust"	**Cue:** **Power Factor meter reads 0.6 LAG,** Operator rotates Voltage Adjust counter clockwise. **CUE:** **Voltage Adjust handle rotated counter clockwise, meter indication reads 0.9 Lagging**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
2	**Continued**			
	Place "1(2) A D/G Sync switch to "OFF".	Same **Cue:** **Switch rotated counterclockwise and is in the "OFF" position**		
	Evaluate Offsite Power operability.	**Cue:** **The SRO will evaluate Offsite Power operability.**		
	Go to step 3.5.5. (Step 3.5.6 for Unit 2)	Same		
3	**WHEN** D/G operated at 800 - 1000 KW for 10 minutes, perform the following:	Same **Cue:** **10 minutes have elapsed**		
	• Lower D/G load to less than 200 KW using "1(2) A D/G Gov Control"	Same **Cue:** **Lower pushbutton depressed,** **Meter indicates less than 200 KW.**		
*	• Open "1(2) ETA Emergency Breaker"	Same **Cue:** **Pushbutton depressed and green lamp is illuminated.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	Ensure D/G operates unloaded for 15 minutes	**CUE:** **15 minutes have elapsed.**		
5	**If** performing Hot Bearing Deflection Measurements.....	Operator determines that the D/G is not being run for maintenance and N/A's this step.		
	NOTE: Starting the B&A Lube Oil Pump in the following step prevents the pump from cycling off and on during D/G coast down.			
6	Place "Before & After Lube Oil Pump" in "RUN"	Same **Cue:** **Switch rotated clockwise. Red Light Illuminated**		
*7	Depress "STOP" on "1(2) A Diesel Generator".	Same **Cue:** **Pushbutton depressed, and green lamp is illuminated**		
8	Check 1(2) A D/G coasts to a complete stop.	Same **Cue:** **D/G shaft has stopped rotating.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
9	Place "Before & After Lube Oil Pump" in "AUTO"	Same **Cue:** **Switch rotated to AUTO.**		
10	Check Running: ☐ Jacket & Intercooler Water Pumps. ☐ Before & After Lube Oil Pump ☐ Crankcase Vacuum Blower	Same **Cue:** **Red Light Illuminated** **Red Light Illuminated** **Red Light Illuminated**		
11	Have the control room perform the following.....	**Cue:** **Another NLO will perform step 3.13 and complete the enclosure.** **This JPM is complete.**		

STOP TIME_____

*** DENOTES CRITICAL**

D/G SIMULATOR OPERATIONAL GUIDELINES (DG-175)

1. Reset D/G Simulator to IC-39.
2. Go to RUN.
3. Insert OVR-DG024B (1A D/G SWGR 1ETA Mode Sel Local Pos), Select "ON".
4. Depress the "1ETA Normal Breaker" Trip pushbutton on the simulator panel.
5. Allow simulator to stabilize for approximately one minute.
6. Insert OVR-EQB001B (DG LOAD SEQUENCER 1A RESET PB), Select "ON"
7. When examinee is ready, begin the JPM.

INITIAL CONDITIONS **(Unit 1 JPM)**

- Unit 1 is recovering from a loss of power to 1ETA due to an inadvertent Normal breaker trip.
- Power has been restored to 1ETA from 1A D/G per AP/1/A/5500/07, Case II (Loss of Normal Power to Either 1ETA or 1ETB).
- All steps have been completed up to step 73.
- 1A D/G output is approximately 2100 KW.

  - **The SRO directs you to return the 4160V Bus (1ETA) to normal power supply (Normal Breaker Closed) and shutdown the D/G locally <u>PER</u> OP/1/A/6350/002, DIESEL GENERATOR, Enclosure 4.3 (D/G 1A Shutdown).**
  - **All initial conditions of the Operating Procedure have been satisfied.**
  - **The Control Room D/G Mode Select Switch has been placed to Local.**
  - **All R&R's have been evaluated.**

INITIAL CONDITIONS **(Unit 2 JPM)**

- Unit 2 is recovering from a loss of power to 2ETA due to an inadvertent Normal breaker trip.
- Power has been restored to 2ETA from 2A D/G per AP/2/A/5500/07, Case II (Loss of Normal Power to Either 2ETA or 2ETB).
- All steps have been completed up to step 73.
- 2A D/G output is approximately 2100 KW.

  - **The SRO directs you to return the 4160V Bus (2ETA) to normal power supply (Normal Breaker Closed) and shutdown the D/G locally <u>PER</u> OP/2/A/6350/002, DIESEL GENERATOR, Enclosure 4.3 (D/G 2A Shutdown).**
  - **All initial conditions of the Operating Procedure have been satisfied.**
  - **The Control Room D/G Mode Select Switch has been placed to Local.**
  - **All R&R's have been evaluated.**

CONTROL ROOM

(SIMULATOR)

JPMs

Reviewed By_____

Approved By_____

TASK: **Increase Level in Cold Leg Accumulator 1A**

POSITION: **RO**

Operator's Name_____

Location: **Simulator/ Plant** Method: **Perform/ 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: OP/1/A/6200/009 Accumulator Operation

JPM verified current with references by _____

Date ___/___/

Rev. 10 / 2-28-07

KA: 006 A1.13 (3.5/3.7)

INITIAL CONDITIONS

You are the Unit 1 Balance of Plant (BOP) Operator.

Unit 1 is operating at 100% power when "1 Alpha Cold Leg Accumulator Abnormal Level" alarm is received in the control room. You observe Cold Leg Accumulator "1 Alpha" level to be approximately 20%. This accumulator has been slowly losing level requiring periodic make up. All other CLA levels are normal.

You are instructed to adjust level in CLA "1 Alpha" to 23% using the <u>preferred</u> method per OP/1/A/6200/009 (Accumulator Operation) Enclosure 4.2 (Adjusting Accumulators Level During Operation).

All Initial Conditions are met, all valves are aligned per the valve checklist, and there are no outstanding R&R's in effect for this system.
The WCC SRO has evaluated PRA Risk using the Electronic Risk Assessment Tool and has determined this procedure can be completed.

JPM OVERALL STANDARD: 1A NI Pump is utilized to increase Cold Leg Accumulator 1A level to clear the abnormal level alarm. 1A NI Pump is re-aligned to the injection flow path following makeup.

NOTES: This JPM is designed to be done on the Simulator (Perform) <u>**or**</u> at the Plant (Walkthrough).

