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W F Kitchens	NUCLEAR OPERATIONS	18038-1
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NOT MIDCOOP BUT MIDCOOP CONCERN FOR OPERATION OF SGARVs w/o POWER

SD 05-91-90

ABNORMAL OPERATING PROCEDURES

OPERATION FROM REMOTE SHUTDOWN PANELS

PURPOSE

This procedure provides operator instructions in evacuating the Main Control Room, maintaining hot standby, and attaining cold shutdown from the remote shutdown panels. This procedure is applicable with or without the availability of offsite power. This procedure addresses potential or actual component failures which may be induced by Control Room fire events.

This procedure also provides instructions in the following attachments.

ATTACHMENT A - TURBINE DRIVEN AFW PUMP OPERATION FROM SHUTDOWN PANEL C
ATTACHMENT B - STARTING AND PLACING DG A(B) ON DEAD BUS FROM OUTSIDE THE CONTROL ROOM
ATTACHMENT C - REQUIRED SHUTDOWN MARGIN FOR MODES 3 AND 4
ATTACHMENT D - REQUIRED SHUTDOWN MARGIN FOR MODE 5
ATTACHMENT E - RCS/PRZR TEMPERATURE AND PRESSURE DATA
ATTACHMENT F - RCS PRESSURE TEMPERATURE LIMITS
ATTACHMENT G - LOCAL OPERATION OF THE SGARVs
ATTACHMENT H - ESTABLISHING CHARGING WITHOUT INSTRUMENT AIR
ATTACHMENT I - NON- PERIODIC OPERATION OF 1-TV-12725
ATTACHMENT J - FIRE EMERGENCY OPERATION OF SGARVs FROM SHUTDOWN PANEL PSDB

SYMPTOMS

The Main Control Room is or is about to become inaccessible due to fire, toxic gas, or any other unforeseen reasons.

ACTION/EXPECTED RESPONSE — RESPONSE NOT OBTAINED

IMMEDIATE OPERATOR ACTIONS

1. Manually trip the reactor

NOTE

- Step 2 or 3 should be done prior to Control Room evacuation IF personnel safety is NOT hindered.
- 19000-C REACTOR TRIP AND SAFETY INJECTION should NOT be implemented IF the Control Room is evacuated.

SUBSEQUENT OPERATOR ACTIONS

2. IF a Control Room fire, and at discretion of Shift Supervisor THEN:

   a. Shift CCP suction to RWST -

      1) OPEN LV-112E and/or LV-112D

      2) Shut LV112B and/or LV112C

   b. Shut PRZR PORV block valves

   c. Stop RCPs 1 and 4.

   d. Isolate Main Feedwater SHUT:

      - MFIVs
      - BFIVs

   e. Shut SG blowdown isolation valves.

   f. Shut MSIVs and bypass valves.

   g. Throttle total AFW to minimum - GREATER THAN 570 gpm.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3. IF NOT a Control Room fire or at discretion of Unit Shift Supervisor, THEN	
a. Verify turbine trip.	
b. Align VCT for AUTO makeup: • HS-40001A in AUTO • HS-40001B in AUTO-AFTER-START • FIC-110 pot set at 8.6. • LV-112A in AUTO • PV-131 in AUTO	
c. Place PRZR pressure control in AUTO.	
d. Place SG pressure control in AUTO. • SG ARVs in AUTO. • Steam Dumps in STEAM PRESSURE mode.	
e. Throttle total AFW flow to minimum - GREATER THAN 570 gpm.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

If at any time the Control Room becomes habitable, recovery should commence at Step 53 of this procedure.

CAUTION

If Control Room is evacuated due to fire, Shutdown Panel A controls and instrumentation may not be reliable. Train B is preferable for Control Room fire event operation. Fire Event qualified instrumentation is marked in red.

4.	Send operators to the following locations to perform applicable actions of Steps 6 through 9:	4. If insufficient personnel are available, use the following priority:
	a. Shutdown Panel B. • Shift Supervisor • Reactor Operator • Extra Shift Personnel	a. Shutdown Panel B.
	b. Shutdown Panel A. • BOP Operator.	b. Shutdown Panel A.
	c. Shutdown Panel C AFW Pumphouse. • Outside Area Operator.	c. Shutdown Panel C AFW Pumphouse.
	d. TSC - ERF Terminal • OSOS • STA	d. TSC - ERF Terminal.
5.	Upon exiting Control Room, isolate shutdown sound-powered phone system from the Control Room. (located outside east entrance to Unit 1 Control Room)	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If an SI actuation occurs, any components previously transferred to the Shutdown Panels must be manually actuated by the operator. Diesel Generator sequencing is also disabled for any load previously transferred to the Shutdown Panels. Components not transferred to the Shutdown Panel should realign to the safety configuration.

6.	Verify reactor is tripped. • Reactor Trip and Bypass Breaker - OPEN. • Neutron flux - LOWERING.	6. Trip the reactor: • HS-40002A - Panel A • HS-40002B - Panel B -OR- Locally open Reactor Trip and Bypass Breakers. (Control Building, Room RB-71) -OR- Place the Rod Drive MG sets Motor and Generator Circuit Breakers in TRIP position.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE After transfer of controls is complete, then match applicable switch flags (targets) with component status.	
7. IF a Control Room fire, THEN perform following: a. At Shutdown Panel A: • ENSURE Aux. Spray Valve HV-8145 is shut, THEN place transfer switch to LOCAL. • ENSURE control switches with orange dots are aligned properly, THEN place all transfer switches to LOCAL. b. At Shutdown Panel B: • ENSURE control switches with orange dots are aligned properly, THEN place all transfer switches to LOCAL. c. THEN place all transfer switches on 1AA02-00 to LOCAL. d. THEN place all transfer switches on 1BA03-00 to LOCAL.	7. IF NOT a Control Room fire, THEN place transfer switches to LOCAL when required by procedural steps.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE 91000-C, EMERGENCY CLASSIFICATION AND IMPLEMENTING PROCEDURE should be implemented at this time.	
8. Establish communications between all stations. (Preferably sound powered telephones remote shutdown channel, red box)	8. All stations on same channel or line: • Bridge Phone Ext 3055 • Page • Radio
CAUTION If a loss of offsite power occurs, the NSCW pump should be started immediately after the diesel generators have restored power to the bus.	
9. Locally verify AC Emergency Buses 1AA02 and 1BA03 - ENERGIZED by observing: 4160 volt meter on each bus. -OR- NSCW Flow on each bus • FI-1640C (Train A) • FI-1641C (Train B)	9. Attempt to energize any unenergized bus from preferred sources using handswitch on 1AA02-00 or 1BA03-00. IF any Emergency Buses cannot be energized from preferred normal source, THEN start a diesel generator on that bus using Attachment B.

ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED

CAUTION

Shutting SG ARVs by opening 1AY2A or 1BYC1 and shutting MSIVs and MSBVs by opening 1AD12 or 1BD12 will require secondary pressure control using Main Steam Code safeties unless initiating Attachment G to locally control SG pressure.

10. IF a Control Room fire, THEN send operator to:

    a. Trip the following breakers in Table:

Breaker No.	Location	Significant Equipment Actions
1BD12-08	Control Bldg., RB-47	• Shuts MSIVs • Shuts MFIVs • Shuts BFIVs
1BD12-03	Control Bldg., RB-47	• Shuts MSBVs • Isolates RMW to VCT blender • Shuts Head Vent to PRT HV-0442B • Shuts Accumulator Vent HV-0943B • Shuts Safety Grade Charging HV-0190B
1AD12-08	Control Bldg., RB-52	• Shuts MSIVs • Shuts MFIVs • Shuts BFIVs
1AD12-03	Control Bldg., RB-52	• Shuts MSBVs • Isolates RMW to VCT blender • Shuts Head Vent to PRT HV-0442A • Shuts Accumulator Vent HV-0943A • Shuts Safety Grade Charging HV-0190A
1BYC1-10	Control Bldg., RB-61	• Shuts SG ARV PV-3010
1BYC1-12	Control Bldg., RB-61	• Shuts SG ARV PV-3020
1AD11-08	Control Bldg., RB-52	• Shuts SGBD • Isolates Fire Protection to CNMT

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

b. Transfer switches on following SWGR to LOCAL:

- 1BB06 (Control Bldg, RB-61)
- 1BB07 (Control Bldg, RB-61)
- 1AB05 (Control Bldg, RB-76)
- 1AB04 (Control Bldg, RB-76)
- 1BB16 (Aux. Bldg, R207)
- 1AB15 (Aux. Bldg, RD-105)

c. Trip the following breakers in Table:

Breaker No.	Location	Significant Equipment Actions
1AY2A-17	Aux. Bldg, R118	• Shuts SG ARV PV-3000
1AY2A-18	Aux. Bldg, R118	• Shuts SG ARV PV-3030

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

If there is a Control Room fire, Train B is the preferred pressure train.

11. Control PRZR pressure between 2220 and 2260 psig:

    a. Operate backup heaters on Panel A or Panel B.

    b. Operate PRZR sprays on Panel A.

    c. Ensure at least one PRZR PORV block valve HV-8000A on Panel A or HV-8000B on Panel B - OPEN.

11. IF pressure less than 2220 psig AND lowering THEN:

    1) Verify PRZR PORVs PV-455A on Panel A and PV-456A on Panel B - SHUT

       IF PRZR PORV can NOT be shut,
       THEN manually shut its block valve.
       HV-8000A on Panel A or
       HV-8000B on Panel B.

       -OR-

       Trip Breaker 4 on 1AD1M for PV-455A or Breaker 4 on 1BD1M for PV-456A. (located in Control Bldg., room RB-52, RB-47)

    2) Verify PRZR spray valves on Panel A - SHUT

       IF NOT, THEN manually shut.

       IF PRZR spray valve can NOT be shut,
       THEN stop RCP supplying failed valve. RCP 1 for PV-455C or RCP 4 for PV-455B on Panel A.

    3) Energize PRZR heaters

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

4) IF PRZR pressure - LESS THAN 1870 psig or continues to lower, THEN perform the following to restore PRZR pressure between 2220 and 2260 psig and PRZR level 50% to 70%:

   a. Start additional ECCS pumps.

   b. Align CCPs to RWST suction.

      - Open LV-112D or LV-112E
      - Shut LV-112B or LV-112C.

   c. OPEN BIT isolation valves.

IF pressure greater than 2260 psig, THEN:

1) De-energize PRZR heater on Panel A and Panel B.

2) Control pressure using normal sprays on Panel A.

   IF normal PRZR spray NOT available, AND letdown is in service, THEN use auxiliary spray HV-8145 on Panel A.

   IF auxiliary spray NOT available, THEN use PV-455A on Panel A or PV-456A on Panel B.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

The AFW pumps and throttle valves will NOT respond to automatic signals after control has been transferred.

12. Control SG WR level(s) at 65% to 70% on all SGs.

    a. On Shutdown Panel A:

    - Start MD-AFW Pump A
    - Throttle FV-5139 and FV-5137
    - Verify miniflow FV-5155 - OPEN.

    b. On Shutdown Panel B:

    - Start MD-AFW Pump B
    - Throttle FV-5134 and FV-5132
    - Verify miniflow FV-5154 - OPEN.

12. Initiate Attachment A, Turbine Driven AFW pump operation from Panel C.

    Go to step 13.

13. IF both MDAFW pumps are available, THEN locally stop the TDAFW pump using Attachment A.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Shutting MSBV's by opening 1AD12-03 and 1BD12-03 will isolate RMW to VCT blender.

14. Verify RCS temperature. STABLE AT OR TRENDING TO 557°F.

14. IF temperature is less than 557°F and lowering THEN:

1) Verify SGARVs on Panel A and Panel B are SHUT.

IF SGARV can NOT be manually shut, THEN control RCS temperature by initiating Attachment G, Local Operation of the S/G Atmospheric Relief Valves.

