ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-RO-CO-1

JPM Title: Shutdown margin with inoperable CEA

Approximate Time: 20 min   Actual Time: ________________

Reference(s): TDB-V.9 "Shutdown Margin Worksheet" R35
TDB-II "Reactivity Curves" R28

JPM Prepared by: Jerry Koske   Date: 05/11/05

JPM Reviewed by: ____________________   Date: __________

JPM Approved by: ____________________   Date: __________

JPM No: AJPM-RO-CO-1

JPM Title: Shutdown margin with inoperable CEA

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: Technical Data Book, calculator

Safety Considerations: None

Comments:

JPM No: AJPM-RO-CO-1

JPM Title: Shutdown margin with inoperable CEA

INITIATING CUE: **The plant is operating at 100% power with all CEAs fully withdrawn. Group 2 CEA #27 has been declared inoperable (untrippable). You have been requested to perform an instantaneous shutdown margin calculation to determine if technical specification requirements for shutdown margin are being met.**

The RCS boron concentration is 700 ppm. The burnup is 7000 MWD/MTU

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Obtain a copy of TDB-V.9	After candidate locates TDB-V.9 in the Technical Data Book, provide a copy of TDB-V.9 Part I. [SAT] [UNSAT]
2	Obtain a copy of TDB section II, Reactivity Curves.	Obtains copy of TDB-II [SAT] [UNSAT]
3	Determines part I of TDB procedure should be used.	Performs calculation using part 1. [SAT] [UNSAT]
4	Performs calculation of the difference between actual and required shutdown margin.	Difference calculated on line 11 of TDB-V.9, section 1 is -0.42 [between -0.22, -0.62] [SAT] [UNSAT]
5	Determines if SDM is adequate	Shutdown margin is adequate [SAT] [UNSAT]

JPM No: AJPM-RO-CO-1

JPM Title: Shutdown margin with inoperable CEA

Termination Criteria: Shutdown Margin determination has been made

JPM No: AJPM-RO-CO-1

INITIATING CUE: **The plant is operating at 100% power with all CEAs fully withdrawn. Group 2 CEA #27 has been declared inoperable (untrippable). You have been requested to perform an instantaneous shutdown margin calculation to determine if technical specification requirements for shutdown margin are being met.**

The RCS boron concentration is 700 ppm. The burnup is 7000 MWD/MTU

SHUTDOWN MARGIN WORKSHEET

PART I - Instantaneous Shutdown Margin for use prior to a Reactor Trip or immediately following a Reactor trip. No changes are assumed for either boron or xenon, since this worksheet is only applicable for calculation of an instantaneous shutdown margin.

NOTE: Enter values exactly as determined from the figures in the Technical Data Book and carry the algebraic signs through the calculations.

Condition

1. Present Date/Time: _______/_____

2. Reactor Power (before trip): ___________%

3. CEA Positions: Group 1____________________ inches

   Group 2____________________ inches

   Group 3____________________ inches

   Group 4____________________ inches

4. Reactor Coolant System Boron Concentration prior to shutdown: (Boron concentration analysis must have been performed within the past 24 hours or more recently if boration or dilution has occurred.)

   _________________________ppm
   4

5. Burnup (Take the most recent burnup from the Control Room Log and add 30 MWD/MTU per EFPD.)

   _________________________MWD/MTU
   5

Calculation of Shutdown Margin

6. Enter Regulating Group Worth, based on burnup (Step 5) and CEA positions (Step 3) using TDB Figure II.B.2.

   ________________________% $\Delta\rho$ TDB Figure used:___________________
   6

7. Enter Shutdown Group Worths, based on burnup (Step 5) using TDB Figure II.B.1.a.

   a. Shutdown Group B ____________________% Δp

   b. Shutdown Group A ____________________% Δp

   c. Total Shutdown Worth

   _____________ + _____________ =_____________ % Δp
   7.a 7.b 7.c

8. Determine Power Defect

   Enter Power Defect based on Reactor power level (Step 2) and burnup (Step 5) using TDB Figure II.C.2.

   ____________________% Δp
   8

9. Determination of Stuck CEA Allowance (3 cases)

   NOTE: Consider dropped CEAs which can not be verified to be fully inserted as inoperable.

   (Enter N/A if this case is not applicable.)

   a. Case I - All CEAs are assumed to be operable. (No known inoperable CEAs)

   Assume the highest worth CEAs will stick out of the core upon a Reactor trip. Enter the value of the most reactive CEA, based on burnup (Step 5), from TDB Figure II.B.1.b., lines (1) thru (3) for the pre-trip configuration. Select the higher value.

   ____________________% Δp
   9.a

NOTE: The worth of one inoperable CEA is dependent on the configuration of the withdrawn group(s) and the inoperable CEA.

9. b. Case II - One CEA is known to be inoperable (per Technical Specification 2.10.2(4) a.)

(Enter N/A if this case is not applicable.)

Account for this defective CEA (and the highest worth stuck CEA) by entering only the value from lines (4) thru (17) of TDB Figure II.B.1.b. for the inoperable CEA, based on burnup (Step 5). Select the higher value.

____________________%Δp
9.b

NOTE: The worth of more than one inoperable CEA is calculated by multiplying the most conservative Stuck CEA plus Ejected CEA Worth (TDB Figure II.B.1.b. lines 4-17 by the number of inoperable CEAs.

NOTE: The values of lines (4) thru (17) of TDB FIGURE II.B.1.b. Include the total reactivity associated with the known inoperable CEA and the highest worth CEA which is assumed to stick out of the core upon a Reactor trip.

c. Case III - More than one CEA is known to be inoperable (per Technical Specification 2.10.2.(4)a.).

(Enter N/A if this case is not applicable.)

(1) Enter total number of CEA's which are known to be inoperable per Technical Specification 2.10.2.(4) a.).

#_____________________
9.c.(1)

(2) Enter the most conservative defective CEA worth from TDB FIGURE II.B.1.b. Lines (4) thru (17) depending on defective CEA(s) location, based on burnup (Step 5). Select the higher value.

_______________________%Δp
9.c.(2)

[(#________) X (__________%Δp)] = _____________%Δp
9.c.(1) 9.c.(2) 9.c

9. d. Enter total available CEA worth from TDB Figure II.B.1.a. based on burnup (Step 5)

_________________% Δp
9.d

e. Determine the maximum stuck CEA worth by selecting the minimum of either 9.c or 9.d and record that value.

_________________% Δp
9.e

f. Enter value from 9.a or 9.b or 9.e as appropriate _______________%Δp
9.f

10. Calculation of the Total Instantaneous Shutdown Margin (SDM_I):

SDM_I = Stuck CEAs + Power Defect - S/D CEAs worth - Regulating CEA worth

SDM_I = ________%Δρ + ________%Δρ - _______%Δρ - ________%Δρ = ________%Δρ Total
9.f 8 7.c 6 10

11. Calculate difference from required 3.6% Δp Shutdown Margin.

(____________% Δp) + 3.6% Δp = ____________% Δp
10 11

NOTE: A 3.6% Δp shutdown margin must be maintained in a Hot Shutdown condition, Tc > 210°F (Technical Specification 2.10.2(1) and TDB-VI Item 13.0).

12. Shutdown Margin check:

a. If Step 11 is less than or equal to zero, the shutdown margin is adequate.

b. If Step 11 is greater than zero, use OI-ERFCS-1, Procedure 32 to determine the number of gallons of acid to add.

REMARKS____
____
____
____

Completed by____Date/Time_______/_____

SHUTDOWN MARGIN WORKSHEET

PART I - Instantaneous Shutdown Margin for use prior to a Reactor Trip or immediately following a Reactor trip. No changes are assumed for either boron or xenon, since this worksheet is only applicable for calculation of an instantaneous shutdown margin.

NOTE: Enter values exactly as determined from the figures in the Technical Data Book and carry the algebraic signs through the calculations.

Condition

1. Present Date/Time: 07/11/05 0900
2. Reactor Power (before trip): 100 %
3. CEA Positions:
   Group 1 128 inches
   Group 2 128 inches
   Group 3 128 inches
   Group 4 128 inches
4. Reactor Coolant System Boron Concentration prior to shutdown: (Boron concentration analysis must have been performed within the past 24 hours or more recently if boration or dilution has occurred.)

   700 ppm
   4

5. Burnup (Take the most recent burnup from the Control Room Log and add 30 MWD/MTU per EFPD.)

   7000 MWD/MTU
   5

Calculation of Shutdown Margin

6. Enter Regulating Group Worth, based on burnup (Step 5) and CEA positions (Step 3) using TDB Figure II.B.2.

   3.33 % Δρ   TDB Figure used: II.B.2.b
   6

7. Enter Shutdown Group Worths, based on burnup (Step 5) using TDB Figure II.B.1.a.

   a. Shutdown Group B 1.986 % Δp

   b. Shutdown Group A 2.911 % Δp

   c. Total Shutdown Worth

   1.986 (7.a) + 2.911 (7.b) = 4.897 (7.c) % Δp

8. Determine Power Defect

   Enter Power Defect based on Reactor power level (Step 2) and burnup (Step 5) using TDB Figure II.C.2.

   1.757 (8) % Δp

9. Determination of Stuck CEA Allowance (3 cases)

   NOTE: Consider dropped CEAs which can not be verified to be fully inserted as inoperable.

   (Enter N/A if this case is not applicable.)

   a. Case I - All CEAs are assumed to be operable. (No known inoperable CEAs)

   Assume the highest worth CEAs will stick out of the core upon a Reactor trip. Enter the value of the most reactive CEA, based on burnup (Step 5), from TDB Figure II.B.1.b., lines (1) thru (3) for the pre-trip configuration. Select the higher value.

   N/A (9.a) % Δp

NOTE: The worth of one inoperable CEA is dependent on the configuration of the withdrawn group(s) and the inoperable CEA.

9. b. Case II - One CEA is known to be inoperable (per Technical Specification 2.10.2(4) a.)

(Enter N/A if this case is not applicable.)

Account for this defective CEA (and the highest worth stuck CEA) by entering only the value from lines (4) thru (17) of TDB Figure II.B.1.b. for the inoperable CEA, based on burnup (Step 5). Select the higher value.

2.45 %Δp
9.b

NOTE: The worth of more than one inoperable CEA is calculated by multiplying the most conservative Stuck CEA plus Ejected CEA Worth (TDB Figure II.B.1.b. lines 4-17 by the number of inoperable CEAs.

NOTE: The values of lines (4) thru (17) of TDB FIGURE II.B.1.b. Include the total reactivity associated with the known inoperable CEA and the highest worth CEA which is assumed to stick out of the core upon a Reactor trip.

c. Case III - More than one CEA is known to be inoperable (per Technical Specification 2.10.2.(4)a.).

(Enter N/A if this case is not applicable.)

(1) Enter total number of CEA's which are known to be inoperable per Technical Specification 2.10.2.(4) a.).

# N/A
9.c.(1)

(2) Enter the most conservative defective CEA worth from TDB FIGURE II.B.1.b. Lines (4) thru (17) depending on defective CEA(s) location, based on burnup (Step 5). Select the higher value.

N/A %Δp
9.c.(2)

[(# ______) X (______ %Δp)] = N/A %Δp
9.c.(1) 9.c.(2) 9.c

9. d. Enter total available CEA worth from TDB Figure II.B.1.a. based on burnup (Step 5)

   N/A % Δp
   9.d

e. Determine the maximum stuck CEA worth by selecting the minimum of either 9.c or 9.d and record that value.

   N/A % Δp
   9.e

f. Enter value from 9.a or 9.b or 9.e as appropriate 2.45 %Δp
   9.f

10. Calculation of the Total Instantaneous Shutdown Margin (SDM_I):

SDM_I = Stuck CEAs + Power Defect - S/D CEAs worth - Regulating CEA worth

SDM_I = 2.45 %Δp (9.f) + 1.757 %Δp (8) - 4.897 %Δp (7.c) - 3.33 %Δp (6) = -4.02 %Δp Total (10)

11. Calculate difference from required 3.6% Δp Shutdown Margin.

(-4.02 % Δp) (10) + 3.6% Δp = -0.42 % Δp (11)

NOTE: A 3.6% Δp shutdown margin must be maintained in a Hot Shutdown condition, Tc > 210°F (Technical Specification 2.10.2(1) and TDB-VI Item 13.0).

12. Shutdown Margin check:

a. If Step 11 is less than or equal to zero, the shutdown margin is adequate.

b. If Step 11 is greater than zero, use OI-ERFCS-1, Procedure 32 to determine the number of gallons of acid to add.

REMARKS____________________

Completed by____________________ Date/Time_____/_____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-RO-CO-2

JPM Title: Minimum HPSI flow with Containment Sump Blockage

Approximate Time: 15 minutes Actual Time: ________________

Reference(s): EOP-AOP Attachments R 17

JPM Prepared by: Jerry Koske Date: 05/12/05

JPM Reviewed by: ____________________ Date: __________

JPM Approved by: ____________________ Date: __________

JPM No: AJPM-RO-CO-2

JPM Title: Minimum HPSI flow with Containment Sump Blockage

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: EOP-AOP Attachments

Safety Considerations: None

Comments:

JPM No: AJPM-RO-CO-2

JPM Title: Minimum HPSI flow with Containment Sump Blockage

INITIATING CUE: **Following a loss of coolant accident, containment sump blockage has restricted the available HPSI and Containment Spray flow. Efforts are underway to provide makeup water to the SIRWT. The CRS has directed you to determine the minimum HPSI flow required to remove decay heat.**

2 hours and 20 minutes have elapsed since the reactor tripped due to the LOCA.

The CRS has also asked you to determine when 3 charging pumps would be able to provide adequate injection flow to remove decay heat.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Obtains a copy of EOP/AOP attachments.	Locates EOP/AOP attachments. (Do not provide) [SAT] [UNSAT]
2	Refers to the proper attachment	Refers to the second page of Attachment 26 (EOP/AOP attachments page 149 of 150) [SAT] [UNSAT]
3	Determines required HPSI flow.	Determines that 132 gpm HPSI flow is the minimum required to remove decay heat [acceptable range - 128 to 136 gpm] [SAT] [UNSAT]

JPM No: AJPM-RO-CO-2

JPM Title: Minimum HPSI flow with Containment Sump Blockage

STEP	ELEMENT	STANDARD
4	Determines when 3 charging pumps will be able to provide the required charging flow.	Determines that the flow from 3 charging pumps (120 gpm) will be adequate 3 hours and 50 minutes after the trip. [acceptable range- 3 hour 45 minutes to 4 hours] [SAT] [UNSAT]

Termination Criteria: **Candidate has determined HPSI flow required to remove decay heat and time when charging pump flow will be adequate.**

JPM No: AJPM-RO-CO-2

INITIATING CUE: **Following a loss of coolant accident, containment sump blockage has restricted the available HPSI and Containment Spray flow. Efforts are underway to provide makeup water to the SIRWT. The CRS has directed you to determine the minimum HPSI flow required to remove decay heat.**

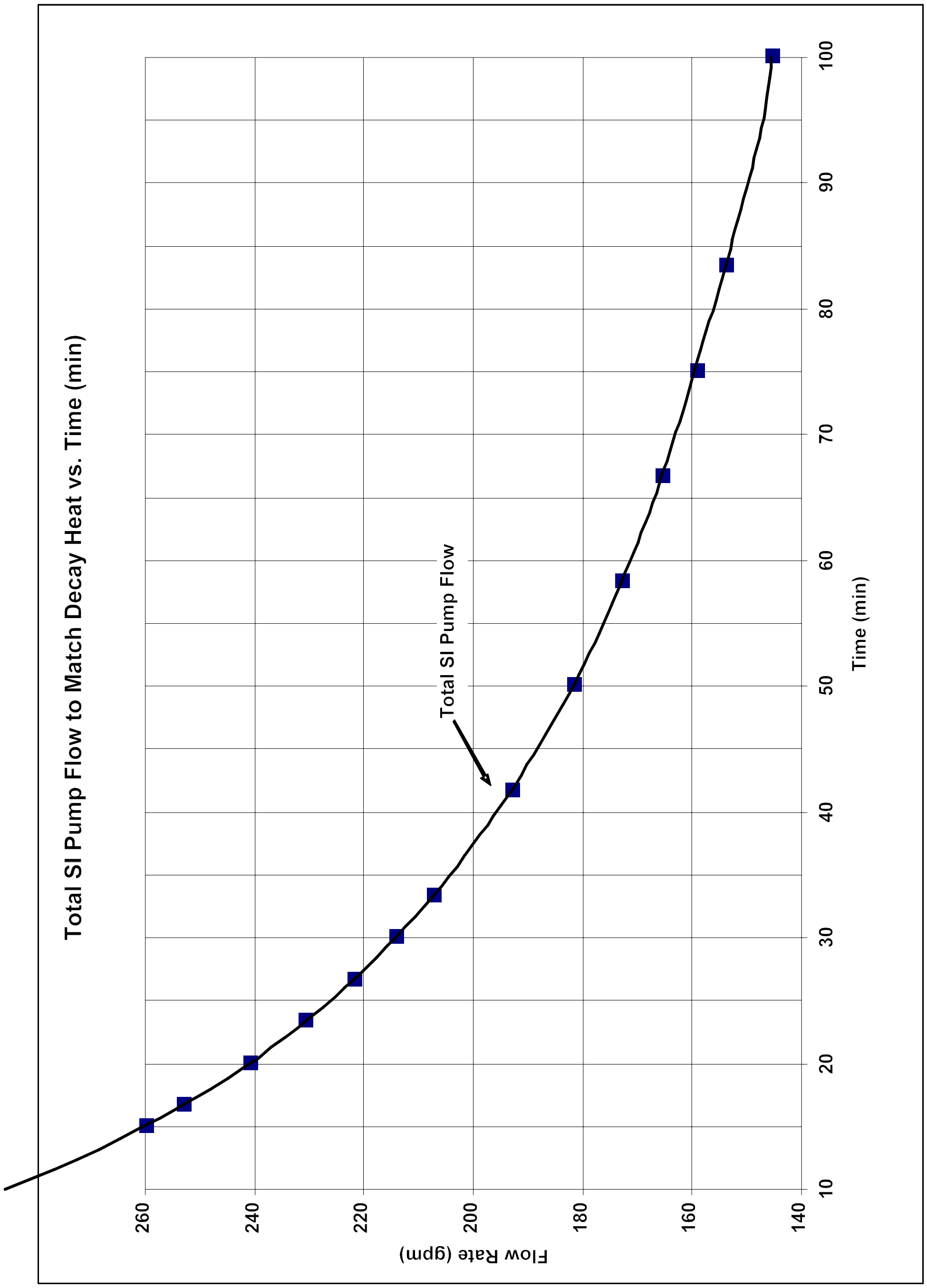
2 hours and 20 minutes have elapsed since the reactor tripped due to the LOCA.

The CRS has also asked you to determine when 3 charging pumps would be able to provide adequate injection flow to remove decay heat.

START

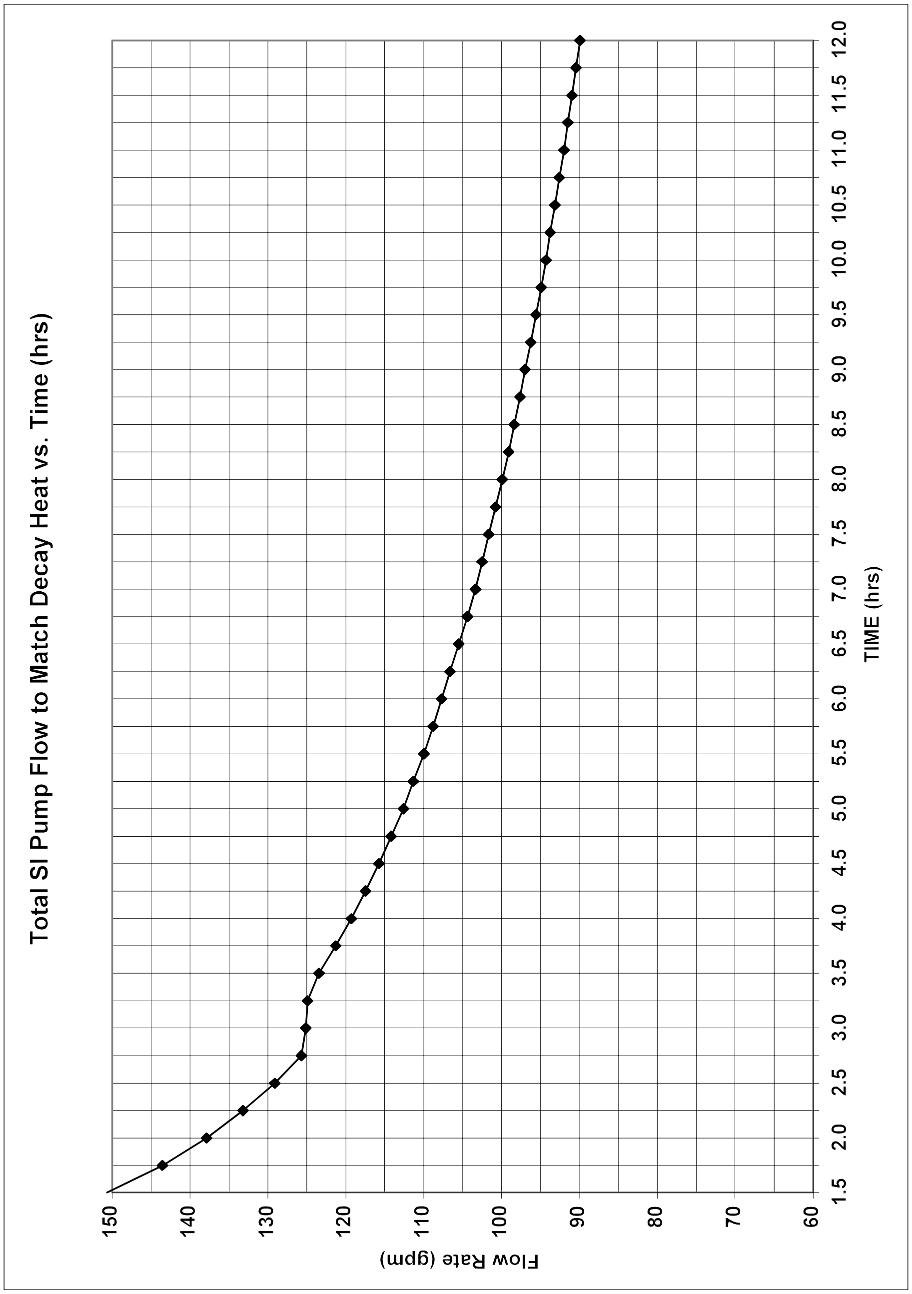
Attachment 26

Total SI Pump Flow to Match Decay Heat vs. Time



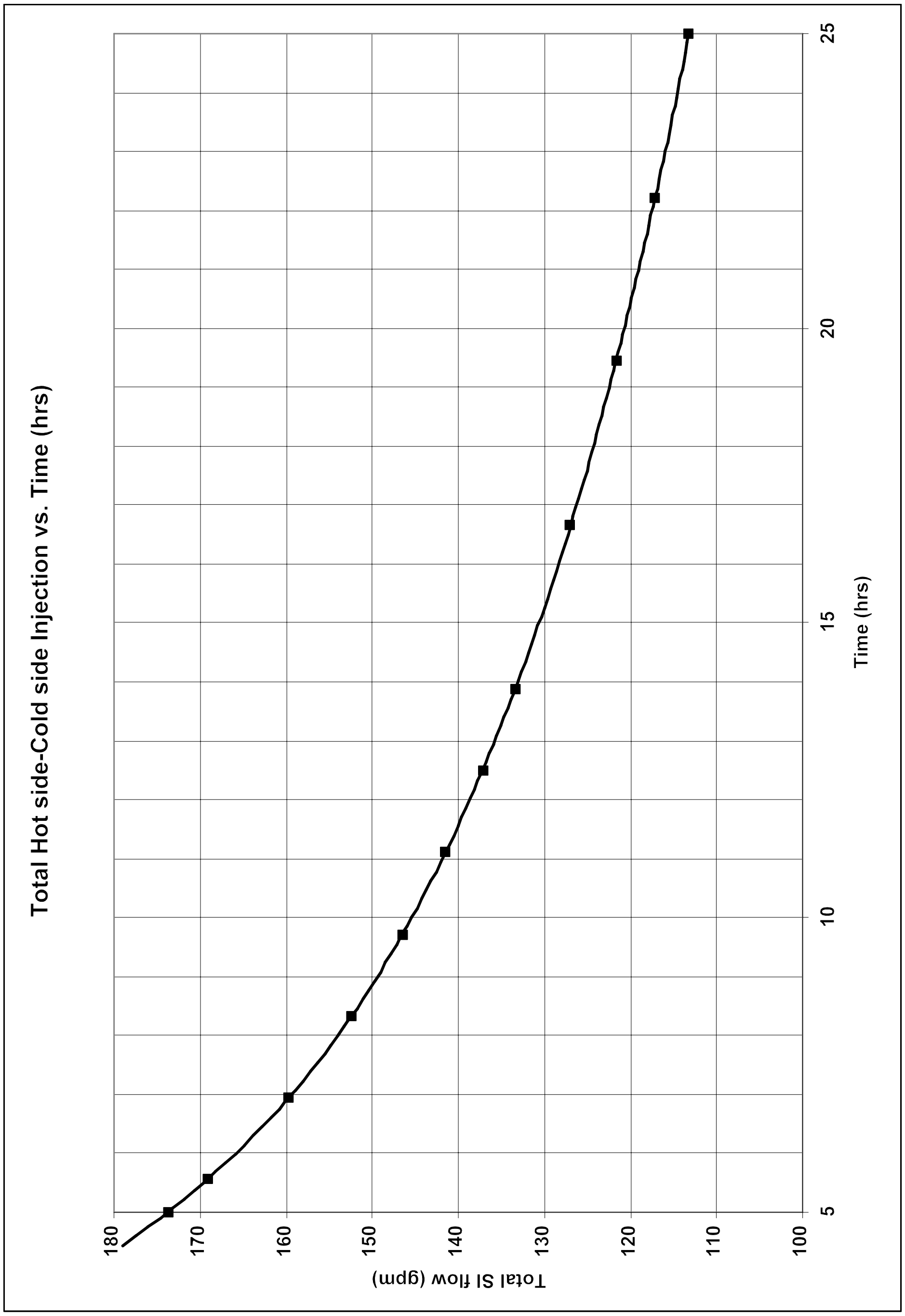
Attachment 26

Total SI Pump Flow to Match Decay Heat vs. Time



Attachment 26

Total SI Pump Flow to Match Decay Heat vs. Time



ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-RO-EC-1

JPM Title: Boration paths with equipment out of service

Approximate Time: 20 min

Actual Time: ________________

Reference(s): SO-O-21
TDB-VI
One line electrical drawing

JPM Prepared by: Jerry Koske Date: 05/12/05

JPM Reviewed by: ____________________ Date: ________

JPM Approved by: ____________________ Date: ________

JPM No: AJPM-RO-EC-1

JPM Title: Boration paths with equipment out of service

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: SO's, TDB and plant drawings

Safety Considerations: None

Comments:

JPM No: AJPM-RO-EC-1

JPM Title: Boration paths with equipment out of service

INITIATING CUE: **The plant is in SO-O-21, Shutdown Condition 1, “Refueling Cavity Water Level Greater than or Equal to 23 feet above the top of the core with UGS removed”**

CH-11A and CH-11B levels are both 30% with a boron concentration of 3.5 WT % Boric Acid. The SIRWT level is 24” with a boron concentration of 2150 ppm. Charging pump CH-1C has been tagged out of service.

480 volt buses 1B3A and 1B3A-4A will be deenergized to allow some work to be performed on BT-1B3A.

You have been requested to determine if 2 independent boration paths will be available once the buses are deenergized. If so, identify:
(1) the borated water source(s) and
(2) pump
for each boration path.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		Note: steps 1-3 may be performed in any order:
1	Determine equipment that will be affected by deenergizing the busses	Refers to plant one line electrical drawing (or other suitable plant reference) and determines that there will be no power to CH-1A, SI-2A and SI-2C. [SAT] [UNSAT]

JPM No: AJPM-RO-EC-1

JPM Title: Boration paths with equipment out of service

STEP	ELEMENT	STANDARD
2	Determines BAST suitability as a boric acid source	Refers to TDB-VI (COLR) figure 9 and determines that with 2150 PPM in the SIRWT and BAST boron at 3.5%, BAST level must be greater than 32%. With a level of 30% in each BAST, neither BAST can be a source by itself, but together they can count as one source. [SAT] [UNSAT]
3	Determines SIRWT suitability as a boric acid source	Determine that the SIRWT can not be used as a source with the charging pumps because the level is less that 80" but that it can be used as a source for the HPSI pump. [SAT] [UNSAT]
4	Determines if two independent boration paths are available with the buses deenergized and identifies them.	Determines that 2 independent boration paths are available: 1. CH-11A <u>AND</u> CH-11B (source) through (pump) CH-1B 2. SIRWT (Source) through pump SI-2B [SAT] [UNSAT]

Termination Criteria: Boration paths have been identified.

JPM No: AJPM-RO-EC-1

INITIATING CUE: **The plant is in SO-O-21, Shutdown Condition 1, "Refueling Cavity Water Level Greater than or Equal to 23 feet above the top of the core with UGS removed"**

CH-11A and CH-11B levels are both 30% with a boron concentration of 3.5 WT % Boric Acid. The SIRWT level is 24" with a boron concentration of 2150 ppm. Charging pump CH-1C has been tagged out of service.

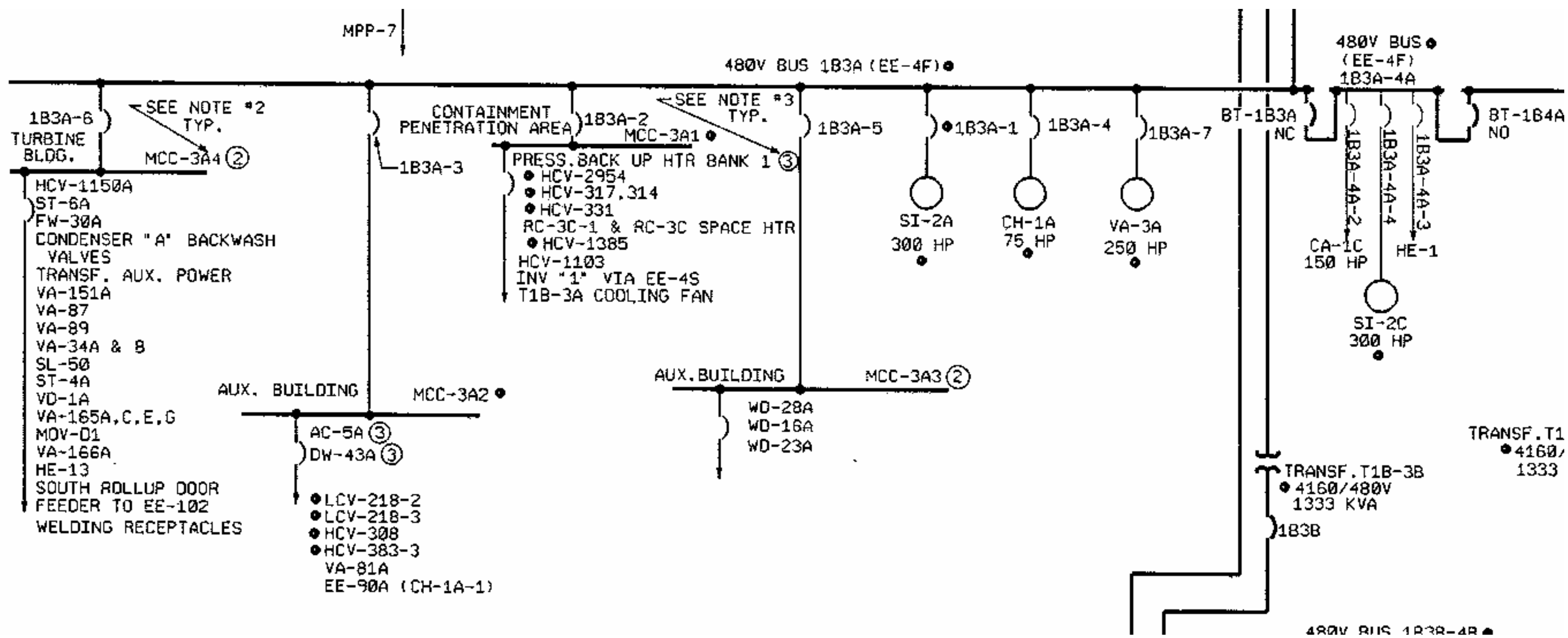
480 volt buses 1B3A and 1B3A-4A will be deenergized to allow some work to be performed on BT-1B3A.