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Evaluate all outstanding R&Rs that may impact the performance of this procedure	Per the Initial Conditions there are no outstanding R&Rs.		
2	Perform the following sections as applicable: Section 3.3, Increasing level with NC System pressure less than 1600 PSIG Using 1A NI Pump Section 3.4, Increasing level with NC System pressure Less Than 1600 PSIG Using 1B NI Pump **Section 3.5 Increasing level with NC System Pressure Greater Than 1600 PSIG Using 1A NI Pump** Section 3.6, Increasing level with NC System Pressure Greater Than 1600 PSIG Using 1B NI Pump Section 3.7, Lowering accumulator levels via sample lines Section 3.8, Adjusting accumulator levels via equalization	Based on Initial Conditions, Operator determines Section 3.5 will be used.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	**Increasing level with the NC System Pressure Greater Than 1600 PSIG using 1A NI Pump.**			
	NOTE: Performance of this section makes "A" Train NI unavailable.			
	Evaluate PRA Risk interactions for this section, utilizing Electronic Risk Assessment Tool	Per Initial Conditions this has been done.		
4	**NOTE:** Closing 1NI-118A (Train A NI to Cold Leg Isol) makes "A" Train NI inoperable.			
	Declare "A" Train NI inoperable	Same		
		Cue: **The SRO has logged "Alpha" Train NI inoperable in TSAIL**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*4	Close 1NI-118A (Train A NI to Cold Leg Isol)	Same **Cue:** **Pushbutton depressed, green light is lit**		
5	Ensure open: 1NI-100B (FWST To NI Pumps) 1NI-147A (NI Pumps Miniflow Hdr Isol) 1NI-115B (A NI Pump Miniflow)	Same. **Cue:** **Red light is lit** **Cue:** **Red light is lit** **Cue:** **Red light is lit**		
8 *	Start 1A NI Pump Check 1FWP5250 (NI Pumps Recirc Flow) indicates flow.	Same **Cue:** **Pushbutton depressed, red light is lit** Same **Cue:** **Meter indication reads approx. 45 GPM**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*9	Open 1NI-120B (CL Accum Fill From NI Pumps)	Same **Cue:** **Pushbutton depressed, red light is lit**		
10	**IF** Cold Leg Accumulator(s) to be filled **AND** CLA pressure less than 500 psig, perform the following:	Operator determines CLA pressure is approximately 615 psig and N/As the step. **CUE:** **CLA pressure is 615 psig.**		
	NOTE: To maintain Tech Spec operability, only one CLA at a time can have associated liquid fill valve, gas fill valve or sample valve open.			
11 *	**IF** raising level in "A" accumulator, perform the following: Open 1NI-56 (A CL Accum Fill Isol)	Operator determines "A" CLA is to be made up to Same. **Cue:** **Pushbutton depressed, red light is lit**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11 *	**Continued** **WHEN** CLA at desired level, close 1NI-56 (A CL Accum Fill Isol)	Same. **Cue:** **Level is at 23%** **Pushbutton depressed, green light is lit**		
12	**IF** raising level in "B" accumulator, perform the following:	Operator determines that only "A" CLA requires makeup and N/A's step		
13	**IF** raising level in "C" accumulator, perform the following:	Operator determines that only "A" CLA requires makeup and N/A's step		
14	**IF** raising level in "D" accumulator, perform the following:	Operator determines that only "A" CLA requires makeup and N/A's step		
*15	Close 1NI-120B (CL Accum Fill From NI Pumps)	Same **Cue:** **Pushbutton depressed, green light is lit**		
16	**IF** opened in Step 3.5.8...	Operator N/As this step.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*17	Stop 1A NI Pump	Same **Cue:** **Pushbutton depressed, green light is lit**		
18	Bleed pressure off 1NI-118A (Train A NI to Cold Leg Isol) as follows:			
	NOTE: Pressure reduction should occur in 10-15 minute time period with no Operator action.			
*	• Dispatch NLO to monitor 1NIPG6150 (Unit 1 Safety Injection Header Pressure) decreasing to less than 60 psig.	**CUE:** **NLO has been dispatched.**		
	• **IF** 1NIPG6150 (Unit 1 Safety Injection Header Pressure) greater than **OR** equal to 60 psig, open 1NI-120B (CL Accum Fill From NI Pumps).	Operator N/As the step after the following cue: **CUE:** **NLO reports that pressure is 50 psig and going down.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
18	**Continued**			
	• **IF** 1NIPG6150 (Unit 1 Safety Injection Header Pressure) still greater than **OR** equal to 60 psig, perform the following:	Operators N/As this step.		
*	• Check 1NIPG 6150 (Unit 1 Safety Injection Header Pressure) less than 60 psig.	Operator determines from previous cue that pressure is less than 60 psig.		
	• Ensure 1NI-120B (CL Accum Fill from NI Pumps) closed.	Same. **CUE:** **Green light lit.**		
*19	Open 1NI-118A (Train 1A NI To Cold Leg Isol)	Same **Cue:** **Pushbutton depressed, red light is lit**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
20	Evaluate "A" Train NI operability.	**Cue:** **The SRO has declared "Alpha" Train NI operable and removed it from TSAIL**		
21	**IF** necessary, adjust accumulator pressure per Enclosure 4.3 (Adjusting Accumulator Pressures)	Same **CUE:** **Another operator will evaluate the need to adjust pressure.** **This JPM is complete.**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

You are the Unit 1 Balance of Plant (BOP) Operator.

Unit 1 is operating at 100% power when "1 A Cold Leg Accumulator Abnormal Level" alarm is received in the control room. You observe Cold Leg Accumulator 1A level to be approximately 20%. This accumulator has been slowly losing level requiring periodic make up. All other CLA levels are normal.

You are instructed to adjust level in CLA 1A to 23% using the <u>preferred</u> method per OP/1/A/6200/009 (Accumulator Operation) Enclosure 4.2 (Adjusting Accumulators Level During Operation).

All Initial Conditions are met, all valves are aligned per the valve checklist, and there are no outstanding R&R's in effect for this system.
The WCC SRO has evaluated PRA Risk using the Electronic Risk Assessment Tool and has determined this procedure can be completed.

SIMULATOR OPERATIONAL GUIDELINES (CLA-68)

1. Reset the Simulator to IC-39, 100% Power, MOL
2. Open NM-82A and 72B to reduce level in CLA "1A".
3. Allow accumulator to drain until the low level alarm is received (approx. 20%), then close NM-82A and 72B.
4. Freeze the Simulator

Temporary Snap

IC-104

March, 2007

Reviewed By: _____

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 ____/____/____

INITIAL CONDITIONS

- VCT level - 42%
- BAT Boron Concentration 7090 ppm
- NC System Boron Concentration 1314 ppm
- Blender Flow Rate 90 gpm

The Control Room SRO directs you to raise VCT level to 54% using OP/1/A/6150/009 Encl. 4.5 (Manual Makeup to VCT using "NC System Makeup" Controller).

- **All Initial Conditions have been satisfied for OP/1/A/6150/009 Encl. 4.5**
- **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**

JPM OVERALL STANDARD:	Calculates total makeup of 232 gallons (acceptable range: 212 – 251 gal) and total boric acid of 43 gallons (acceptable range 39-47 gal). Terminates makeup when actual Boric acid flow is observed to be less than calculated (at a minimum, must terminate prior to makeup auto-stopping)
NOTES:	When makeup is started, a malfunction that causes Boric Acid flow to decrease 0 GPM will be ramped in over 30 seconds.

KA 004 A4.07 (3.9/3.7)

START TIME_____

The operator will review the following procedure notes before starting the first step of the procedure.

NOTE:

- The "BA Flow Control" potentiometer setpoint will determine makeup water boron concentration. Inaccuracies in the Boron Concentration Control System may result in a boration or dilution of the NC System. Diluting or borating the NC System will add reactivity to the core by changing the percentage of neutron absorbers in the NC System. With the reactor critical and above the POAH, a corresponding change in NC System temperature will occur (R.M.)

- Inadequate mixing of the NC System during makeup can result in pockets of water at a different boron concentration than the NC System which can cause unexpected NC System temperature response (R.M.)

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	If desired NC System boron concentration is greater than or equal to 2200 ppm, go to Encl. 4.15 (VCT Makeup with High NC System Boron Concentration)	Determines NC system Boron concentration is less than 2200 ppm and N/As the step.		
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		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	**WHEN** changing NC system boron concentration, evaluate energizing additional PZR heaters per OP/1/A/6100/003 to enhance mixing (R.M.).	Determine from initial conditions NC system boron concentration will not be changed and N/As the step. If candidate asks SRO, cue as follows: **CUE:** **Additional heaters are not required.**		
4	Determine volume of blended makeup to be added as follows: **IF** increasing VCT level, determine total volume of makeup required as follows:	Calculates the required blended makeup is **232 gal** using the formula in the procedure: (19.3 gal/%) x (12 %) = 231.6 gal. **Acceptable range:** **212 – 251 gal**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	**Continued** Record largest value of the following as Total Blended Makeup: • Flush requirement of 60 gallons OR • Required Blended Makeup determined in Step 3.4.1	Operator records Required Blended Makeup determined in procedure step 3.4.1		
* 5	Calculate the amount of boric acid required (rounded up to the nearest whole number) to achieve proper blended flow for the Total Makeup Volume recorded in Step 3.4.2 as follows (R.M.)	Calculates **43 gal boric acid required** based on the formula in the procedure: $\frac{(231.6 \text{ gal}) \times (1314 \text{ ppm})}{7090 \text{ ppm}}$ = 42.9 gal boric acid Total Boric Acid = 43 gal **Acceptable Range** based on JPM step 4: **39 – 47 gal Total Boric Acid**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	CAUTION: **WHEN** the "NC SYS M/U Controller is selected to "MANUAL", IF either batch integrator is satisfied before the other has recorded its required total, the pump and valve associated with the integrator which has been satisfied terminates flow. The flow controlled by the other integrator continues until that integrator is satisfied. **NOTE:** • Integrator Thumbwheel covers should NOT be opened unless associated counter reset pushbutton depressed. • Integrator Thumbwheel covers must be closed for NC Makeup System to operate. • Flow integrators may count up 1-5 gal after makeup terminated.			

