Final Submittal

MCGUIRE FEB 2005 EXAM
50-369 & 370/2005-301

FEBRUARY 7 - 15, 2005
FEBRUARY 18, 2005 (written)

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

Facility: McGuire Date of Examination: 2/7-16/05
Examination Level (circle one): (RO) / SRO Operating Test Number: 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	AFD Calculation with inoperability
Conduct of Operations	N,S	Perform a Shift turnover
Equipment Control	M,	Manual NC Leakage Calculation
Radiation Control		
Emergency Plan	N,C	Perform RP/11 Conducting a Site Assembly or Evacuation

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

* Type Codes & Criteria:
(C)ontrol room
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)
(S)imulator

Facility: McGuire Date of Examination: 2/7-14/05

Examination Level (circle one): RO / (SRO) Operating Test Number: 1

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
Conduct of Operations	N	AFD Calculation with inoperability determination
Conduct of Operations	M	Shift Manning Requirements
Equipment Control	N	Thermal Margin Calculation and Evaluation of Work Allowed
Radiation Control	M, P, C	Review and Approve a GWR
Emergency Plan	M, C	RP/07 Earthquake with Technical Specification

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

* Type Codes & Criteria:
(C)ontrol room
(D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes)
(N)ew or (M)odified from bank (≥ 1)
(P)revious 2 exams (≤ 1; randomly selected)
(S)imulator

Facility: ___McGuire ___ Date of Examination: 2/7-16/05
Exam Level (circle one): RO / SRO-I / SRO-U Operating Test No.: ___1___

Control Room Systems@ (8 for RO; 7 for SRO-I; 2 or 3 for SRO-U)

System / JPM Title	Type Code*	Safety Function
a. Respond to a Loss of Component Cooling (KC-234A)	N, S, A	SF-8
* b. Respond to a Leak on operating ND System while at Mid Loop	D, L, P	SF-4P
c. Intermediate Range Failure (ENB-235A) **(SROU)**	N, S, A	SF-7
d. Align the Containment Spray system to Cold Leg Recirculation (NS-182A) **(SROU)**	D,S,P,A	SF-5
e. Respond to Additional Dropped Rods While Retrieving a Dropped Control Rod (IRE 174IA)	A, D, S	SF-1
f. Establish Feedwater Flow to S/G's following a Runback (CF-237)	N,S	SF-4S
g. Align Normal Charging With NV Recirc Path Isolated (NV-146A)	A,D, S	SF-2
h. Start and Load 1B D/G then Separate From the Grid (DG-198) **(SROU)**	D, S	SF-6
In-Plant Systems@ (3 for RO; 3 for SRO-I; 3 or 2 for SRO-U)		
i. Control Steam Pressure Using SM PORVs (Unit 2) (SM238) **(SROU)**	E, B	SF-4S
j. Borate the Reactor Coolant System from the Auxiliary Shutdown Panel ASP-138 **(SROU)**	R, E, B	SF-1
k. Aligning Control Air from Backup Cylinders to F VI Compressor VI-110A)	E, A, P	SF-8

@ All control room (and in-plant) systems must be different and serve different safety functions; in-plant systems and functions may overlap those tested in the control room.

* Type Codes	Criteria for RO / SRO-I / SRO-U
(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1
(L)ow-Power	≥ 1 / ≥ 1 / ≥ 1
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)
(R)CA	≥ 1 / ≥ 1 / ≥ 1
(S)imulator	

* N/A SROI

NRC EXAM

2005

ADMIN JPMs
FINAL VERSION

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: G 2.1.33 (3.4/4.0)

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= 169.5 PR-41 B= 238
- PR-42 A= 170 PR-42 B= 242.5
- PR-43 A= 170 PR-43 B= 240
- PR-44 A= 168 PR-44 B= 255

You are instructed to perform a manual AFD calculation per Step 12.8 of PT/1/A/4600/021 A (Loss of Operator Aid Computer While in Mode 1), and verify calculated values are within the limits specified in the COLR.

JPM OVERALL STANDARD:

The manual AFD calculation is performed per Enclosure 13.2 (Axial Flux Difference Monitoring) and the correct results (± 1% and 2/4 channels out of spec.) are obtained for the detector currents used in the calculation.

NOTES: Provide COLR and DATA Book

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Determines that Encl. 13.2, Part B is used to perform manual calculation	same		
*2	Obtains values for column A from the Data Book, Table 2.2	Same		
3	Obtains Measured currents (column B) values for upper and lower detectors of all power range channels	Same **Cue: (provided with initial conditions)** • **PR-41 A= 169.5** • **PR-41 B= 238** • **PR-42 A= 170** • **PR-42 B= 242.5** • **PR-43 A= 170** • **PR-43 B= 240** • **PR-44 A= 168** • **PR-44 B= 255**		
*4	Performs calculation required for columns C & D	Same		

* DENOTES CRITICAL

*5	Obtains values for column E from the Data Book, Table 2.2	Uses Table obtained in Step 3		
*6	Performs calculation required for column F	Values calculated within ± 1% of key.		
7	Locate COLR AFD values.	Same		
*8	Verify calculated AFD is within limits specified in COLR	Determines that 2 of 4 channels exceed the COLR limits		
9	Informs the CR SRO 2 of 4 channels exceed COLR limits	Same		

STOP TIME_____

* DENOTES CRITICAL

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= 169.5 PR-41 B= 238
- PR-42 A= 170 PR-42 B= 242.5
- PR-43 A= 170 PR-43 B= 240
- PR-44 A= 168 PR-44 B= 255

You are instructed to perform a manual AFD calculation per Step 12.8 of PT/1/A/4600/021 A (Loss of Operator Aid Computer While in Mode 1) and verify calculated values are within the limits specified in the COLR.

KEY

Enclosure 13.2

Axial Flux Difference Monitoring

Part B

Sheet ____ of ____
Date:_____Time:[2]_____

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	183.4	169.5	92.42			
				-12.1	1.358	-16.43
PR-41 B	204.1	238	116.61			
PR-42 A	186.6	170	91.1			
				-14.21	1.356	-19.27
PR-42 B	202.9	242.5	119.52			
PR-43 A	182.0	170	93.41			
				-11.47	1.369	-15.7
PR-43 B	206.3	240	116.34			
PR-44 A	182.5	168	92.05			
				-14.92	1.306	-19.48
PR-44 B	209.2	255	121.89			

(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.

Ch BH

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 = 17

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	224.0	159.1	229.0	159.3	221.4	160.4	224.4	161.1
20	210.5	174.1	214.9	173.8	208.2	175.7	210.4	177.1
10	197.0	189.1	200.8	188.4	195.1	191.0	196.5	193.1
0	183.4	204.1	186.6	202.9	182.0	206.3	182.5	209.2
-10	169.9	219.1	172.5	217.5	168.9	221.5	168.6	225.2
-20	156.4	234.1	158.4	232.1	155.8	236.8	154.6	241.2
-30	142.8	249.1	144.2	246.6	142.7	252.1	140.7	257.3
Correlation Coef.=	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Normalized Detector Voltages (Volts At Various Axial Offsets

	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	10.174	6.493	3.681	10.222	6.537	3.685	10.129	6.478	3.651	10.240	6.415	3.825
20	9.559	7.105	2.454	9.592	7.135	2.457	9.530	7.096	2.434	9.603	7.053	2.550
10	8.945	7.718	1.227	8.961	7.732	1.229	8.930	7.713	1.217	8.967	7.692	1.275
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	7.715	8.942	-1.227	7.699	8.928	-1.229	7.730	8.947	-1.217	7.693	8.968	-1.275
-20	7.101	9.555	-2.454	7.068	9.525	-2.457	7.130	9.564	-2.434	7.057	9.607	-2.550
-30	6.486	10.167	-3.681	6.438	10.123	-3.685	6.531	10.182	-3.651	6.420	10.245	-3.825

AFD Incore/Excore Ratios For Quadrants 1 - 4

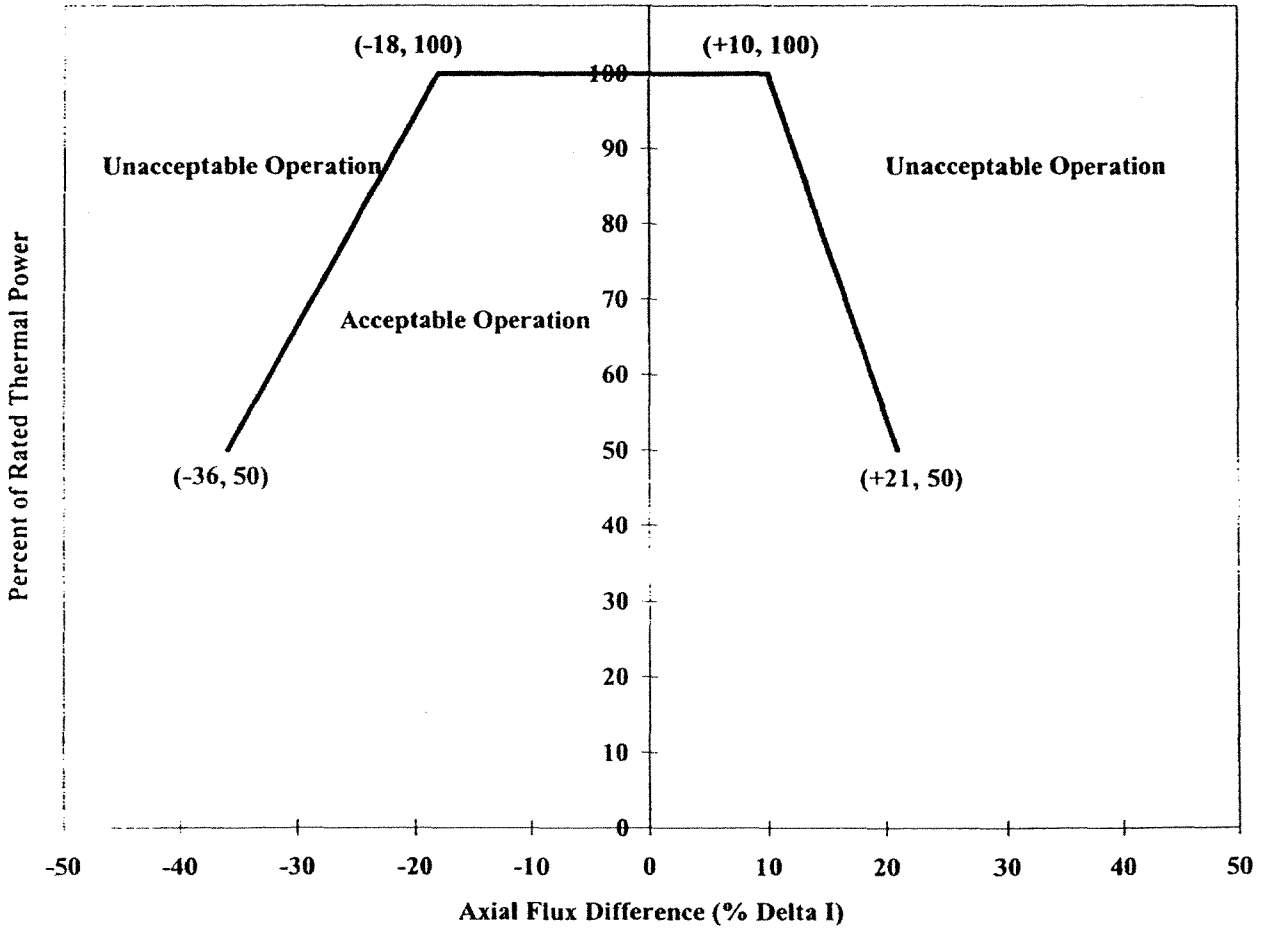
	Quad 4 N41	Quad 2 N42	Quad 1 N43	Quad 3 N44
M=	1.358	1.356	1.369	1.306

Prepared By: Ryan M Davis Date: 7/6/2004 Time: 13:53

McGuire 1 Cycle 17 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.

Duke Power Company McGuire Nuclear Station	Procedure No. **PT/ 1/A/4600/021 A**
	Revision No. **024**
Loss Of Operator Aid Computer While In Mode 1	
	Electronic Reference No. **MC00483T**
Continuous Use	

PERFORMANCE

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

(ISSUED) - PDF Format

Revision History (significant issues, limited to one page)	
Rev 024	(1/13/04) In steps 12.6.2 and 12.6.3.2 replaced "exit this procedure section" with "go to Step. 12.7", to eliminate confusion.
Rev 023	(10-30-02) Per PIP 4090, made changes to Step 12.6 (Electrical Surveillance Items) and Enclosure 13.1 to eliminate unnecessary recording of data if the opposite Unit's Switchboard Log is recording MWH data. If neither Unit is capable of obtaining electrical data, the Digital Counters must be used for recording in Enclosure 13.1. -Added OAC Points to Enclosure 13.7 to identify partial loss of OAC for RP's PI Data.
Rev 022	(10/08/02) The following changes were made: • Reworded Step 12.5 for recording Electrical Surveillance Items. • Changed Encl. 13.1 Hourly Dispatcher Report for ease of recording data.
Rev 021	(6/10/02) • Changed "IAE" to "Eng OAC Group" for group to notify when OAC out of service • Reformatted step on monitoring QPTR. (Step 12.12). When one power range out of service, deleted note and added information as a new step
Rev 020	(3-20-02) -Added Step 12.2.3 to notify RP Shift that OAC is OOS and that PI Data is unavailable. -Added Step 12.15 to notify RP Shift when OAC is returned to service. {PIP 01-4284 -Deleted Steps 12.5.4 and 12.15 associated with IAE placing/removing Easterline Angus recorders to/from service. {PIPs 01-2645, 4176} - Added Step 12.5.4 for guidance to perform "Manual Trigger" of Analog Fault Recorder instead of having IAE operate Easterline Angus recorder. -Added new Enclosure 13.9 (Manual Trigger of Analog Fault Recorder). -Modified Enclosure 13.1 to record MW meter readings.
Rev 019	(7/30/01) Added criteria (step 12.8) requiring containment ventilation temperatures if a containment fire watch is in affect also added to acceptance criteria.
Rev 018	2/28/01: Made changes to support implementation of CA Storage Tank Mod NSM-MG-12518.
Rev 017	9/12/2000 Enclosure 13.4, Corrected footnotes for both upper and lower containment per PIP-0-M00-0552. Also converted to new template and brought procedure in line with Writer's Manual. A 10CFR50.59 Evaluation is not required for this change.

Unit 1

Loss Of Operator Aid Computer While In Mode 1

1. Purpose

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

2. References

2.1 Tech Specs:

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

2.2 Core Operating Limits Report (COLR)

3. Time Required

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

4. Prerequisite Tests

None

5. Equipment Required

5.1 Instrument capable of converting RTD resistance readings to temperature readings (Platinum 100 ohm) for Step 12.10.

5.2 Calibrated digital thermometer, capable of reading ambient air temperatures (Examples: Tegan 871, Keithley 871 or comparable instrument) for Step 12.13.

6. Limits and Precautions

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

7. Unit Status

_____ 7.1 Unit 1 in Mode 1.

8. Prerequisite System Conditions

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

9. Test Method

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

10. Data Required

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

11. Acceptance Criteria

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

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

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

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

11.3 For Control Rod Position:

- All full length rods (individual rod positions) have been checked within 4 hours and every 4 hours thereafter to be within 12 steps (indicated position) of their group demand position and operable.

- **IF** Annunciator 1AD-2, B9 (Control Rod Bank Lo-Lo Limit) out of service, each Control Bank has been checked within 4 hours and every 4 hours thereafter to be above rod insertion limits as specified in COLR.

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

11.4 Containment air temperatures have been checked once per hour after OAC has been out of service for 4 hours. Tech Spec Containment average air temperature shall be 75 - 100°F for containment upper compartment **AND** 100 – 120°F for containment lower compartment (See NOTE).

11.5 **IF** a Containment fire watch in affect **AND** containment air temperatures are being used to satisfy requirements, temperatures have been checked once per hour. (SLC 16.9.6)

11.6 **WHEN** above 50% RTP, Enclosure 13.5 (Calculation Sheet for Quadrant Power Tilt) has been calculated once within 12 hours and every 12 hours thereafter and Quadrant Power Tilt Ratio (QPTR) checked less than or equal to 1.02.

11.7 **IF** outside temperature less than 32°F, within 2 hours FWST Level Instrument Room heaters are checked energized **AND** every 12 hours temperature checked greater than 40°F.

11.8 Required data recorded in PT/1/A/4200/040 (Reactor Coolant Leakage Detection) to determine if reactor coolant leakage into Reactor Building has increased.

11.9 CA Storage Tank temperature 32 - 138°F.

12. Procedure

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

_____ 12.1 **IF** this procedure is entered due to a "Failed" or "Bad Quality" OAC point, go to Enclosure 13.7 (OAC Point List For Partial Loss Of OAC) to determine applicable sections of procedure to perform. All other sections of procedure may be marked NA.

_____ 12.2 Notify Eng OAC Group that OAC is out of service (completely or partially) and needs to be returned to service as soon as possible.

_____ _____/_____
Person Contacted Date Time

_____ 12.3 Notify RP Shift that OAC is out of service and PI data collection is unavailable.

_____ _____/_____
Person Contacted Date Time

12.4 Perform the following:

12.4.1 Enter the following in TSAIL for tracking increased surveillance frequency:

_____ • Rod Position Deviation Monitor (ITS SR 3.1.4.1)
_____ • AFD Monitor Alarm (ITS SR 3.2.3.1)
_____ • QPTR Alarm (ITS SR 3.2.4.1)

_____ 12.4.2 **IF** Annunciator 1AD-2, B9 (Control rod Bank Lo-Lo Limit) unavailable, enter Rod Insertion Limit Monitor (ITS SR 3.1.6.2) in TSAIL for tracking increased surveillance frequency.

☐ 12.5 Reduce turbine generator load as required to maintain indicated Reactor Power level less than 100% as indicated on NI Power Range Meters. {PIP-1-M99-0578}

12.6 Record Unit 1 Electrical Surveillance Items as follows:

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

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

_____ 12.6.2 **IF** all Unit 1 MWH OAC Points in service **AND** M1L1201 (U1 SOC External Gateway Link Status) in service, go to Step 12.7.

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

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

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

_____ _____/_____
Person Contacted Date Time

☐ 12.6.3.2 Go to Step 12.7.

_____ 12.6.3.3 **IF** Unit 2 OAC Point M2L1201 (U2 SOC External Gateway Link Status) out of service, perform the following:

_____ A. Notify SOC that Unit 1 MWH data unavailable.

_____ _____/_____
Person Contacted Date Time

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

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

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

_____ 12.6.4.1 Notify SOC that Unit 1 MWH data unavailable.

_____ _____/_____
Person Contacted Date Time

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

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

_____ 12.7 **IF** OAC will be out of service for greater than 48 hours, perform Manual Trigger of Analog Fault Recorder as follows:

_____ 12.7.1 **WHEN** OAC has been out of service for 48 hours, notify System Engineering.

_____ _____/_____
Person Contacted Date Time

_____ 12.7.2 Depress "Manual Trigger" on Analog Fault Recorder (located on EB7) every hour until OAC is returned to service.

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

_____ 12.8 **IF** AFD Monitor Alarm inoperable **AND** greater than or equal to 50% RTP, perform the following:

_____ 12.8.1 **IF** MCB AFD gauges operable, record AFD within 1 hour and every hour thereafter on Enclosure 13.2 (Axial Flux Difference Monitoring) Part A until OAC AFD Monitor Alarm operable.

_____ 12.8.2 **IF** MCB AFD gauges inoperable, check AFD by performing Enclosure 13.2 (Axial Flux Difference Monitoring) Part B within 1 hour and every hour thereafter until OAC AFD Monitor Alarm **OR** MCB AFD gauges operable.

_____ 12.8.2.1 **IF** MCB AFD gauges restored operable **AND** AFD Monitor Alarm remains inoperable, perform Step 12.8.1.

12.9 For Control Rods, perform the following:

_____ 12.9.1 Record within 4 hours and every 4 hours thereafter that the position of each full length rod to be within 12 steps of its group demand position and operable on Enclosure 13.3 (Full Length Rod Verification Data) Part A.

_____ 12.9.2 **IF** Annunciator 1AD-2, B9 (Control Rod Bank Lo-Lo Limit) unavailable, record within 4 hours and every 4 hours thereafter that each Control Bank of rods are above Rod Insertion Limit on Enclosure 13.3 (Full Length Rod Verification Data) Part B.

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

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

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

_____ _____/_____
Person Contacted Date Time

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

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

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

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

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

_____ _____/_____
Person Contacted Date Time

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

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

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

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

_____ 12.12.2 **IF** input from one PR channel is inoperable, perform the following:

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

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

_____ 12.12.2.2 **IF** greater than or equal to 75% RTP, have Reactor Engineering perform PT/0/A/4150/007 (Verification of QPTR Using Incore Detectors) every 12 hours until QPTR Alarm operable **OR** the inoperable PR input operable.

_____ 12.12.2.3 **WHEN** PR channel restored, monitor QPTR per Step 12.12.1.

_____ 12.12.3 **IF** QPTR is greater than 1.02, refer to ITS 3.2.4 for subsequent action.

_____ 12.13 **IF** outside air temperature is less than 32°F, perform the following:

NOTE:
- FWST Level Instrument Room located within FWST concrete enclosure.
- RWP, dosimetry and Security are required for access to FWST enclosure.

12.13.1 Within 2 hours, check power to FWST Level Instrument Room heaters by ensuring closed:

_____ • Normal heater - Panel board 1KG, Bkr 17
_____ • Backup heater - Panel board 1KC, Bkr 13

☐ 12.13.2 Obtain a calibrated digital thermometer, capable of reading ambient air temperatures (Examples: Tegan 871, Keithley 871, or comparable instrument). Instrument can be obtained at tool issue point in Service Building truck corridor.

☐ 12.13.3 Every 12 hours, check Unit 1 FWST Level Instrument Room area temperature (in vicinity of FWST Level Instruments) greater than 40°F.

☐ 12.13.3.1 Record on Enclosure 13.6 (FWST Level Instrument Room Temperature).

_____ 12.14 **IF** any of the following are out of service, perform PT/1/A/4200/040 (Reactor Coolant Leakage Detection) until all are returned to service:

- OAC
- M1P0591 (1EMF39(L) Difference Last 60 Minutes)
- M1P0592 (1EMF38(L) Containment Leakage Alarm)
- M1P1069 (U1 Total Cont Floor & Equip Sump Lvl Rate)

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

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

_____ 12.15.1 Notify NC System Engineer or designee.

_____ _____/_____
Person Contacted Date Time

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

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

_____gpm.

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

_____ _____
Date Time

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

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

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

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

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

_____ _____/_____
Person Contacted Date Time

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

_____ _____/_____
Person Contacted Date Time

Record Total NC Flow: _____gpm

_____ _____/_____
Calculations Performed By Date Time

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

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

_____ 12.16.1 Notify Reactor Group Engineer or designee.

_____ _____/_____
Person Contacted Date Time

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

_____ 12.16.2.1 Obtain the following PI data:

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

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

_____ _____
Date Time

12.16.2.3 Determine power mismatch as follows:

_____ • Use M1P1407, M1P1408, M1P1409, and M1P1410 of Step 12.16.2.1.

OR

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

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

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

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

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

_____ _____/_____
Person Contacted Date Time

_____ _____/_____
Calculation Performed By Date Time

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

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

_____ 12.17.1 Notify Reactor Group Duty Engineer values have been updated.

_____ _____/_____
Person Contacted Date Time

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

_____ _____/_____
Person Contacted Date Time

13. Enclosures

13.1 Hourly Dispatcher Report

13.2 Axial Flux Difference Monitoring

13.3 Full Length Rod Verification Data

13.4 Containment Air Temperatures

13.5 Calculation Sheet For Quadrant Power Tilt

13.6 FWST Level Instrument Room Temperature

13.7 OAC Point List For Partial Loss Of OAC

13.8 CA Storage Tank Temperatures

13.9 Manual Trigger of Analog Fault Recorder

End of Body

Enclosure 13.1

Hourly Dispatcher Report

Obtain data from Digital Counters [1]

Sheet ____ of ____

			Unit 1 Gross	D/G 1A	D/G 1B	Transf 1ATA	Transf 1ATB	Net MWHs [2]
			M1P1103	M1P1109	M1P1111	M1P1104	M1P1105	M1P0407
Date	**Time**	**Initials**	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=

End of Enclosure

[1] Last two digits on Digital Counters for D/G 1A and 1B are decimal places. Do **NOT** use when recording MWHs.

[2] For each item, subtract previous hour reading from present hour reading and record in (+) and (–) area. Then subtract D/G and Transf readings from Unit 1 Gross reading to obtain Net MWHs.

Enclosure 13.2

Axial Flux Difference Monitoring

Part A

Sheet ____ of ____

Date	Time [1]	Initials	PR-41 AFD	PR-42 AFD	PR-43 AFD	PR-44 AFD

[1] **WHEN** greater than or equal to 50% RTP, performed within 1 hour and every hour thereafter until OAC AFD Monitor Alarm operable.

Unit 1

Enclosure 13.2

Axial Flux Difference Monitoring

Part B

Sheet ____ of ____
Date:_____ Time:[2]_____

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						
PR-41 B						
PR-42 A						
PR-42 B						
PR-43 A						
PR-43 B						
PR-44 A						
PR-44 B						

(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.

Enclosure 13.3

Full Length Rod Verification Data

Part A

Sheet ____ of ____

All full length rods are positioned within 12 steps (indicated position) of their group demand position and operable. (ITS SR 3.1.4.1)

Date	Time [1]	Initials
P		

Date	Time [1]	Initials

[1] Performed within 4 hours and every 4 hours thereafter until OAC Rod Position Deviation Monitor operable.

Sheet ____ of ____

All Control Banks are above the rod insertion limit as specified in the COLR. (ITS SR 3.1.6.2)

	Control Bank A	Control Bank B	Control Bank C	Control Bank D	Date	Time [2]	Initials
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							

End of Enclosure

[2] Performed within 4 hours and every 4 hours thereafter until OAC Rod Insertion Limit Monitor **OR** Annunciator 1AD-2, B9 (Control Rod Bank Lo-Lo Limit) operable.

Enclosure 13.4

Containment Air Temperatures

Sheet ____ of ____

Upper Containment Temperature (°F)					Lower Containment Temperature (°F)					Date	Time [1]	Initials
1A	1B	1C	1D	Average [2]	1A	1B	1C	1D	Average [3]			

End of Enclosure

[1] Performed every hour while OAC is out of service beginning four hours after OAC out of service.
[2] Upper Containment average air temperature shall be computed using temperature points corresponding to AHUs with operable sensors, regardless of AHU running or not running (based on large air volume (mass) in upper containment). {PIP-0-M00-0552}
[3] Lower Containment average air temperature shall be computed using temperature points corresponding to running AHUs with operable sensors. {PIP-0-M00-0552}

Enclosure 13.5

Calculation Sheet For Quadrant Power Tilt

Part A

Sheet ____ of ____

Date _____

Time [1] _____

Initials _____

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

1) From NI cabinet's current meter (located on respective PR B Drawers). Ensure Detector Milliamp Range Switches are in "0.5" position and read 0-500 microamp scale.
2) From most recent calibration data using "0" Incore Axial Offset Current in Data Book, Table 2.2 ("I_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) = [ ] RF of PR-41A + [ ] RF of PR-42A + [ ] RF of PR-43A + [ ] RF of PR-44A x ¼ = _____

Avg RF of B Detectors (RFB) = [ ] RF of PR-41B + [ ] RF of PR-42B + [ ] RF of PR-43B + [ ] RF of PR-44B x ¼ = _____

PR-41A Tilt = RF of PR-41A / RFA = _____ **PR-41B Tilt** = RF of PR-41B / RFB = _____

PR-42A Tilt = RF of PR-42A / RFA = _____ **PR-42B Tilt** = RF of PR-42B / RFB = _____

PR-43A Tilt = RF of PR-43A / RFA = _____ **PR-43B Tilt** = RF of PR-43B / RFB = _____

PR-44A Tilt = RF of PR-44A / RFA = _____ **PR-44B Tilt** = RF of PR-44B / RFB = _____

[1] **WHEN** above 50% RTP, calculation performed within 12 hours and every 12 hours thereafter until QPTR Alarm operable.

Unit 1

Enclosure 13.5

Calculation Sheet For Quadrant Power Tilt

Part B

Sheet ____ of ____

Date _____

Time [2] _____

Initials _____

	PR-4___		PR-4___		PR-4___	
	A	**B**	**A**	**B**	**A**	**B**
1) Measured Current						
2) Calibration Current						
3) Relative Flux (RF)						

1) From NI cabinet's current meter (located on respective PR B Drawers). Ensure Detector Milliamp Range Switches are in "0.5" position and read 0-500 microamp scale.
2) From most recent calibration data using "0" Incore Axial Offset Current in Data Book, Table 2.2 ("I_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) = [ ] (RF of PR-4__A) + [ ] (RF of PR-4__A) + [ ] (RF of PR-4__A) x ⅓ = _____

Avg RF of B Detectors (RFB) = [ ] (RF of PR-4__B) + [ ] (RF of PR-4__B) + [ ] (RF of PR-4__B) x ⅓ = _____

PR-4___A Tilt = RF of PR-4__A / RFA = _____ **PR-4___B Tilt** = RF of PR-4__B / RFB = _____

PR-4___A Tilt = RF of PR-4__A / RFA = _____ **PR-4___B Tilt** = RF of PR-4__B / RFB = _____

PR-4___A Tilt = RF of PR-4__A / RFA = _____ **PR-4___B Tilt** = RF of PR-4__B / RFB = _____

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.

Enclosure 13.6

FWST Level Instrument Room Temperature

Sheet ____ of ____

				Digital Thermometer		
Date	**Time [1]**	**Initials**	**Area Temperature (°F)**	**Manufacturer Model #**	**Instrument #**	**Cal Due Date**

End of Enclosure

[1] Performed every 12 hours while outside temperature less than 32°F.