-OR-

Ensure SGARV shut by opening its breaker:

Aux. Bldg. Room R118;

- 17 on 1AY2A for PV-3000
- 18 on 1AY2A for PV-3030

Control Bldg. Room RB61;

- 10 on 1BYC1 for PV-3010
- 12 on 1BYC1 for PV-3020

2) IF cooldown continues, THEN throttle AFW flows to a minimum of 570 gpm until at least one SG level is above 5% NR

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	3) IF cooldown continues, THEN shut MSIVs, MSBVs and SGBD valves by opening: • Breakers 8 and 3 on 1AD12 (Control Bldg. Rm RB-52) • Breaker 8 on 1AD11 (Control Bldg. Rm RB-52) • Breakers 8 and 3 on 1BD12 (Control Bldg. Rm RB-47) IF temperature greater than 557°F and rising AND IF a Control Room fire, THEN control temperature using 5-20 mA power supply to initiate Attachment J, Fire Emergency Operation of SGARVs From Shutdown Panel PSDB. -OR- Control RCS temperature by initiating for SGARVs PV-3010 and PV-3020 Attachment G, Local Operation of the S/G Atmospheric Relief Valves. IF temperature greater than 557°F and rising, AND IF NOT a Control Room fire, THEN control temperature using SGARVs on Panel A or Panel B. -OR- Control RCS temperature by initiating Attachment G, Local Operation Of The S/G Atmospheric Relief Valves.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE If an SI actuation occurs, TSC consultation may be necessary after it is staffed.	
15. IF an SI actuation occurs, THEN perform the following	
a. Check if ECCS flow should be reduced: • RCS subcooling - GREATER THAN 24°F using Core Exit Temperature and RCS WR pressure • RCS pressure - STABLE OR RISING • PRZR level - GREATER THAN 9% • Secondary heat sink: Total feed flow to SGs - GREATER THAN 570 gpm -OR- SG WR level - GREATER THAN 65%	a. Do not reduce ECCS flow. Consult TSC when it is staffed. Go to Step 17.

ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED

NOTE

Train B is the preferred charging train when operating from remote shutdown panels.

b. Reduce ECCS flow by stopping the following equipment.

- 1 CCP
- PDP by locally (Aux. Bldg. C level Room RC-121) tripping breaker 1NB21-08.
- SI Pumps
- RHR Pumps

c. IF preferred normal power is supplying Emergency 4160V Bus, THEN stop Emergency Diesel Generators using local emergency stop pushbuttons.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

CAUTION

- LV-112B, 112C, 112D, 112E will NOT reposition on VCT low-low level after they have been transferred to the shutdown panels.
- PRZR heaters will NOT cut off on low PRZR level after their control has been transferred to the shutdown panels.
- When operating from the shutdown panels, Train B is the preferable charging train.
- Shutting MSBVs by opening 1AD12-03 and 1BD12-03 will isolate RMW to VCT blender.

16. Control PRZR level 50% to 70%

a. Check CCP suction aligned to VCT.

- LV-112B on Panel A OPEN
- LV-112C on Panel B OPEN
- LV-112D on Panel A SHUT
- LV-112E on Panel B SHUT
- Letdown in service (FI-132B on PSDA)

a. Align CCP Suction to RWST:

1) At Panel B

- OPEN LV-112E
- SHUT LV-112C

-OR-

2) At Panel A

- OPEN LV-112D
- SHUT LV-112B

b. OPEN charging isolation valves:

- HV-8105 (Panel B)
- HV-8106 (Panel A)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
c. IF SI actuated, THEN at discretion of Unit Shift Supervisor shut BIT isolation valves: • HV-8801A (Panel A) • HV-8801B (Panel B)	
d. Start CCP B on Panel B or CCP A on Panel A	d. Start additional CCP if desired while waiting for local charging valve 1-FHC-0121 to be manned.
e. Stop PDP by locally tripping breaker 1NB21-08 (Aux. Bldg. C level Room RC-121).	

ACTION/EXPECTED RESPONSE

f. Maintain PRZR level between 50% and 70%:

- Throttle charging using 1-FHC-0121 (located outside PD Pump Room in Aux. Bldg. RC-113)

- Control seal injection flow at 8 to 13 gpm by adjusting 1-1208-U6-136 and shutting 1-1208-U6-134 (located in PDP Valve Gallery RC-111).

-OR-

IF instrument air is NOT available, THEN maintain PRZR level between 50% and 70% by using Attachment H, Establishing Charging Without Instrument Air.

RESPONSE NOT OBTAINED

f. IF PRZR level cannot be maintained, THEN maintain PRZR level between 50% and 70% using either of the following:

1) With CCP B running:

a) Verify mini-flow path

- HV-3110 on Panel A OPEN
- HV-8111B on Panel B OPEN

b) SHUT HV-8438 CCP discharge cross connect on Panel B

c) OPEN HV-8801B, BIT discharge on Panel B

d) OPEN HV-8485B, CCP B discharge on Panel B

e) Control PRZR level by:

- Shutting or opening HV-8801B

-OR-

- Stopping and starting CCP B.

ACTION/EXPECTED RESPONSE

RESPONSE NOT OBTAINED

f) At Unit Shift Supervisor's discretion, isolate FV-0121 by shutting 1-1208-U6-153 (in PDP Gallery RC-111), and throttle seal injection using 1-1208-U6-151, (located in CCP B Valve Gallery). Flows can be monitored locally on FI-0144B or FI-0145B in A-level Train B Piping Penetration Rooms or on ERF Computer.

-OR-

2) With CCP A running

a) Verify mini-flow path

- HV-8110 on Panel A OPEN
- HV-8111A on Panel B OPEN

b) OPEN HV-8485A CCP A discharge on Panel A.

c) OPEN HV-8438 CCP discharge crossconnect on Panel B.

d) OPEN HV-8801A BIT discharge on Panel A.

e) SHUT HV-8105 CCP discharge on Panel B.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	f) Control PRZR level by: • Shutting and opening HV-8801A -OR- • Stopping and starting CCP A.
	g) At Unit Shift Supervisor's discretion, isolate FV-0121 by shutting 1-1208-U6-153 (in PDP Gallery RC-111) and throttle seal injection using 1-1208-U6-152 (located in CCP A Valve Gallery). Flows can be monitored locally on FI-0144B or FI-0145B A-level in Train B Piping Penetration Rooms or on ERF Computer.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

Power may need to be restored by closing breakers 1AD12-03 and/or 1BD12-03 in Control Building Rooms RB-52 and RB-47 to establish safety grade letdown.

g. IF PRZR level can NOT be maintained less than 88%, THEN open the following until PRZR level lowers less than 70%:

- Train B head vent:
  - HV-8095B
  - HV-8096B
  - HV-0442B
- Train A head vent:
  - HV-8095A
  - HV-8096A
  - HV-0442A

17. Locally verify at least one ACCW pump - RUNNING.

17. Stop all RCPs.

Isolate letdown by closing LV-459 and LV-460 (Panel A).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE RCP 4 or RCP 1 should be run preferentially to provide normal PRZR sprays.	
18. Verify at least one RCP - RUNNING.	18. IF offsite power is available and at least one ACCW pump is in service, THEN: a. Start the RCP Oil Lift Pump. b. Verify PRZR spray valves SHUT. c. After about 2 minutes start the selected RCP. IF offsite power NOT available OR ACCW pump NOT in service THEN: Verify that the RCS is being cooled by natural circulation: • RCS subcooling greater than 50°F. • SG pressures stable or lowering. • RCS hot leg temperatures stable or lowering. • RCS cold leg temperatures at saturation for SG pressure. Refer to Attachment F, RCS Pressure - Temperature Limits.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
19. IF a Control Room Fire, THEN prevent spurious actions from occurring: • Secure Containment Sprays by racking out: • 1AA02-14 • 1BA03-14	
20. At the discretion of the Unit Shift Supervisor, locally trip SGFPTs at its front standard.	
21. At the discretion of the Unit Shift Supervisor, shutdown the following by depressing TRIP on their breakers: • Both Heater Drain Pumps (Turb. Bldg. Level 1) • 1NA04 Brkr 13 • 1NA01 Brkr 12 • All but one Condensate Pump (Turb. Bldg. Level 2) • 1NAA Brkr 6 • 1NAA Brkr 5 • 1NAB Brkr 4 • All but one Circulating Water Pump (Turb. Bldg. Level 2) • 1NAA Brkr 4 • 1NAB Brkr 5 • All River Water Makeup Pumps not required considering requirements of both units. (River Intake) • ANA01A Brkr 2 • ANA01A Brkr 3 • ANA01B Brkr 11 • ANA01B Brkr 12	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
22. IF a Control Room fire, THEN isolate Excess Letdown and BTRS: • Open Brkr 14 on 1ND32. (Control Bldg. Room RB-53) • Open Brkr 8 on 1ND31. (Control Bldg. Room RB-53)	
23. Borate the RCS to a Hot Standby Xenon Free concentration:	
a. Determine required RCS shutdown margin using Attachment C.	
b. Determine actual RCS shutdown margin using 14005-1, SHUTDOWN MARGIN CALCULATION-LESS THAN REQUIRED.	b. Go to Step 24.
c. Start Boric Acid Transfer Pump on Panel A or Panel B.	
d. Open Emergency Boration Valve: • HV-8104 - Panel A -OR- • HV-8439 - Panel B	d. If emergency boration path NOT available THEN shift CCP suction to RWST to borate RCS: Open LV-112D on Panel A or LV-112E on Panel B.

NOTE

With one boric acid transfer pump running and flow through HV-8104, RCS boron concentration will increase about 8 ppm/min. Flow through HV-8439 will increase RCS boron concentration at about 2 ppm/min. Flow from RWST will increase RCS boron concentration about 1 ppm/min.

e. Terminate boration when required shutdown margin is reached or PRZR level reaches 85%.	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
24. IF SI not actuated, THEN have Chemistry sample RCS and PRZR for boron - GREATER THAN REQUIRED.	24. Return to Step 23.

NOTE

If boration was stopped due to high PRZR level THEN continue boration as PRZR level lowers during cooldown.

25. Commence a cooldown to cold shutdown if any ONE of the following occur:
• Both CST levels lower to less than 340,000 gal (66%) as read on:
  • If NOT Control Room fire:
  • LI-5101A for CST-1
  • LI-5104A for CST-2
  • If Control Room fire:
  • LI-5100 for CST-1
  • LI-5115 for CST-2
• PRZR level can NOT be controlled less than 85%.
Cooldown is achieved by continuing following steps.
	25. Maintain Hot Standby. Return to Step 12.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
26. Borate the RCS to Cold Shutdown Xenon-Free concentration:	
a. Determine required RCS shutdown margin using Attachment D.	
b. Determine actual RCS shutdown margin using 14005-1, SHUTDOWN MARGIN CALCULATIONS - LESS THAN REQUIRED.	b. Go to Step 27.
c. Start Boric Acid Transfer Pump on Panel A or Panel B.	
d. Open Emergency Boration Valve: • HV-8104 - Panel A -OR- • HV-8439 - Panel B.	d. IF emergency boration path NOT available THEN shift CCP suction to RWST to borate RCS: Open LV-112D on Panel A or LV-112E on Panel B.
e. Terminate boration when required shutdown margin is reached or PRZR level reaches 85%.	
27. IF RCP 1 or 4 running THEN slightly open one PRZR spray valve to equalize boron between RCS and PRZR.	

CAUTION

Train B is the preferable charging train when operating from the shutdown panel, if a Control Room fire.

28. Raise PRZR level to about 70% using control established in Step 16.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE Pressurizer heaters may be cycled as necessary to stabilize pressure.	
29. Turn off all PRZR heaters: a. Locally open • 1NB08 - Brkr 12 (Control Bldg. RB-50) • 1NB09 - Brkr 12 (Control Bldg. RB-50) b. Turn off heaters • HS-10469B Panel A • HS-10470B Panel B	
30. Open SGARVs to establish a 50°F/hr RCS cooldown rate on the SGs which are provided with AFW flow.	30. Locally open SGARVs to establish 50°F/hr RCS cooldown rate using Attachment G, -OR- IF a Control Room fire, THEN locally open SGARVs FV-3010 and PV-3020 to establish 50°F/hr RCS cooldown rate using: • Attachment G, Local Operation Of The SG Atmospheric Relief Valves. • 5-20 mA power supply to initiate Attachment J, Fire Emergency Operation of SGARVs From Shutdown Panel PSDB.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
31. Using PRZR spray depressurize RCS by using Recommend Heat-up/ Cooldown Path ±25°F curve on Attachment F.	31. IF letdown is in service, open CVCS Auxiliary Spray HV-8145. IF letdown is out of service, THEN use one PRZR PORV. IF PRZR PORVs out of service, THEN close 1AD12-03 and 1BD12-03 Control Bldg. Rooms RB-52 and RB-47 (if closed for CR fire) AND THEN use Rx Head Vents.
32. Adjust AFW flow as required to maintain SG WR level - 65% to 70% using: Train A: • HV-5139 • HV-5137 Train B: • HV-5134 • HV-5132	32. Locally operate AFW pump and throttle valves to control SG level using Attachment A.
33. Adjust charging flow to maintain PRZR level between 50% and 70%.	
34. Monitor and document cooldown using Attachments E and F at least every 30 minutes. (Convert PRZR pressure to saturation temperature using Attachment F and calculate subcooling using Attachment E.)	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
35. At RCS pressure of 1970 psig:	
a. Block PRZR pressure SI: • HS-40012B - Panel A • HS-40013B - Panel B	
b. Block Steamline Pressure SI: • HS-40068B - Panel A • HS-40069B - Panel B	
NOTE RCP 4 or RCP 1 should be run preferably to provide normal PRZR sprays.	
36. At RCS temperature of 450°F, reduce running RCPs to two:	
a. Verify RCPs 1 and 4 - RUNNING	a. Go to step 37.
b. Stop RCP 2 and 3	

ACTION/EXPECTED RESPONSE — RESPONSE NOT OBTAINED

NOTE

Power may need to be restored to HV-0943A and B by closing breakers 1AD12-03 and 1BD12-03 (Control Building RB-52 and RB-47) to vent the accumulators.