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
* 6	Set Total Make Up Flow Counter to value determined in step 3.4.2 (R.M.)	Total Make Up Flow Counter set to **amount determined in JPM Step 4** **(212 - 251 gal)**		
7	**WHEN** Total Make Up Flow Counter cover closed, check counter at desired value (R.M.)	Value does not change when cover closed		
* 8	Set Boric Acid Flow Counter to value determined in Step 3.5 (R.M.)	Boric Acid Flow Counter set to **amount determined in JPM Step 6.** **(39 – 47 gal)**		
9	**WHEN** Boric Acid Flow Counter cover closed, check counter at desired value	Value does not change when cover closed		
* 10	Select "MANUAL" on "NC SYS M/U Controller"	Same. **CUE:** **Switch placed in manual.**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	NOTE: IF Boric Acid flowrate is ≤ 0.2 gpm (BA Flow Control potentiometer ≤ 0.05), the Boric Acid Flow counter will NOT count. This will prevent automatic termination of boric acid flow (R.M.)			
11	**IF** "BA Flow Control" potentiometer setpoint less than or equal to 0.05, set potentiometer at 0.1 (R.M.)	Determines pot setting is 4.17 and N/As this step. The operator may decide to confirm the correct setpoint of the B.A. Flow Control. **NOTE TO EXAMINER:** Operator may refer to Data book to determine correct pot setting if desired.		
* 12	Open 1NV-175A (BA Blender to VCT Outlet)	Same **Cue:** **Switch rotated to Open**		
13	Maintain normal VCT level, using 1NV-137A (NC Filters Otlt 3-Way Control).	No action by the operator at this step.		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	NOTE: • NC Makeup Control switch can be placed in STOP to terminate makeup at any time (R.M.) • Steps 3.4 – 3.20 may be completed and then checked off as time allows.			
* 14	Momentarily select START on "NC System Make Up"	Same **Cue:** **Switch rotated to START**		
15	Check "NC System Make Up" red light lit.	Same **Cue:** **Red light is lit**		
		NOTE TO EXAMINER: JPM steps 16, 17, and/or 18 may not be performed before makeup is terminated.		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
16	Check the following throttled • 1NV-252A (Rx M/U Water to Blender Control) • 1NV-267A (Boric Acid to Blender Control)	Same **Cue:** **Valves indicate intermediate position**		
17	Check RX M/U Water Pump starts	Same **Cue:** **RX M/U Water Pump (1A) selected to AUTO starts**		
18	If in "AUTO", check BA Trans Pump starts	Operator N/As this step since the B.A. pump is in START and was already running. **Cue:** **1B BA Trans pump is in the "START" position and on for recirc**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
* 19	Do **NOT** continue until one of the following occurs: Amount of total makeup recorded per Step 3.4.2 and amount of boric acid recorded per Step 3.5 added OR Blended makeup addition manually terminated.	Operator monitors makeup. OAC alarm "Boric Acid Filter High DP" will alarm, then annunciator 1AD-7, I3 (Boric Acid Flow Deviation). Operator may first refer to ARP for 1AD-7, I3 and **then terminates makeup by placing "NC Makeup Control" to STOP.** **CUE:** **NC Makeup Control placed in STOP.**		
* 20	Ensure makeup terminated as follows (R.M.) **IF** in "AUTO", ensure the following off: • 1A BA Trans Pump • 1B BA Trans Pump • 1A Rx M/U Water Pump • 1B Rx M/U Water Pump	Operator ensures the Rx M/U Water pump is off and ensures NV-252A and NV-267A are closed. The Boric Acid pump will remain running. **CUE:** **Green light lit for Rx M/U Water pump.**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
20	**Continued** Ensure the following closed: • 1NV-252A (Rx M/U Water to Blender Control) • 1NV-267A (Boric Acid to Blender Control)	**CUE:** **Green light lit, red light dark for NV-252A and NV-267A.**		
21	Informs SRO that makeup was manually terminated due to low Boric Acid flow.	Same. **CUE:** **The Control Room SRO will investigate problem and have another RO complete makeup.** **This JPM is complete.**		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

- VCT level - 42%
- BAT Boron Concentration 7090 ppm
- NC System Boron Concentration 1314 ppm
- Blender Flow Rate 90 gpm

The Control Room SRO directs you to raise VCT level to 54% using OP/1/A/6150/009 Encl. 4.5 (Manual Makeup to VCT using "NC System Makeup" Controller).

- **All Initial Conditions have been satisfied for OP/1/A/6150/009 Encl. 4.5**
- **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**

SIMULATOR OPERATIONAL GUIDELINES (NV-207A)

1. Reset the Simulator to IC-20
2. Place 1NV-137A to divert until VCT level is at 42%, then place back to VCT.
3. Insert: **MAL-NV012, Set = 100%, Ramp = 30, Trigger 1**
4. Freeze the simulator
5. Update status board with NC boron (1314 ppm) and BAT Boron (7090 ppm)
6. Reset Boric Acid and Total Makeup Flow counters (remove setting from previous JPM)
7. Set Boric Acid potentiometer to 4.17
8. **Insert malfunction when make up is started.**

TEMPORARY SNAP
IC-100

March, 2007

Reviewed By: _____

Approved By: _____

TASK: **Transfer To Hot Leg Recirc**

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-1.4 Transfer to Hot Leg Recirculation

JPM verified current with references by _____

Date ____/____/____

KAL 006 A4.07 4.4/4.4

INITIAL CONDITIONS

Unit 1 experienced a Loss of Coolant Accident six (6) hours ago. EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant) has been implemented and is completed through step 20. Transfer to Cold Leg Recirculation is complete. The "1 Alpha" NI Pump failed to start initially and cannot be started.

The SRO directs the RO to transfer to Hot Leg Recirc by performing EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirculation).

JPM OVERALL STANDARD: B Train ND has been realigned and is injecting in the Hot Leg Recirc Mode.

NOTES: The simulator initial conditions will have containment pressure still greater than 3 psig and will have "A" Train of ND aligned to Containment Spray. Therefore, only "B" train ND is required (critical) to be aligned to Hot Leg Recirc.

Provide a copy of E-1, completed through Step 20. **Do NOT lay ES-1.4 on the desk. The candidate is expected to pull the procedure from the drawer.**