OAC Point List For Partial Loss Of OAC

OAC Point	Title	Procedure Sections To Be Performed
M1L4375	Tech Spec AFD Monitor Inoperable	12.2, 12.4, 12.5, 12.6, 12.8 12.12, 12.16,12.17
M1P1385	Reactor Thermal Power, Best	
M1L2361	Therm Pwr Limit Change Program Status	
M1L2611	Thermal Power Calcs Program Status	
M1L1200	Jems External Gateway Link Status	12.2, 12.6, 12.7
M1L1201	SOC External Gateway Link Status	
M1L2303	SWBD Application Active Flag	
M1L2221	Upper/Lower Contmnt Temp Program Status	12.2, 12.10
M1P1501	Upper Cont Avg Temp	
M1P0755	Lower Containment Weighted Average Temp	
M1A1228	Lower Cont Ambient Air Temp A	
M1A1234	Lower Cont Ambient Air Temp B	
M1A1240	Lower Cont Ambient Air Temp C	
M1A1246	Lower Cont Ambient Air Temp D	
M1L2211	Equipment Runtime Program Status	
M1A1074	FWST Instrument Room Temperature	12.2, 12.13
M1L2050	NC Flow Monitoring Status	12.2, 12.15, 12.16, 12.17
M1P1085	U1 NC Flow Best (10 min avg)	
M1L1202	EMF External Gateway Link Status	12.2, 12.14
M1E0198	EMF39L Containment Gas Lo Range	
M1E0190	EMF38L Containment Part Lo Range	
M1P1069	U1 Total Cont Floor & Equip sump Lvl Rate	
M1E0178	EMF36L Unit Vent Gas Lo Range	12.2, 12.3, 12.18
M1P2535	Average Unit Vent Stack Flow	

Unit 1

OAC Point	Title	Procedure Sections To Be Performed
M1L2391	Control Rod Posit Monitor Prgm Status	12.2, 12.4, 12.9, 12.17
M1L4051	Rod Bank Position Hardware Malfunction	
M1L4052	Control Rod Position Hardware Malfunct	
M1L4464	Control Rod Insert Limits-Invalid Data	
M1P1551	Max Rod Deviation Shutdown Bank A	
M1P1552	Max Rod Deviation Shutdown Bank B	
M1P1553	Max Rod Deviation Shutdown Bank C	
M1P1554	Max Rod Deviation Shutdown Bank D	
M1P1555	Max Rod Deviation Shutdown Bank E	
M1P1556	Max Rod Deviation Control Bank A	
M1P1557	Max Rod Deviation Control Bank B	
M1P1558	Max Rod Deviation Control Bank C	
M1P1559	Max Rod Deviation Control Bank D	
M1L4409	Ctrl Bank Tech Spec Insert Lmt Reached	
M1L4410	Shutdown Bank Withdrawn Per Tech Specs	
M1L4411	Improper Bank Sequence Or Bank Overlap	
M1P1448	Low Bank Insertion Limit Margin	
M1L1470	Xenon/Samarium Calcs Program Status	12.2, 12.17
M1L2611	Thermal Power Calcs Program Status	
M1A1342	Lower CA Storage Tank Temperature	12.2, 12.11
M1A1371	Middle CA Storage Tank Temperature	
M1A1377	Upper CA Storage Tank Temperature	

End of Enclosure

Enclosure 13.8

CA Storage Tank Temperatures

Sheet _____ of _____

Upper °F	Middle °F	Lower °F	Date	Time [1]	Intitials

End of Enclosure

[1] Performed every hour while OAC is out of service beginning 4 hours after OAC out of service.

Unit 1

Enclosure 13.9

Manual Trigger of Analog Fault Recorder

Manual Trigger Depressed		
Date	**Time**	**Initial**

End of Enclosure

Reviewed By _____

Approved By _____

TASK: **Perform RO Turnover (manual)**

POSITION: **RO**

Operator's Name_____

Validation Time: 20 Minutes

Actual JPM Completion Time: _____ Minutes

Location: **Simulator** Method: **Perform**

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/__

KA: 2.1.3 (3.0/3.4)

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 is starting up after a refueling outage.
- Currently the Unit is in MODE 4 at 318°F and 303 psig.
- It is time to complete the NCO Turnover Checklist prior to shift turnover
- The OAC program for NCO Turnover Checklist is not available
- The most recent calculation for Reactor Coolant System unidentified leakage is 0.001 gpm

The following valves have already been noted closed and evaluated as acceptable for MODE 4 operation:

- FW-27A (FWST Supply to ND)
- NI-178B (B Train ND To C & D CL)
- NI-173A (A Train ND To A & B CL)

Perform NCO Turnover (manual) PER Attachment 1 (Nuclear Control Operator Turnover Checklist) of OMP 5-6 (RO Turnover).

JPM OVERALL STANDARD:

Attachment 1 is completed as applicable with problems noted for 1B2 KC Pump and 1NS-3B alignment.

NOTES: N/A.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Determines Unit, shift being relieved, Mode, and Date/Time	Unit 1 Cue: "C" shift being relieved. Determines Mode from turnover: Mode 4 Cue: Todays date, 1900		
2	Completes Section A: • Records NCS Unidentified Leakage • Records Power Level • Records Xenon	Same Cue: Unidentified 0.001 gpm Determines 0% Determines 0 PCM, circles "constant"		
3	Completes Section B:	Determines Section B is not applicable		
4 * *	Completes Section C: • Record Equipment Status, On or OFF • Record control power as required	Same Determines 1A NV, 1A RN, & 1A Train KC on, the remaining equipment off Determines 1B2 KC Pump does not have control power (note: if required,		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		provide cue another operator has changed out the light bulb.		
	• Records loss of control power to 1B2 KC Pump in Section F	Same		
	• Checks control power available for remaining equipment	same		
5	Completes Section D:	Same		
	• Records actual position of valves listed	same		
*	• Determines 1NS-3B is not in required position	Records 1NS-3B out of position.		
	• Records 1NS-3 in Section F	Same		
6	Completes Section E:	Same: **Cue: Another Operator has completed Section E, Items 1, 2, 5, 6, 7, 8, & 9 and will initial them off.**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	Review Section E, Item 3 & 4	No additional discrepancies noted other than the previous 1NS-3B.		
7	Completes Section F	No additional entries required		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 is starting up after a refueling outage.
- Currently the Unit is in MODE 4 at 318°F and 303 psig.
- It is time to complete the NCO Turnover Checklist prior to shift turnover
- The OAC program for NCO Turnover Checklist is not available
- The most recent calculation for Reactor Coolant System unidentified leakage is 0.001 gpm

The following valves have already been noted closed and evaluated as acceptable for MODE 4 operation:

- FW-27A (FWST Supply to ND)
- NI-178B (B Train ND To C & D CL)
- NI-173A (A Train ND To A & B CL)

Perform NCO Turnover (manual) PER Attachment 1 (Nuclear Control Operator Turnover Checklist) of OMP 5-6 (RO Turnover).

Simulator Setup

SNAP 135

Snap 135 consist of startup Mode 4 snap with the following items added.

1B2 KC Pump control power fuses pulled.

1NS-3B positioned closed.

Duke Power Company McGuire Nuclear Station	Procedure No. **OMP 5-6**
	Revision No. **011**
RO Turnover	
Information Use	Electronic Reference No. **MP0070Q1**

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

ISSUED

Revision History (significant issues, limited to one page)	
Rev 011	(01/15/03) Changed "SWM" and "Shift Work Manager" (one or both may be listed) to "SRO", "STA", or "WWM" per the applicable Operations Change Management Plan.
Rev 010	(08/19/02) The CRIT recommended the addition of a mid-shift control room surveillance which consists of items 1, 3, 4, 5 & 9 of Section E of Attachment 1 "NLO Turnover Checklist".
Rev 009	(03/11/02) Converted to standard template.
Rev 008	(11/05/01) Changed Attachment 1 due to the CA Mod that added the CAST.
Rev 007	(06/11/01) Revised Step 6.1 by adding a sentence stating ROs will discuss and understand significance of Operationally Significant Temp Mods.
Rev 006	(04/25/01) Added paragraph 6.3 under Section 6 Procedure to include guidance on how to verify control power is available and guidance on what to do if power is **NOT** removed. • Added the following statement to 6.7: The OAC Valve Alignment (Section J) shall be reviewed and an explanation for any out of normal alignments shall be noted.

RO Turnover

1. Purpose

To provide a procedure to promote continuity of safety and efficiency during the process of shift turnover.

2. Reference

INPO Good Practice OP-201 (Shift Relief And Turnover)

3. Description

To provide a procedure to promote continuity of safety and efficiency during the process of shift turnover.

4. Responsibilities

4.1 Each individual:

4.1.1 Shall be responsible for reviewing and understanding the Turnover Sheets applicable to that shift position prior to assuming the shift.

4.2 The Ops Shift Manager or another designated SRO:

4.2.1 Shall be responsible for conducting a shift operating crew briefing shortly after the crew accepts the watch. As a minimum, the briefing shall be conducted in the Control Room with the following in attendance: Ops Shift Manager, Control Room SRO, Plant SRO, WCC SRO and unit assigned Licensed Operators. The remainder of the shift operating crew may attend this session if deemed appropriate by the Ops Shift Manager/OSM. However, the Ops Shift Manager may choose to have the Shift Supervisor(s) brief the remainder of the shift operating crew in some location other than the Control Room (attendance is mandatory unless the Ops Shift Manager approves otherwise).

5. Reporting Requirements

None

6. Procedure

6.1 The Licensed Operators shall review the status of systems and equipment under their cognizance prior to being relieved and shall ensure all conditions are registered in logs and records for which they are responsible. Out-of-normal conditions shall be emphasized in this review. They shall verbally pass to their reliefs the results of this review as well as all available information on expected occurrences which could affect plant operation. Also, they shall discuss and understand the significance of Operationally Significant Temp Mods.

6.2 To check control power is available to a valve, check the valve indication lights are lit. **IF** the indication lights are lit, control power is available. **IF** the indication lights are **NOT** lit, generate a work request to have IAE investigate the status of the control power circuit, if power **NOT** removed for other reasons (R&R).

6.3 **WHEN** the relieving process is completed, the person relieving shall verbally declare to the person being relieved that the act of assuming assigned responsibilities is completed. Persons shall **NOT** leave their assigned duties of plant operation until properly assured that their responsibilities have been assumed by their relief or until receiving verbal approval from the Ops Shift Manager or Shift Supervisor.

6.4 After the operating shift is relieved, a shift crew briefing shall be conducted to ensure that all shift operating crew personnel are informed of current plant status, planned evolutions during the current shift and any other information deemed appropriate by the Ops Shift Manager.

6.5 After the operating shift is relieved, the operating areas shall be toured by personnel of the on-coming shift as soon as practical to check equipment operating conditions.

6.6 Shortly after turnover, the relieving shift shall take the first set of operating data on the Shift Turnover Log (VCT, FWST levels, testing annun., etc.). At approximately midshift the second set of operating data should be obtained in addition to performing the specified mid-shift reviews. It is **NOT** necessary to test annunciators twice in one shift.

6.7 The Licensed Operators shall run and complete the NCO Turnover Checklist computer program for the Unit to which they are assigned, prior to shift turnover. (The OAC Valve Alignment (Section J) shall be reviewed and an explanation for any out of normal alignments shall be noted). In the event that the computer is unavailable, the NCO Turnover Checklist(s) (Attachment 1) shall be used.

7. Attachments

7.1 Attachment 1 (Nuclear Control Operator Turnover Checklist)

End Of Body

Attachment 1
Nuclear Control Operator Turnover Checklist

Unit _____
Shift Being Relieved: A B C D E (circle one)
Mode: 1 2 3 4 5 6 No Mode (circle one)

Date/Time _____

A. NCS Leakage _____ gpm and unidentified (from most recent calculation)
Power Level _____%
Xenon _____ PCM (Const/Inc/Dec) (circle one)

B. Critical Parameters (**IF** in Modes 1 or 2)
Tave (557 - 585.1) _____°F
Pzr Pressure (2220 - 2250) _____ PSIG
Pzr Level (25 - 55) _____%

C.

Equipment		On/Off	Control Power Req'd in Following Modes (X)						Control Power Available √
			1	2	3	4	5	6	
A	CA		X	X	X				
A	ND		X	X	X	X*	X**	X***	
A	NI		X	X	X				
A	NV		X	X	X	X*	X*	X*	
A	NS		X	X	X	X			
A	RN		X	X	X	X			
A1	KC		X	X	X	X			
A2	KC		X	X	X	X			
B	CA		X	X	X				
B	ND		X	X	X	X*	X**	X***	
B	NI		X	X	X				
B	NV		X	X	X	X*	X*	X*	
B	NS		X	X	X	X			
B	RN		X	X	X	X			
B1	KC		X	X	X	X			
B2	KC		X	X	X	X			
A	D/G		X	X	X	X	X*	X*	
B	D/G		X	X	X	X	X*	X*	

*Control Power Required for only one train
**Control Power Required for only one train if NC Loops filled.
***Control Power Required for only one train if > 23 ft. of water over RV flange.

D. Valve Alignment O = Open
X = Closed

	Req'd Position in the Following Modes						Actual
	1	2	3	4	5	6	Position
CA-64 (TD CA Pump To S/G A)	O	O	O				
CA-52 (TD CA Pump To S/G B)	O	O	O				
CA-48 (TD CA Pump To S/G C)	O	O	O				
CA-36 (TD CA Pump To S/G D)	O	O	O				
CS-18 (CA Supply From UST)	X	X	X	X			
CA-4 (CA Pump Suct From UST)	X	X	X	X			
CM-265 (CA Supply From Hotwell)	X	X	X	X			
CA-2 CA (U2 CA Pumps Suct From CA Storage Tank Isol)	O	O	O	O			
CA-6 (U2 CA Pumps Suct From CA Cond Stor Tank Isol)	X	X	X	X			
CA-7A (TD CA Pump Suction Isol)	O	O	O				
CA-60 A (CA Pump To S/G A)	O	O	O				
CA-56 A (CA Pump To S/G B)	O	O	O				
CA-44 B (CA Pump To S/G C)	O	O	O				
CA-40 B (CA Pump To S/G D)	O	O	O				
CA-9B B (CA Pump Suction Isol)	O	O	O				
CA-11A A (CA Pump Suction Isol)	O	O	O				
CA-66A (TD CA Pump To S/G A Isol)	O	O	O				
CA-54A (TD CA Pump To S/G B Isol)	O	O	O				
CA-50B (TD CA Pump To S/G C Isol)	O	O	O				
CA-38B (TD CA Pump To S/G D Isol)	O	O	O				
CA-42B B (CA Pump To S/G D Isol)	O	O	O				
CA-46B B (CA Pump To S/G C Isol)	O	O	O				
CA-58A (A CA Pump To S/G B Isol)	O	O	O				
CA-62A (A CA Pump To S/G A Isol)	O	O	O				
ND-19A (A ND Pmp Suct From FWST Or NC)	O	O	O	O*			
ND-33 (A ND Hx Bypass)	X	X	X	X*			
ND-18 (B ND Hx Bypass)	X	X	X	X*			
ND-4B (B ND Pmp Suct From FWST Or NC)	O	O	O	O*			
ND-14 B (ND Hx Outlet)	O	O	O	O*			
ND-34 A & B(ND Hx Bypass)	X	X	X	X*			
ND-29A (ND Hx Outlet)	O	O	O	O*			
ND-30A (Train A ND To Hot Leg Isol)	O	O	O	O*			
FW-27A (FWST Supply To ND)	O	O	O	O*			
ND-15B (Train B ND To Hot Leg Isol)	O	O	O	O*			
NI-178B (Train B ND To C & D CL)	O	O	O	O*			
NI-183B (ND To B & C Hot Leg Isol)	X	X	X	X*			
NI-173A (Train A ND To A & B CL)	O	O	O	O*			
NI-103A (A NI Pump Suct From FWST)	O	O	O				

* In Mode 4 only one Train of ND and NV are required to be operable.

	Req'd Position in the Following Modes						
	1	2	3	4	5	6	Actual Position
NI-135B (B NI Pump Suct From FWST)	O	O	O				
NI-118A (Train A NI To Cold Leg Isol)	O	O	O				
NI-162A (NI Pumps Cold Leg Isol)	O	O	O				
NI-150B (Train B NI To Cold Leg Isol)	O	O	O				
NI-152B (Train B NI To A & D HL)	X	X	X				
NI-121A (Train A NI To B & C HL)	X	X	X				
NI-54A (A Cold Leg Accum Disch Isol)	O	O	O				
NI-76A (C Cold Leg Accum Disch Isol)	O	O	O				
NI-65B (B CL Accum Disch Isol)	O	O	O				
NI-88B (D CL Accum Disch Isol)	O	O	O				
NS-3B (B NS Pump Suct From FWST)	O	O	O	O			
NS-20A (A NS Pump Suct From FWST)	O	O	O	O			
NS-32A (A NS Pump Disch C/I Otsd)	X	X	X	X			
NS-29A (A NS Pump Disch C/I Otsd)	X	X	X	X			
NS-12B (B NS Pump Disch C/I Otsd)	X	X	X	X			
NS-15B (B NS Pump Disch C/I Otsd)	X	X	X	X			

E.

	Operator Being Relieved (Initials)	Relieving Operator (Initials)
1. Control Boards (Switch Alignment/ Alarms*		
2. Reactor Operator Logbook		
3. Status of ESF Monitor Light Panel*		
4. 1.47 Bypass Panel *		
5. Indicating Lights (burned out bulbs) *		
6. Routine Task List Complete or Shift Supervisor Notified		
7. Tech Spec Action Item Log		
8. Special Order Logbook		
9. EFA Alarm Summary (Unit 1 only)		

* Requires Mid-Shift surveillance

F. Remarks (Operator Being Relieved)

_____
_____
_____
_____
_____

Reviewed By Relieving Shift Supervisor

_____

	Shift Being Relieved (Signature)	Relieving Shift (Signature)
Nuclear Control Operator		

End Of Attachment

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_____

Validation Time: 10 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: G 2.2.12 (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 22:10

The following data has been collected:

- Time=22:25 computer point M1A1417 indicates 8.335 inches
  computer point M1A1423 indicates 8.442 inches

- Time=22:55 computer point M1A1417 indicates 8.830 inches
  computer point M1A1423 indicates 8.938 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 12.8 of PT/1/A/4200/040 (Reactor Coolant Leakage Detection), greater than 1 gpm (but less than 1.4 gpm) is determined, and the required actions per Step 12.9 are addressed.

NOTES: N/A.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Determines required Unit Status is met in Step 7.1	same		
2	Determines prerequisite system conditions met in Step 8.1 (M1L4554 O.O.S. per turnover)	same		
*3	Determines that Step 12.8 is required	same		
*4	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 22:25 Same 8.335 (8.3 to 8.4) (per turnover data) 8.442 (8.4 to 8.5) (per turnover data)		
5	N/A's columns for: • Level Change A • Level Change B • Total level Change (inches)	same		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	• Total Volume Change (gal) • Sum of Input (gpm) • Greater than 1 gpm Increase (Yes/no)			
*6	Records 30-min data on Enclosure 13.1: • Date • Time • Initials • Sump level A (OAC Point M1A1417) • Sump level B (OAC Point M1A1423)	 Todays date 22:55 Same 8.830 (8.8-8.9) (per turnover data) 8.938 (8.9-9.0) (per turnover data)		
*7	Performs calculation required for columns: • Level Change (inches) A • Level Change (inches) B • Total Level Change (inches) • Total Volume Change (Gal)	 0.495 0.496 0.991 35.676		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
	• Sum of Input (gpm) Greater than 1 gpm Increase (Yes/no)	1.189 (>1.0 to <1.4) Yes		
*8	Determines Step 12.9 must be performed: • Notify OSM • Refer to T.S.'s 3.4.13 and 3.4.15 • Perform PT for NC Leakage Calc	same CUE: another operator will refer to Tech Spec's and perform the NC leakage PT.		

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 22:10

The following data has been collected:

- Time=22:25 computer point M1A1417 indicates 8.335 inches
  computer point M1A1423 indicates 8.442 inches

- Time=22:55 computer point M1A1417 indicates 8.830 inches
  computer point M1A1423 indicates 8.938 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.

Rev

Enclosure 13.1

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

Reactor Coolant Leakage Data

Date _____ Sheet 1 of 1

		CFAE Parameters								EMF Counts				VUCDT Parameters				
		Sump Level (inches)		Level Change (inches)						1EMF-38L		1EMF-39L						
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	Count Rate	Count Rate Change	Count Rate	Count Rate Change	VUCDT Level (%)	VUCDT Volume (Gal)	Volume Change (Gal)	Rate of Input (gpm)	Greater than 1 gpm Increase (Yes/No
Same	JJ	8.32	8.44	NA	NA	NA	NA	NA	NA									
+30m	JJ	8.83	8.93	.495	.496	.991	35.676	1.189	Yes									
NoTe: If student uses "WL" home page, reads only To nearest 1/10 inch. This still works:																		
																(if JPM performed on Sim)		
		8.3	8.4															
+30		8.8	8.9	.5	.5	1.0	36	1.2	Yes									

End of Enclosure

Unit 1

Duke Power Company McGuire Nuclear Station	Procedure No. **PT/ 1/A/4200/040**
	Revision No. **007**
Reactor Coolant Leakage Detection	
	Electronic Reference No. **MP0070W4**
Continuous Use	
PERFORMANCE	

(ISSUED) - PDF Format

Revision History (significant issues, limited to one page)

Rev 007 (11/05/03) Added the following references to this procedure:

- MCS-1274.00-00-0016 (License Renewal Basis Spec), Section 4.29
- UFSAR Chapter 18 (Aging Management Program and Activities), Table 18-1, Reactor Coolant Operational Leakage Monitoring Program

Rev 006 (09/10/02)

- Deleted note at front of procedure concerning 1EMF-39 inoperable and added a step to Section 12.5 concerning 1EMF-39 inoperable.

Rev 005 (12/30/01)

- Renumbered steps 12.6.2.3 through 12.6.2.12.
- Added note prior to step 12.4 if 1EMF-39 inoperable GWR paperwork and VQ procedure may need to be updated.

Rev 004 (09/05/01) Changed EMF-38 inoperable section (Section 12.6) to either log ITS 3.4.15 if VUCDT is being pumped or use the VUCDT as level monitoring if not being pumped. Change 3a revised the note associated with section 12.6. The note was deleted.

Rev 003 (03/28/2001) Corrected wording in Step 12.6.1.1 to "For initial data, NA "Greater than 1 gpm Increase" and corrected computer point names.

Rev 002 (8-2-00)

MM-11542 will develop an OAC point for VUCDT level rate of change. The value will always be current, therefore eliminating the 1 hour wait for the Operators to generate a trend.

Reactor Coolant Leakage Detection

1. Purpose

To check that Reactor Coolant System leakage inside the Reactor Building has remained less than 1 gpm within a 1 hour period.

2. References

2.1 TS 3.4.13 (RCS Operational Leakage)

2.2 TS 3.4.15 (RCS Leakage Detection Systems)

2.3 NRC Reg. Guide 1.45

2.4 MCS-1274.00-00-0016 (License Renewal Basis Spec), Section 4.29

2.5 UFSAR Chapter 18 (Aging Management Program and Activities), Table 18-1, Reactor Coolant Operational Leakage Monitoring Program

3. Time Required

One operator 10 minutes when data required to be recorded.

4. Prerequisite Tests

None

5. Test Equipment

None

6. Limits and Precautions

None

7. Required Unit Status

_____ 7.1 Unit is in Modes 1, 2, 3 or 4.

8. Prerequisite System Conditions

_____ 8.1 One or more of the following conditions met:

- ☐ M1E0198 (1EMF39L Containment Gas Lo Range) inoperable
- ☐ M1E0190 (1EMF38L Containment Part Lo Range) inoperable
- ☐ 1EMF-38L inoperable
- ☐ M1L4554 (U1 Unidentified Leakage > 1 gpm in Cont) inoperable

9. Test Method

Record information as specified in Section 12.

10. Data Required

10.1 See Enclosure 13.1 (Reactor Coolant Leakage Data).

11. Acceptance Criteria

11.1 Reactor Coolant System leakage inside the Reactor Building has remained less than 1 gpm.

12. Procedure

☐ 12.1 Complete data for appropriate parameters on Enclosure 13.1 (Reactor Coolant Leakage Data) as required.

☐ 12.2 Record date/time for each set of data.

☐ 12.3 Initial each set of data.

12.4 Perform the following sections, as applicable:

- ☐ Section 12.5, 1EMF-38L Operable with M1E0198 (1EMF39L Containment Gas Lo Range) Inoperable
- ☐ Section 12.6, 1EMF-38L Inoperable
- ☐ Section 12.7, 1EMF-39L Operable with M1E0190 (1EMF38L Containment Part Lo Range) Inoperable
- ☐ Section 12.8, M1L4554 (U1 Unidentified Leakage > 1 gpm in Cont) Inoperable

12.5 1EMF-38L Operable with M1E0198 (1EMF39L Containment Gas Lo Range) Inoperable

12.5.1 Check the following to determine the need to update due to 1EMF-39L inoperability:

- ☐ GWR paperwork
- ☐ VQ paperwork

NOTE: Counts Per Minute (cpm) is used for 1EMF-38 count rate.

☐ 12.5.2 Record 1EMF-38 "Count Rate".

_____ 12.5.3 **IF** recording initial 1EMF-38L count rate, NA 1EMF-38L "Count Rate Change".

☐ 12.5.4 Record 1EMF-38L count rate as follows:

- ☐ Each 30 minutes for the first hour
- ☐ Every hour thereafter

☐ 12.5.5 Determine difference in count rate by subtracting previous count rate from current count rate and record difference as 1EMF-38L "Count Rate Change".

_____ 12.5.6 **IF** count rate increases at a rate greater than 600 cpm per hour, perform Section 12.9 (Actions for 1 gpm Leakage).

_____ 12.5.7 **IF** 1EMF-38L filter required to be changed, perform the following:
SRO

_____ 12.5.7.1 Declare 1EMF-38L inoperable.
SRO

☐ 12.5.7.2 Refer to ITS 3.4.15.

12.5.7.3 Perform one of the following:

- ☐ Enter ITS 3.4.15 Action C
  OR
- ☐ Perform Section 12.6 (1EMF-38L Inoperable)

_____ 12.5.7.4 **WHEN** 1EMF-38L filter changed, perform following:

- ☐ A. Record new 1EMF-38L "Count Rate".
- ☐ B. NA 1EMF-38L "Count Rate Change".

☐ 12.5.8 Repeat Steps 12.5.2 - 12.5.7 until M1E0198 (1EMF39L Containment Gas Lo Range) operable.

12.6 1EMF-38L Inoperable

_____ 12.6.1 **IF** VUCDT pumped while 1EMF-38L inoperable, enter ITS 3.4.15 Action C.
SRO

_____ 12.6.2 **IF** VUCDT **NOT** being pumped, perform the following:

☐ 12.6.2.1 **IF** OAC Point M1P1066 (U1 VUCDT Volume Rate) operable, record VUCDT level "Rate of Input" as follows:

☐ A. Record M1P1066 (U1 VUCDT Volume Rate) as "Rate of Input".

_____ B. **IF** recording initial "Rate of Input", NA "Greater than 1 gpm Increase".

C. Record VUCDT level "Rate of Input" as follows:

☐ Each 30 minutes for first hour
☐ Every hour thereafter

☐ D. Determine difference of "Rate of Input" by subtracting previous "Rate of Input" from current "Rate of Input".

_____ E. **IF** difference in "Rate of Input" less than 1 gpm, record "NO" for "Greater than 1 gpm Increase".

_____ F. **IF** difference in "Rate of Input" greater than or equal to 1 gpm, perform the following:

☐ 1. Record "YES" for "Greater than 1 gpm Increase".

☐ 2. Perform Section 12.9 (Actions for 1 gpm Leakage).

☐ G. Repeat Steps 12.6.2.1 A - 12.6.2.1 F hourly until 1EMF-38L operable.

_____ 12.6.2.2 **IF** OAC Point M1P1066 (U1 VUCDT Volume Rate) inoperable, perform the following:

☐ A. Record "VUCDT Level" (OAC Point M1A0653D2 (U1 VUCDT Level (DT))).

_____ 1. **IF** OAC Point M1A0653D2 (U1 VUCDT Level (DT)) inoperable, use 1WLP5590 (#1 VUCDT Level).

☐ B. Record "VUCDT Volume" for corresponding level from Enclosure 13.2 (VUCDT Volume Table).

_____ C. **IF** recording initial data, NA the following:

☐ "Volume Change"
☐ "Rate of Input"
☐ "Greater than 1 gpm Increase"

D. Record VUCDT level as follows:

☐ Each 30 minutes for first hour
☐ Every hour thereafter

☐ E. Subtract previous volume from most current volume and record difference as "Volume Change".

☐ F. Divide most current "Volume Change" by number of minutes since last data entry and record as "Rate of Input".

_____ G. **IF** data for second time period, NA the "Greater than 1 gpm Increase".

☐ H. Determine difference of "Rate of Input" by subtracting previous "Rate of Input" from current "Rate of Input.

_____ I. **IF** difference between "Rate of Input has remained less than 1 gpm increase, record "NO" for "Greater than 1 gpm Increase".

_____ J. **IF** difference between "Rate of Input" has increased by at least 1 gpm, perform the following:

☐ 1. Record "YES" for "Greater than 1 gpm Increase".

☐ 2. Perform Section 12.9 (Actions for 1 gpm Leakage).

☐ K. Repeat Steps 12.6.2.2 A - 12.6.2.2 J hourly until 1EMF-38L operable.

12.7 1EMF-39L Operable with M1E0190 (1EMF38L Containment Part Lo Range) Inoperable

☐ 12.7.1 Record 1EMF-39L "Count Rate".

_____ 12.7.2 **IF** recording initial 1EMF-39L count rate, NA 1EMF-39L "Count Rate Change".

12.7.3 Record 1EMF-39L count rate as follows:

☐ Each 30 minutes for the first hour
☐ Every hour thereafter

☐ 12.7.4 Determine difference in count rate by subtracting previous count rate from current count rate and record difference as 1EMF-39L "Count Rate Change".

_____ 12.7.5 **IF** count rate increases at a rate greater than 3870 cpm per hour, perform Section 12.9 (Actions for 1 gpm Leakage).

☐ 12.7.6 Repeat Steps 12.7.1 - 12.7.5 until M1E0190 (1EMF38L Containment Part Lo Range) operable.

12.8 M1L4554 (U1 Unidentified Leakage > 1 gpm in Cont) Inoperable

☐ 12.8.1 Record the following:

☐ 1A CFAE Level (OAC Point M1A1417 (1A Containment Floor & Equipment Sump Lvl))
☐ 1B CFAE Level (OAC Point M1A1423 (1B Containment Floor & Equipment Sump Lvl))

_____ 12.8.1.1 **IF** OAC points inoperable, use the following:

☐ 1WLP5250 (1A Cont Floor & Equip Sump)
☐ 1WLP5260 (1B Cont Floor & Equip Sump)

_____ 12.8.2 **IF** recording initial data, NA the following:

☐ "Level Change"
☐ "Total Level Change"
☐ "Total Volume Change"
☐ "Sum of Input"
☐ "Greater than 1 gpm Increase"

12.8.3 Record CFAE Sump level as follows:

☐ Each 30 minutes for the first hour
☐ Every hour thereafter

_____ 12.8.4 **IF** CFAE Sump to be pumped, perform the following:

☐ 12.8.4.1 Record Sump Levels.

☐ 12.8.4.2 Perform Step 12.8.5.

☐ 12.8.4.3 Record new sump levels.

12.8.4.4 NA the following:

☐ "Level Change"
☐ "Total Level Change"
☐ "Total Volume Change"
☐ "Sum of Input"
☐ "Greater than 1 gpm Increase"

12.8.5 Determine sump input as follows:

☐ 12.8.5.1 Subtract previous level from current level for each sump.

☐ 12.8.5.2 Record difference as "Level Change" for each sump.

☐ 12.8.5.3 Total "Level Change" of A and B CFAE Sumps (inches).

☐ 12.8.5.4 Record as "Total Level Change".

☐ 12.8.5.5 Multiply "Total Level Change" by 36 and record as "Total Volume Change" (in gallons).

☐ 12.8.5.6 Divide "Total Volume Change" by number of minutes since last data entry and record as "Sum of Input".