You have been requested to determine if 2 independent boration paths will be available once the buses are deenergized. If so, identify:

(1) the borated water source(s) and
(2) pump

for each boration path.

START



MPP-7
480V BUS 1B3A (EE-4F)
1B3A-6
TURBINE BLDG.
SEE NOTE #2 TYP.
MCC-3A4 (2)
HCV-1150A
ST-6A
FW-30A
CONDENSER "A" BACKWASH VALVES
TRANSF. AUX. POWER
VA-151A
VA-87
VA-89
VA-34A & B
SL-50
ST-4A
VD-1A
VA-165A,C,E,G
MOV-D1
VA-166A
HE-13
SOUTH ROLLUP DOOR
FEEDER TO EE-102
WELDING RECEPTACLES
1B3A-3
AUX. BUILDING
MCC-3A2
AC-5A (3)
DW-43A (3)
LCV-218-2
LCV-218-3
HCV-308
HCV-383-3
VA-81A
EE-90A (CH-1A-1)
CONTAINMENT PENETRATION AREA
1B3A-2
MCC-3A1
SEE NOTE #3 TYP.
PRESS.BACK UP HTR BANK 1 (3)
HCV-2954
HCV-317,314
HCV-331
RC-3C-1 & RC-3C SPACE HTR
HCV-1385
HCV-1103
INV "1" VIA EE-4S
T1B-3A COOLING FAN
1B3A-5
AUX.BUILDING
MCC-3A3 (2)
WD-28A
WD-16A
WD-23A
1B3A-1
SI-2A
300 HP
1B3A-4
CH-1A
75 HP
1B3A-7
VA-3A
250 HP
BT-1B3A
NC
480V BUS
(EE-4F)
1B3A-4A
1B3A-4A-2
CA-1C
150 HP
1B3A-4A-4
SI-2C
300 HP
1B3A-4A-3
HE-1
BT-1B4A
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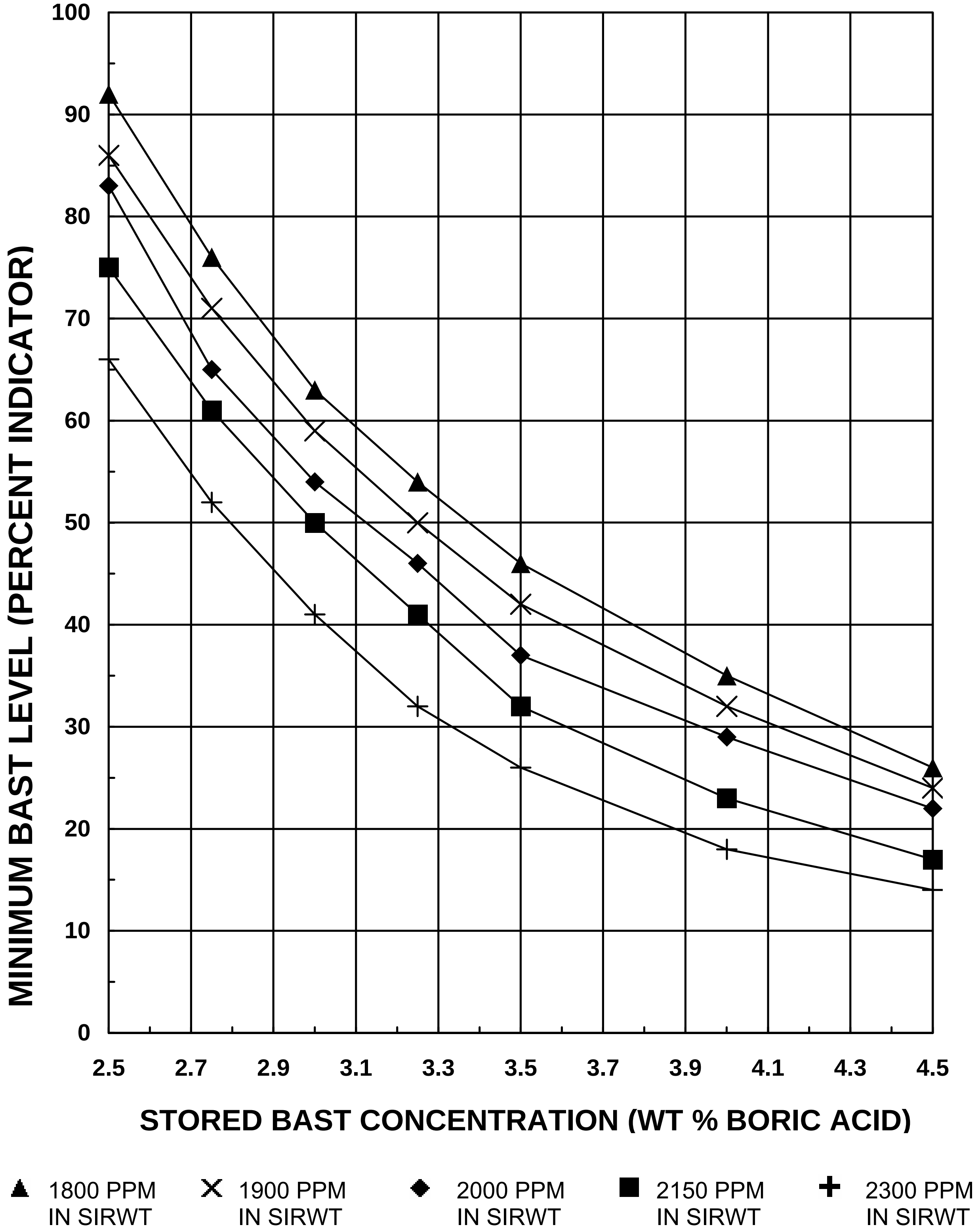
1333 KVA
1B3B
TRANSF.T1
4160/
1333



CYCLE 23 COLR	MINIMUM BAST LEVEL vs. STORED BAST CONCENTRATION	FIGURE 9

Attachment 7.1 - Shutdown Condition 1 - Refueling Cavity Water Level Greater Than or Equal to 23 feet Above the Top of the Core (elev. 1025.2 feet) with UGS Removed

Key Safety Function (Available unless otherwise specified)	Minimum Required	Options (Circle available trains and place check mark next to each operating train.)						Initial
Reactivity Control								
Borated Water Source (operable)	1	CH-11A (Charging) (TDB-VI)	CH-11B (Charging) (TDB-VI)	CH-11A + CH-11B (Charging) (TDB-VI)	SIRWT >6" (1 HPSI)	SIRWT >14" (2 HPSI)		
Boration Pumps (1 operable)	2	CH-1A	CH-1B	CH-1C	SI-2A	SI-2B	SI-2C	
Wide Range NI (operable)	1	AI-31A	AI-31B	AI-31C	AI-31D			
Containment								
Containment Fan with Cooling Water	1	VA-3A	VA-3B	VA-7C	VA-7D			
Radiation Monitor	1	RM-051	RM-052	RM-062				
CRHS/VIAS Channels	1	86A/CRHS 86A/VIAS	86B/CRHS 86B/VIAS					

* Only available if RCS temperature is less than 120º F
** Only available if continuously monitored
*** Although indication may be pegged high, credit may be taken if channel would respond to significant lowering of refueling cavity water level

Performed by STA: ______________________________ Date/Time: ________/_____

Reviewed by SSA: ______________________________ Date/Time: ________/_____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-RO-RC-1

JPM Title: RCA Entry and Exit with spill

Approximate Time: 12 minutes Actual Time: ________________

Reference(s): GET-Radiation Worker Training
Standing Order G-101
K/A 2.3.1 (RO Imp 2.6)

JPM Prepared by: Jerry Koske Date: 05/12/05

JPM Reviewed by: ____________________ Date: __________

JPM Approved by: ____________________ Date: __________

JPM No: AJPM-RO-RC-1

JPM Title: RCA Entry and Exit with spill

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments: This JPM will be performed during RCA entrance and exit during conduct of in-plant JPMs.

JPM No: AJPM-RO-RC-1

JPM Title: RCA Entry and Exit with spill

INITIATING CUE: **You have been directed to enter Room 13 to ensure that blowdown tank transfer pump, FW-34A is operating properly.**

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		Note to Examiner: Provide Initiating CUE to candidate prior to RCA entry.
1	Review RWP	Reads RWP [SAT] [UNSAT]
2	Determine Radiological Conditions in Room 13.	Checks survey maps and/or discusses radiological conditions with RP personnel. [SAT] [UNSAT]
3	Obtains Dosimetry	Verify TLD attached to security badge. Obtain EAD. [SAT] [UNSAT]
4	Sign in on appropriate RWP	Insert EAD in reader. Scan PID and RWP number [SAT] [UNSAT]

JPM No: AJPM-RO-RC-1

JPM Title: RCA Entry and Exit with spill

STEP	ELEMENT	STANDARD
5	Enter RCA	RCA entered [SAT] [UNSAT]
6	Enter Room 13	Enters Room 13 **As soon as candidate clears shield wall while entering room 13:** **CUE: Floor covered with water.**
7	Exits Room and Contacts Control Room.	Leaves Room Immediately and Contacts Control Room. [SAT] [UNSAT] **CUE: Control Room contacted RP. RP has determined that spill is not contaminated. The spill has been cleaned up.**
8	Enter Room 13	Enters room [SAT] [UNSAT] **CUE: All parameters for FW-34A are normal**
9	Exits Room 13	Exits room [SAT] [UNSAT] **Note to Examiner:** In-plant JPMs that are conducted in the RCA may be performed at this time. Steps 10 and 11 are

JPM No: AJPM-RO-RC-1

JPM Title: RCA Entry and Exit with spill

STEP	ELEMENT	STANDARD
		performed during RCA exit.
10	Monitor for personnel contamination prior to exiting RCA	Monitor for contamination using PCM [SAT] [UNSAT]
11	Sign out of RCA	Insert EAD in reader, enter PID number and confirm dose [SAT] [UNSAT]

Termination Criteria: RCA has been exited

JPM No: AJPM-RO-RC-1

INITIATING CUE: **You have been directed to enter Room 13 to ensure that blowdown tank transfer pump, FW-34A is operating properly.**

START

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-SRO-CO-1

JPM Title: Shutdown Margin Review with Boron Depletion

Approximate Time: 20 min Actual Time: ________________

Reference(s): TDB-V.9 “Shutdown Margin Worksheet” R35
TDB-II “Reactivity Curves” R28

JPM Prepared by: Jerry Koske Date: 05/11/05

JPM Reviewed by: ______________________ Date: __________

JPM Approved by: ______________________ Date: __________

JPM No: AJPM-SRO-CO-1

JPM Title: Shutdown Margin Review with Boron Depletion

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: Technical Data Book, calculator

Safety Considerations: None

Comments:

JPM No: AJPM-SRO-CO-1

JPM Title: Shutdown Margin Review with Boron Depletion

INITIATING CUE: **The plant has been tripped due to RCP seal failures. One reactor coolant pump has been tripped. All CEAs, including group "N", have been inserted and boration has taken place. The plant is being cooled down. The RCS is currently at 420°F and a boron concentration of 830 ppm.**

Prior to shutdown, the plant was operating at full power with all CEAs fully withdrawn and a boron concentration of 710 ppm. Burnup is 7000 MWD/MTU.

The STA has performed a shutdown margin calculation and determined that, at the current boron concentration, there is adequate shutdown margin as long as the RCS temperature remains above 400°F.

The Shift Manager has directed you, the CRS, to review the STA's Shutdown Margin Calculation.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Obtain a copy of TDB section II, Reactivity Curves.	Obtains copy of TDB-II [SAT] [UNSAT]
2	Reviews the shutdown margin calculation	Reviews the shutdown margin calculation
3	Identifies error on line d(1)	Entered value should be 0 ppm rather than 510 ppm. Current power level, rather than power level before trip was used when reading TDB figure. [SAT] [UNSAT]

JPM No: AJPM-SRO-CO-1

JPM Title: Shutdown Margin Review with Boron Depletion

STEP	ELEMENT	STANDARD
4	Corrects calculation and determines SDM	Determines that shutdown margin is inadequate because previous error resulted in adding zero for the boron depletion correction in the required boron concentration. Boron need to be 20 ppm (10 to 30 ppm) greater than current value. [SAT] [UNSAT]

Termination Criteria: Shutdown Margin calculation has been reviewed and corrected.

JPM No: AJPM-SRO-CO-1

INITIATING CUE:

The plant has been tripped due to RCP seal failures. One reactor coolant pump has been tripped. All CEAs, including group "N", have been inserted and boration has taken place. The plant is being cooled down. The RCS is currently at 420°F and a boron concentration of 830 ppm.

Prior to shutdown, the plant was operating at full power with all CEAs fully withdrawn and a boron concentration of 710 ppm. Burnup is 7000 MWD/MTU.

The STA has performed a shutdown margin calculation and determined that, at the current boron concentration, there is adequate shutdown margin as long as the RCS temperature remains above 400°F.

The Shift Manager has directed you, the CRS, to review the STA's Shutdown Margin Calculation.

START

PART II - Hot Shutdown, Cold Shutdown, and Refueling (No CEA Movement Planned)

NOTE: This calculation is valid for transient Xenon conditions, as PART II assumes the core is Xenon Free.

Conditions — INITIALS/DATE

1. Date/Time: 7/11/05/2100 — W, 7/11/05

2. Burnup (Take the most recent burnup from the Control Room Log and add 30 MWD/MTU per EFPD.)

   7000 MWD/MTU
   2
   — W, 7/11/05

3. Record the Reactor Coolant System indicated loop temperature:

   a. If on Shutdown Cooling, use TE-346Y (TR-346, RED Pen = Outlet temperature)

      = N/A °F
      3.a

   b. If not on Shutdown Cooling, then use the lowest valid RCS loop temperature.

      = 420 °F
      3.b
      — W, 7/11/05

4. Reactor Coolant System Boron Concentration (Boron Analysis must have been performed within the past 24 hours or more recently if boration or dilution has occurred.)

   830 ppm
   4
   — W, 7/11/05

5. Verify that all regulating and shutdown CEAs are inserted to at least the Lower Electrical Limit (LEL) — W, 7/11/05

6. Determine the required boron concentration by using the applicable TDB Figure II.A.3, based on RCS temperature (Step 3.a or Step 3.b), core burnup (Step 2) and Group N position.

   If in mode 5 enter the refueling boron concentration from the COLR.

   820 ppm (6) TDB Figure used: II A 3f (circle one) Group N (IN / OUT) W 17/11/05

7. Determine the deviation between actual and predicted critical boron (N/A if in Mode 5).

   a. Reactor Coolant System boron concentration prior to shutdown or trip. (N/A if in Mode 5)

      710 ppm (7.a)

   b. Reactor power level before shutdown or trip (% of 1500 MWth)

      100 % (7.b)

   c. Using core burnup (Step 2), determine the predicted full power boron concentration from TDB-II.A.1.b.

      680 ppm (7.c)

   d. Using the Reactor power (Step 7.b), determine the predicted delta boron concentration for the previous power conditions (use TDB-II.A.2)

      (1) 510 ppm (7.d.(1))

      (2) Predicted boron concentration is:

      680 (7.c) + 510 (7.d.(1)) = 1190 ppm (7.d.(2))

   e. Calculate the deviation between predicted and actual boron concentrations: (if the deviation is negative, enter zero)

      710 (7.a) - 1190 (7.d.(2)) = Ø ppm (7.e)

8. Adjust the required boron by adding the value of the boron deviation. If in Mode 5, enter the refueling boron concentration on line 8.

820	+	∅	=	820	ppm
6		7.e		8	

9. Calculate the difference between actual and adjusted required boron.

830	-	820	=	10	ppm
4		8		9	

10. Soluble Boron Concentration

a. IF Step 9 is greater than or equal to zero, the boron concentration is adequate.

b. IF Step 9 is less than zero, use OI-ERFCS-1, Procedure 32 or manual calculations and borate the Reactor coolant system to the concentration given in Step 8.

REMARKS

Completed by

Date/Time 7/1/05 2110

Corrected

PART II - Hot Shutdown, Cold Shutdown, and Refueling (No CEA Movement Planned)

NOTE: This calculation is valid for transient Xenon conditions, as PART II assumes the core is Xenon Free.

INITIALS/DATE

Conditions

1. Date/Time: 7/11/05/2100 — W, 7/11/05

2. Burnup (Take the most recent burnup from the Control Room Log and add 30 MWD/MTU per EFPD.)

   7000 MWD/MTU
   2

   W, 7/11/05

3. Record the Reactor Coolant System indicated loop temperature:

   a. If on Shutdown Cooling, use TE-346Y (TR-346, RED Pen = Outlet temperature)

      = N/A °F
      3.a

   b. If not on Shutdown Cooling, then use the lowest valid RCS loop temperature.

      = 420 °F
      3.b

   W, 7/11/05

4. Reactor Coolant System Boron Concentration (Boron Analysis must have been performed within the past 24 hours or more recently if boration or dilution has occurred.)

   830 ppm
   4

   W, 7/11/05

5. Verify that all regulating and shutdown CEAs are inserted to at least the Lower Electrical Limit (LEL) — W, 7/11/05

6. Determine the required boron concentration by using the applicable TDB Figure II.A.3, based on RCS temperature (Step 3.a or Step 3.b), core burnup (Step 2) and Group N position.

   If in mode 5 enter the refueling boron concentration from the COLR.

   820 ppm (6) TDB Figure used: II A 3 f
   (circle one) Group N (IN / OUT) W 17/11/05

7. Determine the deviation between actual and predicted critical boron (N/A if in Mode 5).

   a. Reactor Coolant System boron concentration prior to shutdown or trip. (N/A if in Mode 5)

      710 ppm (7.a)

   b. Reactor power level before shutdown or trip (% of 1500 MWth)

      100 % (7.b)

   c. Using core burnup (Step 2), determine the predicted full power boron concentration from TDB-II.A.1.b.

      680 ppm (7.c)

   d. Using the Reactor power (Step 7.b), determine the predicted delta boron concentration for the previous power conditions (use TDB-II.A.2)

      (1) Ø ~~510~~ ppm (7.d.(1))

      (2) Predicted boron concentration is:

      680 (7.c) + ~~510~~ Ø (7.d.(1)) = ~~1190~~ 680 ppm (7.d.(2))

   e. Calculate the deviation between predicted and actual boron concentrations: (if the deviation is negative, enter zero)

      710 (7.a) - ~~1190~~ 680 (7.d.(2)) = ~~Ø~~ 30 ppm (7.e)

8. Adjust the required boron by adding the value of the boron deviation. If in Mode 5, enter the refueling boron concentration on line 8.

820 + ~~0~~30 = ~~820~~ 850 ppm
6 7.e 8

9. Calculate the difference between actual and adjusted required boron.

830 - ~~820~~ 850 = ~~10~~ -20 ppm
4 8 9

10. Soluble Boron Concentration

a. ~~IF Step 9 is greater than or equal to zero, the boron concentration is adequate.~~

b. IF Step 9 is less than zero, use OI-ERFCS-1, Procedure 32 or manual calculations and borate the Reactor coolant system to the concentration given in Step 8.

REMARKS

Completed by [signature] Date/Time 7/1/05 2110

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-SRO-CO-2

JPM Title: Equipment Operability Requirements during Mode Change

Approximate Time: 15 minutes Actual Time: ________________

Reference(s): Technical Specifications
TDB-III.42 R1

JPM Prepared by: Jerry Koske Date: 05/14/05

JPM Reviewed by: ____________________ Date: __________

JPM Approved by: ____________________ Date: __________

JPM No: AJPM-SRO-CO-2

JPM Title: Equipment Operability Requirements during Mode Change

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments:

JPM No: AJPM-SRO-CO-2

JPM Title: Equipment Operability Requirements during Mode Change

---

INITIATING CUE: **The reactor has been shutdown for 24 hours and a RCS cooldown is in progress. The RCS temperature is 450°F and the pressure is 1250 psia.**

To allow for some emergent maintenance, outage management has asked you to determine if a procedure change could be made to OP-3A, step 25 and OI-SI-1, prerequisite 2 to allow Safety Injection Tanks to be isolated when RCS pressure is below 1000 psia. They would like to isolate HCV-2954 and HCV-2974.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Checks Technical Specifications	Refers to Tech Sec section 2.3 and determines that this condition is allowed by Tech Specs. [SAT] [UNSAT]
2	Refers to TDB-III.42	Refers to TDB-III.42 and determines that SIT Isolation valves must remain locked open until RCS pressure is below 400 psia. [SAT] [UNSAT]

Termination Criteria: **Candidate determines if condition is allowable or not.**

JPM No: AJPM-SRO-CO-2

INITIATING CUE: **You are an SRO assigned to the One Stop Shop during a refueling outage. The reactor has been shutdown for 24 hours and a RCS cooldown is in progress. The RCS temperature is 450°F and the pressure is 1250 psia.**

To allow for some emergent maintenance, outage management has asked you to determine if Safety Injection Tank Isolation valve, HCV-2974 could be closed and deenergized at this time.

START

Attachment 3 - RCS Cooldown from Mode 3 to Mode 4/5

PROCEDURE (continued)

(✓) INIT/DATE

NOTE

Venting the Reactor Vessel Head to the Pressurizer when RCS T_{ave} is greater than 210°F requires declaring both RCGVS vent paths inoperable due to HCV-176 and/or HCV-177 being open, and HCV-180 being open even though they may be operable.

CAUTION

Bubble formation in the Reactor Vessel Head is possible during shutdown conditions when the Reactor Vessel Head is not removed or vented.

22. Log entry into Technical Specification 2.1.8(3), 30 hour LCO to Cold Shutdown, for two inoperable RCGVS vent paths. ____/____

NOTES

1. When all RCPs are secured, FC-1327 is to be filled out at least once per shift.
2. All available level indications shall be used to track Reactor Vessel Head bubble formation during plant cooldown. Any indication(s) of Reactor Vessel Head bubble formation shall be reported promptly to the Shift Manager/CRS.

23. When all RCPs are secured, track RCS inventory changes and VCT gas space additions for possible Reactor Vessel Head bubble formation using Form FC-1327. ____/____
24. Vent the Reactor Vessel Head, as necessary, to the Pressurizer Quench Tank by performing the following:
    a. Open one of the following valves:
       - HCV-176, Reactor Head RCG Vent Valve (AI-65A) ____
       - HCV-177, Reactor Head RCG Vent Valve (AI-65B) ____
    b. Open HCV-180, RCG Vent Header Release Valve (AI-65B). ____/____
25. WHEN RCS pressure is less than ~~400~~ 1000 psia,
    THEN isolate Safety Injection Tanks per OI-SI-1. ____/____

Attachment 13 - Isolating SI Tank(s)

PREREQUISITES

(✓) INITIALS

1. Procedure Revision Verification

   Revision No. ______ Date:________ ______

2. RCS pressure is less than ~~400~~ 1000 psia. ______

PROCEDURE

1. Unlock and close the circuit breaker(s) for the selected SI Tank(s) Discharge Isolation Valve(s) (1C35 Padlock):

   - 3B1, HCV-2914, SI-6A ___
   - 4A1, HCV-2934, SI-6B ___
   - 3A1, HCV-2954, SI-6C ___
   - 4C1, HCV-2974, SI-6D ___ ______

2. Close the selected SI Tank(s) Discharge Isolation Valve(s):

   - HCV-2914, SI-6A ___
   - HCV-2934, SI-6B ___
   - HCV-2954, SI-6C ___
   - HCV-2974, SI-6D ___ ______

3. Verify valve closure by status light indication for valve(s) closed:

   - HCV-2914, SI-6A ___
   - HCV-2934, SI-6B ___
   - HCV-2954, SI-6C ___
   - HCV-2974, SI-6D ___ ______

Completed by_______________________________________ Date/Time:________/________

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.3 Emergency Core Cooling System

Applicability

Applies to the operating status of the emergency core cooling system.

Objective

To assure operability of equipment required to remove decay heat from the core.

Specifications

(1) Minimum Requirements

The reactor shall not be made critical unless all of the following conditions are met:

a. The SIRW tank contains not less than 283,000 gallons of water with a boron concentration of at least the refueling boron concentration at a temperature not less than 50^{o}F.

b. One means of temperature indication (local) of the SIRW tank is operable.

c. All four safety injection tanks are operable and pressurized to at least 240 psig and a maximum of 275 psig with tank level of at least 116.2 inches (67%) and a maximum level of 128.1 inches (74%) with refueling boron concentration.

d. One level and one pressure instrument is operable on each safety injection tank.

e. One low-pressure safety injection train is operable on each associated 4,160 V engineered safety feature bus.

f. One high-pressure safety injection pump is operable on each associated 4,160 V engineered safety feature bus.

g. Both shutdown heat exchangers are operable.

h. Piping and valves shall be operable to provide two flow paths from the SIRW tank to the reactor coolant system.

i. All valves, piping and interlocks associated with the above components and required to function during accident conditions are operable. HCV-2914, 2934, 2974, and 2954 shall have power removed from the motor operators by locking open the circuit breakers in the power supply lines to the valve motor operators. FCV-326 shall be locked open.

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.3 Emergency Core Cooling System (Continued)

(1) j. One high-pressure safety injection pump is operable on each safety injection refueling water tank-containment sump header.

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.3 Emergency Core Cooling System (Continued)

(2) Modification of Minimum Requirements

During power operation, the Minimum Requirements may be modified to allow one of the following conditions to be true at any one time. If the system is not restored to meet the minimum requirements within the time period specified below, the reactor shall be placed in a hot shutdown condition within 12 hours. If the minimum requirements are not met within an additional 48 hours the reactor shall be placed in a cold shutdown condition within 24 hours.

a. One low-pressure safety injection train may be inoperable provided the train is restored to operable status within seven (7) days.

b. One high-pressure safety injection pump may be inoperable provided the pump is restored to operable status within 24 hours.

c. One shutdown heat exchanger may be inoperable for a period of no more than 24 hours.

d. Any valves, interlocks or piping directly associated with one of the above components and required to function during accident conditions shall be deemed to be part of that component and shall meet the same requirements as listed for that component.

*** e. Any valve, interlock or piping associated with the safety injection and shutdown cooling system which is not covered under d. above but which is required to function during accident conditions may be inoperable for a period of no more than 24 hours.

f. One safety injection tank may be inoperable for reasons other than g. or h. below for a period of no more than 24 hours.

g. Level and/or pressure instrumentation on one safety injection tank may be inoperable for a period of 72 hours.

h. One safety injection tank may be inoperable due to boron concentration not within limits for a period of no more than 72 hours.

***SEE TDB-VIII

2.0 **LIMITING CONDITIONS FOR OPERATION**
2.3 Emergency Core Cooling System (Continued)

(3) Protection Against Low Temperature Overpressurization

The following limiting conditions shall be applied during scheduled heatups and cooldowns. Disabling of the HPSI pumps need not be required if the RCS is vented through at least a 0.94 square inch or larger vent.

Whenever the reactor coolant system cold leg temperature is below 350°F, at least one (1) HPSI pump shall be disabled.

Whenever the reactor coolant system cold leg temperature is below 320°F, at least two (2) HPSI pumps shall be disabled.

Whenever the reactor coolant system cold leg temperature is below 270°F, all three (3) HPSI pumps shall be disabled.

In the event that no charging pumps are operable when the reactor coolant system cold leg temperature is below 270°F, a single HPSI pump may be made operable and utilized for boric acid injection to the core, with flow rate restricted to no greater than 120 gpm.

(4) Trisodium Phosphate (TSP)

During operating Modes 1 and 2, the TSP baskets shall contain a volume of active TSP that is within the area of acceptable operation shown in Figure 2-3.

a. With the above TSP requirements not within limits, the TSP shall be restored within 72 hours.

b. With Specification 2.3(4)a required action and completion time not met, the plant shall be in hot shutdown within the next 6 hours and cold shutdown within the following 36 hours.

Basis

The normal procedure for starting the reactor is to first heat the reactor coolant to near operating temperature by running the reactor coolant pumps. The reactor is then made critical. The energy stored in the reactor coolant during the approach to criticality is substantially equal to that during power operation and therefore all engineered safety features and auxiliary cooling systems are required to be fully operable.

Fort Calhoun Station
Unit 1

TDB-III.42

TECHNICAL DATA BOOK

REQUIREMENTS FOR ECCS AND CONTAINMENT COOLING EQUIPMENT OPERATION IN MODE 3, TRANSITION BETWEEN MODES 3 AND 4 AND MODE 4 AND 5

Change No.	EC 36060
Reason for Change	Converted from WordPerfect to Word.
Requestor	N/A
Preparer	J. Collier
Editorial Correction	N/A
Issue Date	06-16-05 3:00 pm

REQUIREMENTS FOR ECCS AND CONTAINMENT COOLING EQUIPMENT OPERATION IN MODE 3, TRANSITION BETWEEN MODES 3 AND 4 AND MODE 4 AND 5

The purpose of this TDB section is to clarify the **ESF**, **ECCS** and **Containment Cooling Equipment** required in mode 3, the transitional conditions between mode 3 and mode 4 and modes 4 and 5. The transitional conditions are divided into four groupings, as defined below, and subsections are presented for each.

Applicability Statement for Startup

The applicability of the requirements contained herein differ between plant startup and plant shutdown. Since the decay heat and RCS energy during startup is considerably lower (following subcritical operation > 24 hrs) the following guidance is provided for plant startup conditions.

- HPSI Pumps must be available for manual actuation between T_{ave}>300°F and T_{ave}<450°F. At or above 450°F and prior to unblocking PPLS, at least one (1) HPSI Pump must be available for CPHS auto initiation and Operations Personnel must be prepared to manually start this pump.
- Safety Injection Tanks (SITs) are required to be unisolated before reaching an RCS temperature and pressure of 515°F and 1700 psia.
- LPSI/CS systems must be aligned and operable prior to mode 3.
- All other requirements per table 1 & 2 apply.

