Draft Submittal

(Pink Paper)

MCGUIRE MARCH 2007 EXAM

EXAM NOS. 05000369, 370/2007301

MARCH 19 - 22, 2007

MARCH 29, 2007 - WRITTEN

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

DRAFT

ES-301, Rev. 9 **Administrative Topics Outline** **Form ES-301-1**

Facility: _____McGuire_____	Date of Examination: **March 19 2007**
Examination Level: RO [SRO]	Operating Test Number: **HLP-23 NRC**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
A-1a Conduct of Operations	M,R	JPM: Calculate blended makeup volume and boric acid Flow to the FWST. K/A: 2.1.25 Ability to obtain and interpret station reference manuals.
A-1b Conduct of Operations	M, R	JPM: Thermal Margin Calculation in Mode 5 K/A: 2.1.3 Knowledge of Shift Turnover Practices
A-2 Equipment Control	D,R	JPM: SLC Determination of Operable EFA Zone K/A: 2.2.25 Knowledge of bases in tech specs for limiting conditions of operations and safety limits.
A-3 Radiation Control	N,R	JPM: Determine requirements for work in a radiation area. K/A: 2.3.1 Knowledge of 10CFR20 and related facility radiation control requirements.
A-4 Emergency Plan	D,R	JPM: Declare an Emergency Classification and complete the ENS notification form. K/A: 2.4.41: Knowledge of the emergency action level threshold and classifications.

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, (S)imulator, or Class(R)oom
(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)

DRAFT

Facility: McGuire Date of Examination: **March 19 2007**

Examination Level: RO SRO Operating Test Number: **HLP-23 NRC**

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
A-1a Conduct of Operations	M,R	JPM: Calculate blended makeup volume and boric acid Flow to the FWST. K/A: 2.1.25 Ability to obtain and interpret station reference manuals.
A-1b Conduct of Operations	N,R	JPM: CSF Status Tree Monitoring K/A: 2.1.19 Ability to use plant computer to obtain and evaluate parametric information on system or component status.
A-2 Equipment Control	N,R	JPM: Complete and properly document a surveillance procedure. (OAPFT Monthly PT) K/A: 2.2.12 Knowledge of surveillance procedures.
A-3 Radiation Control	M,R	JPM: Determine requirements for work in a radiation area. K/A: 2.3.1 Knowledge of 10CFR20 and related facility radiation control requirements
Emergency Plan		

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

* Type Codes & Criteria:
(C)ontrol room, (S)imulator, or Class(R)oom
(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)

DRAFT

ES-301, Rev. 9 **Control Room/In-Plant Systems Outline** **Form ES-301-2**

Facility: McGuire Date of Examination: **March 19, 2007**

Exam Level: RO SRO-I SRO-U Operating Test No.: **HLP-23 NRC**

Control Room Systems@ (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)

	System / JPM Title		Type Code*	Safety Function
a.	004/	Restore Normal Letdown from Excess Letdown (NV-30) **(SROU)**	D, S	SF-2
b.	002/	Calculate Boric Acid Addition and Manually Borate (NV-207A)	A, D, P, S	SF-1
c.	006/	Transfer to Hot Leg Recirc (NC-115A) **(SROU)**	A, D, E, S	SF-3
d.	005/	Make up to NCS following a Loss of Level while in Midloop Operation (ND-105A) **(SROU)**	A, D, L, S	SF-4P
e.	064/	Manually Sequence Loads after a Blackout (DG-13)	D, S	SF-6
f.	008/	Realign Component Cooling to the NCPs after a Spurious SI (KC-150A)	A, D, S	SF-8
g.	073/	Respond to 1EMF-35 Hi Rad Alarm (EMF-257)	N, S	SF-7
h.	045/	Perform Main Turbine Overspeed Trip Test (EHC-154A) **(RO Only)**	A, D, S	SF-4S

In-Plant Systems@ (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i.	028/	Start the Hydrogen Recombiner (VX-20) **(SROU)**	D, E	SF-5
j.	061/	Start and Stop 2TD CAP (CA-256) **(SROU)**	N, R	SF-4S
k.	062/	Restore Normal Power to 1ETA and Shutdown D/G 1A (DG-175)	D	SF-6

@ 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 / Shutdown	≥ 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	

Reviewed By _____

Approved By _____

TASK: **Calculate blended make up volume and required boric acid flow to the FWST while in Mode 6.**

POSITION: **RO/SRO**

Operator's Name_____

Location: **Control Room** Method: **Perform**

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/__

References:

OP/1/A/6100/22	Unit 1 Data Book
OP/1/A/6200/14 Enc. 4.3	FWST Makeup Using Reactor Makeup Blender in Mode 6
McGuire Unit 1 Cycle 18	Core Operating Limits Report
	Copy of SLC Manual

JPM verified current with references by _____

Date __/__/__

INITIAL CONDITIONS

The following conditions exist:

Unit #1 is in Mode 6 with the refueling canal filled at 374 inches WR Level
NC Boron Concentration = 2808 PPM
FWST Boron Concentration = 2783 PPM
FWST Level = 40 inches
U-1 BAT Boron Concentration = 7000 PPM
EFPD prior to shutdown was 501 EFPD

Due to concerns with maintaining adequate level in the FWST in order to utilize it as a long term injection source, the OCC has requested that the FWST level be increased to 70 inches. The level was lowered to its present level during refueling canal flood up.

1) Using the Data Book, calculate the required make up volume and report this value to the STA in the OCC.

2) Per OP/1/A/6200/014 Enc. 4.3 determine the boric acid flow rate needed to ensure minimum shut down FWST Boron concentration is maintained. This Enclosure has been completed through step 3.16. (Desired Total Blended Flow Rate is 90 GPM)

JPM OVERALL STANDARD:

FWST Level change determined from the Data book Curve 7.7 to be 21000 to 26000 gallons.

Minimum boric Acid Flow Rate determined to be greater than or equal to 37.8 GPM. The minimum allowed FWST boron concentration is 2675 ppm from MNS Cycle 18 COLR Sect 2.15 (Refueling Operations- Boron Concentration)

Evaluate BAT tank level change impact per SLC 16.9.14 (Borated Water Sources –Shutdown)

NOTES:

Unit #1 Data Book, SLC Manual, and Cycle 18 COLR should be available for reference.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator is provided a copy of the U-1 Data Book and the U-1 COLR.	**Operator should determine that Data Book Curve 7.7 is the correct curve to calculate the required volume change**		
*2	Operator determines the required FWST level change for 40 inches to 70 inches Data Book Curve 7.7 (Refueling Water Storage Take Level)	**Required Volume 21000 to 26000 gallons.**		
3	Per the initial conditions, operator should contact the STA in the OCC to report the required FWST volume change.	**Cue:** **The STA in the OCC has been informed.**		
4	Operator should be provided with a copy of OP/1/A/6200/014 Enc 4.3. (FWST Makeup Using Reactor Makeup Blender During Mode 6) Procedure has been completed through step 3.16.	Required information to complete Step 3.16 is given in the Initial conditions. Boric Acid Tank Concentration--- **4000PPM** Desired Total Blended Make up Flow--- **90 GPM**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	Using OP/1/A/6200/014 Enc 4.3. , the Operator will calculate the minimum required Boric Acid Flow Rate.	Per Step 3.17 of this enclosure, the Operator calculates a minimum **Boric Acid Flow Rate of 37.8 GPM**		
6	Operator should proceed to step 3.18 of OP/1/A/6200/014 Enc 4.3. . (FWST Makeup Using Reactor Makeup Blender During Mode 6)	**Cue: Another Operator will complete the FWST make up.** **Cue: As the C/R SRO you are informed by the U-1 OAC that while securing the FWST make up, Annunicator 1AD-7 J-7 (BAT EMPTY) was received.** **U-1 BAT Level is reading 13%** **U-1 FWST Level is reading 70 inches.** **The U-1 OAC also informs you that per the annunciator response, BAT level need to be evaluated per SLC.**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	Operator should be provided with a copy of the MNS SLC manual.	Operator should refer to SLC 16.9.14 "Borated Water Sources (Shutdown) and evaluate BAT operability . Operator should then refer to to the U-1 COLR section 2.16.1 and Figure 6 to determine that for the present NC System boron concentration (2808 ppm) and core EFPD (501 EFPD) both provided in the initial conditions, **Operator determines that SLC 16.9.14 Commitment is met and no actions are required due to:** **Required BAT level Per Figure 6 is 8.7% therefore the minimum BAT level is met per SLC 16.9.14**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Required minimum level for the U-1 FWST is 41 inches therefore the minimum FWST level is also satisified per SLC 16.9.14. Note: SLC 16.9.14 only requires one of these borated sources to be operable.		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

The following conditions exist:

Unit #1 is in Mode 6 with the refueling canal filled at 374 inches WR Level
NC Boron Concentration = 2808 PPM
FWST Boron Concentration = 2783 PPM
FWST Level = 40 inches
U-1 BAT Boron Concentration = 7000 PPM
EFPD prior to shutdown was 501 EFPD

Due to concerns with maintaining adequate level in the FWST in order to utilize it as a long term injection source, the OCC has requested that the FWST level be increased to 70 inches. The level was lowered to its present level during refueling canal flood up.

1) Using the Data Book, calculate the required make up volume and report this value to the STA in the OCC.

2) Per OP/1/A/6200/014 Enc. 4.3 determine the boric acid flow rate needed to ensure minimum shut down FWST Boron concentration is maintained. This Enclosure has been completed through step 3.16. (Desired Total Blended Flow Rate is 90 GPM)

Duke Energy
McGuire Nuclear Station
Refueling Water System

Procedure No.
OP/1/A/6200/014

Revision No.
071

Electronic Reference No.
MC00474K

Continuous Use

PERFORMANCE

This Procedure was printed on 12/06/06 at 14:08:01 from the electronic library as:

(ISSUED) - PDF Format

Compare with Control Copy every 14 calendar days while work is being performed.

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Date(s) Performed	Work Order/Task Number (WO#)
1-15-06	

COMPLETION

- ☐ Yes ☐ NA Checklists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☐ Yes ☐ NA Charts, graphs, data sheets, etc. attached, dated, identified, and marked?
- ☐ Yes ☐ NA Calibrated Test Equipment, if used, checked out/in and referenced to this procedure?
- ☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

Procedure Completion Approved _____ Date _____

Remarks (*attach additional pages, if necessary*)

* - Initials of Trainee
2K - Fred Kirk

IMPORTANT:
Do **NOT** mark on barcodes.

Procedure No. *OP/1/A/6200/014*

Revision No. *071*

Enclosure Number *4.3*

Printed Date *12/06/2006*

1. Limits and Precautions

1.1 Maximum FWST Tech Spec temperature limit is 100°F.

1.2 Minimum FWST Tech Spec temperature limit is 70°F.

1.3 All electrically operated engineered safeguard valves must be operated electrically after any manual operation.

1.4 Maximum FWST level is 483 inches unless FWST overflow is required. (Overflows to SFP at 484 inches)

1.5 NC System sampling during makeup to the FWST is prohibited.

1.6 Dual Boric Acid Tank Pump operation is minimized due to potential to deadhead weaker pump.

2. Initial Conditions

2K 2.1 Unit 1 in Mode 6.

2K 2.2 NI check valve test header alignment to FWST secured.

3. Procedure

☑ 3.1 Evaluate all outstanding R&Rs that may impact performance of this procedure.

____ 3.2 **IF** Emergency Boration Flow is needed, secure makeup to FWST.

2K 3.3 Prepare tags per Pre-Plan PP-00144.

2K 3.4 SRO Ensure that a pre-job briefing has been performed that includes discussion of reactivity management concerns with this procedure.

2K 3.5 Notify RP of change in FW System alignment. {PIP M97-0680}

Bob Smith — 1-15-06 / 0600
Person Contacted — Date Time

2K 3.6 Notify Radwaste Chemistry of expected level changes in BAT and RMWST.

Ron Jones — 1-15-06 / 0615
Person Contacted — Date Time

3.7 Perform the following: (to comply with Tech Specs)

NOTE: Operator will need to obtain six chains and locks to perform the next step.

3.7.1 Tag locked closed:

- ☑ 1NV-131 (Unit 1 Boronometer Inlet Supply Isol)
- ☑ 1NV-140 (Unit 1 VCT Inlet Isol)
- ☑ 1NV-176 (Unit 1 Boric Acid Blender To VCT Outlet Isol)
- ☑ 1NV-468 (Unit 1 Boric Acid Blender Outlet Sample Isol)
- ☑ 1NV-808 (Unit 1 Boronometer Flush Supply Isol)

3.7.2 Tag locked closed one of the following:

☑ 1NV-132 (Unit 1 Boronometer Outlet Isol)

OR

☐ 1NV-1026 (Unit 1 Boronometer Inlet Isol)

2K SRO 3.8 Evaluate Tech Specs for opening 1NV-250 (RX Makeup Water Supply To Unit 1 NV Isol) in Mode 6.

☑ 3.9 Remove tag, unlock and open 1NV-250 (RX Makeup Water Supply To Unit 1 NV Isol).

N/A 2K 3.10 **IF** FWST in Recirculation per Enclosure 4.1 (FWST Recirculation Using 1A (1B) FWST Recirc Pump), stop:

- N/A 2K 1A FWST Recirc Pump
- N/A 2K 1B FWST Recirc Pump

N/A 2K 3.11 **IF** FWST in Recirculation per Enclosure 4.6 (FWST Recirculation Using Unit 1 FWST Pump), stop #1 FWST Pump.

N/A 2K 3.12 **IF** FWST in Purification per Enclosure 4.5 (FWST Purification), stop #1 FWST Pump.

3.13 Ensure closed one of the following:

- N/A 2K 1NI-96B (NI Check Vlv Test Hdr Cont Outside Isol)

OR

- N/A 2K 1NI-99 (Unit 1 NI Check Valve Test Hdr To FWST Isol)

3.14 Ensure locked closed, either:

2K 3.14.1 1NS-70 (1A & 1B NS HX Outlet To FWST Throttle)

OR

3.14.2 Both of the following:

____ / DV ____ • 1NS-8 (1B NS HX Outlet To FWST Isol)

____ / DV ____ • 1NS-25 (1A NS HX Outlet To FWST Isol)

☑ 3.15 Ensure closed 1NB-5 (Unit 1 Boric Acid Blender To NB System Isol). (AB 733'+6, KK-51, S End U1 VCT Hallway)

3.16 Open:

2K • 1NV-172 (Unit 1 Boric Acid Blender To NB & FW Isol)

2K • 1NV-174 (Unit 1 Boric Acid Blender To FWST Isol)

NOTE: Chemistry is unable to obtain a blender sample because Step 3.7 isolates sample flow path. 10% more boric acid is added in step below to ensure makeup within limits.

____ / SV ____ * 3.17 Determine Boric Acid flow rate needed: {PIP 2-M98-0017}

$$\left[\frac{(\text{Desired FWST Boron Concentration})(\text{Desired Total Blended Flow Rate})}{\text{Boric Acid Tank Boron Concentration}}\right](1.1) = \text{Boric Acid Flow Rate}$$

Doer Calculation

$$\left[\frac{(2675\ \text{ppmB})(90\ \text{gpm})}{(7000\ \text{ppmB})}\right](1.1) = 37.8\ \text{gpm}$$

SV Calculation

$$\left[\frac{(\quad\text{ppmB})(\quad\text{gpm})}{(\quad\text{ppmB})}\right](1.1) = \quad\text{gpm}$$

* - INITIALS OF TRAINEE

- RED INK ENTRIES DENOTES INFORMATION TO BE FILLED IN BY THE TRAINEE

CAUTION: IF Total Makeup and Boric Acid Flow integrator Thumbwheels are set too low, Boric Acid Flow or Reactor Makeup Water Flow may be automatically terminated, resulting in inadvertent Dilution or Boration of FWST.

NOTE:
- Excessive operation of Integrator Thumbwheel covers should be avoided.
- Integrator Thumbwheel covers must be closed for NC Makeup System to operate.
- Integrator Thumbwheel covers should **NOT** be opened unless associated counter reset pushbutton depressed.

_____ 3.18 Set Total Makeup Flow Counter to desired value.

_____ 3.19 **WHEN** Total Makeup Flow Counter cover closed, check counter at desired value.

_____ 3.20 Set Boric Acid Flow Counter to desired value.

_____ 3.21 **WHEN** Boric Acid Flow Counter cover closed, check counter at desired value.

☐ 3.22 Record initial FWST level on Attachment 1.

_____ 3.23 Select "MANUAL" on "NC Sys M/U Controller".

3.24 Place in "MAN":

_____ • BA Blend Disch Cntrl
_____ • BA Flow Control

_____ 3.25 **IF** both BA Trans Pumps off, ensure "AUTO" selected on one of the following:

_____ • 1A BA Trans Pump

OR

_____ • 1B BA Trans Pump

_____ 3.26 **IF** it is desired to use both BA Trans Pumps, ensure the following in "AUTO":

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

3.27 Ensure in "AUTO" one of the following:

_____ • 1A Rx M/U Water Pump

OR

_____ • 1B Rx M/U Water Pump

NOTE: Annunciator Alarms 1AD-6, F13 (Total Makeup Flow Deviation) and 1AD-7, I3 (Boric Acid Flow Deviation) are expected alarms when making up to FWST in manual.

_____ 3.28 Momentarily select "START" on "NC System Make Up".

☐ 3.29 Check lit "NC System Makeup" red light.

_____ 3.30 Ensure Rx M/U Water Pump starts.

_____ 3.31 **IF** in "AUTO", ensure BA Trans Pump(s) starts.

3.32 Adjust the following to obtain flow rates determined in Step 3.17:

_____ • BA Blend Disch Cntrl
_____ • BA Flow Control

_____ 3.33 **WHEN** FWST at desired level, flush flow path for 1 minute as follows:

_____ 3.33.1 **IF** desired to flush with blended flow, perform the following:

_____ 3.33.1.1 Set "BA Flow Control" potentiometer for current NCS boron concentration.

_____ 3.33.1.2 **IF** both BA Trans Pumps in "AUTO", select "STOP" on one of the following:

_____ • 1A BA Trans Pump

OR

_____ • 1B BA Trans Pump

3.33.1.3 Place in "AUTO":

_____ • BA Blend Disch Cntrl
_____ • BA Flow Control

_____ 3.33.1.4 Go to Step 3.34.

_____ 3.33.2 **IF** desired to flush with Rx M/U Water, perform the following:

3.33.2.1 Select "STOP" on the following:

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

_____ 3.34 **WHEN** flush complete, select "OFF" on "NC Sys M/U Controller".

3.35 Ensure the following in "STOP":

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

☐ 3.36 Record final FWST level on Attachment 1.

3.37 Place BA Trans Pump(s) in service as follows:

_____ 3.37.1 **IF** desired to place BAT in recirc, select "START" on one of the following:

_____ • 1A BA Trans Pump

OR

_____ • 1B BA Trans Pump

_____ 3.37.2 **IF** BAT recirc is **NOT** desired, select "AUTO" on one of the following:

_____ • 1A BA Trans Pump

OR

_____ • 1B BA Trans Pump

_____ 3.37.3 **IF** OP/1/A/6150/009 Enclosure 4.15 (VCT Makeup With High NC System Boron Concentration) in progress perform the following:

_____ 3.37.3.1 **IF** both BA Trans Pumps off, ensure "AUTO" selected for the following:

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

_____ 3.37.3.2 **IF** one BA Trans Pump on, ensure standby BA Trans Pump in "AUTO":

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

3.38 Close:

_____ • 1NV-172 (Unit 1 Boric Acid Blender To NB & FW Isol)
_____ • 1NV-174 (Unit 1 Boric Acid Blender To FWST Isol)

☐ 3.39 Record in Auto Log final blender contents, either:

☐ Rx Makeup Water

OR

☐ Blend

OR

☐ Boric Acid

_____ 3.40 **IF** desired to align for automatic NC System Makeup, align per OP/1/A/6150/009 (Boron Concentration Control).

☐ 3.41 Place routing stamp in remarks section of cover sheet, check (✓) "Engineering" and fill in "Attachment 1 only".

☐ 3.42 Lock closed and tag 1NV-250 (RX Makeup Water Supply To Unit 1 NV Isol). (Comply with Tech Specs)

3.43 Remove tag and open:

☐ 1NV-131 (Unit 1 Boronometer Inlet Supply Isol)
☐ 1NV-140 (Unit 1 VCT Inlet Isol)
☐ 1NV-176 (Unit 1 Boric Acid Blender To VCT Outlet Isol)
☐ 1NV-468 (Unit 1 Boric Acid Blender Outlet Sample Isol)

3.44 Remove tag and close:

☐ 1NV-808 (Unit 1 Boronometer Flush Supply Isol)
☐ 1NV-132 (Unit 1 Boronometer Outlet Isol)
☐ 1NV-1026 (Unit 1 Boronometer Inlet Isol)

_____ 3.45 **IF** 1A (1B) FWST Recirc Pump was stopped in Step 3.10, start one of the following:

_____ • 1A FWST Recirc Pump

OR

_____ • 1B FWST Recirc Pump

_____ 3.46 **IF** #1 FWST Pump was stopped in Step 3.11 **OR** 3.12, start #1 FWST Pump.

Attachment 1

FWST Makeup Data

Initial FWST Level _____ inches Date _____ Time _____

Final FWST Level _____ inches Date _____ Time _____

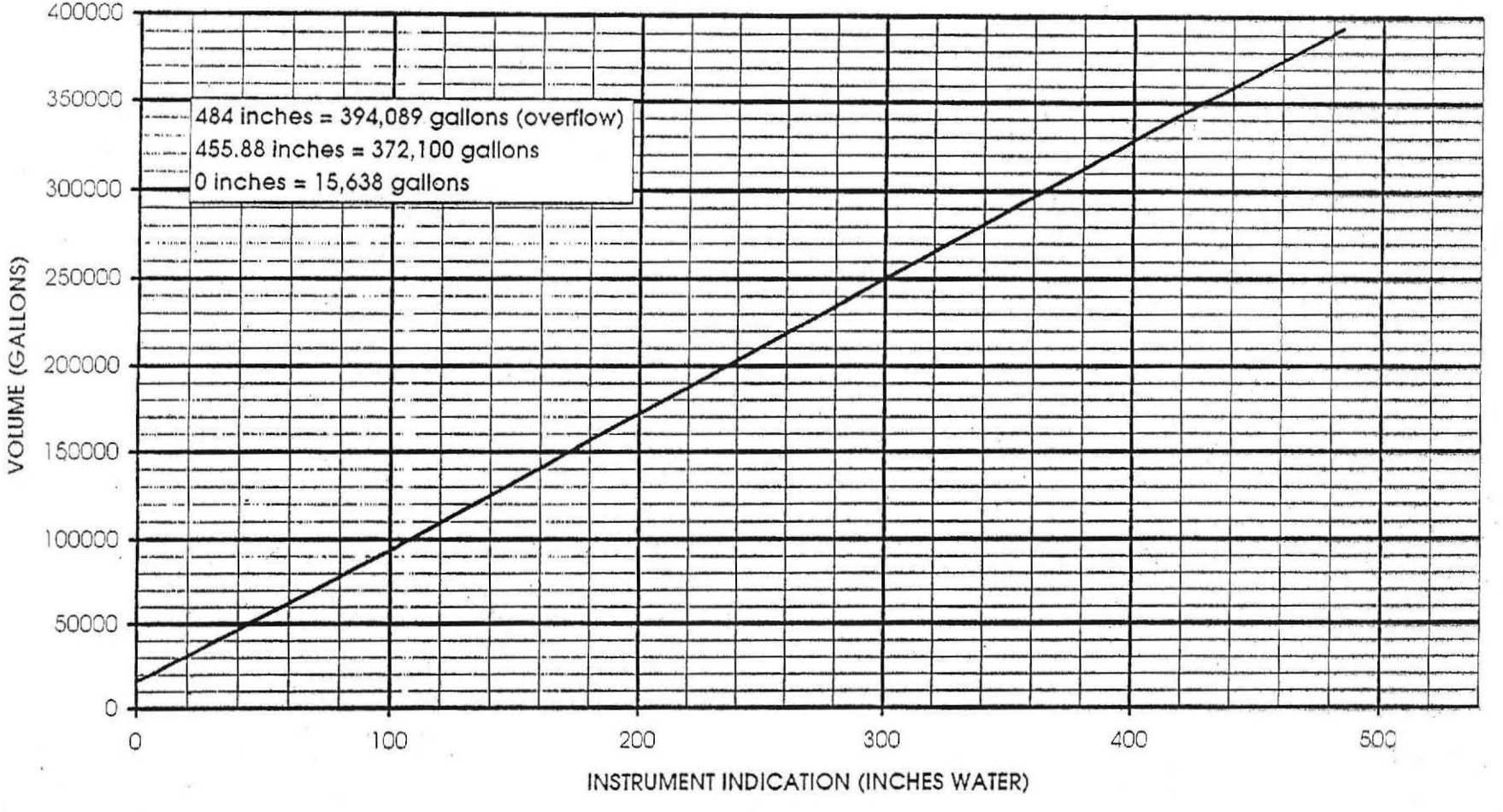
Data Collected By _____

End of Enclosure

V/6100/22
LOSURE 4.3

CURVE 7.7

REFUELING WATER STORAGE TANK LEVEL
(VOLUME vs. TANK LEVEL)



This data is also available on the OAC.