37. Stabilize RCS pressure at 950 psig:

a. Vent accumulators by opening the following:

Train A

- HV-8875A
- HV-8875B
- HV-8875C
- HV-8875D
- HV-0943A

- OR -

Train B

- HV-8875E
- HV-8875F
- HV-8875G
- HV-8875H
- HV-0943B

38. Continue cooldown using sprays and SGARVs:

a. Stabilize RCS pressure at 365 psig.

b. Stabilize RCS temperature at less than 350°F.

39. Rackout the breaker for the non-operating CCP.

- Train A, CCP 1AA02 Brkr 13

- OR -

- Train B, CCP 1BA03 Brkr 13

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
40. Rack out the breaker for both SIPs: • Train A SIP 1AA02 Brkr 16 • Train B SIP 1BA03 Brkr 17	
NOTE RCP 4 or RCP 1 should be run preferably to provide normal PRZR sprays.	
41. Stop all but one RCP.	
42. Locally ensure HV-8804A and HV-8804B are SHUT (located in RHR Hx Rooms RC-90 and RC-91). THEN open Breaker 5 on bus - 1ABB and 1BBB (located in Aux. Bldg. Rooms R118 and R116).	42. Locally open Breaker 5 on bus - 1ABB and 1BBB, THEN locally shut HV-8804A and HV-8804B.
43. Ensure RHR vent valves HV-10465 and HV-10466 are SHUT by opening Breaker 8 on 1ND31. (located in Control Bldg. Room RB-53)	
44. Verify two CCW pumps RUNNING. (Preferably on Train B.)	44. Start two CCW pumps.
45. Verify two NSCW pumps RUNNING. (Preferably on Train B.) Verify CBCI [illegible]SF Chillers running on operating NSCW train.	45. Start two NSCW pumps.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
46. Start NSCW cooling tower fan as needed to support RCS cooldown.	
47. Ensure NSCW tower valves HV-1668A on Panel A and HV-1669A on Panel B - OPEN	47. Manually open valves. (located in NSCW towers)

ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED

CAUTION

The RHR Loop 1 and Loop 4 Inlet Isolations (HV8701A, 8701B, 8702A, 8702B) will NOT auto close on high RCS pressure after control is transferred to the shutdown panels.

NOTE

When operating from the shutdown panels, Train B is the preferable RHR train.

48. Establish one train of RHR:

48. If any preferred RHR train equipment cannot be placed in service, repeat Step 48 to place alternate train RHR in service.

IF no RHR train can be placed in service, verify RCP running or maintain natural circulation as in Step 18 RNO.

Continue attempts to establish RHR and go to Step 49.

a. Place RHR Loop Inlet Isolation inverters in service by initiating 13405-1, 125V DC 1E ELECTRICAL DISTRIBUTION SYSTEM:

- 1DD1I6 - Train B (Control Bldg. RB-48)
- 1CD1I5 - Train A (Control Bldg. RB-55)

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
b. Close inverter AC output breaker: • 1DD1I6 - Train B • 1CD1I5 - Train A	
c. Close RHR isolation starter input breaker. • HV-8702A - Train B • HV-8701B - Train A	
d. Unlock and close RHR isolation valve breaker: (In Control Bldg. Room RA-77): • 1BBE-13-1 - Train B • 1BBE-13-2 - Train B (In Control Bldg. Room RB-79): • 1ABE-15-1 - Train A • 1ABE-15-2 - Train A	
e. Shut RHR Heat Exchanger Outlet: • HV-0607 - Train B • HV-0606 - Train A	
f. Shut RHR Heat Exchanger Bypass: • FV-0619 - Train B • FV-0618 - Train A	
g. Close RWST to RHR suction: • HV-8812B - Train B • HV-8812A - Train A	
h. Ensure RHR to Cold Leg Isolation open: • HV-8809B - Train B • HV-8809A - Train A	h. Transfer control and open the valves.
i. Open RHR Hot Leg Suction: • HV-8702A - Train B • HV-8702B - Train B • HV-8701A - Train A • HV-8701B - Train A	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
j. Start the RHR pump on the selected train.	
k. Slowly adjust RHR heat exchanger bypass to establish a flow rate of 3000 gpm, THEN place in AUTO • FV-0619 - Train B • FV-0618 - Train A	k. IF RHR pump flow indication is NOT established, THEN stop the applicable RHR pump and place other train in service by returning to Step 48. IF RHR flow rate can NOT be controlled less than 4500 gpm, THEN stop the applicable RHR pump and place other train in service by returning to Step 48.

NOTE

It may be necessary to stop RHR pump before throttling RHR discharge valves.

l. Slowly adjust RHR heat exchanger outlet to establish a 50°F/hr RCS cooldown rate. • HV-607 - Train B • HV-606 - Train A	l. IF instrument air is NOT available THEN control cooldown rate by locally throttling RHR pump discharge: • 1-1205-U6-020 - Train B • 1-1205-U6-019 - Train A (located outside RHR Hx rooms in Aux. Bldg. Rooms RC-92 and RC-89) -OR- IF Control Room fire, THEN locally isolate and bleed off air supply to HV-0607 and FV-0619 in RHR B Pump Room, AND THEN control cooldown by throttling 1-1205-U6-020 (outside RHR Hx Room in Aux. Bldg. Room RC-89).

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

CAUTION

Do NOT attempt to take RCS solid from the shutdown panels.

49. IF PRZR level rises to greater than 88% THEN:

a. IF one train of RHR in service, stop the last RCP.	a. IF RHR not in service, do not stop RCP. Continue with Step 49b.
b. Stop the CCP.	
c. Shut letdown isolation valves: • LV-460 - Panel A • LV-459 - Panel A	
d. Shut charging isolation valves: • HV-8147 - Panel B • HV-8146 - Panel A	

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
50. IF a Control Room fire and at the discretion of the Unit Shift Supervisor, THEN prevent spurious actions.	
a. Verify TV-12725 is - OPEN. (located in Control Bldg. Room RB-62)	a. Open TV-12725 by initiating Attachment I, Non-periodic Operation Of 1-TV-12725.
b. IF CBCR ESF Chiller room temperature rises to an uncomfortable level, THEN provide it temporary ventilation.	
c. IF Train B Auxiliary Relay Room (Control Bldg. Room 223) temperature rises to an uncomfortable level, THEN provide temporary ventilation to Room 223.	

ACTION/EXPECTED RESPONSE | RESPONSE NOT OBTAINED

NOTE

Power may need to be restored by closing Breakers 1AD12-03 and/or 1BD12-03 in Control Building Rooms RB-52 and RB-47 to establish safety grade letdown.

51. IF PRZR level rises to greater than 88% with charging and letdown out of service, THEN open the following reactor head vent valves until level lowers to less than 88%:

    Train A

    - HV-8095A
    - HV-8096A
    - HV-0442A

    -OR-

    Train B

    - HV-8095B
    - HV-8096B
    - HV-0442B

52. Maintain the following:

    - RCS pressure - approximately 350 psig.
    - RCS temperature - less than 200°F.
    - Bubble in PRZR.

53. When access to the Control Room is regained, establish communications between the Shutdown Panels and Main Control Room.

ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
NOTE If SGFPTs are not reset, an FWI actuation will occur.	
54. Reset SGFPT A and B at the Main Control Board.	
55. Check that there are NO ESFAS actuation signals present.	55. IF an ESFAS actuation signal is present, THEN reset condition and actuation prior to transfer.
NOTE Prior to transferring switches and controls from the shutdown panel to the Main Control Room panel, switch positions should be verified and controller errors should be nulled between the control stations.	
56. Transfer controls back to Main Control Room while initiating 11510-1, REMOTE SHUTDOWN PANEL LINEUP.	
57. At the Unit Shift Supervisor's discretion, restore any previously altered equipment back to normal configuration.	
58. At the Unit Shift Supervisor's discretion, initiate the appropriate procedure.	

END OF PROCEDURE TEXT

ATTACHMENT A

TURBINE DRIVEN AFW PUMP OPERATION FROM SHUTDOWN PANEL C

CAUTION

The TDAFW pump steam supply valve, HV-5106, will not automatically open on a pump start signal after control has been transferred to the Shutdown Panel.

A.1 STARTING TDAFW PUMP

A.1.1 TRANSFER control of the TDAFW pump steam supply isolation valves, HV-3009 and HV-3019 to LOCAL.

A.1.2 ENSURE at least one steam supply isolation valve is open.

A.1.3 TRANSFER control of the TDAFW Pump Room Outside Air Damper, HV-12010 to LOCAL.

A.1.4 ENABLE differential pressure controller PDIC-5180B by placing transfer switch HS-5180 in LOCAL.

A.1.5 TRANSFER control of the TDAFW Pump AFW Throttle Valves HV-5120, HV-5122, HV-5125 and HV-5127 to LOCAL.

A.1.6 ENSURE TDAFW pump Trip/Throttle Valve PV-15129 is reset by verifying the motor operator is OPEN and the valve is latched and OPEN.

A.1.7 ENSURE differential pressure controller PDIC-5180B is in AUTO.

A.1.8 START the TDAFW pump by placing HS-5106C in LOCAL and opening HV-5106.

A.1.9 VERIFY that pump speed and discharge pressure begin rising.

NOTE

Differential pressure controller PDIC-5180B will attempt to maintain a fixed differential pressure of 500-600 psid between the TDAFW pump turbine steam supply pressure and the pump discharge pressure by raising or lowering turbine speed as steam pressure varies with RCS temperature.

A.1.10 MONITOR AFW flow to each SG using FI-5150C, FI-5151C, FI-5152C and FI-5153C.

ATTACHMENT A

TURBINE DRIVEN AFW PUMP OPERATION FROM SHUTDOWN PANEL C

A.1.11 MONITOR SG levels and adjust TDAFW pump AFW Throttle Valves as necessary to maintain SG WR level - 65% to 70%.

A.2 STOPPING TDAFW PUMP

A.2.1 TRANSFER control of ALL TDAFW pump and valve controls to LOCAL.

A.2.2 PLACE the TDAFW Pump Speed Controller PDIC-5180B in MANUAL and REDUCE turbine speed to 1535 rpm.

A.2.3 TRIP the pump by placing HS-15111B in CLOSE.

A.2.4 CLOSE the Steam Supply Isolation Valve HV-5106.

A.2.5 When TDAFW pump reaches 500 rpm, fully open all TDAFW pump AFW Throttle Valves.

END OF ATTACHMENT A

ATTACHMENT B

STARTING AND PLACING DIESEL GENERATOR A(B)
ON A DEAD BUS FROM OUTSIDE THE CONTROL ROOM

B.1. ESTABLISH communications between the diesel generator and affected 1E 4kv bus.

At the Generator Control Panel PDG1 (3).

B.2. RESET lockout relays A, B, C if required.

B.3. PLACE Local/Remote Switch in LOCAL:

- HS-4516 (4517)

B.4. IF tripped, THEN reset control power breakers on front of engine control panel.

B.5. PLACE Unit/Parallel switch HS-4414A (4452A) in UNIT.

B.6. ALERT personnel in the vicinity that the diesel generator is starting.

B.7. DEPRESS Manual Start pushbutton HS-4569A (4570A).

B.8. OBSERVE the following:

a. Red STARTING lamp energizes.

b. Red SHUTDOWN SYSTEM ACTIVE lamp energizes.

c. Starting air is admitted to cylinders and engine begins to roll.

d. Red RUNNING lamp energizes when engine speed reaches 200 rpm.

e. Blue READY TO LOAD lamp energizes when engine speed reaches 400 rpm.

f. Generator field flashes and generator voltage raises to 3750-4300 volts.

B.9. CONTROL generator voltage at 4kV using HS-4488A (4494A).