Table 1 - ECCS Equipment Summary

Equipment	Mode 3 and Transition 1	Transition 2	Transition 3	Transition 4 and Mode 4-5
Tave	Mode 3 >515°F; < 515 °F ≥300 °F	< 515 °F ≥ 300 °F	< 515 °F ≥ 300 °F	< 300 °F
RCS Press	≥ 1700 psia	< 1700 psia ≥ 400 psia	< 400 psia	< 400 psia
ECCS Equipment				
SIRWT	218,000 Gallons Total (122”) Refueling Boron Concentration ≥ 50°F	218,000 Gallons Total (122") Refueling Boron Concentration ≥ 50°F	218,000 Gallons Total (122”) Refueling Boron Concentration ≥ 50°F	Ref. SO-O-21
SIRWT Instr.	1 Temp Indicator	1 Temp Indicator	1 Temp Indicator	
SIRWT Path	2	1	1	
SIT	4 1 OOS for 24 hrs	(1) 4 1 OOS for 24 hrs	N/A	
SIT Instr.	1-Press 1-Level 1 SIT OOS for 72 hrs if inoperable due to level/pressure instrument or boron concentration	(1) 1-Press 1-Level (1) 1 SIT OOS for 72 hrs if inoperable due to level/pressure instrument or boron concentration	N/A	
SIT Isolation	Locked Open	(1) Locked Open	Closed	
LPSI Pumps	1 on each bus 1 OOS for 7 days	N/A	N/A	
HPSI Pumps	1 on each bus, 1 on each header 1 OOS for 24 hrs	(1) 1 Available	1 Available	
SDC Hx[1]	2 1 OOS for 24 hrs	N/A	N/A	
Actions	Cold S/D within 24 hrs if not restored within 48 hrs	Cold S/D within 24 hrs if not restored within 48 hrs	Cold S/D within 24 hrs if not restored within 48 hrs	

(1) See **Applicability Statement for Startup** requirements

Table 2 - Containment Cooling Equipment Summary

Equipment		Mode 3 and Transition 1		Transition 2		Transition 3		Transition 4 and Mode 4-5
	Tave	Mode 3 >515°F	< 515 °F ≥ 300 °F	< 515 °F ≥ 300 °F		< 515 °F ≥ 300 °F		< 300 °F
	RCS Press	≥ 1700 psia		< 1700 psia ≥ 400 psia		< 400 psia		< 400 psia
Containment Cooling Equipment								
On DG-1 Bus		AC-10A AC-10C AC-3A AC-3C SI-3A[1] VA-3A VA-7C	(3) One component listed may be unavailable for not more than seven days. Two components may be unavailable for not more than 24 hrs.	AC-10A AC-10C AC-3A AC-3C VA-3A VA-7C	(3) One component listed may be unavailable for not more than seven days. Two components may be unavailable for not more than 24 hrs.	AC-10A AC-10C AC-3A AC-3C VA-3A VA-7C	(3) One component listed may be unavailable for not more than seven days. Two components may be unavailable for not more than 24 hrs.	Refer to SOPP, SO-O-21
On DG-2 Bus		AC-10B AC-10D AC-3B VA-3B VA-7D (2) SI-3B (2) SI-3C	Same as DG-1 Bus	AC-10B AC-10D AC-3B VA-3B VA-7D	Same as DG-1 Bus	AC-10B AC-10D AC-3B VA-3B VA-7D	Same as DG-1 Bus	
CCW Hx		3		3		3		
		2 oos for 48 hrs		2 oos for 48 hrs		2 oos for 48 hrs		
Action		Cold S/D within 24 hrs if not restored within 48 hrs		Cold S/D within 24 hrs if not restored within 48 hrs		Cold S/D within 24 hrs if not restored within 48 hrs		

(2) See **Applicability Statement for Startup** requirements
(3) If the river water temperature is below 60 degrees Fahrenheit, one Raw Water pump may be unavailable indefinitely without applying any LCO action statement. When the river water temperature is greater than 60 degrees Fahrenheit, an unavailable Raw Water pump shall be restored to operability within nine days.

Mode 3, Hot Shutdown Tavg > 515˚F; Reactor Sub-Critical

Mode 3-4 Transition 1, 515°F > Tavg ≥300°F; RCS Pressure ≥1700 psia Reactor Sub-Critical

1. MODE 3 AND MODE 3-4 TRANSITION 1 (PPLS ENABLED)

1.1 ECCS Equipment

1.1.1 Requirements

1.1.1.A During Mode 3 and Transition 1 the SIRWT contains not less than 218,000 gallons of water with a boron concentration of at least the refueling concentration at a temperature not less than 50°F.

1.1.1.B Per Technical Specification 2.3(1) (Reference **Applicability Statement for Startup** requirements)

1.1.2 Allowable Out of Service Times

Per Technical Specification 2.3 (2); the requirements of 1.1.1 above may be modified to allow one of the following conditions to be true at any one time. If the system is not restored to meet the minimum requirements within 48 hours, the Reactor shall be placed in a Cold Shutdown condition within 24 hours.

See T.S. 2.3(2)a through h

1.2 Containment Cooling Equipment

1.2.1 Requirements

Per Technical Specification 2.4(1) (Reference **Applicability Statement for Startup** requirements) In Mode 3 (Hot Shutdown) or lower, only three Component Cooling heat exchangers are required to be operable.

1.2.2 Allowable Out of Service Times

Per Technical Specification 2.4 (2); the requirements of 1.2.1 above may be modified to allow one of the following conditions to be true at any one time. If the system is not restored to meet the minimum requirements within 48 hours, the Reactor shall be placed in a Cold Shutdown condition within 24 hours.

See T.S. 2.4(2)a through d

Mode 3-4 Transition 2, 515˚F > Tavg ≥300˚F; 1700 psia > RCS Pressure ≥400 psia
Reactor Sub-Critical

2. MODE 3 - 4 TRANSITION 2

2.1 ECCS Equipment

2.1.1 Requirements (Reference Applicability Statement for Startup requirements)

The following ensures ECCS equipment will be available to provide the required amount of water injection during an accident:

2.1.1.A The SIRW tank contains not less than 218,000 gallons of water with a boron concentration of at least the refueling boron concentration at a temperature not less than 50˚F.

2.1.1.B One means of local temperature indication on the SIRW tank is operable.

2.1.1.C All four Safety Injection Tanks are un-isolated with pressure and level per Tech Spec 2.3(1)c with at least the refueling boron concentration.

2.1.1.D One level and one pressure instrument is available on each Safety Injection Tank.

2.1.1.E One High-Pressure Safety Injection pump is available for automatic actuation.

2.1.1.F Piping and valves shall provide one flow path from the SIRW tank to the Reactor Coolant System.

2.1.1.G All valves, piping and interlocks associated with the above components and required to function during accident conditions are available for automatic actuation.

2.1.2 Allowable Out of Service Times

The requirements of 2.1.1 may be modified to allow one of the following conditions to be true at any one time. If the system is not restored to meet the minimum requirements within 48 hours, the Reactor shall be placed in a Cold Shutdown condition within 24 hours.

2.1.2.A One Safety Injection Tank may be inoperable for reasons other than 2.1.2.B and 2.1.2.C below for a period of not more than 24 hours.

2.1.2.B Level and/or pressure instrumentation on one Safety Injection Tank may be inoperable for a period of 72 hours.

2.1.2.C One Safety Injection Tank may be inoperable due to boron concentration not within limits for a period of no more than 72 hours.

Mode 3-4 Transition 2, 515˚F > Tavg ≥300˚F; 1700 psia > RCS Pressure ≥400 psia
Reactor Sub-Critical (continued)

2.2 Containment Cooling Equipment

2.2.1 Requirements (Reference **Applicability Statement for Startup** requirements)

The following ensures containment cooling equipment will be available for automatic actuation to reduce the containment building pressure and to remove decay heat from Containment.

2.2.1.A The following equipment normally associated with Diesel-Generator DG-1 (4.16-kV bus 1A3 and associated non-automatically transferring 480-Volt bus sections) is available for automatic actuation to provide containment cooling:

Raw water pump AC-10A
Raw water pump AC-10C
Component cooling water pump AC-3A
Component cooling water pump AC-3C
Containment air cooling and filtering unit VA-3A
Containment air cooling unit VA-7C

2.2.1.B The following equipment normally associated with Diesel-Generator DG-2 (4.16-kV 1A4 and associated non-automatically transferable 480 Volt bus sections) is available for automatic actuation to provide containment cooling:

Raw water pump AC-10B
Raw water pump AC-10D
Component cooling water pump AC-3B
Containment air cooling and filtering unit VA-3B
Containment air cooling unit VA-7D

2.2.1.C Three Component Cooling heat exchangers shall be available to provide containment cooling.

2.2.1.D All valves, piping and interlocks associated with the above components and required to function during accident conditions are available for automatic actuation to provide containment cooling.

Mode 3-4 Transition 2, 515˚F > Tavg ≥300˚F; 1700 psia > RCS Pressure ≥400 psia
Reactor Sub-Critical (continued)

2.2.2 Allowable Out of Service Times

The requirements of 2.2.1 above may be modified to allow one of the following conditions to be true at any one time. If the system is not restored to meet the minimum requirements within 48 hours, the Reactor shall be placed in a Cold Shutdown condition within 24 hours.

2.2.2.A One of the components listed in 2.2.1.A and 2.2.1.B may be unavailable for not more than seven days.

2.2.2.B For cases involving Raw Water pump unavailability, if the river water temperature is below 60 degrees Fahrenheit, one Raw Water pump may be unavailable indefinitely without applying any LCO action statement. When the river water temperature is greater than 60 degrees Fahrenheit, an unavailable Raw Water pump shall be restored to operability within seven days.

2.2.2.C The minimum requirements may be modified to allow a total of two of the components listed in 2.2.1.A and 2.2.1.B to be unavailable at any one time for not more than 24 hours. (this does not include one Raw Water pump which may be unavailable as described above if the river water temperature is below 60 degrees Fahrenheit). Only two Raw Water pumps may be out of service.

2.2.2.D Two Component Cooling heat exchangers may be unavailable for up to 48 hours.

2.2.2.E Any valves, interlocks and piping directly associated with one of the above components and required to function during accident conditions shall be deemed to be part of that component and shall meet the same requirements as for that component.

Mode 3-4 Transition 3, 515˚F > Tavg ≥300˚F; RCS Pressure < 400 psia Reactor Sub-Critical

3. MODE 3 - 4 TRANSITION 3

3.1 ECCS Equipment

3.1.1 Requirements (Reference **Applicability Statement for Startup** requirements)

The following ensures ECCS equipment will be available to provide the required amount of water injection during an accident.

3.1.1.A The SIRW tank contains not less than 218,000 gallons of water with a boron concentration of at least the refueling boron concentration at a temperature not less than 50˚F.

3.1.1.B One means of local temperature indication on the SIRW tank is operable.

3.1.1.C One High-Pressure Safety Injection pump is available.

3.1.1.D Piping and valves shall provide one flow path from the SIRWT to the Reactor Coolant System.

3.1.1.E All valves, piping and interlocks associated with the above components and required to function during accident conditions are available.

3.1.2 Allowable Out of Service Times

If the system Is not restored to meet the minimum requirements as stated above within 48 hours, the Reactor shall be placed in a Cold Shutdown condition within 24 hours.

Mode 3-4 Transition 3, 515˚F > Tavg ≥300˚F; RCS Pressure < 400 psia
Reactor Sub-Critical (continued)

3.2 Containment Cooling Equipment

3.2.1 Requirements

The following ensures containment cooling equipment will be available to reduce the Containment Building pressure and to remove decay heat from Containment.

3.2.1.A The following equipment normally associated with Diesel-Generator DG-1 (4.16-kV bus 1A3 and associated non-automatically transferring 480-Volt bus sections) is available to provide containment cooling:

Raw water pump AC-10A
Raw water pump AC-10C
Component cooling water pump AC-3A
Component cooling water pump AC-3C
Containment air cooling and filtering unit VA-3A
Containment air cooling unit VA-7C

3.2.1.B The following equipment normally associated with Diesel-Generator DG-2 (4.16-kV 1A4 and associated non-automatically transferable 480 Volt bus sections) is available to provide containment cooling:

Raw water pump AC-10B
Raw water pump AC-10D
Component cooling water pump AC-3B
Containment air cooling and filtering unit VA-3B
Containment air cooling unit VA-7D

3.2.1.C Three Component Cooling heat exchangers shall be available to provide containment cooling.

3.2.1.D All valves, piping and interlocks associated with the above components and required to function during accident conditions are available to provide containment cooling.

Mode 3-4 Transition 3, 515˚F > Tavg ≥300˚F; RCS Pressure < 400 psia
Reactor Sub-Critical (continued)

3.2.2 Allowable Out of Service Times

The requirements of 3.2.1 above may be modified to allow one of the following conditions to be true at any one time. If the system is not restored to meet the minimum requirements within 48 hours, the Reactor shall be placed in a Cold Shutdown condition within 24 hours.

3.2.2.A One of the components listed in 3.2.1.A and 3.2.1.B may be unavailable for not more than seven days.

3.2.2.B For cases involving Raw Water pump unavailability, if the river water temperature is below 60 degrees Fahrenheit, one Raw Water pump may be unavailable indefinitely without applying any LCO action statement. When the river water temperature is greater than 60 degrees Fahrenheit, an unavailable Raw Water pump shall be restored to operability within seven days.

3.2.2.C The minimum requirements may be modified to allow a total of two of the components listed in 3.2.1A and 3.2.1B to be unavailable at any one time for not more than 24 hours. (this does not include one Raw Water pump which may be unavailable as described above if the river water temperature is below 60 degrees Fahrenheit). Only two Raw Water pumps may be out of service.

3.2.2.D Two Component Cooling heat exchangers may be unavailable for up to 48 hours.

3.2.2.E Any valves, interlocks and piping directly associated with one of the above components and required to function during accident conditions shall be deemed to be part of that component and shall meet the same requirements as for that component.

Mode 3-4 Transition 4, 300˚F > Tavg; RCS Pressure < 400 psia, and Mode 4 and 5
Reactor Sub-Critical

4. MODE 3-4 TRANSITION 4 AND MODE 4 AND 5

4.1 ECCS Equipment

4.1.1 Requirements

Per T.S. 2.1.1 (3) and T.S. 2.8 and Standing Order O-21 (SOPP)

4.2 Containment Cooling Equipment

4.2.1 Requirements

Standing Order SO-O-21 (Shutdown Operations Protection Plan) provides guidance related to equipment required during shutdown conditions.

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-SRO-EC-1

JPM Title: Review of OP-ST-SHIFT-0001

Approximate Time: 20 min Actual Time: ________________

Reference(s): OP-ST-SHIFT-0001 R90

JPM Prepared by: Jerry Koske Date: 05/15/05

JPM Reviewed by: ______________________________ Date: __________

JPM Approved by: ______________________________ Date: __________

JPM No: AJPM-SRO-EC-1

JPM Title: Review of OP-ST-SHIFT-0001

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments:

JPM No: AJPM-SRO-EC-1

JPM Title: Review of OP-ST-SHIFT-0001

INITIATING CUE: **You are acting as Shift Manager. Complete the Shift Manager review for Monday 1900 of the attached portion of OP-ST-SHIFT-0001. Determine if any actions must be taken as a result of the log readings.**

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Reviews portion of OP-ST-SHIFT-0001	Reviews each Monday 1900 reading on provided portion of OP-ST-SHIFT-0001 [SAT] [UNSAT]
2	Determines that RCS Cold Leg Temperature does not meet acceptance criteria.	On page 9 of 49, determines that the maximum difference between $T_{cold\ cal}$ on AI-31A and the highest T_{cold} is greater than 0.2°F. Determines that calibration is required using OI-RPS-2. [SAT] [UNSAT]
3	Determines that the acceptance criteria for RM-057 are not met.	On page 14 of 49, determines that counts have doubled on RM-057. Determines that SO-G-105 must be entered and contacts the Shift Chemist for a primary-secondary sample. [SAT] [UNSAT]

JPM No: AJPM-SRO-EC-1

JPM Title: Review of OP-ST-SHIFT-0001

Termination Criteria: **The Shift Manager review of the provided portion of OP-ST SHIFT-0001 has been completed.**

JPM No: AJPM-SRO-EC-1

INITIATING CUE: **You are acting as Shift Manager. Complete the Shift Manager review for Monday 1900 of the attached portion of OP-ST-SHIFT-0001. Determine if any actions must be taken as a result of the log readings.**

START

SHIFT DATA SHEET

WEEK ENDING:

SI TANK LEVEL

	INSTRUMENT	SI-6C LI-2944	SI-6A LI-2904	SI-6D LI-2964	SI-6B LI-2924	Magnetrol Alarms CLEAR	TIME	INITIALS	STA	SM		
SUN	0700	71.5	72	72	71.7	All clear	0720	DS	ST	SM	0700	SUN
	1900	71.5	72	72	71.6	All clear	1912	NS	ST	SM	1900	
MON	0700	71.5	72	72	71.6	All clear	0710	DS	ST	SM	0700	MON
	1900	71.5	71.8	72	71.6	All clear	1915	NS	ST		1900	
TUE	0700										0700	TUE
	1900										1900	
WED	0700										0700	WED
	1900										1900	
THU	0700										0700	THU
	1900										1900	
FRI	0700										0700	FRI
	1900										1900	
SAT	0700										0700	SAT
	1900										1900	

APPLICABLE MODES:

Modes 1 and 2

PROCEDURE REFERENCE:

None

TECH. SPEC. REFERENCE:

3.1, Table 3-2, Item 14.a

ACCEPTANCE CRITERIA:

- Levels are ≥67% and ≤ 74%
- The following A-7 Annunciators are CLEAR:

  C-2U C-3U D-2U D-3U C-2L C-3L D-2L D-3L

REMARKS: ______________________________

SHIFT DATA SHEET

WEEK ENDING:

SI TANK PRESSURE

INSTRUMENT		SI-6C PI-2941	SI-6A PI-2901	SI-6D PI-2961	SI-6B PI-2921	ANNUN CLEAR	TIME	INITIALS	STA	S M		
SUN	0700	255	250	265	260	All clear	0720	DS	ST	SM	0700	SUN
SUN	1900	255	250	265	260	All clear	1912	NS	ST	SM	1900	SUN
MON	0700	250	250	260	255	All clear	0710	DS	ST	SM	0700	MON
MON	1900	250	250	255	250	All clear	1915	NS	ST		1900	MON
TUE	0700										0700	TUE
TUE	1900										1900	TUE
WED	0700										0700	WED
WED	1900										1900	WED
THU	0700										0700	THU
THU	1900										1900	THU
FRI	0700										0700	FRI
FRI	1900										1900	FRI
SAT	0700										0700	SAT
SAT	1900										1900	SAT

APPLICABLE MODES:

Modes 1 and 2

PROCEDURE REFERENCE:

None

TECH. SPEC. REFERENCE:

3.1, Table 3-2, Item 14.a

ACCEPTANCE CRITERIA:

- Pressures are $\geq$240 psig and $\leq$270 psig
- The following A-7 Annunciators are CLEAR:

  A-2U A-3U A-4U B-4U A-2L A-3L
  A-4L B-4L B-2U B-3U B-2L B-3L

REMARKS: ______________________

SHIFT DATA SHEET

WEEK ENDING:

SIRWT LEVEL

INSTRUMENT		LIC-381	LIC-382	TIME	INITIALS	STA	SM		
SUN	0700	191	193	0721	DS	ST	SM	0700	SUN
	1900	191	193	1913	NS	ST	SM	1900	
MON	0700	191	192	0711	DS	ST	SM	0700	MON
	1900	190	192	1916	NS	ST		1900	
TUE	0700							0700	TUE
	1900							1900	
WED	0700							0700	WED
	1900							1900	
THU	0700							0700	THU
	1900							1900	
FRI	0700							0700	FRI
	1900							1900	
SAT	0700							0700	SAT
	1900							1900	

APPLICABLE MODES:

Modes 1 and 2

PROCEDURE REFERENCE:

None

TECH. SPEC. REFERENCE:

3.1, Table 3-2, Item 13.a

ACCEPTANCE CRITERIA:

- Levels are ≥ 185 inches

REMARKS: ______

SHIFT DATA SHEET

WEEK ENDING:

WIDE RANGE LOGARITHMIC POWER

INSTRUMENT		AI-31A %/CPS	AI-31B %/CPS	AI-31C %/CPS	AI-31D %/CPS	TIME	INITIALS	STA	SM		
SUN	0700	100	105	100	100	0723	DS	ST	SM	0700	SUN
	1900	100	105	100	100	1915	NS	ST	SM	1900	
MON	0700	100	105	100	100	0713	DS	ST	SM	0700	MON
	1900	100	105	100	100	1918	NS	ST		1900	
TUE	0700									0700	TUE
	1900									1900	
WED	0700									0700	WED
	1900									1900	
THU	0700									0700	THU
	1900									1900	
FRI	0700									0700	FRI
	1900									1900	
SAT	0700									0700	SAT
	1900									1900	

APPLICABLE MODES:

Modes 1, 2, 3, 4 and 5

PROCEDURE REFERENCE:

None

TECH. SPEC. REFERENCE:

3.1, Table 3-1, Item 2.a

ACCEPTANCE CRITERIA:

- Maximum difference between the highest and lowest percent (%) reading is one-half (½) decade
- Minimum CPS reading is one (1) CPS

REMARKS: ______________________

SHIFT DATA SHEET

WEEK ENDING:

POWER RANGE SAFETY CHANNELS

INSTRUMENT		AI-31A Minus Offset		AI-31B Minus Offset		AI-31C Minus Offset		AI-31D Minus Offset		RPS pwr Max Diff.	XC105 (MW)*	XC105 divided by 15*	RPS/105 (%) Max Diff. *	TIME	INITIALS	STA	SM		
		ΔT	NI	ΔT	NI	ΔT	NI	ΔT	NI										
SUN	0700	99.2	99.4	99.6	99.5	99.6	99.6	99.7	99.6	0.5	1494	99.6	0.4	0725	DS	ST	SM	0700	SUN
	1900	99.3	99.4	99.6	99.5	99.5	99.6	99.7	99.6	0.4	1492	99.5	0.2	1917	NS	ST	SM	1900	
MON	0700	99.3	99.5	99.5	99.5	99.5	99.5	99.7	99.6	0.4	1494	99.6	0.3	0715	DS	ST	SM	0700	MON
	1900	99.2	99.4	99.6	99.2	99.5	99.5	99.6	99.5	0.4	1495	99.7	0.5	1920	NS	ST		1900	
TUE	0700																	0700	TUE
	1900																	1900	
WED	0700																	0700	WED
	1900																	1900	
THU	0700																	0700	THU
	1900																	1900	
FRI	0700																	0700	FRI
	1900																	1900	
SAT	0700																	0700	SAT
	1900																	1900	

APPLICABLE MODES:

Mode 1 - *NOT required during Startup/Shutdown Periods (including power operation less than 25%)

PROCEDURE REFERENCE:

OP-ST-RPS-0005
RE-CPT-RX-0003

TECH. SPEC. REFERENCE:

3.1, Table 3-1, Items 1.a and 1.b

ACCEPTANCE CRITERIA:

- Maximum difference between the highest and lowest RPS pwr reading (ΔT or NI) and XC105(%) (Thermal pwr) is 1.0% with Reactor power above 25% and stable.
- Maximum difference between the highest and lowest RPS pwr reading (ΔT or NI) is 2% with Reactor power above 50% and stable.
- With the conditions of the RCS flow streaming anomaly. Two (2) channels (A & B or C & D) of ΔT may be as much as 10% lower and/or higher than NI and/or XC105. This applies to all Reactor power levels.

REMARKS:

The RPS Max Diff is the maximum difference for the eight (8) power readings minus scaling amp offset.

Values recorded are to be rounded to nearest tenth.

The RPS/XC105 comparisons are required daily per 3.1 Table 3-1, Item 1b. Mark the XC105, XC105/15, and RPS/105 columns N/A if XC105 is invalid. Perform RE-CPT-RX-0003 if XC105 is invalid for 2 consecutive readings.

Perform OP-ST-RPS-0005 as necessary to adjust RPS power indication.

SHIFT DATA SHEET

WEEK ENDING:

RCS COLD LEG TEMPERATURE

INSTRUMENT		AI-31A		AI-31B		AI-31C		AI-31D		$T_{COLD}/T_{COLD\ cal}$	TIME	INITIALS	STA	SM		
		T_{COLD}	$T_{COLDcal}$	T_{COLD}	$T_{COLDcal}$	T_{COLD}	$T_{COLDcal}$	T_{COLD}	$T_{COLDcal}$	Max. Diff.						
SUN	0700	542.9	542.8	542.9	542.9	542.8	542.9	542.9	542.9	0.1	0728	DS	ST	SM	0700	SUN
	1900	542.9	542.9	542.8	542.8	542.9	542.9	542.9	542.9	0.1	1420	NS	ST	SM	1900	
MON	0700	542.9	542.8	542.9	542.9	542.8	542.9	542.9	542.9	0.1	0718	DS	ST	SM	0700	MON
	1900	542.9	542.6	542.9	542.9	542.8	542.9	542.9	542.9	0.1	1423	NS	ST		1900	
TUE	0700														0700	TUE
	1900														1900	
WED	0700														0700	WED
	1900														1900	
THU	0700														0700	THU
	1900														1900	
FRI	0700														0700	FRI
	1900														1900	
SAT	0700														0700	SAT
	1900														1900	

APPLICABLE MODES:

Mode 1 and 2

PROCEDURE REFERENCE:

OI-RPS-2

TECH. SPEC. REFERENCE:

- 3.1, Table 3-3, Item 17.a
- 3.10(7)a

ACCEPTANCE CRITERIA:

- Maximum T_{cold} above 15% Reactor Power is 545°F
- Maximum difference between each $T_{cold\ cal}$ and the highest T_{cold} reading for the applicable reactor power level is as follows:

  >75% to 100% = 0.2°F
  >50% to ≤75% = 0.5°F
  15% to ≤50% = 1.0°F

REMARKS: EAR 94-130 evaluated up to a 1.0°F deviation on $T_{cold\ Cal}$ regardless of power level for operability concerns.

SHIFT DATA SHEET

WEEK ENDING:

TM / LP TRIP SETPOINTS

INSTRUMENT		AI-31A DVM P_{Trip}	AI-31B DVM P_{Trip}	AI-31C DVM P_{Trip}	AI-31D DVM P_{Trip}	P_{trip} Max Diff.	TIME	INITIALS	STA	SM		
SUN	0700	1886	1883	1888	1892	9	0730	DS	ST	SM	0700	SUN
	1900	1886	1883	1888	1892	9	1422	NS	ST	SM	1900	
MON	0700	1886	1884	1890	1890	6	0720	DS	ST	SM	0700	MON
	1900	1886	1885	1890	1890	5	1426	NS	ST		1900	
TUE	0700										0700	TUE
	1900										1900	
WED	0700										0700	WED
	1900										1900	
THU	0700										0700	THU
	1900										1900	
FRI	0700										0700	FRI
	1900										1900	
SAT	0700										0700	SAT
	1900										1900	

APPLICABLE MODES:

Modes 1 and 2

PROCEDURE REFERENCE:

None

TECH. SPEC. REFERENCE:

3.1, Table 3-1, Item 4.a(1)

ACCEPTANCE CRITERIA:

- Trip setpoints are ≥ TDB-VI limits for existing T_{cold} and Reactor power
- Minimum P_{Trip} is 1750 psia
- Maximum difference between the highest and lowest P_{Trip} is 40 psi
- If RCS Flow Streaming conditions are present, P_{Trip} Max. Diff. is the higher of the difference between Channels A and B and between Channels C and D. The maximum for P_{Trip} Max. Diff. is 40 psi.

REMARKS: ______

SHIFT DATA SHEET

WEEK ENDING:

RCS FLOW VOLTAGES

INSTRUMENT		AI-31A		AI-31B		AI-31C		AI-31D		Meter Input Max. Dif.	TIME	INITIALS	STA	SM		
		Meter Input	Trip S.P.	Meter Input	Trip S.P.	Meter Input	Trip S.P.	Meter Input	Trip S.P.							
SUN	0700	-3.267	-3.053	-3.265	-3.049	-3.267	-3.049	-3.265	-3.052	.002	0734	DS	ST	SM	0700	SUN
	1900	-3.267	N/A	-3.265	N/A	-3.267	N/A	-3.265	N/A	.002	1926	NS	ST	SM	1900	
MON	0700	-3.267	-3.053	-3.265	-3.049	-3.267	-3.049	-3.265	-3.052	.002	0724	DS	ST	SM	0700	MON
	1900	-3.267	N/A	-3.265	N/A	-3.267	N/A	-3.265	N/A	.002	1929	NS	ST		1900	
TUE	0700														0700	TUE
	1900		N/A		N/A		N/A		N/A						1900	
WED	0700														0700	WED
	1900		N/A		N/A		N/A		N/A						1900	
THU	0700														0700	THU
	1900		N/A		N/A		N/A		N/A						1900	
FRI	0700														0700	FRI
	1900		N/A		N/A		N/A		N/A						1900	
SAT	0700														0700	SAT
	1900		N/A		N/A		N/A		N/A						1900	

APPLICABLE MODES:

Modes 1 and 2

PROCEDURE REFERENCE:

OP-ST-RPS-0002

TECH. SPEC. REFERENCE:

3.1, Table 3-1, Item 3.a

ACCEPTANCE CRITERIA:

- Meter Input flow voltages are greater than their respective Low Flow Trip setpoint voltages.
- Maximum difference between the highest and lowest Meter Input valves is 0.140 volts.

REMARKS: Record the highest absolute voltage reading observed over approximately a 15 second interval.

SHIFT DATA SHEET

WEEK ENDING:

AXIAL POWER DISTRIBUTION (APD/ASI)

INSTRUMENT		AI-31A			AI-31B			AI-31C			AI-31D			TIME	INITIALS	STA	SM		
		Lower Trip S.P.	ASI	Upper Trip S.P.	Lower Trip S.P.	ASI	Upper Trip S.P.	Lower Trip S.P.	ASI	Upper Trip S.P.	Lower Trip S.P.	ASI	Upper Trip S.P.						
SUN	0700	-.1324	.0259	.1324	-.1321	.0271	.1311	-.1311	.0291	.1301	-.1312	.0310	.1301	0738	DS	ST	SM	0700	SUN
	1900	-.1318	.0265	.1324	-.1311	.0310	.1312	-.1312	.0310	.1310	-.1311	.0312	.1301	1930	NS	ST	SM	1900	
MON	0700	-.1325	.0281	.1324	-.1300	.0315	.1311	-.1312	.0371	.1308	-.1310	.0321	.1300	0728	DS	ST	SM	0700	MON
	1900	-.1324	.0259	.1324	-.1301	.0310	.1310	-.1312	.0361	.1310	-.1310	.0320	.1301	1931	NS	ST		1900	
TUE	0700																	0700	TUE
	1900																	1900	
WED	0700																	0700	WED
	1900																	1900	
THU	0700																	0700	THU
	1900																	1900	
FRI	0700																	0700	FRI
	1900																	1900	
SAT	0700																	0700	SAT
	1900																	1900	

APPLICABLE MODES:

Mode 1 greater than 15% power

PROCEDURE REFERENCE:

OP-ST-RPS-0004

TECH. SPEC. REFERENCE:

- 3.1, Table 3-1, Item 13.a
- 3.10(7)a

ACCEPTANCE CRITERIA:

- Lower trip setpoint is equal to or less negative (-) than the 4 Pump Operation limit in TDB-VI
- Upper Trip setpoint is equal to or less positive (+) than the 4 Pump Operation limit in TDB-VI
- ASI is within the Lower and Upper Trip setpoints for their respective channels
- ASI is within the DNB limits in TDB-VI

REMARKS: ______

SHIFT DATA SHEET **[AR 12757]**

WEEK ENDING:

EFFLUENT RADIATION MONITORS

	INSTRUMENT	RM-050	RM-051	RM-052	RM-062	RM-043	RM-063	TIME	INITIALS	STA	SM		
SUN	Meter Reading CPM	6.44E2	8.9E1	5.8E1	4.8E1	3.6E1	0.0	1935	KS	ST	SA	1900	SUN
	ALERT SP	1.73E4	7.74E4	9.16E3	8.24E3	3.10E3	N/A						
	Sample Flow	2.0	N/A	2.1	2.0	* 2.1	N/A						
MON	Meter Reading CPM	6.43E2	8.9E1	5.8E1	4.8E1	3.6E1	0.0	1935	KS	ST		1900	MON
	ALERT SP	1.73E4	7.74E4	9.16E3	8.24E3	3.10E3	N/A						
	Sample Flow	2.1	N/A	2.0	2.0	* 2.1	N/A						
TUE	Meter Reading CPM											1900	TUE
	ALERT SP						N/A						
	Sample Flow		N/A			*	N/A						
WED	Meter Reading CPM											1900	WED
	ALERT SP						N/A						
	Sample Flow		N/A			*	N/A						
THU	Meter Reading CPM											1900	THU
	ALERT SP						N/A						
	Sample Flow		N/A			*	N/A						
FRI	Meter Reading CPM											1900	FRI
	ALERT SP						N/A						
	Sample Flow		N/A			*	N/A						
SAT	Meter Reading CPM											1900	SAT
	ALERT SP						N/A						
	Sample Flow		N/A			*	N/A						

APPLICABLE MODES:

Modes 1, 2, 3, 4 and 5

PROCEDURE REFERENCE:

- TDB-IV.7
- OP-ST-RM-0002
- CH-ODCM-0001

TECH. SPEC. REFERENCE:

- 2.1.4(4)
- 2.8.2(3)
- 2.15, Table 2-4, Item 3
- 2.21, Table 2-10, Item 2
- 3.1, Table 3-3, Item 3.a

ACCEPTANCE CRITERIA:

- ALERT SP per TDB-IV.7
- RM-043 Flow is >1.85 SCFM and <2.15 SCFM
- RM-050 Flow is >1.5 SCFM and <3.0 SCFM
- RM-052 and RM-062 Flow is >0.80 SCFM and <5.00 SCFM in Automatic Flow Control Mode
- RM-052 and RM-062 Flow is >1.25 SCFM and <2.75 SCFM in Manual Flow Control Mode

Monitor	Sample Pump Run Time Start	Sample Pump Run Time Stop	Stack Flow FQI-758 X10,000 CFM	Initials	Date
RM-043					
RM-043					
RM-052					
RM-052					
RM-062					
RM-062					

REMARKS: ______

* Reading transferred from AB Log, FC-143.