McGuire 1 Cycle 18 Core Operating Limits Report

2.14 Spent Fuel Pool Boron Concentration (TS 3.7.14)

2.14.1 Minimum boron concentration limit for the spent fuel pool. Applicable when fuel assemblies are stored in the spent fuel pool.

Parameter	Limit
Spent fuel pool minimum boron concentration.	2,675 ppm

2.15 Refueling Operations - Boron Concentration (TS 3.9.1)

2.15.1 Minimum boron concentration limit for the filled portions of the Reactor Coolant System, refueling canal, and refueling cavity for mode 6 conditions. The minimum boron concentration limit and plant refueling procedures ensure that the Keff of the core will remain within the mode 6 reactivity requirement of Keff $\leq$ 0.95.

Parameter	Limit
Minimum Boron concentration of the Reactor Coolant System, the refueling canal, and the refueling cavity.	2,675 ppm

16.9 AUXILIARY SYSTEMS

16.9.14 Borated Water Sources (Shutdown)

COMMITMENT One of the following borated water sources shall be OPERABLE:

a. A boric acid tank (BAT), or

b. The refueling water storage tank.

APPLICABILITY MODE 4 with any RCS cold leg temperature $\leq$ 300°F, MODES 5 and 6.

REMEDIAL ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Required borated water source inoperable.	A.1 Suspend CORE ALTERATIONS.	Immediately
	AND	
	A.2 Suspend positive reactivity additions.	Immediately

TESTING REQUIREMENTS

TEST	FREQUENCY
TR 16.9.14.1 Verify the refueling water storage tank solution temperature is $\geq$ 70°F when the outside air temperature is < 70°F.	24 hours
TR 16.9.14.2 Verify the boron concentration of the required borated water source is within the limits specified in the COLR.	7 days

(continued)

TESTING REQUIREMENTS (continued)

TEST	FREQUENCY
TR 16.9.14.3 Verify the borated water volume of the required borated water source is within the limits specified in the COLR.	7 days
TR 16.9.14.4 Verify the boric acid tank solution temperature is $\geq$ 65°F when the boric acid storage tank is a required source.	7 days

BASES

The borated water sources ensure that negative reactivity control is available during each mode of facility operation.

In Mode 4 with any RCS cold leg temperature below 300 °F. and in Modes 5 and 6, one borated water source is acceptable without single failure consideration on the basis of the stable reactivity condition of the reactor and the additional restrictions prohibiting core alterations and positive reactivity changes in the event the single borated water source becomes inoperable. The boration capability of one borated water source, in association with a flow path and charging pump, is sufficient to provide SDM of 1.3% delta k/k in Mode 4 and 1.0% delta k/k in Modes 5 and 6 after xenon decay and cooldown to 68° F.

The SLC commitment values are presented in the Core Operating Limits Report (COLR) as: (1) the minimum boron concentrations and minimum volumes necessary to attain and maintain SDM in the boric acid tank or the refueling water storage tank, (2) the minimum contained volumes in the boric acid tank or the refueling water storage tank, and (3) a curve specifying the minimum contained volume in the boric acid tank near EOC. The minimum contained water volume is based on the required volume to maintain shutdown margin, an allowance for water not available because of discharge line location and additional margin. The additional margin term includes allowances for instrument uncertainty, vortexing and a margin term consisting of at least 5% of the volume necessary for SDM. The COLR specified volumes and boron concentrations satisfy SDM requirements during Mode 4 with any RCS cold leg temperature below 300 °F and in Modes 5 and 6.

Boric Acid Tank Requirements for Maintaining SDM

Required volume for maintaining SDM	Presented in the COLR
Unusable volume (to maintain full suction pipe)	4,199 gallons
Additional margin	4,100 gallons

Refueling Water Storage Tank Requirements for Maintaining SDM

Required volume for maintaining SDM	Presented in the COLR
Unusable volume (to maintain full suction pipe)	16,000 gallons
Additional margin	23,500 gallons

BASES (continued)

The limits on contained water volume and boron concentration of the RWST also ensure a pH value of between 7.5 and 9.5 for the solution recirculated within containment after a LOCA. This pH band minimizes the evolution of iodine and minimizes the effect of chloride and caustic stress corrosion on mechanical systems and components.

REFERENCES

None

McGuire 1 Cycle 18 Core Operating Limits Report

2.16 Borated Water Source – Shutdown (SLC 16.9-14)

2.16.1 Volume and boron concentrations for the Boric Acid Tank (BAT) and the Refueling Water Storage Tank (RWST) during mode 4 with any RCS cold leg temperature $\leq$ 300 °F and modes 5 and 6.

Parameter	Limit
Boric Acid Tank minimum contained borated water volume	10,599 gallons 13.6% Level
Note: When cycle burnup is > 455 EFPD, Figure 6 may be used to determine the required BAT minimum level.	
Boric Acid Tank minimum boron concentration	7,000 ppm
Boric Acid Tank minimum water volume required to maintain SDM at 7,000 ppm	2,300 gallons
Refueling Water Storage Tank minimum contained borated water volume	47,700 gallons 41 inches
Refueling Water Storage Tank minimum boron concentration	2,675 ppm
Refueling Water Storage Tank minimum water volume required to maintain SDM at 2,675 ppm	8,200 gallons

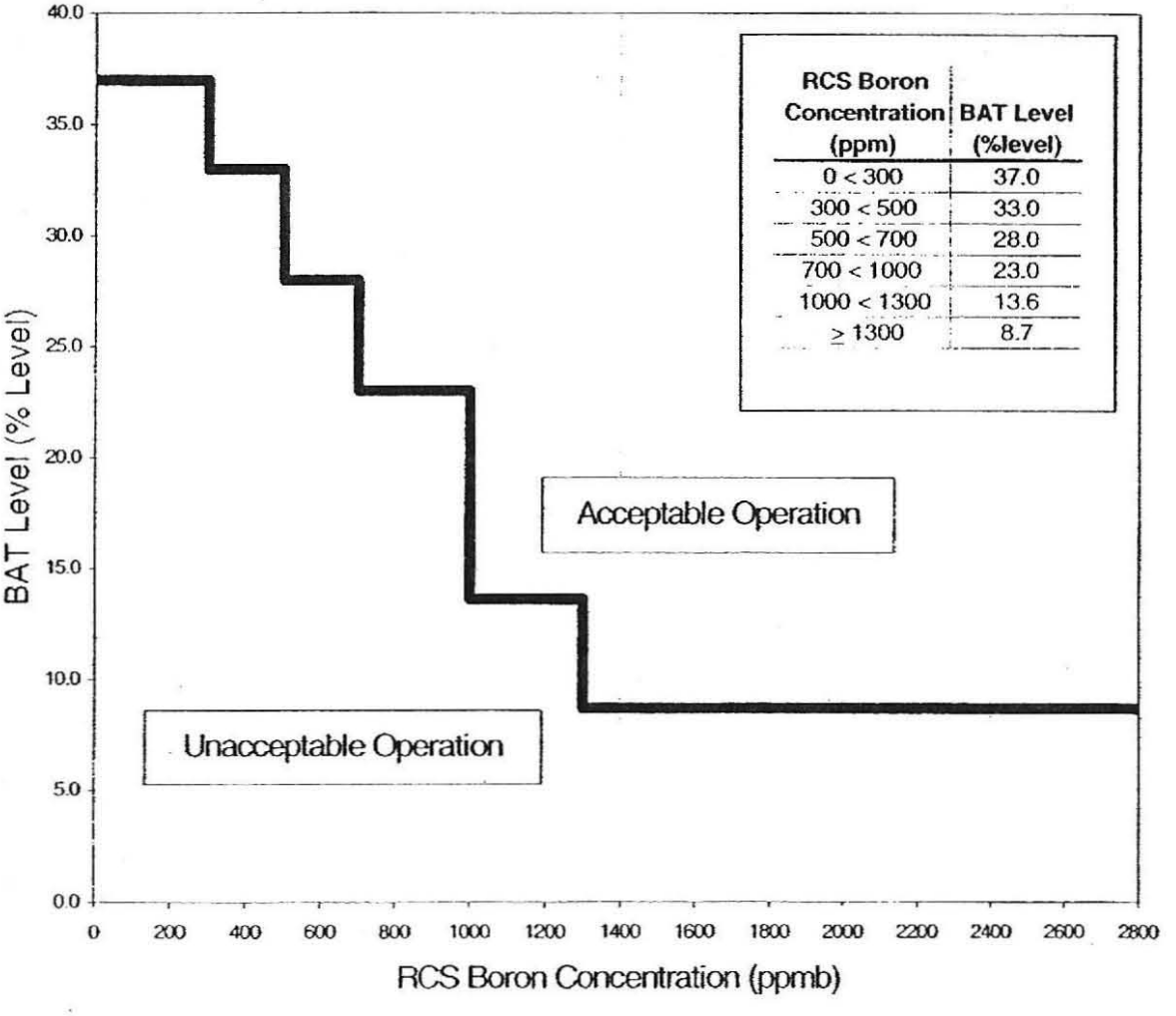
McGuire 1 Cycle 18 Core Operating Limits Report

Figure 6

Boric Acid Storage Tank Indicated Level Versus RCS Boron Concentration

(Valid When Cycle Burnup is > 455 EFPD)

This figure includes additional volumes listed in SLC 16.9-14 and 16.9-11



Reviewed By _____

Approved By _____

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

POSITION: **SRO**

Operator's Name_____

Location: **Control Room** Method: **Perform**

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/

References: OP/1/A/6100/22 (Rev. 475) Unit 1 Data Book
OMP 5-8 Attachments 12.6 and 12.7

JPM verified current with references by _____

Date __/__/

INITIAL CONDITIONS

The following conditions exist:

Unit #1 Reactor is in Mode 5 after being shutdown 9 days ago for a refueling outage. NC system is 114 degrees with "A" Train ND in service. NC System level is presently 140 inches. All S/G's have been drained for inspection. NC system sight glass has been placed in service and preparations are being made to lower NC system level to 65 inches to support reactor vessel head removal and entry into Mode 6 per OP/2/A/6100/SD-20 (Draining the NC System). LTOP requirements are being satisfied by removal of PZR Safety Valve 1NC-1. Containment Closure is in effect and Thermal Margin is 32 minutes.

You are the Control Room SRO on duty and as required by OP/1/A/6100/SD-20 (Draining the NC System) you are required to complete Attachment 12.6 of OMP 5-8 to determine the new thermal margin with NC system level at 65 inches and make the appropriate notifications.

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

For the conditions given, operator should use Unit 1 Data Book Enc. 4.3 Sect 2.10.1.B and determine the new Thermal Margin to be 30 Minutes.

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

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator is provided with a blank copy of OMP 5-8 Attachment 12.6, and a partially complete copy of Attachment 12.7.	Operator checks Unit One as the Applicable Unit on the top of Attachment 12.6		
*2	Operator determines that in order to calculate the new Thermal Margin U-1 Data Book, Enc 4.3, Section 2.10 must be used.	Operator utilizes the provided Copy of the U-1 Data Book and refers to Enc 4.3 Section 2.10.		
*3	Operator determines that from the Initial conditions given, Enclosure 4.3 Section 2.10.1.B Curve is to be used.	**U-1 Data Book Enc 4.3 – Section 2.10.1.B Loss of Decay Heat Removal with Water Level 60 inches above Hot Leg Centerline (Prior to Offload)**		
*4	Using Graph 2.10.1.B Operator determines the new thermal margin for the given conditions.	Operator determines the new Thermal margin from the graph to be = **30 Minutes (9 Days after S/D) (120 Deg Curve)**		

* **DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Operator Completes Step 1 of Attachment 12.6.	In Step 1 of Attach. 12.6 blank beside "Section/Curve Used" should be (**2.10.1.B**) and the performer's Initials filled in on the next line.		
*6	Per Step 2 of Attach. 12.6, Operator documents the Thermal Margin time and Maximum NC temperature allowed in the table at the bottom of the attachment.	In the first two columns, operator records present Date and Time. In the 3rd and 4th Columns Operator records: **30 minutes for the Thermal Margin** and **120 Deg for Max NC Temp.**		
*7	Operator performs Step 3 a. of Attach. 12.6 and records the new Thermal Margin time along with Support Conditions on Attach. 12.7.	Under the "Thermal Margin" Column operator records: **30** in the blank beside **TM Minutes**. Under "Support Conditions": **120** as the **Max NC Temp** **> 60** in the blank beside **NCS Level** Note: The rest of the blanks under "Support Conditions" can be		

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

* **DENOTES CRITICAL**

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

STOP TIME_____

INITIAL CONDITIONS

The following conditions exist:

Unit #1 Reactor is in Mode 5 after being shutdown 9 days ago for a refueling outage. NC system is 114 degrees with "A" Train ND in service. NC System level is presently 140 inches. All S/G's have been drained for inspection. NC system sight glass has been placed in service and preparations are being made to lower NC system level to 65 inches to support reactor vessel head removal and entry into Mode 6 per OP/2/A/6100/SD-20 (Draining the NC System). LTOP requirements are being satisfied by removal of PZR Safety Valve 1NC-1. Containment Closure is in effect and Thermal Margin is 32 minutes.

You are the Control Room SRO on duty and as required by OP/1/A/6100/SD-20 (Draining the NC System) you are required to complete Attachment 12.6 of OMP 5-8 to determine the new thermal margin with NC system level at 65 inches and make the appropriate notifications.

Attachment 12.6
Thermal Margin Determination

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

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

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

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

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

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

3) Communicate thermal margin as follows:

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

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

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

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

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

End of Attachment

Attachment 12.7 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 (SSCs), table is intended to track the individual and/or position responsible for supporting the in the field restoration of the SSCs during a loss of decay heat removal as directed by AP-19.

SSC column - document particular SSC to be restored; example could be "1A NV Pump"

Action column - document 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"

Responsibility column - document the responsible position or individual who will perform the action: example would be "Unit 1 Aux Building Rounds"

Communication column - document 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 65" **Date** 12/21/06 **Time** 1030 **OWPG Staff** F. Kirk **Desired NC Temp** 115° **Date** 12/21/06 **Time** 1030 **OWPG Staff** F. Kirk	**(Should include D/G, NV Pump, BAT Pump, NI Pump, ND Pump, KC Pumps, RN Pump, KF Pump)** **Circle selected Train:** (A) (B)	**(Notify CCC/STA when changed)** **TM Minutes** _____ **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 INC-1 • 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

* ANSWER KEY *

Attachment 12.6
Thermal Margin Determination

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

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

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

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

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

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

3) Communicate thermal margin as follows:

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

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

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

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

				INITIAL COMPLETION OF ITEMS BELOW			
Date	Time	Thermal Margin MIN.	Max NC Temp °F	Thermal Margin Data Written on Shutdown Assessment/Status (Attachment 12.7)	Thermal Margin Time Written on MC-6	CCC Notified	STA Notified
Present Date	Present Time	30	120	*	*	*	*

End of Attachment

* → Red Ink represents information to be filled in by trainee.
* → Initials of Trainee

SHUTDOWN ASSESSMENT/STATUS					
	Protected Train	**Thermal Margin**	**Large Vent Path**	**LTOP Vent Path (Select 1)**	**Gravity Fill Vent Path (Select 1)**
Desired NC Level 65" **Date** 12/21/06 **Time** 1030 **OWPG Staff** F. Kirk **Desired NC Temp** 115°F **Date** 12/21/06 **Time** 1030 **OWPG Staff** F. Kirk	**(Should include D/G, NV Pump, BAT Pump, NI Pump, ND Pump, KC Pumps, RN Pump, KF Pump)** **Circle selected Train:** (A) (B)	**(Notify CCC/STA when changed)** **TM Minutes** 30 **Support Conditions** **Max NC Temp** 120 **S/G Level(s)** N/A **NCS Level** >60" **Refuel Cavity Lvl** N/A	**Required prior to installing any S/G nozzle dam (N-D)** **Requirements (Select 1):** • HL manway/diaphragm removed with HL N-D out (same S/G A,B,C,D) • CL manway/diaphragm removed with HL N-D out (same S/G A, B, D) • Rx Vessel Head removed **S/G Location (circle):** **A B C D**	• NC-32/34 operable • Pzr Safety out INC-1 • Pzr PORV Gagged _____ • Pzr PORV out ____ • Other (specify) _____ _____ _____	• Same as Large Vent Path • Other per Data Book (specify) _____ _____ _____ _____ _____

Restoration of Available SSCs

SSC	Action	Responsibility	Communication

End of Attachment

* → Blue ink represents provided information.

* → To be filled in by trainee.

Attachment 12.7 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 (SSCs), table is intended to track the individual and/or position responsible for supporting the in the field restoration of the SSCs during a loss of decay heat removal as directed by AP-19.

SSC column - document particular SSC to be restored; example could be "1A NV Pump"

Action column - document 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"

Responsibility column - document the responsible position or individual who will perform the action: example would be "Unit 1 Aux Building Rounds"

Communication column - document 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.

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.

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.

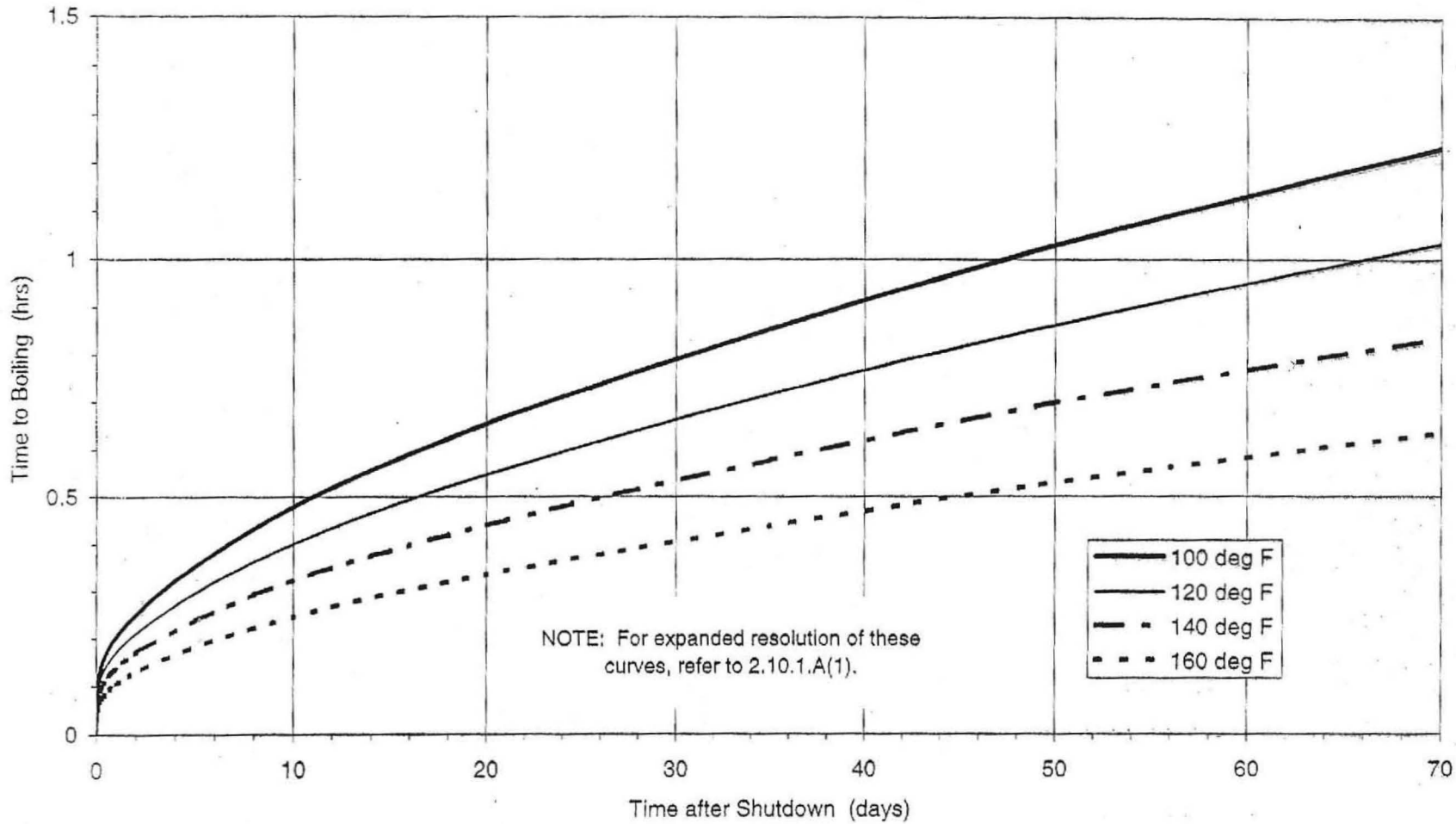
III. References

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

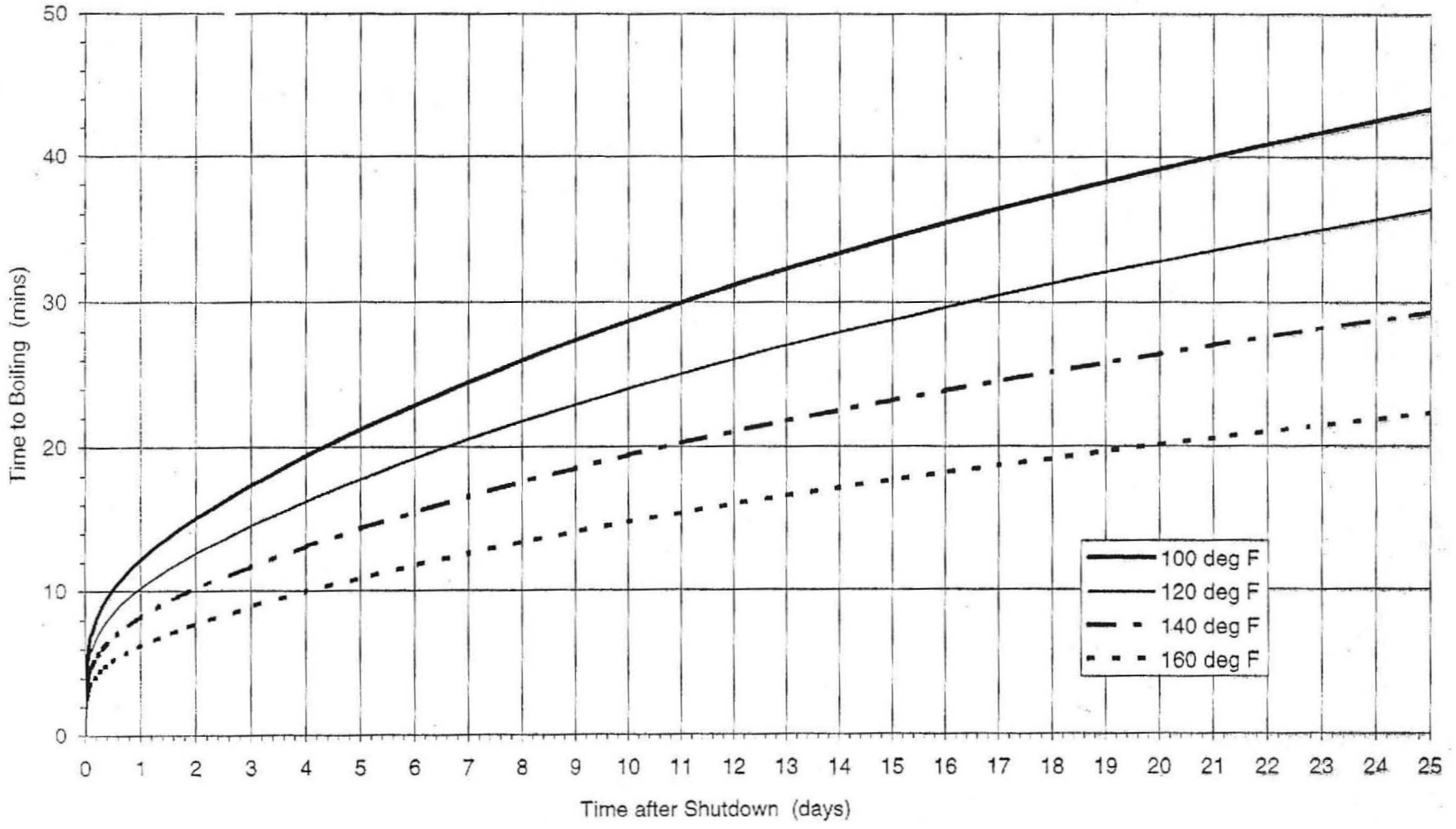
B. DPC-1552.08-00-0051, Decay Heat for Mark-BW and OFA Fuel Types