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Align NI flow path for Hot Leg Recirc:	Operator realizes 1A NI Pump failed to start initially per initial conditions		
	Stop 1A NI Pump	Same **Cue:** **Green lamp illuminated**		
	Close 1NI-118A (Train A NI To Cold Leg Isol)	Same **Cue:** **Pushbutton depressed, green lamp illuminated**		
	Check 1NI-118A (Train A NI to Cold Leg Isol) - CLOSED	**Cue:** **Green lamp illuminated**		
	Open 1NI-121A (Train A NI To B & C Hot Leg)	Same **Cue:** **Pushbutton depressed, red lamp illuminated**		
	Check 1NI-121A (Train A NI to B&C Hotleg) - OPEN	**Cue:** **Red lamp illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	**CONTINUED:**			
	Start NI Pump 1A	Operator determines that the 1A NI Pump will not start **Cue:** **Green lamp illuminated**		
*	Stop NI Pump 1B	**Note**: Step is critical because the pump's discharge flowpath will be isolated in the next 2 steps. **Cue:** **Pushbutton depressed, green lamp illuminated**		
	Close 1NI-150B (Train B NI To Cold Leg Isol)	Same **Cue:** **Pushbutton depressed, green lamp illuminated**		
	Close 1NI-162A (NI Pumps Cold Leg Isol)	Same **Cue:** **Pushbutton depressed, green lamp illuminated**		
	Open 1NI-152B (Train B NI To A & D Hot Leg)	Same **Cue:** **Pushbutton depressed, red lamp illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	**CONTINUED**			
	Check if 1B NI Pump should be started.	Same		
	1NI-150B (Train B NI to Cold Leg Isol) CLOSED	**Cue:** **Green lamp illuminated**		
	1NI-152B (Train B NI to A&D Hot Leg) OPEN	**Cue:** **Red lamp illuminated**		
	Start NI Pump 1B	Same **Cue:** **Pushbutton depressed, <u>green</u> lamp illuminated**		
	Check the following windows on ESF Monitor Light Panel, Group 5 - LIT:	Same		
	A-1 "1NI-118A TRAIN A NI TO CL ISOL CLOSED"	**Cue:** **Window is illuminated**		
	B-1 "1NI-121A TRAIN A NI TO HL ISOL OPEN"	**Cue:** **Window is illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	**CONTINUED**			
	A-8 "1NI-150 TRAIN B NI TO CL ISOL CLOSED"	**Cue:** **Window is illuminated**		
	A-3 "1NI-162A NI PUMPS COLD LEG ISOL CLOSED"	**Cue:** **Window is illuminated**		
	B-8 "1NI-152 TRAIN B NI TO HL ISOL OPEN"	**Cue:** **Window is illuminated**		
2	Check for flow from at least one train of NI.	Operator determines that there is no flow from either NI Pump and proceeds to the RNO **Cue:** **Meter indicates 0 gpm flow**		
	Perform the following:	Same		
	Notify station management that NI flow not indicated.	**Cue:** **Station Management has been notified**		
	IF both trains of NI have failed to operate in Hot Leg Recirc Mode, **THEN GO TO** Step 4.	Same		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	Align ND S/I flowpath for Hot Leg Recirc:			
	Check the following valves - CLOSED:	Same		
	1ND-1B (C NC Loop to ND Pumps)	**Cue:** **Computer indicates valve is closed**		
	1ND-2A, C (C NC Loop to ND Pumps)	**Cue:** **Computer indicates valve is closed**		
	1ND-30A (Train A ND to Hot Leg Isol)	**Cue:** **Green lamp is illuminated**		
	1ND-15B (Train B ND to Hot Leg Isol)	**Cue:** **Green lamp is illuminated**		
*	Open 1NI-183B (ND to B&C Hot Legs Isol)	**Cue:** **Pushbutton depressed, red lamp is illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	**CONTINUED:**			
	For A ND train:	Operator realizes "A" train ND is aligned to NS and proceeds to RNO.		
	Check 1NS-43A (A ND to NS Cont Outside Isol) - CLOSED	**Cue:** **Red lamp is illuminated**		
	GO TO Step 4.d.	Same		
	For B ND Train:			
	Check 1NS-38B (B ND to NS Cont Outside Isol) - CLOSED	Same **Cue:** **Green lamp is illuminated**		
*	Close 1NI-178B (Train B ND to C&D CL)	**Cue:** **Pushbutton depressed, green lamp is illuminated**		
*	Open 1ND-15B (Train B ND to Hot Leg Isol)	**Cue:** **Pushbutton depressed, red lamp is illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	**CONTINUED** Check the following windows on ESF Monitor Light Panel, Group 5 - LIT: A-6 "1NI-183B ND to HL B&C ISOL OPEN" A-7 "1NI-178B Train B ND to CL C&D CLOSED"	Same **Cue:** **Window is illuminated** **Cue:** **Window is illuminated**		
4	Check for flow to NC hot legs from at least one train of ND.	Same **Cue:** **NC Flow to NC HL B&C meter indicates 3200 gpm**		
5	**<u>RETURN TO</u>** procedure and step in effect.	**Cue:** **The SRO will implement procedure and step in effect**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

Unit 1 experienced a Loss of Coolant Accident six (6) hours ago. EP/1/A/5000/E-1 (Loss of Reactor or Secondary Coolant) has been implemented and is completed through step 20. Transfer to Cold Leg Recirculation is complete. The 1A NI Pump failed to start initially and cannot be started.

The SRO directs the RO to transfer to Hot Leg Recirc by performing EP/1/A/5000/ES-1.4 (Transfer to Hot Leg Recirculation).

SIMULATOR OPERATIONAL GUIDELINES (NC:115A)

1. Reset the Simulator to IC-39 (100% Power MOL)

2. Insert Malfunction NC008A (Cold Leg LOCA)

3. Complete EP-E-0 and perform EP-E-1 through step 20.

4. Shutdown A & B D/G's by inserting the following LOA's:

   DG003 SET = STOP DG
   DG004 SET = STOP DG

5. Close 1RN-171 and 1RN-70

6. Allow Accident to continue until the FWST Lo Level Alarm sounds and the Auto Transfer of ND to Cold Leg Recirc initiates

7. Complete the transfer to Cold Leg Recirc Per EP/1/A/5000/ES-1.3 (Transfer To Cold Leg Recirc)

8. Insert the following LOA's to complete EP-E-1 step 19 and **remove stickers:**

   NI019 (NI-162) SET = Racked In
   NI022 (NI-121) SET = Racked In
   NI023 (NI-152) SET = Racked In
   NI024 (NI-173) SET = Racked In
   NI025 (NI-178) SET = Racked In
   NI026 (NI-183) SET = Racked In

9. Allow the NS System to bring FWST level to the LO LO level setpoint then Transfer NS to Cold Leg Recirc

10. Ensure "A" Train ND aligned to Containment Spray via 1NS-43A per the procedure.

11. Stop the 1A NI Pump and insert LOA NI014, SET = Racked Out, to rack out the 1A NI pump.

12. Insert malfunction NI001B (Failure of NI Pump 1B to start) SET = Both.

13. Freeze the Simulator.

TEMP SNAP # 67 (March, 2007)

Reviewed By: _____

Approved By: _____

TASK: **Respond to Leak on ND While at Midloop**

POSITION: **RO & SRO**

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: AP/1/A/5500/019 Loss of ND or ND System Leakage

JPM verified current with references by _____

Date __/__/

Rev. 00 / 3-2-07

KA: 025 AA1.02 (3.8/3.9)

INITIAL CONDITIONS

- Unit 1 is in Mode 5 with the NC System drained to midloop.
- 1B ND Pump is in service
- There are no draining activities in progress at this time.
- The preferred makeup flowpath is the "NV Pumps – S/I flowpath"
- PT/1/A/4200/002 C (Containment Closure / Integrity) is in effect.
- There are no operations in progress that would reduce boron concentration.

- NCS level is at approximately 3 inches and going down.
- NLOs have been dispatched to locate possible leak paths.

The SRO directs you to implement AP/1/A/5500/019 *(Loss of ND or ND System Leakage)*.

JPM OVERALL STANDARD: 1B ND pump is secured prior to reaching 0" NC Level. Makeup to the NC system is initiated prior to core boiling.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	CAUTION: Changes in NC pressure could result in inaccuracies in NC Level indications.			
1	Check ND pumps – ANY RUNNING.	Same. **CUE:** **1B ND pump is running. Red light lit.**		
2	Check if ND pumps should be stopped: NC Level – GREATER THAN 4 INCHES.	Operator goes to RNO because level is about 3 inches. **CUE:** **NC Level is 3 inches**		
3 *	Perform the following: Stop ND pumps.	Same. **CUE:** **Pushbutton depressed. Green light lit.**		
*	Close the following: • 1ND-30A (Train A ND to Hot Leg Isol)	**CUE:** **Pushbutton depressed. Green light lit.**		
	• 1ND-33 (A ND Hx Bypass)	**CUE:** **Green light lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	**Continued**			
*	• 1ND-18 (B ND Hx Bypass)	**CUE:** **Pushbutton depressed. Green light lit.**		
*	• 1ND-15B (Train B ND to Hot Leg Isol)	**CUE:** **Pushbutton depressed. Green light lit.**		
	GO TO Step 4.	Same.		
4	Isolate containment as follows:			
	Announce the following on page: • Description of event. • "All personnel evacuate Unit 1 containment"	Same. If asked, Unit 2 will make the page. **CUE:** **Unit 2 RO has made the announcement.**		
	Actuate containment evacuation alarm.	Same. **CUE:** **Switch rotated clockwise.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	**Continued** **<u>REFER TO</u>** RP/0/A/5700/011 (Conducting a Site Assembly, Site Evacuation, or Containment Evacuation) while continuing with this procedure. Check PT/1/A/4200/002C (Containment Closure/Integrity) – IN EFFECT. Notify Containment Closure Coordinator to initiate containment closure.	Same. **CUE:** **Another SRO will refer to RP/011.** Per the Initial Conditions, the Containment Closure PT is in effect. Same. **CUE:** **The Containment Closure Coordinator has been notified.**		
5	**Check if makeup should be initiated as follows:** Check NC temperature <u>prior to event</u> – GREATER THAN 200 °F	Unit 1 is in Mode 5 (< 200 °F). Operator goes to the RNO.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	Perform the following:			
	IF NC level going down, **THEN**:	Level is going down.		
	• Reduce or isolate letdown.	Letdown is already isolated. **CUE:** **1NV-121 Manual Loader is closed.** **Green lights lit for 1NV-457A, 1NV-458A, and 1NV-35A**		
	• Initiate makeup as required **PER** Enclosure 3 (NC System Makeup During Loss of ND)	Operator goes to Enclosure 3.		
7	**From Enclosure 3**			
	CAUTION: • Use of a makeup path which contains a known NC System opening such as CLA check valve removed or S/G primary manway/nozzle dam removed, may reduce flow though the core.			