SHIFT DATA SHEET **[AR 12757]**

WEEK ENDING:

PROCESS RADIATION MONITORS

Previous Meter Reading: 7.1 E1

Day	INSTRUMENT	RM-053	RM-054A	RM-054B	RM-055	RM-057	RM-057 COUNTS DOUBLE?	RM-064	TIME	INITIALS	STA	SM		
SUN	Meter Reading CPM	1.3E3	9.6E1	2.20E2	1.6E2	7.1 E1	YES NO	1.9E1	1940	NS	ST	ST	1900	SUN
	ALERT SP	6.0E3	4.93E3	4.94E3	4.0E4	1.5 E2								
MON	Meter Reading CPM	1.3E3	9.7E1	4.1E2	1.6E2	1.48E2	YES NO	1.9E1	1940	NS	ST		1900	MON
	ALERT SP	6.0E3	4.93E3	4.94E3	4.0E4	1.5E2								
TUE	Meter Reading CPM						YES NO						1900	TUE
	ALERT SP													
WED	Meter Reading CPM						YES NO						1900	WED
	ALERT SP													
THU	Meter Reading CPM						YES NO						1900	THU
	ALERT SP													
FRI	Meter Reading CPM						YES NO						1900	FRI
	ALERT SP													
SAT	Meter Reading CPM						YES NO						1900	SAT
	ALERT SP													

APPLICABLE MODES:

Modes 1, 2, 3, 4 and 5

PROCEDURE REFERENCE:

- TDB-IV.7
- OP-ST-RM-0002
- CH-ODCM-0001
- Standing Order SO-G-105

TECH. SPEC. REFERENCE:

- 2.1.4(5)
- 2.21, Table 2-10, Item 3
- 3.1, Table 3-3, Item 3.a
- 3.1, Table 3-3, Item 5.a

ACCEPTANCE CRITERIA:

- ALERT SP per TDB-IV.7
- RM-057 counts have not doubled from previous day

REMARKS: If counts on RM-057 have doubled, contact Shift Chemist for primary-secondary sample and implement Standing Order SO-G-105.

SHIFT DATA SHEET **[AR 12757]**

WEEK ENDING:

AREA RADIATION MONITORS

	INSTRUMENT	RM-070	RM-071	RM-072	RM-073	RM-074	RM-075	RM-076	RM-077	TIME	INITIALS	STA	SM		
SUN	Meter Reading mrem/HR	11.1	5.6	3.6	139	20.1	13.5	0.1	0.1	1945	NS	ST	SM	1900	SUN
	Warn S.P. mrem/HR	36	25	20	3E2	50	35	10	10						
MON	Meter Reading mrem/HR	11.0	5.5	3.5	137	20.0	13.5	0.2	0.1	1945	NS	ST		1900	MON
	Warn S.P. mrem/HR	36	25	20	3E2	50	35	10	10						
TUE	Meter Reading mrem/HR													1900	TUE
	Warn S.P. mrem/HR														
WED	Meter Reading mrem/HR													1900	WED
	Warn S.P. mrem/HR														
THU	Meter Reading mrem/HR													1900	THU
	Warn S.P. mrem/HR														
FRI	Meter Reading mrem/HR													1900	FRI
	Warn S.P. mrem/HR														
SAT	Meter Reading mrem/HR													1900	SAT
	Warn S.P. mrem/HR														

APPLICABLE MODES:

Modes 1, 2, 3, 4 and 5

PROCEDURE REFERENCE:

OP-ST-RM-0001

USAR REFERENCE:

- 9.5.5

TECH. SPEC. REFERENCE:

- 3.1, Table 3-3, Item 3.a

ACCEPTANCE CRITERIA:

- Meter readings are digital displayed or are on scale and less than the Warn/Alert setpoint, or the Shift Manager has been notified
- Observed on scale meter response to Warn/Alert Setpoint Check

REMARKS: RM-073 is only required for fuel movement. N/A if not inservice.

SHIFT DATA SHEET **[AR 12757]**

WEEK ENDING:

AREA RADIATION MONITORS

	INSTRUMENT	RM-078	RM-079	RM-080	RM-081	RM-082	RM-084	RM-085	RM-086	TIME	INITIALS	STA	SM		
SUN	Meter Reading mrem/HR	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	1948	NS	ST	SM	1900	SUN
	Warn S.P. mrem/HR	10	10	10	10	10	10	10	10						
MON	Meter Reading mrem/HR	0.1	0.2	0.1	0.1	0.2	0.1	0.1	0.1	1950	NS	ST		1900	MON
	Warn S.P. mrem/HR	10	10	10	10	10	10	10	10						
TUE	Meter Reading mrem/HR													1900	TUE
	Warn S.P. mrem/HR														
WED	Meter Reading mrem/HR													1900	WED
	Warn S.P. mrem/HR														
THU	Meter Reading mrem/HR													1900	THU
	Warn S.P. mrem/HR														
FRI	Meter Reading mrem/HR													1900	FRI
	Warn S.P. mrem/HR														
SAT	Meter Reading mrem/HR													1900	SAT
	Warn S.P. mrem/HR														

APPLICABLE MODES:

Modes 1, 2, 3, 4 and 5

PROCEDURE REFERENCE:

OP-ST-RM-0001

USAR REFERENCE:

- 9.5.5

TECH. SPEC. REFERENCE:

- 3.1, Table 3-3, Item 3.a

ACCEPTANCE CRITERIA:

- Meter readings are digital displayed or are on scale and less than the Warn/Alert setpoint, or the Shift Manager has been notified
- Observed on scale meter response to Warn/Alert Setpoint Check

REMARKS: ______

SHIFT DATA SHEET

WEEK ENDING:

AREA RADIATION MONITORS

	INSTRUMENT	RM-087	RM-088	RM-089	RM-095	RM-096	RM-097	RM-098	TIME	INITIALS	STA	SM		
SUN	Meter Reading mrem/HR	0,1	0.1	0.1	17.1	0.1	0.1	0.2	1953	NS	ST	SM	1900	SUN
	Warn S.P. mrem/HR	10	10	10	100	10	10	10						
MON	Meter Reading mrem/HR	0.1	0.1	0.1	17.2	0.1	0.1	0.2	1953	NS	ST		1900	MON
	Warn S.P. mrem/HR	10	10	10	100	10	10	10						
TUE	Meter Reading mrem/HR												1900	TUE
	Warn S.P. mrem/HR													
WED	Meter Reading mrem/HR												1900	WED
	Warn S.P. mrem/HR													
THU	Meter Reading mrem/HR												1900	THU
	Warn S.P. mrem/HR													
FRI	Meter Reading mrem/HR												1900	FRI
	Warn S.P. mrem/HR													
SAT	Meter Reading mrem/HR												1900	SAT
	Warn S.P. mrem/HR													

APPLICABLE MODES:

Modes 1, 2, 3, 4 and 5

PROCEDURE REFERENCE:

OP-ST-RM-0001

USAR REFERENCE:

- 9.5.5

TECH. SPEC. REFERENCE:

- 3.1, Table 3-3, Item 3.a

ACCEPTANCE CRITERIA:

- Meter readings are digital displayed or are on scale and less than the Warn/Alert setpoints, or the Shift Manager has been notified
- Observed on scale meter response to Warn/Alert Setpoint Check

REMARKS: ____________________

SHIFT DATA SHEET

WEEK ENDING:

AREA RADIATION MONITORS

	INSTRUMENT	RM-091A	RM-091B	TIME	INITIALS	STA	SM		
SUN	Meter Reading R/Hr	0	0	1957	N/S	ST	SM	1900	SUN
	Warn S.P. R/Hr	40	40						
MON	Meter Reading R/Hr	0	0	1957	N/S	ST		1900	MON
	Warn S.P. R/Hr	40	40						
TUE	Meter Reading R/Hr							1900	TUE
	Warn S.P. R/Hr								
WED	Meter Reading R/Hr							1900	WED
	Warn S.P. R/Hr								
THU	Meter Reading R/Hr							1900	THU
	Warn S.P. R/Hr								
FRI	Meter Reading R/Hr							1900	FRI
	Warn S.P. R/Hr								
SAT	Meter Reading R/Hr							1900	SAT
	Warn S.P. R/Hr								

APPLICABLE MODES:

Modes 1, 2, 3, 4 and 5

PROCEDURE REFERENCE:

OP-ST-RM-0001

TECH. SPEC. REFERENCE:

- 2.21, Table 2-10, Item 1
- 3.1, Table 3-3, Item 3.a

ACCEPTANCE CRITERIA:

- Meter readings are digital displayed or are on scale and less than the Alert setpoints, or the Shift Manager has been notified
- Observed on scale meter response to Alert Setpoint Check

REMARKS: ______________________

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-SRO-RC-1

JPM Title: Approve Gas Decay Tank Release

Approximate Time: 15 min Actual Time: __________________

Reference(s): OI-WDG-2
Form FC-213

JPM Prepared by: Jerry Koske Date: 06/21/05

JPM Reviewed by: ________________________________ Date: ____________

JPM Approved by: ________________________________ Date: ____________

JPM No: AJPM-SRO-RC-1

JPM Title: Approve Gas Decay Tank Release

Operators' Name: ______________________ Employee # ______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments:

JPM No: AJPM-SRO-RC-1

JPM Title: Approve Gas Decay Tank Release

INITIATING CUE:

You are the Shift Manager. A release of Waste Gas Decay Tank WD-29A has been scheduled using OI-WDG-2, Attachment 1. You have been requested to authorize the release.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Review Release Package	Reviews the partially filled out portion of OI-WDG-2, Attachment One and the FC-213 Release Permit. [SAT] [UNSAT]
2	Authorize the release	Determines that the recommended flow rate on OI-WDG-2, Attachment 1 line 12 is not at least 30 SCFH below the maximum release rate (line 11) as required. [SAT] [UNSAT] Determines that the radiation monitor used in the release permit is RM-062 while the radiation monitor in operation on OI-WDG-2 is RM-052 [SAT] [UNSAT]

JPM No: AJPM-SRO-RC-1

JPM Title: Approve Gas Decay Tank Release

STEP	ELEMENT	STANDARD
		Refuses to authorize the release [SAT] [UNSAT]

Termination Criteria: **Shift Manager has made a decision on release Authorization**

JPM No: AJPM-SRO-RC-1

INITIATING CUE:

You are the Shift Manager. A release of Waste Gas Decay Tank WD-29A has been scheduled using OI-WDG-2, Attachment 1. You have been requested to authorize the release.

START

Fort Calhoun Station
Unit No. 1

OI-WDG-2

OPERATING INSTRUCTION

Title: WASTE GAS DISPOSAL SYSTEM RELEASE

FC-68 Number: EC 32269

Reason for Change: Add Attachment to manually release a Waste Gas Decay Tank with FIC-532 inoperable.

Requestor: Ricardo Garcia

Preparer: Daniel A Hochstein

WASTE GAS DISPOSAL SYSTEM RELEASE

SAFETY RELATED

ATT PURPOSE | PAGE

PRECAUTIONS

1. If a Noble Gas Stack Radiation Monitor senses a High Radiation level, VIAS will be actuated and the Gas Release will be automatically terminated.

2. All automatic functions are bypassed if FIC-532, Flow indicating Controller Temp and Press Compen, is in MANUAL.

REFERENCES/COMMITMENT DOCUMENTS

1. USAR:
   - 9.13, Sampling System
   - 11.1.3, Gaseous Wastes
2. Procedures:
   - OI-WDG-1-CL-B
   - OI-CE-1
   - OI-VA-2
3. ODCM, Fort Calhoun Station Off-Site Dose Calculation Manual.
4. TM F120.0010 Tab No. 12, Instruction Bulletin for Fisher-Porter Micro-DCI Controller
5. Commitment Documents
   - AR 02401, LIC-73-0031

REFERENCES/COMMITMENT DOCUMENTS (continued)

6. Drawings

Drawings	File	Description
11405-M-1 Sh 2	48962	Containment Heating, Cooling and Ventilating Flow Diagram
11405-M-98 Sh 2	56285	Waste Disposal System Flow Diagram
11405-M-261	10468	Flow Diagram Condenser Evacuation and Hydrogen and Carbon Dioxide Piping
D-4349	38886	Panel Arrangement and Device List AI-110
161F550 Sh 2	09432	Arrangement of Waste Disposal Board AI-100
161F550 Sh 4	09434	Panel Arrangement Device List AI-100
136B2432 Sh 23	05726	Switch Development Elementary Diagram

APPENDICES

Attachment 1 - Automatic Waste Gas Release

PREREQUISITES (✓) INITIALS

1. Procedure Revision Verification

   Revision Number 20 Date: 7/11/05 — initials: W

2. Auxiliary Building Ventilation System is in operation per OI-VA-2. — initials: W

3. Ensure one of the following Radiation Monitors is in operation monitoring the Ventilation Stack per OI-RM-1 (ODCM Section 2.2):

   - RM-062
   - RM-052 ✓ — initials: W

4. Verify one of the four following sets of CRHS/VIAS lockout relays are reset AND amber lights are on:

   a.
   - 86A/CRHS ✓
   - 86A/VIAS ✓ — initials: W

   b.
   - 86A/CRHS ___
   - CHAN "A" DERIVED SIG CUTOFF SWITCH CS-A1/SP-A IN EMERGENCY STANDBY ___
   - 86A1/CRHS ___
   - 86A1/VIAS ___ ________

   c.
   - 86B/CRHS ___
   - 86B/VIAS ___ ________

   d.
   - 86B/CRHS ___
   - CHAN "B" DERIVED SIG CUTOFF SWITCH CS-B1/SP-B IN EMERGENCY STANDBY ___
   - 86B1/CRHS ___
   - 86B1/VIAS ___ ________

Attachment 1 - Automatic Waste Gas Release

PREREQUISITES (continued) (✓) INITIALS

> **NOTE**
>
> The radiation monitor is considered inoperable during the Check Source. Remaining stationed at the monitor AND ensuring the monitor returns to normal before leaving the area administratively replaces the log entry.

5. Perform Check Source on all operational Auxiliary Building Exhaust Stack Noble Gas Radiation Monitors (RM-062 and/or RM-052).
   - RM-062
   - RM-052 ✓

6. Verify all operational Auxiliary Building Exhaust Stack Noble Gas Radiation Monitors (RM-062 and/or RM-052) Alert and High Alarm Setpoints are per TBD-IV.7.

7. Attachment 4 of OI-WDG-2 has been completed within the previous 90 days.

> **NOTE**
>
> The most recently completed Checklist, OI-WDG-1-CL-B, with deviations maintained on file, may be used for alignment verification.

8. Waste Gas Disposal System is aligned for normal operation per OI-WDG-1-CL-B.

9. Verify the following recorders are operable:
   - RR-049A, Process Radiation Monitor Recorder (AI-31E) ✓
   - FR-758, Stack Total Flowrate Recorder (AI-44) ✓
   - FR-532, Waste Gas Release Rate Recorder (AI-100) ✓

10. IF one or more of the recorders is inoperable or a manual release through the orifice is used,
    THEN take applicable readings per ODCM on FC-213, Gas Discharge Log. N/A

11. Record the maximum release flowrate specified in the Waste Decay Tank Release Permit, FC-213:

    550 SCFH

Attachment 1 - Automatic Waste Gas Release

PREREQUISITES (continued) (✓) INITIALS

NOTE

If FIC-532 is in AUTO and the Release Flow Rate exceeds the FIC-532 Set point by 30 SCFH, FIC-532 will automatically close Waste Gas Flow Control Valves FCV-532A, FCV-532B, FCV-532C, and the HIGH DEVIATION FROM SET POINT alarm will be displayed on the controller.

CAUTION

To prevent exceeding the Maximum Release Rate specified in FC-213, the FIC-532 Set point should be set at least 30 SCFH below the Maximum Release Rate.

12. Record the recommended release flowrate:

    525 SCFH ________

13. Authorization has been given to perform a Waste Gas Decay Tank Release. ________
    Shift Mgr

14. At least one of the following conditions is met:

    - Condenser Evacuation is in service per OI-CE-1 ___
    - VA-412, Condenser Evacuation Stack Discharge Isolation Valve, is closed ___ ________

15. Ensure the Δp readings from VA-82 are logged on Table 1 every three hours for the duration of the release. ________

WASTE GAS DECAY TANK RELEASE PERMIT

RELEASE NUMBER: 2000028

"A" WGDT

I. Permit Information:

Issue Date:	21-NOV-2000	Issue Time:	09:55
Sample Date:	21-NOV-2000	Sample Time:	05:32
Isolation Date:	14-OCT-2000	Days of Isolation:	38
Preparer:	JH	Pressure (psig):	84.0

II. Initial Plant Status:

Radiation Monitors/Sampler:

	Gross (cpm)	Bkgd (cpm)	Net (cpm)
RM-062	6.50E+01	5.00E+01	1.50E+01

* Particulate/Iodine Sample Collection via: RM-062

NOTE - An Aux Bldg Stack Gas Monitor MUST be in operation, or WGDT samples done in accordance with the ODCM.

* NOTE - The monitor in service for gaseous analysis of the Auxiliary Building Stack should be utilized for Particulate/Iodine Sample Collection.

WASTE GAS DECAY TANK RELEASE PERMIT

RELEASE NUMBER: 2000028

"A" WGDT

III. Gamma Analysis (uCi/cc):

WGDT Sample 1: 13500

KR-85	4.58E-01
XE-131M	1.70E-02
XE-133	9.71E-02
Total:	5.72E-01

WGDT Sample 2: 13503

KR-85	4.60E-01
XE-131M	1.69E-02
XE-133	9.70E-02
Total:	5.74E-01

Spectrum 13503 will be used for all release calculations.

IV. Projected Release Information at 550 scfh:

Nuclide	WGDT Conc. (uCi/cc)	Unrestricted Area Conc. (uCi/cc)	AEC Limit (uCi/cc)	UA Fraction	Activity (uCi)
KR-85	4.60E-01	2.27E-08	7.00E-07	3.24E-02	2.98E+07
XE-131M	1.69E-02	8.35E-10	2.00E-06	4.18E-04	1.10E+06
XE-133	9.70E-02	4.79E-09	5.00E-07	9.57E-03	6.28E+06
Totals:	5.74E-01	2.83E-08		4.24E-02	3.71E+07

Projected Dose Rate Calculations:

	Dose Rate	Limit	% Limit
Total Body (mRem/yr):	1.48E+01	<= 500	2.96
Skin (mRem/yr):	3.47E+01	<=3000	1.16
Total Organ (mRem/yr):	0.00E+00	<=1500	0.00

WASTE GAS DECAY TANK RELEASE PERMIT

RELEASE NUMBER: 2000028

"A" WGDT

V. Special Instructions:

A. Release Flowrate - Maximum: 550 scfh Recommended: 495 scfh

B. Terminate the Release if Iodine/Particulate sampling is lost and alternate sampling can not be establised.

C. Ensure Containment Release is Secured.

Remarks: ______________________________

____

____

WASTE GAS RELEASE PERMIT 2000028

VI. Projected Cumulative Dose Information

	Current Release	Year to Date	Annual Obj	Percent of Annual Obj
A. Noble Gas Air Dose				
Total Body Gamma(mRad):	1.05E-03	3.73E-01	1.00E+01	3.73%
Total Body Beta(mRad):	2.38E-02	1.36E+00	2.00E+01	6.80%
B. Iodine, Tritium, and Particulate Air Dose				
Total Body(mRem):	0.00E+00	4.85E-03	1.50E+01	0.03%
Critical Organ(mRem):	0.00E+00	1.07E+00	1.50E+01	7.14%

VII. Approvals:

Form Revision Number Agrees with Master Form Revision Number: ______________________
Qualified Chem Tech

Permit Reviewed by: ______________________ Date: __________
Shift Chemist

Release Approved: ______________________ Date: __________
Supervisor-System Chemistry

III. OPERATIONS CHECKLIST (Continued)

A. Initiate Waste Gas release I.A.W OI-WDG-2 and record initial readings in Gas Discharge Log (IF APPLICABLE).* ______/______

B. During Waste Gas Release

1. Record applicable data in Gas Discharge Log* every four (4) hours, if applicable. ______/______

2. If gas release is terminated for a period prior to completion of release, record required readings in Table I of OI-WDG-2. ______/______

C. Terminate waste gas release I.A.W. OI-WDG-2 and record final readings in Gas Discharge Log (IF APPLICABLE)* and attach the working copy of the applicable operating instruction to this permit. ______/______

* (Gas Discharge Log is applicable only if one or more of the recorders itemized in OI-WDG-2 Prerequisites are in operable, or when manual release thru the orifice is used.)

____
Shift Supervisor

GAS DISCHARGE LOG

PERMIT No.__________________ Gas Decay Tank No.________________

TIME/DATE	WASTE GAS FLOW		TOTAL STACK FLOW			AUX. BLDG NOBLE GAS MONITOR	DECAY TANK PRESSURE (psig)	SIGN OFF
	Rate	Total*	FT-758 (CFM)					
	Fr-532-SCFH or as calculated below	FIC-532-ft^3	FQI-758	FR-758	ERF F758			

NOTE: This log will be used per ODCM to record applicable readings when one or more of the recorders itemized in OI-WDG-2 Prerequisites are inoperable, or when manual release thru the orifice is used.

* Not required for manual releases.

Calculate flowrate during manual releases as follows;

$$Flow\ Rate = \frac{(400\ ft^3/WGDT)\ (\Delta P)}{(14.7\ psia)\ (\Delta t)}$$

Where: ΔP = Difference between previous and current tank pressure on psia.
Δt = Difference between previous and current time in hours.

WASTE GAS DECAY TANK RELEASE PERMIT

RELEASE NUMBER:

" " WGDT

IX. Post-Release Summary:

A. Discharged WGDT Volume:

B. WGDT Release Rates
Maximum: scfh
Average: scfh

C. Total Release Duration: minutes

Nuclide	Max UA Conc (uCi/cc)	Avg UA Conc (uCi/cc)	AEC Limit (uCi/cc)	UA Fraction	Activity Released (uCi)
Totals:					

D. Remarks: ______________________________

____

____

X. Final Summarization and Approval:

Summarized by: ______________________ Date: __________
Chemistry

Approved by: ______________________ Date: __________
Supervisor-System Chemistry

ADMINISTRATIVE JOB PERFORMANCE MEASURE

JPM No: AJPM-SRO-EP-1

JPM Title: Emergency Classification and PARs

Approximate Time: 15 minutes Actual Time: ________________

Reference(s): EPIP-OSC-1 R37
EPIP-EOF-7 R15

JPM Prepared by: Jerry Koske Date: 06/21/05

JPM Reviewed by: ____________________ Date: __________

JPM Approved by: ____________________ Date: __________

JPM No: AJPM-SRO-EP-1

JPM Title: Emergency Classification and PARs

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments:

JPM No: AJPM-SRO-EP-1

JPM Title: Emergency Classification and PARs

INITIATING CUE: **The plant was tripped following a RCS leak to containment. The RCS pressure has stabilized at 1050 psia. The pressurizer is empty. RVLMS level is 63%. All Safeguards equipment operated as designed. One RCP is operating in each loop. RCS Dose equivalent Iodine-131 is 200 uCi/g. 40°F subcooling is indicated on all CETs and RCS RTDs.**

The meteorological indications are as follows:

	A	B
• Indicated 10m wind speed (mph):	17	14
• Indicated wind direction:	330°	330°
• Indicated ΔT (°C/100m)	-1.7°	-1.4°

- **It is raining, 0.9 inches daily total**

Two hour doses from EAGLE are all less than 1 mrem.

You are directed to enter the Emergency Plan, classify the event and determine offsite Protective Action Recommendations.

Complete page 1 of form FC-1188.

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Refer to Emergency Plan	Refer to EPIP-OSC-1 [SAT] [UNSAT]
2	Classify the event	The event should be classified as a Site Area Emergency per EAL 1.13 (Failure/Challenge to two fission product barriers) on form FC-1188. [SAT] [UNSAT]

JPM No: AJPM-SRO-EP-1

JPM Title: Emergency Classification and PARs

STEP	ELEMENT	STANDARD
		Note: Attachment 6.3 indicates that the fuel cladding barrier has failed due to the high DEI (F1) and the reactor coolant system has failed due to the leakage rate (R1)
3	Determine Protective Action Recommendations	Refer to EPIP-EOF-7 and determine that there are no PARs for this situation. Document on form FC-1188 [SAT] [UNSAT]

Termination Criteria: **The event has been classified. PARS have been determined and FC-1188 has been completed.**

JPM No: AJPM-SRO-EP-1

INITIATING CUE: **The plant was tripped following a RCS leak to containment. The RCS pressure has stabilized at 1050 psia. The pressurizer is empty. RVLMS level is 63%. All Safeguards equipment operated as designed. One RCP is operating in each loop. RCS Dose equivalent Iodine-131 is 200 uCi/g. 40°F subcooling is indicated on all CETs and RCS RTDs.**

The meteorological indications are as follows:

	A	B
• Indicated 10m wind speed (mph):	17	14
• Indicated wind direction:	330°	330°
• Indicated ΔT (°C/100m)	-1.7°	-1.4°
• It is raining, 0.9 inches daily total		

Two hour doses from EAGLE are all less than 1 mrem.

You are directed to enter the Emergency Plan, classify the event and determine offsite Protective Action Recommendations.

Complete page 1 of form FC-1188.

FORT CALHOUN STATION – EMERGENCY NOTIFICATION FORM

Off-Site Contact Time:	Person Making Off-Site Report:	Contactor's Call Back #:

THE COMMAND AND CONTROL POSITION MUST:
Ensure initiation and completion of the FC-1188 form, but may obtain assistance from other personnel as needed.
Ensure that all offsite notifications are performed as required.

1. [ ] **Initial Declaration** – for **Initial** declaration of any emergency classification
   [ ] **Hourly** – When completing **Hourly** updates, one hour from time of the most recent event notification and on an hourly basis until event termination.
   [ ] **PAR Change** – **Any** change in Protective Action Recommendations (PARs) and a new classification is not being declared.
   [ ] **Termination**

Classification: [ ] NOUE [ ] Alert [ ] Site Area [ ] General	EAL #:
Time Event Declared:	Time Event Terminated:

2. Wind From Degrees (10m):	Weather Wind Speed MPH (Use Slowest 10m):	Precipitation: [ ] Yes [ ] No

Stability Class_____ (use most positive ΔT)	-[ ] A	[ ] B	[ ] C	[ ] D	[ ] E	[ ] F	[ ] G+
	≤ -1.9	>-1.9 to ≤ -1.7	>-1.7 to ≤ -1.5	>-1.5 to ≤ -0.5	>-0.5 to ≤ 1.5	>1.5 to ≤ 4.0	> 4.0

3. There	[ ] is [ ] was [ ] will be	[ ] no [ ] an airborne [ ] a liquid	release of radioactive effluent to the environment that is the result of or associated with this event

4. Protective Action Recommendations (PARs)

OPPD General Emergency Automatic PAR = Evacuate 2 mile radius Review EPIP-EOF-7 for additional guidance on PARs

	None	Evacuate Sectors	Shelter Sectors
0-2 Miles			
2-5 Miles			
5-10 Miles			

5. Prognosis [ ] Stable [ ] Unstable	Plant Status [ ] at Power [ ] Shutdown

6. Remarks

Approved:	Date:	Time:

Notify the following agencies: (refer to Emergency Phone Book for alternate phone numbers)	✓	Name of contact (optional)
State of Iowa		
State of Nebraska		
Harrison County		
Pottawattamie County		
Washington County		
Record any comments, difficulties or observations you had while making this notification		

FORT CALHOUN STATION – EMERGENCY NOTIFICATION FORM

Off-Site Contact Time:	Person Making Off-Site Report:	Contactor's Call Back #:

THE COMMAND AND CONTROL POSITION MUST:
Ensure initiation and completion of the FC-1188 form, but may obtain assistance from other personnel as needed.
Ensure that all offsite notifications are performed as required.

1. [X] **Initial Declaration** – for **Initial** declaration of any emergency classification
[ ] **Hourly** – When completing **Hourly** updates, one hour from time of the most recent event notification and on an hourly basis until event termination.
[ ] **PAR Change** – **Any** change in Protective Action Recommendations (PARs) and a new classification is not being declared.
[ ] **Termination**

Classification: [ ] NOUE [ ] Alert [X] Site Area [ ] General | EAL #: 1.13

Time Event Declared: | Time Event Terminated:

2. Wind From Degrees (10m): 330 | Weather Wind Speed MPH (Use Slowest 10m): 14 | Precipitation: [X] Yes [ ] No

Stability Class____ (use most positive ΔT)	[ ] A	[ ] B	[ ] C	[X] D	[ ] E	[ ] F	[ ] G+
	≤ -1.9	>-1.9 to ≤ -1.7	>-1.7 to ≤ -1.5	>-1.5 to ≤ -0.5	>-0.5 to ≤ 1.5	>1.5 to ≤ 4.0	> 4.0

3. There [X] is / [ ] was / [ ] will be — [X] no / [ ] an airborne / [ ] a liquid — release of radioactive effluent to the environment that is the result of or associated with this event

4. Protective Action Recommendations (PARs)

OPPD General Emergency Automatic PAR = Evacuate 2 mile radius Review EPIP-EOF-7 for additional guidance on PARs

	None	Evacuate Sectors	Shelter Sectors
0-2 Miles	X		
2-5 Miles	X		
5-10 Miles	X		

5. Prognosis [X] Stable [ ] Unstable | Plant Status [ ] at Power [X] Shutdown

6. Remarks

Approved:	Date:	Time:

JOB PERFORMANCE MEASURE

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

Location: Simulator

Approximate Time: 18 minutes Actual Time: ________________

Reference(s): OI-SI-1 , R79
NRC K/A 006000 A3.01 (RO 4.0 / SRO 3.9)

JPM Prepared by: Jerry Koske Date: 05/04/05

JPM Reviewed by: ____________________ Date: __________

JPM Approved by: ____________________ Date: __________

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: Key for HCV-2928

Safety Considerations: None

Comments: Run MFP SIS05A 5% until alarm comes in. Use Exam Load IC# 106.