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

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

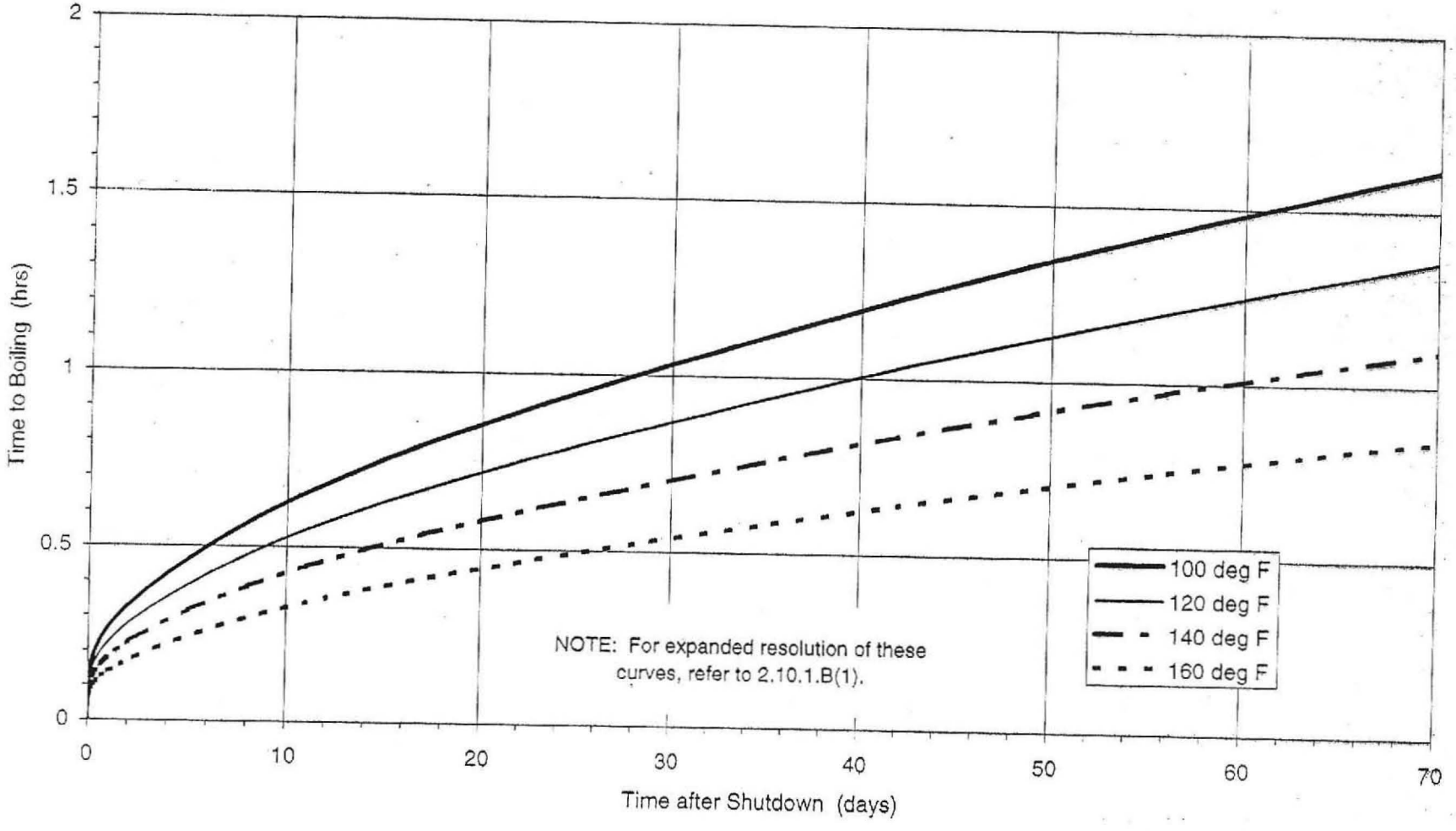


Loss of Decay Heat Removal with Water Level 9" Above Hot Leg Centerline (Prior to Offload)

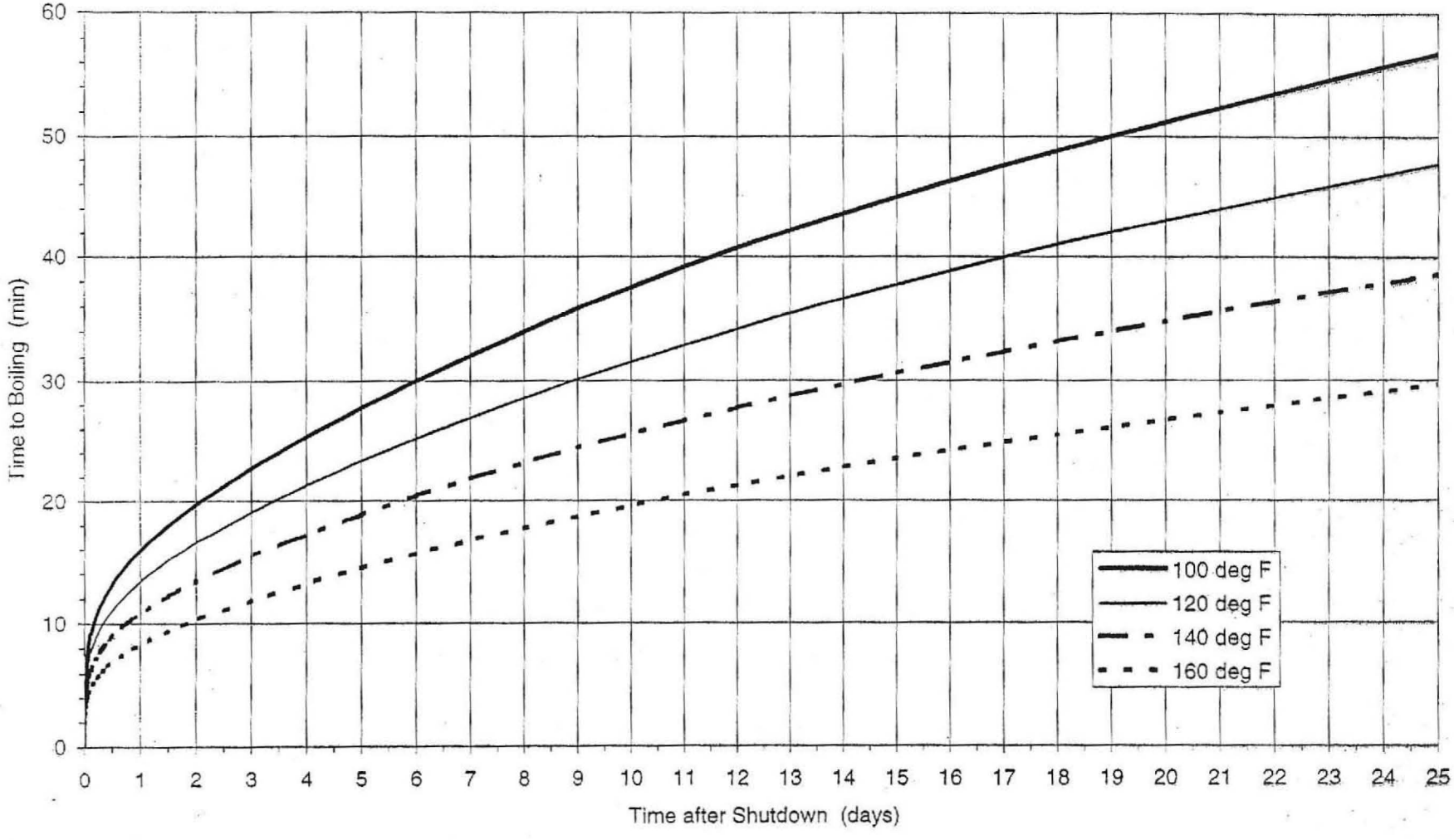


Enclosure 4.3 - Section 2.10.1.B

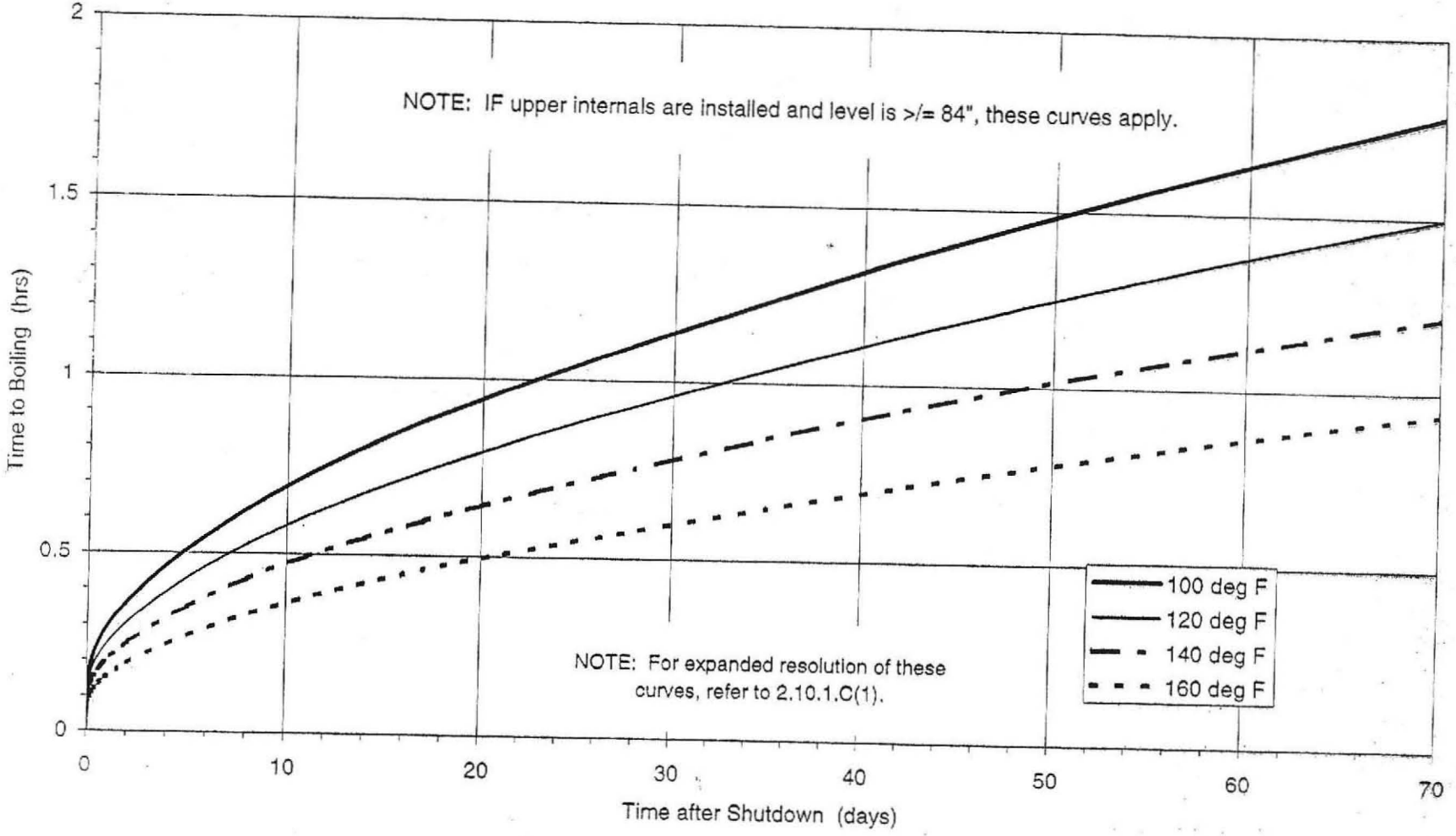
Loss of Decay Heat Removal
with Water Level 60" Above Hot Leg Centerline
(Prior to Offload)



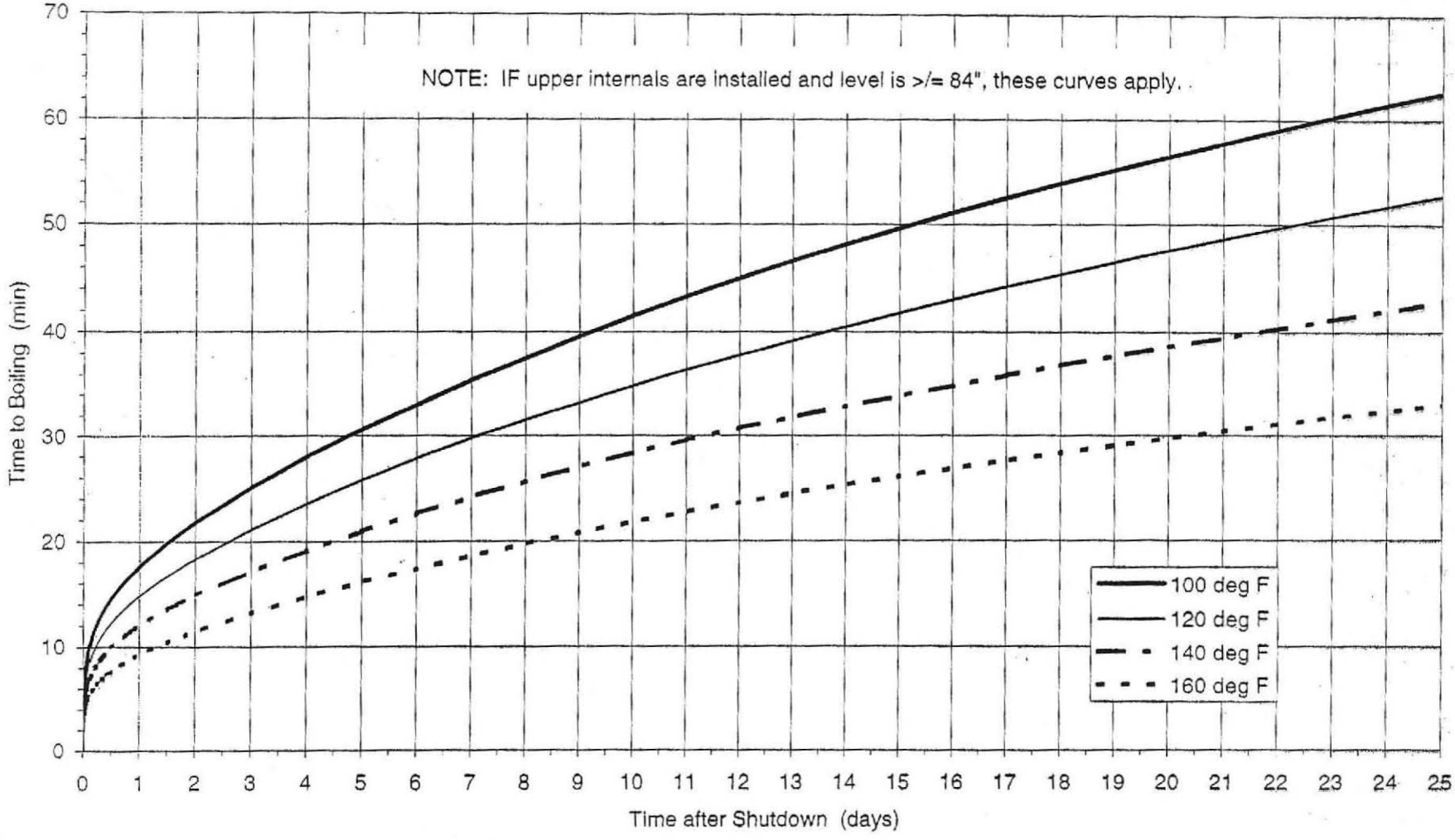
Loss of Decay Heat Removal with Water Level 60" Above Hot Leg Centerline (Prior to Offload)



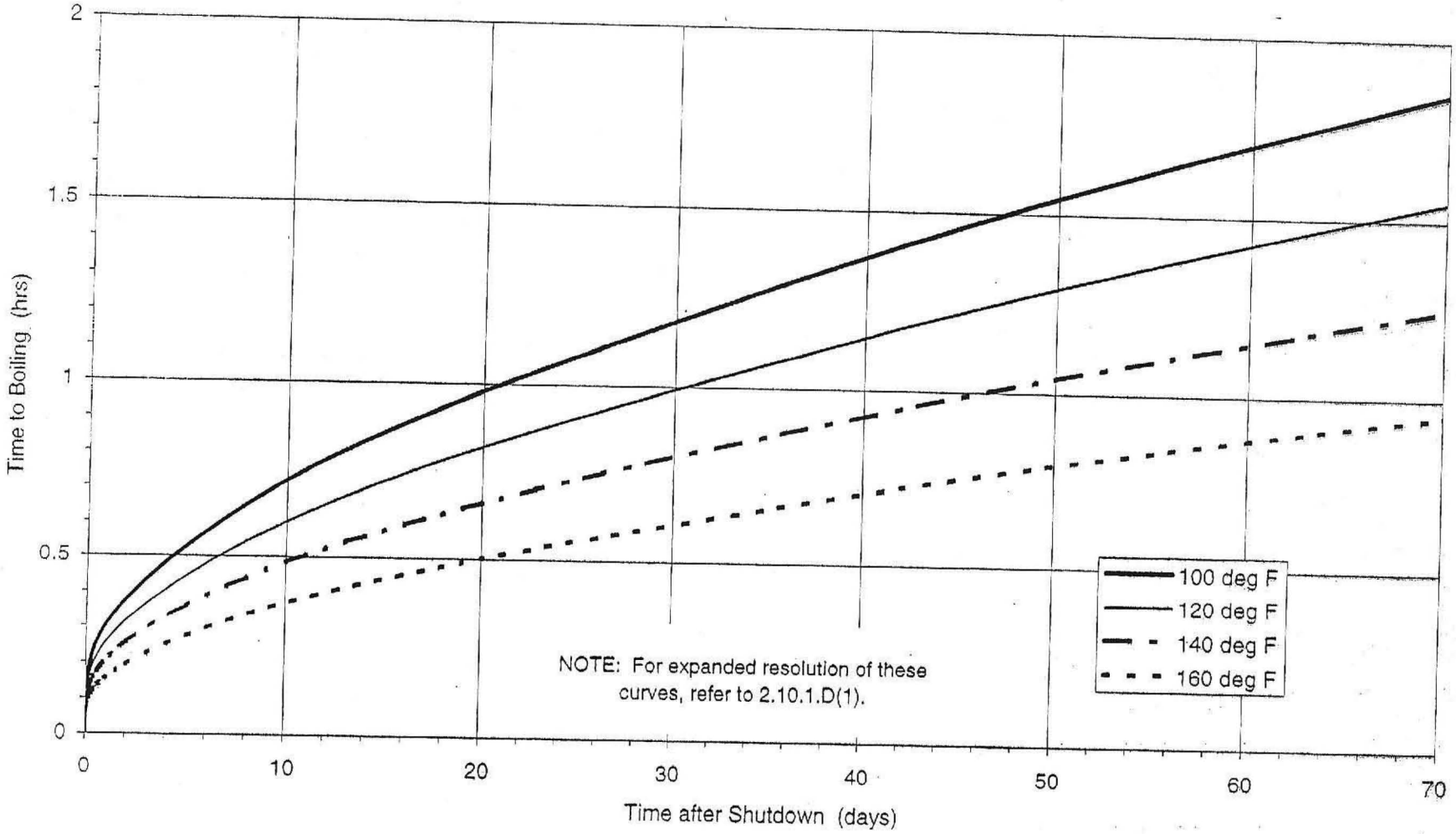
Loss of Decay Heat Removal with Water Level 84" Above Hot Leg Centerline (Prior to Offload)