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	**Continued**			
	CAUTION: • 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. NC System pressure, desired flow rate, and availability as noted in the Shift Supervisor checklist should be considered when making selection.			

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	**Continued** Select desired makeup flowpath from table and initiate makeup **PER** indicated enclosure.	Per the Initial Conditions, the desired flowpath is "NV Pumps – S/I Flowpath", Enclosure 5. Operator goes to **Enclosure 5.** **NOTE TO EVALUATOR:** **IF** the operator goes to Enclosure 4 and attempts to open 1FW-27A, a simulator malfunction has been inserted to fail it closed.		
8 * OR *	**From Enclosure 5:** Open the following: • 1NV-221A (NV Pumps Suct From FWST) • 1NV-222B (NV Pumps Suct From FWST)	**NOTE TO EVALUATOR:** It is critical to open AT LEAST one of these valves. Opening BOTH valves is not critical. **CUE:** **Pushbutton depressed. Red light lit.** **CUE:** **Pushbutton depressed. Red light lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
9 * OR *	Close the following: • 1NV-141A (VCT Outlet Isol) • 1NV-142B (VCT Outlet Isol)	**NOTE TO EVALUATOR** Since these valves are in series, It is critical to open only ONE of these valves. **CUE:** **Pushbutton(s) depressed. Green light lit for both valves.**		
10	Ensure NV pump miniflow valves are open: • 1NV-151A (NV Pumps Recirculation) • 1NV-150B (NV Pumps Recirculation)	Same. **CUE:** **Red lights lit for both valves.**		
11	CAUTION: Failure to maintain the normal charging header isolated while 1NI-9A (NC Cold Leg Inj From NV) or 1NI-10B (NC Cold Leg Inj From NV) is open, will result in NV pump runout conditions.			

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11 * OR *	**Continued** Close one of the following to prevent pump runout: • 1NV-244A (Charging Line Cont Outside Isol) • 1NV-245B (Charging Line Cont Outside Isol)	**NOTE TO EVALUATOR** Since these valves are in series, It is critical to close only ONE of these valves. **CUE:** **Pushbutton(s) depressed. Green light(s) lit.**		
12 * OR *	Open from the Control Room, or dispatch operator to open one or more of the following: • 1NI-9A (NC Cold Leg Inj From NV) • 1NI-10B (NC Cold Leg Inj From NV)	**NOTE TO EVALUATOR** It is critical to open AT LEAST one of these valves. Opening BOTH valves is not critical. Same. **CUE:** **Pushbutton depressed. Red light lit.** Same. **CUE:** **Pushbutton depressed. Red light lit.**		
13	Check NV pump – RUNNING.	Operator goes to the RNO since the NV pump is NOT running. **CUE:** **Green light lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
14	Perform the following: Close 1NV-238 (Charging Line Flow Control). Start associated NV Lube Oil pump. * Start NV pump. Place associated NV Lube Oil pump in "AUTO".	Same. **CUE:** **Green light lit.** **CUE:** **Pushbutton depressed. Red light lit.** **CUE:** **Pushbutton depressed. Red light lit.** **CUE:** **"Start" pushbutton released. Green light lit.**		
15	Check NC pump seal injection – IN SERVICE.	Operator goes to the RNO because seal injection is NOT in service. **CUE:** **Seal injection flow is 0. 1NV-238 is closed.**		
16	Observe Caution prior to Step 9 and **GO TO** Step 9.	Same.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
17	CAUTION: Failure to monitor FWST may cause loss of pump suction.			
	IF AT ANY TIME FWST level reaches 20 inches, **THEN GO TO** Step 13 to secure makeup via S/I flowpath.	Same.		
18	**IF AT ANY TIME** it is desired to reduce makeup flow, **THEN** perform one of the following:	Operator determines makeup flow should continue and goes to the next step.		
19	**WHEN** desired to secure makeup via S/I flowpath, **THEN GO TO** Step 13.	Operator determines makeup flow should continue and goes to the next step.		
20	**GO TO** Step 15.	Same.		
21	**IF AT ANY TIME** FWST level goes below 100 inches **AND** NV pump suction aligned to FWST, **THEN** isolate NV pump recirc flowpath to conserve FWST inventory as follows:	Operator observes FWST level is approximately 480 inches and goes to the next step. **CUE:** **FWST level is 480 inches.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
22	Use different or multiple makeup options as required to maintain NC temperature and level.	**CUE:** **The SRO will evaluate different makeup options.** **This JPM is complete.**		

STOP TIME_____

*** DENOTES CRITICAL**

SIMULATOR OPERATIONAL GUIDELINES (ND-258A)

1. Reset to IC-40, EOC, NCS at ~9.5".
2. Insert **OVR-FW007C = OFF** (Prevents 1FW-27A from opening)
3. Insert **MAL-ND010B = 200 gpm.**
4. Set up OAC point M1A0608 on "showdig".
5. Allow leak to run until NC level < 4 inches on <u>all</u> OAC level indications.
6. Freeze simulator.
7. **When simulator is taken to run for the JPM, increase leak size to 300 gpm.**

TEMPORARY SNAP

IC-153

March, 2007

INITIAL CONDITIONS

- Unit 1 is in Mode 5 with the NC System drained to midloop.
- 1B ND Pump is in service
- There are no draining activities in progress at this time.
- The preferred makeup flowpath is the "NV Pumps – S/I flowpath"
- PT/1/A/4200/002 C (Containment Closure / Integrity) is in effect.
- There are no operations in progress that would reduce boron concentration.

- NCS level is at approximately 3 inches and going down.
- NLOs have been dispatched to locate possible leak paths.

The SRO directs you to implement AP/1/A/5500/019 *(Loss of ND or ND System Leakage*).

Reviewed By: _____

Approved By: _____

TASK: **Manually Sequence Loads during a Blackout**

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: AP/1/A/5500/07 Loss of Electrical Power

JPM verified current with references by _____

Date ___/___/

INITIAL CONDITIONS

Unit 1 is operating at 100% power with "Bravo" train equipment in service. Electrical testing of the "1 Alpha" Train Diesel Generator Sequencer requires the Sequencer Control Power to be removed. While in this condition, a low voltage condition occurs on 1ETA. The Diesel Generator has been started manually from the Control Room. The crew has implemented AP/1/A/5500/07 (Loss of Electrical Power) Case II (Loss of Normal Power to either 1ETA or 1ETB) and are performing the actions of step 42.

The SRO directs you to load Essential Bus 1ETA by performing AP/1/A/5500/07, Enclosure 1 (Manual Loading of Emergency Bus).

JPM OVERALL STANDARD:

1. Essential Bus 1ETA is energized from the 1A D/G per Enclosure 1 of AP/1/A/5500/07.
2. The following components shall be energized per Enclosure 1:
   - ELXA Fdr Breaker
   - ELXC Fdr Breaker
   - RN Pump 1A (ONLY if RN-43A was closed in prior step)

   The other components on ETA are not required to be energized, but it is acceptable if they are placed in service.

NOTES: Mark body of AP/07 up to step 42.