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

INITIATING CUE: **You have been directed to fill only SI-6A to 72% using HPSI pump SI-2A, HCV-312 and PCV-2909. Flushing of SI tank fill and drain lines is not required. Recirculation with all leakage cooler valves closed is desired.**
All prerequisites are met.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1 (1)	Ensure SIRWT Tank Recirculation Valves are open:	
	• HCV-385	AI-30A Valve OPEN and RED light lit.
	• HCV-386	AI-30B Valve OPEN and RED light lit.
		[SAT] [UNSAT]
2 (2)	Ensure HCV-2983, SI Check valve leakage Header CVCS Isolation valve is closed	AI-30A GREEN light lit [SAT] [UNSAT]
3 (3.a.1)	Place the selected leakage cooler discharge valves in manual: • PCV-2929 • PCV-2909 • PCV-2949 • PCV-2969	AI-30A PCV-2949 CS to MANUAL AMBER light OFF PCV-2909 CS to MANUAL AMBER light OFF AI-30B PCV-2929 CS to MANUAL AMBER light OFF PCV-2969 CS to MANUAL AMBER light OFF

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
		[SAT] [UNSAT]
4 (3.a.2)	Close the leakage cooler discharge valve controller(s): • PCV-2929 • PCV-2909 • PCV-2949 • PCV-2969	<u>AI-30A</u> PCV-2949 POT to 100% output, GREEN light lit PCV-2909 POT to 100% output, GREEN light lit <u>AI-30B</u> PCV-2929 POT to 100% output, GREEN light lit PCV-2969 POT to 100% output, GREEN light lit [SAT] [UNSAT]
5 (3.b)	Start SI-2A	<u>AI-30A</u> SI-2A CS to START and RED light lit Verify amps return to normal after start [SAT] [UNSAT]
6 (3.c)	Recirculate for 15 minutes	**CUE: 15 minutes have elapsed**
7 (5.a)	Open HCV-545	<u>CB-1,2,3</u> HCV-545 CS to OPEN, RED light lit [SAT] [UNSAT]

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
8 (5.b)	Open HCV-312	<u>AI-30B</u> HCV-312 CS held to OPEN until RED light lit [SAT] [UNSAT]
9 (5.c.2)	Throttle open PCV-2909	<u>AI-30A</u> Adjust POT to throttle open [SAT] [UNSAT]
10 (6)	Open SI Tank Drain valve, HCV-2916	<u>CB-1,2,3</u> HCV-2916 CS to OPEN, RED light lit [SAT] [UNSAT]
11 (7)	Close HCV-545	<u>CB-1,2,3</u> HCV-545 CS to CLOSE, GREEN light lit [SAT] [UNSAT]
12 (10)	When SI-6A level is 72%: Close PCV-2909	Note: PCV-2909 should be closed before HCV-2916 because HCV-2916 is the last SIT drain valve open. Level should be 72% or greater but below the high level alarm. <u>AI-30A</u> PCV-2909 POT to 100% output, GREEN light lit [SAT] [UNSAT] **Note: If the SI-6A high pressure alarm comes in, CUE: Another Operator will adjust the SI Tank pressure.**

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
13 (11)	Close HCV-2916	CB-1,2,3 HCV-2916 CS to CLOSE, GREEN light lit [SAT] [UNSAT]
14 (12)	Close HCV-312	AI-30B HCV-312 CS held to CLOSE until GREEN light lit [SAT] [UNSAT]
15 (13)	Stop SI-2A	AI-30A SI-2A CS to STOP and GREEN light lit, GREEN Flag [SAT] [UNSAT]
16 (14)	Open HCV-545	CB-1,2,3 HCV-545 CS to OPEN, RED light lit [SAT] [UNSAT]
17 (15)	Lower leakage cooler pressure to less than 350 psig by cracking open PCV-2909	AI-30A Adjust POT to throttle open until pressure less than 350 psig on PIC-2909 [SAT] [UNSAT]
18 (16.a)	Throttle closed PCV-2909	AI-30A PCV-2909 POT to 100% output, GREEN light lit [SAT] [UNSAT]

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
19 (16.b)	Place PCV-2909 in AUTO	AI-30A Momentarily place PCV-2909 CS in OVERIDE and return to AUTO, AMBER light lit [SAT] [UNSAT]
20 (17)	Close HCV-545	CB-1,2,3 HCV-545 CS to CLOSE, GREEN light lit [SAT] [UNSAT]
21 (18)	Ensure the leakage cooler discharge valve controllers are in AUTO • PCV-2929 • PCV-2909 • PCV-2949 • PCV-2969	AI-30A Momentarily place PCV-2949 CS in OVERIDE and return to AUTO, AMBER light lit Verify PCV-2909 is in AUTO, AMBER light lit AI-30B Momentarily place PCV-2929 CS in OVERIDE and return to AUTO, AMBER light lit Momentarily place PCV-2969 CS in OVERIDE and return to AUTO, AMBER light lit [SAT] [UNSAT]
22 (19)	Verify Operability of all HPSI loop injection valves by confirming amber light is on: • HCV-314 • HCV-315 • HCV-311 • HCV-312	AI-30A AMBER lights on for: • HCV-317 • HCV-314 • HCV-320 • HCV-311

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
	• HCV-317 • HCV-318 • HCV-320 • HCV-321	<u>AI-30B</u> AMBER lights on for: • HCV-315 • HCV-318 • HCV-312 • HCV-321 [SAT] [UNSAT]
23 (20.b)	When both HPSI header pressures are between 250 psig and 140 psig:	**CUE: HPSI header pressures are 200 psig.** **CUE: Tech Spec logging is being performed by another operator**
	Close HCV-2928	Provide key for HCV-2928 <u>AI-128A</u> Place key in HCV-2928 CS and turn to Close position, GREEN light lit [SAT] [UNSAT]
24 (20.c)	Open HCV-2928	<u>AI-128A</u> Place HCV-2928 CS in OPEN position, RED light lit, Remove key <u>AI-30A</u> Reset and acknowledge “SI Pumps Valves Off-Normal Alarm” [SAT] [UNSAT]

JPM No: JPM-0329 (a)

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
25 (20.d)	Verify HPSI header pressures: • HPSI header #1 approximately 0 psig • HPSI Header #2 approximately 250 psig	AI-30A **CUE: PI-309 indicates 0 psig** AI-30B **CUE: PI-310 indicates 250 psig** [SAT] [UNSAT]

Termination Criteria: **SI Tank SI-6A has been filled. HPSI pumps and valves have been restored to normal.**

JPM No: JPM-0329 (a)

INITIATING CUE: **You have been directed to fill only SI-6A to 72% using HPSI pump SI-2A, HCV-312 and PCV-2909. Flushing of SI tank fill and drain lines is not required. Recirculation with all leakage cooler valves closed is desired.**
All prerequisites are met.

START

C
Continuous Use

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PREREQUISITES (✓) INITIALS

1. Procedure Revision Verification

   Revision No. ______ Date:________ ________

2. Instrument Air System is in service per OI-CA-1. ________

3. The Component Cooling Water System is in operation per OI-CC-1. ________

4. The SIRWT has been filled to normal operating level with at least Refueling Boron Concentration plus 50 ppm. ________

5. Reactor Coolant System Pressure is greater than 1600 psia. ________

6. IF WD-2B is not aligned for automatic operation,
   THEN station an Operator at AI-100 to maintain the RCDT Level as required. ________

7. Ensure one of the following:

   - HCV-507A/B, Vent Header Isolation Valves, are open (AI-100 or AI-43A/B) ___
   - An Operator is stationed at AI-100 to maintain RCDT level and pressure as required ___ ________

PROCEDURE

1. Ensure the following SIRWT Tank Recirculation Valves are open.

   - HCV-385 (AI-30B) ___
   - HCV-386 (AI-30A) ___ ________

2. Ensure HCV-2983, SI Check Vlv Lkg Hdr CVCS Isol Valve, is closed. (AI-30A) ________

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

NOTES

1. If successive fills are going to be performed:
   - Successive fill operations must not last longer than four hours
   - Recirculation is only required to be performed once for each suction header
2. Recirculation is not required if flushing is performed.
3. Recirculation may be N/A'd if filling Safety Injection Tanks to clear Technical Specification 2.3(2)f LCO.

3. IF recirculation is desired,
THEN complete the following:

   a. IF it is desired to manually close leakage cooler discharge valve(s),
   THEN complete the following:

      1) Place the selected leakage cooler discharge valve(s) in MANUAL:

         - PCV-2929, Leakage Clr SI-4B Discharge Valve ___
         - PCV-2909, Leakage Clr SI-4A Discharge Valve ___
         - PCV-2949, Leakage Clr SI-4C Discharge Valve ___
         - PCV-2969, Leakage Clr SI-4D Discharge Valve ___ _________

      2) Close the leakage cooler discharge valve controller(s):

         - PCV-2929, Leakage Clr SI-4B Disch Vlv Cntrlr ___
         - PCV-2909, Leakage Clr SI-4A Disch Vlv Cntrlr ___
         - PCV-2949, Leakage Clr SI-4C Disch Vlv Cntrlr ___
         - PCV-2969, Leakage Clr SI-4D Disch Vlv Cntrlr ___ _________

   b. Start one of the following HPSI Pumps:

      - SI-2A ___
      - SI-2B ___
      - SI-2C ___

   c. Recirculate the HPSI through the minimum flow lines for 15 minutes. ___

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

3 d. IF no other evolutions are desired,
THEN complete the following:

1) Stop the running HPSI Pump:

- SI-2A ___
- SI-2B ___
- SI-2C ___

2) Ensure the selected Leakage Cooler Discharge Valve Controller(s) in CLOSE:

- PCV-2929 ___
- PCV-2909 ___
- PCV-2949 ___
- PCV-2969 ___ ________

3) Ensure the selected Leakage Cooler Discharge Valve(s) control switch(es) in AUTO:

- PCV-2929 ___
- PCV-2909 ___
- PCV-2949 ___
- PCV-2969 ___ ________

4) Ensure the Leakage Cooler Discharge Valve Controller(s) are in AUTO by checking the amber light is on. If amber light is not on, momentarily place hand control switch in OVERRIDE position to reset the AUTO circuitry:

- PCV-2929 ___
- PCV-2909 ___
- PCV-2949 ___
- PCV-2969 ___ ________

5) GO TO Step 20. ________

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

4. IF flushing is desired,
THEN complete the following: (AI-30A/B)

> **NOTE**
>
> Opening HCV-545 prevents lifting SI-222.

a. Open HCV-545, SIRWT/Lkg Hdr to RCDT Isolation Valve. (CB-1,2,3) ________

b. Open the loop injection valve for each safety injection tank line to be used:

- HCV-314, Loop 1A HPSI Injection Valve ___
- HCV-315, Loop 1A HPSI Injection Valve ___
- HCV-311, Loop 1B HPSI Injection Valve ___
- HCV-312, Loop 1B HPSI Injection Valve ___
- HCV-317, Loop 2A HPSI Injection Valve ___
- HCV-318, Loop 2A HPSI Injection Valve ___
- HCV-320, Loop 2B HPSI Injection Valve ___
- HCV-321, Loop 2B HPSI Injection Valve ___ ________

> **NOTE**
>
> At a minimum the leakage CLR discharge valve(s) for the associated HPSI loop injection valve(s) opened in Step 4.b will be opened.

c. Open/close the desired leakage CLR discharge valve(s) as follows (AI-30A/B):

1) IF in AUTO,
THEN place the selected leakage cooler discharge valve(s) in MANUAL:

- PCV-2929, Leakage Clr SI-4B Discharge Valve ___
- PCV-2909, Leakage Clr SI-4A Discharge Valve ___
- PCV-2949, Leakage Clr SI-4C Discharge Valve ___
- PCV-2969, Leakage Clr SI-4D Discharge Valve ___ ________

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

CAUTION

Throttling of leakage cooler PCVs may be required to prevent HPSI Pump runout and limit flow to RCDT from SI-222, Safety Injection Tanks SI-6A/B/C/D Fill/Drain Line Relief Valve.

4.c 2) Throttle the selected leakage cooler discharge valve controller(s) open/closed as desired to flush the fill and drain lines:

- PCV-2929, Leakage Clr SI-4B Disch Vlv Cntrlr ___
- PCV-2909, Leakage Clr SI-4A Disch Vlv Cntrlr ___
- PCV-2949, Leakage Clr SI-4C Disch Vlv Cntrlr ___
- PCV-2969, Leakage Clr SI-4D Disch Vlv Cntrlr ___ ________

NOTE

Flush duration is determined by the Shift Manager.

d. Ensure the desired HPSI pump is running:

- SI-2A ___
- SI-2B ___
- SI-2C ___ ________

5. IF flushing is not desired,
THEN complete the following: (AI-30A/B)

NOTE

Opening HCV-545 prevents lifting SI-222.

a. IF a HPSI Pump is running,
THEN open HCV-545, SIRWT/Lkg Hdr to RCDT Isolation Valve. (CB-1,2,3) ________

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

5 b. Open one or more of the following valves:

- HCV-314, Loop 1A HPSI Injection Valve ___
- HCV-315, Loop 1A HPSI Injection Valve ___
- HCV-311, Loop 1B HPSI Injection Valve ___
- HCV-312, Loop 1B HPSI Injection Valve ___
- HCV-317, Loop 2A HPSI Injection Valve ___
- HCV-318, Loop 2A HPSI Injection Valve ___
- HCV-320, Loop 2B HPSI Injection Valve ___
- HCV-321, Loop 2B HPSI Injection Valve ___ ________

NOTE

At a minimum the leakage CLR discharge valve(s) for the associated HPSI loop injection valve(s) opened in Step 5.b will be opened.

c. Open/close the desired leakage cooler discharge valve(s) as follows:

1) IF in AUTO,
THEN place the selected leakage cooler discharge valve(s) in MANUAL:

- PCV-2929, Leakage Clr SI-4B Discharge Valve ___
- PCV-2909, Leakage Clr SI-4A Discharge Valve ___
- PCV-2949, Leakage Clr SI-4C Discharge Valve ___
- PCV-2969, Leakage Clr SI-4D Discharge Valve ___ ________

CAUTION

Throttling of the leakage cooler PCVs may be required to prevent HPSI pump runout and limit flow to RCDT from SI-222, Safety Injection Tanks SI-6A/B/C/D Fill /Drain Line Relief Valve.

2) Throttle the selected leakage cooler discharge valve controller(s) open/closed as desired:

- PCV-2929, Leakage Clr SI-4B Disch Vlv Cntrlr ___
- PCV-2909, Leakage Clr SI-4A Disch Vlv Cntrlr ___
- PCV-2949, Leakage Clr SI-4C Disch Vlv Cntrlr ___
- PCV-2969, Leakage Clr SI-4D Disch Vlv Cntrlr ___ ________

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

NOTE

More than one tank at a time may be filled through one leakage control valve.

6. Open the SI Tank Drain Valve(s) for the tank(s) to be filled: (CB-1,2,3):

- HCV-2916, SI-6A ___
- HCV-2936, SI-6B ___
- HCV-2956, SI-6C ___
- HCV-2976, SI-6D ___ ________

7. Ensure that HCV-545 is closed. ________

8. Ensure the desired HPSI pump is running:

- SI-2A ___
- SI-2B ___
- SI-2C ___ ________

CAUTION

To prevent lifting Relief Valve SI-222, the drain valve on the last SI tank to be filled must remain open until the Leakage Cooler Discharge Valve Controllers are in CLOSE per Step 10.

9. WHEN the desired level is reached in an SI Tank,
THEN close the Drain Valve for that tank:

- HCV-2916, SI-6A ___
- HCV-2936, SI-6B ___
- HCV-2956, SI-6C ___
- HCV-2976, SI-6D ___ ________

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

NOTE

The following Step may be N/Aed if plant conditions require the valve to remain in MANUAL as determined by Shift Manager.

10. WHEN the desired level is reached in the last SI Tank,
THEN place the opened Leakage Cooler Discharge Valve Controller(s) in CLOSE:

- PCV-2929 ___
- PCV-2909 ___
- PCV-2949 ___
- PCV-2969 ___ ________

11. Close the last SI tank drain valve. ________

12. Close the HPSI loop injection valve(s) opened in Step 4.b or 5.b:

- HCV-314, Loop 1A HPSI Injection Valve ___
- HCV-315, Loop 1A HPSI Injection Valve ___
- HCV-311, Loop 1B HPSI Injection Valve ___
- HCV-312, Loop 1B HPSI Injection Valve ___
- HCV-317, Loop 2A HPSI Injection Valve ___
- HCV-318, Loop 2A HPSI Injection Valve ___
- HCV-320, Loop 2B HPSI Injection Valve ___
- HCV-321, Loop 2B HPSI Injection Valve ___ ________

13. Stop the running HPSI Pump:

- SI-2A ___
- SI-2B ___
- SI-2C ___ ________

NOTE

Steps 14 thru 17 may be N/A'd if plant conditions require the valve to remain in MANUAL as determined by Shift Manager.

14. Open HCV-545, SIRWT/Lkg Hdr to RCDT Isolation Valve. ________

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

15. Lower Leakage Cooler Pressure to less than 350 psig by cracking open the selected Leakage Cooler Discharge Valve Controller:

- PCV-2929 ___
- PCV-2909 ___
- PCV-2949 ___
- PCV-2969 ___ ________

16. WHEN pressure on the selected leakage Clr Indicator is below 350 psig, THEN close the associated SI tank valves as follows (AI-30A/B):

    a. Throttled closed the selected Leakage Cooler Discharge Valve Controller(s):

    - PCV-2929 ___
    - PCV-2909 ___
    - PCV-2949 ___
    - PCV-2969 ___ ________

    b. Place the selected Leakage Cooler Discharge Valve in AUTO:

    - PCV-2929 ___
    - PCV-2909 ___
    - PCV-2949 ___
    - PCV-2969 ___ ________

17. Close HCV-545. ________

18. Ensure the Leakage Cooler Discharge Valve Controller(s) are in AUTO by checking the amber light is on. If amber light is not on, momentarily place hand control switch in OVERRIDE position to reset the AUTO circuitry:

- PCV-2929 ___
- PCV-2909 ___
- PCV-2949 ___
- PCV-2969 ___ ________

Attachment 4 - Filling SI Tank(s) Using HPSI Pumps

PROCEDURE (continued) (✓) INITIALS

19. Verify operability of all HPSI loop injection valves opened by confirming the amber light is on for each valve:

- HCV-314, Loop 1A HPSI Injection Valve ___
- HCV-315, Loop 1A HPSI Injection Valve ___
- HCV-311, Loop 1B HPSI Injection Valve ___
- HCV-312, Loop 1B HPSI Injection Valve ___
- HCV-317, Loop 2A HPSI Injection Valve ___
- HCV-318, Loop 2A HPSI Injection Valve ___
- HCV-320, Loop 2B HPSI Injection Valve ___
- HCV-321, Loop 2B HPSI Injection Valve ___ ________

20. WHEN both HPSI header pressures have dropped back to between 250 psig and 140 psig following completion of SI Tank fill,
THEN perform the following:

a. Close HCV-2928, HPSI Pump 2A Disch, observing all applicable Tech Spec LCO requirements regarding HPSI pump operability. ________

b. WHEN HCV-2928 indicates closed,
THEN open HCV-2928. ________

c. WHEN HCV-2928 has fully opened,
THEN restore SI-2A to operable status and log out of applicable Tech Spec LCOs. ________

d. Verify HPSI Header #1 pressure drops to approximately 0 psig and HPSI Header #2 rises to approximately 250 psig. ________

Completed by_______________________________________ Date/Time:_______/______

JOB PERFORMANCE MEASURE

JPM No: JPM-0718 (b)

JPM Title: Place a Containment Cooling Unit in Service

Location: Simulator

Approximate Time: 12 minutes Actual Time: ________________

Reference(s): OI-VA-1, Attachment 2 R57
NRC K/A 022000 A4.01 (RO 3.6 / SRO 3.6)

JPM Prepared by: Jerry Koske Date: 05/05/05

JPM Reviewed by: ________________ Date: ________

JPM Approved by: ________________ Date: ________

JPM No: JPM-0718 (b)

JPM Title: Place a Containment Cooling Unit in Service

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments:

JPM No: JPM-0718 (b)

JPM Title: Place a Containment Cooling Unit in Service

INITIATING CUE: **You have been directed to place VA-7C and VA-8A in service.**

All prerequisites are met.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1. (1.a.1)	Open HCV-402B/D	CB-1,2,3 Momentarily place HCV-402B/D in OPEN. Verify RED lights lit for both valves. [SAT] [UNSAT]
2 (1.a.2)	Ensure HCV-402C is closed	CB-1,2,3 Ensure controller POT in closed position (100% output), GREEN light lit [SAT] [UNSAT]
3 (1.a.3)	Place HCV-402A/C in CIRC	CB-1,2,3 Momentarily place HCV-402A/C in CIRC position and release HCV-402A RED light lit [SAT] [UNSAT]

JPM No: JPM-0718 (b)

JPM Title: Place a Containment Cooling Unit in Service

STEP	ELEMENT	STANDARD
4 (1.a.4)	Throttle open HCV-402C maintaining CCW discharge header pressure greater than or equal to 70 psig	CB-1,2,3 Adjust POT for HCV-402C toward OPEN position. ENSURE pressure on PI-499 does not go below 70 psig. [SAT] [UNSAT]
5 (1.a.5)	Monitor the following parameters: • VA-8A Flow • VA-8A Temperature • CCW Discharge Header Press • CCW Discharge Header Temp	CB-1,2,3 • FI-418 • TIC-422 • PI-499 • TIC-2800 [SAT] [UNSAT]
6 (1.b)	Start VA-7C	AI-30A VA-7C CS to AFTER-START (Red flag), RED light lit [SAT] [UNSAT]
7 (1.b)	Monitor Parameters: • VA-7C amps • VA-7C DP • VA-7C cooling coil DP • VA-7C Outlet Temp	AI-30A • VA-7C ammeter AI-44 Monitor: • PIC-702 • PI-710 • TI-719 [SAT] [UNSAT]

JPM No: JPM-0718 (b)

JPM Title: Place a Containment Cooling Unit in Service

Termination Criteria: **VA-7C is running and CCW is being supplied to VA-8A**

JPM No: JPM-0718 (b)

INITIATING CUE: **You have been directed to place VA-7C and VA-8A in service.**

All prerequisites are met.

START

C
Continuous Use

Attachment 2 - Containment Cooling Operation VA-7C & VA-7D

PREREQUISITES (√) INITIALS

1. Procedure Revision Verification:

   Revision No. ___________ Date:______________ ________

2. OI-VA-1-CL-A has been completed per OP-1. ________

3. IF Containment Cooling is desired,
   THEN CCW is in service and at least one of the following Containment Cooling Coils is operable:

   - VA-8A ___
   - VA-8B ___ ________

4. Electrical power is available to the desired fan(s):

   - VA-7C, Containment Air Cooling Fan, 1B3C-4C-3 ___
   - VA-7D, Containment Air Cooling Fan, 1B3B-4B-4 ___ ________

PROCEDURE

1. IF VA-7C, Cntmt Vent Fan, is to be started,
   THEN perform the following:

   a. IF Containment Cooling is desired,
      THEN initiate CCW to VA-8A as follows:

      1) Momentarily place HCV-402B/D, Cntmt Clg Coil VA-8A AC Vlvs Control SW to OPEN. ___

      2) Ensure HCV-402C, Cntmt Clg Coil VA-8A Outlt Isol Vlv Cntrlr is closed. ___

      3) Momentarily place HCV-402A/C, Cntmt Clg Coil VA-8A Isol Vlvs Control SW to CIRC. ___

      4) Throttle open HCV-402C maintaining PI-499, CCW Discharge Header Pressure, greater than or equal to 70 psig. ___

Attachment 2 - Containment Cooling Operation VA-7C & VA-7D

PROCEDURE (continued) (✓) INITIALS

1.a 5) Monitor the following parameters:

- FI-418, VA-8A Flow ___
- TIC-422, VA-8A Temp ___
- PI-499, CCW Discharge Header Press ___
- TIC-2800, CCW Discharge Header Temp ___ ________

CAUTION

Running a fan for extended period with the CCW isolated to the cooling coil can cause the water to heatup inside the coil and possibly lift or cause the reliefs to weep.

b. Start VA-7C and monitor the following (AI-30A):

- VA-7C amps ___
- PIC-702, Fan VA-7C Diff Press (AI-44) ___
- PI-710, Fan VA-7C Clg Coil Diff Press (AI-44) ___
- TI-719, Fan VA-7C Outlt Temp (AI-44) ___ ________

2. IF VA-7D, Cntmt Vent Fan, is to be started,
THEN perform the following:

a. IF Containment Cooling is desired,
THEN initiate CCW to VA-8B as follows:

1) Momentarily place HCV-403B/D, Cntmt Clg Coil VA-8B AC Vlvs Control SW to OPEN. ___

2) Ensure HCV-403C, Cntmt Clg Coil VA-8B OUTLT Isol Vlv Cntrlr is closed. ___

3) Momentarily place HCV-403A/C, Cntmt Clg Coil VA-8B Isol Vlvs Control SW to CIRC. ___

4) Throttle open HCV-403C maintaining PI-499, CCW Discharge Header Pressure, greater than or equal to 70 psig. ___

Attachment 2 - Containment Cooling Operation VA-7C & VA-7D

PROCEDURE (continued) (✓) INITIALS

2.a 5) Monitor the following parameters:

- FI-419, VA-8B Flow ___
- TIC-423, VA-8B Temp ___
- PI-499, CCW Discharge Header Press ___
- TIC-2800, CCW Discharge Header Temp ___ ________

CAUTION

Running a fan for extended period with the CCW isolated to the cooling coil can cause the water to heatup inside the coil and possibly lift or cause the reliefs to weep.

b. Start VA-7D and monitor the following (AI-30B):

- VA-7D amps ___
- PIC-703, Fan VA-7D Diff Press (AI-44) ___
- PI-711, Fan VA-7D Clg Coil Diff Press (AI-44) ___
- TI-721, Fan VA-7D Outlt Temp (AI-44) ___ ________

3. IF VA-7C, Cntmt Vent Fan, is to be shutdown,
THEN perform the following:

a. Stop VA-7C (AI-30A). ________

b. IF CCW Flow to the cooler is to be secured,
THEN isolate CCW to VA-8A as follows:

1) Throttle close HCV-402C, Cntmt Clg Coil VA-8A Outlt Isol Vlv Cntrlr maintaining PI-499, CCW Discharge Header Pressure, less than 125 psig. ___

2) Momentarily place HCV-402A/C, Cntmt Clg Coil VA-8A Isol Vlvs Control SW to ISOL. ___

3) Momentarily place HCV-402B/D, Cntmt Clg Coil VA-8A Vlvs Control SW to CLOSE. ___ ________

Attachment 2 - Containment Cooling Operation VA-7C & VA-7D

PROCEDURE (continued) (✓) INITIALS

4. IF VA-7D, Cntmt Vent Fan, is to be shutdown,
THEN perform the following:

a. Stop VA-7D (AI-30B). ________

b. IF CCW Flow to the cooler is to be secured,
THEN isolate CCW to VA-8B as follows:

1) Throttle close HCV-403C, Cntmt Clg Coil VA-8B Outlt Isol Vlv Cntrlr maintaining PI-499, CCW Discharge Header Pressure, less than 125 psig. ___

2) Momentarily place HCV-403A/C, Cntmt Clg Coil VA-8B Isol Vlvs Control SW to ISOL. ___

3) Momentarily place HCV-403B/D, Cntmt Clg Coil VA-8B Vlvs Control SW to CLOSE. ___ ________

Completed by ____ Date/Time ________/______

JPM No: JPM-0778 (c)

JPM Title: RPS T-Cold Calibration

Location: Simulator

Approximate Time: 10 minutes Actual Time: ________________

Reference(s): OI-RPS-2, R6
NRC K/A 012000 A1.01 (RO 2.9 / SRO 3.4)

JPM Prepared by: Jerry Koske Date: 05/05/05

JPM Reviewed by: ______________________ Date: __________

JPM Approved by: ______________________ Date: __________

JPM No: JPM-0778 (c)

JPM Title: RPS T-Cold Calibration

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: Bypass key for trip unit #9

Safety Considerations: NONE

Comments: Simulator JPM Exam Load IC# 106

JPM No: JPM-0778 (c)

JPM Title: RPS T-Cold Calibration

INITIATING CUE: **The plant is operating at 100% power. The channel "A" T-cold Cal is indicating low. The other channel T-cold values are within 0.1°F of each other.**

The Shift Manager has directed you to adjust the channel "A" T-cold Cal.

All prerequisites have been met

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		CUE: Provide a copy of OI-RPS-2
1 (1.a)	Record T-cold DVM readings on all four RPS channels	AI-31A/B/C/D Select T-Cold on selector switch and record value in procedure [SAT] [UNSAT]
2 (1.b)	Record T-cold cal DVM readings on all four RPS channels	AI-31A/B/C/D For each channel, Select T-Cold CAL on selector switch and record value in procedure [SAT] [UNSAT]
3 (1.c)	Record T-cold cal pot settings for all four channels	AI-31A/B/C/D For each channel, Record POT setting in procedure [SAT] [UNSAT]

JPM No: JPM-0778 (c)

JPM Title: RPS T-Cold Calibration

STEP	ELEMENT	STANDARD
4 (1.d)	Obtain the RPS Trip Unit #9 bypass key	**CUE: Provide key**
5. (1.e)	Log into Tech Spec 2.15(1) 48 hour LCO for channel "A"	Notify CR Operator that Tech Spec Log Entry must be made. [SAT] [UNSAT] **CUE: Log entry has been made**
6 (1.f)	Bypass RPS TM/LP Trip Unit on channel "A"	<u>AI-30A</u> Insert key in RPS channel "A" Trip Unit #9 bypass switch and place in BYPASS (clockwise) position. AMBER light lit [SAT] [UNSAT]
7 (1.g)	Adjust T-cold cal POT on RPS channel "A" until the T-cold cal reading on the DVM equals the highest RPS channel T-cold	<u>AI-30A</u> Adjust T-cold cal POT on RPS channel "A" until the T-cold cal reading on the DVM equals the highest RPS channel T-cold recorded in step 1 (1.a) [SAT] [UNSAT]
8 (1.h)	Ensure TM/LP Trip unit is reset	<u>AI-30A</u> Place RPS channel "A" Trip Unit #9 bypass switch in RESET (counterclockwise) position. AMBER light off. [SAT] [UNSAT]

JPM No: JPM-0778 (c)

JPM Title: RPS T-Cold Calibration

STEP	ELEMENT	STANDARD
9 (1.i)	Remove bypass key	<u>AI-30A</u> Remove key [SAT] [UNSAT] **Cue: Accept key**
10 (1.j)	Exit Tech Spec 2.15(1)	**Cue: Log entry has been made**
11 (1.l)	Record T-cold DVM readings on all four RPS channels	<u>AI-31A/B/C/D</u> For each channel, Select T-Cold on selector switch and record value in procedure [SAT] [UNSAT]
12 (1.m)	Record T-cold cal pot settings for all four channels	<u>AI-31A/B/C/D</u> For each channel, Record POT setting in procedure [SAT] [UNSAT]

Termination Criteria: RPS channel “A” T-cold has been calibrated and no RPS Trip Units are bypassed

JPM No: JPM-0778 (c)

INITIATING CUE: **The plant is operating at 100% power. The channel "A" T-cold Cal is indicating low. The other channel T-cold values are within 0.1°F of each other.**

The Shift Manager has directed you to adjust the channel "A" T-cold Cal.

All prerequisites have been met

START

Fort Calhoun Station
Unit No. 1

OI-RPS-2

OPERATING INSTRUCTION

Title: REACTOR PROTECTIVE SYSTEM - TM/LP $T_{COLD\ CAL}$ CALIBRATION

FC-68 Number: DCR 10481

Reason for Change: Reformat per FCSG-9.

Initiator: J. Borger/S. Lindquist

Preparer: Stan Heyden

Correction (a): Page 1 and 2 (01-25-01)

REACTOR PROTECTIVE SYSTEM - TM/LP $T_{COLD\ CAL}$ CALIBRATION

PRECAUTIONS

1. The selected RPS TM/LP Trip Unit is placed in BYPASS prior to adjusting the $T_{cold\ cal}$ Pot to prevent an inadvertent channel trip.

2. T_{cold} DVM readings while at a steady state power are normally kept within close tolerances. Hence, if while at steady state power readings differ by greater than 1.0 °F, the System Engineer should be consulted prior to adjustment to ensure operability of the affected channel.