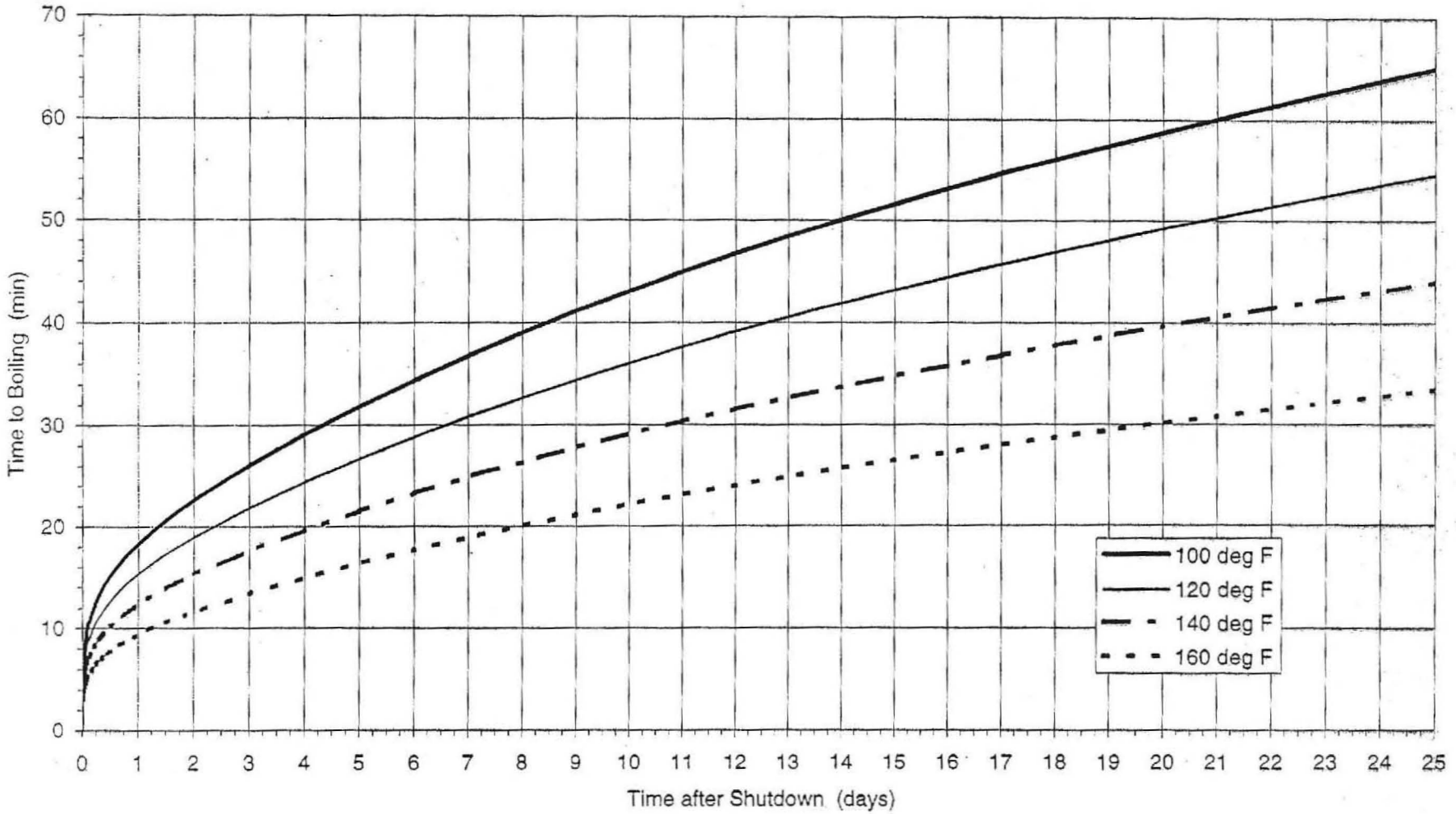
Loss of Decay Heat Removal with Water Level 84" Above Hot Leg Centerline (Prior to Offload)



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

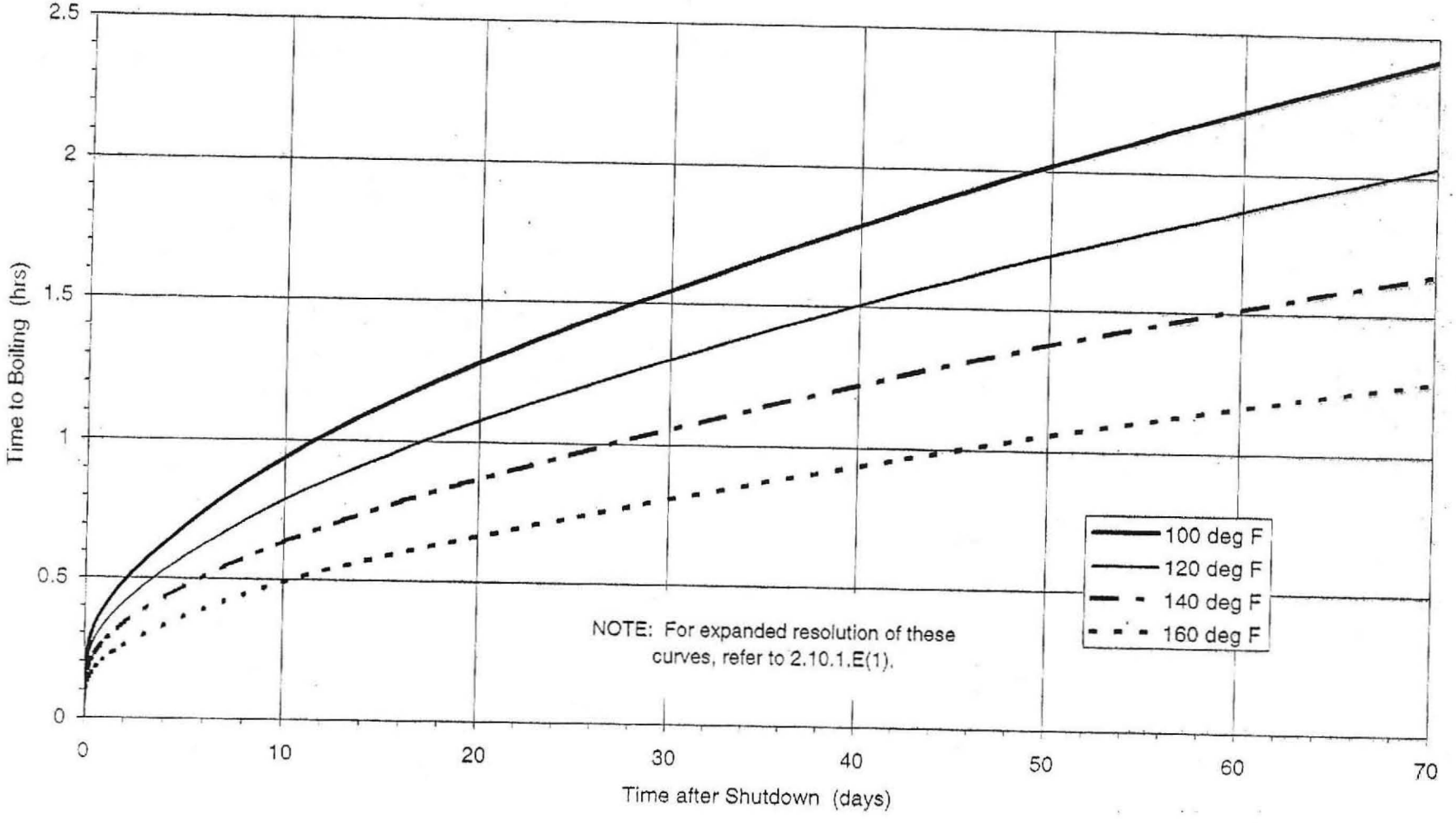


Loss of Decay Heat Removal with Water Level 9" Above Hot Leg Centerline (After Reload)

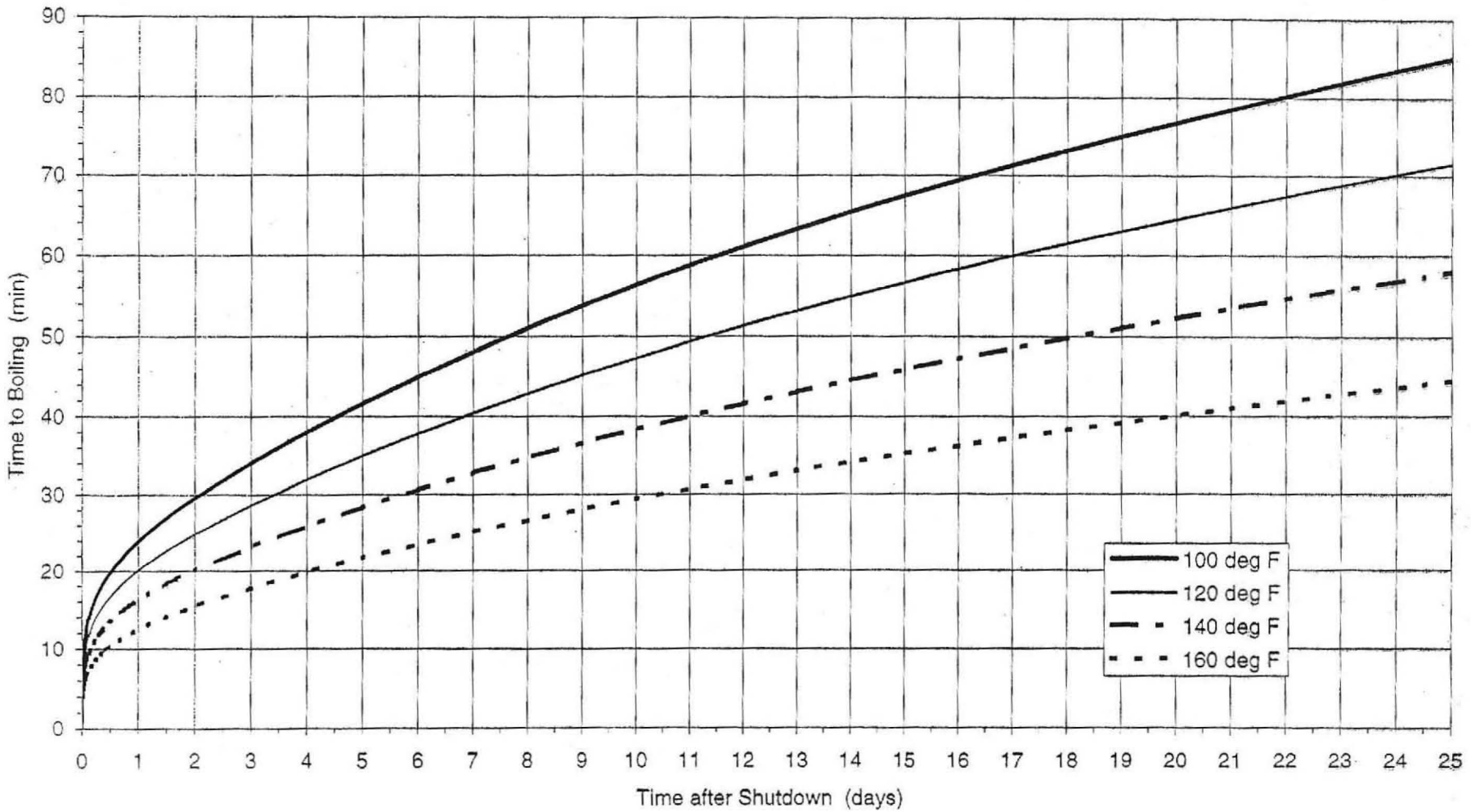


Enclosure 4.3 - Section 2.10.1.E

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

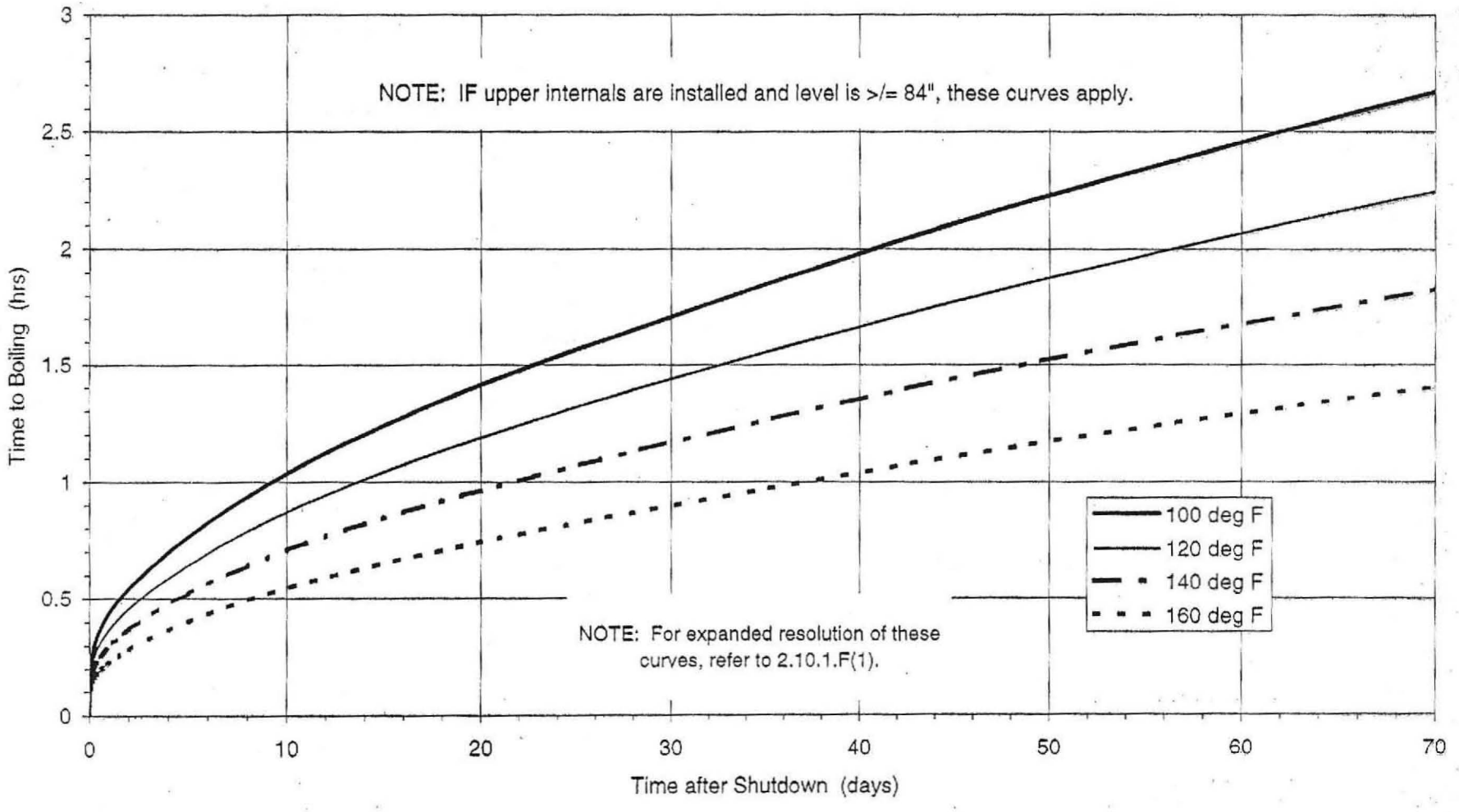


Loss of Decay Heat Removal with Water Level 60" Above Hot Leg Centerline (After Reload)

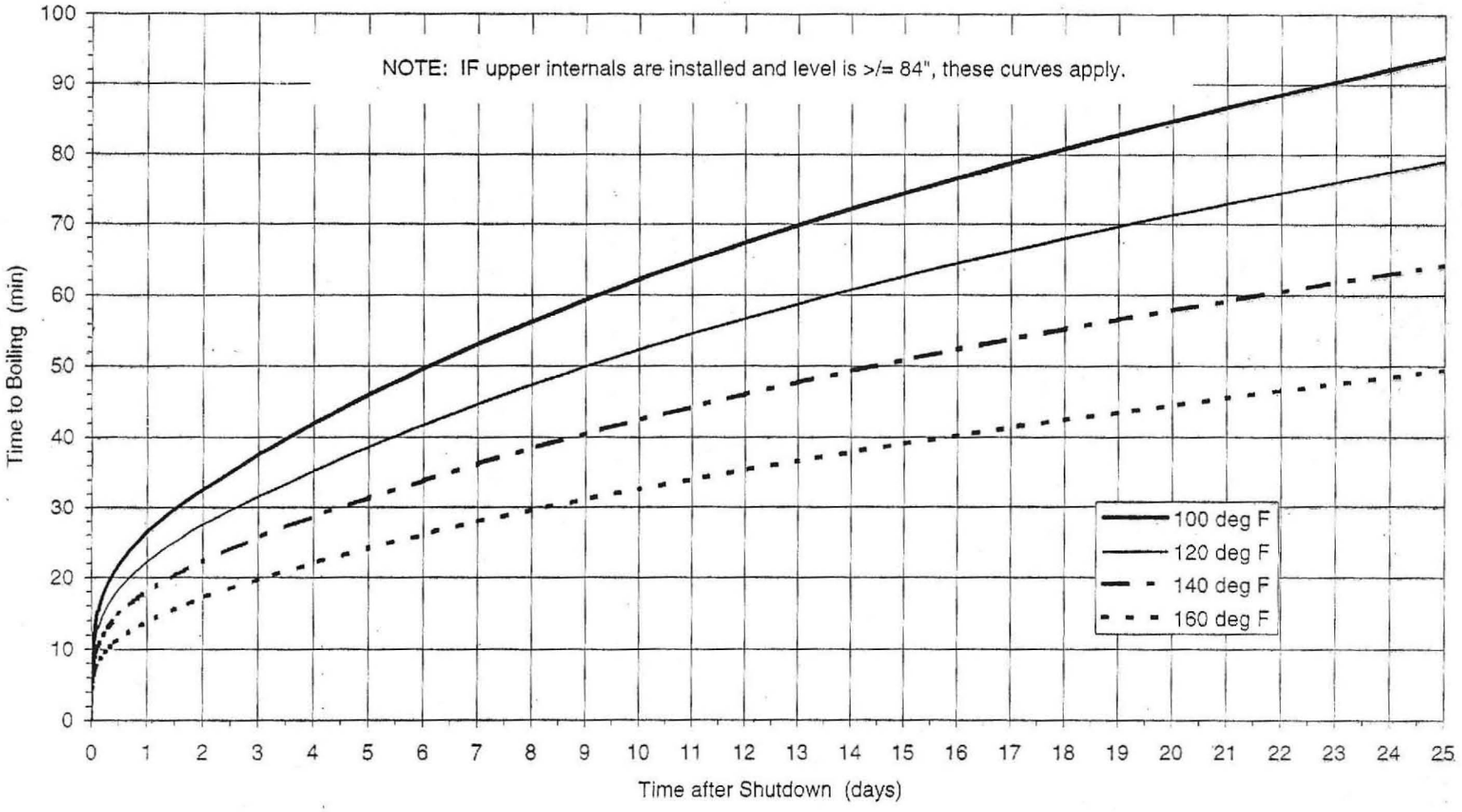


Enclosure 4.3 - Section 2.10.1.F

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



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

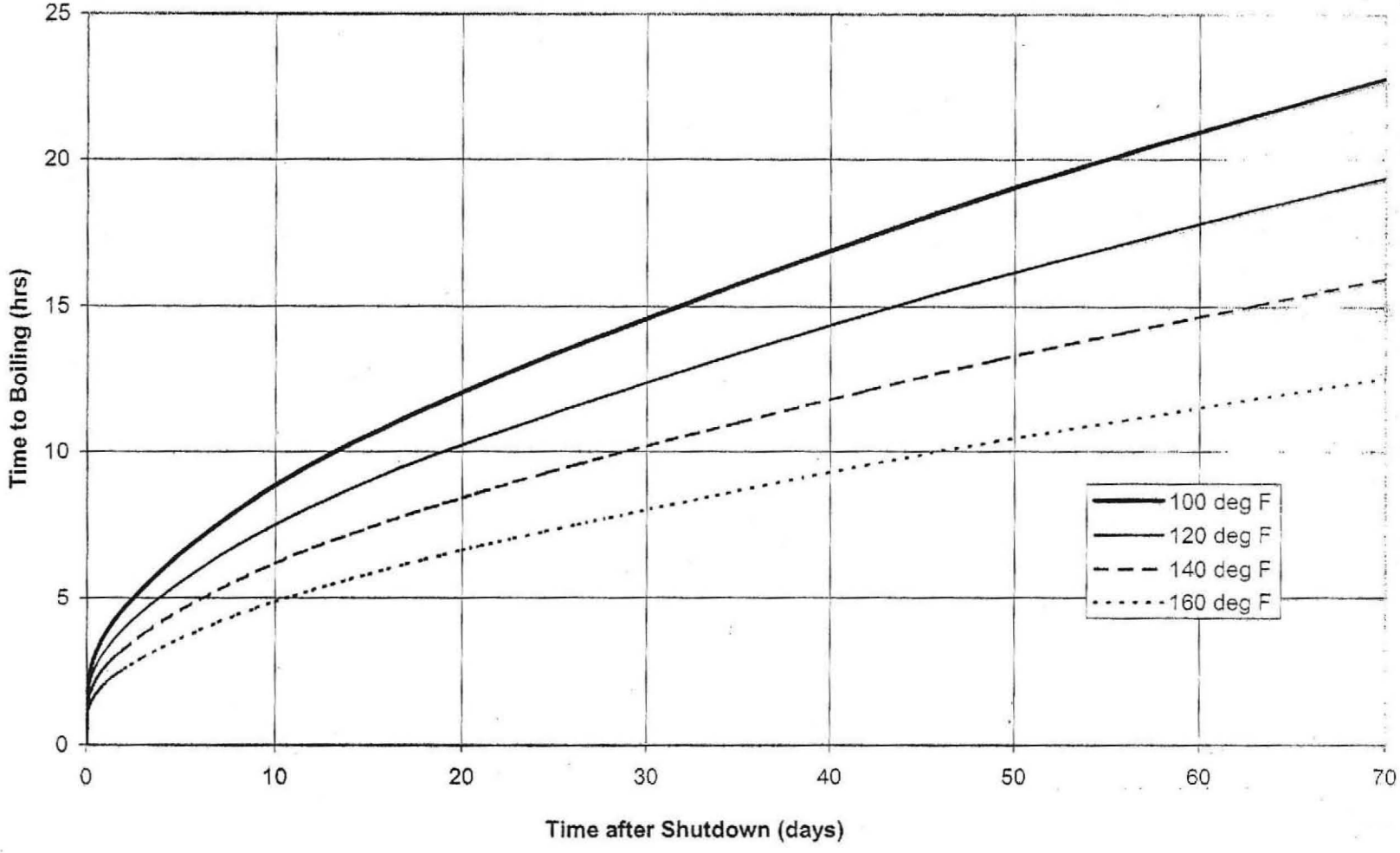
B. DPC-1552.08-00-0051, Decay Heat for Mark-BW and OFA Fuel Types

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

UNIT 1

Enclosure 4.3 - Section 2.10.2.A

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

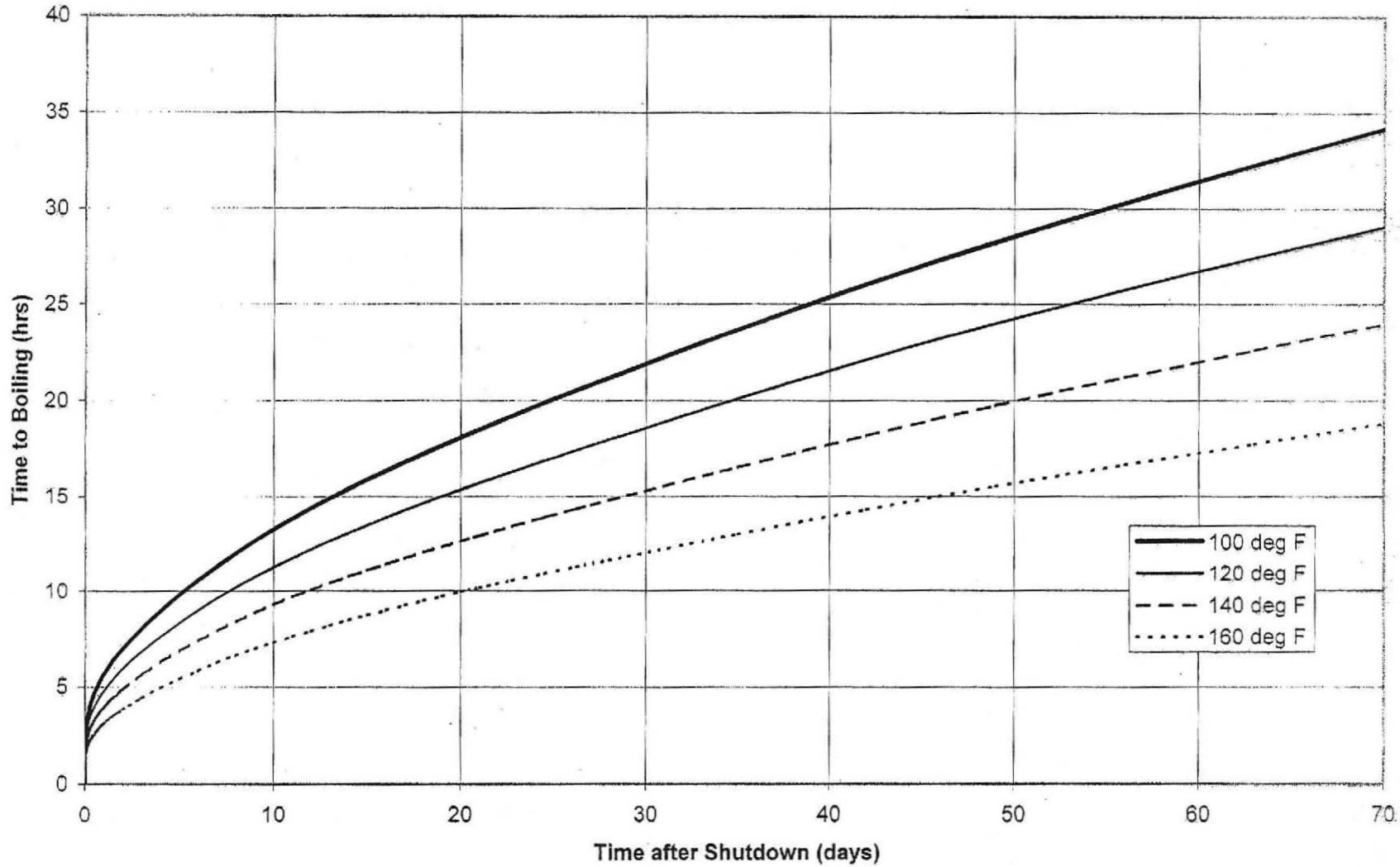


UNIT 1

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 ºF 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.