B.10. CONTROL generator frequency at 60 Hz using HS-4518A (4519A).

ATTACHMENT B

B.11. At the 1E 4kV bus local control panels 1AA02-00 (1BA03-00).

a. TRANSFER control to LOCAL and TRIP PREF NORM INCM BRKR 1AA02-05 (1BA03-01).

b. TRANSFER control to LOCAL and CLOSE DIESEL GEN BRKR 1AA02-19 (1BA03-19).

B.12. At the Remote Shutdown Panels:

a. START at least one Nuclear Service Water pump on the affected bus.

b. START AFW pumps on the affected bus.

B.13. At the 1E 4kV bus local control panels:

a. TRANSFER control to LOCAL and CLOSE the following Sply FDR Brkrs:

- 1AA02-10 (1BA03-06)
- 1AA02-20 (1BA03-04)
- 1AA02-21 (1BA03-09)
- 1AA02-22 (1BA03-18)

B.14. At 480V AC MCC 1NBI(1NBO), CHECK the following:

a. The Generator Space Heater red indicating lamp is OFF,

b. The Jacket Water Circulating Pump green indicating lamp is ON,

c. The Lube Oil Circulating Pump green indicating lamp is ON.

ATTACHMENT B

B.15. CHECK the following parameters after the engine has been operating for several minutes:

a. Engine oil pressure stabilizes between 50 and 55 psig,

b. Turbocharger oil pressure stabilizes between 20 and 25 psig,

c. Jacket water pressure stabilizes between 10 and 30 psig,

d. Fuel oil pressure stabilizes between 20 and 30 psig,

e. LO OUT and JW OUT thermocouple temperatures stabilized at less than 180°F,

f. Generator bearing oil rings are turning freely.

B.16. Periodically VERIFY operation of the Fuel Oil Transfer Pumps. If A train transfer pump(s) is not operating properly and is required, 27579-C, EMERGENCY DIESEL GENERATOR FUEL OIL PUMP CONTROL CIRCUIT EMERGENCY may be used to provide guidance in bypassing Control Room circuitry.

B.17. VERIFY associated Diesel Generator Room Fan is running or CLOSE Supply Breaker 1AB04-01 in Control Building RB-76 (1BB07-01 in Control Building RB-61).

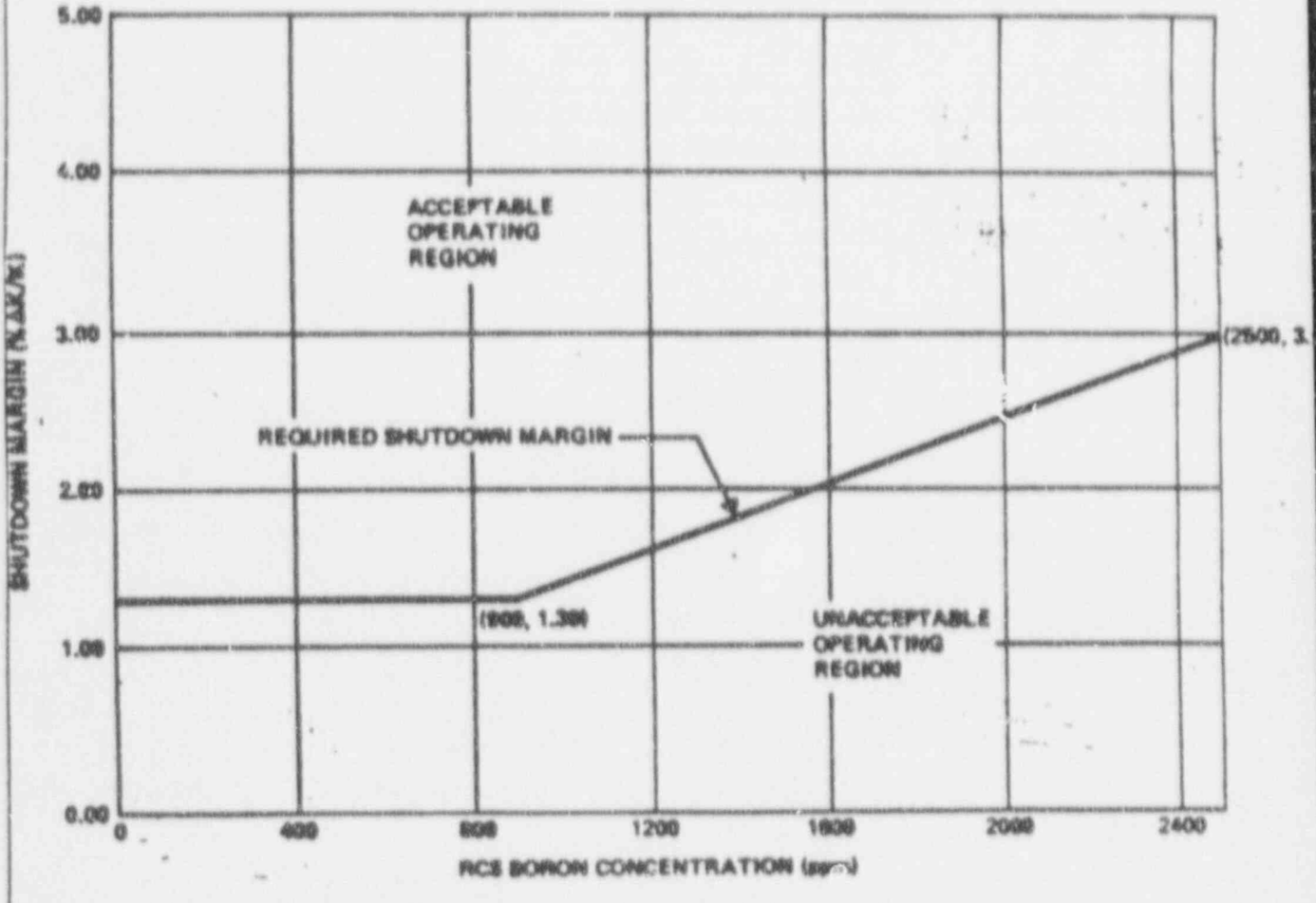
END OF ATTACHMENT B

Sheet 1 of 1

ATTACHMENT C

REQUIRED SHUTDOWN MARGIN FOR MODES 3 AND 4

(MODE 4 WITH AT LEAST ONE RCP RUNNING)

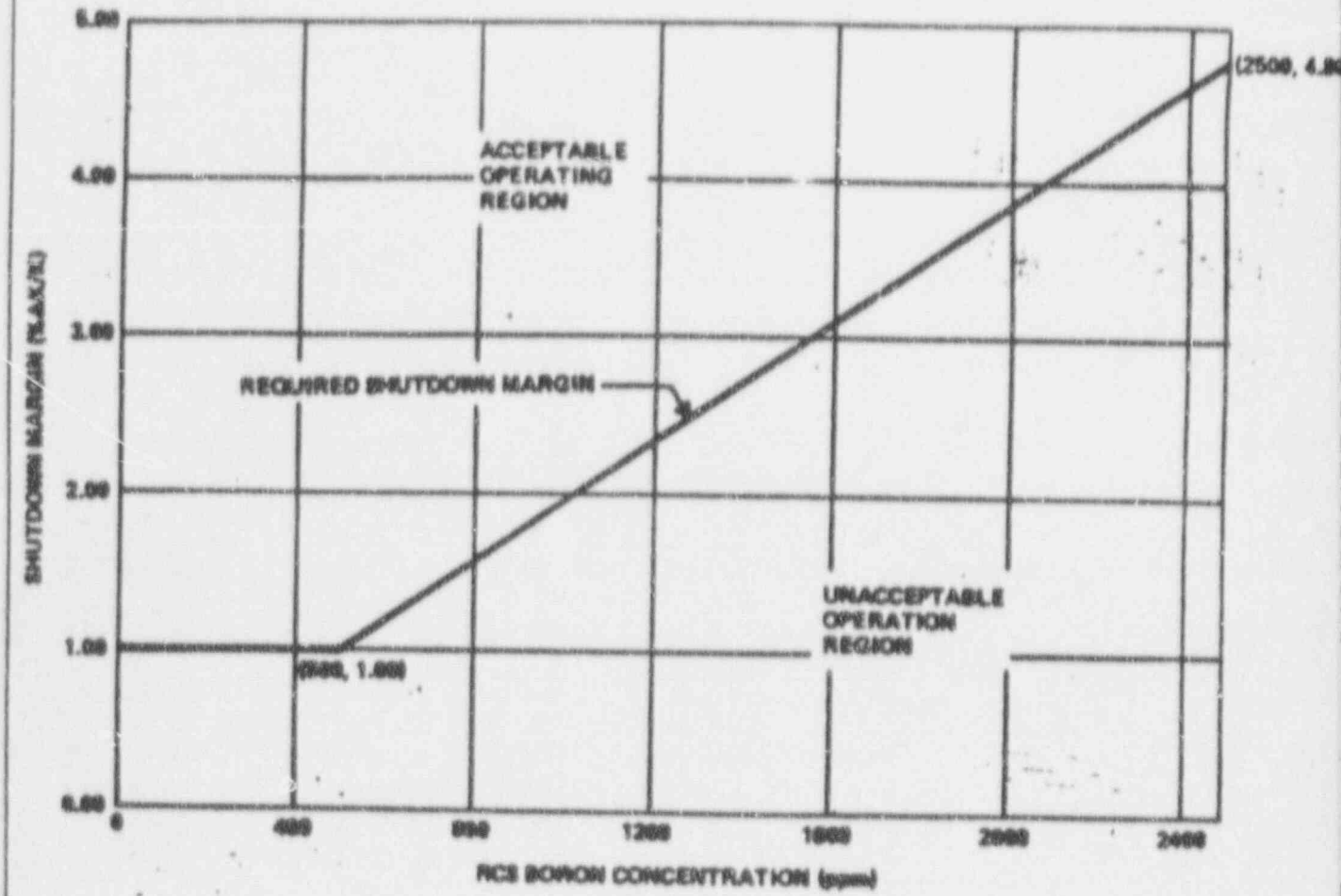


Sheet 1 of 1

ATTACHMENT D

REQUIRED SHUTDOWN MARGIN FOR MODE 5

(MODE 4 WITH NO RCP's RUNNING)