KA064000 A4.06 (3.9/3.9)

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Ensure S/I reset	Same **Cue:** **"S/I Actuated" status light is dark. "S/I RESET" light is lit.**		
2	Check 1ETA - ENERGIZED FROM OFFSITE POWER	RO determines 1ETA is NOT energized from offsite power and goes to the RNO. **Cue:** **Green light illuminated on 1ETA Normal breaker**		
3	**GO TO** step 4	Same		
4	Check 1ETA - ENERGIZED FROM 1A D/G	RO determines that 1ETA is not energized from 1A D/G and proceeds to the RNO **Cue:** **Green lamp is illuminated for 1A D/G Emergency Breaker**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Perform the following: **IF** 1A D/G off, **THEN GO TO** step 15 **IF** 1A D/G is running , **THEN GO TO** step 7	RO determines that 1A D/G is running and goes to Step 7 **Cue:** **Red light lit on 1A D/G** Same. **Cue:** **1A D/G is running**		
6	Depress and hold "RESET" on "1A D/G LOAD SEQ" while completing steps 8 through 10.	**NOTE TO EVALUATOR:** The sequencer control power is pulled and it is NOT required that the reset pushbutton be held down. The RO may realize this and not hold the button. If he does want to hold down the pushbutton, you may allow the simulator runner to hold it for him while he performs the other tasks Same **Cue:** **Pushbutton is depressed**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	Unload 1ETA bus as follows:	**Note**: Most of the following breakers will already be open and will **NOT** require pushbutton depression. Each breaker should be verified **OPEN**. Cue accordingly.		
	Open 1A CA Pump Breaker	Same **Cue:** **Green light illuminated**		
	Open remaining pump breakers on 1ETA:			
	NV	Same **Cue:** **Green light illuminated**		
	ND	Same **Cue:** **Green light illuminated**		
	NI	Same **Cue:** **Green light illuminated**		
	KC	Same **Cue:** **Green light illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	**Continued**			
	RN	Same **Cue:** **Green light illuminated**		
	KF	Same **Cue:** **Green light illuminated**		
	Ensure Train A Containment Spray is reset and open NS Pump breaker.	Same **Cue:** **Train "A" Containment Spray "Reset" light lit.** **Green light illuminated**		
	Open 600V essential transformer feeder breakers:			
*	1ELXA	Same **Cue:** **Pushbutton depressed, green light illuminated**		
*	1ELXC	Same **Cue:** **Pushbutton depressed, green light illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7 *	**Continued** 1ELXE	Same **Cue:** **Pushbutton depressed, green light illuminated**		
8	Place "1A D/G MODE SELECT" switch to "C/R"	Same **Cue:** **Switch is in "C/R"**		
* 9	Close "1ETA EMERG BREAKER"	Same **Cue:** **Pushbutton depressed, red lamp is illuminated**		
10	Release "RESET" on "1A D/G LOAD SEQ"	Same **Cue:** **Pushbutton released**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
11	**IF** any equipment is manually started in subsequent steps, **THEN** observe the following limitations:			
	Continuous load on 1A D/G should not exceed 4000 KW	Same		
	Maximum load on 1A D/G should not exceed 4400 KW for 2 hours in any 24 hour period	Same		
	Voltage and frequency should be allowed to stabilize before applying the next load group	Same		
12	Check the following status lights on 1SI-14 - DARK			
	"ELXA STD-BY BKR CLOSED"	Same		
	"ELXC STD-BY BKR CLOSED"	**Cue:** **Status lights are dark**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	Load 1ETA as required:	Note to examiner : As each breaker is closed, cue the operator: **Cue:** **D/G load is less than 4000KW**		
*	1ELXA Fdr Breaker - CLOSED	Same **Cue:** **Pushbutton depressed, red lamp illuminated**		
	1A NV Pump-ON	Operator determines 1A NV pump is not needed and N/A's this step. If asked, give the following cue: **Cue:** **1A NV pump is not required to be running at this time**		
	EVCA Batt Charger - ON	EVCA Batt Charger is currently powered from U2 due to previous steps in AP/07. The operator may decide to N/A this step. It is acceptable either way.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	**Continued**			
	EVCC Batt Charger - ON	EVCC Batt Charger is powered from U2 (its normal power source). The operator may decide to N/A this step. It is acceptable either way. **IF** the operator asks the status of EVCC switch on the Unit 2 control board, give the following cue:		
		CUE: **Red light lit on EVCC.**		
*	1ELXC Fdr Breaker - CLOSED	Same **Cue:** **Pushbutton depressed, red lamp illuminated**		
	Ensure 1KC-51A (Train A Recirc Isol) control switch - IN AUTO	Same Operator may N/A this step since KC pumps will not be started in next step. Cue accordingly. **Cue:** **Switch rotated clockwise**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	**Continued**			
	1A1 KC Pump -ON	Operator determines "A" train KC pumps are not needed and N/A's the next two steps. **Cue:** **1A1 KC pump is not required to be running at this time**		
	1A2 KC Pump -ON	**Cue:** **1A2 KC pump is not required to be running at this time**		
	Ensure RN pump suction and discharge flowpath available	Operator checks control board indications **OR** OAC graphics and determines flowpath is available. **Cue:** **Suction and discharge flowpaths are aligned**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	**Continued**			
	Close 1RN-43A (Train B to Non Ess Hdr Isol)	The operator may decide to leave 1RN-43A open to ensure B Train RN is cooling the A Train. ***IF*** the operator asks for SRO guidance, give the following cue:		
		CUE: **The SRO directs you to close 1RN-43A.**		
		Cue: **Pushbutton depressed, green light illuminated**		
*	1A RN Pump - On	Same. **NOTE TO EVALUATOR**: Starting the 1A RN pump is critical **ONLY** if the cross-tie (1RN-43A) was closed in the previous step. Same **Cue:** **Pushbutton depressed, red lamp illuminated**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	**Continued**			
	Ensure the following valves full open: • 1RN-70A (A D/G Hx Inlet Isol) • 1RN-73A (A D/G Hx Outlet Isol)	Same **Cue:** **Red lamp illuminated** **Cue:** **Red lamp illuminated**		
	1A CA Pump - On	Same. Operator determines 1A CA pump is not needed and N/A's this step. **Cue:** **1A CA pump is not required to be running at this time**		
	Align RN **PER** Enclosure 3 (A Train Valve Alignment)	Same **Cue:** **Another operator will perform Enclosure 3**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
13	**Continued**			
	On OAC graphic for 1ETA bus, check 1ELXC load center breaker to 1EMXG-CLOSED	Same **Cue:** **Breaker indicates CLOSED on OAC**		
	IF S/I has occurred, **THEN** align and start equipment **PER** Enclosure 5 (S/I Equipment Alignment)	Operator determines S/I has NOT occurred and goes to step 15. **Cue:** **S/I actuated status light is dark. S/I Reset light is lit.**		
14	Check 1ETB - ENERGIZED FROM OFFSITE POWER	Operator checks OAC **OR** looks at the Control Boards to determine ETB is energized from off-site power. **Cue:** **Red lamp illuminated on 1ETB "Normal" breaker, "B" busline is energized**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	Return to step in effect in body of this procedure	RO returns to step 42 of Case II in AP07		
		Cue: **Another operator will continue with AP-07**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

Unit 1 is operating at 100% power with "B" train equipment in service. Electrical testing of the '1A' Train Diesel Generator Sequencer requires the Sequencer Control Power to be removed. While in this condition, a low voltage condition occurs on 1ETA. The Diesel Generator has been started manually from the Control Room. The crew has implemented AP/1/A/5500/07 (Loss of Electrical Power) Case II (Loss of Normal Power to either 1ETA or 1ETB) and are performing the actions of step 42.

The SRO directs you to load Essential Bus 1ETA by performing AP/1/A/5500/07, Enclosure 1 (Manual Loading of Emergency Bus).

SIMULATOR OPERATIONAL GUIDELINES (DG-13)

1. Reset simulator to IC-39 (100% Power MOL.)

2. Insert **MAL-EQB002A** (Loss of A train Sequencer Control Power).

3. Insert **MAL-EP009A** (opens 1ETA normal supply breaker).

4. Perform subsequent actions of AP/1/A/5500/07 (Loss of Electrical Power), Case II (Loss of either ETA or ETB), through step 41. Check off steps as they are performed.

5. Stabilize the plant

6 . Freeze the Simulator

7. Ensure "B" train is running

NOTE :

Simulator runner may be required to hold the 1A Sequencer "RESET" P.B. down during steps 6-10.

TEMPORARY SNAP IC-79
(March, 2007)

Reviewed By: _____

Approved By: _____

TASK: **Manually Align "Phase A Isolation" Components Following a LOCA**

POSITION:

Operator's Name_____

Location: Method:

Estimated JPM Completion Time: 25 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/E-0 Reactor Trip or Safety Injection

JPM verified current with references by _____

Date ___/___/

KA: 103 A2.03 (3.5/3.8)

INITIAL CONDITIONS

- A large break LOCA inside containment has occurred on Unit 1.
- Coincident with the reactor trip, a ground fault caused a blackout in 1ETA.
- EP/1/A/5000/E-0 (*Reactor Trip or Safety* Injection) has been completed up through Step 6.

You are instructed to perform Step 7 of EP/1/A/5000/E-0 (*Reactor Trip or Safety Injection*).