_____ 12.8.6 **IF** "Sum of Input" less than 1 gpm, record "NO" for "Greater than 1 gpm Increase".

_____ 12.8.7 **IF** "Sum of Input" greater than 1 gpm, perform the following:

☐ 12.8.7.1 Record "YES" for "Greater than 1 gpm Increase".

☐ 12.8.7.2 Perform Section 12.9 (Actions for 1 gpm Leakage).

☐ 12.8.8 Repeat Steps 12.8.1 - 12.8.7 until M1L4554 (U1 Unidentified Leakage > 1 gpm in Cont) operable.

12.9 Actions for 1 gpm Leakage

☐ 12.9.1 Notify OSM.

☐ 12.9.2 Refer to ITS 3.4.13 and 3.4.15.

☐ 12.9.3 Perform PT/1/A/4150/001 B (Reactor Coolant Leakage Calculation) to ensure unidentified leakage is less than 1 gpm.

13. Enclosures

13.1 Reactor Coolant Leakage Data

13.2 VUCDT Volume Table

End Of Body

Unit 1

Enclosure 13.1

Reactor Coolant Leakage Data

Date _____ Sheet ____ of ____

		CFAE Parameters								EMF Counts				VUCDT Parameters				
		Sump Level (inches)		Level Change (inches)						1EMF-38L		1EMF-39L						
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	Count Rate	Count Rate Change	Count Rate	Count Rate Change	VUCDT Level (%)	VUCDT Volume (Gal)	Volume Change (Gal)	Rate of Input (gpm)	Greater than 1 gpm Increase (Yes/No

End of Enclosure

Unit 1

Enclosure 13.2

VUCDT Volume Table

VUCDT LEVEL %	VUCDT VOLUME (Gal)	VUCDT LEVEL %	VUCDT VOLUME (Gal)	VUCDT LEVEL%	VUCDT VOLUME (Gal)
0	79	35	1411	70	3122
1	100	36	1460	71	3166
2	122	37	1508	72	3210
3	146	38	1557	73	3254
4	172	39	1607	74	3296
5	199	40	1656	75	3339
6	227	41	1706	76	3380
7	256	42	1756	77	3421
8	287	43	1806	78	3461
9	319	44	1856	79	3501
10	352	45	1906	80	3539
11	385	46	1956	81	3577
12	420	47	2006	82	3614
13	456	48	2057	83	3650
14	492	49	2107	84	3686
15	530	50	2157	85	3720
16	568	51	2207	86	3753
17	607	52	2257	87	3785
18	647	53	2307	88	3817
19	687	54	2357	89	3847
20	729	55	2407	90	3875
21	770	56	2457	91	3903
22	813	57	2506	92	3929
23	856	58	2555	93	3954
24	900	59	2604	94	3977
25	944	60	2653	95	3999
26	989	61	2701	96	4019
27	1034	62	2750	97	4037
28	1080	63	2798	98	4054
29	1126	64	2845	99	4068
30	1172	65	2892	100	4079
31	1219	66	2939		
32	1267	67	2985		
33	1315	68	3031		
34	1363	69	3077		

End of Enclosure

Unit 1

Reviewed By _____

Approved By _____

TASK: **Perform RP-11 (Conducting A Site Assembly, Site Evacuation or Containment Evacuation) For An Alert Classification**

POSITION: **RO**

Operator's Name_____

Validation Time: 10 Minutes

Actual JPM Completion Time: _____ Minutes

Location: **Plant** Method: **Perform**

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/

KA: G 2.4.43 (2.8/3.5)

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 was at 100% power when it experienced a loss of electrical power
- An E-Plan "ALERT" classification has been declared due to the loss of power
- While performing RP/2 (ALERT), the OSM determines a "Site Assembly" is required
- No personnel are inside Unit 1 or Unit 2 Containment.

The SRO instructs you to perform the Immediate Actions of RP-11 (Conducting A Site Assembly, Site Evacuation or Containment Evacuation) for the ALERT classification.

JPM OVERALL STANDARD:

The Site Assembly is initiated per Step 2.2 of RP-11 (Conducting A Site Assembly, Site Evacuation or Containment Evacuation).

NOTES: N/A.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Determines that Step 2.1 is N/A	step		
*2	Determines that Step 2.2 is required	same		
3	Inform Security at Ext. 2688 or 4900 that Site Assembly is being initiated.	same		
4	Confirms with Security plant-wide emergency accountability system has been activated	same		
*5	Turn on outside page speakers	Same **Cue:** **Switch "toggeled" to "ON"**		
*6	Sound a 10-second blast of the Site Assembly alarm	Same **Cue:** **Switch rotated Clockwise to "ALARM"**		

* DENOTES CRITICAL

7	Record the time of the Site Assembly alarm from the previous step at the <u>end of step **F**</u> to be announced to the site.	Same		
8	Makes initial page per Step 2.2.1.F. as follows:			
	Determines "this is a drill/this is a drill" is not required.	Same		
*	"Dial 710, pause, dial 80"	Same		
*	Announce "This is a Site Assembly. This is a Site Assembly. McGuire Unit 1 is in an ALERT classification due to a loss of electrical power	Same NOTE: the wording for the description and reason can vary, but must contain the concepts ALERT and loss of electrical power		
	Reads into the page the last paragraph of Step 2.2.1.F.	same		
9	Repeats Step 6 and Step 8	same		

* DENOTES CRITICAL

*10	Performs Step 2.2.1.H.	Same		
11	Repeat Steps 6 and 8 at 10-minute intervals until Site Assembly complete	Same **Cue:** **Another operator will make any additional pages.**		
12	Determines remaining portions of RP-11 not applicable at this time	Same.		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 was at 100% power when it experienced a loss of electrical power
- An E-Plan "ALERT" classification has been declared due to the loss of power
- While performing RP/2 (ALERT), the OSM determines a "Site Assembly" is required
- No personnel are inside Unit 1 or Unit 2 Containment.

The SRO instructs you to perform the Immediate Actions of RP-11 (Conducting A Site Assembly, Site Evacuation or Containment Evacuation) for the ALERT classification.

(R04-01)

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. RP/0/A/5700/011
Revision No. 006

PREPARATION

(2) Station MCGUIRE NUCLEAR STATION

(3) Procedure Title Conducting A Site Assembly, Site Evacuation or Containment Evacuation

(4) Prepared By J M Cooke Date 7-16-02

(5) Requires NSD 228 Applicability Determination?

- ☒ Yes (New procedure or revision with major changes)
- ☐ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By _____ (QR) Date 7/22/02

Cross-Disciplinary Review By _____ (QR) NA _____ Date 7/22/02

Reactivity Mgmt. Review By _____ (QR) NA _____ Date 7/22/02

Mgmt. Involvement Review By _____ (Ops Supt.) NA _____ Date 7/22/02

(7) Additional Reviews

Reviewed By _____ Date _____

Reviewed By _____ Date _____

(8) Temporary Approval (*if necessary*)

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

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

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

(10) Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____

Work Order Number (WO#) _____

COMPLETION

(12) Procedure Completion Verification

- ☐ Yes ☐ 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*)

Duke Power Company McGuire Nuclear Station **Conducting A Site Assembly, Site Evacuation or Containment Evacuation** **Reference Use**	Procedure No. RP/**0**/A/5700/011 Revision No. 006 Electronic Reference No. MC0048ME

Conducting A Site Assembly, Site Evacuation or Containment Evacuation

1. Symptoms

1.1 A Site Assembly is an occurrence that warrants the accountability of all personnel on site for reasons of personnel safety or for dissemination of information. Examples include:

- Alert, Site Area Emergency or General Emergency has been declared
- Other plant conditions that, in the opinion of the Operations Shift Manager/Emergency Coordinator, warrant an assembly.

1.2 A Site Evacuation is an occurrence that necessitates the evacuation of non-essential personnel for reasons of safety. Examples include:

- Site Area Emergency, if plant conditions are rapidly degrading
- General Emergency
- Other plant conditions that, in the opinion of the Operations Shift Manager/Emergency Coordinator, warrant an evacuation.

1.3 A Containment Evacuation is an occurrence that necessitates the evacuation of personnel from containment and the annulus. The following valid conditions warrant a Containment Evacuation:

- AUTO:
  - Refueling Bridge Radiation Monitor Alarm 1EMF-16 or 2EMF-3
  - Hi Flux At Shutdown Alarm.
- MANUAL:
  - Loss of ND Abnormal Procedure implemented.
  - Spent Fuel Damage Abnormal Procedure implemented.
  - Other plant conditions that, in the opinion of the Operations Shift Manager/Emergency Coordinator, warrant an evacuation.

2. Immediate Actions

NOTE: Site Assembly is a required on-site protective action in response to an Alert or higher declaration. There may be certain security events where the need for site assembly may need to be evaluated.

2.1 The Operations Shift Manager or designee shall:

_____ 2.1.1 **IF** a Security Event exists, **THEN** contact the Security Shift Supervisor either via the ringdown phone to CAS/SAS, at extension 2688 or 4900, or use the Control Room Security radio to discuss the advisability of conducting a Site Assembly.

2.1.2 Following discussion with the Security Shift Supervisor concerning the security event, **IF** a site assembly is considered not advisable, **THEN** perform the following:

_____ A. Turn on the outside page speakers.

)TE:
- For drill purposes, state "This is a drill. This is a drill."
- Any plant phone in the Control Room horse shoe area or extension 4021 is programmed to access 710, site all call. {PIP-0-M98-2545}

_____ B. Dial 710; pause, dial 80 and following the beep, announce: "This is the Operations Shift Manager. A security event is in progress. Do not move about the site. Remain at your present location until further notice. Report any suspicious activities to Security."

_____ C. Repeat the preceding announcement one time.

_____ D. Mark steps in 2.2 N/A and **do not** conduct a Site Assembly at this time.

_____ E. Continue to repeat steps 2.1.2 A thru C at 10-minute intervals until advised by Security that it is safe for site personnel to move about.

_____ F. Turn off the outside page speakers when no longer needed for non-routine on-site announcements.

NOTE: 1. All personnel inside the protected area are to be accounted for within thirty (30) minutes of the initiation of Site Assembly and continuously thereafter until released or until instructed to report to an evacuation site.

2. All personnel outside the protected area and within the owner controlled area should report to their site assembly point and their supervision/designee within thirty (30) minutes of the initiation of Site Assembly and continuously thereafter until released or until instructed to report to an evacuation site. {PIP-M-02-01347}

2.2 **IF** a Site Assembly is required, **THEN** perform the following:

Initial

2.2.1 The Operations Shift Manager or designee shall:

_____ A. Contact Security at extension 2688 or 4900 to inform them that a Site Assembly is being initiated.

_____ B. Confirm that Security has activated the plant-wide emergency accountability system.

_____ C. Turn on outside page speakers.

_____ D. Sound a 10-second blast of the Site Assembly alarm.

_____ E. Record the time of the Site Assembly alarm from the previous step at the end of step **F** to be announced to the site.

NOTE: 1. Any plant phone in the Control Room horse shoe or extension 4021 (Support Assistant Desk) is programmed to access 710, site all call. {PIP-0-M-98-2545}

2. For Drill purposes, state "this is a drill, this is a drill" prior to any announcements.

_____ F. Dial 710; pause, dial 80, and following the beep, announce:

"This is a Site Assembly. This is a Site Assembly.

(Give a brief description/reason for assembly).

_____
_____
_____
_____
_____
_____

All personnel are to report immediately to their assembly points. For persons inside the protected area, if you do not know the location of your assembly point, either report to the Canteen Office Warehouse, or report to the site assembly point in the Admin Building. For persons outside the protected area and in the owner controlled area, if you do not know the location of your assembly point, report to the auditorium in building 7422 or to the lobby of building 7405. **Assembly start time is :_____."**

_____ G. **Repeat steps of 2.2.1 D and F in full, one time.**

_____ H. Contact Security and request that security perform a sweep of the discharge canal, the nature trail, and the beach to evacuate visitors from the owner controlled area.

_____ I. Continue to repeat steps of 2.2.1 D and F at 10-minute intervals until notification that the Site Assembly has been completed.

_____ J. Turn off outside page speakers following completion of site assembly.

2.3 **IF** a containment evacuation is required, **THEN** perform the following:

_____ 2.3.1 **IF** a manual Containment Evacuation alarm is warranted, **THEN** the Operations Shift Manager or designee shall sound a 60-second blast of the Containment Evacuation alarm.

2.3.2 The Operations Shift Manager or designee shall:

_____ A. Call Radiation Protection and Security at upper and lower containment at the following numbers:

Unit 1		Unit 2	
Outside Upper	2354	Outside Upper	2361
Outside Lower	2424	Outside Lower	2427
Inside Upper	2355	Inside Lower	2359.

_____ B. **IF** no answer at either upper or lower containment, call the following:

- Security Shift Supervisor: 4550 / 2678
- RP Supervisor: 2027.

_____ C. Notify Security at Ext. 2688 or 4900 when any valid containment evacuation alarm is received.

_____ 2.3.3 **IF** all personnel inside containment are not accounted for, **THEN** the Operations Shift Manager, or designee, and the Shift Technical Advisor will consider containment conditions prior to implementing the initial search/warning of personnel inside containment.

_____ 2.3.4 **WHEN** the condition requiring containment evacuation is cleared, **AND** access to containment is allowed, **THEN** the Operations Shift Manager or designee will notify Radiation Protection and Security, at telephone numbers in Step 2.3.2, that access to containment is now allowed.

3. Subsequent Actions

NOTE: 1. Evacuation will be coordinated by the Site Assembly/Site Evacuation Coordinator if the TSC is activated.

2. Evacuation will be coordinated by the Operations Shift Manager if the TSC is not activated.

3. Site evacuation must be preceded by a Site Assembly.

3.1 **IF** a Site Evacuation is required, **THEN** perform the following:

3.1.1 The Site Assembly /Site Evacuation Coordinator or Operations Shift Manager shall:

_____ A. Contact Radiation Protection Duty Supervisor (4528 or plant pager number 75-255) for assistance in assessing the radiological hazard, wind speed, and wind direction and in selecting the evacuation site.

_____ B. Choose the site evacuation **most opposite** the direction that the wind may be carrying any expected release (Enclosure 4.1):

- Training and Technology Center located on the Island ½ mile northeast of the plant.
- Cowans Ford Dam located ¾ mile west of the plant.

OR

- Offsite/home. (Choose an offsite or home location based on the hazard and other influencing factors such as whether or not the person is contaminated.)

_____ C. Get concurrence with the Emergency Coordinator on the evacuation site if the TSC is activated.

_____ D. Inform the Operations Shift Manager that a site evacuation is necessary. Give the Operations Shift Manager the reason for the site evacuation and the evacuation relocation site.

_____ E. Contact Security at extension 2688 or 4900 to inform them that a Site Evacuation is being initiated and inform them of the Evacuation – Relocation Site.

_____ F. Notify the chosen Evacuation-Relocation Site of the expected arrival of personnel:

- 9-704-579-3210: Training and Technology Center. This is a cellular telephone carried by an industrial security guard who roams the site seven days a week, 24 hours a day.

- 4335: Powerhouse at Cowans Ford Dam. This phone rings throughout the dam site. This location is staffed Monday through Friday, 10 hours per day. If no answer at 4335, call the Hydro Central Operations Office at 8-382-6838 or 8-382-6836 and request that the security gates at the plant entrance and at highway NC73 and the Cowans Ford Power House be unlocked so that the Cowans Ford service bay can be used as an evacuation site.

_____ G. Have Security notify the Mecklenburg Police (911) and request them to assist in traffic control, if deemed necessary by the Emergency Coordinator or Security Shift Supervisor.

_____ H. Notify Station Security to direct traffic until the Mecklenburg Police arrive.

_____ I. Turn on outside pager speakers.

_____ J. Sound a 10-second blast of the Site Evacuation alarm.

NOTE: 1. For drill purposes, state "this is a drill, this is a drill."

_____ K. Dial 710; pause, dial 80, and following the beep, announce:

"This is a Site Evacuation. This is a Site Evacuation. (Give a brief description/reason for site evacuation.)

_____

_____

_____

_____

_____

All non-essential personnel are to proceed immediately to (Provide the chosen evacuation relocation site)."

_____ L. Repeat steps 3.1.1 J and K in full, one time.

_____ M. Continue to repeat steps 3.1.1 J and K at 10-minute intervals until notification that the Site Evacuation has been completed.

_____ N. Turn off outside page speakers following completion of site evacuation.

3.2 Secure from a Site Assembly as follows:

3.2.1 The Operations Shift Manager or designee shall:

_____ A. Turn on outside page speakers.

NOTE:
1. A message for securing from site assembly may be provided from the Site Assembly Coordinator if the TSC is activated.
2. Any plant phone in the Control Room horse shoe or extension 4021 (Support Assistant Desk) is programmed to access 710, site all call. {PIP-0-M-98-2545}
3. For drill purposes, state "this is a drill, this is a drill."

_____ B. The Operations Shift Manager or designee shall dial 710; pause, dial 80, and following the beep, announce one of the following:

- **IF** provided a message for securing from the site assembly by the TSC, **THEN** read the provided message.

OR

- "This is the Operations Shift Manager/Emergency Coordinator. Secure from Site Assembly. Secure from Site Assembly".

_____ C. Repeat step 3.2.1 B in full, one time.

_____ D. Turn off outside page speakers following completion of announcement.

3.3 Secure from a Site Evacuation as follows:

——— 3.3.1 The Emergency Coordinator/Operations Shift Manager shall notify the Evacuation Coordinator at the Evacuation-Relocation Site when evacuated personnel can return to their work location.

4. Enclosures

4.1 Evacuation Routes to Training and Technology and Cowans Ford

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: **SRO**

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: G 2.1.33 (3.4/4.0)

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= 169.5 PR-41 B= 238
- PR-42 A= 170 PR-42 B= 242.5
- PR-43 A= 170 PR-43 B= 240
- PR-44 A= 168 PR-44 B= 255

You are instructed to perform a manual AFD calculation per Step 12.8 of PT/1/A/4600/021 A (Loss of Operator Aid Computer While in Mode 1) and verify calculated values are within the limits specified in the COLR and Evaluate any required Tech Spec actions.

JPM OVERALL STANDARD:

The manual AFD calculation is performed per Enclosure 13.2 (Axial Flux Difference Monitoring) and the correct results (± 1% and 2/4 channels out of spec.) are obtained for the detector currents used in the calculation.

NOTES: Provide COLR, Data Book, and Tech Specs

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Determines that Encl. 13.2, Part B is used to perform manual calculation	same		
*2	Obtains values for column A from the Data Book, Table 2.2	Same		
3	Obtains Measured currents (column B) values for upper and lower detectors of all power range channels	Same **Cue: (provided with initial conditions)** • **PR-41 A= 169.5** • **PR-41 B= 238** • **PR-42 A= 170** • **PR-42 B= 242.5** • **PR-43 A= 170** • **PR-43 B= 240** • **PR-44 A= 168** • **PR-44 B= 255**		
*4	Performs calculation required for columns C & D	Same		

* DENOTES CRITICAL

*5	Obtains values for column E from the Data Book, Table 2.2	Uses Table obtained in Step 3		
*6	Performs calculation required for column F	Values calculated within ± 1% of key.		
7	Locate COLR AFD values.	Same		
*8	Verify calculated AFD is within limits specified in COLR	Determines that 2 of 4 channels exceed the COLR limits		
*9	Determine required Tech Spec action	Either reduce Power to < 50% or restore AFD within 30 min		

STOP TIME_____

* DENOTES CRITICAL

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= 169.5 PR-41 B= 238
- PR-42 A= 170 PR-42 B= 242.5
- PR-43 A= 170 PR-43 B= 240
- PR-44 A= 168 PR-44 B= 255

You are instructed to perform a manual AFD calculation per Step 12.8 of PT/1/A/4600/021 A (Loss of Operator Aid Computer While in Mode 1) and verify calculated values are within the limits specified in the COLR.

KEY

Enclosure 13.2

Axial Flux Difference Monitoring

Part B

Sheet ____ of ____
Date:____ Time:[2]_____

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	183.4	169.5	92.42			
				-12.1	1.358	-16.43
PR-41 B	204.1	238	116.61			
PR-42 A	186.6	170	91.1			
				-14.21	1.356	-19.27
PR-42 B	202.9	242.5	119.52			
PR-43 A	182.0	170	93.41			
				-11.47	1.369	-15.7
PR-43 B	206.3	240	116.34			
PR-44 A	182.5	168	92.05			
				-14.92	1.306	-19.48
PR-44 B	209.2	255	121.89			

(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.

ch BH

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 = 17

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	224.0	159.1	229.0	159.3	221.4	160.4	224.4	161.1
20	210.5	174.1	214.9	173.8	208.2	175.7	210.4	177.1
10	197.0	189.1	200.8	188.4	195.1	191.0	196.5	193.1
0	183.4	204.1	186.6	202.9	182.0	206.3	182.5	209.2
-10	169.9	219.1	172.5	217.5	168.9	221.5	168.6	225.2
-20	156.4	234.1	158.4	232.1	155.8	236.8	154.6	241.2
-30	142.8	249.1	144.2	246.6	142.7	252.1	140.7	257.3
Correlation Coef.=	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Normalized Detector Voltages (Volts At Various Axial Offsets

	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	10.174	6.493	3.681	10.222	6.537	3.685	10.129	6.478	3.651	10.240	6.415	3.825
20	9.559	7.105	2.454	9.592	7.135	2.457	9.530	7.096	2.434	9.603	7.053	2.550
10	8.945	7.718	1.227	8.961	7.732	1.229	8.930	7.713	1.217	8.967	7.692	1.275
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	7.715	8.942	-1.227	7.699	8.928	-1.229	7.730	8.947	-1.217	7.693	8.968	-1.275
-20	7.101	9.555	-2.454	7.068	9.525	-2.457	7.130	9.564	-2.434	7.057	9.607	-2.550
-30	6.486	10.167	-3.681	6.438	10.123	-3.685	6.531	10.182	-3.651	6.420	10.245	-3.825

AFD Incore/Excore Ratios For Quadrants 1 - 4

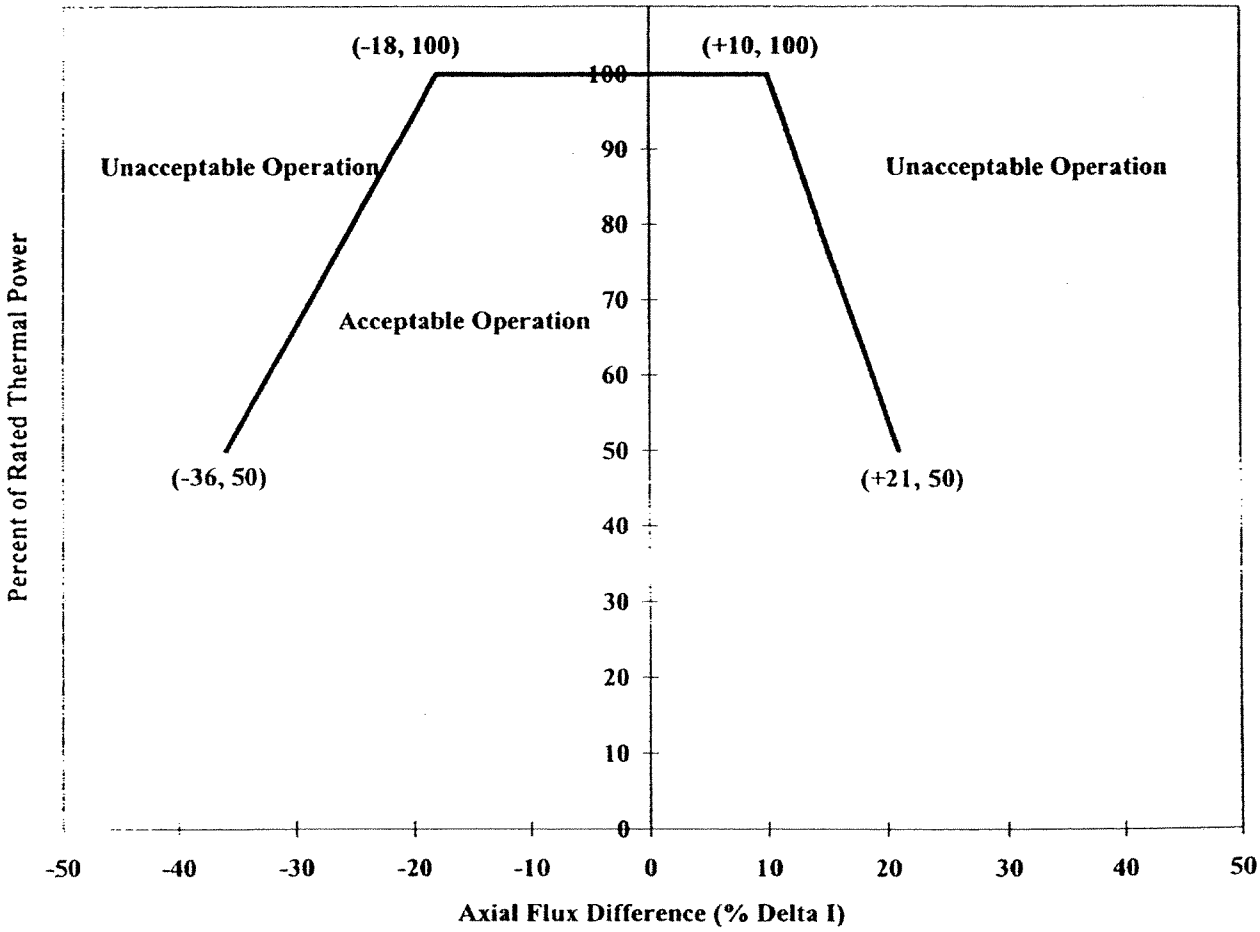
	Quad 4 N41	Quad 2 N42	Quad 1 N43	Quad 3 N44
M=	1.358	1.356	1.369	1.306

Prepared By: Ryan M Davis Date: 7/6/2004 Time: 13:53

McGuire 1 Cycle 17 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.

3.2 POWER DISTRIBUTION LIMITS

3.2.3 AXIAL FLUX DIFFERENCE (AFD)

LCO 3.2.3 The AFD in % flux difference units shall be maintained within the limits specified in the COLR.

---NOTE---
The AFD shall be considered outside limits when two or more OPERABLE excore channels indicate AFD to be outside limits.

APPLICABILITY: MODE 1 with THERMAL POWER $\geq$ 50% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. AFD not within limits.	A.1 Reduce THERMAL POWER to < 50% RTP.	30 minutes

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.3.1	Verify AFD within limits for each OPERABLE excore channel.	7 days AND Once within 1 hour and every 1 hour thereafter with the AFD monitor alarm inoperable

Duke Power Company McGuire Nuclear Station	Procedure No. **PT/ 1/A/4600/021 A**
	Revision No. **024**
Loss Of Operator Aid Computer While In Mode 1	
	Electronic Reference No. **MC00483T**
Continuous Use	
PERFORMANCE	

(ISSUED) - PDF Format

Revision History (significant issues, limited to one page)	
Rev 024	(1/13/04) In steps 12.6.2 and 12.6.3.2 replaced "exit this procedure section" with "go to Step. 12.7", to eliminate confusion.
Rev 023	(10-30-02) Per PIP 4090, made changes to Step 12.6 (Electrical Surveillance Items) and Enclosure 13.1 to eliminate unnecessary recording of data if the opposite Unit's Switchboard Log is recording MWH data. If neither Unit is capable of obtaining electrical data, the Digital Counters must be used for recording in Enclosure 13.1. -Added OAC Points to Enclosure 13.7 to identify partial loss of OAC for RP's PI Data.
Rev 022	(10/08/02) The following changes were made: • Reworded Step 12.5 for recording Electrical Surveillance Items. • Changed Encl. 13.1 Hourly Dispatcher Report for ease of recording data.
Rev 021	(6/10/02) • Changed "IAE" to "Eng OAC Group" for group to notify when OAC out of service • Reformatted step on monitoring QPTR. (Step 12.12). When one power range out of service, deleted note and added information as a new step
Rev 020	(3-20-02) -Added Step 12.2.3 to notify RP Shift that OAC is OOS and that PI Data is unavailable. -Added Step 12.15 to notify RP Shift when OAC is returned to service. {PIP 01-4284 -Deleted Steps 12.5.4 and 12.15 associated with IAE placing/removing Easterline Angus recorders to/from service. {PIPs 01-2645, 4176} - Added Step 12.5.4 for guidance to perform "Manual Trigger" of Analog Fault Recorder instead of having IAE operate Easterline Angus recorder. -Added new Enclosure 13.9 (Manual Trigger of Analog Fault Recorder). -Modified Enclosure 13.1 to record MW meter readings.
Rev 019	(7/30/01) Added criteria (step 12.8) requiring containment ventilation temperatures if a containment fire watch is in affect also added to acceptance criteria.
Rev 018	2/28/01: Made changes to support implementation of CA Storage Tank Mod NSM-MG-12518.
Rev 017	9/12/2000 Enclosure 13.4, Corrected footnotes for both upper and lower containment per PIP-0-M00-0552. Also converted to new template and brought procedure in line with Writer's Manual. A 10CFR50.59 Evaluation is not required for this change.

Loss Of Operator Aid Computer While In Mode 1

1. Purpose

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

2. References

2.1 Tech Specs:

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

2.2 Core Operating Limits Report (COLR)

3. Time Required

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

4. Prerequisite Tests

None

5. Equipment Required

5.1 Instrument capable of converting RTD resistance readings to temperature readings (Platinum 100 ohm) for Step 12.10.

5.2 Calibrated digital thermometer, capable of reading ambient air temperatures (Examples: Tegan 871, Keithley 871 or comparable instrument) for Step 12.13.

6. Limits and Precautions

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

7. Unit Status

_____ 7.1 Unit 1 in Mode 1.

8. Prerequisite System Conditions

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

9. Test Method

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

10. Data Required

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

11. Acceptance Criteria

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

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

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

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

11.3 For Control Rod Position:

- All full length rods (individual rod positions) have been checked within 4 hours and every 4 hours thereafter to be within 12 steps (indicated position) of their group demand position and operable.

- **IF** Annunciator 1AD-2, B9 (Control Rod Bank Lo-Lo Limit) out of service, each Control Bank has been checked within 4 hours and every 4 hours thereafter to be above rod insertion limits as specified in COLR.

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

11.4 Containment air temperatures have been checked once per hour after OAC has been out of service for 4 hours. Tech Spec Containment average air temperature shall be 75 - 100°F for containment upper compartment **AND** 100 – 120°F for containment lower compartment (See NOTE).

11.5 **IF** a Containment fire watch in affect **AND** containment air temperatures are being used to satisfy requirements, temperatures have been checked once per hour. (SLC 16.9.6)

11.6 **WHEN** above 50% RTP, Enclosure 13.5 (Calculation Sheet for Quadrant Power Tilt) has been calculated once within 12 hours and every 12 hours thereafter and Quadrant Power Tilt Ratio (QPTR) checked less than or equal to 1.02.

11.7 **IF** outside temperature less than 32°F, within 2 hours FWST Level Instrument Room heaters are checked energized **AND** every 12 hours temperature checked greater than 40°F.

11.8 Required data recorded in PT/1/A/4200/040 (Reactor Coolant Leakage Detection) to determine if reactor coolant leakage into Reactor Building has increased.