Sheet 1 of 1

ATTACHMENT E

RCS/PRZR TEMPERATURE AND PRESSURE DATA

TIME	PRZR PRESS	SAT TEMP	RCS TEMP	SUBCOOLING = SAT TEMP - RCS TEMP

Completed _____
Signature Date/Time

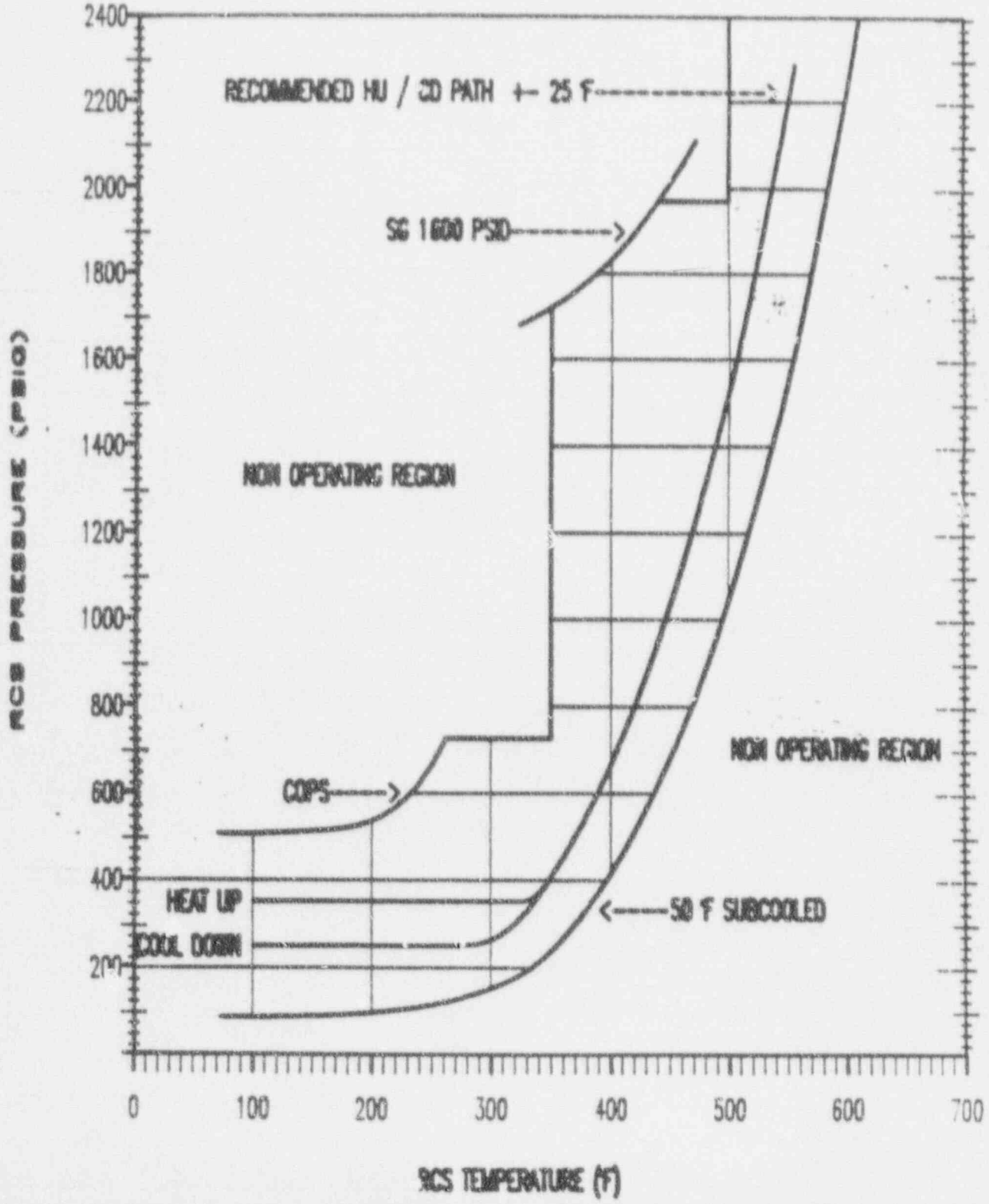
Reviewed _____
Signature Date/Time

Comments _____

Sheet 1 of 1

ATTACHMENT F

RCS PRESSURE TEMPERATURE LIMITS



ATTACHMENT G

LOCAL OPERATION OF THE STEAM GENERATOR ATMOSPHERIC RELIEF VALVES

G1. OPEN the breaker for the Hydraulic Operator Pump of the Atmospheric Relief Valve (ARV) intended to be locally operated.

SG1	1PV-3000	1ABB-25 (Aux. Bldg., Room 118)
SG2	1PV-3010	1BBB-25 (Aux. Bldg., Room 116)
SG3	1PV-3020	1BBB-26 (Aux. Bldg., Room 116)
SG4	1PV-3030	1ABB-26 (Aux. Bldg., Room 118)

'ABLISH COMMUNICATIONS between the Shutdown panels and the Steam Valve Room ARV Local Hand Pump Station.

E the Local Hand Pump Station in STANDBY by performing following steps:

CHECK level in hydraulic fluid reservoir,

b. POSITION Selector Valve 2 to NEUTRAL (Valve handle will point directly away from the reservoir),

c. CLOSE the hand pump bleed off valve using the slotted end of the ,ump handle,

d. STROKE hand pump several times to check free movement,

e. CLOSE the Reservoir Inlet Valve 11A,

f. OPEN the Accumulator Dump Pilot Supply valve 11B,

g. STROKE hand pump until Gauge 8 reads 1000 to 1500 psig for approximately 1 minute,

NOTE

Maintaining this pressure may be accomplished by applying continuous force downward on the pump handle while monitoring pressure.

h. OPEN the Reservoir Inlet Valve, 11A and allow the pressure on Gauge 8 to drop to 0 psig,

i. CLOSE valve 11B,

j. CLOSE valve 11A.

ATTACHMENT G

G4. When directed by the Shutdown panels, LOCALLY POSITION the ARV by performing the following applicable steps:

a. To jack valve in the OPEN direction:

(1) Shift the Selector Valve 2 to the OPEN position,

(2) STROKE the hand pump until the desired valve position (as determined by the Shutdown panels) is obtained,

(3) SHIFT the Selector Valve 2 back to the NEUTRAL position.

b. To jack valve in the CLOSE direction:

(1) SHIFT the Selector Valve 2 to the CLOSE position,

(2) STROKE the hand pump until the desired valve position (as determined by the Shutdown panels) is obtained,

(3) SHIFT the Selector Valve 2 back to the NEUTRAL position.

G5. When it is desired to TRANSFER CONTROL of the ARV back to the Shutdown panels, perform the following steps:

NOTE

It may be desirable to control Reactor Coolant System temperature with one of the other ARVs while re-establishing control of the locally operated ARV to the Shutdown Panels.

a. At the ARV Local Hand Pump Station:

(1) POSITION the Selector Valve 2 to the Neutral position,

(2) OPEN the Reservoir Inlet Valve 11A,

(3) OPEN the hand pump bleed-off valve using the slotted end of the pump handle.

ATTACHMENT G

b. On the Shutdown panels, ADJUST the ARV controller 1PIC-3000B (3010B, 3020B, 3030B) for MINIMUM FLOW,

c. CLOSE the breaker to supply power to the ARV hydraulic pump opened in Step G1.

d. ADJUST the ARV controller to maintain Reactor Coolant System temperature as required.

G6. RETURN to Step in effect.

END OF ATTACHMENT G

ATTACHMENT H

ESTABLISHING CHARGING WITHOUT INSTRUMENT AIR

H.1. Establish Charging With Train A Emergency Bus Energized:

1. Verify Train A normal miniflow isolation valves - OPEN:

   - HV-8111A
   - HV-8110

2. Verify Train A CCP - RUNNING.

3. Verify Train A charging isolation valves - OPEN:

   - HV-8116
   - HV-190A

4. Shut the following charging isolation valves:

   - HV-8485A
   - HV-8106

5. Dispatch local operators to do the following:

   a. Verify - OPEN 1-HV-8105.

   b. Maintain 8 to 13 gpm seal injection flow by throttling OPEN 1-1208-U6-152.

NOTE

If breaker 1AD12-03 was tripped, it must be reset prior to operating HV-190A.

6. Maintain desired charging flow using HV-190A.

ATTACHMENT H (Cont'd.)

H.2. Establish Charging With Train B Emergency Bus Energized:

1. Verify Train B alternate miniflow isolation valves - OPEN:

   - HV-8111B
   - HV-8110

2. Verify Train B CCP - RUNNING.

3. Verify Train B charging isolation valve HV-190B - OPEN.

4. Verify Train B BIT outlet isolation valve HV-8801B - OPEN.

5. Shut the following charging isolation valves:

   - HV-8438
   - HV-8485B

6. Dispatch local operators to do the following:

   Maintain 8 to 13 gpm seal injection flow by throttling OPEN 1-1208-U6-151.

NOTE

If breaker 1BD12-03 was tripped, it must be reset prior to operating HV-190B.

7. Maintain desired charging flow using HV-190B.

END OF ATTACHMENT H

ATTACHMENT I

NON-PERIODIC OPERATION OF 1-TV-12725

NOTES

a. Manual operation of these valves is accomplished by positioning the 4-way Selector Valve and operating the Hand Pump to cycle the valve.

b. This valve serves the subsystem Control Building Safety Features Electrical Equipment Room Train B.

I.1. OPEN the Power Supply Breaker for the following valve:

VALVE	BREAKER	MCC	LOCATION
1-TV-12725	1BYA1-22	1BBA	CB R-322

I.2. REMOVE the small Cover Plate from the side of the Valve Cover.

NOTE

The 4-way Selector Valve is located directly below the Hand Pump.

I.3. POSITION the 4-way Selector Valve as required to open or close the valve.

I.4. PUMP the Hand Pump until the valve completely strokes.

I.5. POSITION the 4-way Selector Valve to the center position.

I.6. REPLACE the side cover on the Valve Cover.

END OF ATTACHMENT I

ATTACHMENT J

FIRE EMERGENCY OPERATION OF SGARVS FROM SHUTDOWN PANEL PSDB

J.1. CONTACT the I&C Shop and DIRECT them to send an I&C Technician to Panel PSDB. The technician should bring a Transmation Digital Calibrator, Model 1040 or equivalent and test leads suitable to plug in banana jack plugs in PSDB and the Transmation.

NOTE

Steam Generator Atmospheric Relief Valves for Steam Generators 2 and 3 (1-PV-3010, 3020) are operated remotely from Remote Shutdown Panel PSDB. These ARVs have the capability to be controlled with a portable temporary current source.

J.2. POSITION 1-HS-3010A (3020A) to the FIRE EMERGENCY position at the PSDB.

J.3. CONNECT a 4-20 mA current signal via banana jack plugs inside the PSDB for the ARV to be operated. (Use Transmation Digit. Calibrator, Model 1040, or equivalent supplied by the I&C Department.)

J.4. Manually ADJUST the current signal to the valve to maintain Reactor Coolant System temperature as required.

J.5. Upon completion of the Fire Emergency Operation, PERFORM the following; independent verification required:

a. Manually ADJUST the current signal to CLOSE the ARV being operated,

b. DISCONNECT the Transmation Calibrator from inside the PSDB for the ARV being operated,

c. POSITION 1-HS-3010A (3020A) to the NORMAL position at the PSDB.

END OF ATTACHMENT J

(Warren Lyon)

05-92-90

RADIATION MONITORS STATUS

Immediately before the event:
Channels inoperable from daily report

ARE2532A & B	Fuel Handling Bldg. Exhaust System Isolation
1RE0017A	CCW Train A *Admin
1RE0020A	NSCW Train A *Admin
1RE1950	ACCW Pump Inlet
1RE48000	CVCS Letdown Monitor
1RE0024 A & B	Select Component Cubicle Monitor
1RE12839X	SJAE & Stm Packing Exhaust Rad Monitor

Immediately after the event during loss of power to the 1-E busses:
Channels operable for monitoring only (powered from DC source through an inverter).

1RE0002	Area Monitors Containment - Operating Level
1RE0003	Area Monitors Containment - Operating Level
1RE0005	Area Monitors Containment - Operating Level
1RE0006	Area Monitors Containment - Operating Level
ARE2533 A & B	FHB Exhaust System Isolation
1RE12116	Main Control Room Outside Air Intake
1RE12117	Main Control Room Outside Air Intake
1RE2562 A, B, C	Containment Atmosphere
1RE13119, 13120 13121, 13122	Main Steam Live Monitors

Instruments read out in the Control Room on the Safety Related Display Console (SDRC).

How do we identify and assess safety issues in the planning phase of outage preparation?

The Outage Planning Group collects the information on the work to be performed and using the Tech Specs, Limiting Conditions of Operation, industry experience, and operability requirements imposed either by procedures or the Operations Department for guidance, lays out a sequence of work activities. Normally, Engineering, Chemistry, Health Physics, and Radwaste will provide input to operability requirements, not necessarily spelled out in procedures, to aid the initial sequencing of work.

The draft schedule is reviewed by all departments and comments provided to the Outage Planning Group. Significant comments or concerns are discussed at the Outage Planning Meetings where all departments are represented. Action Items are generated out of the Outage Planning Meeting to resolve the concerns. The progress on the significant issues is discussed at the Outage Planning Meetings until resolution is reached.

The resolution of items can take many forms. Sometimes an Engineering evaluation is needed; special testing may be prescribed; schedule changes can result with additions, deletions, or changing work sequence.

A good example of this process is the scheduling of remaining switchgear from service for cleaning and inspection. First, the loads on the switchgear were determined. Then a plan was developed whereby we would take out 1/3 of the switchgear each cycle. Operational concerns were referred to Engineering for review.

The adequacy of these review efforts by all parties in each stage of schedule development is heavily dependent on the training, knowledge, and experience of our plant staff. In addition to our plant staff, Westinghouse reviews our NSSS work for proper sequencing, work durations, crew size, etc. and provides comments through their Site Manager.

How do you factor industry event information into the Vogtle Outage Schedule. My comments are restricted to how information gets into the Outage Schedule, and does not include the entire process for disseminating industry event information.

Industry Event Information is received at the site and processed in accordance with Procedure 00414-C, the Operations Assessment Program. There the information is categorized and any information involving refueling outages or work controls or anything that would effect outage activities, is sent to the Outage and Planning Manager for information and sometimes for action. The Outage and Planning Manager then will review the information and provide copies of this information to the Outage Scheduling Group. Based on his initial assessment of the information, action items may or may not be assigned, depending upon the information at hand or the event that has taken place.

In parallel with the Scheduling Group reviewing the industry event for possible schedule action. These events are also discussed in outage planning meetings where the broader scope of plant population evaluates the impact on activities such as midloop and seismic events during refueling, etc. During the outage planning meetings actions are then assigned to the individual departments such as, Engineering or Operations where either a Engineering evaluation or procedural requirements from Operations or the Reactor Engineering Group are ask for to address these specific industry events.