REFERENCES/COMMITMENT DOCUMENTS

1. Technical Specifications:

   - 1.1: Safety Limits - Reactor Core
   - 1.3: Table 1-1: RPS Limiting Safety System Settings
   - 2.15: Instrumentation and Control Systems
   - 2.15: Table 2-2: Instrument Operating Requirements for Reactor Protective System
   - 3.1: Table 3-3: Item 17: Reactor Coolant Inlet Temperature
   - 3.1: Table 3-1: Minimum Frequencies for Checks, Calibrations and Testing of Miscellaneous Instrumentation and Controls
   - 3.10(7)a: DNB Parameters

2. USAR:

   - 7.2: Reactor Protective System
   - 7.5: Instrumentation Systems

3. Others:

   - OP-ST-SHIFT-0001
   - SO-G-100: Operability Dispositions When Calibrating, Testing or Operating Safety Related Equipment
   - EAR 94-130, Appropriate Acceptance Criteria or Requirements to T_{COLD} Cal

C
Continuous Use

Attachment 1 - Adjust the $T_{cold\ cal}$ POT(s)

PREREQUISITES (✓) INITIAL

1. Procedure Revision Verification

   Revision Number________________ Date:________ ________

2. Reactor is at steady state conditions. ________

3. Reactor power is greater than 15%. ________

4. Adjustment is requested by the Shift Manager OR the difference between the highest T_{cold} DVM reading and any $T_{cold\ cal}$ DVM reading for the applicable Reactor power level is as follows:

   - greater than 75% to 100% power greater than or equal to 0.2°F
   - greater than 50% to less than or equal to 75% power greater than or equal to 0.5°F
   - greater than or equal to 15% to less than or equal to 50% power greater than or equal to 1.0°F ________

5. IF T_{cold} DVM readings differ by more than 1.0°F, THEN contact the System Engineer prior to adjustment. ________

6. Shift Manager notified prior to adjustment. ________ Shift Mgr

PROCEDURE

1. Perform the following:

   a. Record T_{cold} DVM readings on all four RPS channels.

      - AI-31A _______°F ___
      - AI-31B _______°F ___
      - AI-31C _______°F ___
      - AI-31D _______°F ___ ________

Attachment 1 - Adjust the $T_{cold\ cal}$ POT(s)

PROCEDURE (continued) (✓) INITIAL

1 b. Record $T_{cold\ cal}$ DVM readings on all four RPS channels.

- AI-31A _______°F ___
- AI-31B _______°F ___
- AI-31C _______°F ___
- AI-31D _______°F ___ ________

c. Record $T_{cold\ cal}$ POT settings.

- AI-31A _______ ___
- AI-31B _______ ___
- AI-31C _______ ___
- AI-31D _______ ___ ________

d. Obtain the RPS TM/LP Trip Unit # 9 Bypass Key. ________

CAUTION

Only **ONE** channel shall be adjusted at a time.

e. Log into Technical Specification 2.15(1) 48 hour LCO for selected channel:

- AI-31A ___
- AI-31B ___
- AI-31C ___
- AI-31D ___ ________

f. Bypass TM/LP trip unit on the selected channel:

- AI-31A ___
- AI-31B ___
- AI-31C ___
- AI-31D ___ ________

g. Adjust $T_{cold\ cal}$ POT on the selected channel until the $T_{cold\ cal}$ DVM reading equals highest RPS channel T_{cold} recorded in Step a. ________

h. Ensure selected TM/LP Trip Unit #9 is RESET. ________

Attachment 1 - Adjust the $T_{cold\ cal}$ POT(s)

PROCEDURE (continued) (✓) INITIAL

1 i. Remove Bypass Key for selected TM/LP Trip Unit. ________

j. Exit Technical Specification 2.15(1) for the selected channel

- AI-31A ___
- AI-31B ___
- AI-31C ___
- AI-31D ___ ________

k. Repeat Steps e. through j. for any remaining channels out of specification. ________

l. Record $T_{cold\ cal}$ DVM readings:

- AI-31A _______°F ___
- AI-31B _______°F ___
- AI-31C _______°F ___
- AI-31D _______°F ___ ________

m. Record new $T_{cold\ cal}$ POT settings:

- AI-31A _______ ___
- AI-31B _______ ___
- AI-31C _______ ___
- AI-31D _______ ___ ________

Completed by____Date/Time__________/_________

JOB PERFORMANCE MEASURE

JPM No: JPM-0726 (d)

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

Location: Control Room

Approximate Time: 20 minutes Actual Time: ________________

Reference(s): OI-VA-3 Attachments 1 and 9 R28
K/A 000067 AA1.05 (RO 3.0 / SRO 3.1)

JPM Prepared by: Jerry Koske Date: 05/05/05

JPM Reviewed by: ______________________ Date: __________

JPM Approved by: ______________________ Date: __________

JPM No: JPM-0726 (d)

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

Operators' Name: ______________________ Employee # _______________

All Critical Steps (*) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments:

JPM No: JPM-0726 (d)

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

---

INITIATING CUE:

A smoke detector has tripped the Control Room ventilation system following a fire in the kitchen area. The fire has been extinguished and smoke has been cleared from the area. The system has been shutdown for 2 hours.

You are directed to restore the Control Room ventilation system to the normal mode of operation, with VA-46A as the running unit. START

CRITICAL STEP	ELEMENT	STANDARD
1	Obtain copy of OI-VA-3	Locates OI-VA 3 [SAT] [UNSAT] **Provide candidate with a copy of OI-VA-3**
2 (Att-9 1)	Ensure the following: • All ventilation dampers closed • Operating ventilation units tripped (VA-46A/B)	AI-106A/B GREEN lights Control switch in AUTO or STOP position GREEN light ON [SAT] [UNSAT]
3 (2)	Place Smoke Detector Override switches in override	AI-106A/B HC-VA46A-3 and HC-VA46B-3 in OVERRIDE [SAT] [UNSAT]

JPM No: JPM-0726 (d)

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

CRITICAL STEP	ELEMENT	STANDARD
4.		Acknowledge Smoke Detector Override Annunciators [SAT] [UNSAT]
	Turns to OI-VA-3, attachment 1	**CUE: All prerequisites are met**
5. (att-1 2)	Ensure VA-46A/B are in stop	AI-106A/B HC-VA46-A-2 and HC-VA-46-B-2 in STOP with GREEN lights lit [SAT] [UNSAT]
6 (3)	Verify filter fan control switch position	AI-106A/B HC-VA63A and HC-VA63B in AUTO [SAT] [UNSAT]
7 (4)	Ensure third-stage cooling VIAS Override control switch in normal	AI-106A HC-VA-46A, VA-46A 3rd stage cooling VIAS override switch in NORMAL [SAT] [UNSAT]
8 (5.a)	Start VA-46A	AI-106A HC-VA 46A-2 to START then release. RED light lit [SAT] [UNSAT]

JPM No: JPM-0726 (d)

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

CRITICAL STEP	ELEMENT	STANDARD
9 (5.b)	Verify valve alignment	All of the following are OPEN: <u>AI-106A</u> • PCV 840B (RED Light lit) • PCV-840A-1(RED Light lit) • PCV-840A-2 (RED Light lit) <u>CB-1,2,3</u> • HCV-2898A (RED Light lit) • HCV-2898B (RED Light lit) **CUE : GREEN lights are ON and RED lights are OFF for HCV-2898A and HCV-2898B. When reported, candidate is directed to restore CR cooling using available equipment.** [SAT] [UNSAT]

Note: It is acceptable for the candidate to perform step 10 out of sequence.

10	Shut Down VA-46A	<u>AI-106A</u> HC-VA 46A-2 to STOP and GREEN light lit [SAT] [UNSAT]

JPM No: JPM-0726 (d)

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

CRITICAL STEP	ELEMENT	STANDARD
11 (4)	Ensure third-stage cooling VIAS Override control switch in normal	AI-106B HC-VA-46B, VA-46B 3rd stage cooling VIAS override switch in NORMAL [SAT] [UNSAT]
12 (5.a)	Start VA-46B	AI-106B HC-VA 46B-2 to START then release. RED light lit [SAT] [UNSAT]
13 (5.b)	Verify valve alignment	All of the following are OPEN AI-106B • PCV 841B (RED Light lit) • PCV-841A-1 (RED Light lit) • PCV-841A-2 (RED Light lit) CB-1,2,3 • HCV-2899A (RED Light lit) • HCV-2899B (RED Light lit) [SAT] [UNSAT] **CUE : The ductwork is clear of smoke**
14 (att-9 4)	Place smoke detector override switches in normal	AI-106A/B HC-VA-46A-3 and HC-VA-46B-3 in NORMAL [SAT] [UNSAT]

JPM No: JPM-0726 (d)

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

---

Termination Criteria: **CR Ventilation in normal operation with VA-46B running**

JPM No: JPM-0726 (d)

INITIATING CUE:

A smoke detector has tripped the Control Room ventilation system following a fire in the kitchen area. The fire has been extinguished and smoke has been cleared from the area. The system has been shutdown for 2 hours.

You are directed to restore the Control Room ventilation system to the normal mode of operation, with VA-46A as the running unit. START

C
Continuous Use

Attachment 9 - System Restoration Following a Smoke Detector Trip

PREREQUISITES (✓) INITIALS

1. Procedure Revision Verification

   Revision Number_______________ Date:________ ________

PROCEDURE

CAUTION
Before restarting the Control Room Ventilation Unit, the source of smoke in the Ventilation System must be identified and corrected.

1. IF smoke is detected in the Control Room Ventilation Duct,
   THEN verify the following:

   - All ventilation dampers are closed (AI-106A/B) ___
   - The operating Ventilation Units VA-46A/B tripped. ___
   - The operating Filtered Air Units VA-63A/B tripped. ___ ________

2. Place the following Smoke Detector Auto Trip Override switches in OVERRIDE to override all Zone 25 and Zone 31 detector trips:

   - HC-VA-46A-3, Smoke Detector Auto Trip Override (AI-106A) ___
   - HC-VA-46B-3, Smoke Detector Auto Trip Override (AI-106B) ___ ________

3. Manually align the Control Room Ventilation System to the desired mode per Attachment 1 (NORMAL), 4 (FILT-AIR), or 5 (RECIRC). ________

4. WHEN the smoke has been flushed from the duct,
   THEN return the Smoke Detector Auto Trip Override switches to NORMAL:

   - HC-VA-46A-3, Smoke Detector Auto Trip Override (AI-106A) ___
   - HC-VA-46B-3, Smoke Detector Auto Trip Override (AI-106B) ___ ________

Completed by____Date/Time_______/______

Attachment 1 - VA-46A/46B Normal Startup

PREREQUISITES	(✓)	INITIALS
1. Procedure Revision Verification		
Revision Number_______________ Date:________		________
2. Electrical power is available to the following components as required:		
• VA-46A, Control Room Air Conditioner, MCC-3B1-FO2	___	
• VA-63A, Control Room Emergency Air Supply Fan, MCC-3B1-CO1	___	
• VA-64A, Control Room Emergency Supply Filter Heater, MCC-3B1-C2R	___	
• VA-46B, Control Room Air Cond. Unit, MCC-4A1-DO1	___	
• VA-63B, Control Room Air Supply Fan, MCC-4C2-BO1	___	
• VA-64B, Control Room Air Filter Heater, MCC-4A1-CO3	___	
• VA-49, Control Room Toilet Exhaust Fan, MPP-1C3A-1 Bkr 7 (MCC-3B1-AO2)	___	________
3. Component Cooling Water is in service per OI-CC-1.		________
4. Verify that humidification is available in the Control Room by installed or portable means.		________
5. Instrument Air is in service per OI-CA-1.		________
6. Fire Protection System is in service per OI-FP-1 Attachment 30 for VA-64A and Attachment 31 for VA-64B.		________
7. VA-46A and VA-46B air filters are in place.		________ SE
8. VA-64A and VA-64B prefilters, HEPA filters, and charcoal media are in place.		________ SE
9. Manual Dampers are lined up per IC-ST-VA-0027.		________ SE
10. Checklist OI-VA-3-CL-A complete per OP-1.		________

C
Continuous Use

Attachment 1 - VA-46A/46B Normal Startup

PROCEDURE (✓) INITIALS

NOTES

1. By placing both HC-VA-46A/B-1, Cont Rm Ventilation "A"/"B" Mode Switches, in NORMAL, the running Ventilation unit will operate on a fixed amount of fresh air makeup (1000 cfm) with system dampers positioned as follows:

   - PCV-6681A/B, Fresh Air Inlet Dampers, open
   - PCV-6680A-1/2, VA-63A Filtered Air Inlet / Outlet Dampers closed
   - PCV-6680B-1/2, VA-63B Filtered Air Inlet / Outlet Dampers closed
   - PCV-6682, Recirculating Air Damper closed

2. The NORMAL Mode of operation is automatically overridden by the following:

   - Toxic Gas actuation
   - Smoke Detector actuation
   - VIAS actuation
   - Opening of MS-291 or 292, Main Steam Safety valves
   - Manually placing HC-VA-46A/B-1, Cont Rm Ventilation "A"/"B" Mode Switch in FILT-AIR or RECIRC.

3. HCV-2898A/B and HCV-2899A/B close on VIAS, isolating the economizers.

1. IF the unit being started has been de-energized for greater than 24 hours and the unit was not pumped down or the compressor was not isolated, THEN perform the following prior to startup:

   a. Verify power has been applied for at least 24 hours:

      - VA-46A ___
      - VA-46B ___ ________ Maint

   b. Verify the Compressor Isolation Valves are open. ________ Maint

Attachment 1 - VA-46A/46B Normal Startup

PROCEDURE (continued) (✓) INITIALS

2. Verify the non-operating unit is in STOP (AI-106A/B):
   - HC-VA-46-A-2, Cont Room A/C VA-46-A ___
   - HC-VA-46-B-2, Cont Room A/C VA-46-B ___ ________

3. Verify both Filter Fan Control Switches are in the same position based on Plant conditions (AI-106A/B):
   - HC-VA-63A, VA-63A Control Switch ___
   - HC-VA-63B, VA-63B Control Switch ___ ________

4. For the desired Ventilation Air Unit ensure Third-stage Cooling VIAS Override control switch is in NORMAL (AI-106A/B):
   - HC-VA-46A, VA-46A 3rd Stage Cooling VIAS Override ___
   - HC-VA-46B, VA-46B 3rd Stage Cooling VIAS Override ___ ________

NOTE

If cooling water temperature is below the preset limit (normally 70°F), the CCW flows thru the economizer and condenser sections via a three-way plug valve.

5. If VA-46A, Control Room Air Conditioner is to be rotated on, complete the following:
   a. Place HC-VA-46A-2, Cont Room A/C VA-46A, in the START position. ___
   b. Verify the following open:
      - PCV-840B, VA-46A Inlet ___
      - PCV-840A-1, VA-46A Outlet ___
      - PCV-840A-2, VA-46A Outlet ___
      - HCV-2898A, CR Air Cond VA-46A AC Inlet Valve ___
      - HCV-2898B, CR Air Cond VA-46A AC Outlet Valve ___ ________

6. If VA-46B Control Room Air Conditioner is to be rotated on, complete the following:
   a. Place HC-VA-46B-2, Cont Room A/C VA-46B, in the START position. ___

Attachment 1 - VA-46A/46B Normal Startup

PROCEDURE (continued) (✓) INITIALS

6 b. Verify the following open:

- PCV-841B, VA-46B Inlet ___
- PCV-841A-1, VA-46B Outlet ___
- PCV-841A-2, VA-46B Outlet ___
- HCV-2899A, CR Air Cond VA-46B AC Inlet Valve ___
- HCV-2899B, CR Air Cond VA-46B AC Outlet Valve ___ ________

7. IF the remaining unit needs to be shutdown,
THEN GO TO Attachment 2. ________

Completed by____Date/Time_______/_____

JOB PERFORMANCE MEASURE

JPM No: JPM-0042 (e)

JPM Title: Transfer Clutch Power Supply

Location: Simulator

Approximate Time: 12 Minutes Actual Time: ________________

Reference(s): OI-EE-4, Attachments 7 and 1 R31
NRC K/A 062000 A2.10 (RO 3.0 / SRO 3.3)

JPM Prepared by: Jerry Koske Date: 05/05/05

JPM Reviewed by: ______________________________ Date: __________

JPM Approved by: ______________________________ Date: __________

JPM No: JPM-0042 (e)

JPM Title: Transfer Clutch Power Supply

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment:	None
Safety Considerations:	None
Comments:	Cross Tie Instrument busses A&C, Open Supply breaker for instrument bus A. Place PS1&PS3 supply to bus "B" (Use exam load IC #105)

JPM No: JPM-0042 (e)

JPM Title: Transfer Clutch Power Supply

INITIATING CUE: **The plant is in an outage. Maintenance has been completed on Instrument Bus A and will begin on instrument bus B. You have been directed to transfer Clutch Power Supply PS1 & PS3 from Instrument Bus B to Instrument Bus A.**

Inverter "A" has been bypassed by an Operator in the Switchgear Room.

All prerequisites are met. RCS Temperature is less than 300°F.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1 (1 a)	Ensure Instrument Bus A is not cross-tied to Instrument Bus C	AI-40A, AI-40C Checks position of Instrument Bus Tie Breakers and determines that the Buses are cross-tied. [SAT] [UNSAT] **CUE: If Candidates reports that the buses are cross tied, then say "The Shift Manager states that the cross-tie is no longer needed and directs you to hot bus transfer the Instrument Bus A loads connected to Instrument Bus C back to Instrument Bus A** **(Provide OI-EE-4, Attachment 1)**

JPM No: JPM-0042 (e)

JPM Title: Transfer Clutch Power Supply

STEP	ELEMENT	STANDARD
		CUE: Inverter "C" has been placed on bypass transformer. No fuel movement or core alterations are in progress. No work is being performed that requires electrical power from AI-57.
2 (Att 1-7.e.1)	Close 1-BUS-1A-1, Instrument Bus "A" Supply Breaker	AI-40A Instrument Bus "A" supply breaker to CLOSE [SAT] [UNSAT]
3 (7.e.2)	Open I-BUS-AC-2, Instrument Bus C Tie Breaker	AI-40C Instrument Bus "C" tie breaker to OPEN [SAT] [UNSAT]
4 (7.e.3)	Open I-BUS-AC-1, Instrument Bus A Tie Breaker	AI-40A Instrument Bus "A" tie breaker to OPEN [SAT] [UNSAT]
5 (Att-7 1.c)	Verify Clutch Power Supply breaker RPS/CB-CD is closed	AI-57 Breaker in ON position [SAT] [UNSAT]
6 (1.d)	Place Clutch Power Supply Transfer Switch RPS/TS-AB in the Instrument Bus A position #1	AI-57 Turn switch to position 1 (left) [SAT] [UNSAT]

JPM No: JPM-0042 (e)

JPM Title: Transfer Clutch Power Supply

STEP	ELEMENT	STANDARD
7 (1.e,f)	Verify Clutch Power Supply breaker RPS/CB-AB is closed. If in trip free position, the reset and close	AI-57 RESET and CLOSE Clutch Power Supply Breaker RPS/BC-AB [SAT] [UNSAT]
8 (1.g)	Verify all four Clutch Power Supply ammeters read upscale.	AI-3 Ammeters read upscale [SAT] [UNSAT]
9 (1.h)	Verify proper indicating lights in Clutch Power Supply Cabinet are energized.	AI-3 WHITE lights ON [SAT] [UNSAT]
10 (1.i)	Place Inverter A in normal operation per Attachment 1.	Contacts Operator in switchgear room to place Inverter “A” in normal operation. [SAT] [UNSAT] **CUE: Inverter A has been placed in normal operation**

Termination Criteria: **Clutch Power Supply PS1 & PS3 are supplied from Instrument Bus A. Instrument busses A&C are not cross-tied**

JPM No: JPM-0042 (e)

INITIATING CUE: **The plant is in an outage. Maintenance has been completed on Instrument Bus A and will begin on instrument bus B. You have been directed to transfer Clutch Power Supply PS1 & PS3 from Instrument Bus B to Instrument Bus A.**

Inverter "A" has been bypassed by an Operator in the Switchgear Room.

All prerequisites are met. RCS Temperature is less than 300°F.

START

Attachment 7 - Clutch Power Supplies

PREREQUISITES (✓) INITIALS

1. Procedure Revision Verification

   Revision No._______________ Date:________ ________

2. 125 VDC Bus 1 (EE-8F) and Bus 2 (EE-8G) are in service per OI-EE-3. ________

3. IF RCS temperature is greater than 300°F,
   THEN verify Checklist OI-EE-4-CL-A has been completed. ________

PROCEDURE

CAUTIONS

1. Only one power supply transfer switch may be transferred at a time.
2. This procedure may cause a Reactor Trip if performed incorrectly.

1. IF transferring Clutch Power Supply to 120 Volt AC Instrument Bus A,
   THEN perform the following:

   a. Ensure Instrument Bus A is not cross-tied to Instrument Bus C. ___

   b. Bypass Inverter A per Attachment 1. ___

   c. Verify Clutch Power Supply breaker RPS/CB-CD is closed. ___

   NOTE

   Breaker RPS/CB-AB may go to the trip free position when Clutch Power Supply Transfer Switch RPS/TS-AB is placed in the Bus A position due to momentary undervoltage.

   d. Place Clutch Power Supply Transfer Switch RPS/TS-AB in the Instrument Bus A position #1. ___

   e. Verify Clutch Power Supply Breaker RPS/CB-AB is closed. ___

   f. IF Breaker RPS/CB-AB is in the trip free position,
      THEN reset and close Breaker RPS/CB-AB. ___

Attachment 7 - Clutch Power Supplies

PROCEDURE (continued) (✓) INITIALS

1 g. Verify all four Clutch Power Supply ammeters read upscale. ___

h. Verify proper indicating lights in Clutch Power Supply Cabinet are energized. ___

i. Place Inverter A in normal operation per Attachment 1. ___ ________

CAUTIONS

1. Only one power supply transfer switch may be transferred at a time.
2. This procedure may cause a Reactor Trip if performed incorrectly..

2. IF transferring Clutch Power Supply to 120 Volt AC Instrument Bus B, THEN perform the following:

a. Ensure Instrument Bus B is not cross-tied to Instrument Bus D. ___

b. Bypass Inverter B per Attachment 2. ___

c. Verify Clutch Power Supply Breaker RPS/CB-CD is closed. ___

NOTE

Breaker RPS/CB-AB may go to the trip free position when Clutch Power Supply Transfer Switch RPS/TS-AB is placed in the Bus B position due to momentary undervoltage.

d. Place Clutch Power Supply Transfer Switch RPS/TS-AB in the Instrument Bus B position #2. ___

e. Verify Clutch Power Supply Breaker RPS/CB-AB is closed. ___

f. IF Breaker RPS/CB-AB is in the trip free position, THEN reset and close Breaker RPS/CB-AB. ___

g. Verify all four Clutch Power Supply ammeters read upscale. ___

Attachment 7 - Clutch Power Supplies

PROCEDURE (continued) (✓) INITIALS

2 h. Verify proper indicating lights in Clutch Power Supply Cabinet are energized. ___

i. Place Inverter B in normal operation per Attachment 2. ___ ________

CAUTIONS

1. Only one power supply transfer switch may be transferred at a time.
2. This procedure may cause a Reactor Trip if performed incorrectly..

3. IF transferring Clutch Power Supply to 120 Volt AC Instrument Bus C, THEN perform the following:

a. Ensure Instrument Bus C is not cross-tied to Instrument Bus A. ___

b. Bypass Inverter C per Attachment 3. ___

c. Verify Clutch Power Supply Breaker RPS/CB-AB is closed. ___

NOTE

Breaker RPS/CB-CD may go to the trip free position when Clutch Power Supply Transfer Switch RPS/TS-CD is placed in the Bus C position due to momentary undervoltage.

d. Place Clutch Power Supply Transfer Switch RPS/TS-CD in the Instrument Bus C position #3. ___

e. Verify Clutch Power Supply breaker RPS/CB-CD is closed. ___

f. IF Breaker RPS/CB-CD is in the trip free position, THEN reset and close Breaker RPS/CB-CD. ___

g. Verify all four Clutch Power Supply ammeters read upscale. ___

h. Verify proper indicating lights in Clutch Power Supply Cabinet are energized. ___

Attachment 7 - Clutch Power Supplies

PROCEDURE (continued) (✓) INITIALS

3 i. Place Inverter C in normal operation per Attachment 3. ___ ________

CAUTIONS

1. Only one power supply transfer switch may be transferred at a time.
2. This procedure may cause a Reactor Trip if performed incorrectly..

4. IF transferring Clutch Power Supply to 120 Volt AC Instrument Bus D, THEN perform the following:

   a. Ensure Instrument Bus D is not cross-tied to Instrument Bus B. ___

   b. Bypass Inverter D per Attachment 4. ___

   c. Verify Clutch Power Supply breaker RPS/CB-AB is closed. ___

NOTE

Breaker RPS/CB-CD may go to the trip free position when Clutch Power Supply Transfer Switch RPS/TS-CD is placed in the Bus D position due to momentary undervoltage.

   d. Place Clutch Power Supply Transfer Switch RPS/TS-CD in the Instrument Bus D position #4. ___

   e. Verify Clutch Power Supply breaker RPS/CB-CD is closed. ___

   f. IF Breaker RPS/CB-CD is in the trip free position, THEN reset and close Breaker RPS/CB-CD. ___

   g. Verify all four Clutch Power Supply ammeters read upscale. ___

   h. Verify proper indicating lights in Clutch Power Supply Cabinet are energized. ___

   i. Place Inverter D in normal operation per Attachment 4. ___ ________

Completed by____Date/Time______/______

Attachment 1 - Inverter A (EE-8H) Operation

PREREQUISITES (✓) INITIALS

1. Procedure Revision Verification

   Revision No. _______________ Date:________ ________

2. 125 VDC Bus 1 (EE-8F) is in service per OI-EE-3. ________

3. IF RCS temperature is greater than 300°F,
   THEN verify Checklist OI-EE-4-CL-A has been completed. ________

PROCEDURE

NOTES

1. Instrument bus panels AI-40A has a pair of white lights for indicating grounds. Both lights will be dimly lit when no grounds are present on the bus. If a ground occurs, one light will become brighter than the other until the ground is removed. The lights automatically reset to the normal mode (both lights dimly lit) after ground removal.

2. A hard ground will cause an inverter trouble alarm to annunciate on CB-20. However, it is possible for the white lights to indicate a ground without the trouble alarm being in. The voltage sensing alarm relay only actuates on a hard ground signal.

1. IF short-term bypass of Inverter A (EE-8H) is desired,
   THEN perform the following:

   NOTE

   Once Inverter A (EE-8H) is in reverse transfer it is inoperable because it can not forward transfer automatically back to its instrument bus.

   a. Declare Inverter A (EE-8H) inoperable per Technical Specification 2.7(2)(o).

   ____
   SM/CRS

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

NOTE

Instrument Bus voltage may be lower than normal 117.6 - 122.4 Volts AC when being fed from a bypass transformer.

1 b. Ensure MCC-3B1-E3R, EE-4N Inverter A Bypass transformer Breaker is closed. ___

c. Verify sync loss light is off. ___

d. Push the reverse transfer button. ___

e. Verify sync loss light is off. ___

f. Verify reverse transfer light is on. ___ ________

2. IF restoration from short-term bypass of Inverter A (EE-8H) is desired, THEN perform the following:

a. Verify reverse transfer light is on. ___

b. Verify EE-8H-S1, Inverter A, EE-8H Manual Transfer Switch, is in the INVERTER position. ___

c. Ensure sync loss light is off. ___

d. Push the forward transfer button. ___

e. Verify reverse transfer light is off. ___

f. Verify forward transfer light is on. ___

g. Ensure EE-8H-CB3, Inverter A EE-8H Vent Fans Breaker is closed. ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

CAUTION

Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

2 h. Verify Inverter A Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

i. Verify Inverter A Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___ ________

j. Once Inverter A is operable and has been returned to its bus (i.e. forward transferred) declare Inverter A (EE-8H) operable. ________ SM/CRS

3. IF switching Inverter A (EE-8H) from normal operation to bypass power is desired,
THEN perform the following:

NOTE

Instrument Bus voltage may be lower than normal 117.6 - 122.4 Volts AC when being fed from a bypass transformer.

a. Ensure MCC-3B1-E3R, EE-4N Inverter A Bypass Transformer Breaker is closed. ___

b. Verify sync loss light is off. ___

NOTE

Once Inverter A (EE-8H) is in reverse transfer it is inoperable because it can not forward transfer automatically back to its instrument bus.

c. Declare Inverter A (EE-8H) inoperable per Technical Specification 2.7(2)(o). ___ ________ SM/CRS

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

3 d. Push the reverse transfer button. ___

e. Verify sync loss light remains off. ___

f. Verify reverse transfer light is on. ___

g. Place EE-8H-S1, Inverter A, EE-8H Manual Transfer Switch, in BYPASS. ___

h. Verify sync loss light is on. ___

i. Open EE-8H-CB1, Inverter A, EE-8H DC Input Breaker. ___ ________

4. IF Bypass Transformer EE-4N is in operation AND Inverter A (EE-8H) startup is desired,
THEN perform the following:

a. Ensure EE-8H-CB1, Inverter A, EE-8H DC Input Breaker is open. ___

b. Ensure EE-8F-CB24, Inverter A, EE-8H Breaker on DC Bus 1 is closed. ___

c. Ensure EE-8H-S1, Inverter A, EE-8H Manual Transfer Switch, is in BYPASS. ___

d. Momentarily push the precharge button, then wait ten (10) seconds. ___

e. Close EE-8H-CB1, Inverter A, EE-8H DC Input Breaker. ___

f. Verify sync loss light is on. ___

g. Verify reverse transfer light is on. ___

h. Place EE-8H-S1, Inverter A, EE-8H Manual Transfer Switch, in the INVERTER position. ___

i. Ensure sync loss light is off. ___

j. Push the forward transfer button. ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

4 k. Verify reverse transfer light is off. ___

l. Verify forward transfer light is on. ___

m. Ensure EE-8H-CB3, Inverter A EE-8H Vent Fans Breaker is closed. ___

CAUTION

Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

n. Verify Inverter A Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

o. Verify Inverter A Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___ ________

p. Once Inverter A is operable and has been returned to its bus (i.e. forward transferred) declare Inverter A (EE-8H) operable. ________
SM/CRS

CAUTION

Step 5 isolates Instrument Bus AI-40A from Instrument Bus AI-40C if cross-tied.

5. IF EE-4N, Bypass Transformer is not available AND Inverter A (EE-8H) startup is desired,
THEN perform the following:

a. Remove all loads from 120 Volt AC Instrument Bus A (AI-40A). ___

b. Remove all loads from 120 Volt AC Instrument Bus A1 (AI-40A). ___

c. Open I-BUS-AC-2, Instrument Bus C Tie Breaker (AI-40C). ___

d. Open I-BUS-AC-1, Instrument Bus A Tie Breaker (AI-40A). ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

5 e. Ensure EE-8H-CB1, Inverter A, EE-8H DC Input Breaker is open. ___

f. Place EE-8H-S1, Inverter A, EE-8H Manual Transfer Switch, in the INVERTER position. ___

g. Momentarily push the precharge button, then wait ten (10) seconds. ___

h. Close EE-8H-CB1, Inverter A, EE-8H DC Input Breaker. ___

i. Verify reverse transfer light is on. ___

j. Push the forward transfer button. ___

k. Verify forward transfer light is on. ___

l. Ensure EE-8H-CB3, Inverter A EE-8H Vent Fans Breaker is closed. ___

CAUTION

Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

m. Verify Inverter A Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

n. Verify Inverter A Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___

o. Close I-BUS-IA-1, Instrument Bus A Supply Breaker (AI-40A). ___

p. Ensure EE-8H-CB2, Inverter A, EE-8H AC Output Breaker is closed. ___

q. Sequentially load 120 Volt AC Instrument Bus A (AI-40A). ___

r. Sequentially load 120 Volt AC Instrument Bus A1 (AI-40A). ___ ________

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

5 s. Once Inverter A is operable and has been returned to its bus (i.e. forward transferred) declare Inverter A (EE-8H) operable.