11.9 CA Storage Tank temperature 32 - 138°F.

12. Procedure

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

_____ 12.1 **IF** this procedure is entered due to a "Failed" or "Bad Quality" OAC point, go to Enclosure 13.7 (OAC Point List For Partial Loss Of OAC) to determine applicable sections of procedure to perform. All other sections of procedure may be marked NA.

_____ 12.2 Notify Eng OAC Group that OAC is out of service (completely or partially) and needs to be returned to service as soon as possible.

_____ _____/_____
Person Contacted Date Time

_____ 12.3 Notify RP Shift that OAC is out of service and PI data collection is unavailable.

_____ _____/_____
Person Contacted Date Time

12.4 Perform the following:

12.4.1 Enter the following in TSAIL for tracking increased surveillance frequency:

_____ • Rod Position Deviation Monitor (ITS SR 3.1.4.1)
_____ • AFD Monitor Alarm (ITS SR 3.2.3.1)
_____ • QPTR Alarm (ITS SR 3.2.4.1)

_____ 12.4.2 **IF** Annunciator 1AD-2, B9 (Control rod Bank Lo-Lo Limit) unavailable, enter Rod Insertion Limit Monitor (ITS SR 3.1.6.2) in TSAIL for tracking increased surveillance frequency.

☐ 12.5 Reduce turbine generator load as required to maintain indicated Reactor Power level less than 100% as indicated on NI Power Range Meters. {PIP-1-M99-0578}

12.6 Record Unit 1 Electrical Surveillance Items as follows:

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

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

_____ 12.6.2 **IF** all Unit 1 MWH OAC Points in service **AND** M1L1201 (U1 SOC External Gateway Link Status) in service, go to Step 12.7.

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

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

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

_____ _____/_____
Person Contacted Date Time

☐ 12.6.3.2 Go to Step 12.7.

_____ 12.6.3.3 **IF** Unit 2 OAC Point M2L1201 (U2 SOC External Gateway Link Status) out of service, perform the following:

_____ A. Notify SOC that Unit 1 MWH data unavailable.

_____ _____/_____
Person Contacted Date Time

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

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

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

_____ 12.6.4.1 Notify SOC that Unit 1 MWH data unavailable.

_____ _____/_____
Person Contacted Date Time

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

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

_____ 12.7 **IF** OAC will be out of service for greater than 48 hours, perform Manual Trigger of Analog Fault Recorder as follows:

_____ 12.7.1 **WHEN** OAC has been out of service for 48 hours, notify System Engineering.

_____ _____/_____
Person Contacted Date Time

_____ 12.7.2 Depress "Manual Trigger" on Analog Fault Recorder (located on EB7) every hour until OAC is returned to service.

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

_____ 12.8 **IF** AFD Monitor Alarm inoperable **AND** greater than or equal to 50% RTP, perform the following:

_____ 12.8.1 **IF** MCB AFD gauges operable, record AFD within 1 hour and every hour thereafter on Enclosure 13.2 (Axial Flux Difference Monitoring) Part A until OAC AFD Monitor Alarm operable.

_____ 12.8.2 **IF** MCB AFD gauges inoperable, check AFD by performing Enclosure 13.2 (Axial Flux Difference Monitoring) Part B within 1 hour and every hour thereafter until OAC AFD Monitor Alarm **OR** MCB AFD gauges operable.

_____ 12.8.2.1 **IF** MCB AFD gauges restored operable **AND** AFD Monitor Alarm remains inoperable, perform Step 12.8.1.

12.9 For Control Rods, perform the following:

_____ 12.9.1 Record within 4 hours and every 4 hours thereafter that the position of each full length rod to be within 12 steps of its group demand position and operable on Enclosure 13.3 (Full Length Rod Verification Data) Part A.

_____ 12.9.2 **IF** Annunciator 1AD-2, B9 (Control Rod Bank Lo-Lo Limit) unavailable, record within 4 hours and every 4 hours thereafter that each Control Bank of rods are above Rod Insertion Limit on Enclosure 13.3 (Full Length Rod Verification Data) Part B.

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

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

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

_____ _____/_____
Person Contacted Date Time

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

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

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

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

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

_____ _____/_____
Person Contacted Date Time

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

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

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

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

_____ 12.12.2 **IF** input from one PR channel is inoperable, perform the following:

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

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

_____ 12.12.2.2 **IF** greater than or equal to 75% RTP, have Reactor Engineering perform PT/0/A/4150/007 (Verification of QPTR Using Incore Detectors) every 12 hours until QPTR Alarm operable **OR** the inoperable PR input operable.

_____ 12.12.2.3 **WHEN** PR channel restored, monitor QPTR per Step 12.12.1.

_____ 12.12.3 **IF** QPTR is greater than 1.02, refer to ITS 3.2.4 for subsequent action.

_____ 12.13 **IF** outside air temperature is less than 32°F, perform the following:

NOTE:
- FWST Level Instrument Room located within FWST concrete enclosure.
- RWP, dosimetry and Security are required for access to FWST enclosure.

12.13.1 Within 2 hours, check power to FWST Level Instrument Room heaters by ensuring closed:

_____ • Normal heater - Panel board 1KG, Bkr 17
_____ • Backup heater - Panel board 1KC, Bkr 13

☐ 12.13.2 Obtain a calibrated digital thermometer, capable of reading ambient air temperatures (Examples: Tegan 871, Keithley 871, or comparable instrument). Instrument can be obtained at tool issue point in Service Building truck corridor.

☐ 12.13.3 Every 12 hours, check Unit 1 FWST Level Instrument Room area temperature (in vicinity of FWST Level Instruments) greater than 40°F.

☐ 12.13.3.1 Record on Enclosure 13.6 (FWST Level Instrument Room Temperature).

_____ 12.14 **IF** any of the following are out of service, perform PT/1/A/4200/040 (Reactor Coolant Leakage Detection) until all are returned to service:

- OAC
- M1P0591 (1EMF39(L) Difference Last 60 Minutes)
- M1P0592 (1EMF38(L) Containment Leakage Alarm)
- M1P1069 (U1 Total Cont Floor & Equip Sump Lvl Rate)

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

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

_____ 12.15.1 Notify NC System Engineer or designee.

_____ _____/_____
Person Contacted Date Time

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

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

_____gpm.

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

_____ _____
Date Time

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

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

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

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

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

_____ _____/_____
Person Contacted Date Time

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

_____ _____/_____
Person Contacted Date Time

Record Total NC Flow: _____gpm

_____ _____/_____
Calculations Performed By Date Time

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

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

_____ 12.16.1 Notify Reactor Group Engineer or designee.

_____ _____/_____
Person Contacted Date Time

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

_____ 12.16.2.1 Obtain the following PI data:

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

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

_____ _____
Date Time

12.16.2.3 Determine power mismatch as follows:

_____ • Use M1P1407, M1P1408, M1P1409, and M1P1410 of Step 12.16.2.1.

OR

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

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

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

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

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

_____ _____/_____
Person Contacted Date Time

_____ _____/_____
Calculation Performed By Date Time

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

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

_____ 12.17.1 Notify Reactor Group Duty Engineer values have been updated.

_____ _____/_____
Person Contacted Date Time

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

_____ _____/_____
Person Contacted Date Time

13. Enclosures

13.1 Hourly Dispatcher Report

13.2 Axial Flux Difference Monitoring

13.3 Full Length Rod Verification Data

13.4 Containment Air Temperatures

13.5 Calculation Sheet For Quadrant Power Tilt

13.6 FWST Level Instrument Room Temperature

13.7 OAC Point List For Partial Loss Of OAC

13.8 CA Storage Tank Temperatures

13.9 Manual Trigger of Analog Fault Recorder

End of Body

Enclosure 13.1

Hourly Dispatcher Report

Sheet ____ of ____

Obtain data from Digital Counters [1]

			Unit 1 Gross	**D/G 1A**	**D/G 1B**	**Transf 1ATA**	**Transf 1ATB**	**Net MWHs** [2]
			M1P1103	M1P1109	M1P1111	M1P1104	M1P1105	M1P0407
Date	**Time**	**Initials**	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)	(MWH)
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=
			(+)	(–)	(–)	(–)	(–)	=

End of Enclosure

[1] Last two digits on Digital Counters for D/G 1A and 1B are decimal places. Do **NOT** use when recording MWHs.

[2] For each item, subtract previous hour reading from present hour reading and record in (+) and (–) area. Then subtract D/G and Transf readings from Unit 1 Gross reading to obtain Net MWHs.

Enclosure 13.2

Axial Flux Difference Monitoring

Part A

Sheet ____ of ____

Date	Time [1]	Initials	PR-41 AFD	PR-42 AFD	PR-43 AFD	PR-44 AFD

[1] **WHEN** greater than or equal to 50% RTP, performed within 1 hour and every hour thereafter until OAC AFD Monitor Alarm operable.

Enclosure 13.2

Axial Flux Difference Monitoring

Part B

Sheet ____ of ____
Date:_____Time:[2]_____

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						
PR-41 B						
PR-42 A						
PR-42 B						
PR-43 A						
PR-43 B						
PR-44 A						
PR-44 B						

(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.

All full length rods are positioned within 12 steps (indicated position) of their group demand position and operable. (ITS SR 3.1.4.1)

Date	Time [1]	Initials
P		

Date	Time [1]	Initials

[1] Performed within 4 hours and every 4 hours thereafter until OAC Rod Position Deviation Monitor operable.

All Control Banks are above the rod insertion limit as specified in the COLR. (ITS SR 3.1.6.2)

	Control Bank A	Control Bank B	Control Bank C	Control Bank D	Date	Time [2]	Initials
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							
Insertion Limit							
Bank Position							

End of Enclosure

[2] Performed within 4 hours and every 4 hours thereafter until OAC Rod Insertion Limit Monitor **OR** Annunciator 1AD-2, B9 (Control Rod Bank Lo-Lo Limit) operable.

Enclosure 13.4

Containment Air Temperatures

Sheet ____ of ____

Upper Containment Temperature (°F)					Lower Containment Temperature (°F)					Date	Time [1]	Initials
1A	1B	1C	1D	Average [2]	1A	1B	1C	1D	Average [3]			

End of Enclosure

[1] Performed every hour while OAC is out of service beginning four hours after OAC out of service.
[2] Upper Containment average air temperature shall be computed using temperature points corresponding to AHUs with operable sensors, regardless of AHU running or not running (based on large air volume (mass) in upper containment). {PIP-0-M00-0552}
[3] Lower Containment average air temperature shall be computed using temperature points corresponding to running AHUs with operable sensors. {PIP-0-M00-0552}

Enclosure 13.5

PT/1/A/4600/021 A

Calculation Sheet For Quadrant Power Tilt

Part A

Sheet ____ of ____

Date _____

Time [1] _____

Initials _____

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

1) From NI cabinet's current meter (located on respective PR B Drawers). Ensure Detector Milliamp Range Switches are in "0.5" position and read 0-500 microamp scale.
2) From most recent calibration data using "0" Incore Axial Offset Current in Data Book, Table 2.2 ("I_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) = [ ] RF of PR-41A + [ ] RF of PR-42A + [ ] RF of PR-43A + [ ] RF of PR-44A x ¼ = _____

Avg RF of B Detectors (RFB) = [ ] RF of PR-41B + [ ] RF of PR-42B + [ ] RF of PR-43B + [ ] RF of PR-44B x ¼ = _____

PR-41A Tilt = RF of PR-41A / RFA = _____

PR-41B Tilt = RF of PR-41B / RFB = _____

PR-42A Tilt = RF of PR-42A / RFA = _____

PR-42B Tilt = RF of PR-42B / RFB = _____

PR-43A Tilt = RF of PR-43A / RFA = _____

PR-43B Tilt = RF of PR-43B / RFB = _____

PR-44A Tilt = RF of PR-44A / RFA = _____

PR-44B Tilt = RF of PR-44B / RFB = _____

[1] **WHEN** above 50% RTP, calculation performed within 12 hours and every 12 hours thereafter until QPTR Alarm operable.

Enclosure 13.5

Calculation Sheet For Quadrant Power Tilt

Part B

Sheet ____ of ____

Date _____

Time [2] _____

Initials _____

	PR-4___		PR-4___		PR-4___	
	A	**B**	**A**	**B**	**A**	**B**
1) Measured Current						
2) Calibration Current						
3) Relative Flux (RF)						

1) From NI cabinet's current meter (located on respective PR B Drawers). Ensure Detector Milliamp Range Switches are in "0.5" position and read 0-500 microamp scale.
2) From most recent calibration data using "0" Incore Axial Offset Current in Data Book, Table 2.2 ("I_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) [ ] RF of PR-4__A + [ ] RF of PR-4__A + [ ] RF of PR-4__A x ⅓ = _____

Avg RF of B Detectors = (RFB) [ ] RF of PR-4__B + [ ] RF of PR-4__B + [ ] RF of PR-4__B x ⅓ = _____

PR-4___A Tilt = RF of PR-4__A / RFA = _____ **PR-4___B Tilt** = RF of PR-4__B / RFB = _____

PR-4___A Tilt = RF of PR-4__A / RFA = _____ **PR-4___B Tilt** = RF of PR-4__B / RFB = _____

PR-4___A Tilt = RF of PR-4__A / RFA = _____ **PR-4___B Tilt** = RF of PR-4__B / RFB = _____

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.

Enclosure 13.6

FWST Level Instrument Room Temperature

Sheet ____ of ____

				Digital Thermometer		
Date	**Time [1]**	**Initials**	**Area Temperature (°F)**	**Manufacturer Model #**	**Instrument #**	**Cal Due Date**

End of Enclosure

[1] Performed every 12 hours while outside temperature less than 32°F.

Enclosure 13.7

OAC Point List For Partial Loss Of OAC

OAC Point	Title	Procedure Sections To Be Performed
M1L4375	Tech Spec AFD Monitor Inoperable	12.2, 12.4, 12.5, 12.6, 12.8 12.12, 12.16,12.17
M1P1385	Reactor Thermal Power, Best	
M1L2361	Therm Pwr Limit Change Program Status	
M1L2611	Thermal Power Calcs Program Status	
M1L1200	Jems External Gateway Link Status	12.2, 12.6, 12.7
M1L1201	SOC External Gateway Link Status	
M1L2303	SWBD Application Active Flag	
M1L2221	Upper/Lower Contmnt Temp Program Status	12.2, 12.10
M1P1501	Upper Cont Avg Temp	
M1P0755	Lower Containment Weighted Average Temp	
M1A1228	Lower Cont Ambient Air Temp A	
M1A1234	Lower Cont Ambient Air Temp B	
M1A1240	Lower Cont Ambient Air Temp C	
M1A1246	Lower Cont Ambient Air Temp D	
M1L2211	Equipment Runtime Program Status	
M1A1074	FWST Instrument Room Temperature	12.2, 12.13
M1L2050	NC Flow Monitoring Status	12.2, 12.15, 12.16, 12.17
M1P1085	U1 NC Flow Best (10 min avg)	
M1L1202	EMF External Gateway Link Status	12.2, 12.14
M1E0198	EMF39L Containment Gas Lo Range	
M1E0190	EMF38L Containment Part Lo Range	
M1P1069	U1 Total Cont Floor & Equip sump Lvl Rate	
M1E0178	EMF36L Unit Vent Gas Lo Range	12.2, 12.3, 12.18
M1P2535	Average Unit Vent Stack Flow	

Unit 1

OAC Point	Title	Procedure Sections To Be Performed
M1L2391	Control Rod Posit Monitor Prgm Status	12.2, 12.4, 12.9, 12.17
M1L4051	Rod Bank Position Hardware Malfunction	
M1L4052	Control Rod Position Hardware Malfunct	
M1L4464	Control Rod Insert Limits-Invalid Data	
M1P1551	Max Rod Deviation Shutdown Bank A	
M1P1552	Max Rod Deviation Shutdown Bank B	
M1P1553	Max Rod Deviation Shutdown Bank C	
M1P1554	Max Rod Deviation Shutdown Bank D	
M1P1555	Max Rod Deviation Shutdown Bank E	
M1P1556	Max Rod Deviation Control Bank A	
M1P1557	Max Rod Deviation Control Bank B	
M1P1558	Max Rod Deviation Control Bank C	
M1P1559	Max Rod Deviation Control Bank D	
M1L4409	Ctrl Bank Tech Spec Insert Lmt Reached	
M1L4410	Shutdown Bank Withdrawn Per Tech Specs	
M1L4411	Improper Bank Sequence Or Bank Overlap	
M1P1448	Low Bank Insertion Limit Margin	
M1L1470	Xenon/Samarium Calcs Program Status	12.2, 12.17
M1L2611	Thermal Power Calcs Program Status	
M1A1342	Lower CA Storage Tank Temperature	12.2, 12.11
M1A1371	Middle CA Storage Tank Temperature	
M1A1377	Upper CA Storage Tank Temperature	

End of Enclosure

Enclosure 13.8

CA Storage Tank Temperatures

Sheet _____ of _____

Upper °F	Middle °F	Lower °F	Date	Time [1]	Intitials

End of Enclosure

[1] Performed every hour while OAC is out of service beginning 4 hours after OAC out of service.

Manual Trigger Depressed		
Date	**Time**	**Initial**

End of Enclosure

Reviewed By _____

Approved By _____

TASK: **Determine Minimum Shift Crew Composition for turnover conditions**

POSITION: **SRO**

Operator's Name_____

Location: **Classroom** 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: OMP 5-8

KA: G 2.1.4 (2.3/3.4)

INITIAL CONDITIONS

Both Units at MNS are at 100% power.

Due to inclement weather conditions, the following is a list of the Operations personnel who have reported for duty at shift turnover. No additional personnel will be available for at least three (3) hours.

SRO-A (OSM)	RO-A	NLO-A	STA-A	NO SPOC personnel
SRO-B	RO-B	NLO-B		
		NLO-C		
		NLO-D		

Based on the information provided to you, PER OMP 5-8:

- **determine if adequate shift manning exists.**
- **determine how many crew members (if any) must be held over.**
- **determine what positions need to be manned.**

JPM OVERALL STANDARD: The Control Room SRO Turnover Checklist Section IV is filled out to show that it will be necessary to holdover ten (10) to eleven (11) operators/SPOC personnel from the present shift. SRO's should be assigned to the #1 (OSM), #3, #4 positions. RO's should be assigned to the #5 positions. STA should be assigned to the #2 position. Position 7.A should be assigned to a RO or SRO. At least 4 NLO's and additional 2 positions from either NLO's or SPOC to complete # 7 & # 8. An SRO should be assigned to the #9 position (could be same person as the #7A if SRO).

NOTES: Provide OMP 5-8, Rev 25.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Candidate completes Section IV of the Control Room SRO Turnover Checklist, using personnel listed in the initial conditions.	❑ Items #1 & #3 have SRO's listed ❑ Item #4 has a Holdover SRO listed ❑ Item #2 has the STA listed ❑ Item #5 has 2RO's listed, as well as 2 Holdover RO's ❑ Item #6 has 3 NLO's listed ❑ Item #7 has 1 NLO listed and 4 Holdovers (1 SRO or 1 RO) and 2 NLO and 1 SPOC/NLOs) ❑ Item #8 has 2 NLO's and 1 additional NLO/SPOC, all holdovers. ❑ Item #9 has 1 Holdover SRO, but can be same individual as #7A if SRO.		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

Both Units at MNS are at 100% power.

Due to inclement weather conditions, the following is a list of the Operations personnel who have reported for duty at shift turnover. No additional personnel will be available for at least three (3) hours.

SRO-A (OSM)	RO-A	NLO-A	STA-A	NO SPOC personnel
SRO-B	RO-B	NLO-B		
		NLO-C		
		NLO-D		

Based on the information provided to you, PER OMP 5-8:

- **determine if adequate shift manning exists.**
- **determine how many crew members (if any) must be held over.**
- **determine what positions need to be manned.**

Key

IV. Minimum Shift Crew Composition:

SHIFT CREW POSITION	NAME
1. Operations Shift Manager (OSM)	SRO-A (OSM)
2. Shift Technical Advisor (STA)*	STA-A
3. Control Room Supervisor (SRO)	SRO-B
4. Offsite Communicator (SRO)**	Holdover SRO
5. Reactor Operators (RO) Unit 1 ROATC	RO-A
Unit 1 BOP	RO-B
Unit 2 ROATC	Holdover RO
Unit 2 BOP	Holdover RO
6. Non-Licensed Operators (NLO)	
Unit 1	NLO-A
Unit 2	NLO-B
Designated	NLO-C
7. SLC Required Fire Brigade***	
A. Leader (RO or SRO)	A. Holdover RO or SRO
B. Brigade Members	B1. NLO-D
	B2. Holdover NLO
	B3. Holdover NLO
****	B4. Holdover NLO/SPOC
8. Supplemental Fire Brigade	1. Holdover NLO
(Not SLC Related)	2. Holdover NLO
****	3. Holdover NLO/SPOC
9. Plant SRO	Holdover SRO

can be Same

* The STA must be an SRO who is **NOT** serving as the OSM, CR Supervisor, Offsite Communicator, or Fire Brigade Leader.

** The Offsite Communicator must be an SRO who is **NOT** serving as the OSM, STA, CR Supervisor, or Fire Brigade Leader.

*** A 5 member fire brigade must be onsite at all times. None of the minimum shift crew composition from positions 1 through 6 can be listed on fire brigade. Qualification of each brigade member shall be verified, by Supervisor of the group providing member, using ERO Database Access List.

**** Normally covered by SPOC. Qualification of each brigade member shall be verified, by Supervisor of the group providing member, using ERO Database Access List.

Duke Power Company McGuire Nuclear Station	Procedure No. **OMP 5-8**
	Revision No. **025**
Shift Supervision Turnovers	
Information Use	Electronic Reference No. **MP0070O4**

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

ISSUED

Revision History (significant issues, limited to one page)

Rev 025 (08/18/04) Added Note in Attachment 5.

Rev 024 (05/11/04)

- Added New Step 4.1.4.
- Attachment 1, added Mode 4 to Step 3 and added New Step 8.
- Shaded areas in Table in Attachment 1 to avoid confusion.
- Added more information on list in Enclosure 4.
- Changed Attachment 7 (Shutdown Assessment/Status)

Rev 023 (02/23/04)

- Changed title of OMP.
- Added OSM Turnover information.
- Replaced SRO with Supervisor as needed.
- Cleaned up minor items.
- Changed Attachment 7.
- Added Attachment 4.

Rev 022 (02/09/04) Updated per 1EOC16 outage IRT comments. Added steps to SRO turnover to ensure risk management plans and complex plans are included in turnover.

Rev 021 (06/23/03)

- Reformatted Encl. 3 to fit on one page.
- Added note to SLC required fire brigade and supplemental fire brigade.
- Added Step 4.4.4.
- Changed Modes in Step 9.1 and 9.2.
- Changed Attachments 5 and 7.

Rev 020 (02/18/03) Added new Step 4.4.3 under WCC SRO. Changed Attachment 1 to read Control Room SRO Turnover Checklist. Changed Attachment 1 Turnover Checklist.

Rev 019 (11/21/02) Changed all references to SWM.

Rev 018 (02/25/02) Converted to standard template. Deleted part of Step 10.1.5 and 10.2.3.

Rev 017 (11/27/01) On Attachment 5 added steps to ensure tagging ND-35 does not cause delay in implementation of strategy.

Shift Supervision Turnovers

1. Purpose

To provide a procedure to promote continuity during the shift turnover process.

2. Reference

2.1 INPO Good Practice OP-201 (Shift Relief And Turnover)

2.2 PIP 0-M97-0086

3. Description

3.1 To provide the procedure for preparing for and performing turnover, and for expectations following the completion of turnover.

3.2 To provide the procedure for Control Room Supervisor relief.

3.3 To describe additional expectations for turnover during shutdown conditions.

3.4 To describe the succession plan for the unavailability of an OSM.

4. Responsibilities

4.1 The OSM or designee:

4.1.1 Shall ensure turnovers are complete and accurate.

4.1.2 Shall prepare for and conduct the OSM turnover.

4.1.3 Shall review all PIP's generated during his/her watch for any potential operability concerns. Any potential operability concerns identified during this review shall be resolved by either the off going OSM or on coming OSM as soon as possible. At a minimum the following PIP information shall be reviewed: Plant System, Brief Problem Description, Detailed Problem Description and Immediate Corrective Action.

4.1.4 Shall review all pertinent Operating Experience with the on coming OSM.

4.2 Control Room Supervisor:

4.2.1 Shall wear a clear plastic sleeve over the security badge to prevent exit from the control room without proper relief.

4.2.2 Shall prepare for and conduct the Control Room Supervisor turnover.

4.2.3 Shall ensure turnover information is understood.

4.3 Work Control Center (WCC) Supervisor:

4.3.1 Shall be the offsite communicator unless that responsibility has been reassigned by the OSM.

4.3.2 Shall prepare for and conduct the WCC Supervisor turnover.

4.3.3 Shall ensure turnover information is understood.

4.4 Plant Supervisor:

4.4.1 Shall prepare for and conduct the Plant Supervisor turnover.

4.4.2 Shall ensure turnover information is understood.

4.4.3 Shall be the Fire Brigade leader unless that responsibility has been reassigned by the OSM.

4.4.4 The supervisor assigning fire brigade members to Attachment 1 (CR Supervisor Turnover Checklist) is responsible for verifying current qualifications per the ERO Database Access List.

5. Succession Plan

5.1 **IF** the Operations Shift Manager (OSM) and OSM designee become unavailable due to sickness, injury, or other emergency, the senior (by years in position) Shift Supervisor with an active license will assume the position of OSM until a qualified replacement becomes available.

6. Turnover Procedure

6.1 The OSM, the STA, Control Room, Plant, and WCC Supervisors shall review the status of systems and equipment prior to being relieved and shall ensure all conditions are registered in logs and records for which they are responsible.

6.2 Attachments 1, 2, 3 and 4 shall be completed. Attachment 8 (Unit 1 and 2 Conditional Surveillances) shall be completed by Control Room Supervisor when required.

7. Turnover Process

7.1 The status of plant system and equipment shall be reviewed. Out-of-normal conditions as well as all available information on expected occurrences which could affect plant operation shall be emphasized in this review.

7.2 **WHEN** the process is complete and the turnover information is understood, the relieving OSM/Supervisor shall declare that he/she has assumed the assigned responsibilities.

7.3 No off going Supervisors may leave their assigned duties until properly assured that their responsibilities have been assumed by their relief or until receiving verbal approval from an OSM or designee.

8. Following Turnover

8.1 The Supervisors shall, as soon as possible, review, at a minimum, those areas listed on their turnover checklists. Operating areas shall be toured as soon as practicable to verify equipment conditions. On the first day of each shift, the Operator Workarounds should be reviewed.

8.2 The Control Room Supervisor shall identify those individuals who will fill positions required for minimum shift composition.

8.3 The shift Supervisors who may relieve the Control Room Supervisor shall review the Control Room Supervisor Turnover checklist as soon as practical.

8.4 A shift crew briefing shall be conducted to ensure that all crew personnel are informed of current plant status, planned evolutions, and any other information deemed relevant by any crew member.

9. Other Expectations During Shutdown Conditions

9.1 Prior to entry into Mode 4 from Mode 3, the Control Room Supervisor shall ensure the appropriate entries are made on Attachment 7 (Shutdown Assessment/Status Sheet).

9.2 The Control Room Supervisor shall ensure Attachment 7 (Shutdown Assessment/Status Sheet) is updated as conditions change until the associated unit is returned to Mode 3.

9.3 **WHEN** ND is in service and fuel is in the core, the Control Room Supervisor shall complete Attachment 5 (NC System Emergency Make-up Sources) and attach it to the Control Room Supervisor Turnover checklist. The attachment shall be updated as conditions change.

9.4 **WHEN** Containment Closure is required and fuel is in the core, the Control Room Supervisor shall complete Attachment 6 (Thermal Margin Determination) and attach it to the Control Room Supervisor Turnover checklist.

10. Control Room Supervisor Relief Process

10.1 **WHEN** the Control Room Supervisor requires relief the following process shall be followed:

10.1.1 A Supervisor with an active SRO license (on or off shift) shall relieve the Control Room Supervisor.

10.1.2 Any changes that have occurred since initial turnover shall be discussed including changes in sections I, II, III.A, and VI of the Control Room Supervisor turnover checklist. Any significant activities affecting operations or indication shall be discussed.

10.1.3 **IF** the relief is for a duration of greater than 30 minutes, then section VII of the turnover checklist shall be reviewed.

10.1.4 **IF** relief is by an off shift Supervisor, then a complete review of the turnover checklist shall be performed.

10.1.5 The relieving Supervisor shall complete section VIII of the Control Room turnover checklist.

10.2 **WHEN** the Control Room Supervisor returns to assume duties from the relief Supervisor:

10.2.1 Any changes that have occurred since relief shall be discussed including changes in sections I, II, III.A, and VI of the Control Room Supervisor turnover checklist. Any significant activities affecting operations or indication shall be discussed.

10.2.2 **IF** the relief was for a duration of greater than 30 minutes, then section VII of the turnover checklist shall be reviewed.

10.2.3 The Control Room Supervisor shall complete section VIII of the Control Room Supervisor turnover checklist.

11. Records

11.1 The Control Room Supervisor turnover checklist shall be routed to Master File.

11.2 The Plant Supervisor, WCC Supervisor turnover checklist may be discarded.

12. Attachments

12.1 Attachment 1 (Control Room Supervisor Turnover Checklist)

12.2 Attachment 2 (Plant Supervisor Turnover Checklist)

12.3 Attachment 3 (Work Control Center Supervisor Turnover Checklist)

12.4 Attachment 4 (OSM Turnover Guidelines)

12.5 Attachment 5 (NC System Emergency Make-up Sources)

12.6 Attachment 6 (Thermal Margin Determination)

12.7 Attachment 7 (Shutdown Assessment/Status)

12.8 Attachment 8 (Unit 1 and Unit 2 Conditional Surveillances)

End of Body

Attachment 1
Control Room Supervisor Turnover Checklist

Shift being relieved: A B C D E (circle one)

Date/Time _____

	UNIT 1	UNIT 2
I.	Mode of Operation _____ Power Level _____	Mode of Operation _____ Power Level _____

II. Review the general status of each section of the Main Control Boards and note any abnormal conditions. The Nuclear Control Operator of the shift being relieved agrees to the status of each section.

Unit 1 Remarks: _____

Unit 1 NCO (Initials) _____

Unit 2 Remarks: _____

Unit 2 NCO (Initials) _____

III. Review:

	Control Room Supervisor (Being Relieved)	Control Room Supervisor (Relieving)
A.		
1. Unit 1 and 2 Technical Specifications Action Items	_____	_____
2. Status of Unit 1 and 2 ESF Monitor Light Panels	_____	_____
3. Shutdown Assessment/ Status Sheet (Attachment 7) (required in Modes 4, 5 and 6)		
Unit 1	_____	_____
Unit 2	_____	_____
4. NC System Emergency Makeup sources (Attachment 5- required in Modes 4, 5 and 6 while ND in service)		
Unit 1	_____	_____
Unit 2	_____	_____
5. Thermal Margin Determination (Attachment 6 - Required in Modes 5 and 6)		
Unit 1	_____	_____
Unit 2	_____	_____
6. Conditional Surveillances (Attachment 8) If required		
Unit 1	_____	_____
Unit 2	_____	_____
7. Applicable Complex and/or Significant Risk Plans		
Unit 1	_____	_____
Unit 2	_____	_____
8. Outstanding Red Tag Parameters	_____	_____

B.