During the First Refueling Outage preparations an evaluation was done to use the Unit 2 Turbine Building Crane on the Unit 1 side of the

Turbine Building, because of the concern for seismic events and dropping loads onto the Control Building the electrical alignment to allow taking one reserve auxiliary transformer out of service, as asked for by the Augusta Division to change oil.

At the Outage and Planning Meetings, Resolution Items (Action Items) are assigned to various departments. Such as, Engineering, Operations, Licenses, etc. to address the specific issue to determine if the FSAR needs to be revised, some analysis performed, whether a Tech Spec change may be appropriate, some Operations Procedure changes or other changes may be appropriate. These resolution items are tracked through to completion.

The issue dealing with the safety significance of the plant are presented to the Plant Review Board for such things as safety evaluations or certain operation procedure changes, as required by Tech Spec. Once a resolution has been reached then the Outage Scheduling Group decides whether a milestone is appropriate for flagging some information in the schedule or whether it should be an activity of specified duration to ensure that the activity is constantly being reminded about during the outage. An example would be safety injection pump available while nozzle dams are installed. To ensure proper train availability during the 1R2 Schedule, the appropriate safety injection pump was flagged in the schedule to be

operable while nozzle dams were installed. To accommodate the Switchgear Cleaning Program established, the operable SI Train was spelled out by long durations, in the schedule, to ensure that they were constantly reminded that the train could not be taken out of service.

To ensure operational considerations are addressed, the Operations Department reviews the schedule and verify the appropriate Tech Spec compliance issues are addressed, the appropriate operational considerations are addressed, and where necessary appropriate temporary modification plans are established to do such things as feed the appropriate interlocks, etc.

The Outage and Planning Department currently has a licensed SRO as the Department Manager with 9 years of nuclear plant experience. In addition the Scheduling Group has a supervisor who is a former NRC Certified Instructor for Plant Vogtle with over 24 years of nuclear plant experience. In addition the Scheduling Group has a Planning Scheduling Coordinator who is also a currently licensed SRO for Plant Vogtle with 10 year of nuclear plant experience. The Section also has a Planning and Scheduling Coordinator who has extensive experience utilizing the scheduling program, Project 2 and has 9 years of nuclear plant experience, most of which has been in the outage scheduling area. The bottom line is that the training and experience of the staff in the Outage Scheduling Group coupled with the process of disseminating information throughout the plant staff along with the processing utilized in the outage planning meetings to address these significant issues helps to ensure that significant industry events are adequately addressed and reflected in Plant Vogtle Outage Schedules.

Another mechanism that Vogtle uses to feedback pertinent information is a Lesson Learned Program. Throughout the outage comments are solicited as to the logic of particular work efforts, the sequence of work efforts. In essence any particular identified problem that would inhance the smooth operation of refueling activities captured. During the first refueling outage several comments were received that were reflected into the scheduled changes, such as the improvement in containment access controls, the improvement in the area for Health Physics dress out trailers and access to containment, the ALARA Briefing activities, and the processing of contractors in to adequate records are maintained.

In the area of Midloop activities, evaluations were done to allow the utilization of the cross tie valve between RHR Trains during Midloop activities to allow the Tech Spec required inspection of the accumulator isolation check valve internals.

Some of the significant issues that have been evaluated are; 1) the electrical alignment removing one reserve auxiliary transformer into service 2) The cross tie between RHR Systems to allow the inspection check valve internals, 3) Keeping a SI Pump available during the time the nozzle dams are installed, 4) The modification to containment penetration to allow for sludge lancing, and 5) The process to using the Kelly System for deconing the reactor cavity during the draining down period.

Of course, I would like to also add that in the process of schedule development all departments receive industry experience information. They view from their specific disciplines such as, Engineering, Operations, Maintenance, Health Physics, etc. and provide comments to the schedule development.

05-93-90

RELIEF REQUEST

RR-7

SYSTEM: Safety Injection-System No. 1204

VALVE(S): 1204-U6 079, 1204-U6 080, 1204-U6 081, 1204-U6 082

CATEGORY: AC

CLASS: 1

FUNCTION: These valves open when the downstream pressure is less than the upstream pressure which allows cold leg injection from the accumulator tanks.

QUARTERLY TEST REQUIREMENT: Verify forward flow operability.

BASIS FOR RELIEF: The SIS accumulator tanks are isolated from the RCS by these normally closed check valves. Each accumulator is charged with a nitrogen blanket of 650 psig. This pressure is insufficient during operation to inject into the RCS. If these valves were to be exercised at cold shutdown, the contents of the tank would be dumped into the RCS at the charge pressure of 650 psig which could result in a low temperature overpressurization of the RCS.

ALTERNATE TESTING: One of these valves will be disassembled and manually stroked at refueling on a staggered test basis. If disassembly reveals that the valve is inoperable, the remaining valves will be disassembled. These valves will not be disassembled and manually stroked to perform preservice testing.

RELIEF REQUEST

RR-11

SYSTEM: Safety Injection-System No. 1204

VALVE(S): 1204-U6 083, 1204-U6 084, 1204-U6 085, 1204-U6 086

CATEGORY: AC

CLASS: 1

FUNCTION: These valves open when the downstream pressure is less than the upstream pressure which allows cold leg injection from the accumulator tanks. These valves also open for RHR flow.

QUARTERLY TEST REQUIREMENT: Verify forward flow operability.

BASIS FOR RELIEF: The SIS accumulator tanks are isolated from the RCS by these normally closed check valves. Each accumulator is charged with a nitrogen blanket of 650 psig. This pressure is insufficient during operation to inject into the RCS. If these valves were to be exercised at cold shutdown, the contents of the tank would be dumped into the RCS at the charge pressure of 650 psig which could result in a low temperature overpressurization of the RCS.

ALTERNATE TESTING: One of these valves will be disassembled and manually stroked at refueling on a staggered test basis. If disassembly reveals that the valve is inoperable, the remaining valves will be disassembled. These valves will not be disassembled and manually stroked to perform preservice testing. In addition, these valves will be partially stroke exercised during cold shutdown by normal flow from the RHR pumps.

DESIGN SURVEY CHECKLIST FOR INPO SOER 86-03

IDENTIFICATION

Valve MPL: 1-1208-14-033 System: 1208
P&ID: 1X4DB112 E5 ISO: 1K4-1201-029-02
Manuf: Kerotest Vend Dwg: 1X44R66-0147 28, 30, 33
Service: Aux Spray Ck. Vlv

TYPE SUITABILITY

Valve Type: 2" Mod 545 Springloaded lift Ck
Requirements: Fast Closure Speed No
Variable Flow Yes
Low Press Drop No
Seal Tightness No
Compare to Table 2-1 of EPRI (X) SAT ( ) UNSAT
COMMENTS: ok

ORIENTATION

Valve Orientation: Horiz
Vendor Dwg/Manual Reqm'ts: Horiz
(X) SAT ( ) UNSAT

COMMENTS: ok

SYSTEM CONFIGURATION

Distance to first upstream fitting: 24" to V/V
Pipe Diameter: 2" #Pipe Diams: 12
Distance to first downstream fitting: 12" to EL
Pipe Diameter: 2" #Pipe Diams: 6
Compare to EPRI Application Guidelines 2.3.1 including Addendum.
(X) SAT ( ) UNSAT

COMMENTS: ok

DISC STABILITY

Approximate Disc Full-Opening Angle: N/A
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. (X) SAT ( ) UNSAT
COMMENTS: N/A

NEED FOR VALVE

Is this valve needed for system operation? (Y) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: No

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (Y) SAT ( ) UNSAT
COMMENTS: All parts captive including Spring

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(Y) SAT ( ) UNSAT
COMMENTS: N/A

SIZING

Normal flowrates: 0 to 75 GPM
Vnorm (calculated normal flow velocities): 0 to 7.0 FPS
Vendor Specified Vmin: 6 FPS or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): N/A
Vmin Vnorm
( ) SAT (X) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

- Review and summarize significant maintenance history: None

PREVENTIVE MAINTENANCE

Is a change to the Preventive Mantenance Program necessary?
( ) YES (X) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: 11209098-036M

GENERAL COMMENTS: 36 Month PM should identify any excessive wear

CONCLUSIONS

( ) SAT (X) UNSAT, Recommend further A/E Review.

[signature] / 3/28/89
Evaluator Date
(System Engineer)

[signature] / 3/30/89
Reviewer Date
(Engineering Supervisor)

DESIGN SURVEY CHECKLIST FOR INPO SOER 86-03

IDENTIFICATION

Valve MPL: 1-1208-U6-036 System: 1205
P&ID: 1X4DB111 133 ISO: 1M4-1208-008-03
Manuf: Anchor/Darling Vend Dwg: 1X4A96-367
Service: NML Att Chg to RCS Loop #1

TYPE SUITABILITY

Valve Type: 3" Model 88 Sw Ck
Requirements: Fast Closure Speed No
Variable Flow Yes
Low Press Drop No
Seal Tightness Yes
Compare to Table 2-1 of EPRI ( ) SAT (X) UNSAT
COMMENTS: Variable Flow not part of Sw. Ck's.

ORIENTATION

Valve Orientation: Horiz
Vendor Dwg/Manual Reqm'ts: Horiz
(X) SAT ( ) UNSAT

COMMENTS: n/a

SYSTEM CONFIGURATION

Distance to first upstream fitting: 58"
Pipe Diameter: 3" #Pipe Diams: 19.33
Distance to first downstream fitting: 74"
Pipe Diameter: 3" #Pipe Diams: 24.67
Compare to EPRI Application Guidelines 2.3.1 including Addendum.
(X) SAT ( ) UNSAT

COMMENTS: n/a

DISC STABILITY

Approximate Disc Full-Opening Angle: 54°
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. (Y) SAT ( ) UNSAT
COMMENTS: N/A

NEED FOR VALVE

Is this valve needed for system operation? ( ) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: No

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (Y) SAT ( ) UNSAT
COMMENTS: All parts captive to Valve body

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(Y) SAT ( ) UNSAT
COMMENTS: N/A

SIZING

Normal flowrates: 0 - 55 GPM
Vnorm (calculated normal flow velocities): 0 - 2.5 FPS
Vendor Specified Vmin: 5.3 FPS or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): N/A
Vmin Vnorm ( ) SAT (Y) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

Review and summarize significant maintenance history: None

PREVENTIVE MAINTENANCE

Is a change to the Preventive Maintenance Program necessary?
( ) YES (X) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: 1120805-018M

GENERAL COMMENTS: 18 Month PM should delete excessive valve due to low flow rates.

CONCLUSIONS

( ) SAT (X) UNSAT, Recommend further A/E Review.

M S Shore 3/28/89
Evaluator Date
(System Engineer)

J W Wilcox 3/31/89
Reviewer Date
(Engineering Supervisor)

DESIGN SURVEY CHECKLIST FOR INPO SOER 86-03

IDENTIFICATION

Valve MPL: 1-1208-U6-037 System: 1208
P&ID: 1X4DB111 B4 ISO: 1M4-1208-488-04
Manuf: Velan Vend Dwg: 1X6AA6-363
Service: Air Op to RCS Loop 4

TYPE SUITABILITY

Valve Type: 3" Model C88
Requirements: Fast Closure Speed No
Variable Flow Yes
Low Press Drop No
Seal Tightness Yes
Compare to Table 2-1 of EPRI ( ) SAT (X) UNSAT
COMMENTS: Variable flow outboard SW Cks

ORIENTATION

Valve Orientation: Horiz
Vendor Dwg/Manual Reqm'ts: Horiz
(X) SAT ( ) UNSAT

COMMENTS: n/a

SYSTEM CONFIGURATION

Distance to first upstream fitting: 34ft"
Pipe Diameter: 3" #Pipe Diams: 11.33
Distance to first downstream fitting: 92'
Pipe Diameter: 3" #Pipe Diams: 30.66
Compare to EPRI Application Guidelines 2.3.1 including Addendum.

(X) SAT ( ) UNSAT

COMMENTS: n/a

DISC STABILITY

Approximate Disc Full-Opening Angle: 54°
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. (Y) SAT ( ) UNSAT
COMMENTS: N/A

NEED FOR VALVE

Is this valve needed for system operation? (X) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: N/A

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (Y) SAT ( ) UNSAT
COMMENTS: All parts Captive to Valve body

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(Y) SAT ( ) UNSAT
COMMENTS: N/A

SIZING

Normal flowrates: 0 - 55 GPM
Vnorm (calculated normal flow velocities): 0-2.5 FPS
Vendor Specified Vmin: 5.3 FPS or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): N/A
Vmin Vnorm (Y) SAT (X) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

Review and summarize significant maintenance history: None

PREVENTIVE MAINTENANCE

Is a change to the Preventive Maintenance Program necessary?
( ) YES (X) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: 1126/148-018M

GENERAL COMMENTS: 18 month PM should identify excessive wear due to low flows

CONCLUSIONS

( ) SAT (X) UNSAT, Recommend further A/E Review.