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)

THERMAL MARGIN FOR LOOPS FILLED CONDITION WITH 2 STEAM GENERATORS

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

1) Greater than 18 hours have elapsed since entry into Mode 3.

2) NC System temperature is less than 250°F.

3) A maximum of 2 NC pumps are 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 <u>two</u> Steam Generator PORVs, with both S/G levels at ≥ 68% wide range. ("A", "B" and/or "D" Steam Generator preferred)

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.

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.

See Section 2.10.3 for discussion of "C" Steam Generator voiding concerns.

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:

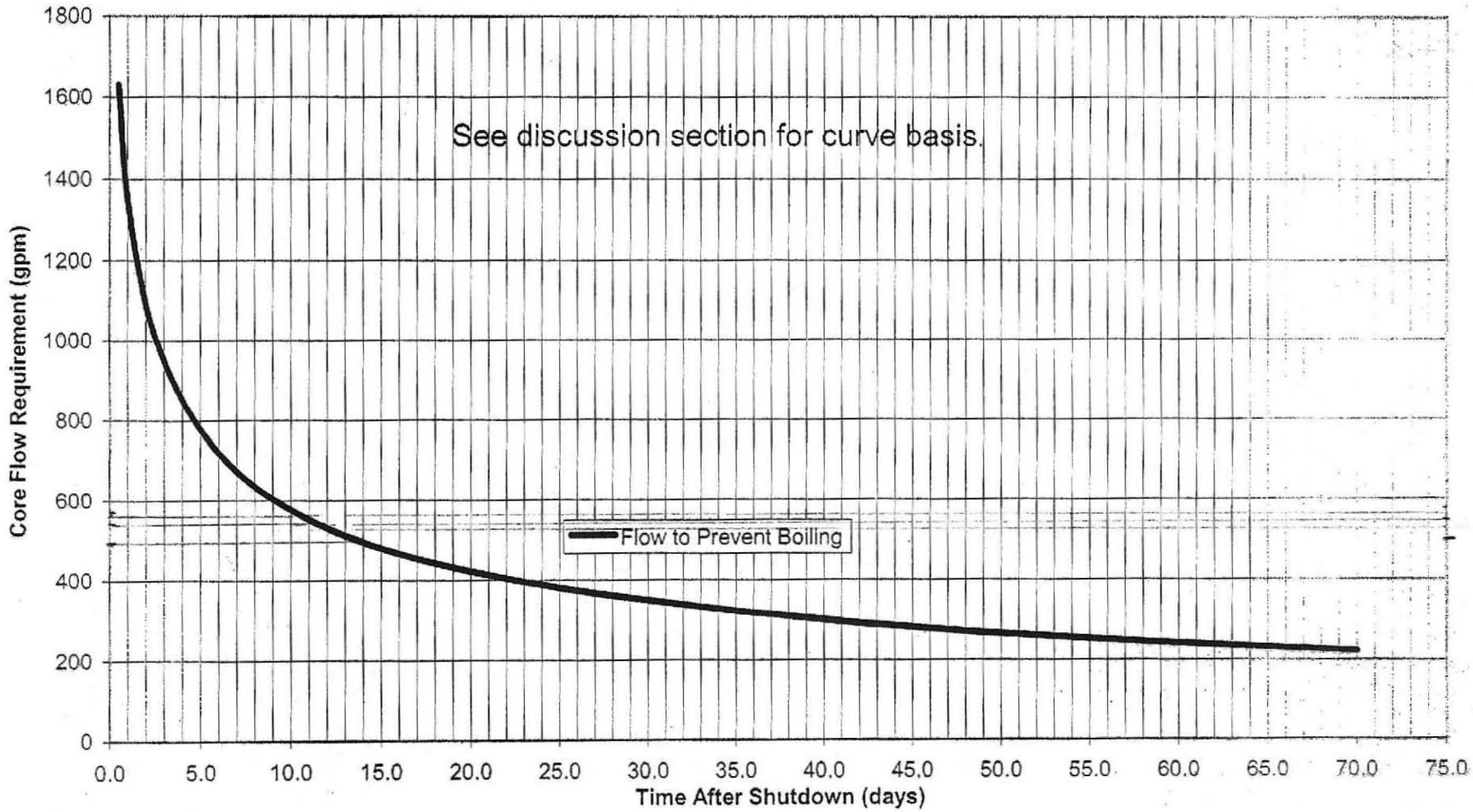
The NC system is capable of natural circulation due to the heat source (the core) being physically lower than the heat sink (the steam generators), assuming that the NC system be intact. Natural circulation is that flow generated by the density difference between the NC hot leg and cooled cold return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

UNIT 1
OP/1/A/6100/22
ENCLOSURE 4.3
SECTION 2.10.4

Core Flow Required to Prevent Boiling for Loss of Decay Heat Removal



Detailed Discussion of Development and Application of Section 2.10.4

Section 2.10.4 contains a graph of Core Flow Required to Prevent Boiling for Loss of Decay Heat Removal. The supporting calculations for this graph are in DPC-1552.08-00-0143, *Upper Internals Spray Nozzle Flow Capability During A Loss of Decay Heat Removal Event.* Detailed calculations to determine the point at which required core flow to prevent boiling can be met by the circulation available through the upper internal nozzles have not been developed.

Therefore, the thermal margin values in 2.10.2 are non-conservative when the upper internals are installed, and thus do not apply. For conservatism, anytime upper internals are installed, no credit can be taken for water level greater than 84", and the appropriate curves from Section 2.10.1 should be used.

The results presented in the thermal margin curves for section 2.10.1 are not affected by this analysis. However, the presence of the upper internals coupled with the heat loads at times near shutdown may lead to localized core voiding. If decay heat removal capability (forced flow) were lost, the limited flow past the upper internals nozzles (with the normal configuration of a vented RCS) could lead to rapid voiding in the top of the core even with water level above the upper internals. In addition, the core flow requirements for mitigation of core boiling are based on forced flow required to dissipate decay heat with no allowances for recovery of core volume. The flow requirement presented in the graph are valid for mitigation of boiling for a pre-refueling core. This information should be used in conjunction with 2.10.1 and 2.10.2 to ensure appropriate contingencies are planned to mitigate core boiling in the event of a loss of decay heat removal capability.

For AP/EP use:

1. ***This curve specifically addresses the condition of a vented reactor coolant system.***
2. ***The makeup flow to the NC system is assumed to be at 140 °F.***
3. ***To ensure adequate makeup flow for inlet temperatures approaching saturation, multiply the flow requirements of this graph by 1.10.***
4. ***This curve assumes atmospheric pressure, any application for RCS pressures > 14.7 psig could result in a non-conservative flowrate.***
5. ***SAMG Calculation Aids requirements for makeup flow may also be helpful.***

References:

1. DPC-1552.08-00-0143, *Upper Internals Spray Nozzle Flow Capability During A Loss of Decay Heat Removal Event*
2. WOG DW-95-23

Duke Power Company McGuire Nuclear Station **Shift Supervision Turnovers**	Procedure No. **OMP 5-8**
	Revision No. **032**
Information Use	Electronic Reference No. **MP0070O4**

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ISSUED

Revision History (significant issues, limited to one page)
Rev 032 (05/03/06) Delete info in Steps 10.1.2 and 10.2.1 concerning Control Room Supervisor Turnover Checklist.
Rev 031 (03/20/06) • On Attachment 12.1, Footnote 4, changed ....through 6 to read ....through 4. • Made minor formatting and editorial changes.
Rev 030 (09/25/05) Divided Control Room Turnover Checklist into 4 Tables.
Rev 029 (08/29/05) Made changes to Attachment 2 and 3 due to AFIs from Assessment No. OPS-SA04-14. PIP M-04-5693
Rev 028 (03/11/05) Changed Attachment 1 data to match OAC data.
Rev 027 (03/09/05) Changed Attachment 1, Section IV Page 4 of 8 to avoid conflicting responsibilities.
Rev 026 (01/11/05) • Changed Attachment 1, 2 & 3 to specify TSAIL Turnover Report (No Details). • Added reason to Note 1 in Attach. 5.
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.

Shift Supervision Turnovers

1. Purpose

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

2. References

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 OPS Shift Manager (OSM) or OSM 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 PIPs 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 oncoming OSM as soon as possible. At a minimum the following PIP information shall be reviewed:

- Plant System
- Brief Problem Description
- Detailed Problem Description
- Immediate Corrective Action

4.1.4 Shall review all pertinent Operating Experience with the oncoming 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 12.1 (Control Room Supervisor Turnover Checklist) is responsible for verifying current qualifications per the ERO Database Access List.

5. Succession Plan

5.1 **IF** the 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 12.1, 12.2, 12.3, and 12.4 shall be completed.

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 OSM 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 12.7 (Shutdown Assessment/Status).

9.2 The Control Room Supervisor shall ensure Attachment 12.7 (Shutdown Assessment/Status) 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 12.5 (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 12.6 (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. 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, Section VII of the turnover checklist shall be reviewed.

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

10.1.5 The relieving Supervisor shall complete Section VIII of the Control Room Supervisor 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. 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, 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 (Attachment 12.1) shall be routed to Master File.

11.2 The Plant Supervisor (Attachment 12.2) and WCC Supervisor Turnover Checklists (Attachment 12.3) may be discarded.

12. Attachments

12.1 Control Room Supervisor Turnover Checklist

12.2 Plant Supervisor Turnover Checklist

12.3 Work Control Center Supervisor Turnover Checklist

12.4 OSM Turnover Guide

12.5 NC System Emergency Make-up Sources

12.6 Thermal Margin Determination

12.7 Shutdown Assessment/Status

End of Body

Attachment 12.1
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. TSAIL Turnover Report (No Details)	_____	_____
2. Status of Unit 1 and 2 ESF Monitor Light Panels	_____	_____
3. Shutdown Assessment/ Status (Attachment 12.7) (required in Modes 4, 5 and 6)		
Unit 1	_____	_____
Unit 2	_____	_____
4. NC System Emergency Make-up Sources (Attachment 12.5) (required in Modes 4, 5 and 6 while ND in service)		
Unit 1	_____	_____
Unit 2	_____	_____
5. Thermal Margin Determination (Attachment 12.6) (required in Modes 5 and 6)		
Unit 1	_____	_____
Unit 2	_____	_____
6. Applicable Complex and/or Significant Risk Plans		
Unit 1	_____	_____
Unit 2	_____	_____
7. Outstanding Red Tag Parameters	_____	_____

B.

The following documents are reviewed and signed; one column should be checked and one NA.

		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) [1]	
3. Control Room Supervisor (Active SRO)	
4. Offsite Communicator (SRO) [2]	
5. Plant SRO	
6. Second Active SRO [3]	
7. Reactor Operators (RO)	
Unit 1 ROATC	
Unit 1 BOP	
Unit 2 ROATC	
Unit 2 BOP	
8. Non-Licensed Operators (NLO)	
Unit 1	
Unit 2	
Designated SSF Operator	
9. SLC Required Fire Brigade [4]	
A. Leader (RO or SRO)	A.
B. Brigade Members	B1.
	B2.
	B3.
[5]	B4.
10. Supplemental Fire Brigade [6]	1.
(Not SLC Related) [6]	2.
[5]	3.

---

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

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

[3] The Second Active SRO must be an Active SRO who is **NOT** serving as the OSM, CR Supervisor, or STA.

[4] A 5 member fire brigade must be onsite at all times. None of the minimum shift crew composition from positions 1 through 4 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.

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

[6] Can be responsible for closing Containment Air Locks while Containment Closure is in effect. NO other minimum Shift Crew composition positions can be responsible for Containment Closure.

V. Unit 1 & 2 - 1.47 Byp Panels:

(Unit 1) 1A

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
TD CA Pump Train 1A Byp	NC Pzr Relief 1A Byp	S/I 1A Not Available	NI Accum 1A Not Available	NI CHG 1A Not Available	Ice Cond AHU Gly Isol 1A Byp	KF 1A Byp
ND 1A Byp	RN 1A Byp	KC 1A Byp	NV 1A Byp		NS 1A Byp	VC-YC A Byp
FWST LVL Inst Chan 1 Byp	FWST LVL Inst Chan 2 Byp	FWST LVL Inst Chan 4 Byp	WZ 1A Byp		WN 1A Byp	

(Unit 1) 1B

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 1B Byp	NC Pzr Relief 1B Byp	S/I 1B Not Available	NI Accum 1B Not Available	NI CHG 1B Not Available	Ice Cond AHU Gly Isol 1B Byp	KF 1B Byp
ND 1B Byp	RN 1B Byp	KC 1B Byp	NV 1B Byp		NS 1B Byp	VC-YC B Byp
WZ 1B Byp	WN 1B Byp					

(Unit 2) 2A

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
TD CA Pump Train 2A Byp	NC Pzr Relief 2A Byp	S/I 2A Not Available	NI Accum 2A Not Available	NI CHG 2A Not Available	Ice Cond AHU Gly Isol 2A Byp	KF 2A Byp
ND 2A Byp	RN 2A Byp	KC 2A Byp	NV 2A Byp		NS 2A Byp	
FWST LVL Inst Chan 1 Byp	FWST LVL Inst Chan 2 Byp	FWST LVL Inst Chan 4 Byp		WN 2A Byp		

(Unit 2) 2B

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 2B Byp	NC Pzr Relief 2B Byp	S/I 2B Not Available	NI Accum 2B Not Available	NI CHG 2B Not Available	Ice Cond AHU Gly Isol 2B Byp	KF 2B Byp
ND 2B Byp	RN 2B Byp	KC 2B Byp	NV 2B Byp		NS 2B Byp	
	WN 2B Byp					

NOTE: The Control Room Supervisor <u>being relieved</u> 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 Room Supervisor (being relieved) Initial _____

Control Room 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, Pre and Post-Job Briefings.)

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

Attachment 12.2
Plant Supervisor Turnover Checklist

DATE / TIME_____

Review the following with relief:

1. Worklist
2. TSAIL Turnover Report (No Details)
3. Fire Impairments (eFIL report)
4. Work Orders to be performed by OPS
5. 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 effect
3. Fuel movement in progress
4. Defense in Depth report
5. Outage CAT sheet

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

1. Special Orders, Operability Evaluations, Engineering Guidance, Immediate Training, Operationally Significant Temp Mods

End of Attachment

Attachment 12.3
Work Control Center Supervisor Turnover Checklist

DATE / TIME _____

Review the following with relief:

1. PRA Activity Report
2. Worklist
3. TSAIL Turnover Report (No Details)
4. Work Orders to be performed by OPS
5. Outstanding OPs and PTs
6. Fire Impairments (eFIL report)
7. Tags Lifted for Testing
8. Status of Work Order Sign-On Folders
9. 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 effect
4. Fuel Handling in progress
5. Outage CAT sheet

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. Special Orders, Operability Evaluations, Engineering Guidance, Immediate Training, Operationally Significant Temp Mods

* 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 (Station Log) 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 12.5
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. With a cold leg opening, need capability to make-up to hot legs. In a feed and bleed/boil scenario, injection into hot legs may be more effective in maintaining vessel level than injecting into cold legs with opening.

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

Prepared By: R. P. Weaver

Reviewed By: T K Poteat

Approved By: Alan Orton

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

POSITION: **SRO**

Operator's Name_____

Location: **Plant C/R** Method: **Walkthrough**

Estimated JPM Completion Time: 10 Minutes

Actual JPM Completion Time: _____ Minutes

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/__

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

JPM verified current with references by _____

Date __/__/__

Rev. 00/04/27/06

INITIAL CONDITIONS

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

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

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

NOTES:

KA: 2.2.25

START TIME_____

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

STOP TIME_____

* **DENOTES CRITICAL**

INITIAL CONDITIONS

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

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

16.9 AUXILIARY SYSTEMS

16.9.6 Fire Detection Instrumentation

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

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

REMEDIAL ACTIONS

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

(continued)

REMEDIAL ACTIONS (continued)

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

TESTING REQUIREMENTS

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

(continued)

TESTING REQUIREMENTS (continued)

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

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

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

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

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

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

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

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

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

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

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

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

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

TABLE 16.9.6-1

FIRE DETECTION INSTRUMENTATION[1]

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

NOTES:

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

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

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

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

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

BASES

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

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

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

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

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

REFERENCES

1. McGuire Nuclear Station UFSAR, Chapter 9.5.1

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

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

4. McGuire Fire Protection Review, as revised

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

6. NFPA Codes 72D and 72E

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

Prepared By: W H Killette

Reviewed By: John H. Sadler

Approved By: S A Helms

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

POSITION: **SRO**

Operator's Name _____

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

Estimated JPM Completion Time: 20 Minutes

Actual JPM Completion Time: _____ Minutes

Required Time Critical Completion Time 15 Minutes

Actual Time Critical Completion Time _____ Minutes

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date ____/____/____

References:

RP/0/A/5700/000	Classification of an Emergency
RP/0/A/5700/003	Site Area Emergency
RP/0/A/5700/029	Notifications to Offsite Agencies From The Control Room

JPM verified current with references by _____

Date ____/____/____

INITIAL CONDITIONS

THIS IS A DRILL.....

You are the WCC SRO/Offsite Communicator.

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

NOTE: TIME CRITICAL AFTER CLASSIFICATION OF EVENT IS DETERMINED.

.....THIS IS A DRILL

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

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

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

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

KA 194 001 A1.16

TASK MO-9303

START TIME_____

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

* **DENOTES CRITICAL**

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

*** DENOTES CRITICAL**

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

*** DENOTES CRITICAL**

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

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

*** DENOTES CRITICAL**

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

*** DENOTES CRITICAL**

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

*** DENOTES CRITICAL**

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

STOP TIME_____

*** DENOTES CRITICAL**

INITIAL CONDITIONS

THIS IS A DRILL.....

You are the WCC SRO/Offsite Communicator.

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

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

.....THIS IS A DRILL

Attachment 1

DATA SHEET

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

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

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

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

MALFUNCTIONING/INOPERABLE EQUIPMENT:

None

OTHER INFORMATION:

None

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

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

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

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

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

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

5. **PROTECTIVE ACTION RECOMMENDATIONS:** [A] NONE

[B] EVACUATE _____

[C] SHELTER _____

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

[E] OTHER _____

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

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

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

9. METEOROLOGICAL DATA: Wind Direction* from _____ degrees Wind Speed* _____ mph

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

10. [A] DECLARATION [B] TERMINATION Time _____ Date ____ / ____ / ____

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

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

[A] U1 _____ % Power Shutdown at: Time _____ Date ____ / ____ / ____

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

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

13. REMARKS: _____

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

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

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

MAGNITUDE: Noble Gases: _____ Iodines: _____ Particulates: _____ Other: _____

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

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

15. PROJECTION PARAMETERS: Projection Period: _____ Hours Estimated Release Duration: _____ Hours

Projection performed: Time _____ Date ____ / ____ / ____

16. PROJECTED DOSE:

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

17. APPROVED BY: _____ Title: Emergency Coordinator Time: _____ Date: ____ / ____ / ____

NOTIFIED BY: _____ RECEIVED BY: _____ Time: _____ Date: ____ / ____ / ____

GOVERNMENT AGENCIES NOTIFIED

Record the name, date, time and agencies notified:

1. _____ (name)
   _____ (date) (time) **NC State** (agency) EOC Sel. Sig. 314
   EOC Bell Line 1-919- 733-3943

2. _____ (name)
   _____ (date) (time) **Mecklenburg County** (agency) WP Sel. Sig. 116
   WP Bell Line 704-943-6200

3. _____ (name)
   _____ (date) (time) **Gaston County** (agency) WP Sel. Sig. 112
   WP Bell Line 1-704- 866-3300

4. _____ (name)
   _____ (date) (time) **Lincoln County** (agency) WP Sel. Sig. 113
   WP Bell Line 1-704- 735-8202

5. _____ (name)
   _____ (date) (time) **Iredell County** (agency) WP Sel. Sig. 114
   WP Bell Line 1-704- 878-3039

6. _____ (name)
   _____ (date) (time) **Catawba County** (agency) WP Sel. Sig. 118
   WP Bell Line 1-828- 464-3112

7. _____ (name)
   _____ (date) (time) **Cabarrus County** (agency) WP Sel. Sig. 119
   WP Bell Line 1-704- 920-3000

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

[A] DRILL [B] ACTUAL EVENT MESSAGE # _____

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

FROM: McGuire Nuclear Site Confirmation Phone # ( ) _____

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

BASED ON EAL# _____ EAL DESCRIPTION: _____

PROTECTIVE ACTION RECOMMENDATIONS: [A] NONE

[B] EVACUATE _____

[C] SHELTER _____

[D] CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLA

[E] OTHER _____

BLANK FORM

EMERGENCY RELEASE: [A] None [B] Is Occurring

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

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

METEOROLOGICAL DATA: Wind Direction* from _____ degrees Wind Speed* _____ mph

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

[A] DECLARATION [B] TERMINATION Time _____ Date ____ / ____ / ____

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

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

[A] U1 _____ % Power Shutdown at: Time _____ Date ____ / ____ / ____

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

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

REMARKS: _____

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

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

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

MAGNITUDE: Noble Gases: _____ Iodines: _____ Particulates: _____ Other: _____

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

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

PROJECTION PARAMETERS: Projection Period: _____ Hours Estimated Release Duration: _____ Hours

Projection performed: Time _____ Date ____ / ____ / ____

PROJECTED DOSE:

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

APPROVED BY: _____ Title: _____ Time: _____ Date: ____ / ____ / ____

NOTIFIED BY: _____ RECEIVED BY: _____ Time: _____ Date: ____ / ____ / ____

GOVERNMENT AGENCIES NOTIFIED

Record the name, date, time and agencies notified:

1. _____ (name)
   _____ (date) _____ (time) NC State (agency) EOC Sel. Sig. 314
   EOC Bell Line 1-919- 733-3943

2. _____ (name)
   _____ (date) _____ (time) Mecklenburg County (agency) WP Sel. Sig. 116
   WP Bell Line 704-943-6200