The following documents are reviewed and signed; one column should be checked and one N/A.

		0700-1900	1900-0700
1. Semi-Daily Surveillance PT			
Unit 1		_____	_____
Unit 2		_____	_____
2. Daily Surveillance PT			
Unit 1			_____
Unit 2			_____
3. NCO Turnover & Alarm Summary	Unit 1	_____	_____
	Unit 2	_____	_____
4. Unit 1 and Unit 2 RO/SRO Logs		_____	_____

IV. Minimum Shift Crew Composition:

SHIFT CREW POSITION	NAME
1. Operations Shift Manager (OSM)	
2. Shift Technical Advisor (STA)*	
3. Control Room Supervisor (SRO)	
4. Offsite Communicator (SRO)**	
5. Reactor Operators (RO) Unit 1 ROATC	
Unit 1 BOP	
Unit 2 ROATC	
Unit 2 BOP	
6. Non-Licensed Operators (NLO)	
Unit 1	
Unit 2	
Designated	
7. SLC Required Fire Brigade***	
A. Leader (RO or SRO)	A.
B. Brigade Members	B1.
	B2.
	B3.
****	B4.
8. Supplemental Fire Brigade	1.
(Not SLC Related)	2.
****	3.
9. Plant SRO	

* The STA must be an SRO who is **NOT** serving as the OSM, CR Supervisor, Offsite Communicator, or Fire Brigade Leader.

** The Offsite Communicator must be an SRO who is **NOT** serving as the OSM, STA, CR Supervisor, or Fire Brigade Leader.

*** A 5 member fire brigade must be onsite at all times. None of the minimum shift crew composition from positions 1 through 6 can be listed on fire brigade. Qualification of each brigade member shall be verified, by Supervisor of the group providing member, using ERO Database Access List.

**** Normally covered by SPOC. Qualification of each brigade member shall be verified, by Supervisor of the group providing member, using ERO Database Access List.

V. Unit 1 & 2 - 1.47 Byp Panels.

1

MD CA Pump 1A Byp	D/G 1A Inop	VX 1A Byp	WL & NM 1A Byp	E/S PMP Rm AHU 1A Byp	VE 1A Byp	PRT Isol Sys 1A Byp
MD CA Pump 1B Byp	D/G 1B Inop	VX 1B Byp	WL & NM 1B Byp	E/S PMP Rm AHU 1B Byp	VE 1B Byp	PRT Isol Sys 1B Byp
TD CA Pump Train 1A Byp	NC Pzr Relief 1A Byp	NI 1A Not Available	NI Accum 1A Not Available	ND 1A To NV/NI Not Available	Ice Cond AHU Gly Isol 1A Byp	KF 1A Byp
TD CA Pump Train 1B Byp	NC Pzr Relief 1B Byp	NI 1B Not Available	NI Accum 1B Not Available	ND 1B To NV/NI Not Available	Ice Cond AHU Gly Isol 1B Byp	KF 1B Byp
ND 1A Byp	RN 1A Byp	KC 1A Byp	NV 1A Byp		NS 1A Byp	VC-YC A Byp
ND 1B Byp	RN 1B Byp	KC 1B Byp	NV 1B Byp		NS 1B Byp	VC-YC B Byp
FWST LVL Inst Chan 1 Byp	FWST LVL Inst Chan 2 Byp	FWST LVL Inst Chan 4 Byp	WZ 1A Byp	WZ 1B Byp	WN 1A Byp	WN 1B Byp

2

MD CA Pump 2A Byp	D/G 2A Inop	VX 2A Byp	WL & NM 2A Byp	E/S PMP Rm AHU 2A Byp	VE 2A Byp	PRT Isol Sys 2A Byp
MD CA Pump 2B Byp	D/G 2B Inop	VX 2B Byp	WL & NM 2B Byp	E/S PMP Rm AHU 2B Byp	VE 2B Byp	PRT Isol Sys 2B Byp
TD CA Pump Train 2A Byp	NC Pzr Relief 2A Byp	NI 2A Not Available	NI Accum 2A Not Available	ND 2A To NV/NI Not Available	Ice Cond AHU Gly Isol 2A Byp	KF 2A Byp
TD CA Pump Train 2B Byp	NC Pzr Relief 2B Byp	NI 2B Not Available	NI Accum 2B Not Available	ND 2B To NV/NI Not Available	Ice Cond AHU Gly Isol 2B Byp	KF 2B Byp
ND 2A Byp	RN 2A Byp	KC 2A Byp	NV 2A Byp		NS 2A Byp	
ND 2B Byp	RN 2B Byp	KC 2B Byp	NV 2B Byp		NS 2B Byp	
FWST LVL Inst Chan 1 Byp	FWST LVL Inst Chan 2 Byp	FWST LVL Inst Chan 4 Byp			WN 2A Byp	WN 2B Byp

NOTE:	The C/R Supervisor being relieved shall circle the blocks corresponding to any lamps lit. For any lamp lit that has a work request associated with it, place an asterisk (*) in the associated block after circling it.
	Control Rm Supervisor (being relieved) Initial _____.
	Control Rm Supervisor (relieving) Initial _____.

VI.

Unit 1 Additional Remarks: _____

_____

_____

_____

Unit 2 Additional Remarks: _____

_____

_____

LWR In Progress _____ Yes _____ No

WMT A or B VUCDT Unit 1 or 2

(Circle Appropriate Tank or Unit)

GWR In Progress _____ Yes _____ No

VP Unit 1 or Unit 2

VQ Unit 1 or Unit 2

Waste Gas Tank A B C D E F

(Circle Appropriate Tank Or Unit)

	(Shift Being Relieved)	(Relieving Shift)
Control Room Supervisor	_____ (Signature)	_____ (Signature)
OSM Review	_____ (Signature)	_____ (Signature)

VII. Review as soon as possible after assuming shift responsibilities.

Initial

____ Ensure all outstanding Immediate Training Sheets have been reviewed by designated personnel.

____ RO/SRO Logs since last on shift or at least the seven preceding days.

____ Special Orders/Reactor Group Guidance/Operability Evaluation Book/Operationally Significant Temp Mods.

____ Main Control Boards.

____ Review with Control Room Team all applicable Complex and/or Significant Risk Plans

NOTE: Print the following report from each unit's OAC by using "PPLOG" turn-on code. Control Room Supervisor shall be cognizant of all such OAC activity and ensure there are no Tech Spec, SLC, Comp Actions, Operability or other conditions related to points in the report that are not understood.

____ Evaluate Unit 1 and Unit 2 OAC points that have inserted values or are deleted from processing or deleted from alarm.

____ Hold Shift Crew Briefing and review Medical and Other Restriction Status of on-coming shift, per OMP 3-2 (Shift and Pre-Job Briefing).

VIII. Documentation of designated Control Room Supervisor Relief (Short Term and Long Term)

Relief Control Room Supervisor assumes watch	____________ Signature	____/____ Date/Time
Designated Control Room Supervisor resumes watch	____________ Signature	____/____ Date/Time
Relief Control Room Supervisor assumes watch	____________ Signature	____/____ Date/Time
Designated Control Room Supervisor resumes watch	____________ Signature	____/____ Date/Time
Relief Control Room Supervisor assumes watch	____________ Signature	____/____ Date/Time
Designated Control Room Supervisor resumes watch	____________ Signature	____/____ Date/Time
Relief Control Room Supervisor assumes watch	____________ Signature	____/____ Date/Time
Designated Control Room Supervisor resumes watch	____________ Signature	____/____ Date/Time

Relief Control Room Supervisor assumes watch	____________________ Signature	___/___ Date/Time
Designated Control Room Supervisor resumes watch	____________________ Signature	___/___ Date/Time
Relief Control Room Supervisor assumes watch	____________________ Signature	___/___ Date/Time
Designated Control Room Supervisor resumes watch	____________________ Signature	___/___ Date/Time
Relief Control Room Supervisor assumes watch	____________________ Signature	___/___ Date/Time
Designated Control Room Supervisor resumes watch	____________________ Signature	___/___ Date/Time
Relief Control Room Supervisor assumes watch	____________________ Signature	___/___ Date/Time
Designated Control Room Supervisor resumes watch	____________________ Signature	___/___ Date/Time
Relief Control Room Supervisor assumes watch	____________________ Signature	___/___ Date/Time
Designated Control Room Supervisor resumes watch	____________________ Signature	___/___ Date/Time
Relief Control Room Supervisor assumes watch	____________________ Signature	___/___ Date/Time
Designated Control Room Supervisor resumes watch	____________________ Signature	___/___ Date/Time
Relief Control Room Supervisor assumes watch	____________________ Signature	___/___ Date/Time
Designated Control Room Supervisor resumes watch	____________________ Signature	___/___ Date/Time

End of Attachment

PLANT SUPERVISOR TURNOVER CHECKLIST

DATE & TIME_____

UNIT 1 **UNIT 2**

MODE _____ **MODE** _____

POWER _____ **POWER** _____

Review the following with relief:

1. Worklist
2. TSAIL
3. Plant Status Remarks
4. Turnover Beeper

NOTE: **IF** computer turnover files are unavailable, use the attachments from the previous turnover and denote any changes.

Additional remarks:

_____
_____
_____

During outages review the following:

1. Midloop operation
2. LTOP in affect
3. Fuel movement in progress

Review the following as soon as possible after assuming shift responsibilities.

1. Control Room Logs (autolog) (since last on shift or previous 7 days)
2. Special Orders, Operability Evaluations, Engineering Guidance, Immediate Training/Operationally Significant Temp Mods
3. Main Control Boards

Notes:

_____
_____
_____
_____

End of Attachment

Attachment 3
Work Control Center Supervisor Turnover Checklist

DATE & TIME _____

UNIT 1		**UNIT 2**	
MODE	_____	**MODE**	_____
POWER	_____	**POWER**	_____

Review the following with relief:

1. PRA Activity Report
2. Worklist
3. TSAIL
4. Plant Status Remarks
5. Innage operating Schedule
6. Fire Impairments
7. Tags Lifted for Testing
8. Status of Work Order Sign-On Folders
9. Risk Assessment Matrix/Oram/Sentinel
10. Key Locker Checked
11. Work request/work order review with STA at 05:30/17:30 *
12. Complex/Critical Maintenance Plans
13. Turnover Beeper
14. Any outstanding Containment Closeout Checksheets
15. SPOC Log

NOTE:	**IF** computer file is unavailable, use the attachment from the previous turnover and denote any changes.

Additional remarks:

_____

During outages review the following:

1. Defense In Depth Report
2. Midloop operation
3. LTOP in affect
4. Fuel Handling in progress

STA Specific Items

1. STA Logs for each unit
2. Phone status sheet
3. Review STA logs (since last shift or previous seven days).

NOTE:	Operations Oversight Report automatically prints out at 0500 and 1700 each day. Any unit in an outage should be excluded. Any work signed on for clearance to begin work after this report is printed should be noted in the remarks section of this turnover.

Review the following as soon as possible after assuming shift responsibilities:

1. Control Room Logs (autolog) (since last on shift or previous 7 days)
2. Special Orders, Operability Evaluations, Engineering Guidance, Immediate Training, Operationally Significant Temp Mods

Notes:_____

* Reference: LER 369/99-02

End of Attachment

OSM Turnover Guide

The following information should be reviewed with relief:

McGuire Nuclear Station Plan of the Day Package
Plant Status
Plant Concerns
Shift Supervisor Turnover Sheet for both units
Autolog for both units
STA Logs
Annunciators
Complex or Critical Plan in progress or planned for next 12 shift
New Operability Evaluations
New Engineering Guidance
Technical Specifications Log
Any on going Safety Concerns or Issues
Grid Condition
NRC Threat Condition Level
PIPs
Pertinent Operating Experience

During outages the following information should also be reviewed:

Defense in Depth Sheet
Configuration Assessment Tool Sheet
LTOP in effect
Outage Schedule
Major Evolutions/Testing in Progress or scheduled for next 12 hours
Risk Management Plans in progress or planned for next 12 hours

End of Attachment

Attachment 5
NC System Emergency Make-Up Sources

Applicable to Units: **[ ] One**
[ ] Two

AP/1(2)/A/5500/019 (Loss of ND or ND System Leakage) references the use of specific make-up options to the NC system. GL 88-17 (Loss of Decay Heat Removal) requires at least one low head source and one high head source while on ND. Options available and options not available will be documented below throughout the outage while on ND.

CAUTION: Credit cannot be taken for flow path options which contain known openings between the source (FWST) and reactor vessel.

NOTE 1: Option #3 capable of injecting into the hot leg(s) shall be available if openings totaling greater than 1 square inch exist in the cold legs, reactor coolant pumps, and cross-over piping of the NC System.

Option	Flow Path	Flow	Pressure	Inject To	Note
1	FW-27A	High	Low	C Hot Leg	
2	NV Pumps - SI Path	High	High	Cold Legs A, B, C, D*	
3	NI Pumps	High	High	Hot or Cold Leg*	Note 1
4	NV Pumps - Charging	Low - Medium	High	A or D Cold Leg*	
5	ND-35, NI-173A	High	Low	A & B Cold Leg	Local Actions
6	ND-35, NI-178B	High	Low	C & D Cold Leg	Local Actions
7	ND-35, NI-183B	High	Low	B & C Hot Leg	Local Actions
8	VCT Overpressure	Low	Low	A or D Cold Leg*	
9	FWST - Charging	Low	Low	A or D Cold Leg*	
10	PD Pump	Low	High	A or D Cold Leg*	

* Circle Available Injection Path

NC System M/U Sources

Initial/Date	Options Available

End of Attachment

Attachment 6
Thermal Margin Determination

Applicable to Units: **[ ] One**
[ ] Two

PT/1(2)/A/4200/002C (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 _____ 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 Sheet" (Attachment 7). Include any Data Book Enclosure 4.3 "Section" 2.10 support parameters (S/G Lvls, Pzr Lvl, etc.). Initial in the table below.

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

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

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

				INITIAL COMPLETION OF ITEMS BELOW			
Date	Time	Thermal Margin MIN.	Max NC Temp °F	Thermal Margin Data Written on Shutdown Assessment Status Sheet	Thermal Margin Time Written on MC-6	CCC Notified	STA Notified

End of Attachment

Attachment 7 is intended to help the Control Room Supervisor on the outage unit keep track of important plant configurations and status in the event of a loss of decay heat removal. The Restoration of Available Systems/Structures/Components, SSC's, table is intended to track the individual and/or position responsible for supporting the in the field restoration of the SSC's during a loss of decay heat removal as directed by AP-19.

The SSC column is used to write in the particular SSC to be restored; example could be "1A NV Pump".

The Action column is used to write in what manual action must be taken to restore the SSC function, example would be "remove white tag and rack in breaker for 1A NV Pump.

The Responsibility column is used to write in the responsible position or individual who will perform the action: example would be "Unit 1 Aux Building Rounds".

The communication column is used to write in the primary means to be used to contact the individual; example would be "Radio".

The individual(s) responsible for performing these task(s) must be determined in such a manner as to ensure continuous coverage during shift turnovers.

SHUTDOWN ASSESSMENT/STATUS					
	Protected Train	**Thermal Margin**	**Large Vent Path**	**LTOP Vent Path (Select 1)**	**Gravity Fill Vent Path (Select 1)**
Desired NC Level _____ **Date** _____ **Time** _____ **OWPG Staff** _____ **Desired NC Temp** _____ **Date** _____ **Time** _____ **OWPG Staff** _____	**(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** _____ **Support Conditions** **Max NC Temp**_____ **S/G Level(s)** _____ **NCS Level** _____ **Refuel Cavity Lvl** ____	**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 ____ • Pzr PORV Gagged _____ • Pzr PORV out ____ • Other (specify) _____ _____ _____	• Same as Large Vent Path • Other per Data Book (specify) _____ _____ _____ _____ _____

Restoration of Available SSCs

SSC	Action	Responsibility	Communication

End of Attachment

Conditional Surveillances

Tech Spec #	Description	Date/Time Inoperable	Conditional Surveillance Required	Date/Time Next Due	Responsible Group

End of Attachment

Reviewed By _____

Approved By _____

TASK: **Perform a Thermal Margin Determination**

POSITION: **SRO**

Operator's Name_____

Location: **Classroom** 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: Unit 1 Data Book

JPM verified current with references by _____

Date __/__/

INITIAL CONDITIONS

The following conditions are noted on Unit 1:

- It has been shutdown for seven (7) days preparing for Off-load
- Reactor Coolant System temperature is 113°F
- Reactor Coolant System depressurized and open to the Containment atmosphere.
- Reactor Coolant System level is 65 inches
- The S/G's are drained

The following three jobs need to be evaluated against "thermal margin" for consideration of clearance to begin work. The following times include the time to re-establish closure upon notification Containment Closure is required.

- Job "A" requires 33 minutes to close the equipment hatch
- Job "B" requires 28 minutes to close at least one Lower Containment Personnel Airlock Door
- Job "C" requires 38 minutes to establish Containment Closure for a penetration.

Your task is to perform a Thermal Margin Determination for Unit 1 and determine which jobs would be allowed based on the Thermal Margin.

JPM OVERALL STANDARD: Determines Thermal Margin is greater than 26minutes and less than 28 minutes . No Jobs are allowed.

NOTES: Provide Data Book and/or OMP 5-8 if asked

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Candidate determines Thermal Margin:			
*	• Chooses correct Thermal Margin Section	Selects Section 2.10.1		
*	• Uses Curve 2.10.1.B or 2.10.1.B(1)	2.10.1.B would be preferred but 2.10.1.B(1) is acceptable		
*	• Determines Thermal Margin	More than 26 minutes and less than 28 minutes is acceptable		
*	• Determines Jobs allowed	None of the Jobs can be allowed with present conditions		

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

The following conditions are noted on Unit 1:

- It has been shutdown for seven (7) days preparing for Off-load
- Reactor Coolant System temperature is 113°F
- Reactor Coolant System depressurized and open to the Containment atmosphere.
- Reactor Coolant System level is 65 inches
- The S/G's are drained

The following three jobs need to be evaluated against "thermal margin" for consideration of clearance to begin work. The following times include the time to re-establish closure upon notification Containment Closure is required.

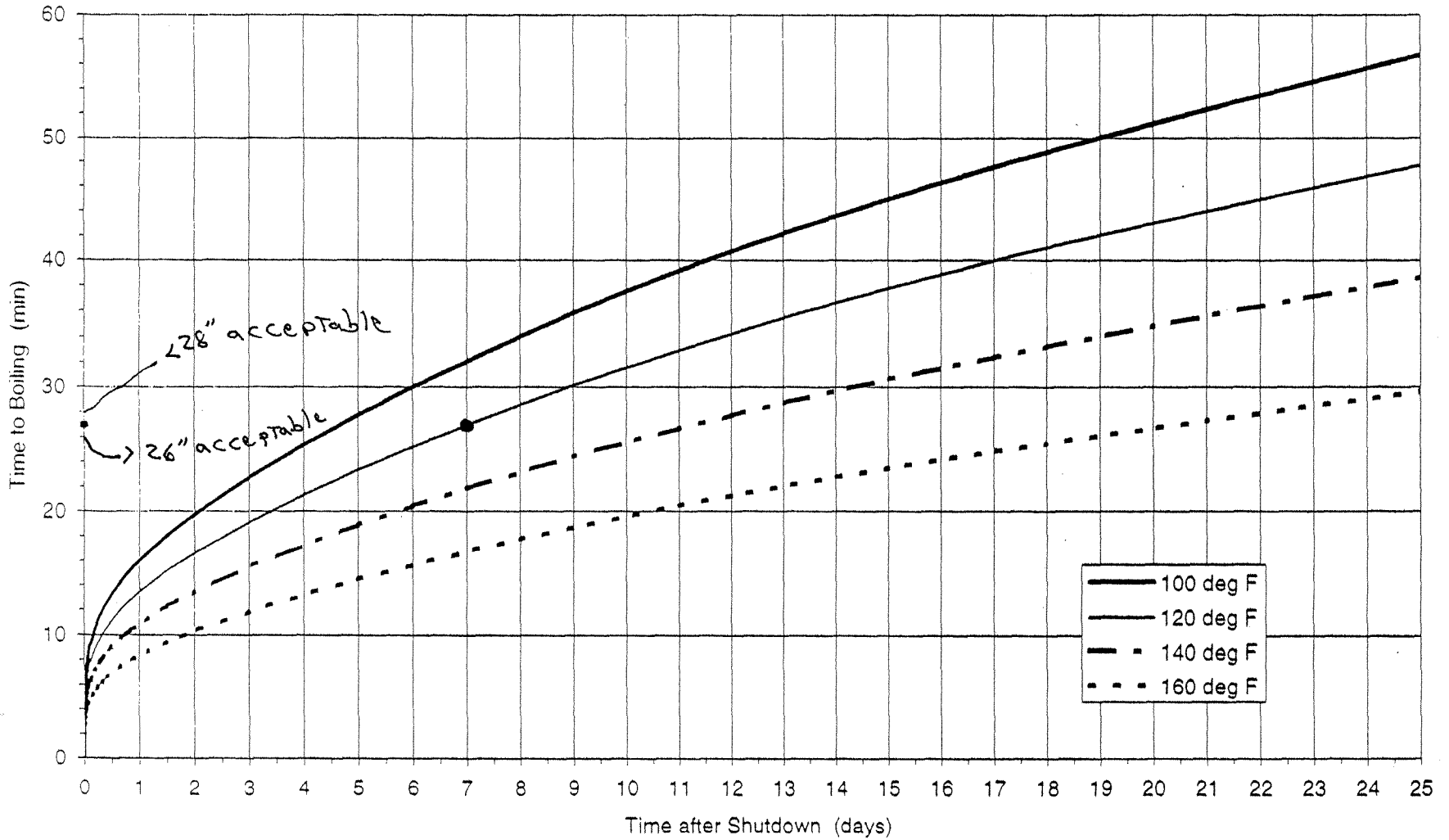
- Job "A" requires 33 minutes to close the equipment hatch
- Job "B" requires 28 minutes to close at least one Lower Containment Personnel Airlock Door
- Job "C" requires 38 minutes to establish Containment Closure for a penetration.

Your task is to perform a Thermal Margin Determination for Unit 1 and determine which jobs would be allowed based on the Thermal Margin.

Enclosure 4 ction 2.10.1.B(1)

Key

Loss of Decay Heat Removal with Water Level 60" Above Hot Leg Centerline (Prior to Offload)



UNIT 1

OP/1/A/6100/22
ENCLOSURE 4.3
SECTION 2.10.1

THERMAL MARGIN CURVES AT VARIOUS REACTOR VESSEL LEVELS

Purpose:

The thermal margin curves presented in section 2.10.1 are to be used in assessing time to core boiling for loss of decay heat removal capabilities. This information is used in assessing the need for containment closure for periods when either the Reactor Coolant system is not intact (not capable of being pressurized), the Reactor Coolant system level is below 20% Pressurizer cold calibration level (or Corrected Pressurizer Level, P0301) or the decay heat removal function is compromised or degraded.

Use of the Curves:

These curves are documented in DPC-1552.08-00-0014, Rev. 6, "Loss of Decay Heat Removal". This calculation is based upon the decay heat generated by cores operated at 100% power for nominally 505 continuous days. The decay heat values used should be reevaluated for continuous 100% power operation extending beyond 525 days.

The user should be aware that the information presented in these curves should be used in conjunction with the information in Section 2.10.4 to ensure adequate contingency planning to mitigate core boiling (particularly for reduced inventory coupled with high decay heat conditions). For times when the upper internals are in place (prior to reload), care should be taken to ensure appropriate flow paths are aligned to ensure adequate forced flow through the core upon a loss of decay heat removal capacity. With internals in place and a loss of decay heat removal, resistance across the nozzles would restrict circulation / replenishment flow and could lead to voiding in the top of the core *even with Reactor Coolant level above the upper internals.* This voiding phenomena will not occur if forced flow is initiated prior to the onset of boiling at a flow rate defined in Section 2.10.4 or if the internals are removed. Therefore, when the RCS is no longer intact and the upper internals are installed, Thermal Margin should be determined using the 84" curves as a maximum.

The curves contained in this section contain information on time to core boiling following a complete loss of decay heat removal capability based on various Reactor Coolant system volumes and initial temperatures. To ensure conservatism, for any initial temperature in between the given range, the user should default to the curve with the higher initial temperature in calculation of thermal margin. Likewise, for any initial level in between the given range, the user should default to the curve with the lower level in calculation of thermal margin.

OP/1/A/6100/22
ENCLOSURE 4.3
SECTION 2.10.1

Detailed Discussion of Development and Application of Section 2.10.1

Section 2.10.1 contains thermal margin curves for various Reactor Vessel Levels (9", 60" and 84" above Hot Leg Centerline) based on time to boil verses time after shutdown for pre-refueling and post refueling configurations.

In the Initial Conditions section of 2.10.1, the provision is included stating that prior to shutdown, 100% power operation was achieved for a minimum of one week. In the event a unit is shutdown after operating for a period less than one week and a less conservative thermal margin determination is required, Primary System Engineering should be contacted to determine the changes in the heat load assumptions for the thermal margin determination.

I. Initial Conditions

A. 100% power operation (for a minimum of one week) prior to shutdown.

B. Complete Loss of Decay Heat Removal Capability.

C. No mitigative actions are taken.

II. Assumptions and Conservatisms

A. The RCS is depressurized and open to the Reactor Building atmosphere.

B. Water in the lower plenum, the downcomer, the barrel-baffle region, the hot legs, and the cold legs are assumed to be thermally isolated from the core region during the heatup to saturation. Therefore, the volume of water used to determine when the core region reaches saturation consists of the water in and above the active fuel (inside the core barrel but excluding the barrel-baffle region) up to elevation 740.96 feet.

D. Perfect mixing is assumed to occur in the regions being heated to saturation. Therefore, all of the heated water is assumed to reach saturation at the same time.

E. Water volumes in geometrically complex regions are minimized for conservative results.

F. The heating of the reactor vessel internal structures is neglected as an additional conservatism.

G. The effect of the elevation head in the RCS in raising the saturation temperature is considered.

H. Decay heat and core volumes are referenced from the applicable revision of DPC-1552.08-00-0014.

III. References

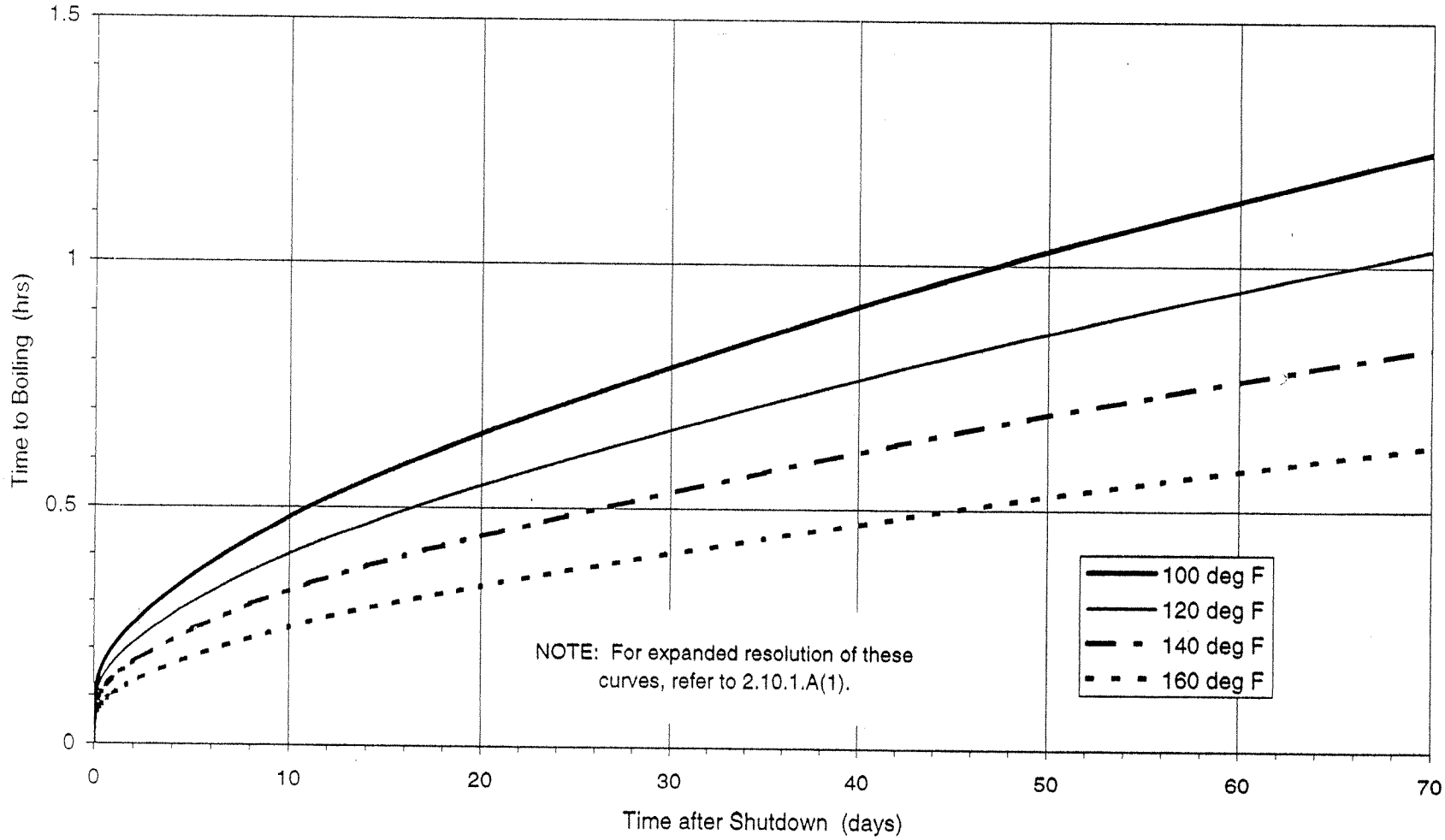
A. DPC-1552.08-00-0014, Loss of Decay Heat Removal