Evaluator (System Engineer) — Date: 12/28/87

Reviewer (Engineering Supervisor) — Date: 3/31/89

DESIGN SURVEY CHECKLIST FOR INPO SOER 85-03

IDENTIFICATION

Valve MPL: 1-1208-U6-C38 System: 1208
P&ID: 1X4DR111 B4 ISO: 1X4-1208-488-04
Manuf: Ⓒ EMD Vend Dwg: 1X4AA-363
Service: Alt Chg to RCS Loop 4

TYPE SUITABILITY

Valve Type: 3" Model C88
Requirements: Fast Closure Speed No
Variable Flow Yes
Low Press Drop No
Seal Tightness Yes
Compare to Table 2-1 of EPRI ( ) SAT (X) UNSAT
COMMENTS: Variable flow not good on Sw. Chs.

ORIENTATION

Valve Orientation: Horiz
Vendor Dwg/Manual Reqm'ts: (X) SAT ( ) UNSAT
COMMENTS: N/A

SYSTEM CONFIGURATION

Distance to first upstream fitting: 52 1/16" to 61
Pipe Diameter: 3" #Pipe Diams: 17.35
Distance to first downstream fitting: 74" to 81
Pipe Diameter: 3" #Pipe Diams: 24.667
Compare to EPRI Application Guidelines 2.3.1 including Addendum.
(N/A) SAT ( ) UNSAT
COMMENTS: N/A

DISC STABILITY

Approximate Disc Full-Opening Angle: 54°
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. (X) SAT ( ) UNSAT
COMMENTS: N/A

NEED FOR VALVE

Is this valve needed for system operation? (X) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: N/A

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (X) SAT ( ) UNSAT
COMMENTS: All parts captive to valve body

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(X) SAT ( ) UNSAT
COMMENTS: N/A

SIZING

Normal flowrates: 0-55 GPM
Vnorm (calculated normal flow velocities): 0-2.5 FPS
Vendor Specified Vmin: 5.3 FPS or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): N/A
Vmin Vnorm ( ) SAT (X) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

Review and summarize significant maintenance history: None

PREVENTIVE MAINTENANCE

Is a change to the Preventive Manteruance Program necessary?
( ) YES (X) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: 1208148-08M

GENERAL COMMENTS: 18 month PM should identify blockage when due to low flow

CONCLUSIONS

( ) SAT (X) UNSAT, Recommend further A/E Review.

[signature] 3/28/89
Evaluator Date
(System Engineer)

[signature] 3/31/89
Reviewer Date
(Engineering Supervisor)

DESIGN SURVEY CHECKLIST FOR INPO SOER 86-03

IDENTIFICATION

Valve MPL: 2-1208-U4-033 System: 1208
P&ID: 2X4DB112 ISO: 2K4-1201-029-02
Manuf: DRESSER Vend Dwg: 2X4AB06-0144
Service: AUX SPRAY CK. VLV.

TYPE SUITABILITY

Valve Type: SPRING LOADED CHECK
Requirements: Fast Closure Speed NO
Variable Flow NO
Low Press Drop NO
Seal Tightness NO
Compare to Table 2-1 of EPRI (✓) SAT ( ) UNSAT
COMMENTS: NONE

ORIENTATION

Valve Orientation: HORIZONTAL
Vendor Dwg/Manual Reqm'ts: HORIZ.
(✓) SAT ( ) UNSAT

COMMENTS: NONE

SYSTEM CONFIGURATION

Distance to first upstream fitting: 24"
Pipe Diameter: 2" #Pipe Diams: 12
Distance to first downstream fitting: 12"
Pipe Diameter: 2" #Pipe Diams: 6
Compare to EPRI Application Guidelines 2.3.1 including Addendum.
(✓) SAT ( ) UNSAT

COMMENTS:

FOR INFORMATION ONLY

DISC STABILITY

Approximate Disc Full-Opening Angle: N/A
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. (✓) SAT ( ) UNSAT
COMMENTS: NONE.

NEED FOR VALVE

Is this valve needed for system operation? (✓) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: NONE

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (✓) SAT ( ) UNSAT
COMMENTS: NO COMPONENTS IN QUESTION.

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(✓) SAT ( ) UNSAT
COMMENTS: NONE

SIZING

Normal flowrates: 0 - 75 GPM
Vnorm (calculated normal flow velocities): 0 - 7.0 FPS
Vendor Specified Vmin: 6 or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): SEE GEN COMMENTS
Vmin Vnorm (✓) SAT ( ) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

Review and summarize significant maintenance history: _____

NONE

PREVENTIVE MAINTENANCE

Is a change to the Preventive Mantenance Program necessary?
(✓) YES (✗) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: 36 MONTH PM SHOULD BE INITIATED, SIMILAR TO UNIT #1 (120B09B-036M).

GENERAL COMMENTS: ASSUME ⇒ $\bar{V}$ = .016130 FAILURE COULD RESULT DUE TO FLOW OSCILLATION

CONCLUSIONS

( ) SAT (✓) UNSAT, Recommend further A/E Review.

Thomas Sexton, 3/28/89
Evaluator Date
(System Engineer)

John Will C, 3/30/89
Reviewer Date
(Engineering Supervisor)

DESIGN SURVEY CHECKLIST FOR INPO SOER 86-03

IDENTIFICATION

Valve MPL: 2-1208-U6-035 System: 1208
P&ID: 2X42B111 ISO: 3K4-1208-008-Q3
Manuf: WEST Vend Dwg: 2X6AA06-0363
Service: NORMAL CHG. CHECK AT LOOP #1.

TYPE SUITABILITY

Valve Type: SWING CHECK VALVE
Requirements: Fast Closure Speed NO
Variable Flow NO
Low Press Drop NO
Seal Tightness NO
Compare to Table 2-1 of EPRI (✓) SAT ( ) UNSAT
COMMENTS: NONE

ORIENTATION

Valve Orientation: HORIZONTAL
Vendor Dwg/Manual Reqm'ts: HORIZ
(✓) SAT ( ) UNSAT

COMMENTS: NONE

SYSTEM CONFIGURATION

Distance to first upstream fitting: 40"
Pipe Diameter: 3" #Pipe Diams: 13.3
Distance to first downstream fitting: 6"
Pipe Diameter: 3" #Pipe Diams: 2
Compare to EPRI Application Guidelines 2.3.1 including Addendum.
( ) SAT (✓) UNSAT

COMMENTS:

DISC STABILITY

Approximate Disc Full-Opening Angle: 54°
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. ( ) SAT (✓) UNSAT
COMMENTS: SEE SIZING

NEED FOR VALVE

Is this valve needed for system operation? (✓) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: NONE

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (✓) SAT ( ) UNSAT
COMMENTS: ALL PARTS CAPTIVE BY VALVE BODY

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(✓) SAT ( ) UNSAT
COMMENTS: NONE

SIZING

Normal flowrates: 0-55 GPM
Vnorm (calculated normal flow velocities): 0-2.5 FPS
Vendor Specified Vmin: 5.3 or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): N/A
Vmin Vnorm ( ) SAT (✓) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

Review and summarize significant maintenance history: _____

NONE

PREVENTIVE MAINTENANCE

Is a change to the Preventive Mantenance Program necessary?
(✓) YES ( ) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: ~~REF~~ INSPECT VALVE EVERY REFUELING OUTAGE.

GENERAL COMMENTS: VALVE FAILS SYS CONFIG. AND FLOW REQUIREMENTS

CONCLUSIONS

( ) SAT (✓) UNSAT, Recommend further A/E Review.

Thomas Leyton, 3/28/89
Evaluator Date
(System Engineer)

4/4/89
Reviewer Date
(Engineering Supervisor)

DESIGN SURVEY CHECKLIST FOR INPO SOER 86-03

IDENTIFICATION

Valve MPL: 2-1208-U6-036 System: 1208
P&ID: 2X4DB111 ISC: 2K4-1208-008-03
Manuf: WEST Vend Dwg: 2X6AA06-0363
Service: NORMAL CHG. TO RCS LOOP #1.

TYPE SUITABILITY

Valve Type: SWING CHECK VALVE
Requirements: Fast Closure Speed NO
Variable Flow NO
Low Press Drop NO
Seal Tightness NO
Compare to Table 2-1 of EPRI (✓) SAT ( ) UNSAT
COMMENTS: NONE

ORIENTATION

Valve Orientation: HORIZONTAL
Vendor Dwg/Manual Reqm'ts: HORIZ.
(✓) SAT ( ) UNSAT

COMMENTS: NONE.

SYSTEM CONFIGURATION

Distance to first upstream fitting: 6"
Pipe Diameter: 3" #Pipe Diams: 2
Distance to first downstream fitting: 62"
Pipe Diameter: 3" #Pipe Diams: 20.6
Compare to EPRI Application Guidelines 2.3.1 including Addendum.
( ) SAT (✓) UNSAT

COMMENTS:

DISC STABILITY

Approximate Disc Full-Opening Angle: 54°
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. ( ) SAT (✓) UNSAT
COMMENTS: SEE (SIZING)

NEED FOR VALVE

Is this valve needed for system operation? (✓) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: NONE

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (✓) SAT ( ) UNSAT
COMMENTS: ALL PARTS CAPTIVE BY VALVE BODY

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(✓) SAT ( ) UNSAT
COMMENTS: NONE

SIZING

Normal flowrates: 0 - 55 GPM
Vnorm (calculated normal flow velocities): 0 - 2.5 FPS
Vendor Specified Vmin: 5.3 or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): N/A
Vmin Vnorm ( ) SAT (✓) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

Review and summarize significant maintenance history: NONE

PREVENTIVE MAINTENANCE

Is a change to the Preventive Maintenance Program necessary?
(✓) YES ( ) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: INSPECT VALVE EVERY REFUELING OUTAGE.

GENERAL COMMENTS: VALVE FAILS SYS. CONFIG. AND FLOW RECOMMENDATIONS.

CONCLUSIONS

( ) SAT (✓) UNSAT, Recommend further A/E Review.

Thomas Sexton, 3/28/89
Evaluator Date
(System Engineer)

[signature], 4/4/89
Reviewer Date
(Engineering Supervisor)

DESIGN SURVEY CHECKLIST FOR INPO SOER 86-03

IDENTIFICATION

Valve MTL: 2-1208-U6-037 System: 1208
P&ID: 2X4C3111 ISO: 2K4-1208-488-04
Manuf: WEST Vend Dwg: 2X6AA06-0603 363
Service: ALT. CHG. TO RCS LOOP 4

TYPE SUITABILITY

Valve Type: SWING CHECK VALVE
Requirements: Fast Closure Speed NO
Variable Flow NO
Low Press Drop NO
Seal Tightness NO
Compare to Table 2-1 of EPRI (✓) SAT ( ) UNSAT
COMMENTS: NONE

ORIENTATION

Valve Orientation: HORIZONTAL
Vendor Dwg/Manual Reqm'ts: HORIZ
(✓) SAT ( ) UNSAT

COMMENTS: NONE

SYSTEM CONFIGURATION

Distance to first upstream fitting: 6"
Pipe Diameter: 3" /Pipe Diams: 2
Distance to first downstream fitting: 34.0625"
Pipe Diameter: 3" /Pipe Diams: 11.35
Compare to EPRI Application Guidelines 2.3.1 including Addendum.
( ) SAT (✓) UNSAT

COMMENTS:

DISC STABILITY

Approximate Disc Full-Opening Angle: 54°
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. ( ) SAT (✓) UNSAT
COMMENTS: SEE (SIZING)

NEED FOR VALVE

Is this valve needed for system operation? (✓) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: NONE

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (✓) SAT ( ) UNSAT
COMMENTS: ALL PARTS CAPTIVE BY VALVE BODY

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(✓) SAT ( ) UNSAT
COMMENTS: NONE

SIZING

Normal flowrates: 0-55 GPM
Vnorm (calculated normal flow velocities): 0-2.5 FPS
Vendor Specified Vmin: 5.3 or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): N/A
Vmin Vnorm ( ) SAT (✓) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

Review and summarize significant maintenance history:

NONE

PREVENTIVE MAINTENANCE

Is a change to the Preventive Maintenance Program necessary?
(✓) YES ( ) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: INSPECT VALVE EVERY REFUELING OUTAGE

GENERAL COMMENTS: VALVE FAILS SYS. CONFIG. AND FLOW RECOMMENDATIONS

CONCLUSIONS

( ) SAT (✓) UNSAT, Recommend further A/E Review.