JPM OVERALL STANDARD: "B" train Phase A Isolation valves are manually closed such that there are no release paths from containment.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	**Check ESF Monitor Light Panel on energized train(s):** Groups 1,2,5 – DARK Group 3 – LIT OAC – IN SERVICE	Operator checks Monitor Light Panel for "B" train only. **CUE:** **Groups 1, 2, 5- Dark** **CUE:** **Group 3 – LIT** Operator determines OAC is in service. **CUE:** **Annunciator AD-13, E-6 (OAC Trouble) is dark**		
2	Group 4, Rows A through F – LIT AS REQUIRED	Operator determines that some "B" train windows in Group 4 are NOT lit as required and goes to the RNO.		
3	Perform the following: Ensure both trains Phase A Isolation are initiated.	Operator Initiates Train B of Phase A Isolation on 1MC-10 **CUE:** **Pushbutton depressed. Reset light still lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3 *	**Continued** Align or start S/I and Phase A components with individual windows in Group 4 as required.	**NOTE TO EVALUATOR:** The operator will manually close the components listed below. The critical valves are identified by an asterisk (*). * **1NC-53B** (N_2 to PRT Cont Isol OTSD) 1NC-56B (PRT Spray Cont Isol INSD) 1NF-233B (NF INLT Isol) 1NV-7B (Letdown Cont Isol OTSD) * **1WL-41B** (NCDT Vent OTSD Isol) * **1WL-1B** (NCDT Pmps Disch OTSD Isol) 1NV-95B (NC Pumps Seal Ret C/I OTSD) 1NV-150B (NV Pumps Recirc)		
4	**GO TO** Step 7.f.	Same.		
5	Check LOCA Sequencer Actuated status light (1SI-14) on energized train(s) – LIT.	Same. **CUE:** **"B" Train LOCA Sequencer Actuated status light is lit.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	Check the following windows on Monitor Light Panel Group 4 – LIT:			
	• C-3 "CONT ISOL PHASE A TRN A VLVS ALIGNED"	N/A (Train A not energized)		
	• **C-6 "CONT ISOL PHASE A TRN B VLVS ALIGNED"**	Operator determines that C-6 is dark and goes to the RNO.		
	• F-4 "SAFETY INJECTION TRAIN A COMPONENTS ALIGNED"	N/A (Train A not energized)		
	• F-5 "SAFETY INJECTION TRAIN B COMPONENTS ALIGNED"	F-5 is lit. **CUE:** **F-5 is LIT.** **C-6 is DARK.**		
7	Perform the following on energized train(s): Check OAC Monitor Light Program ("MONL") for associated light.	Operator queries "MONL" on the OAC and identifies the remaining Phase A Isolation valves that need to be closed.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7 *	**Continued** Align valves as required, while continuing with this EP.	Cue only if needed: **CUE:** **The SRO will continue in E-0 while you align the valves as required.** The operator will manually close the components listed below. The critical valves are identified by an asterisk (*). 1KC-332B (NCDT HX Rtn Hdr Cont INSD Isol) 1VI-148B (Upp Cont Non Ess Cont OTSD Isol) * **1KC-429B** (Rx Bldg Drn Hdr Cont INSD Isol) * **1NM-7B** (PZR Sample Cont OTSD Isol) * **1NM-26B** (NC loop Sample Cont OTSD Isol) * **1WL-322B** (Cont Vent Unit Drn Cont OTSD Isol)		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	**Continued**	1MISV-5581 (EMF-38/39 INSD Cont Isol) 1MISV-5583 (EMF-38/39 INSD Cont Isol) 1NSSV5550 (INSD Cont Isol Vlv)		
	End of E-0, Step 7.	**CUE:** **This JPM is complete.**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

- A large break LOCA inside containment has occurred on Unit 1.
- Coincident with the reactor trip, a ground fault caused a blackout in 1ETA.
- EP/1/A/5000/E-0 (*Reactor Trip or Safety* Injection) has been completed up through Step 6.

You are instructed to perform Step 7 of EP/1/A/5000/E-0 (*Reactor Trip or Safety Injection*).

SIMULATOR OPERATIONAL GUIDELINES (ISE-259A)

1. Reset to IC-39

2. Insert:

   MAL EP-008A
   (Ground fault on ETA)
   Trigger 1
   Set Trigger 1 activate on Reactor Trip

   MAL ISE-003B
   Set = Blk Both
   (Blocks Auto and Manual Phase A Isolation or Train B)

   MAL NC-008B
   (Cold Leg LOCA Loop B)

3. Perform Immediate Actions of E-0.

4. Acknowledge alarms.

5. Freeze simulator

Temporary Snap

IC-149

March, 2007

Reviewed By: _____

Approved By: _____

TASK: **Respond to EMF-35 (Unit Vent Particulate) Hi Rad Alarm**

POSITION: **RO/SRO**

Operator's Name_____

Location: **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:

JPM verified current with references by _____

Date ___/___/

INITIAL CONDITIONS

Unit 1 is at 100% power. The following alarm is received on 1RAD2-A1: 1EMF-35 UNIT VENT PART HI RAD. The RO observes 1EMF-35 to be in Trip 2 condition and determines the alarm to be valid.

The SRO directs you to respond to the 1EMF-35 Trip 2 alarm.

JPM OVERALL STANDARD: VA Filters placed in "TEST" (Filter mode). "A" Train CR Outside Air Pressure Fan placed in service.

NOTES:

KA: 073 G.2.3.10 (2.9/3.3)
061 AA1.01 (3.6/3.6)

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	**From ARP for 1RAD-2, A1 (OP/1/A/6100/010 R, A1):** Ensure Aux Building Unfiltered Exhaust Fans trip.	Same. **CUE:** **Green lights lit.**		
* 2	Place Aux Building Ventilation in the FILTER MODE by selecting "TEST" with the "VA Filter Units 1A Test" **AND** "VA Filter Units 1B Test" switches until the cause of the Hi Rad condition can be determined.	**NOTE TO EVALUATOR:** Either switch (1A or 1B) will close the bypass damper. Selecting "TEST" on ONE switch is critical. **CUE:** **Switches rotated to the TEST position.**		
3	**IF** a valid EMF-35 (Trip 2) alarm does **NOT** clear within 5 minutes of the alarm initiation time, do the following: Ensure at least one train of VC outside air pressure filtration is in service per OP/0/A/6450/011 (Control Area Ventilation / Chilled Water System) Enclosure 4.4 (Control Room Atmosphere Pressurization During Abnormal Conditions).	**CUE:** **5 minutes have elapsed.** When Operator obtains Control Copy of OP/0/A/6450/011 or asks for a Working Copy, give him/her a copy of Enclosure 4.4.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
4	**From OP/0/A/6450/011, Enclosure 4.4:** **Initial Conditions** • Control Room atmosphere has been determined to be in need of pressurization to protect Control Room personnel. • VC/YC Train A **OR** B is selected and is in operation per this procedure.	Operator signs off both Initial Conditions and continues to the next step.		
5	Evaluate all outstanding R&Rs that may impact performance of this procedure.	Same. **CUE:** **No outstanding R&Rs affect performance of this procedure.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
6	Pressurize Control Room using Outside Air Pressure Fans as follows: Ensure one of the following groups of intake valves open: • 1VC-1A (VC Otsd Air Intake Isol from Unit 1) • 1VC-2A (VC Otsd Air Intake Isol from Unit 1) • 1VC-3B (VC Otsd Air Intake Isol from Unit 1) • 1VC-4B (VC Otsd Air Intake Isol from Unit 1) OR • 1VC-9A (VC Otsd Air Intake Isol from Unit 2) • 1VC-10A (VC Otsd Air Intake Isol from Unit 2) • 1VC-11B (VC Otsd Air Intake Isol from Unit 2) • 1VC-12B (VC Otsd Air Intake Isol from Unit 2)	Same. **CUE:** **Intake Isolation valves from Unit 1 are open.** N/A		
7	<u>IF</u> A Train VC/YC operating, place "A Train CR Outside Air Press Fan" to "ON".	"A" Train VC/YC is NOT operating. Operator N/As this step.		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
* 8	<u>IF</u> B Train VC/YC operating, place "B Train CR Outside Air Press Fan" to "ON".	Same. **CUE:** **Switch rotated clockwise.**		
9	Depress "MAN" for the following (to ensure fans off): • #1 CRA Otsd Air Fan • #2 CRA Otsd Air Fan	Same. **CUE:** **"MAN" pushbuttons depressed. Green lights lit.**		
10 * <u>OR</u> *	Depress "OFF" for the following: • CRA-OAD-4 (CR Area Otsd Air Fans Damper) • CRA-OAD-3 (CR Area Otsd Air Fan Damper)	**<u>NOTE TO EVALUATOR:</u>** These dampers are in series. Only ONE is critical. **CUE:** **"OFF" pushbuttons depressed. "OPEN" lights are dark.**		
11	Check the following dark: • CRA-OAD-4 (CR Area Otsd Air Fans Damper) "OPEN" light • CRA-OAD-3 (CR Area Otsd Air Fans Damper) "OPEN" light	Same. **CUE:** **"OPEN" lights are dark.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
12	**WHEN** desired to stop pressurization of Control Room atmosphere, perform the following:....	Operator determines pressurization of CR atmosphere should NOT be stopped, and returns to the ARP for 1RAD-2, A1.		
13	**From ARP OP/1/A/6100/010 R, A1 (Supplementary Action 1.B):** **WHEN** the EMF-35 (Trip 2) alarm resets, do the following: 1. Request OSM to determine final alignment of VC/YC. 2. Align VC/YC as determined by OSM using OP/0/A/6450/011.	This step is not applicable at this time. The alarm is still in Trip 2 so the operator goes to Supplementary Action 2.		
14	Notify RP	Operator simulates calling RP and informs them of the Trip 2 alarm. **CUE:** **RP has been notified.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
15	**WHEN** RP has determined that filtration is no longer required **AND** the alarm has cleared, return Aux Building Ventilation System to normal operation per OP/0/A/6450/003 (Auxiliary Building Ventilation System).	N/A **CUE:** **RP will notify the Control Room when filtration is no longer required.** **This JPM is complete.**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