B. DPC-1552.08-00-0051, Decay Heat for Mark-BW and OFA Fuel Types

C. DPC-1552.08-00-0089, Time Required After Shutdown Before Entering Mid-Loop Operation

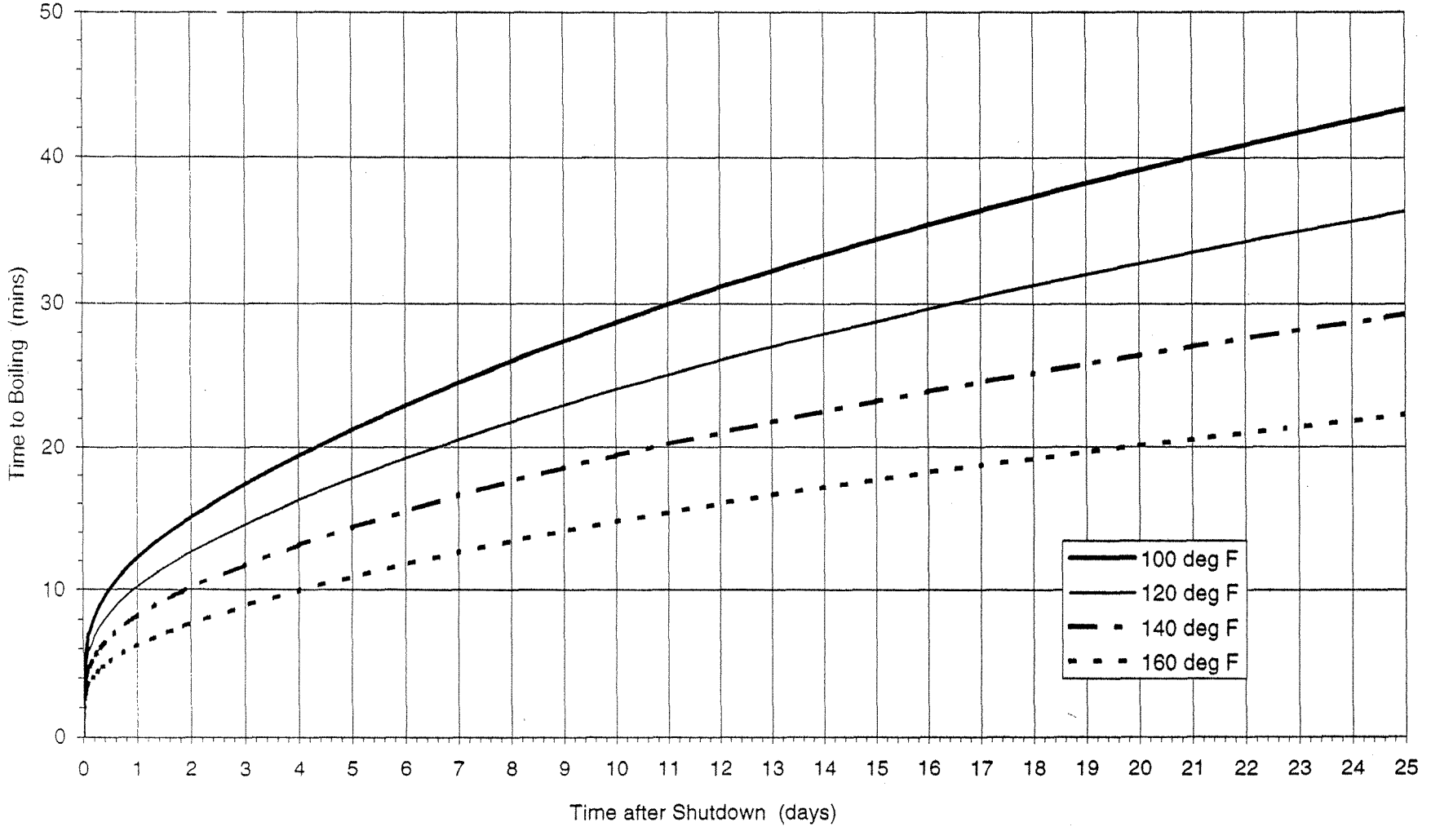
Enclosure 4.3 - Section 2.10.1.A

Loss of Decay Heat Removal
with Water Level 9" Above Hot Leg Centerline
(Prior to Offload)



UNIT 1

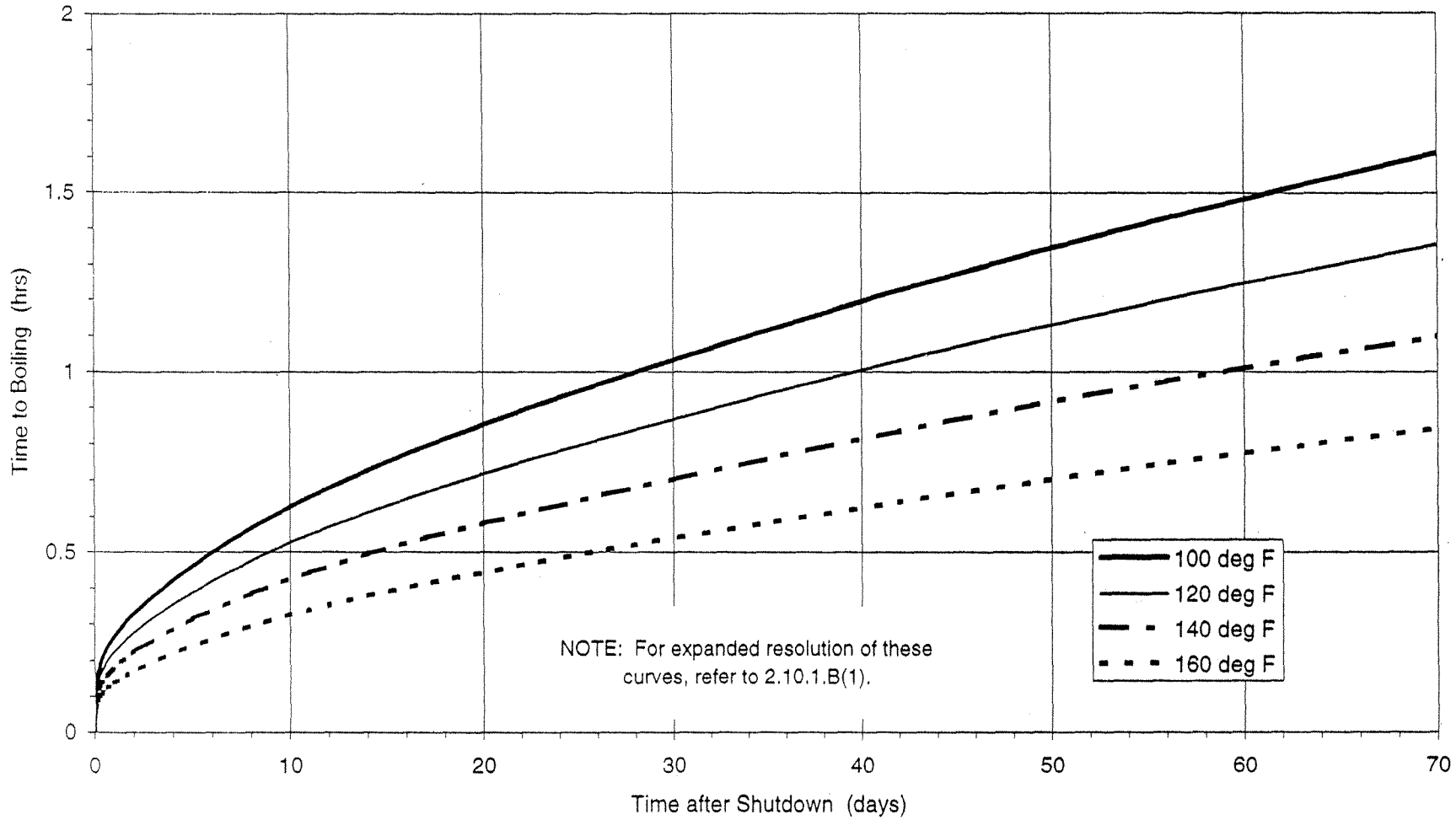
Loss of Decay Heat Removal with Water Level 9" Above Hot Leg Centerline (Prior to Offload)



UNIT 1

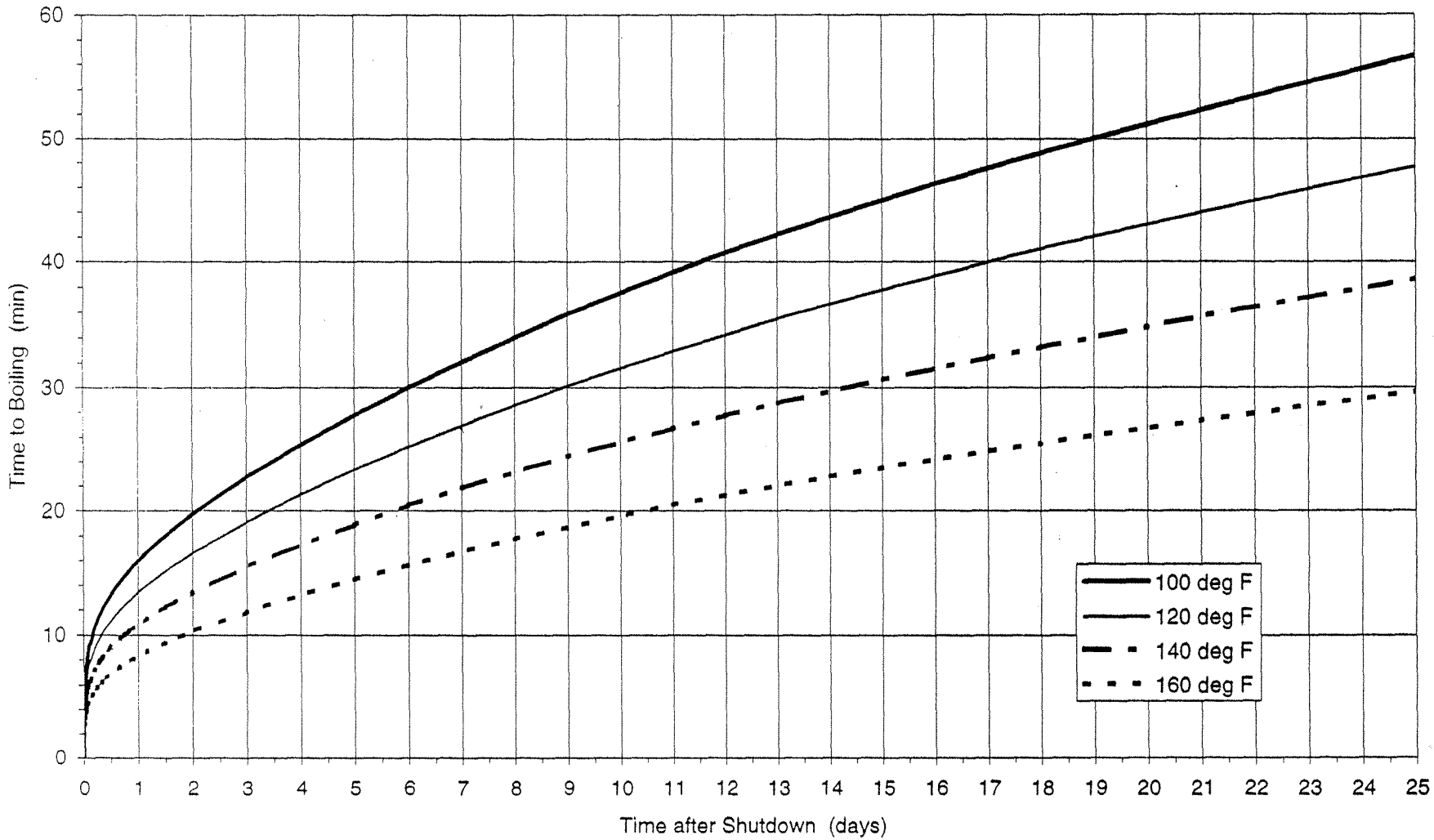
Enclosure 4.3 - Section 2.10.1.B

Loss of Decay Heat Removal with Water Level 60" Above Hot Leg Centerline (Prior to Offload)



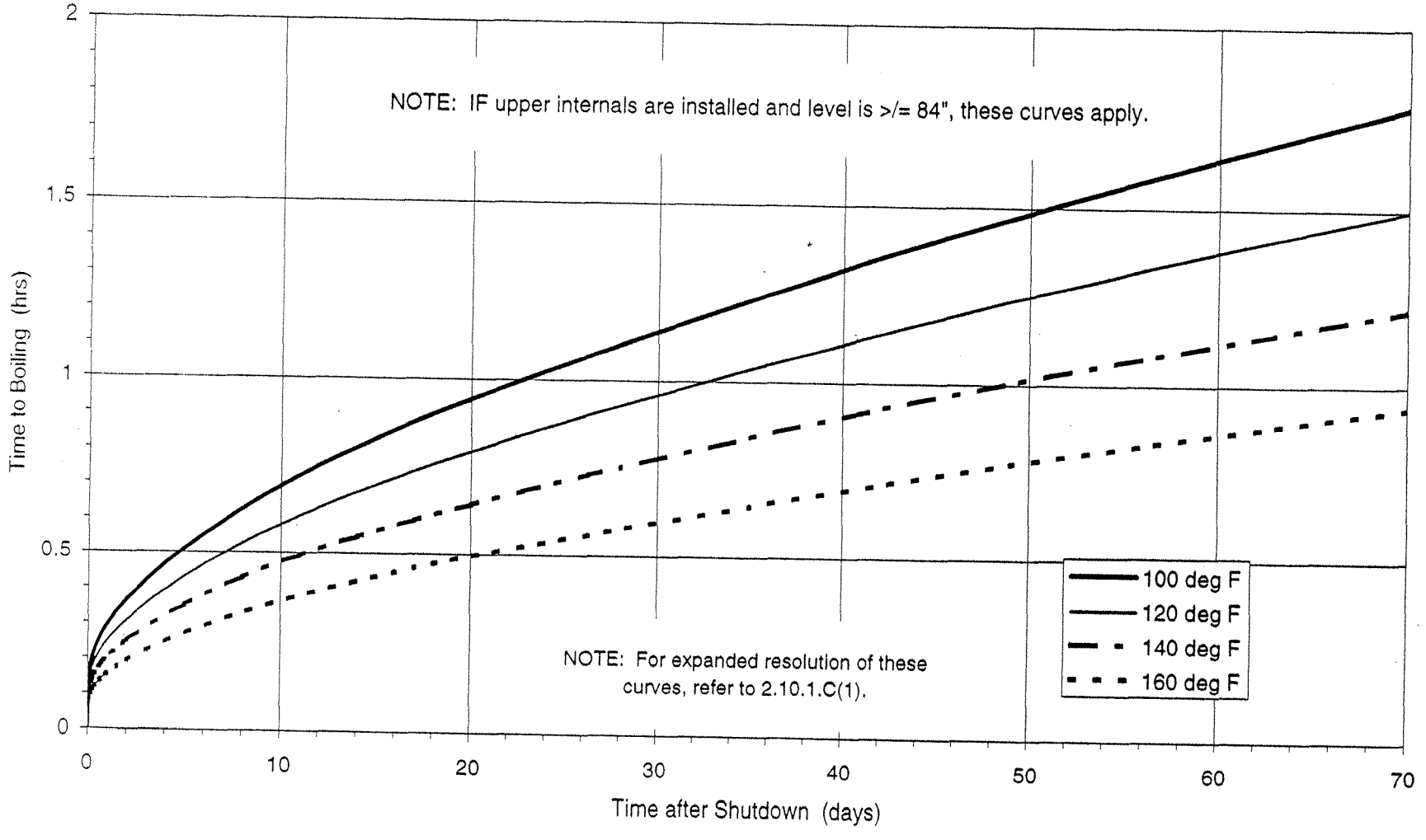
UNIT 1

Loss of Decay Heat Removal
with Water Level 60" Above Hot Leg Centerline
(Prior to Offload)



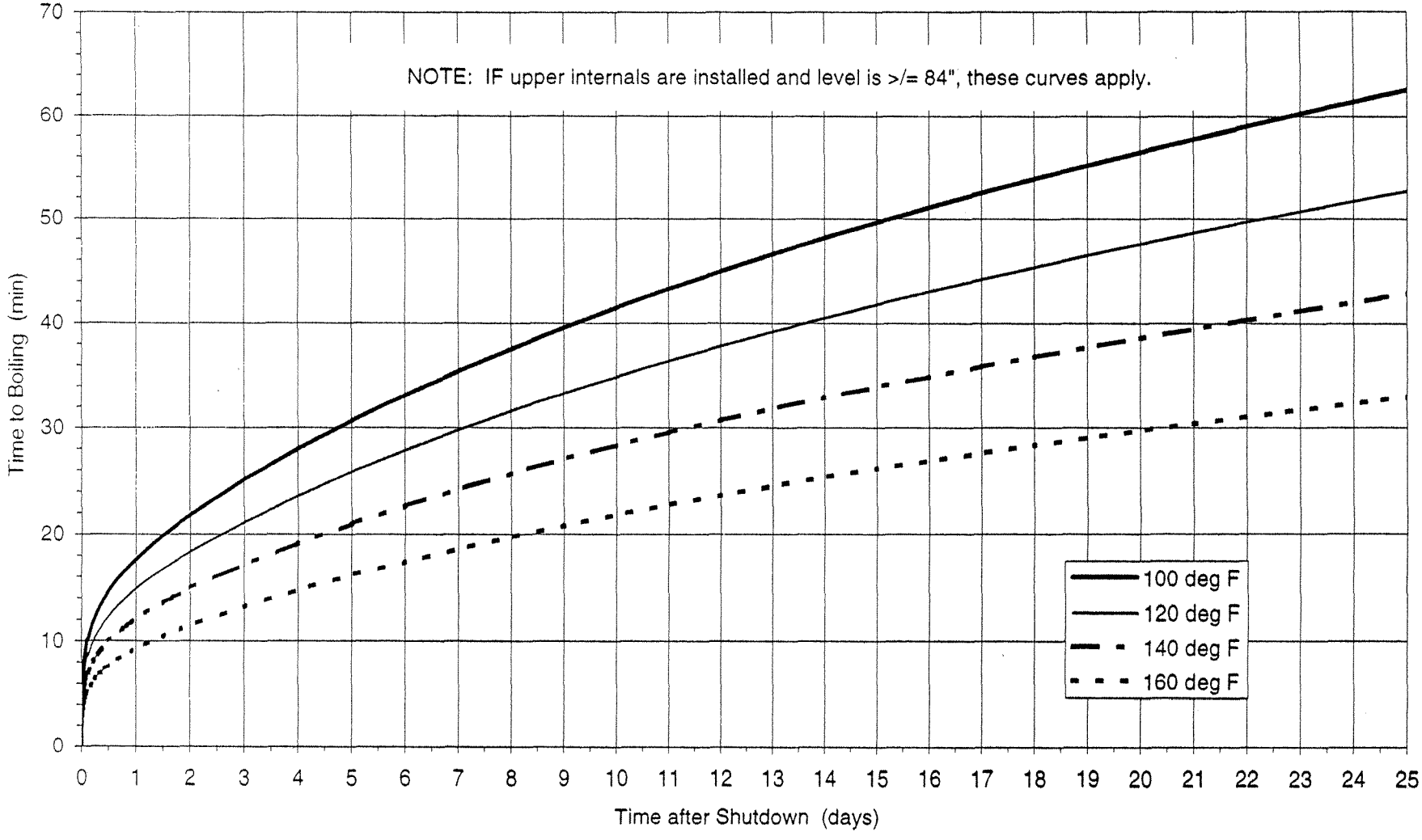
UNIT 1

Loss of Decay Heat Removal with Water Level 84" Above Hot Leg Centerline (Prior to Offload)



UNIT 1

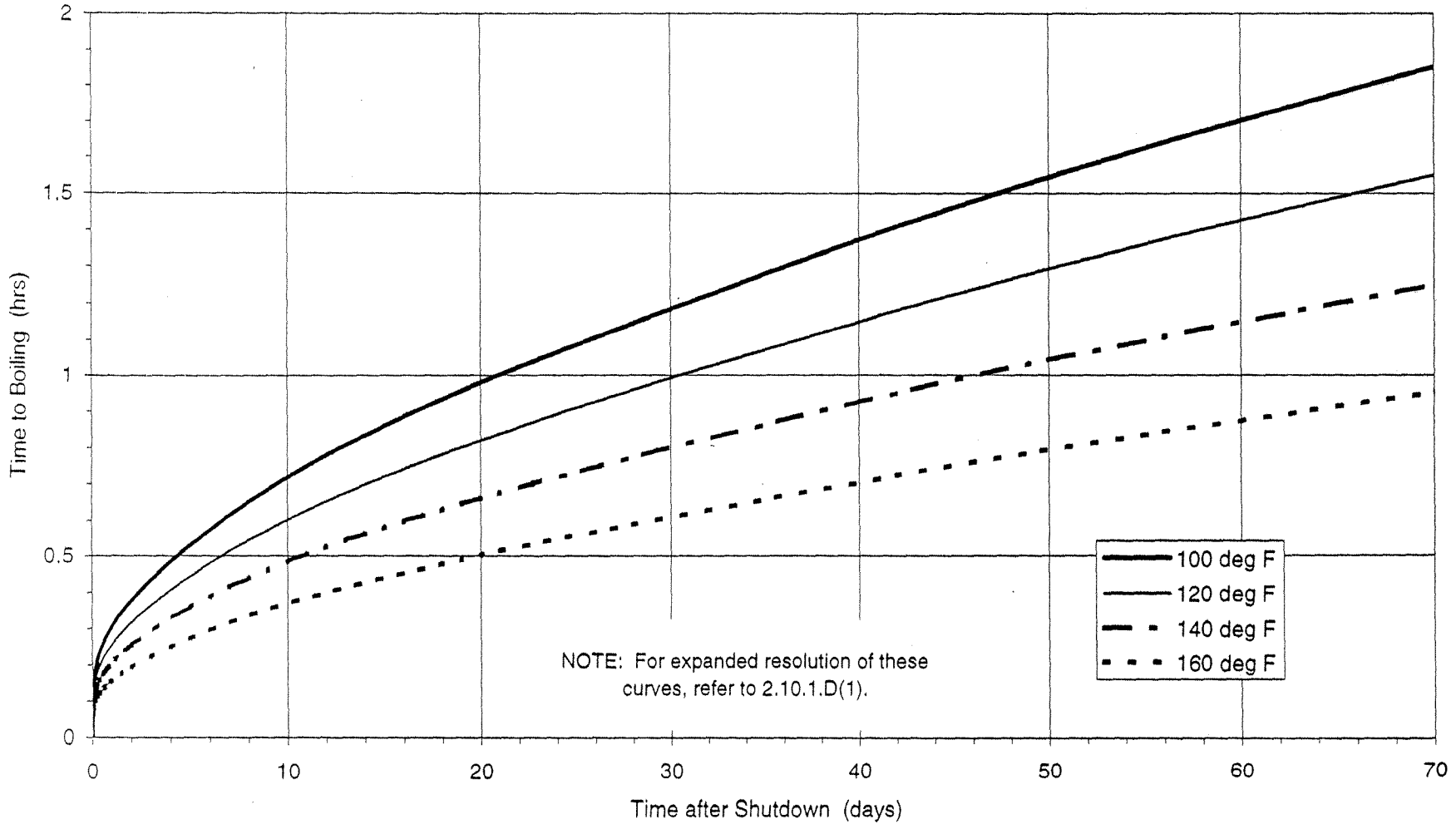
Loss of Decay Heat Removal with Water Level 84" Above Hot Leg Centerline (Prior to Offload)



UNIT 1

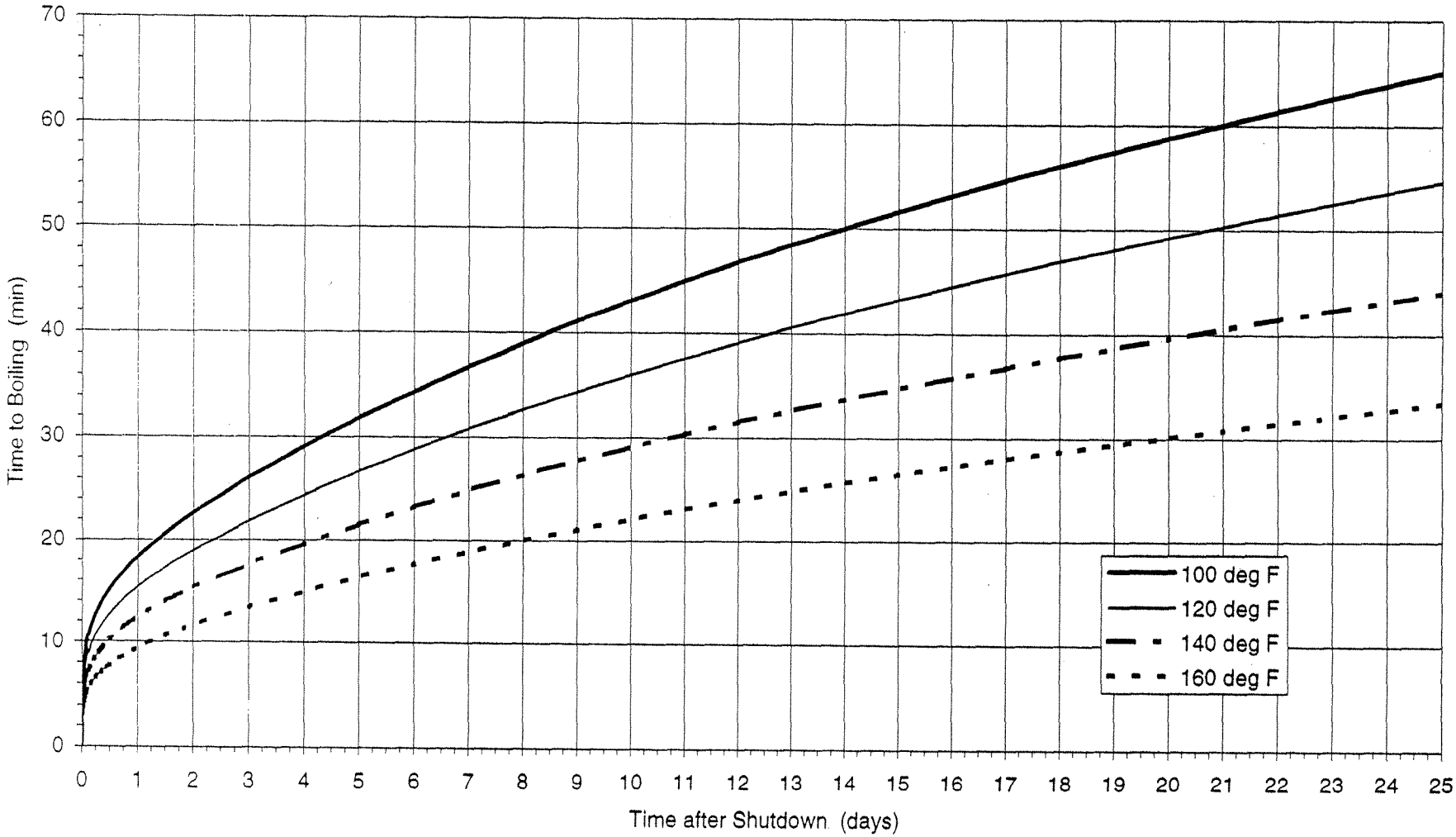
Enclosure 4.3 - Section 2.10.1.D

Loss of Decay Heat Removal with Water Level 9" Above Hot Leg Centerline (After Reload)



UNIT 1

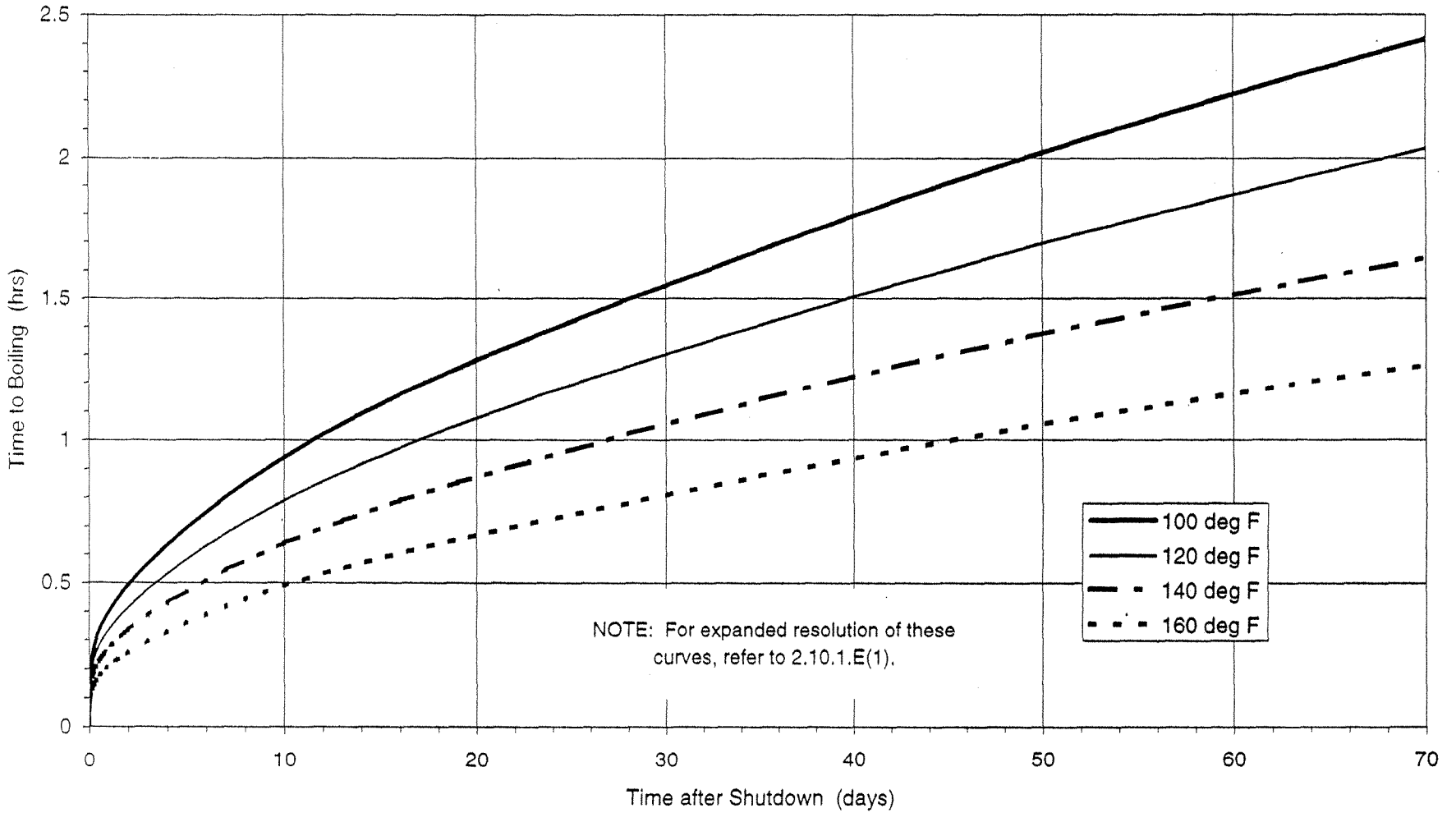
Loss of Decay Heat Removal with Water Level 9" Above Hot Leg Centerline (After Reload)