Thomas Sexton, 3/28/89
Evaluator Date
(System Engineer)

John Will, 4/4/89
Reviewer Date
(Engineering Supervisor)

DESIGN SURVEY CHECKLIST FOR INPO SOER 86-03

IDENTIFICATION

Valve MPL: 2-120B-U6-038 System: 120B
P&ID: 2X4DB111 ISO: 2R4-120B-488-04
Manuf: WEST Vend Dwg: 2X6AA06-0623 363
Service: ALT CHG. TO RCS LOOP 4.

TYPE SUITABILITY

Valve Type: SWING CHECK VALVE
Requirements: Fast Closure Speed NO
Variable Flow NO
Low Press Drop NO
Seal Tightness NO
Compare to Table 2-1 of EPRI (✓) SAT ( ) UNSAT
COMMENTS: NONE

ORIENTATION

Valve Orientation: HORIZONTAL
Vendor Dwg/Manual Reqm'ts: HORIZ
(✓) SAT ( ) UNSAT

COMMENTS: NONE

SYSTEM CONFIGURATION

Distance to first upstream fitting: 62"
Pipe Diameter: 3" #Pipe Diams: 20.66
Distance to first downstream fitting: 6"
Pipe Diameter: 3" #Pipe Diams: 2
Compare to EPRI Application Guidelines 2.3.1 including Addendum.
( ) SAT (✓) UNSAT

COMMENTS.

DISC STABILITY

Approximate Disc Full-Opening Angle: 54°
Compare to EPRI Figure 3-8. A "clearway" check (opens 90 with no stop) is UNSAT. ( ) SAT (✓) UNSAT
COMMENTS: SEE SIZING)

NEED FOR VALVE

Is this valve needed for system operation? (✓) YES ( ) NO
If NO, initiate Design Change to remove internals of check valve. DCP # N/A (Refer to EPRI A.G. 2.6.3).
COMMENTS: NONE

INTERNAL PARTS LOCKING DEVICES

Compare retaining / locking of internal parts to EPRI A.G. 2.5.7. (✓) SAT ( ) UNSAT
COMMENTS: ALL PARTS CAPTIVE BY VALVE BODY.

MATERIALS

The materials in the check valve are adequate to prevent excessive erosion/corrosion. Compare to EPRI A.G. 2.4.1.
(✓) SAT ( ) UNSAT
COMMENTS: NONE

SIZING

Normal flowrates: 0-55 GPM
Vnorm (calculated normal flow velocities): 0-2.5 FPS.
Vendor Specified Vmin: 5.3 or
Calculated Vmin (from EPRI AG 2.1.1, attach assumptions, references, etc.): N/A
Vmin Vnorm ( ) SAT (✓) UNSAT
COMMENTS:

MAINTENANCE HISTORY REVIEW

Review and summarize significant maintenance history: NONE

PREVENTIVE MAINTENANCE

Is a change to the Preventive Maintenance Program necessary?
(✓) YES ( ) NO
See EPRI A.G. 2.5.6. If yes, specify PM and frequency.
COMMENTS: INSPECT VALVE EVERY REFUELING OUTAGE.

GENERAL COMMENTS: VALVE FAILS SYS. CONFIG. AND FLOW. RECOMMENDATIONS

CONCLUSIONS

( ) SAT (✓) UNSAT, Recommend further A/E Review.

Thomas Sexton / 3/28/89
Evaluator Date
(System Engineer)

John Wilt / 4/4/89
Reviewer Date
(Engineering Supervisor)

18015-C,Rev. 5
SECONDARY PLANT CHEMISTRY

NOT INCLUDED:
Is divided into various modes including MODES 4,5, AND 6 But does not involve Mid-loop issues.

18028-C,Rev. 7
LOSS OF INSTRUMENT AIR

SECTION B APPIES TO MODE 3
B6 NOTE states that if there is a loss of instrument air pressure, then MANUAL control of the SG Atmospheric Relief Valves will be required
SECTION C APPLIES TO MODES 4,5, AND 6
C5 CAUTION and step requires tripping one RHR Pump if tow are running due to RHR HX outlet valves failing full open.
C9 Requires tripping of running RHR Pump due to continued cooldown
C10 If RHR Temperature rises, actions are throttle RHR Flow

18032-1,Rev. 4
LOSS OF 120 V AC INSTRUMENT POWER

NOT INCLUDED:
Written independent of mode to address concerns resulting from loss of 120 V AC 1E instrument power. Primarily addresses at power issues but may address some losses that affect a shutdown condition. Examples: (a) loss of 1NY1N addresses losses of AFW instrumentation which is a Shutdown concern, (b) loss of 1BY1B addresses a loss of SR SR countrate indication which would be a shutdown concern.

18034-1,Rev. 1
LOSS OF CLASS 1E 125V DC POWER
Written independent of mode to address concerns resulting from loss of 125 VDC 1E.

18038-C,Rev. 10
OPERATION FROM REMOTE SHUTDOWN PANELS
Not a midloop procedure, but does include ATTACHMENT G for local operation of SG Atmospheric Relief Valves.

19000-C,Rev. 4
ECA-0.0 LOSS OF ALL AC POWER
Does not apply to the midloop situation.

MIDLOOP PROCEDURES

12000-C,Rev. 16
REFUELING RECOVERY
(MODE 6 TO MODE 5)

2.1.4	WORK ACTIVITIES
2.2.2	TECH SPECS
2.2.13	RWST INVENTORY
4.1.5	CONTROLS WHEN BELOW 17 % PRZR LEVEL
4.1.10	MAINTAIN 1 FOOT ABOVE MID-NOZZLE,2 FEET IF SG NOZZLE DAMS INSTALLED

12006-C,Rev. 15
UNIT COOLDOWN TO COLD SHUTDOWN

2.1.4	WORK ACTIVITIES
2.2.6	TECH SPECS SG AVAILABLE
2.2.7	RHR AVAILABILITY IF NOT FILLED
2.2.17	RWST INVENTORY
D4.2.15	CONTROLS WHEN BELOW 17 % PRZR LEVEL

12007-C,Rev. 14
REFUELING ENTRY
(MODE 5 TO MODE 6)

2.1.17	WORK ACTIVITIES
2.2.6	TECH SPECS
2.2.15	RWST INVENTORY
4.1.1	CONTROLS WHEN BELOW 17 % PRZR LEVEL
4.1.3	MAINTAIN 1 FOOT ABOVE MID-NOZZLE

13005-1,Rev. 10
REACTOR COOLANT SYSTEM DRAINING

2.1.2	MAINTAIN 1 FOOT ABOVE MID-NOZZLE AND 6 INCHES IF BURPING SG TUBES WITHOUT USE OF NITROGEN PURGE
2.1.3	TREND RHR PUMP PARAMETERS WHEN AT 1 FOOT ABOVE MID-NOZZLE
2.1.8	CONTROLS IF DRAINING DOWN TO PERFORM MAINTENANCE ON REACTOR HEAD, SGs , OR RCP SEALS
2.1.9	ACTIONS IF LEVEL INDICATION LOST
2.1.10	ONLY ONE DRAIN PATH AT A TIME
2.1.11	NOT DRAIN FROM SAME LOOP AS BEING MONITORED FOR LEVEL
2.2.1	TECH SPECS ON SG LEVELS
4.1.2	HAS MAINTENANCE INSTALL TYGON TUBING AND DEFEAT RHR SUCTION VALVES AUTO CLOSURE INTERLOCK WHEN DRAINING VIA RCDT
4.1.8	CAUTION NOT DRAIN FROM SAME LOOP BEING MONITORED FOR RCS LEVEL
4.1.12	PLACES TYGON HOSE LEVEL INDICATIONS IN SERVICE
4.1.13	MAINTENANCE TO INSTALL REMOTE RCS TEMPORARY LEVEL INDICATION IF DRAINING BELOW 25 % PRZR LEVEL
4.1.15	CAUTION FOR DRAINAGE RATE AFFECT ON TYGON TUBING
4.1.18	USE NITROGEN TO ASSISTING DRAINING SG TUBES
4.1.19	CAUTIONS AND NOTES ABOUT DRAINING TO 1 FOOT ABOVE MID-NOZZLE
4.1.20	NOTE ABOUT DRAINING TO 1 FOOT ABOVE MID-NOZZLE
4.2.2	MAINTENANCE TO INSTALL REMOTE RCS TEMPORARY LEVEL INSTRUMENTATION IF DRAINING RCS BELOW 25%
4.2.11	PLACEMENT TO TYGON HOSE LEVEL INDICATION IN SERVICE
4.2.12	MAINTENCE TO INSTALL REMOTE RCS TEMPORARY LEVEL INSTRUMENTATION
4.2.14	CAUTION FOR DRAINAGE RATE AFFECT ON TYGON TUBING
4.2.18	USE NITROGEN TO ASSISTING DRAINING SG TUBES
4.2.19	CAUTIONS AND NOTES ABOUT DRAINING TO 1 FOOT ABOVE MID-NOZZLE
4.2.21	NOTE ABOUT DRAINING TO 1 FOOT ABOVE MID-NOZZLE
CHECKLIST 1	SG TUBE BUNDLE DRAINING

13011-1,Rev. 18
RESIDUAL HEAT REMOVAL SYSTEM

2.1.6	WHENEVER 1 FOOT ABOVE MID-NOZZLE THE RHR FLOW SHOULD BE LIMITED IN RANGE FROM 3000 TO 3500 GPM.
4.8.1	CAUTION THAT EXCESSIVE FLOWRATE DURING PUMPDOWN WITH UPPER INTERNALS ASSEMBLY INSTALLED COULD LEAD TO VOID FORMATION IN RHR PUMP SUCTION.

17006-1,Rev. 11
ANNUNCIATOR RESPONSE PROCEDURES FOR ALB 06 ON PANEL 1A2 ON MCB

PAGE 7	RCS LEVEL LOW PER ANNUNCIATOR WINDOW A03
PAGE 21	RHR PUMP OVERLOAD TRIP INITIATES 18019-C,LOSS OF RHR
PAGE 36	RWST EMPTY LEVEL ALARM INITIATES REFILLING

18004-C,Rev. 6
REACTOR COOLANT SYSTEM LEAKAGE

SECTION B ADDRESSES MODES 4 OR 5:
B1 NOTE IF RCS LEAKAGE IS DETECTED WHILE OPERATING WITH RCS LEVEL BELOW PRZR INDICATION RANGE OR WITH SG NOZZLE DAMS INSTALLED THEN GO TO 18019-C,LOSS OF RHR SYSTEM.
B5 RHR PUMP OPERATION INDICATIONS

18006-C,Rev. 2
FUEL HANDLING EVENT

12 SENDS OPERATOR TO 18004-C,RCS LEAKAGE IF SPENT FUEL POOL OR REACTOR CAVITY LOWERS UNEXPLAINABLY

18019-C,Rev. 7
LOSS OF RESIDUAL HEAT REMOVAL

SECTION A APPLIES TO MODES 4 OR 5
ENTIRE SECTION ADDRESSES MIDLOOP CONCERNS

SECTION B APPLIES TO MODE 6 WITH HEAD REMOVED
ENTIRE SECTION ADDRESSES MIDLOOP CONCERNS TO SOME EXTENT
SYMPTOMS ADDRESS MIDLOOP CONCERNS
A1 CAUTION,NOTE AND STEP ADDRESSES WCAP ISSUES

18020-C,Rev. 3
LOSS OF COMPONENT COOLING WATER

2RNO IF ONE TRAIN OF CCW CAN NOT BE PLACED IN SERVICE,THEN INITIATE 18019-C,LOSS OF RHR
4 IF NON-AFFECTED TRAIN RHR CAN NOT BE PLACED IN SERVICE, THEN INITIATE 18019-C,LOSS OF RHR

18021-C,Rev. 4
LOSS OF NUCLEAR SERVICE COOLING WATER SYSTEM

5RNO IF RHR CAN NOT BE ESTABLISHED TO AN OPERATING NSCW TRAIN, THEN INITIATE 18019-C, LOSS OF RHR

PTDB-1 TAB 8.0,Rev. 2
PICTORIAL AIDS

8.2 SHOWS LAYOUT OF REMOTE AND LOCAL TEMPORARY MID-LOOP INSTRUMENTATION