Unit 1 is at 100% power. The following alarm is received on 1RAD2-A1: "1EMF-35 UNIT VENT PART HI RAD. The RO observes 1EMF-35 to be in Trip 2 condition and determines the alarm to be valid.

The SRO directs you to respond to the 1EMF-35 Trip 2 alarm.

SIMULATOR OPERATORS GUIDELINES (EMF-257)

1. Reset to IC-39

2. Insert the following malfunctions:

   MAL- EMF135L = 200 CPM

   MAL- EMF137 = 200 CPM

3. Freeze simulator

Temporary Snap

IC-152

March, 2007

Reviewed By: _____

Approved By: _____

TASK: **Perform the Main Turbine Overspeed Trip Test**

POSITION: **RO/SRO**

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: PT/1/A/4250/004 C Turbine OPC and Mechanical Overspeed Trip Test

JPM verified current with references by _____

Date ____/____/____

INITIAL CONDITIONS

- Unit 1 is starting up after a refueling outage.
- The Turbine/Generator is off line and rolling at 1800 RPM in preparation for performing PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test).
- All prerequisite conditions have been met and two operators have been stationed at the Turbine as required.
- Communications have been established with all involved.

The SRO instructs you to complete PT/1/A/4250/004C, beginning with step 12.7.

JPM OVERALL STANDARD: Turbine speed is increased to OPC setpoint. Speed is then increased until the Turbine Overspeed trip should be actuated. The operator recognizes the turbine has failed to trip at the expected setpoint and then manually trips the Turbine.

NOTES: **A copy of PT/1/A/4250/004C, signed off through step 12.6, shall be provided during turnover.**

This JPM is designed to be performed as a **SIMULATION** or as a **WALKTHROUGH.** Cues found in shaded boxes should be given to the trainee for either setting.

Provide an operator to acknowledge unrelated alarms and control Reactor Power (since Rods are in "Manual").

Ensure "OPC" key #63 (test key) is available.

KA 045 A3.08 (3.3*/3.5*)

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Depress ACC RATE	Same **Cue:** **Pushbutton depressed**		
*2	Enter acceleration rate of 25 RPM/MIN in "Variable Display".	Same **Cue:** **Data inserted**		
*3	Depress REFERENCE	Same **Cue:** **Pushbutton depressed**		
*4	Enter speed of 1860 rpm in the "Variable Display" window.	Same **Cue:** **Data inserted**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	NOTE: • Steps 12.11 – 12.14 should be read and understood for quick performance. Once OPC Controller actuates, going to "Mechanical Overspeed Test" on Turbine will prevent multiple actuation of OPC Controller and loss of LH header pressure. • The digital Control Board meter should be used in the following steps.			
*5	Depress "GO"	Same **Cue:** **Pushbutton depressed**		
6	Check Turbine starts increasing speed at selected rate	Same **Cue:** **Turbine speed is increasing at the selected rate**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	**IF** demand speed of 1860 rpm is reached before OPC Controller actuates, reduce Turbine speed to 1800 rpm (100%) • **IF** unable to reduce speed, have operator at Turbine Trip Lever trip Turbine.	Same **NOTE:** Operator will N/A this step if OPC controller functions properly **Cue:** **The OPC Controller has actuated properly**		
*8	**When** OPC Controller actuated, place "OPC" in "MECHANICAL OVERSPEED TEST" using "OPC" key #63.	Same **Cue:** **Key in switch and rotated clockwise**		
9	**IF** LH header pressure fails to recover, following an OPC controller actuation, perform the following:…..	Operator will N/A this step if LH header pressure is recovering as indicated on OAC or chart recorder. **Cue:** **LH header pressure is recovering**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
10	Record on Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet) the actual speed at which the Turbine OPC Controller actuated.	Same **Cue:** **Another operator will log the data.**		
	NOTE: Steps 12.17 – 12.24 test Mechanical Overspeed Trip mechanism.			
11	Block Overfrequency Trip Relay by simultaneously opening all knife switches on GENERATOR NO 1 OVERFREQUENCY TEST BLOCK located on 1EB8	Same **Cue:** **The Overfrequency Trip Relay has been blocked**		
*12	Depress "ACC RATE".	Same **Cue:** **Pushbutton depressed**		
*13	Enter acceleration rate of 50 rpm/min in "Variable Display".	Same **Cue:** **Data inserted**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*14	Depress "REFERENCE".	Same **Cue:** **Pushbutton depressed**		
*15	Enter speed of 2000 rpm in “Variable Display”.	Same **Cue:** **Data inserted**		
*16	Depress "GO".	Same **Cue:** **Pushbutton depressed**		
17	Check Turbine starts increasing speed to 2000 rpm at selected rate.	Same **Cue:** **Turbine speed is increasing**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*18	**CAUTION:** The Mechanical Overspeed Trip must occur at or before 1998 RPM (111%) **IF** Turbine speed reaches 1998 rpm (111%) before Mechanical Overspeed Trip actuates, trip Turbine.	Operator determines Turbine has not tripped at or before 1998 RPM and manually trips the turbine after recognizing the failure. **NOTE TO EVALUATOR:** **The student must have their hand on the Turbine Trip switch by the time the turbine reaches 2000 rpm to pass this step.** **Cue:** **Turbine speed indicates 1999 RPM and is increasing** (After Turbine is manually tripped) **Cue:** **All Throttle and Governor valves indicate closed, speed is decreasing.**		

*** DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
19	Record on Enclosure 13.1 (Turbine OPC Overspeed Test and Turbine Overspeed Mechanical Trip Test Data Sheet) the actual speed at which the Turbine trips.	**Cue:** **The SRO has directed another operator to log the test data and complete this procedure.** **This JPM is complete.**		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

- Unit 1 is starting up after a refueling outage.
- The Turbine/Generator is off line and rolling at 1800 RPM in preparation for performing PT/1/A/4250/004C (Turbine OPC and Mechanical Overspeed Trip Test).
- All prerequisite conditions have been met and two operators have been stationed at the Turbine as required.
- Communications have been established with all involved.

The SRO instructs you to complete PT/1/A/4250/004C, beginning with step 12.7.

SIMULATOR OPERATIONAL GUIDELINES (EHC-154A)

1. Reset to IC-30, Turbine at 1800 RPM
2. Insert malfunction: MAL-DEH003A, Failure of Auto Turbine Trip
3. Place voltage regulator switch to "MAN" position.
4. Ensure "excitation" is in "TRIP"
5. Ensure Main Gen MOD's open.
6. Freeze the Simulator

NOTES: **A copy of PT/1/A/4250/004C, signed up through step 12.6 shall be provided during turnover.**

Provide an operator to acknowledge unrelated alarms and control Reactor Power (since Rods are in "Manual").

Ensure test key #63 is available.

Temporary Snap

IC-148

March, 2007