UNIT 1

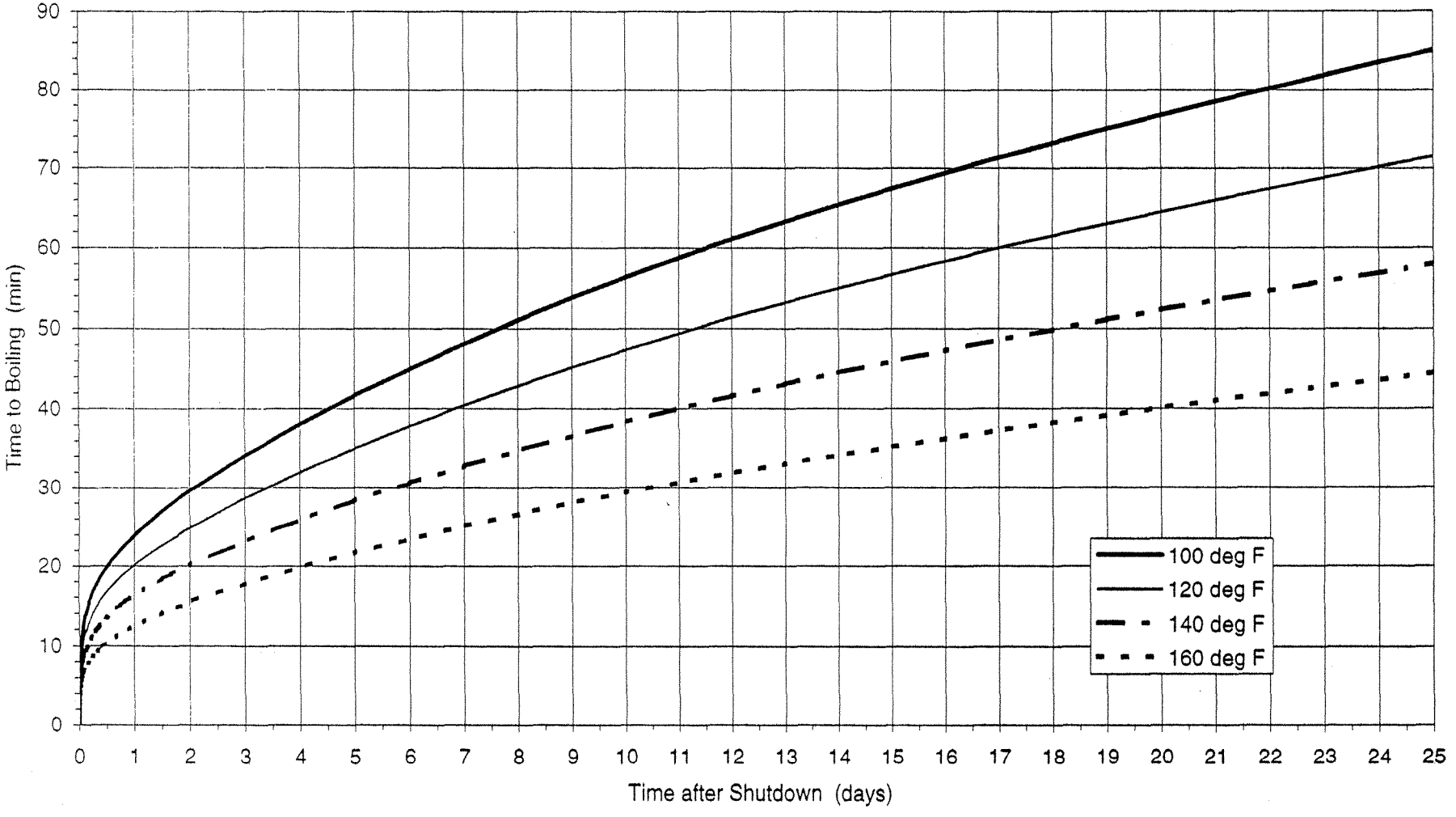
Enclosure 4.3 - Section 2.10.1.E

Loss of Decay Heat Removal with Water Level 60" Above Hot Leg Centerline (After Reload)



UNIT 1

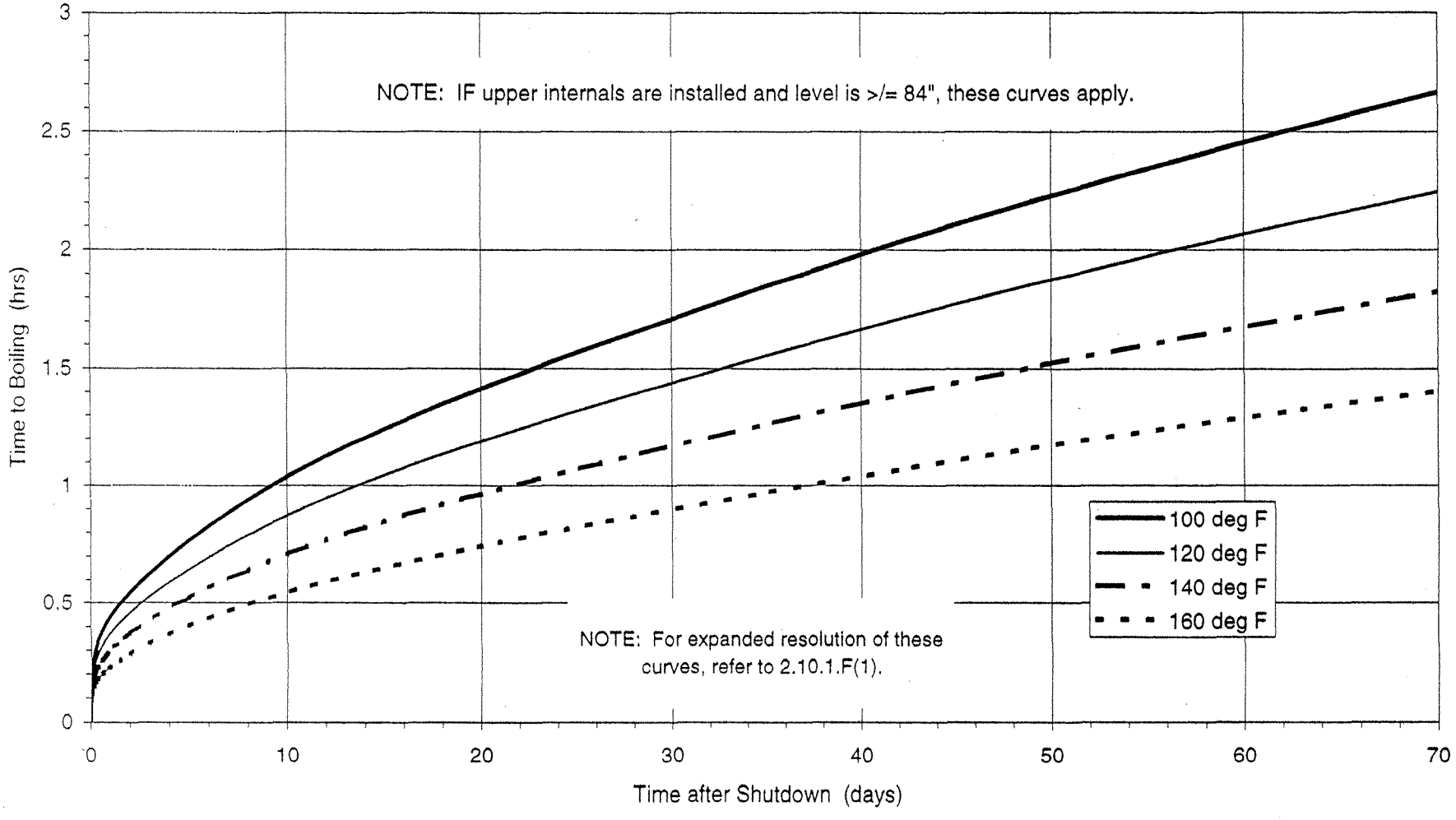
Loss of Decay Heat Removal with Water Level 60" Above Hot Leg Centerline (After Reload)



UNIT 1

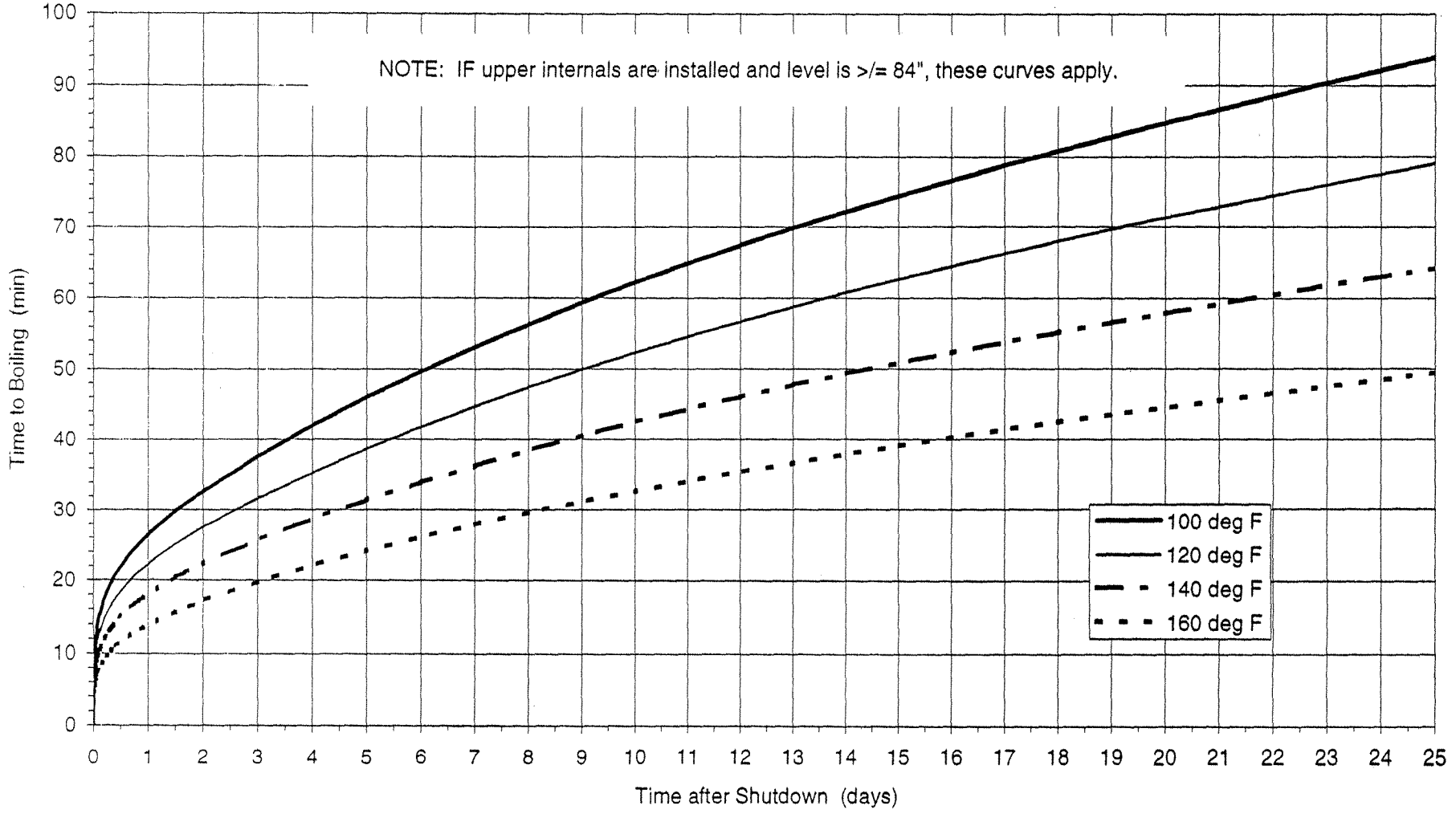
Enclosure 4.3 - Section 2.10.1.F

Loss of Decay Heat Removal with Water Level 84" Above Hot Leg Centerline (After Reload)



UNIT 1

Loss of Decay Heat Removal with Water Level 84" Above Hot Leg Centerline (After Reload)



OP/1/A/6100/22
ENCLOSURE 4.3
SECTION 2.10.2

THERMAL MARGIN CURVES WITH UPPER INTERNALS REMOVED AND FULL REFUELING CAVITY LEVEL

Purpose:

The thermal margin curves presented in section 2.10.2 are to be used in assessing time to core boiling for loss of decay heat removal capabilities with the refueling cavity filled and upper internals removed. The requirements of Refueling Integrity do not necessarily meet the requirements of Containment Closure as a functional barrier against effluent release (as required per NSD 403, NUMARC 91-06 and NUREG 1447).

Use of the Curves:

These curves are documented in DPC-1552.08-00-0014, Rev. 6, "Loss of Decay Heat Removal". This calculation is based upon the decay heat generated by cores operated at 100% power for nominally 505 continuous days. The decay heat values used should be reevaluated for continuous 100% power operation extending beyond 525 days.

The user should be aware that the information presented in these curves should be used in conjunction with the information in Section 2.10.4 to ensure adequate contingency planning to mitigate core boiling. With the upper internals removed, any loss of decay heat removal will result in establishing a natural convective heat transfer circuit in the cavity with hours to core boiling (if shutdown a minimum of 2 days).

The curves contained in this section contain information on time to core boiling following a complete loss of decay heat removal capability based on a full refueling cavity and the assumption of full convective heat transfer (i.e., upper internals removed).

OP/1/A/6100/22
ENCLOSURE 4.3
SECTION 2.10.2

Detailed Discussion of Development and Application of Section 2.10.2

Section 2.10. 2 contains thermal margin curves for full refueling cavity level based on time to boil verses time after shutdown for pre-refueling and post refueling configurations. This section has been reformatted to include the purpose of the curves and guidance on the use of the curves. In the Purpose section, this set of curves is defined to be applicable at times the Reactor Coolant system is not intact, the upper internals are removed, and the refueling cavity is at full level.

In the Initial Conditions section of 2.10.2, the provision is included stating that prior to shutdown, 100% power operation was achieved for a minimum of one week. In the event a unit is shutdown after operating for a period less than one week and a less conservative thermal margin determination is required, Primary System Engineering should be contacted to determine the changes in the heat load assumptions for the thermal margin determination.

I. Initial Conditions

A. 100% power operation (for a minimum of one week) prior to shutdown.

B. Complete Loss of Decay Heat Removal Capability.

C. No mitigative actions are taken.

II. Assumptions and Conservatisms

A. The RCS is depressurized and open to the Reactor Building atmosphere.

B. Water in the lower plenum, the downcomer, the barrel-baffle region, the hot legs, and the cold legs are assumed to be thermally isolated from the core region during the heatup to saturation. Therefore, the volume of water used to determine when the core region reaches saturation consists of the water in and above the active fuel (inside the core barrel but excluding the barrel-baffle region) up to full cavity level.

D. Perfect mixing is assumed to occur in the regions being heated to saturation. Therefore, all of the heated water is assumed to reach saturation at the same time.

E. Water volumes in geometrically complex regions are minimized for conservative results.

F. The heating of the reactor vessel internal structures is neglected as an additional conservatism.

G. The effect of the elevation head in the RCS in raising the saturation temperature is considered.

H. Decay heat and core volumes are referenced from the applicable revison of DPC-1552.08-00-0014.

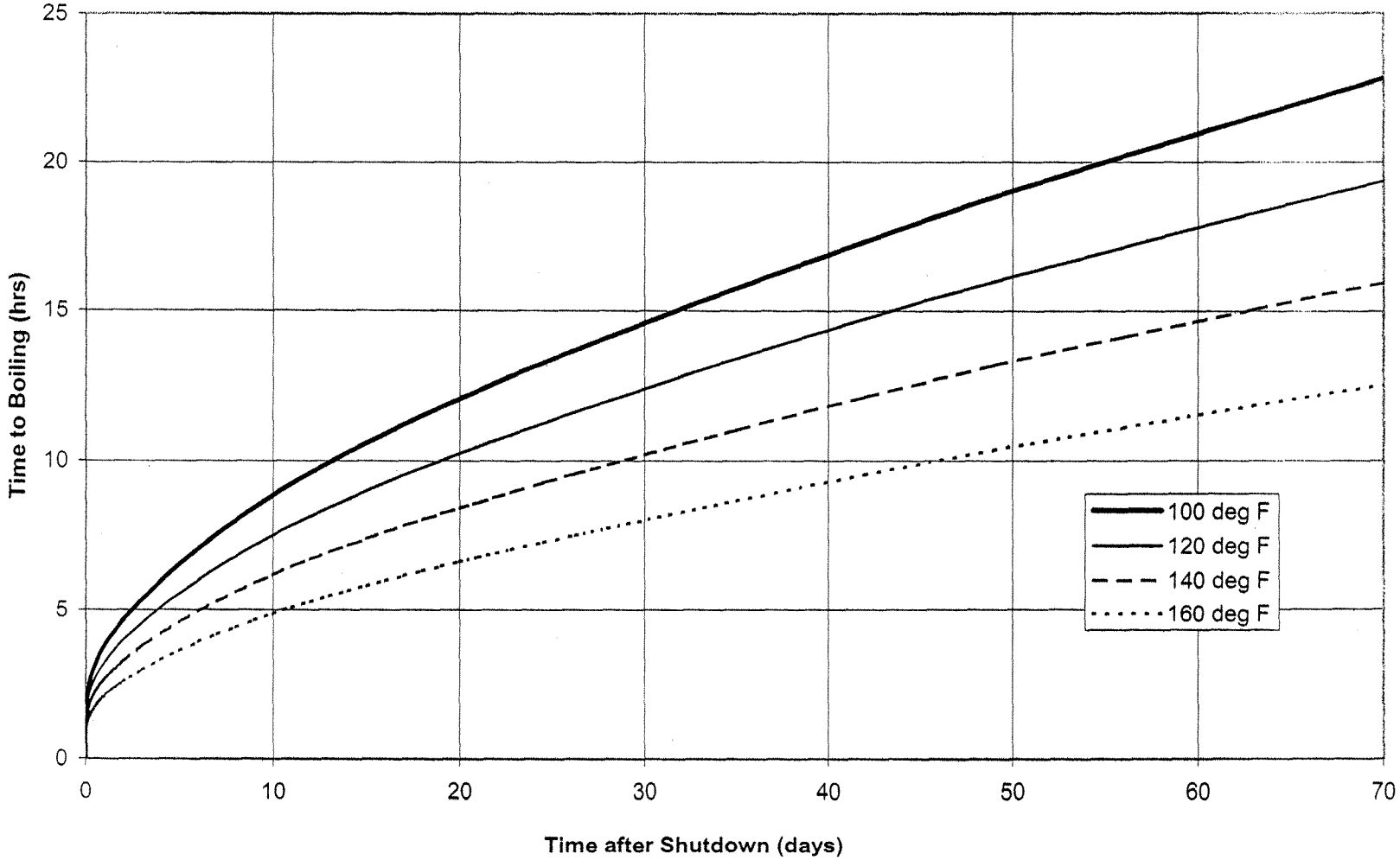
III. References

A. DPC-1552.08-00-0014, Loss of Decay Heat Removal

B. DPC-1552.08-00-0051, Decay Heat for Mark-BW and OFA Fuel Types

C. DPC-1552.08-00-0089, Time Required After Shutdown Before Entering Mid-Loop Operation

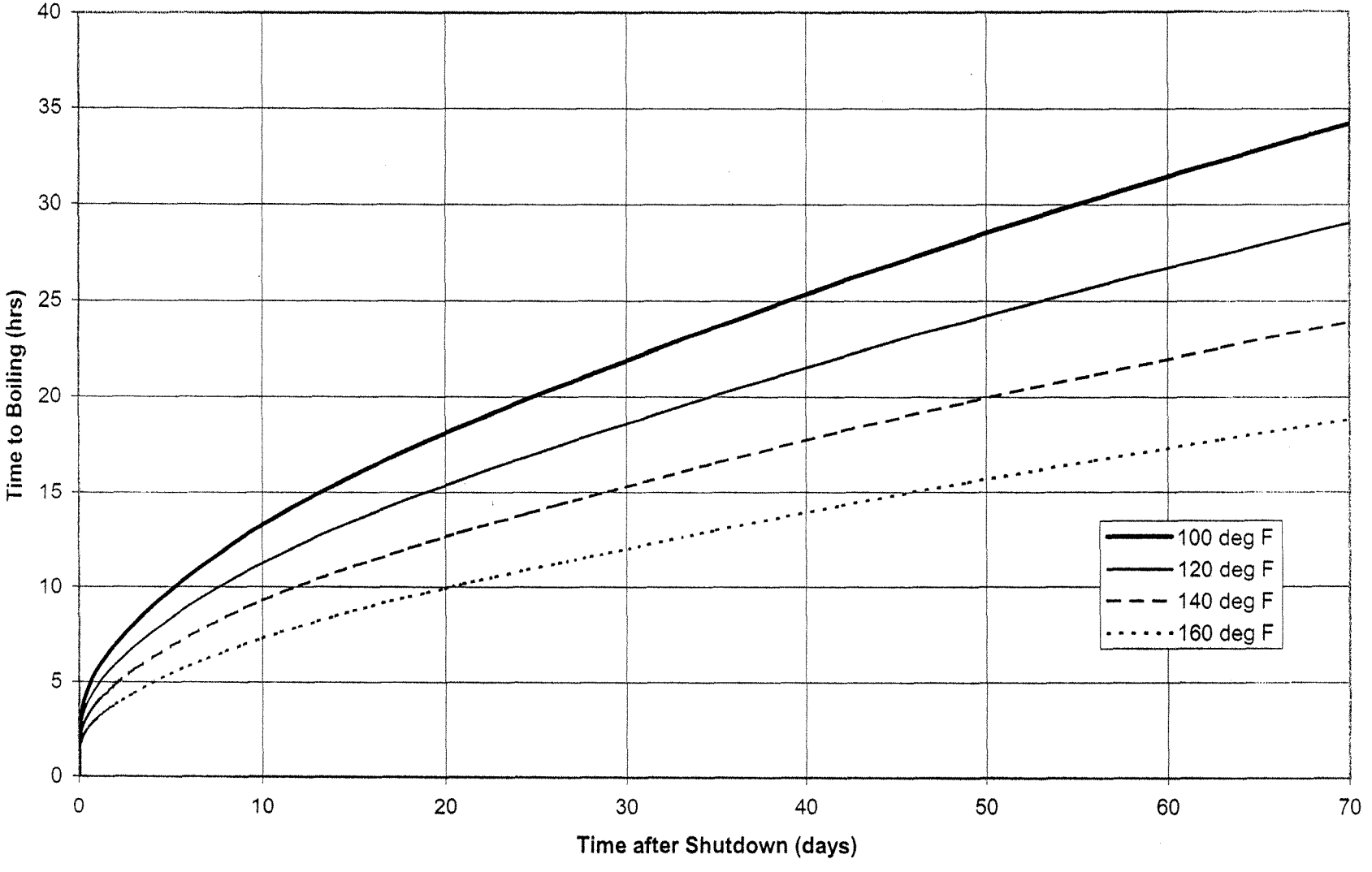
Loss of Decay Heat Removal with Refueling Canal Filled and Upper Internals Removed (Prior to Offload)



UNIT 1

Enclosure 4.3 - Section 2.10.2.B

Loss of Decay Heat Removal with Refueling Cavity Filled and Upper Internals Removed (After Reload)



UNIT 1

OP/1/A/6100/22
ENCLOSURE 4.3
SECTION 2.10.3

THERMAL MARGIN DETERMINATION NORMAL CONDITIONS FOR LOSS OF DECAY HEAT

The following special conditions ensure that thermal margin can be determined for most conditions encountered during normal outage evolutions. These conditions assume a Loops Filled Condition, utilizing the water on the secondary side of the steam generators as a heat sink to establish natural circulation. A given for these cases is that the NC System [NCS] is filled and vented and either intact or capable of being made intact by remote means. The expected conditions are as follows:

Section	Time Since Entry into Mode 3	Steam Generators Available	Steam Generator Level
2.10.3.A	3 hours	4	42% NR
2.10.3.B	18 hours	2	68% WR
2.10.3.C	40 hours	≥ 1 (*)	42% NR

(*) - Note: A single SG does not meet the Tech Spec requirements for redundancy; this information is presented to aid in contingency planning.

When it is desired to take credit for thermal margin provided by the secondary heat sink capability of the Steam Generators, the "A", "B" and "D" Steam Generators should be used in lieu of the "C" Steam Generator. The residual heat removal system takes suction off the "C" hot leg. Nitrogen tends to come out of solution, due to solubility changes as flow passes upwards through the core. The pressure drop across the core coupled with temperature increases can lead to significant changes in the solubility of Nitrogen in the NCS. During shutdown conditions (with fuel in the vessel) the "C" hot leg is the flow path for all core flow exiting the outlet plenum. This flow path, coupled with the solubility changes for the NCS increase the likelyhood of sweeping non-condensable gases (Nitrogen) into the "C" leg, leading to voiding in the "C" Steam Generator U-tubes.

Discussion of Loops Filled and Loops Not Filled Conditions

The inability to make the NCS intact remotely (ie. closing the PORVs or the associated block valves from the control room) or the NCS level less than 20% Pressurizer Cold Calibration level defines the condition known as *Loops Not Filled.* For a refueling outage, Operations usually begins "draindown" of the reactor coolant system by pulling a code safety from the Pressurizer, draining the NCS while opening head vent valves and pulling the head spool piece to vent the NCS to atmosphere to assist in the drain. Once the safety is pulled, the NCS is no longer intact and NCS is considered *Loops Not Filled* due to the inability to pressurize the NCS. If the safety is not pulled, however, the head vents and/or the spool piece are pulled, the NCS is also considered *Loops Not Filled* due to the presence of non-condensable gases in the NCS. In this case, the NCS may be capable of some pressurization, however the presence of non-condensable gases may lead to voids in the Steam Generator U-tubes such that natural circulation cannot be established. In order to meet the *Loops Filled condition*, the U-tubes of the Steam Generators must be filled with liquid or condensable gases (steam) and the NCS must be capable of pressurization (to the LTOP setpoint). This ensures that proper conditions are in place to establish natural circulation in the NCS, using the heat transfer to the secondary side of the Steam Generators for decay heat removal.

If the unit has existed in a *Loops Not Filled condition* such that non-condensable gases are present in the NCS, it is essential that the NCS be filled and vented (with water available to the secondary side of the Steam Generators) prior to taking credit for decay heat removal capability (thermal margin) via the secondary heat sink. This ensures that the U-tubes of the Steam Generators are filled and capable of establishing a natural convective circuit with the heat source (core) at a lower elevation than the heat sink (the Steam Generators).

The level requirements referenced in this procedure for maintaining the *Loops Filled condition* is 20% Pressurizer Cold Calibration level or OAC Corrected Pressurizer Level (this is in addition to the requirement to make the NCS intact remotely). It is recognized that during an initial drain, with the NCS able to be made intact, that the Steam Generator U-tubes will remain filled even with partial draining of the Reactor Vessel due to siphoning at the lower pressure, higher elevation of the U-tubes. However, it is extremely unlikely that the NCS would be drained to below 20% Pressurizer Cold Calibration Level without opening a large vent path that cannot readily be isolated. Since these curves have been developed to support normal evolutions, a requirement of 20% Pressurizer Cold Calibration level is acceptable.

During a normal outage evolution, fill and vent includes filling to 80% Pressurizer Level followed by system heatup and pressurization. During these evolutions, the *Loops Filled condition* will not be applied until the NCS is at 80% Pressurizer Level, filled and vented.

Detailed Discussion of Development and Application of Section 2.10.3

Section 2.10.3.A provides information on thermal margin available for the condition of Loops Filled with four Steam Generators available at $\geq$ 42% narrow ranges level. Meeting the conditions of section 2.10.3.B is preferred over 2.10.3.A due to the higher probability of non-condensable gases (steam) in the "C" Steam Generator (see previous discussion). The NCS initial temperature of 350°F is supported by DPC-1552.08-00-0014, *Loss of Decay Heat Removal*, Attachment 1. The elimination of the requirement to have the safeties installed was replaced with a requirement to have the NCS intact or capable of being made intact to ensure that any work to the PORV block valves, Reactor Vessel Head vent valves or pulling of the spool piece are also evaluated as having an impact on NCS pressurization capabilities. The time requirements since entering Mode 3 of three hours is supported by DPC-1552.08-00-0014, *Loss of Decay Heat Removal*, Attachment 1. As referenced in the previous paragraph, the references to a minimum of 2 hours of thermal margin is due to Work Control administrative requirements. The actual thermal margin available is directly proportional to the makeup capability to the Steam Generators.

Section 2.10.3.B provides information on thermal margin available for the condition of Loops Filled with two Steam Generators available at $\geq$ 68% wide range level. The "A", "B" and "D" Steam Generators should be used in lieu of the "C" Steam Generator (see previous). In this condition, thermal margin can be sustained for a *minimum* of 2 hours. Therefore, the thermal margin is recorded as greater than or equal to 2 hours via Work Control procedures defining thermal margin. The actual thermal margin available is directly proportional to the makeup capability to the Steam Generators. If there is no makeup capability to the generators, the thermal margin is > 2 hours. If there are redundant means of makeup capability to the generators (this includes redundant sources and available power and equipment) then the thermal margin is >> 2 hours.

Section 2.10.3.C addresses information on thermal margin available for the condition of Loops Filled with $\geq$ one Steam Generator available at $\geq$ 42% narrow ranges level. This information is presented to aid in contingency planning, but does NOT meet the Tech Spec requirements for redundancy.

OP/1/A/6100/22
ENCLOSURE 4.3
SECTION 2.10.3.A

THERMAL MARGIN FOR LOOPS FILLED CONDITION WITH 4 STEAM GENERATORS

The minimum time to boiling is at least 2 hours, provided:

1) Greater than 3 hours have elapsed since entry into Mode 3.

2) NC System temperature is less than 350°F.

3) A maximum of 4 NC pumps are in operation.

1) NC System level is greater than or equal to 20% pressurizer cold cal level or greater than or equal to 20% corrected pressurizer level.

3) The NCS is intact or capable of being made intact.

4) Capability to steam through four Steam Generator PORVs, with all S/G levels at ≥ 42% narrow range.

5) Pressurizer PORVs or block valves closed (or ability to close remotely from the control room) and at least one PORV capable of LTOP Mode of Operation.

Discussion:
The NC System is capable of natural circulation due to the heat source (the core) being physically lower than the heat sink (the steam generators), assuming that the NC system is intact. Natural circulation is that flow generated by the density difference between the NC hot leg and cooled cold return leg from the steam generator, which provides the motive force for NC flow.

For the conditions presented here, the heat generated by the core can be dissipated by the conversion of secondary fluid from fluid to vapor at a rate of 870 BTU/lbm. Given an intact NC System with the ability to pressurize, and a secondary system volume of 4 Steam Generators at 42% narrow range level, the core heat can be dissipated for greater than 2.5 hours prior to boiling the generators dry.

Ref:
1. DPC-1552.08-00-0014, Loss of Decay Heat Removal, Attachment 1.
2. EPRI TR-102969, Contingency Strategies for Diablo Canyon During Potential Shutdown Operation Events.
3. MCC-1210.04-00-0066, Replacement Steam Generators Wide Range Level Indication Uncertainty (1 and 2 CFLP5610, 5620, 5630 and 5640)

OP/1/A/6100/22
ENCLOSURE 4.3
SECTION 2.10.3.C

THERMAL MARGIN FOR LOOPS FILLED CONDITION WITH ≥ 1 STEAM GENERATORS

Note: A single SG does not meet the Tech Spec requirements for redundancy; this information is presented to aid in contingency planning.

The minimum time to boiling is at least 2 hours, provided:

1) Greater than 40 hours have elapsed since entry into Mode 3.

2) NC System temperature is less than 200°F.

3) A maximum of 1 NC pump is in operation.

4) NC System level is greater than or equal to 20% pressurizer cold cal level or greater than or equal to 20% corrected pressurizer level.

5) The NC System is intact or capable of being made intact.

6) Capability to steam through at least one Steam Generator PORVs, with S/G level at ≥ 42% narrow range. ("A", "B" or "D" Steam Generator required)

7) Pressurizer PORVs or block valves closed (or ability to close remotely from the control room) and at least one PORV capable of LTOP Mode of Operation.