3. _____ (name)
   _____ (date) _____ (time) Gaston County (agency) WP Sel. Sig. 112
   WP Bell Line 1-704- 866-3300

4. _____ (name)
   _____ (date) _____ (time) Lincoln County (agency) WP Sel. Sig. 113
   WP Bell Line 1-704- 735-8202

5. _____ (name)
   _____ (date) _____ (time) Iredell County (agency) WP Sel. Sig. 114
   WP Bell Line 1-704- 878-3039

6. _____ (name)
   _____ (date) _____ (time) Catawba County (agency) WP Sel. Sig. 118
   WP Bell Line 1-828- 464-3112

7. _____ (name)
   _____ (date) _____ (time) Cabarrus County (agency) WP Sel. Sig. 119
   WP Bell Line 1-704- 920-3000

* ANSWER KEY *

NUCLEAR POWER PLANT EMERGENCY NOTIFICATION FORM

1. [A] DRILL [B] ACTUAL EVENT MESSAGE # 1
2. [A] INITIAL [B] FOLLOW-UP NOTIFICATION: TIME _____ DATE ____ / ____ / ____ AUTHENTICATION # _____
3. SITE: McGuire Nuclear Site Confirmation Phone # (704) 875-6044

4. **EMERGENCY CLASSIFICATION:** [A] UNUSUAL EVENT [B] ALERT [C] SITE AREA EMERGENCY [D] GENERAL EMERGENCY
   BASED ON EAL# 4.1.S.3 EAL DESCRIPTION **Loss of Containment AND Loss OR Potential Loss of Any Other Barrier. This EAL poses no threat to the safety of the general public.**
5. **PROTECTIVE ACTION RECOMMENDATIONS:** [A] NONE
   [B] EVACUATE _____
   [C] SHELTER _____
   [D] CONSIDER THE USE OF KI (POTASSIUM IODIDE) IN ACCORDANCE WITH STATE PLANS AND POLICY.
   [E] OTHER _____
6. **EMERGENCY RELEASE:** [A] None [B] Is Occurring [C] Has Occurred

7. RELEASE SIGNIFICANCE: [A] Not applicable [B] Within normal operating limits [C] Above normal operating limits [D] Under Evaluation
8. EVENT PROGNOSIS: [A] Improving [B] Stable [C] Degrading
9. METEOROLOGICAL DATA: Wind Direction* from _____ degrees Wind Speed* _____ mph
   (* May not be available for Initial Notifications) Precipitation* _____ Stability Class* [A] [B] [C] [D] [E] [F] [G]
10. [A] DECLARATION [B] TERMINATION Time (TIME STEP 1 OF THE JPM IS COMPLETE) Date (PRESENT DATE)
11. AFFECTED UNIT(S): [1] [2] [3] [All]
12. Unit Status: (Unaffected Unit(s) Status Not Required for Initial Notifications)
    [A] U1 ____ % Power Shutdown at: Time (Present Time Minus 15 min) Date (PRESENT DATE)
    [B] U2 ____ % Power Shutdown at: Time _____ Date ____ / ____ / ____
    [C] U3 ____ % Power Shutdown at: Time _____ Date ____ / ____ / ____
13. REMARKS: _____

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

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

14. RELEASE CHARACTERIZATION: TYPE: [A] Elevated [B] Mixed [C] Ground UNITS: [A] Ci [B] Ci/sec [C] µCi/sec
    MAGNITUDE: Noble Gases: _____ Iodines: _____ Particulates: _____ Other: _____
    FORM: [A] Airborne Start Time: _____ Date: ____ / ____ / ____ Stop Time: _____ Date ____ / ____ / ____
    [B] Liquid Start Time: _____ Date: ____ / ____ / ____ Stop Time: _____ Date ____ / ____ / ____
15. PROJECTION PARAMETERS: Projection Period: _____ Hours Estimated Release Duration: _____ Hours
    Projection performed: Time _____ Date ____ / ____ / ____
16. PROJECTED DOSE:

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

17. APPROVED BY: JOHN DOE Title: Emergency Coordinator Time: CURRENT TIME Date: AND / DATE
    NOTIFIED BY: OPERATORS OWN NAME RECEIVED BY: _____ Time: _____ Date: ____ / ____ / ____

GOVERNMENT AGENCIES NOTIFIED

Record the name, date, time and agencies notified:

1. _____ (name)
   _____ (date) (time) **NC State** (agency) EOC Sel. Sig. 314
   EOC Bell Line 1-919- 733-3943

2. _____ (name)
   _____ (date) (time) **Mecklenburg County** (agency) WP Sel. Sig. 116
   WP Bell Line 704-943-6200

3. _____ (name)
   _____ (date) (time) **Gaston County** (agency) WP Sel. Sig. 112
   WP Bell Line 1-704- 866-3300

4. _____ (name)
   _____ (date) (time) **Lincoln County** (agency) WP Sel. Sig. 113
   WP Bell Line 1-704- 735-8202

5. _____ (name)
   _____ (date) (time) **Iredell County** (agency) WP Sel. Sig. 114
   WP Bell Line 1-704- 878-3039

6. _____ (name)
   _____ (date) (time) **Catawba County** (agency) WP Sel. Sig. 118
   WP Bell Line 1-828- 464-3112

7. _____ (name)
   _____ (date) (time) **Cabarrus County** (agency) WP Sel. Sig. 119
   WP Bell Line 1-704- 920-3000

Reviewed By FB Kinkel

Approved By Charles Sawyer

TASK: **Calculate blended make up volume and required boric acid flow to the FWST while in Mode 6.**

POSITION: (RO)/SRO

Operator's Name_____

Location: **Control Room** Method: **Perform**

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/__

References:

OP/1/A/6100/22	Unit 1 Data Book
OP/1/A/6200/14 Enc. 4.3	FWST Makeup Using Reactor Makeup Blender in Mode 6
McGuire Unit 1 Cycle 18	Core Operating Limits Report

JPM verified current with references by _____

Date __/__/__

INITIAL CONDITIONS

The following conditions exist:

Unit #1 is in Mode 6 with the refueling canal filled at 374 inches WR Level

NC Boron Concentration = 2808 PPM

FWST Boron Concentration = 2783 PPM

FWST Level = 40 inches

U-1 BAT Boron Concentration = 7000 PPM

Due to concerns with maintaining adequate level in the FWST in order to utilize it as a long term injection source, the OCC has requested that the FWST level be increased to 70 inches. The level was lowered to its present level during refueling canal flood up.

1)- Using the Data Book, calculate the required make up volume and report this value to the STA in the OCC.

2)- Per OP/1/A/6200/014 Enc. 4.3 determine the boric acid flow rate needed to ensure minimum shut down FWST Boron concentration is maintained. This Enclosure has been completed through step 3.16. (Desired Total Blended Flow Rate is 90 GPM)

JPM OVERALL STANDARD:

FWST Level change determined from the Data book Curve 7.7 to be 21000 to 26000 gallons.

Minimum boric Acid Flow Rate determined to be greater than or equal to 37.8 GPM. (This flow rate assumes a 90 GPM total blended flow rate and 7000 PPM Boric Acid Tank Boron Concentration) The minimum allowed FWST boron concentration is 2675 ppm from MNS Cycle 18 COLR Sect 2.15 (Refueling Operations- Boron Concentration)

NOTES:

Unit #1 Data Book and Cycle 18 COLR should be available for reference.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Operator is provided a copy of the U-1 Data Book and the U-1 COLR.	**Operator should determine that Data Book Curve 7.7 is the correct curve to calculate the required volume change**		
*2	Operator determines the required FWST level change for 40 inches to 70 inches Data Book Curve 7.7 (Refueling Water Storage Take Level)	**Required Volume 21000 to 26000 gallons.**		
3	Per the initial conditions, operator should contact the STA in the OCC to report the required FWST volume change.	**Cue: The STA in the OCC has been informed**		
4	Operator should be provided with a copy of OP/1/A/6200/014 Enc 4.3. (FWST Makeup Using Reactor Makeup Blender During Mode 6) Procedure has been completed through step 3.16.	Required information to complete Step 3.16 is given in the Initial conditions. Boric Acid Tank Concentration--- **4000PPM** Desired Total Blended Make up Flow--- **90 GPM**		

* **DENOTES CRITICAL**

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*5	Using OP/1/A/6200/014 Enc 4.3. , the Operator will calculate the minimum required Boric Acid Flow Rate.	Per Step 3.17 of this enclosure, the Operator calculates a minimum **Boric Acid Flow Rate of 37.8 GPM**		
6	Operator should proceed to step 3.18 of OP/1/A/6200/014 Enc 4.3. . (FWST Makeup Using Reactor Makeup Blender During Mode 6)	**Cue:** **The SRO has directed another operator to complete the FWST makeup.**		

STOP TIME_____

* **DENOTES CRITICAL**

INITIAL CONDITIONS

The following conditions exist:

Unit #1 is in Mode 6 with the refueling canal filled at 374 inches WR Level

NC Boron Concentration = 2808 PPM

FWST Boron Concentration = 2783 PPM

FWST Level = 40 inches

U-1 Boric Acid Tank Concentration is 7000 PPM

Due to concerns with maintaining adequate level in the FWST in order to utilize it as a long term injection source, the OCC has requested that the FWST level be increased to 70 inches. The level was lowered to its present level during refueling canal flood up.

1)- Using the Data Book, calculate the required make up volume and report this value to the STA in the OCC.

2)- Per OP/1/A/6200/014 Enc. 4.3 determine the boric acid flow rate needed to ensure minimum shut down FWST Boron concentration is maintained. This Enclosure has been completed through step 3.16. . (Desired Total Blended Flow Rate is 90 GPM)

INITIAL CONDITIONS

The following conditions exist:

Unit #1 is in Mode 6 with the refueling canal filled at 374 inches WR Level

NC Boron Concentration = 2808 PPM

FWST Boron Concentration = 2783 PPM

FWST Level = 40 inches

U-1 Boric Acid Tank Concentration is 7000 PPM

Due to concerns with maintaining adequate level in the FWST in order to utilize it as a long term injection source, the OCC has requested that the FWST level be increased to 70 inches. The level was lowered to its present level during refueling canal flood up.

1)- Using the Data Book, calculate the required make up volume and report this value to the STA in the OCC.

2)- Per OP/1/A/6200/014 Enc. 4.3 determine the boric acid flow rate needed to ensure minimum shut down FWST Boron concentration is maintained. This Enclosure has been completed through step 3.16. . (Desired Total Blended Flow Rate is 90 GPM)

Duke Energy
McGuire Nuclear Station
Refueling Water System

Procedure No.
OP/1/A/6200/014

Revision No.
071

Electronic Reference No.
MC00474K

Continuous Use

PERFORMANCE

This Procedure was printed on 12/06/06 at 14:08:01 from the electronic library as:

(ISSUED) - PDF Format

Compare with Control Copy every 14 calendar days while work is being performed.

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Date(s) Performed	Work Order/Task Number (WO#)
	N/A

COMPLETION

- ☐ Yes ☐ NA Checklists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☐ Yes ☐ NA Charts, graphs, data sheets, etc. attached, dated, identified, and marked?
- ☐ Yes ☐ NA Calibrated Test Equipment, if used, checked out/in and referenced to this procedure?
- ☐ Yes ☐ NA Procedure requirements met?

Verified By Date

Procedure Completion Approved Date

Remarks (*attach additional pages, if necessary*)

2K- Fred Kirk

IMPORTANT:
Do **NOT** mark on barcodes.

Procedure No. *OP/1/A/6200/014*

Revision No. *071*

Enclosure Number *4.3*

Printed Date *12/06/2006*

1. Limits and Precautions

1.1 Maximum FWST Tech Spec temperature limit is 100°F.

1.2 Minimum FWST Tech Spec temperature limit is 70°F.

1.3 All electrically operated engineered safeguard valves must be operated electrically after any manual operation.

1.4 Maximum FWST level is 483 inches unless FWST overflow is required. (Overflows to SFP at 484 inches)

1.5 NC System sampling during makeup to the FWST is prohibited.

1.6 Dual Boric Acid Tank Pump operation is minimized due to potential to deadhead weaker pump.

2. Initial Conditions

2K 2.1 Unit 1 in Mode 6.

2K 2.2 NI check valve test header alignment to FWST secured.

3. Procedure

☑ 3.1 Evaluate all outstanding R&Rs that may impact performance of this procedure.

____ 3.2 **IF** Emergency Boration Flow is needed, secure makeup to FWST.

2K 3.3 Prepare tags per Pre-Plan PP-00144.

2K 3.4 SRO Ensure that a pre-job briefing has been performed that includes discussion of reactivity management concerns with this procedure.

2K 3.5 Notify RP of change in FW System alignment. {PIP M97-0680}

Bob Smith — 1-8-06 / 1400
Person Contacted — Date Time

2K 3.6 Notify Radwaste Chemistry of expected level changes in BAT and RMWST.

Ron Jones — 1-8-06 / 1410
Person Contacted — Date Time

3.7 Perform the following: (to comply with Tech Specs)

NOTE:	Operator will need to obtain six chains and locks to perform the next step.

3.7.1 Tag locked closed:

- ☑ 1NV-131 (Unit 1 Boronometer Inlet Supply Isol)
- ☑ 1NV-140 (Unit 1 VCT Inlet Isol)
- ☑ 1NV-176 (Unit 1 Boric Acid Blender To VCT Outlet Isol)
- ☑ 1NV-468 (Unit 1 Boric Acid Blender Outlet Sample Isol)
- ☑ 1NV-808 (Unit 1 Boronometer Flush Supply Isol)

3.7.2 Tag locked closed one of the following:

☑ 1NV-132 (Unit 1 Boronometer Outlet Isol)

OR

☐ 1NV-1026 (Unit 1 Boronometer Inlet Isol)

2K SRO 3.8 Evaluate Tech Specs for opening 1NV-250 (RX Makeup Water Supply To Unit 1 NV Isol) in Mode 6.

☑ 3.9 Remove tag, unlock and open 1NV-250 (RX Makeup Water Supply To Unit 1 NV Isol).

N/A 2K 3.10 **IF** FWST in Recirculation per Enclosure 4.1 (FWST Recirculation Using 1A (1B) FWST Recirc Pump), stop:

- 1A FWST Recirc Pump
- N/A 2K 1B FWST Recirc Pump

N/A 2K 3.11 **IF** FWST in Recirculation per Enclosure 4.6 (FWST Recirculation Using Unit 1 FWST Pump), stop #1 FWST Pump.

N/A 2K 3.12 **IF** FWST in Purification per Enclosure 4.5 (FWST Purification), stop #1 FWST Pump.

3.13 Ensure closed one of the following:

- 1NI-96B (NI Check Vlv Test Hdr Cont Outside Isol)

OR

- N/A 2K 1NI-99 (Unit 1 NI Check Valve Test Hdr To FWST Isol)

3.14 Ensure locked closed, either:

2K 3.14.1 1NS-70 (1A & 1B NS HX Outlet To FWST Throttle)

OR

3.14.2 Both of the following:

DV • 1NS-8 (1B NS HX Outlet To FWST Isol)

DV • 1NS-25 (1A NS HX Outlet To FWST Isol)

☑ 3.15 Ensure closed 1NB-5 (Unit 1 Boric Acid Blender To NB System Isol). (AB 733'+6, KK-51, S End U1 VCT Hallway)

3.16 Open:

2K • 1NV-172 (Unit 1 Boric Acid Blender To NB & FW Isol)

2K • 1NV-174 (Unit 1 Boric Acid Blender To FWST Isol)

NOTE: Chemistry is unable to obtain a blender sample because Step 3.7 isolates sample flow path. 10% more boric acid is added in step below to ensure makeup within limits.

SV * 3.17 Determine Boric Acid flow rate needed: {PIP 2-M98-0017}

$$\left[\frac{(\text{Desired FWST Boron Concentration})(\text{Desired Total Blended Flow Rate})}{\text{Boric Acid Tank Boron Concentration}}\right](1.1) = \text{Boric Acid Flow Rate}$$

Doer Calculation

$$\left[\frac{(2675\ \text{ppmB})(90\ \text{gpm})}{(7000\ \text{ppmB})}\right](1.1) = 37.8\ \text{gpm}$$

SV Calculation

$$\left[\frac{(\quad\ \text{ppmB})(\quad\ \text{gpm})}{(\quad\ \text{ppmB})}\right](1.1) = \_\_\_\_\_\ \text{gpm}$$

* → INITIALS OF TRAINEE

→ RED INK ENTRIES DENOTES INFORMATION TO BE FILLED IN BY THE TRAINEE

CAUTION: **IF** Total Makeup and Boric Acid Flow integrator Thumbwheels are set too low, Boric Acid Flow or Reactor Makeup Water Flow may be automatically terminated, resulting in inadvertent Dilution or Boration of FWST.

NOTE:
- Excessive operation of Integrator Thumbwheel covers should be avoided.
- Integrator Thumbwheel covers must be closed for NC Makeup System to operate.
- Integrator Thumbwheel covers should **NOT** be opened unless associated counter reset pushbutton depressed.

_____ 3.18 Set Total Makeup Flow Counter to desired value.

_____ 3.19 **WHEN** Total Makeup Flow Counter cover closed, check counter at desired value.

_____ 3.20 Set Boric Acid Flow Counter to desired value.

_____ 3.21 **WHEN** Boric Acid Flow Counter cover closed, check counter at desired value.

☐ 3.22 Record initial FWST level on Attachment 1.

_____ 3.23 Select "MANUAL" on "NC Sys M/U Controller".

3.24 Place in "MAN":

_____ • BA Blend Disch Cntrl
_____ • BA Flow Control

_____ 3.25 **IF** both BA Trans Pumps off, ensure "AUTO" selected on one of the following:

_____ • 1A BA Trans Pump

OR

_____ • 1B BA Trans Pump

_____ 3.26 **IF** it is desired to use both BA Trans Pumps, ensure the following in "AUTO":

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

3.27 Ensure in "AUTO" one of the following:

_____ • 1A Rx M/U Water Pump

OR

_____ • 1B Rx M/U Water Pump

NOTE: Annunciator Alarms 1AD-6, F13 (Total Makeup Flow Deviation) and 1AD-7, I3 (Boric Acid Flow Deviation) are expected alarms when making up to FWST in manual.

_____ 3.28 Momentarily select "START" on "NC System Make Up".

☐ 3.29 Check lit "NC System Makeup" red light.

_____ 3.30 Ensure Rx M/U Water Pump starts.

_____ 3.31 **IF** in "AUTO", ensure BA Trans Pump(s) starts.

3.32 Adjust the following to obtain flow rates determined in Step 3.17:

_____ • BA Blend Disch Cntrl
_____ • BA Flow Control

_____ 3.33 **WHEN** FWST at desired level, flush flow path for 1 minute as follows:

_____ 3.33.1 **IF** desired to flush with blended flow, perform the following:

_____ 3.33.1.1 Set "BA Flow Control" potentiometer for current NCS boron concentration.

_____ 3.33.1.2 **IF** both BA Trans Pumps in "AUTO", select "STOP" on one of the following:

_____ • 1A BA Trans Pump

OR

_____ • 1B BA Trans Pump

3.33.1.3 Place in "AUTO":

_____ • BA Blend Disch Cntrl
_____ • BA Flow Control

_____ 3.33.1.4 Go to Step 3.34.

_____ 3.33.2 **IF** desired to flush with Rx M/U Water, perform the following:

3.33.2.1 Select "STOP" on the following:

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

_____ 3.34 **WHEN** flush complete, select "OFF" on "NC Sys M/U Controller".

3.35 Ensure the following in "STOP":

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

☐ 3.36 Record final FWST level on Attachment 1.

3.37 Place BA Trans Pump(s) in service as follows:

_____ 3.37.1 **IF** desired to place BAT in recirc, select "START" on one of the following:

_____ • 1A BA Trans Pump

OR

_____ • 1B BA Trans Pump

_____ 3.37.2 **IF** BAT recirc is **NOT** desired, select "AUTO" on one of the following:

_____ • 1A BA Trans Pump

OR

_____ • 1B BA Trans Pump

_____ 3.37.3 **IF** OP/1/A/6150/009 Enclosure 4.15 (VCT Makeup With High NC System Boron Concentration) in progress perform the following:

_____ 3.37.3.1 **IF** both BA Trans Pumps off, ensure "AUTO" selected for the following:

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

_____ 3.37.3.2 **IF** one BA Trans Pump on, ensure standby BA Trans Pump in "AUTO":

_____ • 1A BA Trans Pump
_____ • 1B BA Trans Pump

3.38 Close:

_____ • 1NV-172 (Unit 1 Boric Acid Blender To NB & FW Isol)
_____ • 1NV-174 (Unit 1 Boric Acid Blender To FWST Isol)

☐ 3.39 Record in Auto Log final blender contents, either:

☐ Rx Makeup Water

OR

☐ Blend

OR

☐ Boric Acid

_____ 3.40 **IF** desired to align for automatic NC System Makeup, align per OP/1/A/6150/009 (Boron Concentration Control).

☐ 3.41 Place routing stamp in remarks section of cover sheet, check (✓) "Engineering" and fill in "Attachment 1 only".