________ SM/CRS

NOTE

Upon loss of an Instrument Bus implement AOP-16, Loss of Instrument Bus Power.

6. IF hot bus transfer of Instrument Buses A and A1 feed to Instrument Bus AI-40C is desired,
THEN perform the following:

a. Ensure the following plant conditions are met:

- Reactor Coolant System temperature is less than 300°F ___
- All Fuel movement has been secured ___
- All core alterations have been secured ___
- No work is being performed that requires electrical power from AI-57 on the Control Element Drive Mechanisms (CEDM) ___

________ Shift Mgr

b. Verify that there are no hard grounds on either Instrument Bus A or Instrument Bus C.

____

c. Block the PPLS/BLOCK A relay (device #817) in the PICKED-UP position (located behind CB-3).

________ EM

________ Ind Verif

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

6 d. Transfer the load on Instrument Inverter C to the bypass source by performing the following:

NOTE

Instrument Bus voltage may be lower than normal 117.6 - 122.4 Volts AC when being fed from a bypass transformer.

1) Ensure MCC-3C1-A4R, EE-4Q Inverter C Bypass Transformer, Breaker is closed. ___

2) Verify sync loss light is off. ___

3) Push the reverse transfer button. ___

4) Verify sync loss light is off. ___

5) Verify reverse transfer light is on. ___ ________

e. Transfer the load on Instrument Inverter A to the Bypass source by performing the following:

NOTE

Instrument Bus voltage may be lower than normal 117.6 - 122.4 Volts AC when being fed from a bypass transformer.

1) Ensure MCC-3B1-E3R, EE-4N Inverter A Bypass Transformer, Breaker is closed. ___

2) Verify sync loss light is off. ___

3) Push the reverse transfer button. ___

4) Verify sync loss light is off. ___

5) Verify reverse transfer light is on. ___ ________

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

CAUTION

Maximum Inverter load is 62.5 amps. Non-essential loading may need to be reduced to prevent an overload condition following the load transfer.

6 f. Hot bus transfer loads from Instrument Bus A to Instrument Bus C by performing the following in the sequence listed:

1) Close I-BUS-AC-2, Instrument Bus C Tie Breaker (AI-40C). ___

2) Close I-BUS-AC-1, Instrument Bus A Tie Breaker (AI-40A). ___

3) Open I-BUS-IA-1, Instrument Bus A Supply Breaker (AI-40A). ___

4) Ensure Inverter C load is less than 62.5 amps. ___ ________

g. IF restoration from short-term bypass of Inverter C (EE-8K) is desired, THEN perform the following:

1) Verify reverse transfer light is on. ___

2) Verify EE-8K-S1, Inverter C, EE-8K Manual Transfer Switch, is in the INVERTER position. ___

3) Ensure sync loss light is off. ___

4) Push the forward transfer button. ___

5) Verify reverse transfer light is off. ___

6) Verify forward transfer light is on. ___

7) Ensure EE-8K-CB3, Inverter C EE-8K Vent Fans Breaker is closed. ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

CAUTION

Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

6.g 8) Verify Inverter C Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

9) Verify Inverter C Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___ ________

h. IF desired,
THEN open EE-8H-CB2, Inverter A, EE-8H AC Output Breaker. ________

i. IF desired,
THEN open EE-8H-CB1, Inverter A, EE-8H DC Input Breaker. ________

j. IF desired,
THEN open MCC-3B1-E3R, EE-4N Inverter A Bypass Transformer Breaker. ________

NOTE

Upon loss of an Instrument Bus implement AOP-16, Loss of Instrument Bus Power.

7. IF hot bus transfer of Instrument Buses A and A1 feed back to normal alignment is desired,
THEN perform the following:

a. Ensure the following plant conditions are met:

- Reactor Coolant System temperature is less than 300°F ___
- All Fuel movement has been secured ___
- All core alterations have been secured ___
- No work is being performed, that requires electrical power from AI-57, on the Control Element Drive Mechanisms (CEDM) ___ ________
Shift Mgr

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

7 b. Verify that there are no hard grounds on either Instrument Bus A or Instrument Bus C. ________

CAUTION

Maximum Inverter load is 62.5 amps. Non-essential loading may need to be reduced to prevent an overload condition following the load transfer.

c. Transfer Instrument Inverter A to the bypass source by performing the following:

NOTE

Instrument Bus voltage may be lower than normal 117.6 - 122.4 Volts AC when being fed from a bypass transformer.

1) Ensure MCC-3B1-E3R, EE-4N Inverter A Bypass Transformer Breaker, is closed. ___

2) Verify sync loss light is off. ___

3) Push the reverse transfer button. ___

4) Verify sync loss light is off. ___

5) Verify reverse transfer light is on. ___ ________

d. Transfer the load on Instrument Inverter C to the bypass source by performing the following:

NOTE

Instrument Bus voltage may be lower than normal 117.6 - 122.4 Volts AC when being fed from a bypass transformer.

1) Ensure MCC-3C1-A4R, EE-4Q Inverter C Bypass Transformer, Breaker is closed. ___

2) Verify sync loss light is off. ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

7.d 3) Push the reverse transfer button. ___

4) Verify sync loss light is off. ___

5) Verify reverse transfer light is on. ___ ________

e. Hot bus transfer the Instrument Bus A loads connected to Instrument Bus C from Instrument Bus C to Instrument Bus A by positioning the following breakers in the sequence listed:

1) Close I-BUS-IA-1, Instrument Bus A Supply Breaker (AI-40A). ___

2) Open I-BUS-AC-2, Instrument Bus C Tie Breaker (AI-40C). ___

3) Open I-BUS-AC-1, Instrument Bus A Tie Breaker (AI-40A). ___ ________

f. WHEN restoration from short-term bypass of Inverter A (EE-8H) is desired,
THEN perform the following:

1) Verify reverse transfer light is on. ___

2) Verify EE-8H-S1, Inverter A, EE-8H Manual Transfer Switch, is in the INVERTER position. ___

3) Ensure sync loss light is off. ___

4) Push the forward transfer button. ___

5) Verify reverse transfer light is off. ___

6) Verify forward transfer light is on. ___

7) Ensure EE-8H-CB3, Inverter A EE-8H Vent Fans Breaker is closed. ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

CAUTION

Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

7.f 8) Verify Inverter A Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

9) Verify Inverter A Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___ ________

g. IF restoration from short-term bypass of Inverter C (EE-8K) is desired, THEN perform the following:

1) Verify reverse transfer light is on. ___

2) Verify EE-8K-S1, Inverter C, EE-8K Manual Transfer Switch, is in the INVERTER position. ___

3) Ensure sync loss light is off. ___

4) Push the forward transfer button. ___

5) Verify reverse transfer light is off. ___

6) Verify forward transfer light is on. ___

7) Ensure EE-8K-CB3, Inverter C EE-8K Vent Fans Breaker is closed. ___

CAUTION

Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

8) Verify Inverter C Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

7.g 9) Verify Inverter C Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___ ________

h. Remove the block from the PPLS/BLOCK A relay (device #817), located behind CB-3.

____
EM

____
Ind Verif

8. IF dead bus transfer of instrument Buses A and A1 back to normal alignment is desired,
THEN perform the following:

a. Ensure no grounds are present on Instrument Bus A. ___

b. Ensure I-BUS-IA-1, Instrument Bus A Supply Breaker, is open (AI-40A). ___

c. Ensure EE-8H-CB1, Inverter A, EE-8H DC Input Breaker is open. ___

d. Ensure EE-8H-S1, Inverter A, EE-8H Manual Transfer Switch, is in BYPASS. ___

e. Ensure MCC-3B1-E3R, EE-4N Inverter A Bypass Transformer, Breaker is closed. ___

f. Remove all loads from Buses A and A1. ___

g. Close EE-8H-CB2, Inverter A, EE-8H AC Output Breaker. ___

h. Open I-BUS-AC-2, Instrument Bus C Tie Breaker (AI-40C). ___

i. Open I-BUS-AC-1, Instrument Bus A Tie Breaker (AC-40A). ___

j. Close I-BUS-IA-1, Instrument Bus A Supply Breaker (AI-40A). ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

NOTE

If desired then startup inverter A otherwise N/A all remaining steps.

8 k. Ensure EE-8F-CB24, EE-8H Inverter A, Breaker on DC Bus No. 1 is closed. ___

NOTE

The following steps will place Inverter A in service.

l. Momentarily push the precharge button on Inverter A, then wait ten (10) seconds. ___

m. Close EE-8H-CB1, Inverter A, EE-8H DC Input Breaker. ___

n. Verify sync loss light is on. ___

o. Verify reverse transfer light is on. ___

p. Place EE-8H-S1, Inverter A, EE-8H Manual Transfer Switch, in the INVERTER position. ___

q. Ensure sync loss light is off. ___

r. Push the forward transfer button. ___

s. Verify reverse transfer light is off. ___

t. Verify forward transfer light is on. ___

u. Ensure EE-8H-CB3, Inverter A EE-8H Vent Fans Breaker, is closed. ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

CAUTION
Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

8 v. Verify Inverter A Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

w. Verify Inverter A Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___ ________

x. Once Inverter A is operable and has been returned to its bus (i.e. forward transferred) declare Inverter A (EE-8H) operable. ________ SM/CRS

9. IF Inverter A (EE-8H) is in service AND removal from operation of Bypass transformer is desired,
THEN perform the following:

a. IF Clutch Power Supply is being fed from Instrument Bus A,
THEN transfer Clutch power per OI-EE-4, Attachment 7. ___

b. Ensure sync loss light is off. ___

c. Verify reverse transfer light is off. ___

d. Verify forward transfer light is on. ___

e. Inform the Control Room that **INVERTER A TROUBLE** (CB-20, A15, A-6) will alarm when MCC-3B1-E3R, EE-4N Inverter A Bypass Transformer breaker is opened. ___

f. Open breaker MCC-3B1-E3R. ___

g. Verify Sync loss light is on. ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

CAUTION

Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

9 h. Verify Inverter A Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

i. Verify Inverter A Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___

10. IF Inverter A (EE-8H) is in service AND return to service of Bypass transformer EE-4N is desired,
THEN perform the following:

a. Ensure the following:

1) Inverter A is in operation. ___

2) MCC-3B1-E3R, EE-4N Inverter A Bypass Transformer breaker is open. ___

3) Inverter A sync loss light is on. ___

b. Inform the Control Room **INVERTER A TROUBLE** (CB-20, A15, A-6) alarm will clear when breaker MCC-3B1-E3R, breaker is closed. ___

c. Close breaker MCC-3B1-E3R. ___

d. Verify the sync loss light is off at the Inverter. ___

e. Verify with Control Room that **INVERTER A TROUBLE** (CB-20, A15, A-6) alarm is clear. ___

f. Verify reverse transfer light is off. ___

g. Verify forward transfer light is on. ___

Attachment 1 - Inverter A (EE-8H) Operation

PROCEDURE (continued) (✓) INITIALS

CAUTION

Adjustments to inverter output frequency or output voltage shall only be made by Electrical Maintenance. Guidance from EM-PM-EX-0800 may be referenced as necessary.

10 h. Verify Inverter A Output Frequency is between 59.4 and 60.6 Hz (normal 60.0 Hz). ___

i. Verify Inverter A Output Voltage is between 117.6 and 122.4 Volts AC (normal 120.0 Volts AC). ___ ________

Completed by_________________________________Date/Time__________/________

JPM No: JPM-0613A (f)

JPM Title: Shutdown a Reactor Coolant Pump

Location: Simulator Control Room

Approximate Time: 8 minutes Actual Time: ________________

Reference(s): OI-RC-9, Attachment 2 (R59)
K/A 003000 A4.06 (RO 2.9 / SRO2.9)

JPM Prepared by: Jerry Koske Date: 05/05/05

JPM Reviewed by: ____________________ Date: ________

JPM Approved by: ____________________ Date: ________

JPM No: JPM-0613A (f)

JPM Title: Shutdown a Reactor Coolant Pump

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment:	Zero Power Mode Bypass Keys
Safety Considerations:	None
Comments:	Fail RC-3D's 90% speed switch COP JOB3171L As is
	This is an Alternate Path JPM Exam Load IC# 107

JPM No: JPM-0613A (f)

JPM Title: Shutdown a Reactor Coolant Pump

INITIATING CUE: **The reactor is in Hot Shutdown and is being cooled down to go into refueling. The RCS T-cold is 505°F and lowering approximately 30°F per hour.**

You, the LO, are directed to shutdown Reactor Coolant Pump RC-3D. You <u>are</u> to verify that the prerequisites are met. The procedure revision has been verified.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1 (prereq 2)	Ensure the reactor is shutdown prior to stopping a RCP.	<u>CB-4</u> Verify all trippable rods are inserted [SAT] [UNSAT]
2 (prereq 3)	Ensure Zero Power Mode Bypass switches are in Bypass	<u>AI-31 A/B/C/D</u> Keys installed and AMBER lights lit [SAT] [UNSAT]
3 (1)	Stop Reactor Coolant Pump RC-3D	<u>CB-1,2,3</u> RC-3D CS to AFTER-STOP position and release GREEN light lit [SAT] [UNSAT]

JPM No: JPM-0613A (f)

JPM Title: Shutdown a Reactor Coolant Pump

STEP	ELEMENT	STANDARD
4 (2)	Ensure the Oil Lift Pump starts automatically as pump speed lowers.	CB-1,2,3 Determines pump did not start. Manually starts lift oil pump within 25 seconds by placing Oil Lift Pump CS, RC-3D-1, in START position and verifying RED light on. [SAT] [UNSAT]
5 (2)	Holds Oil Lift Pump control switch in the START position	If the control switch is released, the lift pump will stop. It should then be returned to the START position. Control switch may only be released and restarted once. The control switch should be held in the START position until the zero speed light comes on. (approximately 2 minutes) [SAT] [UNSAT]
6 (3)	Ensure Reverse Rotation Annunciator is clear.	CB-1,2,3, A6 D-5 Annunciator is OFF [SAT] [UNSAT]
7 (5)	Confirm Zero Speed light is on	CB-1,2,3 RC-3D GREEN light on [SAT] [UNSAT]

JPM No: JPM-0613A (f)

JPM Title: Shutdown a Reactor Coolant Pump

STEP	ELEMENT	STANDARD
8 (4)	Confirm RCP tachometer indicates zero	**CUE: Local Operator reports RC-3D speed is zero rpm.**
9 (6)	Stop oil lift pump.	<u>CB-1,2,3</u> Control switch to AFTER-STOP GREEN light lit [SAT] [UNSAT]

Termination Criteria: **Reactor Coolant Pump RC-3D is secured and its Oil Lift pump has been stopped**

JPM No: JPM-0613A (f)

INITIATING CUE: **The reactor is in Hot Shutdown and is being cooled down to go into refueling. The RCS T-cold is 505°F and lowering approximately 30°F per hour.**

You, the LO, are directed to shutdown Reactor Coolant Pump RC-3D. You are to verify that the prerequisites are met. The procedure revision has been verified.

START

Attachment 2 - Shutdown Reactor Coolant Pumps (Coupled)

PREREQUISITES (✓) INITIALS

1. Procedure Revision Verification

   Revision No.________ Date:________ ________

2. The Reactor is Shutdown (Mode 3, Mode 4 or Mode 5). ________

3. The Zero Power Mode Bypass Switches on AI-31A/B/C/D are in bypass to disable the RPS Low Flow Trip before the first RCP is stopped. ________

PROCEDURE

NOTES

1. The order for stopping the RCPs is at the discretion of the Shift Manager.

2. When an RCP is shutdown its seal Bleedoff temperature will rise.

1. Secure the selected RCP by placing its Control Switch to AFTER STOP:

   - RC-3A, RC Pump ___
   - RC-3B, RC Pump ___
   - RC-3C, RC Pump ___
   - RC-3D, RC Pump ___ ________

NOTES

1. Oil Lift Pumps start at less than 90% of full speed.

2. If RCP Lift Pump fails to start , it will be necessary to hold the RCP Oil Lift Control Switch in START until the RCP is verified stopped.

2. Ensure Oil Lift Pump starts (Red indicating light is ON):

   - RC-3A-1, Oil Lift Pump ___
   - RC-3B-1, Oil Lift Pump ___
   - RC-3C-1, Oil Lift Pump ___
   - RC-3D-1, Oil Lift Pump ___ ________

Attachment 2 - Shutdown Reactor Coolant Pumps (Coupled)

PROCEDURE (continued) (✓) INITIALS

3. For the selected RCP verify the following Annunciator is clear:

- RC-3A **REACTOR COOLANT PUMP RC-3A REVERSE ROTATION** (CB-1/2/3, A6, A5) ___
- RC-3B **REACTOR COOLANT PUMP RC-3B REVERSE ROTATION** (CB-1/2/3, A6, B5) ___
- RC-3C **REACTOR COOLANT PUMP RC-3C REVERSE ROTATION** (CB-1/2/3, A6, C5) ___
- RC-3D **REACTOR COOLANT PUMP RC-3D REVERSE ROTATION** (CB-1/2/3, A6, D5) ___ ________

4. Confirm that the RCP tachometer (AI-270, Room 57) indicates zero:

- RC-3A 129-1 ZS Tach ___
- RC-3B 149-1 ZS Tach ___
- RC-3C 169-1 ZS Tach ___
- RC-3D 189-1 ZS Tach ___ ________

5. Confirm that the Zero Speed Light is ON:

- Pump RC-3A Zero Speed ___
- Pump RC-3B Zero Speed ___
- Pump RC-3C Zero Speed ___
- Pump RC-3D Zero Speed ___ ________

6. WHEN selected RCP has been verified stopped,
THEN place the Oil Lift Pump for the selected RCP to AFTER STOP:

- RC-3A-1 ___
- RC-3B-1 ___
- RC-3C-1 ___
- RC-3D-1 ___ ________

7. IF other RCPs are to be stopped,
THEN repeat Steps 1 through 6 for each RCP to be stopped. ________

Completed by______________________________Date/Time_______/_______

JOB PERFORMANCE MEASURE

JPM No: JPM-R (g)

JPM Title: AFW Operability Verification From AI-179

Location: Simulator ASD panels

Approximate Time: 20 minutes Actual Time: ____________________

Reference(s): OP-ST-AFW-0006

JPM Prepared by: Jerry Koske Date: 06/21/2005

JPM Reviewed by: ______________________________ Date: __________

JPM Approved by: ______________________________ Date: __________

JPM No: JPM-R (g)

JPM Title: AFW Operability Verification From AI-179

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment:

Safety Considerations:

Comments:

JPM No: JPM-R (g)

JPM Title: AFW Operability Verification From AI-179

INITIATING CUE:

The Plant is mode 5. OP-ST-AFW-0006 is to be conducted. You have been directed to perform the AI-179 portions of OP-ST-AFW-0006. (steps 3.3 – 3.13 and steps 3.29 through 3.45)

All prerequisites are met. The test has been completed through step 3.2.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1 (3.3)	Place Transfer switches in the LOCAL position. • 43/RC-2A • 43/RC-2B	Both Switches placed in LOCAL [SAT] [UNSAT]
2 (3.4)	Verify: AUX FW System Local Control in Alarm	Contact control room for alarm status: CUE: Control room reports AUX FW SYSTEM LOCAL CONTROL alarm is in..
	• 43X/RC-2A transfers • 43X/RC-2B transfers • HCV-1107A open • HCV-1107B open • HCV-1108A open • HCV-1108B open • FCV-1368 open • FCV-1369 open	• Relay trips • Relay trips • Red light ON • Red light ON • Red light ON • Red light ON • Red light ON • Red light ON
	• YCV-1045	Note: Procedure does not give position for YCV-1045. If

JPM No: JPM-R (g)

JPM Title: AFW Operability Verification From AI-179

STEP	ELEMENT	STANDARD
	• YCV-1045A open • YCV-1045B open	questioned, direct candidate to record position and proceed. • Red light ON • Red light ON [SAT] [UNSAT]
3 (3.5)	Close HCV-1107A	Control switch to close. Green light ON [SAT] [UNSAT]
4 (3.6)	Close HCV-1107B	Place control switch to THROTTLE. Turn air loader until valve closes. [SAT] [UNSAT]
5 (3.7)	Close HCV-1108A	Control switch to close. Green light ON [SAT] [UNSAT]
6 (3.8)	Close HCV-1108B	Place control switch to THROTTLE. Turn air loader until valve closes. [SAT] [UNSAT]
7 (3.9)	Close FCV-1368	Control switch to CLOSE Green light ON
8 (3.10)	Close FCV-1369	Control switch to CLOSE Green light ON [SAT] [UNSAT]

JPM No: JPM-R (g)

JPM Title: AFW Operability Verification From AI-179

STEP	ELEMENT	STANDARD
9 (3.11)	Close YCV-1045	Control switch to STOP Green light ON [SAT] [UNSAT]
10 (3.12)	Close YCV-1045B	Control switch to CLOSE Green light ON [SAT] [UNSAT]
11 (3.13)	Close YCV-1045A	Control switch to CLOSE Green light ON [SAT] [UNSAT]
		CUE: Control Room has completed steps 3.14 through 3.28.
12 (3.29)	Open YCV-1045A	Control switch to OPEN and release to NORMAL. Red light ON [SAT] [UNSAT]
13 (3.30)	Open YCV-1045B	Control switch to OPEN and release to NORMAL. Red light ON [SAT] [UNSAT]
		CUE: steps 3.31 and 3.32 have been completed
14 (3.33)	Open HCV-1107A	Control switch to OPEN Red light ON [SAT] [UNSAT]

JPM No: JPM-R (g)

JPM Title: AFW Operability Verification From AI-179

STEP	ELEMENT	STANDARD
15 (3.34, 3.35)	Open HCV-1107B	Turn air loader to open Control switch to OPEN Red light ON [SAT] [UNSAT]
16 (3.36)	Open FCV-1368	Control switch to OPEN Red light ON [SAT] [UNSAT]
17 (3.37, 3.38)	Open HCV-1108B	Turn air loader to open Control switch to OPEN Red light ON [SAT] [UNSAT]
18 (3.39)	Open HCV-1108A	Control switch to OPEN Red light ON [SAT] [UNSAT]
19 (3.40)	Open FCV-1369	Control switch to OPEN Red light ON [SAT] [UNSAT]
20 (3.41)	Place transfer switch 43/RC-2A in REMOTE	Transfer switch in REMOTE position. [SAT] [UNSAT]
21 (3.42)	Reset Aux Relay 43X/RC-2A	Turn relay to RESET [SAT] [UNSAT]

JPM No: JPM-R (g)

JPM Title: AFW Operability Verification From AI-179

STEP	ELEMENT	STANDARD
22 (3.43)	Place transfer switch 43/RC-2B in REMOTE	Transfer switch in REMOTE position. [SAT] [UNSAT]
23 (3.44)	Reset Aux Relay 43X/RC-2B	Turn relay to RESET [SAT] [UNSAT]
		CUE: Control room reports AUX FW SYSTEM LOCAL CONTROL alarm has cleared.

Termination Criteria: OP-ST-AFW-0006 has been completed through step 3.45

JPM No: JPM –R (g)

INITIATING CUE:

The Plant is mode 5. OP-ST-AFW-0006 is to be conducted. You have been directed to perform the AI-179 portions of OP-ST-AFW-0006. (steps 3.3 – 3.13 and steps 3.29 through 3.45)

All prerequisites are met. The test has been completed through step 3.2.

START

Fort Calhoun Station
Unit No. 1

OP-ST-AFW-0006

SURVEILLANCE TEST

Title: AFW OPERABILITY VERIFICATION FROM AI-179

FC-68 Number:	EC 33898
Reason for Change:	Add tag number and label for FW-64-RL & FW-64. Delete ST Signature Sheet. Correct label for HC-1045-1.
Requestor:	N/A
Preparer:	Daniel A Hochstein
Correction (a):	Page 10 (05-19-05)

AFW OPERABILITY VERIFICATION FROM AI-179

SAFETY RELATED

1. PURPOSE

1.1 The purpose of this test is to verify operability of the Auxiliary Feedwater valve control circuits from Emergency Auxiliary Feedwater Panel AI-179. This test also provides a negative logic test to verify that equipment operation from the Control Room is not possible when control from AI-179 is selected, and vice versa.

1.2 Performance of this procedure at Mode 5 on a refueling outage basis fully satisfies the requirements of Technical Specification 3.1, Table 3-3A, Item 11.

2. REFERENCES/COMMITMENT DOCUMENTS

2.1 Technical Specifications:

- Section 2.15(5) and (6)
- Section 3.1, Table 3-3a, Item 11

2.2

Drawings	File	Description
11405-M-252	10458	Steam Flow Diagram
11405-M-253	10459	Steam Generator Feedwater and Blowdown
11405-M-254	10460	Flow Diagram, Condensate
11405-EM-1039	15770	FW-10 Speed Control Loop
161F568, Sh 1	09642	AI-179 Arrangement Drawing
GE 161F593	097897	AI-179 Connection Diagram
11405-E-45	12280	YCV 1045A/B Control Circuits
136B2432, Sh 5	05707	43/FW Switch Development
136B2432, Sh 40	05743	HC-1045-1 Switch Development
136B2736, Sh 2	06172	Control Circuit Power Arrangement
136B2736, Sh 15	22125	43X/RC2B Switch Development
136S2432, Sh 44A	20454	43/RC2B Switch Development
11405-E-137	21423	YCV-1045 Schematic Diagram

3. DEFINITIONS

None

4. EQUIPMENT LIST

None

5. PRECAUTIONS AND LIMITATIONS

5.1 This test shall be conducted in Plant Operating Mode 5. When transferring control from Panel AI-179, the AFW containment isolation valves will open. Ensure that no containment isolation requirements will be violated.

5.2 All anomalies and deficiencies shall be reported immediately to the immediate Supervisor and to the Shift Manager and noted on the Comment Sheet. An immediate check shall be made to verify Limiting Conditions for Operation, per Technical Specifications, have not been exceeded.

5.3 The System Engineer shall be notified within 24 hours of the completion of this test of any marginal, unexpected, or unacceptable results.

5.4 The following may alarm during this Surveillance Test.

- **FW-10 TURBINE DRIVEN FEEDWATER PUMP TROUBLE** (AI-66B, A66B,18)
- **AUX FW PUMPS RECIRC VALVES FCV-1368/1369 SWITCH IN CLOSE POSITION** (CB10/11, A9, C-1L)
- **AUX FW SYSTEM LOCAL CONTROL** (CB10/11, A9, C1U)

6. PREREQUISITES INITIALS/DATE

6.1 Procedure Revision Verification

Revision No.___________ _______/_____

6.2 A RWP has been issued, if required.

RWP No.______________ _______/_____

6.3 Plant operating condition is Mode 5. _______/_____

6.4 No other test is in progress which could potentially affect this test, or if this test were performed, could have an effect on that test. _______/_____

6.5 A prejob briefing has been conducted prior to the start of this test. _______/_____

6.6 Shift Manager authorizes performance of this test to ensure that no containment isolation requirements will be violated by the performance of this test (Reference Step 5.1).

Shift Manager ____________________________________ Date/Time _______/_____

7. PROCEDURE

NOTE: Step 7.1 can be performed at anytime and repeated as necessary.

7.1 IF this Surveillance Test is turned over, a prejob briefing must be conducted prior to the continuation of this test. _______/_____

7.2 Perform the following attachment.

ATTACHMENTS PAGE

 ______/______

Completed by____Date/Time______/_____

8. RESTORATION

8.1 Shift Manager has been notified this test has been completed.

Shift Manager ____________________________________ Date/Time _______/_____

9. ACCEPTANCE CRITERIA

9.1 All controls and indications operate as described in Section 7.0.

10. TEST RECORD

10.1 This entire procedure.

11. REVIEW

11.1 Test data shall be evaluated by the STA and reviewed by the Shift Manager for acceptability within 24 hours of the completion of this test.

Evaluated by______________________________________Date/Time________/_____
STA

Reviewed by ______________________________________Date/Time________/_____
Shift Manager

11.2 The ISI Coordinator is responsible for reviewing this test to ensure compliance with the FCS ISI Program Plan and to analyze the trending information. This test, including trending, has been reviewed and found acceptable or the deficiencies have been noted on the Comment Sheet.

ISI Coordinator__________________________________Date/Time________/_____

11.3 The System Engineer is responsible for reviewing this test data, trending, and identified deficiencies noted within the test. This test has been reviewed and found acceptable or deficiencies and actions taken have been noted on the Comment Sheet.

System Engineer________________________________Date/Time________/_____

Attachment 1 - AFW Operability Verification from AI-179

PROCEDURE — INITIALS

1. Record As Found position of the following Valves (AI-66A and AI-66B):

   - HCV-1107A, Aux FW to S/G RC-2A Isolation Valve Inbd ________
   - HCV-1107B, Aux FW to S/G RC-2A Isolation Valve Outbd ________
   - HCV-1108A, Aux FW to S/G RC-2B Isolation Valve Inbd ________
   - HCV-1108B, Aux FW to S/G RC-2B Isolation Valve Outbd ________
   - YCV-1045, Stm to Pump FW-10 Control Valve ________
   - YCV-1045B, S/G RC-2B STM to FW-10 Hdr B Isolation Valve ________
   - YCV-1045A, S/G RC-2A STM to FW-10 Hdr A Isolation Valve ________
   - FCV-1368, Aux FW Pump FW-6 Recirculation Valve ________
   - FCV-1369, Aux FW Pump FW-10 Recirculation Valve ________ ________

2. Verify no control is possible from AI-179 when the 43/RC-2A and 43/RC-2B transfer switches are in REMOTE control by completing the following.

   2.1 Verify operable and position valves as follows (AI-66A and AI-66B):

	Operable	Position	(√)	
• HCV-1107A	________	CLOSED	___	
• HCV-1107B	________	CLOSED	___	
• HCV-1108A	________	CLOSED	___	
• HCV-1108B	________	CLOSED	___	
• YCV-1045	________	CLOSED	___	
• YCV-1045B	________	CLOSED	___	
• YCV-1045A	________	CLOSED	___	
• FCV-1368	________	OPEN	___	
• FCV-1369	________	OPEN	___	________

   2.2 To prevent LO-39, FW-10 Aux Oil Pump, from starting place HC/LO-39, Aux Lube Oil Pump LO-39 Override Switch, in TEST. (FW-10, LO-39-MS) ________

   2.3 Verify **FW-10 TURBINE DRIVEN FEEDWATER PUMP TROUBLE** (AI-66B, A66B,18) is in alarm. ________

Attachment 1 - AFW Operability Verification from AI-179

PROCEDURE (continued) INITIALS

NOTE: The following switches are located at AI-179 unless otherwise noted.

2.4 Verify the following:

	(√)	
• 43/RC-2A, AFW Controls Transfer Switch, is in REMOTE position	___	
• 43X/RC-2A, AFW Controls Transfer Relay, is in RESET position	___	
• 43/RC-2B, AFW Controls Transfer Switch, is in REMOTE position	___	
• 43X/RC-2B, AFW Controls Transfer Relay, is in RESET position	___	________

2.5 Place the switches for the following valves in OPEN position and verify valves remain closed:

• HCV-1107A, Aux FW to S/G RC-2A Isolation Valve Inbd	___	
• HCV-1108A, Aux FW to S/G RC-2B Isolation Valve Inbd	___	
• YCV-1045A, S/G RC-2A STM to FW-10 Hdr A Isolation Valve	___	
• YCV-1045B, S/G RC-2B STM to FW-10 Hdr B Isolation Valve	___	________

2.6 Place the following switches in THROTTLE:

• HCV-1107B, Aux FW to S/G RC-2A Isol Vlv Controller	___	
• HCV-1108B, Aux FW to S/G RC-2B Isol Vlv Controller	___	________

2.7 Verify the following valves do not respond to signals from air loaders on AI-179:

• HIC-1107B, Aux FW to S/G RC-2A Isolation Valve Outbd	___	
• HIC-1108B, Aux FW to S/G RC-2B Isolation Valve Outbd	___	________

2.8 Place the following switches in OPEN position:

• HIC-1107B	___	
• HCV-1107B	___	
• HIC-1108B	___	
• HCV-1108B	___	________

2.9 Place the switches for the following valves to CLOSE and verify valves remain open and verify switches return to NORMAL position.