8) Redundant means of makeup inventory available to the Steam Generators (including redundant power supply).

Discussion:

The NC system is capable of natural circulation due to the heat source (the core) being physically lower than the heat sink (the steam generators), assuming that the NC system be intact. Natural circulation is that flow generated by the density difference between the NC hot leg and cooled cold return leg from the steam generator, which provides the motive force for NC flow.

For the conditions presented here, greater than 2 hours of thermal margin is available via the secondary heat sink provided makeup capability is maintained to the Steam Generators. See Section 2.10.3 for discussion of "C" Steam Generator voiding concerns.

Ref: 1. EPRI TR-102969, Contingency Strategies for Diablo Canyon During Potential Shutdown Operation Events.

Reviewed By _____

Approved By _____

TASK: **Review a Gaseous Release Permit Report**

POSITION: **SRO**

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: 2.3.6 (2.1/3.1)

INITIAL CONDITIONS

A Unit #1 Gaseous Release Permit Report for the VQ Release has been authorized by the CR SRO, the VQ release has been completed and the completion of release has been acknowledged by the CR SRO. The VQ Totalizer is INOPERABLE.

As the OSM, review the Gaseous Release Permit Report for completeness and accuracy.

JPM OVERALL STANDARD:

The GWR is reviewed with the trip-1/trip2 setpoint swap and release volume in wrong blank errors identified.

NOTES: N/A.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Reviews the GWR for appropriate Unit and EMF setpoints.	Provide candidate with the GWR Paperwork for Unit #1. Determines the Setpoint for the Trip 2 setpoint is less than the Trip 1 setpoint.		
*2	Reviews values entered for the release for completeness.	Determines that the release volume was entered in wrong blank.		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

A Unit #1 Gaseous Release Permit Report for the VQ Release has been authorized by the CR SRO, the VQ release has been completed and the completion of release has been acknowledged by the CR SRO. The VQ Totalizer is INOPERABLE.

As the OSM, review the Gaseous Release Permit Report for completeness and accuracy.

TRAINING USE ONLY

RETDAS V3.1.4 <DPCMNS Rev..1.0> VSSI

GASEOUS RELEASE PERMIT REPORT

GWR Number 02209
Release ID: Unit 1 VQ (Cont Air Release & Addition)

==ALLOWABLE RELEASE RATE==

Total body dose release rate (cfm)..... 1.13E+06
Skin and Gamma air dose release rate (cfm)..... 3.24E+06
Food, Ground, Inhalation dose release rate (cfm)..... 2.08E+07

Most restrictive release rate (cfm)..... 1.13E+06
Recommended release rate..... 3.00E+02

==SETPOINT DATA==

EMF39L Monitor Operable?..... Yes
EMF39L entered Background (cpm)..... 3.45E+02
EMF39L Expected CPM..... 3.45E+02
Xe-133 Equivalence (uCi/cc)..... 5.69E+06

Trip 1 Setpoint (cpm)..... 4.10E+04
Trip 2 Setpoint (cpm)..... 6.90E+02

Performed by: BR Smith
Ived by: DL Jones

==SPECIAL INSTRUCTIONS==

GWR Unit 1 VQ release Instructions
Use for: "Unit 1 VQ release only"

CR SRO Authorization: C Sawyer Date/time: _____

Release Initiation.....
Unit 1 EMF39L Trip 1 & 2
Set/Verified by: BR Smith
Dved by: DL Jones
OPS U EMF Recorder stamped
OPS U Release Start ____/____
Date Time
OPS U VQ Totalizer Operable
OPS U
VQ Totalizer X 10 = 13,420 ft3

Release Completion.....
OPS U EMF Recorder stamped

OPS U Release Stop ____/____
Date Time

OPS U
VQ totalizer X 10 = 0 ft3
OPS U Vol. Rel 0 ft3

Completion of Release Acknowledged

CR SRO _____ Date/Time: ____/____
RP Review _____ Date/Time: ____/____

Key

TRAINING USE ONLY

RETDAS V3.1.4 <DPCMNS Rev..1.0> VSSI

GASEOUS RELEASE PERMIT REPORT

GWR Number 02209
Release ID: Unit 1 VQ (Cont Air Release & Addition)

ALLOWABLE RELEASE RATE

Total body dose release rate (cfm)..... 1.13E+06
Skin and Gamma air dose release rate (cfm)..... 3.24E+06
Food, Ground, Inhalation dose release rate (cfm)..... 2.08E+07

Most restrictive release rate (cfm)..... 1.13E+06
Recommended release rate..... 3.00E+02

SETPOINT DATA

EMF39L Monitor Operable?..... Yes
EMF39L entered Background (cpm)..... 3.45E+02
EMF39L Expected CPM..... 3.45E+02
Xe-133 Equivalence (uCi/cc)..... 5.69E+06

Trip 1 Setpoint (cpm)..... 4.10E+04
Trip 2 Setpoint (cpm)..... 6.90E+02

error #1

Performed by: BR Smith
Ived by: DL Jones

SPECIAL INSTRUCTIONS

GWR Unit 1 VQ release Instructions
Use for: "Unit 1 VQ release only"

CR SRO Authorization: C Sawyer Date/time: _____

Release Initiation

Unit 1 EMF39L Trip 1 & 2
Set/Verified by: BR Smith
Dved by: DL Jones
OPS LL EMF Recorder stamped
OPS LL Release Start ____/____ (Date / Time)
OPS LL VQ Totalizer Operable
OPS LL
VQ Totalizer X 10 = 13,420 ft3

Release Completion

OPS LL EMF Recorder stamped
OPS LL Release Stop ____/____ (Date / Time)
OPS LL
VQ totalizer X 10 = 0 ft3
OPS LL Vol. Rel 0 ft3

Error #2

Completion of Release Acknowledged

CR SRO C Sawyer Date/Time: ____/____
RP Review _____ Date/Time: ____/____

Duke Power Company McGuire Nuclear Station	Procedure No. OP/ 1/A/6450/017
	Revision No. 026
Containment Air Release and Addition System e -	Electronic Reference No. MC00475F
Continuous Use	
PERFORMANCE	

(ISSUED) - PDF Format

Revision History (significant issues, limited to one page)

Rev 026 (04/22/04)

- Enclosure 4.1 added "less than or equal to" to initial condition 2.1 and deleted "at".
- Enclosure 4.2 and Enclosure 4.3:
  - Deleted old Step 3.2 and Attachment 2. This step is very confusing to the operators and Attachment 2 is just a duplication of what is required by the TSAIL program.
  - Made old Step 3.3 conditional. VQ Releases can be monitored by EMF-36L or EMF-39L. This step only needs to be performed if EMF-39 is the monitoring EMF. The setpoints for EMF-36L are not adjusted for a VQ Release, they are set to ensure dose limits at the site boundary are not violated. If both EMF's are inoperable RP will be performing grab samples per TSAIL requirements. Making this step conditional will eliminate the need to apply OMP guidance to NA step if EMF-39L is not the monitoring EMF.
  - Made minor Writer's Guide changes.
- Enclosure 4.3:
  - Added blank formula for calculating volume released to old Step 3.9.2. The Writer's Guide requires that space be provided within the body of the procedure to perform calculations. This addition will align procedure with Writer's Guide requirements.
- Enclosure 4.8:
  - Deleted old Step 3.2. This step is very confusing to the operators and is just a duplication of what is required by the TSAIL program.
  - Made minor Writer's Guide changes.
  - Revised entire enclosure to make more user friendly. The procedure was confusing as written and did not meet all the requirements of old Step 3.5. Also added steps to back fit GWR paperwork when obtained.
  - Added steps to log start time, stop time and volume released in Auto Log. This is required per OMP 5-2 (Control Room Unit Logs): "The following types of activities and occurrences shall be entered in the appropriate Control Room Unit Log: Planned releases of radioactive effluents, including Release No., Tank, Start/Stop Date & Time, and Volume Released".

Rev 025 (01/15/04)

- Per PIP 03-4718, in Enclosures 4.5 and 4.6, gave guidance for removal, control and replacement of "Notify CCC" windows on Main Control Board switches.

Rev 024 (4/15/03)

- Added steps to Enclosures 4.2 and 4.3 to record release information in Auto Log.
- Changed "recommended release rate to 300 cfm" in- Enclosure 4.2 per PIP M-01-1565.

eP Containment Air Release And Addition System

1. Purpose

To outline operation of VQ System in the Air Addition Mode and the Air Release Mode.

2. Limits and Precautions

2.1 Containment Pressure Tech Spec limit is ±0.3 psig.

2.2 All Engineered Safeguards Valves shall be cycled electrically after any manual operation.

2.3 Valves operated in this procedure shall be operated by normal means only. Artificial assistance prohibited (Examples: Tightening an MOV with handwheel or using a cheater-bar on a manual valve).

3. Procedure

See Section 4.

4. Enclosures

4.1 Air Addition Mode

4.2 Air Release Mode With VQ Flow Monitor Operable

4.3 Air Release Mode With VQ Flow Monitor Inoperable

4.4 Valve Checklist

4.5 Establishing Conditions For Testing Penetration 1M-243

4.6 Establishing Conditions For Testing Penetration 1M-384

4.7 Swapping VQ Filters

4.8 Emergency VQ Release Without GWR Release Paperwork

4.9 1EMF 38, 39, 40 Sample Flow Select Module Operation

End of Body

1. Limits and Precautions

1.1 Containment Pressure Tech Spec limit is ±0.3 psig.

1.2 All Engineered Safeguards Valves shall be cycled electrically after any manual operation.

2. Initial Conditions

_____ 2.1 VQ Flow Monitor inoperable.

_____ 2.2 Containment pressure requires an air release.

_____ 2.3 GWR # _____ has been issued.

3. Procedure

☐ 3.1 Evaluate all outstanding R&Rs that may impact performance of this procedure.

_____ 3.2 **IF** 1EMF-39L monitoring release, perform the following:

_____ DV _____ 3.2.1 Ensure 1EMF-39L Trip 1 setpoint set per GWR.

_____ DV _____ 3.2.2 Ensure 1EMF-39L Trip 2 setpoint set per GWR.

_____ 3.2.3 Notify RP to update 1EMF-39L setpoints in EMF Setpoint Log.

_____ _____/_____
Person Contacted Date Time

_____ 3.3 Ensure "Release Initiation" on GWR is completed.

_____ 3.4 **IF** VQ Flow Monitor becomes operable perform the following:

☐ 3.4.1 Ensure 1VQ-2B (Cont Air Rel Outside Isol) closed per Attachment 1.

☐ 3.4.2 Record Total Cu. Ft. Released on GWR.

3.4.3 Record the following in Auto Log:

☐ Release number
☐ Stop time
☐ Volume released

_____ 3.4.4 Exit this Enclosure **AND** go to Enclosure 4.2 (Air Release Mode With VQ Flow Monitor Operable).

_____ 3.5 Open 1VQ-1A (Cont Air Rel Inside Isol).

NOTE:	1VQ-4 (VQ To Unit Vent Control) is required to be in full open position for air releases with VQ Flow Monitor inoperable.

_____ _____ 3.6 Fully open 1VQ-4 (VQ To Unit Vent Control).
DV

3.7 Start VQ release as follows:

☐ 3.7.1 Open 1VQ-2B (Cont Air Rel Outside Isol) per Attachment 1.

_____ 3.7.2 **WHEN** release is initiated, record containment pressure on Attachment 1.

_____ 3.8 **IF** this is initial release, record the following in Auto Log:

☐ Release number
☐ Start time

_____ 3.9 **WHEN** containment pressure reaches 0.12 psig, secure VQ release as follows:

☐ 3.9.1 Close 1VQ-2B (Cont Air Rel Outside Isol) per Attachment 1.

☐ 3.9.2 Calculate volume released using the following and record on Attachment 1:

Cu. Ft. Released = X + (Y x Z)

Where: **X** and **Y** are from Table 1
Z is actual release duration in minutes from Attachment 1

_____ ft^3 + (_____ ft^3/min X _____ min) = _____ ft^3
X (Table) Y (Table) Z (Release Duration)

Table 1

Start Pressure (psig)	Stop Pressure (Always 0.12) (psig)	X (ft^3)	Y (ft^3/min)
0.12	0.12	0	0
0.13	0.12	0	188.29
0.14	0.12	0.64	191.71
0.15	0.12	2.39	194.98
0.16	0.12	5.60	198.10
0.17	0.12	10.51	201.10
0.18	0.12	17.31	203.99
0.19	0.12	26.13	206.78
0.20	0.12	37.07	209.47
0.21	0.12	50.21	212.07
0.22	0.12	65.57	214.60
0.23	0.12	83.20	217.06
0.24	0.12	103.09	219.44

☐ 3.10 For subsequent releases, perform Steps 3.7 - 3.9 to maintain containment pressure less than 0.20 psig.

_____ 3.11 **WHEN** it is desired to close out existing GWR, perform the following:

_____ 3.11.1 Close 1VQ-1A (Cont Air Rel Inside Isol).

_____ _____ 3.11.2 ~~Close 1VQ-4 (VQ To Unit Vent Control).~~
DV

☐ 3.11.3 Ensure 1VQ-2B (Cont Air Rel Outside Isol) closed per Attachment 1.

_____ 3.11.4 Notify RP that VQ release has been secured and 1EMF-38, 1EMF-39, and 1EMF-40 setpoints need to be evaluated. {PIP 1-M97-1925}

_____ _____/_____
Person Contacted Date Time

☐ 3.11.5 Record Total Cu. Ft released on Attachment 1.

_____ 3.11.6 Ensure "Release Completion" on GWR is completed.

3.11.7 Record the following in Auto Log:

☐ Release number
☐ Stop time
☐ Volume released

_____ 3.11.8 Route GWR to SRO.

Reviewed By _____

Approved By _____

TASK: **Perform RP-07 (Earthquake) for an earthquake**

POSITION: **SRO**

Operator's Name_____

Validation Time: 20 Minutes

Actual JPM Completion Time: _____ Minutes

Location: **Plant** Method: **Perform**

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/

KA: 2.4.40 (2.3/4.0)

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 is at 100% power
- Unit 2 is in Mode 5, at 110°F and depressurized for maintenance

- "OBE Exceeded" annunciator (1AD-13, E7) comes in alarm
- The Control Room floor vibrates for about 4 or 5 seconds.
- The Time History Accelerograph System computer alarm (M1D2422) has activated and is collaborated by indications of an 0.06g Vertical and an 0.07g Horizontal quake.
- The Peak Shock Annunciator Panel has two Red lower frequency lights illuminated

The OSM enters the Control Room immediately and directs you to implement the procedure RP/0/A/5700/007 (Earthquake) and take any necessary actions.

JPM OVERALL STANDARD:

The procedure, RP/0/A/5700/007 (Earthquake), is implemented with technical correctness through Step 7. Plant shutdown to Mode 3 (Hot Standby) within 6 hours is commenced. It is acceptable for the candidate to elect to trip the plant due to conservatism.

NOTES: The Operator should be given a copy of RP/0/A/5700/007 (Earthquake)).

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Evaluates Step 3.1: Unit 1, determines 3.4.15 inoperable Unit 2, determines 3.4.15 not applicable	Evaluates Note prior to step 3.1 Action "A" entered B, C & E and ~~"C" for tracking~~ Entry into 3.03 Same, acceptable to enter in TSAIL for tracking **CUE: The WCC SRO will make the requested entry(s)**	3/3/06	
*2	Performs Step 3.2: Source Check for 1 & 2 EMF 38(L) & 39(L) Determines condition "C" entered for both 1EMF38(L) & VUCDT Level Check sample pumps	 Same **CUE: 1EMF 38(L) did not respond to source check** Same Dispatch NLO to check 1 & 2 EMF 38(L) & 39(L) sample pumps. **CUE: all sample pumps operational**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
3	Perform Step 3.3:	**CUE: The WCC SRO will perform Step 3.3**		
*4	Perform Step 3.4 Determine inspection steps to be performed	Determines Steps 3.14, 3.15, & 3.16 need to be performed **CUE: the WCC SRO will perform Steps 3.14, 3.15, & 3.16**		
5	Perform Step 3.5 Step 3.5.1 visual inspection safe shutdown equipment	**CUE: The WCC SRO will perform Step 3.5.1**		
*	Perform 3.5.2	Determines Unit 1shutdown to Mode 3 required in 6 hours.		
	Perform 3.5.3	Determines from initial conditions that Step 3.5.3 is N/A		
6	Perform Step 3.6	Determines from initial conditions that Step 3.6 is N/A		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*7	Perform Step 3.7	Determines "Alert" required per 4.7.A.1-1 **CUE: When classification choice is made, provide cue the WCC SRO will complete RP/000 and RP/7.**		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

The following conditions exist:

- Unit 1 is at 100% power
- Unit 2 is in Mode 5, at 110°F and depressurized for maintenance

- "OBE Exceeded" annunciator (1AD-13, E7) comes in alarm
- The Control Room floor vibrates for about 4 or 5 seconds.
- The Time History Accelerograph System computer alarm (M1D2422) has activated and is collaborated by indications of an 0.06g Vertical and an 0.07g Horizontal quake.
- The Peak Shock Annunciator Panel has two Red lower frequency lights illuminated

The OSM enters the Control Room immediately and directs you to implement the procedure RP/0/A/5700/007 (Earthquake) and take any necessary actions.

(R04-01)

Duke Power Company
PROCEDURE PROCESS RECORD

(1) ID No. RP/0/A/5700/007
Revision No. 007

PREPARATION

(2) Station MCGUIRE NUCLEAR STATION

(3) Procedure Title Earthquake

(4) Prepared By [signature] Date 8/22/01

(5) Requires NSD 228 Applicability Determination?

- ☒ Yes (New procedure or revision with major changes)
- ☐ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By Alan L. Beaver (QR) Date 9/10/2001

Cross-Disciplinary Review By _____ (QR) NA ACB Date 9/10/2001

Reactivity Mgmt. Review By _____ (QR) NA ACB Date 9/10/2001

Mgmt. Involvement Review By _____ (Ops Supt.) NA KB Date 9/10/2001

(7) Additional Reviews

Reviewed By Dayna J. Herrick Date 8/29/01

Reviewed By _____ Date _____

(8) Temporary Approval (*if necessary*)

By _____ (OSM/QR) Date _____

By _____ (QR) Date _____

(9) Approved By K. L. Murray Date 9-12-01

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*)

Duke Power Company McGuire Nuclear Station	Procedure No. RP/0/A/5700/007
Earthquake	Revision No. 007
Multiple Use	Electronic Reference No. MC0094NI

Earthquake

1. Symptoms

1.1 Time History Accelerograph System OAC alarm (M1D2422) "actuated" which indicates one of the following is exceeded:

- Transverse acceleration: ≥0.01g
- Longitudinal: ≥0.01g
- Vertical: ≥0.01g.

1.2 Effects of an earthquake may be seen, heard, or felt.

1.3 "OBE Exceeded" annunciator (1AD-13 - E7) actuated.

2. Immediate Actions

None

3. Subsequent Actions

NOTE: The Reactor Coolant Leakage Detection Systems on each unit are **NOT** seismically qualified and must be assumed to be inoperable following any seismic event. Reactor Coolant Leakage Detection Systems are **NOT** required to be operable during Cold Shutdown.

_____ 3.1 Following any earthquake, including earthquakes smaller than OBE, assume the following Reactor Coolant Leakage Detection Systems, on each unit, (listed below) are inoperable and implement appropriate Tech Spec Action Statement 3.4.15.

- Containment Floor and Equipment Sump Level Monitoring System
- VUCDT Level Monitoring System.

3.2 Determine the operable status of 1(2)EMF38(L) and 1(2)EMF39(L) by the following:

3.2.1 Perform a source check from the Control Room to ensure power is available to the following:

_____ • 1EMF38(L)

_____ • 1EMF39(L)

_____ • 2EMF38(L)

_____ • 2EMF39(L).

3.2.2 Check the following sample pumps are operational, by visual inspection at the skids:

_____ • 1EMF38(L)

_____ • 1EMF39(L)

_____ • 2EMF38(L)

_____ • 2EMF39(L).

_____ 3.2.3 **IF** 1(2)EMF38(L) or 1(2)EMF39(L) are determined to be inoperable, **THEN REFER TO** Tech Spec 3.4.15.

NOTE: Enclosure 4.1 (Seismic Instrument Locations) should be referenced while performing the following step.

3.3 Evaluate the magnitude of the earthquake damage as follows:

_____ 3.3.1 Contact the U.S. Geological Survey Office at (303) 273-8500 to obtain seismic verification.

3.3.2 Contact the SWM to ensure IAE personnel perform the following procedures to evaluate the seismic equipment for verification and classification of the event:

_____ • IP/0/B/3150/001 (Model PRA-103 Peak Recording Accelerometer Calibration and Data Retrieval)

_____ • IP/0/B/3150/002 (Peak Shock Recorder and Annuciator Calibration)

_____ • IP/0/B/3150/004 (SMA-3 Strong Motion Accelerographs System Calibration).

3.3.3 Contact the SWM to ensure the following model work order numbers are performed to check the torque values of the bolting for the Main Feed Isolation Valves (CF-26, 28, 30, 35) as required by the EQ program:

_____ • Unit 1: 85055211; 85055212; 85055213; 85055214

_____ • Unit 2: 85055215; 85055216; 85055217; 85055218.

_____ 3.3.4 Contact Civil Engineering (MCE) to obtain recorded data from Maintenance or Instrumentation Engineering (RES) after it has been returned from the Laboratory/Vendor (plates have to be sent to be read). Civil Engineering (MCE) should perform the comparison analysis required in UFSAR section 3.7.4.4. {PIP -M-01-02069}.

3.4 Based on the magnitude of the earthquake, perform a plant inspection as follows:

_____ • **IF** magnitude is GREATER THAN .01g, **THEN** perform an inspection **PER** Steps 3.14 and 3.15.
OR

_____ • **IF** magnitude is GREATER THAN .08g horizontal or .053g vertical, **THEN** perform an inspection **PER** Steps 3.14,3.15 and 3.16.

NOTE: The following step is a Facility Operating License Amendment , per Docket Nos. 50 - 369,370.

3.5 **IF** the Operational Bases Earthquake (OBE) Exceeded Alarm (1AD-13 - E7) is received AND the effects of an earthquake are felt OR analysis determines an earthquake of greater than .08g horizontal, or .053g vertical, has occurred, **THEN**:

_____ 3.5.1 **IF** time allows. **THEN** visual inspection of essential safe shutdown equipment should be performed to determine its readiness.

_____ 3.5.2 Shutdown the Unit(s) to Hot Standby (Mode 3) within 6 hours.

_____ 3.5.3 **IF** the plant tripped under conditions which would warrant shutdown, **THEN** the plant should remain shutdown for detailed inspections.

NOTE: The following step is a Facility Operating License Amendment , per Docket Nos. 50 - 369,370.

_____ 3.6 **IF** analysis determines that an earthquake of GREATER THAN 0.15g horizontal **OR** GREATER THAN 0.1g vertical has occurred, **THEN** shutdown the Unit(s) to Cold Shutdown (Mode 5) within 30 hours.

_____ 3.7 **REFER TO** RP/0/A/5700/000 (Classification of Emergency).

_____ 3.8 Monitor KC Surge tank levels on both units while performing the following steps.

_____ 3.9 **IF AT ANY TIME** KC Surge tank level is low or is going down, **THEN GO TO** AP/1(2)/A/5500/021 (Loss of KC or KC System Leakage), while continuing with this procedure.

NOTE: The following step is a commitment due to concerns on the seismic qualification of the Reactor Protection System cards.

_____ 3.10 Contact IAE to have the overpower and over temperature delta temperature function generator outputs calibrated for each unit.

3.11 Dispatch operator to close the following:

NOTE: The following valves isolate flow to 1(2)EMF46A(B).

_____ • 1KC-36 (KC Train 1A Radiation Monitor Inlet) (N of KC Pmp 2A2, above EMF 46A)

_____ • 1KC-37 (KC Train 1A Radiation Monitor Outlet) (N of KC Pmp 2A2, above EMF 46A)

_____ • 1KC-45 (KC Train 1B Radiation Monitor Inlet) (N of KC Pmp 2A2, above EMF 46B)

_____ • 1KC-46 (KC Train 1B Radiation Monitor Outlet) (N of KC Pmp 2A2, above EMF 46B)

_____ • 2KC-36 (2EMF-46A Inlet) (750' + 4', 9' W of Col GG57)

_____ • 2KC-37 (2EMF-46A Outlet) (750' +4', Above 2EMF-46A)

_____ • 2KC-45 (2EMF-46B Inlet) (750' + 4', 10' W of Col GG57)

_____ • 2KC-46 (2EMF-46B Outlet) (750' +7', above 2EMF-46B)

CAUTION: Chemistry should be contacted to ensure sample flow is isolated prior to removing KC cooling flow in the next step

_____ • 1KC-873 (Liquid Sample Panel Outlet Isolation) (733'+6', 6' N of Col. JJ, 2' W of Col 55)

_____ • 1KC-973 (Liquid Sample Panel Inlet Isolation) (733' + 5' N of 1A2 KC Pump)

_____ • 2KC-973 (Liquid Sample Panel Inlet Isolation) (750' + 7' Between GG56 and south end at 2A KC HX)

_____ • 2KC-974 (Liquid Sample Panel Coolers Outlet) (750 +10' JJ58).

3.12 Contact Chemistry to stop the following pumps:

_____ • NB Evaporator Concentrates Pump

_____ • WL Evaporator Concentrates Pump.

CAUTION: Evaporators should be removed from service per appropriate Chemistry procedures prior to removing KC flow.

3.13 Contact Chemistry to close the following:

____ • 1KC-906 (NB Evap Conc Pump Mech Seal Cooling Water HX Inlet)

____ • 1KC-908 (NB Evap Conc Pump Mech Seal Cooling Water HX Outlet)

____ • 1KC-909 (WL Evap Conc Pump Mech Seal Cooling Water HX Inlet)

____ • 1KC-911 (WL Evap Conc Pump Mech Seal Cooling Water HX Outlet).

NOTE: All normally monitored plant parameters should be closely observed to ensure stable plant status.

CAUTION: The site inspection is meant to be done after the seismic event occurs. It would **NOT** be prudent to send a team out to survey the site during a seismic event. Operations Shift Manager discretion based on safety considerations should determine sending personnel for any site inspection.

NOTE: The following step performs a site inspection for earthquake GREATER THAN .01g.

3.14 Perform the following to tour the station for damages being particularly observant for wall cracks, bent/broken hangers, pipe ruptures, bends or cracks, structural damage:

____ 3.14.1 Contact Engineering to assist with the site inspection in the following steps.

____ 3.14.2 **IF AT ANY TIME** any of the following exists, **THEN GO TO** AP/1(2)/A/5000/020 (Loss Of RN), while continuing with this procedure:

- damage to LLI piping to the RN system
- damage to the structural integrity of Cowans Ford Dam or any earthen support structures associated with the dam visible from the McGuire Site
- loss of lake level instrumentation
- actual lake level going down.

_____ 3.14.3 Include in the tour, but do **NOT** limit it to, the following areas:

- Reactor Building (outside)
- Auxiliary and Turbine Buildings
- Auxiliary Liquid Waste Processing Building
- Gas and oil storage areas
- Refueling Water Storage Tanks
- Reactor Makeup Water Storage Tanks
- Spent Fuel Pool areas
- Diesel Generator Rooms
- Standby Shutdown Facility
- Main Step-up and Auxiliary Transformers (bus lines included)
- Low Level Intake Supply Piping to RN System.

_____ 3.14.4 Dispatch operator and Engineering to visually inspect the structural integrity of Cowans Ford Dam and any earthen support structures associated with the dam visible from the McGuire Site.

NOTE:
- Lake Level indication may **NOT** be reliable during a seismic event. **IF** indication is erratic or fails high or low, **THEN** consider it failed.
- Ladder rungs at the Main Intake RC Pump Bays are spaced at 1 foot centers per MC-1341-3. Counting the number of ladder rungs from present water level to determine if lake level is changing is used to determine lake level fluctuations.

_____ 3.14.5 **IF** applicable, locally check Lake Norman water level remains stable, by performing the following:

_____ 3.15.5.1 Count the number of ladder rungs from the grating to surface of water in any of the RC Pump bays.

_____ 3.15.5.2 Re-count the number of ladder rungs in the same the RC Pump bay periodically over 30 minutes to determine if lake level is going down over time.

3.15 After evaluating the extent of the earthquake and the results of station tour, the Station Manager shall decide whether or not to preclude startup on one, or both units, in order to inspect the following:

_____ • Structures Inside Containment

_____ • Reactor Coolant System

_____ • Control Rod Drive Mechanisms.

CAUTION: The site inspection is meant to be done after the seismic event occurs. It would **NOT** be prudent to send a team out to survey the site during a seismic event. Operations Shift Manager discretion based on safety considerations should determine sending personnel for any site inspection.

NOTE: The following step performs additional site inspections for earthquakes GREATER THAN .08g horizontal, or .053g vertical.

3.16 Perform the following to tour the station for damages being particularly observant for wall cracks, bent/broken hangers, pipe ruptures, bends or cracks, structural damage, etc.:

_____ 3.16.1 Include in the tour, but do **NOT** limit it to, the following areas:

- Emergency Core Cooling Systems
- Switch Gear, MCC and cable rooms
- Underground piping such as RC, RF, RL, RN
- Acid and Caustic Storage Tanks.

_____ 3.17 Notify Radiation Protection to survey Reactor, Auxiliary and Fuel Pool Buildings to ensure shielding integrity.

_____ 3.18 **IF** Control Room evacuation becomes imminent, **THEN** activate Standby Shutdown Facility **PER** AP/1(2)/A/5500/024 (Loss of Plant Control Due to Fire).

_____ 3.19 A thorough evaluation of the extent of the earthquake damage shall be made prior to startup.

4. Enclosures

4.1 Seismic Instrument Locations

End Of Body

Enclosure - 4.1
Seismic Instrument Locations

Seismic Instrument	Location
Time-History Accelerograph recorder	1MC-9
• The seismic switch (MIMT-5060). • The time-history Accelerograph starter unit (MIMT-5020). • One of the time-history Accelerograph sensor units (MIMT-5000). • The response spectrum recorder to be coupled with the peak shock annunciator (MIMT-5070).	All on the Containment basement slab, in the annulus under the first ring girder at azimuth 0°, (Elev. 725 ± 0").
The second time-history Accelerograph sensor unit (MIMT-5010).	Directly above MIMT-5000 at azimuth 0°, (Elev. 786 ± 5") and bolted to the ring girder at this position.
One Response Spectrum Recorder, instrument number MIMT-5070.	On the Pressurizer Low Support Structure at Elev. 751' 8¼".
One Response Spectrum Recorder, instrument number MIMT-5090.	In the Auxiliary Building at Elev. 750' 0", column lines QQ and 56.
Peak Recording Accelerometer (MIMT-5030).	Strap mounted to the 6" CA elbow just off the 1D Steam Generator CA nozzle at Elev. 786' 8 9/16".
Peak Recording Accelerometer (MIMT-5040).	On pipe hanger for the Pressurizer Surge line at Elev. 746' 2½".
Peak Recording Accelerometer (MIMT-5050).	At base of NI Pump 1A at Elev. 716' 6".

End Of Enclosure