☐ 3.42 Lock closed and tag 1NV-250 (RX Makeup Water Supply To Unit 1 NV Isol). (Comply with Tech Specs)

3.43 Remove tag and open:

☐ 1NV-131 (Unit 1 Boronometer Inlet Supply Isol)
☐ 1NV-140 (Unit 1 VCT Inlet Isol)
☐ 1NV-176 (Unit 1 Boric Acid Blender To VCT Outlet Isol)
☐ 1NV-468 (Unit 1 Boric Acid Blender Outlet Sample Isol)

3.44 Remove tag and close:

☐ 1NV-808 (Unit 1 Boronometer Flush Supply Isol)
☐ 1NV-132 (Unit 1 Boronometer Outlet Isol)
☐ 1NV-1026 (Unit 1 Boronometer Inlet Isol)

_____ 3.45 **IF** 1A (1B) FWST Recirc Pump was stopped in Step 3.10, start one of the following:

_____ • 1A FWST Recirc Pump

OR

_____ • 1B FWST Recirc Pump

_____ 3.46 **IF** #1 FWST Pump was stopped in Step 3.11 **OR** 3.12, start #1 FWST Pump.

Attachment 1

FWST Makeup Data

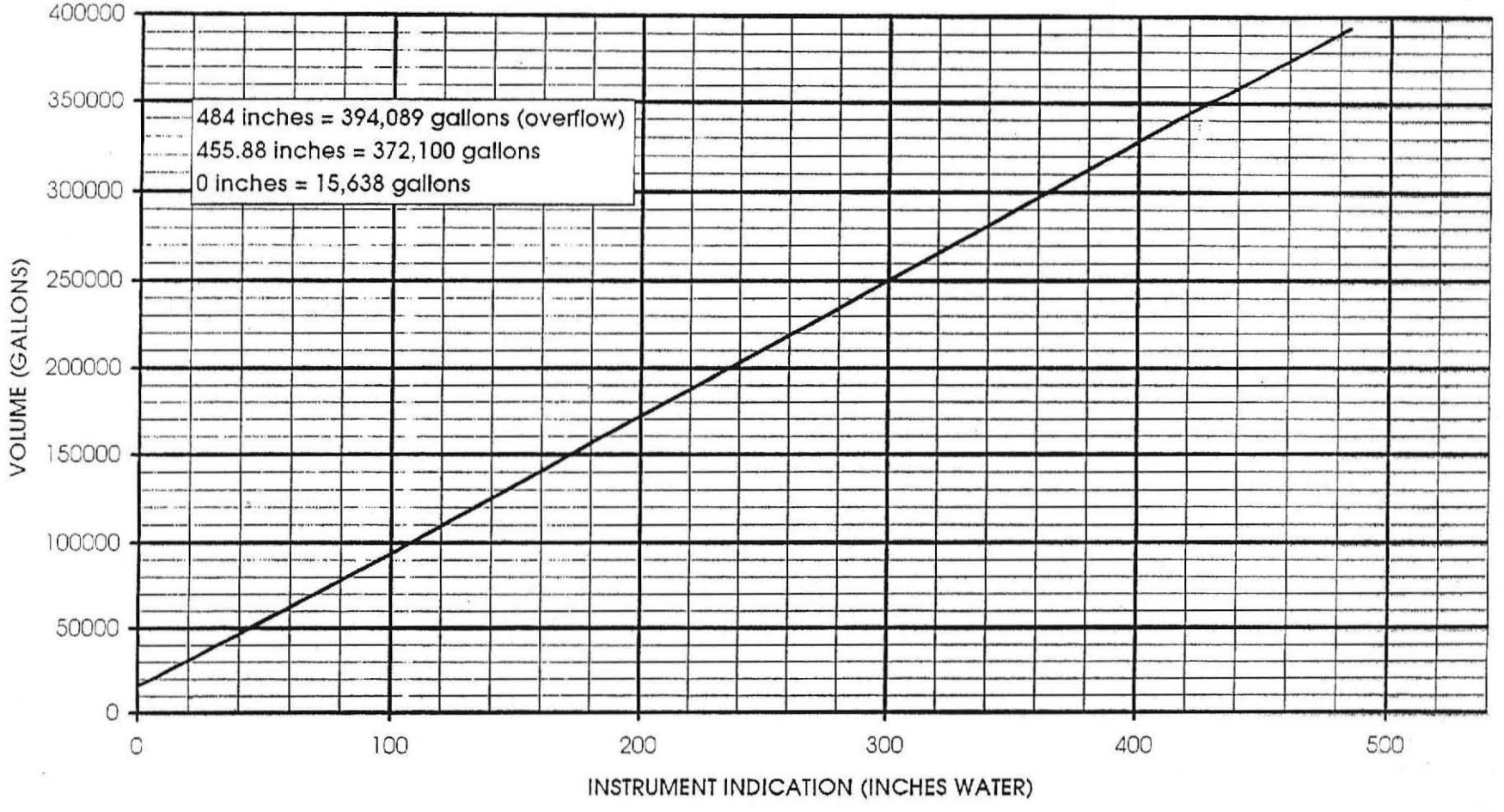
Initial FWST Level _____ inches Date _____ Time _____

Final FWST Level _____ inches Date _____ Time _____

Data Collected By _____

End of Enclosure

O. 6100/22
ENCLOSURE 4.3
CURVE 7.7
REFUELING WATER STORAGE TANK LEVEL
(VOLUME vs. TANK LEVEL)



This data is also available on the OAC.

McGuire 1 Cycle 18 Core Operating Limits Report

2.14 Spent Fuel Pool Boron Concentration (TS 3.7.14)

2.14.1 Minimum boron concentration limit for the spent fuel pool. Applicable when fuel assemblies are stored in the spent fuel pool.

Parameter	Limit
Spent fuel pool minimum boron concentration.	2,675 ppm

2.15 Refueling Operations - Boron Concentration (TS 3.9.1)

2.15.1 Minimum boron concentration limit for the filled portions of the Reactor Coolant System, refueling canal, and refueling cavity for mode 6 conditions. The minimum boron concentration limit and plant refueling procedures ensure that the Keff of the core will remain within the mode 6 reactivity requirement of Keff $\leq$ 0.95.

Parameter	Limit
Minimum Boron concentration of the Reactor Coolant System, the refueling canal, and the refueling cavity.	2,675 ppm

Reviewed By _____

Approved By _____

TASK: **Monitor A Critical Safety Function Status Tree**

POSITION: **RO**

Operator's Name_____

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

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/

K/A: 2.1.19

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

JPM verified current with references by _____

Date __/__/

INITIAL CONDITIONS

--A reactor trip from and SI from 100% has occurred on Unit 1 30 minutes ago.

--The team has transitioned to E-2, FAULTED STEAM GENERATOR ISOLATION.

--The STA had just finished validating the Critical Safety Function Status Trees (CSFST) when the INTEGRITY CSFST turned magenta and stopped responding.

--NC System Cold Leg Temperatures as read from the MCB are:

A-254°F **B-250°F** **C-245°F** **D-251°F**

--NC System WR Pressure is 400 psig.

The STA is needed to confirm the proper EAL and classification and the Control Room SRO directs you to monitor associated parameters and determine the actual status of the Reactor Coolant INTEGRITY Critical Safety Function Status Tree.

JPM OVERALL STANDARD: Operator determines from the given parameters that the Reactor Coolant System Integrity Status Tree is ORANGE and that the crew should transition to FR-P.1 "Response to Imminent Pressurized Thermal Shock Condition"

References: Copy of EP/1/A/5000/F-0 (Critical Safety Function Status Trees) will be provided.

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*1	Enters CSFST at correct CSFST point.	Enters CSFST at **"TEMP DECR IN ALL COLD LEGS LESS THAN 100°F IN THE LAST 60 MINUTES"** decision box.		
*2	Operator determines if TEMP DECR IN ALL CL IN LAST 60 MIN LESS THAN 100°F and follows appropriate branch line based on given parameters.	**Since the temperatures are all at 254°F and less and within the last 30 min the reactor was at >557°F, the decision is <u>NO</u>.**		
*3	Determines if ALL NC PRESS/T-COLD TEMP POINTS TO RIGHT OF LIMIT A and follows appropriate branch line based on actual plant conditions.	Since the lowest temperature given is 245°F, ALL temperatures are to the right of Limit A, the decision is **<u>YES.</u>**		
*4	Determines if ALL NC T-COLDS GREATER THAN 250°F and follows appropriate branch line based on actual plant conditions.	Since the "B" and "C" Cold Legs Temps are **<u>250°F Or Less</u>**, the decision is **<u>NO.</u>**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
5	Determines an Orange path is in effect.	Determines **FR-P.1** must be entered on an **Orange Path** **Cue:** (**IF ASKED**: No other red or orange paths exist.)		
6	Informs C/R SRO that an Valid Orange path exists on the NC System Integrity CSFST	**Cue: C/R SRO has been notified.**		

STOP TIME_____

INITIAL CONDITIONS

--A reactor trip and SI has occurred on Unit 1 30 minutes ago.

--The team has transitioned to E-2, FAULTED STEAM GENERATOR ISOLATION.

--The STA is monitoring the Critical Safety Function Status Trees (CSFST) and the Integrity CSFST is INDETERMINATE.

--NC System Cold Leg Temperatures as read from the MCB are:

A-254°F **B-250°F** **C-245°F** **D-251°F**

--NC System WR Pressure is 400 psig.

The STA is needed to confirm the proper EAL and classification and will therefore be unavailable to monitor CSF.s for a period of time. The Control Room SRO directs you to monitor associated parameters and determine the actual status of the Reactor Coolant INTEGRITY Critical Safety Function Status Tree.

(R04-01)

Duke Power Company
PROCEDURE PROCESS RECORD

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

INFORMATION ONLY

EPARATION
.) Station **McGuire Nuclear Station**

(3) Procedure Title **Critical Safety Function Status Trees**

(4) Prepared By **Weiner,Michael R** Date **September 26, 2003**

(5) Requires NSD 228 Applicability Determination? If Applicability Determination is required, attach NSD 228 documentation.
- ☒ Yes (New procedure or revision with major changes)
- ☐ No (Revision with minor changes)
- ☐ No (To incorporate previously approved changes)

(6) Reviewed By S Hatchney (QR) Date 10/13/03
Cross-Disciplinary Review By _____ (QR) NA JSH Date 10/13/03
Reactivity Mgmt. Review By _____ (QR) NA JSH Date 10/13/03
Mgmt. Involvement Review By _____ (OPS Supt.) NA JSH Date 10/13/03

(7) Additional Reviews
Reviewed By _____ Date _____
Reviewed By _____ Date _____

(8) Temporary Approval (*if necessary*)
By _____ (OSM/QR) Date _____
By _____ (QR) Date _____

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

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

(10) Compared with Control Copy _____ Date _____
Compared with Control Copy _____ Date _____
Compared with Control Copy _____ Date _____

(11) Date(s) Performed _____
Work Order Number (WO#) _____

COMPLETION
(12) Procedure Completion Verification
- ☐ Yes ☐ NA Check lists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- ☐ Yes ☐ NA Required enclosures attached?
- ☐ Yes ☐ NA Data sheets attached, completed, dated and signed?
- ☐ Yes ☐ NA Charts, graphs, etc. attached, dated, identified, and marked?
- ☐ Yes ☐ NA Procedure requirements met?

Verified By _____ Date _____

(13) Procedure Completion Approved _____ Date _____

'14) Remarks (*Attach additional pages, if necessary.*)

A. **Purpose**

This procedure provides guidance on monitoring the Critical Safety Functions.

B. **Symptoms or Entry Conditions**

This procedure is entered from:

- EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection), when S/I cannot be terminated and cause has not been determined.
- On any transition out of EP/1/A/5000/E-0 (Reactor Trip Or Safety Injection).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

C. Operator Actions

1. **Monitor Critical Safety Functions:**

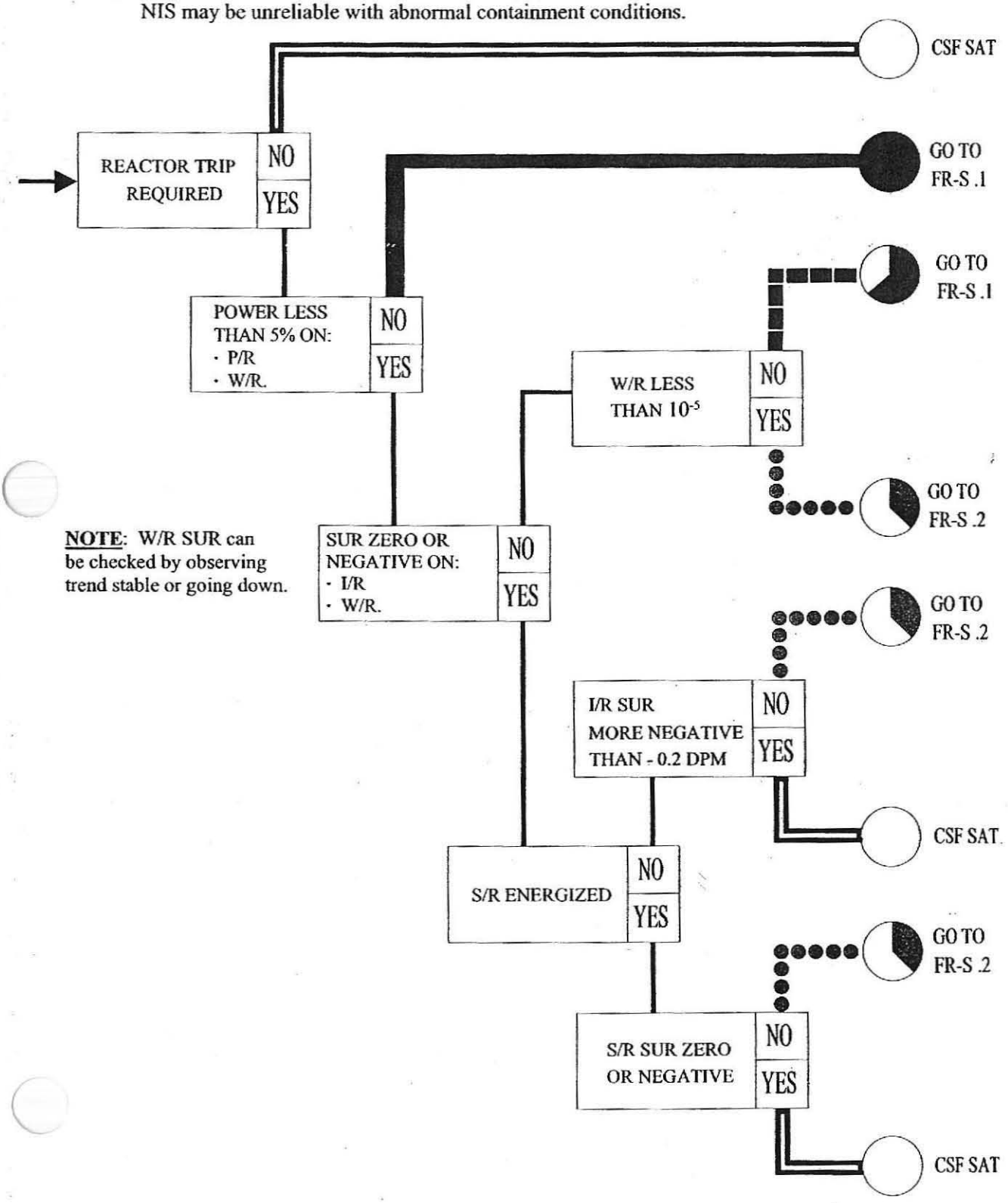
__ a. Use attached status trees or OAC to monitor Critical Safety Functions (CSFs).

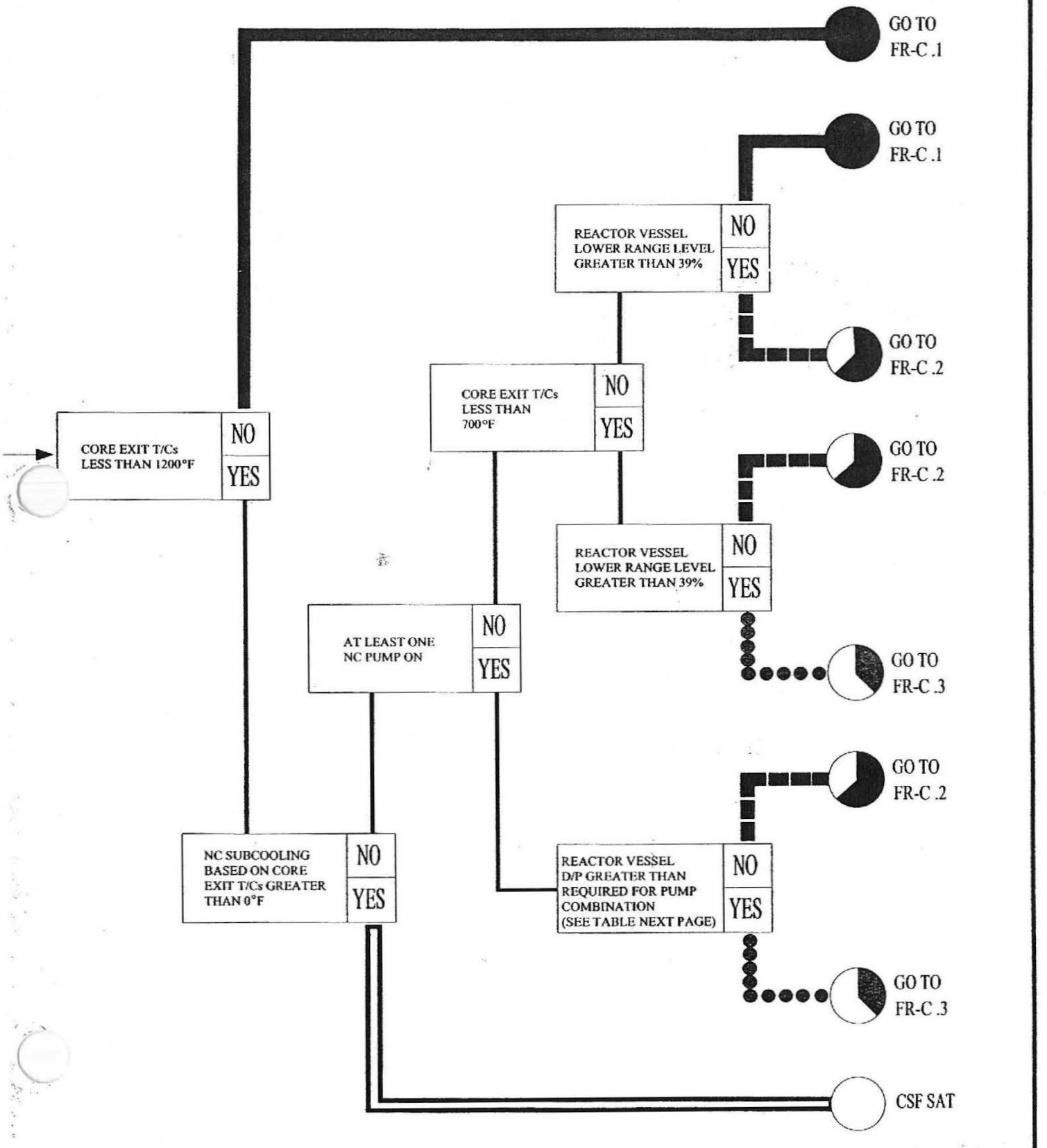
__ b. The following table may be used to track status of CSFs.

TIME	SUB-CRITICALITY	CORE COOLING	HEAT SINK	NC INTEGRITY	CONTAINMENT	NC INVENTORY	INITIAL

END

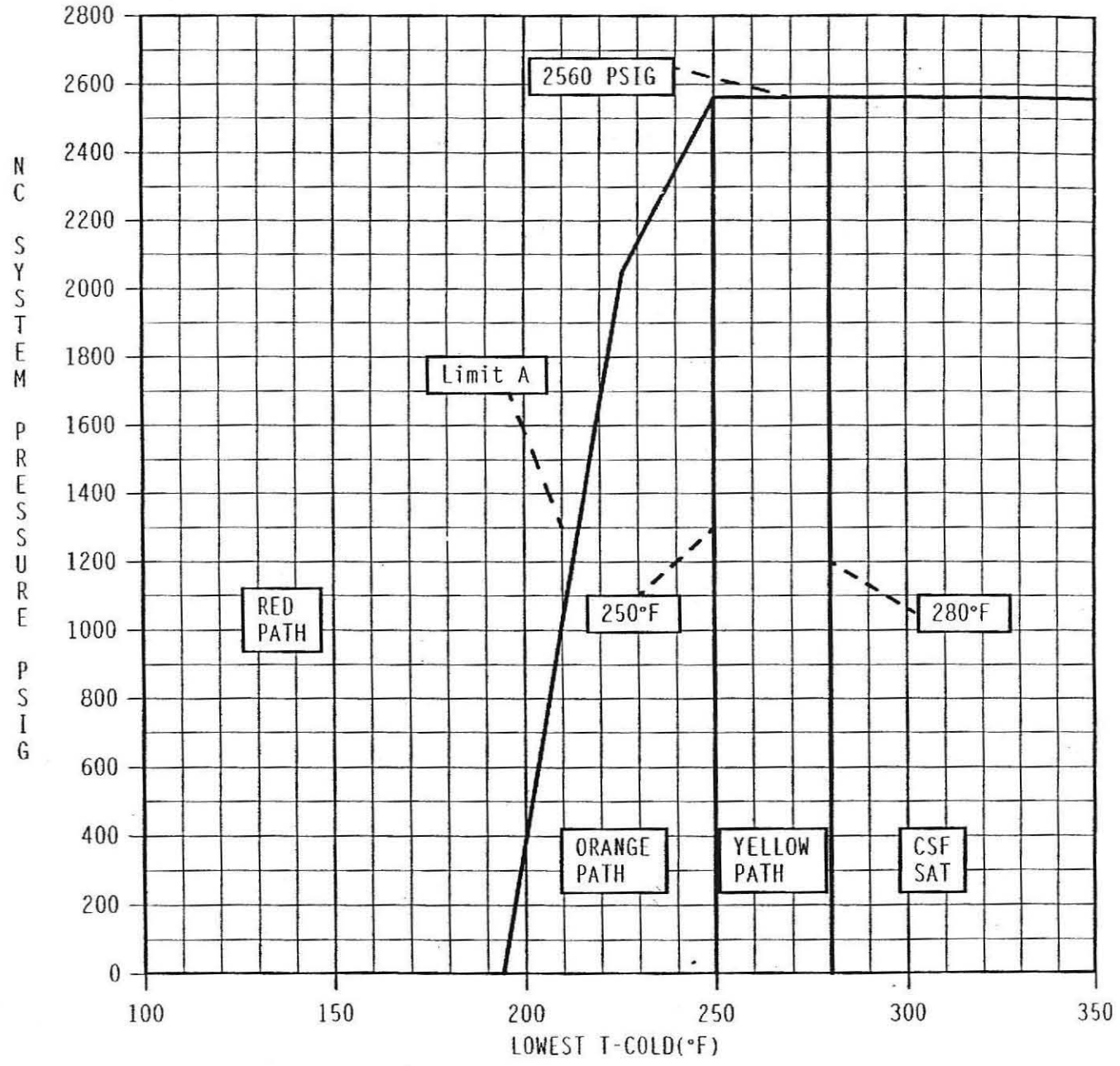
NOTE: Only W/R Neutron Flux is environmentally qualified. Normal NIS may be unreliable with abnormal containment conditions.

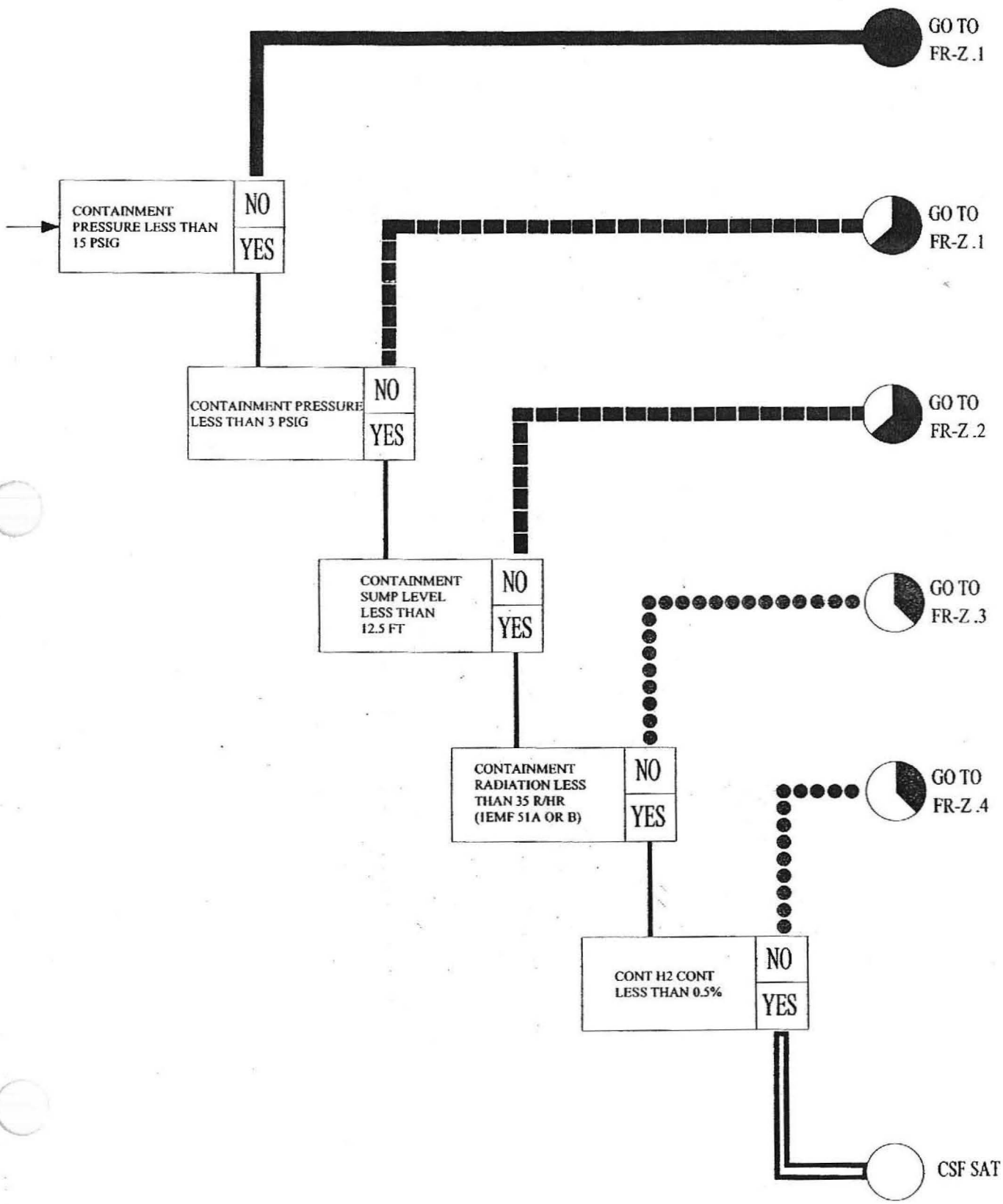


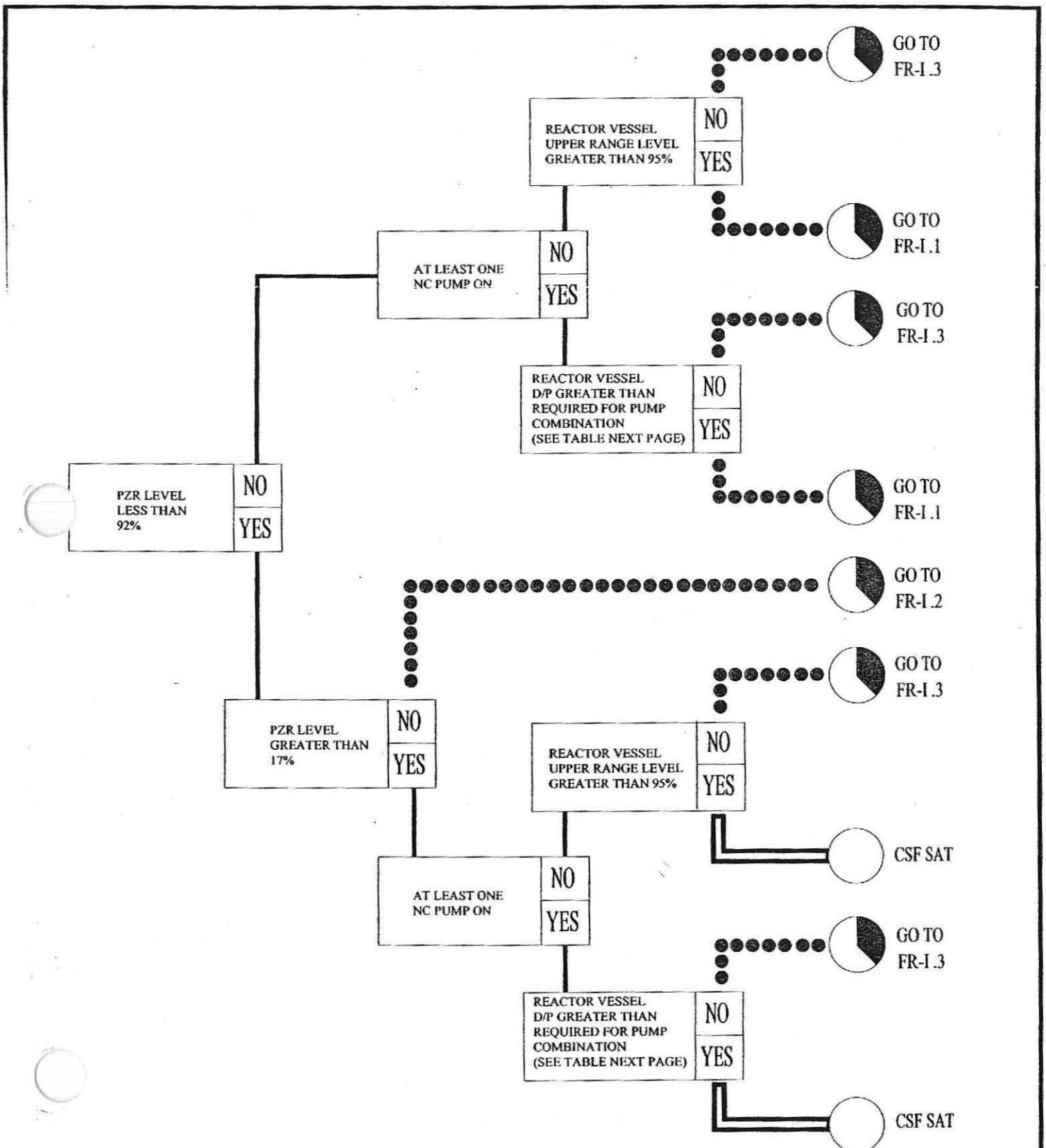

CORE EXIT T/Cs LESS THAN 1200°F
NO
YES
GO TO FR-C .1
CORE EXIT T/Cs LESS THAN 700°F
NO
YES
GO TO FR-C .1
REACTOR VESSEL LOWER RANGE LEVEL GREATER THAN 39%
NO
YES
GO TO FR-C .2
AT LEAST ONE NC PUMP ON
NO
YES
GO TO FR-C .2
REACTOR VESSEL LOWER RANGE LEVEL GREATER THAN 39%
NO
YES
GO TO FR-C .3
NC SUBCOOLING BASED ON CORE EXIT T/Cs GREATER THAN 0°F
NO
YES
GO TO FR-C .2
REACTOR VESSEL D/P GREATER THAN REQUIRED FOR PUMP COMBINATION (SEE TABLE NEXT PAGE)
NO
YES
GO TO FR-C .3
CSF SAT

"REACTOR VESSEL D/P" SETPOINTS FOR DEGRADED CORE COOLING

Number of NC Pumps On	Required "REACTOR VESSEL D/P"			
	TRN A With 1A NC Pump		TRN B With 1C NC Pump	
	ON	OFF	ON	OFF
4	44%	N/A	44%	N/A
3	30%	24%	30%	24%
2	23%	15%	23%	15%
1	16%	10%	16%	10%


2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
800
600
400
200
0
NC SYSTEM PRESSURE PSIG
2560 PSIG
Limit A
250°F
280°F
RED PATH
ORANGE PATH
YELLOW PATH
CSF SAT
100
150
200
250
300
350
LOWEST T-COLD(°F)


CONTAINMENT PRESSURE LESS THAN 15 PSIG
NO
YES
GO TO FR-Z .1
CONTAINMENT PRESSURE LESS THAN 3 PSIG
NO
YES
GO TO FR-Z .1
GO TO FR-Z .2
CONTAINMENT SUMP LEVEL LESS THAN 12.5 FT
NO
YES
GO TO FR-Z .3
CONTAINMENT RADIATION LESS THAN 35 R/HR (1EMF 51A OR B)
NO
YES
GO TO FR-Z .4
CONT H2 CONT LESS THAN 0.5%
NO
YES
CSF SAT


REACTOR VESSEL UPPER RANGE LEVEL GREATER THAN 95%
NO
YES
GO TO FR-I .3
AT LEAST ONE NC PUMP ON
NO
YES
GO TO FR-I .1
REACTOR VESSEL D/P GREATER THAN REQUIRED FOR PUMP COMBINATION (SEE TABLE NEXT PAGE)
NO
YES
GO TO FR-I .3
PZR LEVEL LESS THAN 92%
NO
YES
GO TO FR-I .1
PZR LEVEL GREATER THAN 17%
NO
YES
GO TO FR-I .2
REACTOR VESSEL UPPER RANGE LEVEL GREATER THAN 95%
NO
YES
GO TO FR-I .3
AT LEAST ONE NC PUMP ON
NO
YES
CSF SAT
REACTOR VESSEL D/P GREATER THAN REQUIRED FOR PUMP COMBINATION (SEE TABLE NEXT PAGE)
NO
YES
GO TO FR-I .3
CSF SAT

"REACTOR VESSEL D/P" SETPOINTS FOR REACTOR COOLANT INVENTORY

Number of NC Pumps On	Required "REACTOR VESSEL D/P"			
	TRN A With 1A NC Pump		TRN B With 1C NC Pump	
	ON	OFF	ON	OFF
4	95%	N/A	95%	N/A
3	74%	39%	74%	39%
2	59%	23%	59%	23%
1	50%	14%	50%	14%

Reviewed By _____

Approved By _____

TASK: **Complete a Surveillance Procedure (OAPFT Monthly PT)**

POSITION: **RO**

Operator's Name_____

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

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

SATISFACTORY/UNSATISFACTORY (circle one)

Evaluator's Signature_____ Date __/__/__

References: PT/0/A/4450/008 A (Control Room OAPFT Train A Test)
OMP 4-1 (Use of Operating and Periodic Test Procedures)

JPM verified current with references by _____

Date __/__/__

INITIAL CONDITIONS

The following conditions exist:

PT/0/A/4450/008 A (Control Room Outside Air Pressure Filter Train A Test) was started by the previous shift at 1405 on 11/11/06. The PT is complete up to Step 12.9 on page 5 of 6 in the body of the procedure. It is now 0010 on 11/12/06.

You are the U-1 Balance of Plant Operator on duty and the C/R SRO directs you to complete PT/0/A/4450/008 A and submit it for Procedure Completion Approval.

JPM OVERALL STANDARD: Operator should properly complete the procedure per OMP 4-1 (Use of Operating and Test Procedures), evaluate the acceptance criteria with given information and fill out a discrepancy sheet per NSD-704 (Technical Procedure Use and Adherence).

NOTES: Operator will be provided with a copy of PT/0/A/4450/008 A complete up to Step 12.9

When asked examiner should provide a copy of NSD-704 Appendix C (Procedure Discrepancies Process Record)

START TIME_____

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
1	Operator is provided with a copy of PT/0/A/4450/008 A complete up to Step 12.9 on pg. 5 of 6.			
*2	Operator determines the A Train CR Outside Air Press has operated for the required 10 hours and signs off the step as complete.	Operator determines from the initial conditions that the train has been operating for greater than 10 hours.		
3	Operator performs Step 12.10.	The U-2 Aux Building rounds NLO provided the following local information from panel (CRA-OFPT-1) **Cue: NLO Reports:** ■ **"Main Heater Stage 1 On" is lit** ■ **"Main Heater Stage 2 On" is Dark** ■ **"Stby Charcoal Heater ON" light is Dark**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Operator will either leave the box beside "Main Heater Stage 2 on" **Unchecked** or write in **"Item 1"** for reference in the Procedure discrepancy sheet.		
4	Operator may determine at this point that the heater malfunction discovered affects the PT acceptance criteria.	Operator may attempt to stop here and/or request guidance from the C/R SRO. If Needed: **Cue: Control Room SRO directs you to complete the PT as performed along with all required paperwork and submit for approval.**		
*5	Operator may determine that the heater malfunction represents a procedure discrepancy and that a Procedure Process Discrepancy Sheet is required to be filled out.	Note: If the Operator decides to complete one later, examiner should return to this step to record performance. **Operator asks for and is provided a blank Procedure Discrepancy Sheet**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Operator correctly fills in the required information on Lines 1 thru 4. **Operator completes the Table per the supplied completed Discrepancy Sheet.** Note: All that is normally expected of the RO is to complete the first three columns, the rest are normally completed by an SRO. The operator may choose to provide corrective action information but is not required to. If needed provide the following cue: **Another operator will generate a WR for this problem.**		
*6	Operator should Notify the Control Room SRO of the heater problem and to Log the affected heater in TSAIL.	**Cue: Control Room SRO notified and heater logged in TSAIL.**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
7	Operator evaluates Step 12.12 for filter D/P as read locally on gage 0VCPG9370.	**Cue:** **NLO reports that 0VCPG9370 is reading 4.0 inches water gage.** Operator should **N/A** Step 12.12 base on this given information.		
*8	Operator determines that the A Train Cont Rm Outside Air Pressure Fan was started in Step 12.4 and the switch should be returned to "OFF"	**Cue:** **Switch has been returned to "OFF"** **Operator should sign off step 12.13 as complete**		
*9	Operator evaluates Step 12.14 using previously completed procedure steps.	**Operator determines from the procedure that step 12.3.2 was not performed and then N/A's step 12.14.**		
*10	Operator performs Step 12.15 and completes Enclosure 13.1.	**Operator completes the 2nd line of Enc.13.1 by filling in the Stop time in the blank provided and initialing the step as complete.**		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		Cue: Stop time is 0017 **Operator Initials the 3rd line.** **The 4th line should be somehow noted as being a discrepancy. (Normally done by filling in the Item # that will reference the problem the Procedure discrepancy sheet.)** **"Procedure Discrepancy Record Attached" should be checked at the bottom of enc. 13.1.** Note: If not done earlier, Operator may now complete a Discrepancy Sheet per Step 5 of this JPM.		
11	Operator reads Step 12.16.	**Cue: C/R SRO desires to maintain the "A" Train in service.** Operator should then **N/A** Step 12.16		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
*12	Operator reads Step 12.17	**Cue: N1YM-275 has been opened.** Operator should sign off Step 12.17 as complete.		
*13	Per Step 12.18 "When one minute has elapsed, Close 1YM-275.	**Cue: One Minute has elapsed.** **Cue: NLO reports 1YM-275 is closed.** Operator should sign off Step 12.17 as complete.		
14	Operator should now complete the PT Cover Sheet.	Fill in the given completion date in the "Date(s) Performed" section. Under the "Completion" section the **Yes** boxes should be checked with the exception of the **"Calibrated Test Equipment...."** Line which should be checked **NA**. and		

* DENOTES CRITICAL

STEPS	ELEMENTS	STANDARD	S/U	COMMENTS REQUIRED FOR UNSAT
		The "Procedure requirements met?" Line should either be: <u>left blank or somehow noted as being not met.</u> Operator should **<u>sign and date the "Verified By" line.</u>** Under the **<u>"Remarks</u>**" section, the Operator should include his/her **<u>initials followed by name</u>** and the following noted: **<u>"Discrepancy Sheet Attached" or a description of the problem associated with the Main Heater Stage 2 .</u>**		
15	Operator should then turn in the completed PT to the C/R SRO.	**Cue: C/R SRO acknowledges completion of the PT and will evaluate the problems discovered.**		

STOP TIME_____

* DENOTES CRITICAL

INITIAL CONDITIONS

The following conditions exist:

PT/0/A/4450/008 A (Control Room Outside Air Pressure Filter Train A Test) was started by the previous shift at 1405 on 11/11/06. The PT is complete up to Step 12.9 on page 5 of 6 in the body of the procedure. It is now 0010 on 11/12/06.

You are the U-1 Balance of Plant Operator on duty and the C/R SRO directs you to complete PT/0/A/4450/008 A and submit it for Procedure Completion Approval.

Duke Energy
McGuire Nuclear Station
Control Room Outside Air Pressure Filter Train A Test

Procedure No.
PT/0/A/4450/008 A

Revision No.
021

Electronic Reference No.
MC0047GG

Continuous Use

PERFORMANCE

This Procedure was printed on 12/21/06 at 14:46:21 from the electronic library as:

(ISSUED) - PDF Format

Compare with Control Copy every 14 calendar days while work is being performed.

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Compared with Control Copy _____ Date _____

Date(s) Performed 11/11/06 - 11/12/06

Work Order/Task Number (WO#) 01719372

COMPLETION

- [x] Yes [ ] NA Checklists and/or blanks initialed, signed, dated, or filled in NA, as appropriate?
- [x] Yes [ ] NA Required enclosures attached?
- [x] Yes [ ] NA Charts, graphs, data sheets, etc. attached, dated, identified, and marked?
- [ ] Yes [x] NA Calibrated Test Equipment, if used, checked out/in and referenced to this procedure?
- [ ] Yes [ ] NA Procedure requirements met?

Verified By OPERATORS OWN NAME Date 11/12/06

Procedure Completion Approved Date

Remarks (*attach additional pages, if necessary*)

* - Operators Initials.
2K - Fred Kirk
JW - Jasper Williams

" Discrepancy sheet attached " OR Problems Noted Here

IMPORTANT: Do **NOT** mark on barcodes.

Procedure No. *PT/0/A/4450/008 A*

Revision No. *021*

Enclosure Number *FULL*

Printed Date *12/21/2006*

Revision History (significant issues, limited to one page)

Rev 021 10/31/2006 Changed Step 12.4.1 signoff to DV required. Made several other administrative changes to conform with writers guide.

Rev 020 (1/4/06)
Updated nomenclature for 1YM-275, added Hold Step to clarify intent, added option to place and remove jumpers in lieu of swapping VC/YC Trains, revised Steps directing action on D/P across Control Room Filter Train to include a D/P equal to 4.9 inches water gauge which had been inadvertently omitted, made Writers Guide changes.

Rev 019 (09/13/01) Deleted DV requirements for Control Room outside pressure filter train.

Rev 018 (03/20/2001) Reformatted to new template and updated to writer's manual standard.

Control Room Outside Air Pressure Filter Train A Test

1. Purpose

To demonstrate the operability of Control Room Outside Air Pressure Filter Train A.

2. References

2.1 Technical Specification: TS SR 3.7.9.1

2.2 OP/0/A/6450/011 (Control Area Ventilation/Chilled Water System).

3. Time Required

3.1 One operator for 10 hours every 31 days.

3.2 One Operations Test Technician, jumper qualified Operator or I&E Tech for 30 minutes at beginning and end of test for jumper placement and removal. (Optional)

4. Prerequisite Tests

None

5. Equipment Required

Jumper (Optional)

6. Limits and Precautions

6.1 Pressure drop across the Particulate Absolute Carbon Filter for the Control Room filter train should not exceed a D/P of 4.9 inches water gauge as read on the local installed gauge.

6.2 Train A or Train B must always be selected to provide for proper operation of the VC/YC System under B/O and/or SI Conditions. Without either Train being selected neither chiller will run during a B/O and or SI event.

7. Required Station Status

None

8. Prerequisite System Conditions

None

9. Test Method

The Outside Air Pressure Filter Train A will be started manually and run for 10 hours.

10. Data Required

The time of the start and end of the test.

11. Acceptance Criteria

11.1 Successful operation of Outside Air Pressure Filter Train A for 10 hours with both first and second stage heaters energized.

12. Procedure

12.1 Ensure the following on the Control Room Air Filter Train A local control panel (CRA-OAPFT-1):

- "Local Main Heater Enable" switch "ON"
- "Standby Charcoal Heater Enable" switch "ON"

NOTE: **IF** jumper is used in the following Steps, it may be installed by a jumper qualified Operator, I&E or OTG personnel.

N/A 2M 12.2 **IF** jumpers are required, ensure that approved screw on safety insulated connectors are used on all applicable jumper work or contact supervision for discussion of possible "alligator" clip hazards.

12.3 Perform one of the following options (NA option **NOT** performed):

☑ 12.3.1 Ensure VC/YC Train A operating per OP/0/A/6450/011 (Control Area Ventilation/Chilled Water System).

OR

DV _____ 12.3.2 Install a jumper from P-20 to P-23 in HVAC Aux. Relay Cabinet A (767, FF-55).

2K 12.4 **IF** A Train Cont Rm Outside Air Pressure Fan **NOT** in operation, perform the following:

JW DV 2K 12.4.1 Place "A Train CR Outside Air Press Fan" switch to "ON".

☑ 12.4.2 Record time in Enclosure 13.1 (Outside Air Pressure Filter Train A Data Sheet).

12.5 Check the following on VC/YC section of HVAC board:

☑ "A Train CR Outside Air Press Fan On" lit
☐ "A Train CR Filter Preheat Enabled" lit

NOTE:	Main Heater Stage 1, Main Heater Stage 2 and the Standby Charcoal Heater do **NOT** impact OAPFT operability. Heaters required for surveillance only and will **NOT** render the VC System inoperable.

12.6 Check the following on the Control Room Air Filter Train A local control panel (CRA-OAPFT-1):

☑ "Main Heater Stage 1 On" lit
☑ "Main Heater Stage 2 On" lit
☑ "Standby Charcoal Heater On" dark. (Heater should **NOT** operate when the filter package is operating)

N/A 2K 12.7 **IF** any of the heaters in the previous step are **NOT** in their listed condition, perform the following:

___ 12.7.1 Notify Control Room SRO.

N/A 2K 12.7.2 Log affected heater in TSAIL.

N/A 2K 12.8 **IF** filter D/P is greater than **OR** equal to 4.9 inches water gauge as read from local gauge 0VCPG9370 (CRA-OAPFT-1 Train A CRA-OAPFT Filter Total Diff Press), notify Operations Test Group.

_____ _____/_____
Person Notified Date Time

___ 12.9 **HOLD** until A Train CR Outside Air Press has operated at least 10 hours.

12.10 Check the following on the Control Room Filter Train A Local Panel (CRA-OAPFT-1):

☑ "Main Heater Stage 1 On" lit
Jtan ☐ "Main Heater Stage 2 On" lit
☑ "Standby Charcoal Heater On" dark

* 12.11 **IF** any of the heaters in the previous step are **NOT** in their listed condition, perform the following:

* 12.11.1 Notify Control Room SRO.

* 12.11.2 Log affected heater in TSAIL.

N/A* 12.12 **IF** filter D/P is greater than **OR** equal to 4.9 inches water gauge as read from local gauge 0VCPG9370 (CRA-OAPFT-1 Train A CRA-OAPFT Filter Total Diff Press), notify Operations Test Group.

_____ _____/_____
Person Notified Date Time

* 12.13 **IF** A Train Cont Rm Outside Air Pressure Fan was started in Step 12.4, return switch to "OFF".

> **NOTE:** **IF** jumper removal is required in the following Step, it may be removed by a jumper qualified Operator, I&E or OTG personnel.

DV N/A* 12.14 **IF** placed in Step 12.3.2, remove jumper installed between P-20 and P-23 in HVAC Aux Relay Cabinet A. (767, FF-55)

☑ 12.15 Complete Enclosure 13.1 (Outside Air Pressure Filter Train A Data Sheet).

N/A* 12.16 **IF** required, realign to Train B per OP/0/A/6450/011 (Control Area Ventilation/Chilled Water System) in order to maintain balanced running time for both trains.

* 12.17 Open 1YM-275 (Unit 1 VC Filter Unit Drain Trap YM Makeup Isol) to allow for makeup to the trap. (750 + 12' Cable trays above 2A2 KC Pump).

* 12.18 **WHEN** one minute has elapsed, close 1YM-275 (Unit 1 VC Filter Unit Drain Trap YM Makeup Isol).

13. Enclosures

13.1 Outside Air Pressure Filter Train A Data Sheet

End Of Body

Enclosure 13.1

Outside Air Pressure Filter Train A Data Sheet

Initial		
JK	Train A of C/R Outside Ventilation System in operation.	Time 1405
*	Train A has run for at least 10 hours.	Time 0017
*	Stage 1 Main heater on for at least 10 hours.	
Item 1	Stage 2 Main heater on for at least 10 hours.	

Check One:

☐ No Discrepancy
☑ Procedure Discrepancies Process Record Attached

End of Enclosure

APPENDIX C. 704. PROCEDURE DISCREPANCIES PROCESS RECORD

1. Station: McGuire Nuclear Station
2. Procedure No: PT/0/A/4450/008 A
3. Procedure Title: C/R Outside Air Pressure Filter Train A Test.
4. Date(s) Performed: 11/11/06 – 11/12/06

Item Number	Procedure Step	Description of Discrepancy	Corrective Action	Deficiency		Signature	Completion Date
				Yes	No		
1	12.10	Main Heater Stage 2 on Light not lit.					