• FCV-1368, Aux FW Pump FW-6 Recirculation Valve	___	
• FCV-1369, Aux FW Pump FW-10 Recirculation Valve	___	________

Attachment 1 - AFW Operability Verification from AI-179

PROCEDURE (continued)	INITIALS

2.10 Place Control Switch for YCV-1045, Stm to Pump FW-10 Control Valve, to the After Start (red flag) position and verify the following valves remain closed:

(√)

- YCV-1045. ___
- YCV-1045A ___
- YCV-1045B ___ ________

3. Test controls associated with Transfer Switch 43/RC-2A and 43/RC-2B by completing the following.

3.1 Close the following valves using Switches on AI-66A and AI-66B.

- FCV-1368 (AI-66A) ___
- FCV-1369 (AI-66B) ___ ________

3.2 Verify **AUX FW PUMPS RECIRC VALVES FCV-1368/1369 SWITCH IN CLOSE POSITION** (CB10/11, A9, C-1L) in alarm. ________

NOTE: Steps 3.3 through 3.13 are performed from AI-179, unless otherwise noted.

CAUTION

Performance of the next step will cause HCV-1107A, HCV-1107B, HCV-1108A, HCV-1108B, YCV-1045, YCV-1045A, YCV-1045B, FCV-1368, and FCV-1369 to open.

3.3 Place the following Transfer Switches in the LOCAL position.

- 43/RC-2A ___
- 43/RC-2B ___ ________

Attachment 1 - AFW Operability Verification from AI-179

PROCEDURE (continued) INITIALS

3.4 Verify the following:

(√)

- **AUX FW SYSTEM LOCAL CONTROL** (CB10/11, A9, C1U) in alarm ___
- 43X/RC-2A transfers ___
- 43X/RC-2B transfers ___
- HCV-1107A open ___
- HCV-1107B open ___
- HCV-1108A open ___
- HCV-1108B open ___
- FCV-1368 open ___
- FCV-1369 open ___
- YCV-1045 ___
- YCV-1045A open ___
- YCV-1045B open ___ ________

3.5 Place HCV-1107A Control Switch to CLOSE and verify valve closes. ________

3.6 Place HCV-1107B Control Switch to THROTTLE and close valve with Air Loader HIC-1107B. ________

3.7 Place HCV-1108A Control Switch to CLOSE and verify valve closes. ________

3.8 Place HCV-1108B Control Switch to THROTTLE and close valve with Air Loader HIC-1108B. ________

3.9 Place FCV-1368 Control Switch to CLOSE and verify valve closes. ________

3.10 Place FCV-1369 Control Switch to CLOSE and verify valve closes. ________

3.11 Place YCV-1045 Control Switch to STOP and verify valve closes. ________

3.12 Place YCV-1045B Control Switch to CLOSE and verify valve closes. ________

3.13 Place YCV-1045A Control Switch to CLOSE and verify valve closes. ________

NOTE: Steps 3.14 through 3.28 are performed from the Control Room.

3.14 Place HCV-1107A Control Switch in the OPEN position and verify valve remains closed. (AI-66A) ________

Attachment 1 - AFW Operability Verification from AI-179

PROCEDURE (continued) INITIALS

3.15 Place HCV-1107B Control Switch in the OPEN position and verify valve remains closed. (AI-66A) ________

3.16 Place HCV-1107B Control Switch in CLOSE. (AI-66A) ________

3.17 Verify HCV-1107B cannot be opened using HIC-1107B, Aux FW to S/G RC-2A Isol Vlv Controller. (CB-10/11) ________

3.18 Place HCV-1108A Control Switch in the OPEN position and verify valve remains closed. (AI-66B) ________

3.19 Place HCV-1108B Control Switch in the OPEN position and verify valve remains closed. (AI-66B) ________

3.20 Place HCV-1108B Control Switch in CLOSE. (AI-66B) ________

3.21 Verify HCV-1108B cannot be opened using HIC-1108B, Aux FW to S/G RC-2B Isol Vlv Controller. (CB-10/11) ________

3.22 Place FCV-1368 Control Switch to OPEN position and verify valve remains closed. (AI-66A) ________

3.23 Place FCV-1368 Control Switch to OPEN and verify valve remains closed. (CB-10/11) ________

3.24 Place FCV-1369 Control Switch to OPEN position and verify valve remains closed. (AI-66B) ________

3.25 Place YCV-1045 Control Switch to the OPEN position and verify valve remains closed. (AI-66B) ________

3.26 Place YCV-1045 Control Switch in the CLOSE position. (AI-66B) ________

3.27 Place YCV-1045A Control Switch on AI-66B to the OPEN position and verify valve remains closed and verify switch returns to NORMAL. ________

3.28 Place YCV-1045B Control Switch to the OPEN position and verify valve remains closed and Verify switch returns to NORMAL. (AI-66B) ________

Attachment 1 - AFW Operability Verification from AI-179

PROCEDURE (continued) INITIALS

NOTE: Steps 3.29 through 3.44 are performed at AI-179.

3.29 Place YCV-1045A Control Switch to the OPEN position and Verify valve opens and verify switch returns to NORMAL. ________

3.30 Place YCV-1045B Control Switch to the OPEN position and Verify valve opens and verify switch returns to NORMAL. ________

3.31 Place HC/LO-39 in OPERATE. (FW-10, LO-39-MS) ________

3.32 Verify **FW-10 TURBINE DRIVEN FEEDWATER PUMP TROUBLE** (AI-66B, A66B,18) clears. ________

3.33 Open HCV-1107A. ________

3.34 Return the Air Loader and Control Switch for HCV-1107B to the OPEN position.

	(√)	
• HIC-1107B	___	
• HCV-1107B	___	________

3.35 Verify HCV-1107B opens. ________

3.36 Open FCV-1368. ________

3.37 Return the Air Loader and Control Switch for HCV-1108B to the OPEN position.

• HIC-1108B	___	
• HCV-1108B	___	________

3.38 Verify HCV-1108B opens. ________

3.39 Open HCV-1108A. ________

3.40 Open FCV-1369. ________

3.41 Place Transfer Switch 43/RC-2A in the REMOTE position. ________

3.42 Reset Auxiliary Relay 43X/RC-2A. ________

Attachment 1 - AFW Operability Verification from AI-179

PROCEDURE (continued) INITIALS

3.43 Place Transfer Switch 43/RC-2B in the REMOTE position. ________

3.44 Reset Auxiliary Relay 43X/RC-2B. ________

3.45 Verify **AUX FW SYSTEM LOCAL CONTROL** (CB10/11, A9, C1U) clears. ________

4. Test Remaining Off Normal Annunciation and Logic

4.1 Manually actuate FW-64, Aux Feedwater Pump FW-10 Back Pressure Trip Latch, and verify the following:

(√)

- White light on AI-179 is on ___
- White light on AI-66B is on ___
- **FW-10 TURBINE DRIVEN FEEDWATER PUMP TROUBLE** (AI-66B, A66B,18) in alarm ___ ________

4.2 Reset FW-64, Aux Feedwater Pump FW-10 Back Pressure Trip Latch by pulling up FW-64-RL, Aux Feedwater Pump FW-10 Back Pressure Trip Latch Reset Lever, and verify trouble lights and annunciators return to normal.

- White light on AI-179 is off ___
- White light on AI-66B is off ___
- **FW-10 TURBINE DRIVEN FEEDWATER PUMP TROUBLE** (AI-66B, A66B,18) is clear ___ ________

5. Place the following valve control switches in CLOSED:

- HCV-1107A (AI-66A) ___
- HCV-1107B (AI-66A) ___
- HCV-1108A (AI-66B) ___
- HCV-1108B (AI-66B) ___
- YCV-1045 (AI-66B) ___
- YCV-1045A (AI-66B) ___
- YCV-1045B (AI-66B) ___
- HCV-1107B (CB-10,11) ___
- HCV-1108B (CB-10,11) ___ ________

Attachment 1 - AFW Operability Verification from AI-179

PROCEDURE (continued) INITIALS

6. In the Control Room verify the following:

	(√)	
• FCV-1368 open in NORM (CB-10/11)	___	
• FCV-1368 open in AUTO (AI-66A)	___	
• FCV-1369 open In AUTO (AI-66B)	___	________

Completed by____Date/Time______/_____

Comment Sheet

JOB PERFORMANCE MEASURE

JPM No: JPM-0627 (h)

JPM Title: Reduce RCS Pressure using Aux Spray

Location: Simulator

Approximate Time: 12 minutes Actual Time: ________________

Reference(s): OI-RC-7 attachments 2 and 3 R12
NRC K/A 010000 A4.01 (RO 3.7 / SRO 3.5)

JPM Prepared by: Jerry Koske Date: 05/10/05

JPM Reviewed by: ______________________________ Date: ___________

JPM Approved by: ______________________________ Date: ___________

JPM No: JPM-0627 (h)

JPM Title: Reduce RCS Pressure using Aux Spray

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations: None

Comments: Fail the normal pressurizer spray valves in the closed position. Ensure only B/U heater Bank 2 ON

JPM No: JPM-0627 (h)

JPM Title: Reduce RCS Pressure using Aux Spray

INITIATING CUE: **The Plant is in hot shutdown. The CRS has directed you to reduce RCS pressure to 1900 psia using pressurizer spray and automatic control.**

All prerequisites are met

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
		Note: Provide a copy of OI-RC-7, attachment 3 when located by candidate.
1 (2.a)	Verify PC-103Y is in automatic	CB-1,2,3 PC-103Y controller in AUTO [SAT] [UNSAT]
2 (2.b)	Ensure proportional heaters control switches are in auto.	CB-1,2,3 Group 6 and Group 7 switches in AUTO [SAT] [UNSAT]
3 (2.c)	Ensure backup heater switches in auto	CB-1,2,3 Bank 1 Group 1/2/3, Bank 3 Group 8/9 and Bank 4 Group 10/11/12 switches in AUTO [SAT] [UNSAT]
4 (2.d)	Ensure pressurizer spray valves in auto	CB-1,2,3 PCV-103-1 and PCV-103-2 control switches in AUTO [SAT] [UNSAT]

JPM No: JPM-0627 (h)

JPM Title: Reduce RCS Pressure using Aux Spray

STEP	ELEMENT	STANDARD
5 (2.e)	Lower RCS pressure by adjusting setpoint pushbuttons on PC-103Y	<u>CB-1,2,3</u> Adjust setpoint push buttons in small increments to lower pressure setpoint [SAT] [UNSAT]
6	Determines the pressurizer spray valves are not responding	<u>CB-1,2,3</u> PCV-103-1 and PCV-103-2 GREEN lights lit [SAT] [UNSAT]
7 (optional)	May attempt to use PC-103X in automatic to lower pressure	<u>CB-1,2,3</u> Place channel selector switch in “X” position and repeat step 5 using PC-103X
8 (optional)	May attempt to use manual mode to lower RCS pressure	Note: Provide a copy of OI-RC-7, attachment 2 if located by candidate <u>CB-1,2,3</u> Place controller PC-103Y and/or PC-103X in Manual and move the manual control lever to the right so that the output increases to greater than 67% **CUE: After candidate identifies failure of the spray valves, direct candidate to use aux spray in a controlled manner.**

JPM No: JPM-0627 (h)

JPM Title: Reduce RCS Pressure using Aux Spray

STEP	ELEMENT	STANDARD
9	Lower pressure using Aux spray	CB-1,2,3 Perform one or both of the following: • Place HCV-240 in the OPEN position. • Place HCV-249 in the OPEN position [SAT] [UNSAT]
10		CB-1,2,3 May place loop charging valves in CLOSE position as needed to divert adequate flow to Aux Spray line • HCV-247 • HCV-238 • HCV-248 • HCV-239
11	When pressure reaches 1900 psia, close the aux spray valves.	CB-1,2,3 HCV-240 and HCV-249 both in CLOSE position. [SAT] [UNSAT]
12	Reopen loop charging valves that may have been closed in step 10	CB-1,2,3 ENSURE at least one loop charging valve is open to provide loop charging flow • HCV-247 • HCV-238 • HCV-248 • HCV-239 [SAT] [UNSAT]

JPM No: JPM-0627 (h)

JPM Title: Reduce RCS Pressure using Aux Spray

Termination Criteria: **The RCS is at 1900 psia and the Aux Spray valves are closed**

JPM No: JPM-0627 (h)

INITIATING CUE: **The Plant is in hot shutdown. The CRS has directed you to reduce RCS pressure to 1900 psia using pressurizer spray and automatic control.**

All prerequisites are met

START

Attachment 2 - Manual RCS Pressure Control with a Steam Bubble in the Pressurizer

PREREQUISITES (✓) INITIALS

1. Procedure Revision Verification

   Revision Number________________ Date:________ ________

2. 120 VAC Instrument Power is operable from A and B Instrument Buses. ________

3. Pressurizer Heater Power is operable from the following MCC Panels:

   - MCC-3B1 to Proportional Heater Groups ___
   - MCC-4A1 to Proportional Heater Groups ___
   - MCC-3A1 to Heater Groups 1, 2 and 3 ___
   - MCC-3C1 to Heater Groups 4 and 5 ___
   - MCC-4B1 to Heater Groups 8 and 9 ___
   - MCC-4C1 to Heater Groups 10, 11 and 12 ___ ________

4. Instrument Air is available to Pressurizer Spray Valves PCV-103-1 and PCV-103-2. ________

PROCEDURE

NOTES

1. When the manual control lever is moved toward close to less than 17% output the proportional heaters will come on.

2. When the manual control lever is moved toward open to greater than 67% output AND the Spray Valve Switches are in AUTO, the Spray Valves will begin to open.

3. The Output meter will read approximately 50% when neither Proportional Heaters or Spray Valves receive action signals.

1. IF raising RCS pressure,
   THEN perform the following steps:

   a. Verify the Selected Controller is in MANUAL.

      - PC-103X, Pressurizer Press Controller ___
      - PC-103Y, Pressurizer Press Controller ___ ________

Attachment 2 - Manual RCS Pressure Control with a Steam Bubble in the Pressurizer

PROCEDURE (continued) (✓) INITIALS

1

b. Ensure the following RC-4 Spray Valve Control Switches are in AUTO:

- PCV-103-1, PZR Spray Valve From Loop 2A ___
- PCV-103-2, PZR Spray Valve From Loop 1B ___ ________

c. Ensure the following Proportional Heater Control Switches for RC-4 are in AUTO:

- 75 KW Proportional Htrs Bank P1 Group 6 ___
- 75 KW Proportional Htrs Bank P2 Group 7 ___ ________

d. Place the Backup Heater Bank Control Switches in ON as desired:

- 225 KW Backup Htrs Bank 1 Group 1/2/3 ___
- 150 KW Backup Htrs Bank 2 Group 4/5 ___
- 150 KW Backup Htrs Bank 3 Group 8/9 ___
- 225 KW Backup Htrs Bank 4 Group 10/11/12 ___ ________

e. Move the Manual Control Lever for the selected controller, PC-103X or PC-103Y, left to raise the Proportional Heater Output. ________

f. WHEN the desired RCS pressure is attained,
THEN place the Backup Heater Control Switches as required by one of the following:

1) IF the RCS is at normal operating pressure,
THEN place the following switches in AUTO or ON:

- 225 KW Backup Htrs Bank 1 Group 1/2/3 ___
- 150 KW Backup Htrs Bank 2 Group 4/5 ___
- 150 KW Backup Htrs Bank 3 Group 8/9 ___
- 225 KW Backup Htrs Bank 4 Group 10/11/12 ___ ________

Attachment 2 - Manual RCS Pressure Control with a Steam Bubble in the Pressurizer

PROCEDURE (continued) (✓) INITIALS

1.f

2) IF the desired RCS pressure is less than normal operating pressure,
THEN cycle the following heaters as necessary to maintain desired pressure:

- 225 KW Backup Htrs Bank 1 Group 1/2/3 ___
- 150 KW Backup Htrs Bank 2 Group 4/5 ___
- 150 KW Backup Htrs Bank 3 Group 8/9 ___
- 225 KW Backup Htrs Bank 4 Group 10/11/12 ___ ________

g. Adjust manual control lever as necessary on the selected controller, PC-103X or PC-103Y, to maintain RCS pressure. ________

2. To lower the RCS pressure, then perform the following steps:

NOTE
Refer to Attachment 10 if the temperature differential between Pressurizer and Spray Line is greater than 200°F.

a. Verify the Selected Controller is in MANUAL.

- PC-103X, Pressurizer Press Controller ___
- PC-103Y, Pressurizer Press Controller ___ ________

b. Ensure the following Spray Control Switches are in AUTO:

- PCV-103-1, PZR Spray Valve From Loop 2A ___
- PCV-103-2, PZR Spray Valve From Loop 1B ___ ________

c. IF the RCS pressure is to be reduced below 2060 psia,
THEN place the following Backup Heater Switches in OFF:

- 225 KW Backup Htrs Bank 1 Group 1/2/3 ___
- 150 KW Backup Htrs Bank 2 Group 4/5 ___
- 150 KW Backup Htrs Bank 3 Group 8/9 ___
- 225 KW Backup Htrs Bank 4 Group 10/11/12 ___ ________

Attachment 2 - Manual RCS Pressure Control with a Steam Bubble in the Pressurizer

<u>PROCEDURE</u> (continued) (✓) <u>INITIALS</u>

2

d. Move the Manual Control Lever right on the selected controller, PC-103X or PC-103Y to greater than 67% to open the Spray Valves. _______

e. WHEN the desired RCS pressure is attained,
THEN place the Backup Heater Control Switches as required by one of the following:

1) IF the RCS is at normal operating pressure,
THEN place the following switches in AUTO or ON:

- 225 KW Backup Htrs Bank 1 Group 1/2/3 ___
- 150 KW Backup Htrs Bank 2 Group 4/5 ___
- 150 KW Backup Htrs Bank 3 Group 8/9 ___
- 225 KW Backup Htrs Bank 4 Group 10/11/12 ___ _______

2) IF the desired RCS pressure is less than normal operating pressure,
THEN cycle the following heaters as necessary to maintain desired pressure:

- 225 KW Backup Htrs Bank 1 Group 1/2/3 ___
- 150 KW Backup Htrs Bank 2 Group 4/5 ___
- 150 KW Backup Htrs Bank 3 Group 8/9 ___
- 225 KW Backup Htrs Bank 4 Group 10/11/12 ___ _______

f. Adjust Manual Control Lever as necessary on selected controller, PC-103X or PC-103Y, to maintain RCS pressure. _______

Completed by____Date/Time_______/____

Attachment 3 - Automatic RCS Pressure Control with a Steam Bubble in the Pressurizer

PREREQUISITES (✓) INITIALS

1. Procedure Revision Verification

Revision Number_______________ Date:_________ _______

PROCEDURE

NOTE

RCS Pressure Control should automatically maintain setpoint for normal operation at 2100 (2080 to 2145) psia.

1. IF raising the RCS pressure,
THEN perform the following steps:

   a. Verify the Selected Controller is in AUTOMATIC.

      - PC-103X, Pressurizer Press Controller ___
      - PC-103Y, Pressurizer Press Controller ___ _______

   b. Ensure the following Proportional Heater Control Switches are in AUTO:

      - 75 KW Proportional Htrs Bank P1 Group 6 ___
      - 75 KW Proportional Htrs Bank P2 Group 7 ___ _______

NOTE

During normal operation, one bank of pressurizer heaters is usually maintained in the ON position.

   c. IF one Bank of Heaters is in ON,
   THEN ensure the remaining Backup Heater Switches are in AUTO; OR ensure all of the following switches are in AUTO:

      - 225 KW Backup Htrs Bank 1 Group 1/2/3 ___
      - 150 KW Backup Htrs Bank 2 Group 4/5 ___
      - 150 KW Backup Htrs Bank 3 Group 8/9 ___
      - 225 KW Backup Htrs Bank 4 Group 10/11/12 ___ _______

Attachment 3 - Automatic RCS Pressure Control with a Steam Bubble in the Pressurizer

PROCEDURE (continued) (✓) INITIALS

1

d. Ensure the following Spray Control Switches are in AUTO:

- PCV-103-1, PZR Spray Valve From Loop 2A ___
- PCV-103-2, PZR Spray Valve From Loop 1B ___ ________

e. Raise the RCS pressure by adjusting the Setpoint Push-button(s) on selected controller, PC-103X or PC-103Y, to desired RCS pressure setpoint. ________

f. Ensure RCS pressure stabilizes at the desired setpoint. ________

2. IF lowering the RCS pressure,
THEN perform the following steps:

NOTE
If the temperature differential between Pressurizer and Spray Line is greater than 200°F, refer to Attachment 10.

a. Verify the Selected Controller is in AUTOMATIC.

- PC-103X, Pressurizer Press Controller ___
- PC-103Y, Pressurizer Press Controller ___ ________

b. Ensure the following Proportional Heaters Control Switches are in AUTO:

- 75 KW Proportional Htrs Bank P1 Group 6 ___
- 75 KW Proportional Htrs Bank P2 Group 7 ___ ________

Attachment 3 - Automatic RCS Pressure Control with a Steam Bubble in the Pressurizer

PROCEDURE (continued) (✓) INITIALS

NOTE

During normal operation, one bank of pressurizer heaters is usually maintained in the ON position.

2

c. IF one (1) Bank of Heaters is in ON,
THEN ensure the remaining Backup Heater Switches are in AUTO;
OTHERWISE ensure all of the following switches are in AUTO:

- 225 KW Backup Htrs Bank 1 Group 1/2/3 ___
- 150 KW Backup Htrs Bank 2 Group 4/5 ___
- 150 KW Backup Htrs Bank 3 Group 8/9 ___
- 225 KW Backup Htrs Bank 4 Group 10/11/12 ___ ______

d. Ensure the following Spray Control Switches are in AUTO:

- PCV-103-1, PZR Spray Valve From Loop 2A ___
- PCV-103-2, PZR Spray Valve From Loop 1B ___ ______

CAUTION

When reducing RCS pressure, decreasing pressure in small increments will prevent overshoot from selected setpoint.

e. Lower RCS pressure by adjusting the Setpoint Push-button(s) on selected controller, PC-103X or PC-103Y, to the desired RCS pressure setpoint. ______

f. Ensure RCS pressure stabilizes at the desired setpoint. ______

Completed by____Date/Time_______/_____

JOB PERFORMANCE MEASURE

JPM No: JPM-0225 (i)

JPM Title: Initiate Air Compressor Backup Cooling

Location: Room 19

Approximate Time: 10 minutes Actual Time: ________________

Reference(s): EOP-20, MVA-IA R16
NRC K/A 078000 K1.04 (RO 2.6 / SRO 2.9)

JPM Prepared by: Jerry Koske Date: 05/10/05

JPM Reviewed by: ______________________ Date: __________

JPM Approved by: ______________________ Date: __________

JPM No: JPM-0225 (i)

JPM Title: Initiate Air Compressor Backup Cooling

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment: None

Safety Considerations:
1. Observe local industrial safety postings
2. Use caution around hot/warm piping
3. DO NOT operate any actual plant equipment

Comments: Static In-plant JPM

JPM No: JPM-0225 (i)

JPM Title: Initiate Air Compressor Backup Cooling

INITIATING CUE:

A loss of offsite power has occurred. You have been directed to line up the CA-1A local control switches for Control Room Start and then lineup backup cooling to Air Compressor CA-1A. The Control Room has placed the control switch for CA-1A in pull-to lock.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1 (Operator knowledge)	Place the CA-1A controller switch in the Control Room Start position	<u>Room-19</u> 1SS switch in CS position [SAT] [UNSAT]
2 (Operator knowledge)	Ensure that the CA-1A load transfer switch is either position 1 or 2	<u>Room-19</u> Ensure Compressor load transfer switch in the 1 or 2 position [SAT] [UNSAT] **CUE: CA-1A is not running**
3 (2.1.a.1)	Isolate Bearing Water to CA-1A	<u>Room 19</u> CLOSE all of the following valves: • AC-584 • AC-588 • AC-586 • AC-589 [SAT] [UNSAT]

JPM No: JPM-0225 (i)

JPM Title: Initiate Air Compressor Backup Cooling

STEP	ELEMENT	STANDARD
4 (2.1.a.2)	Align Potable Water to CA-1A	Room 19 OPEN all of the following valves: • AC-1042 • AC-1043 • AC-1044 • AC-1045 • AC-583 [SAT] [UNSAT]
	Notify Control Room that Potable Water has been placed on CA-1A	Contacts Control Room and reports that potable water has been placed on CA-1A [SAT] [UNSAT] **CUE: The Control Room has started CA-1A**
5 (2.1.a.4)	Verify cooling water flow	Room-19 Read FI-1955 to verify flow [SAT] [UNSAT]

Termination Criteria: CA-1A is being cooled by potable water

JPM No: JPM-0225 (i)

INITIATING CUE:

A loss of offsite power has occurred. You have been directed to line up the CA-1A local control switches for Control Room Start and then lineup backup cooling to Air Compressor CA-1A. The Control Room has placed the control switch for CA-1A in pull-to lock.

START

12.0 MAINTENANCE OF VITAL AUXILIARIES - IA

INSTRUCTIONS

****

CAUTION

Do not allow Diesel Generator loads to exceed power and current rating limits.

****

2. **IF** any of the Air Compressors have tripped because of low Turbine Plant Cooling Water pressure, **THEN** restore Turbine Plant Cooling Water by performing the following steps:

   a. Start **ONE** Bearing Water Pump, AC-9A/B.

   b. Verify cooling water header pressure is approximately 70 psig.

   c. Start at least one Air Compressor, CA-1A/B/C.

(continue)

CONTINGENCY ACTIONS

2.1 **IF** Turbine Plant Cooling Water is **NOT** available, **THEN** align Potable Water to the Air Compressors by performing the following steps:

   a. Align backup Potable Water cooling to CA-1A, Air Compressor, by performing the following steps:

(continue)

12.0 MAINTENANCE OF VITAL AUXILIARIES - IA

INSTRUCTIONS

2. (continued)

(continue)

CONTINGENCY ACTIONS

2.1.a (continued)

1) Close **ALL** of the following valves (Room 19):

- AC-584, "AIR COMPRESSOR CA-1A INTERCOOLER INLET VALVE"
- AC-588, "AIR COMPRESSOR CA-1A OUTLET VALVE"
- AC-586, "AIR COMPRESSOR CA-1A AFTERCOOLER CA-2A INLET VALVE"
- AC-589, "AIR COMPRESSOR CA-1A AFTERCOOLER CA-2A OUTLET VALVE"

(continue)

12.0 MAINTENANCE OF VITAL AUXILIARIES - IA

INSTRUCTIONS

2. (continued)

(continue)

CONTINGENCY ACTIONS

2.1.a (continued)

2) Open **ALL** of the following valves (Room 19):

- AC-1042, "AIR COMPRESSOR CA-1A INTERCOOLER POTABLE WATER INLET VALVE"
- AC-1043, "AIR COMPRESSOR CA-1A POTABLE WATER OUTLET VALVE"
- AC-1044, "AIR COMPRESSOR CA-1A AFTERCOOLER CA-2A POTABLE WATER INLET VALVE"
- AC-1045, "AIR COMPRESSOR CA-1A AFTERCOOLER CA-2A POTABLE WATER OUTLET VALVE"
- AC-583, "AIR COMPRESSOR CA-1A INTERCOOLER INLET PRESS INDICATOR PI-1942A ROOT VALVE"

3) Start CA-1A, Air Compressor.

(continue)

12.0 MAINTENANCE OF VITAL AUXILIARIES - IA

INSTRUCTIONS	CONTINGENCY ACTIONS
2. (continued)	2.1.a (continued)
	4) Check for flow through FI-1955A (Room 19).
	b. Align backup Potable Water cooling to CA-1B, Air Compressor, by performing the following steps:
	1) Close **ALL** of the following valves (Room 19):
	• AC-577, "AIR COMPRESSOR CA-1B INTERCOOLER INLET VALVE"
(continue)	• AC-581, "AIR COMPRESSOR CA-1B OUTLET VALVE"
	• AC-582, "AIR COMPRESSOR CA-1B AFTERCOOLER CA-2B OUTLET VALVE"
	• AC-579, "AIR COMPRESSOR CA-1B AFTERCOOLER CA-2B INLET VALVE"
	(continue)

JOB PERFORMANCE MEASURE

JPM No: JPM-0356 (j)

JPM Title: Emergency Start of Diesel-Generator D-1

Location: DG-1 Room

Approximate Time: 12 minutes Actual Time: ________________

Reference(s): EOP/AOP Attachments, Attachment 12 R18
NRC K/A 064000 A4.06 (RO 3.9 / SRO 3.9)

JPM Prepared by: Jerry Koske Date: 05/10/05

JPM Reviewed by: ______________________ Date: __________

JPM Approved by: ______________________ Date: __________

JPM No: JPM-0356 (j)

JPM Title: Emergency Start of Diesel-Generator D-1

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment:	None
Safety Considerations:	Observe Industrial Safety practices DO NOT operate and plant equipment
Comments:	In Plant alternate path JPM

JPM No: JPM-0356 (j)

JPM Title: Emergency Start of Diesel-Generator D-1

INITIATING CUE: **A station blackout has occurred. D/G-1 did not start and attempts to start D/G-1 from the control room have been unsuccessful.**

You have been directed to start D/G-1 using EOP/AOP Attachment 12.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1 (3.a)	Place the "Engine Control 143/SS" switch to local	D1 Engine Control panel 143/SS Switch to LOCAL [SAT] [UNSAT]
2 (3.b)	Press the "Normal Engine Start" push button	D1 Engine Control panel Push NORMAL ENGINE START button [SAT] [UNSAT] **CUE: D/G-1 did not start**
3 (3.1.a)	Place the "Engine Control 143/SS" switch to EMERG	143/SS Switch to EMERG [SAT] [UNSAT]
4 (3.1.b)	Press the "Emergency Engine Start" push button	D1 Engine Control panel Push EMERGENCY ENGINE START button [SAT] [UNSAT] **CUE: D/G-1 did not start**

JPM No: JPM-0356 (j)

JPM Title: Emergency Start of Diesel-Generator D-1

STEP	ELEMENT	STANDARD
5 (5)	Check primary air receiver tank and secondary air receiver tank pressures.	D1 Engine Control panel Read indicators **CUE: both pressure indicators "as read"** [SAT] [UNSAT]
6 (14)	Ensure overspeed trip is reset	West end of D/G-1 Ensure trip is reset [SAT] [UNSAT] **CUE: Overspeed trip is reset**
7 (15.a)	Place the Engine Control 143/SS switch in LOCAL	D1 Engine Control panel Place 143/SS switch in the LOCAL position [SAT] [UNSAT]
8 (15.b)	Press the "Normal Engine Start" pushbutton	D1 Engine Control panel Press NORMAL ENGINE START pushbutton [SAT] [UNSAT] **CUE: D/G-1 did not start**
9 (15.1)	Manually override SA-142, Diesel-Generator DG-1 Primary Air System Solenoid valve	On top of valve Open the "T" handled valve. [SAT] [UNSAT] **CUE: D/G-1 has started**

JPM No: JPM-0356 (j)

JPM Title: Emergency Start of Diesel-Generator D-1

STEP	ELEMENT	STANDARD
10 (16)	Ensure Engine Control 143/SS switch is in the EMERG	D1 Engine Control panel 143/SS Switch in EMERG position [SAT] [UNSAT]
11 (17)	Check DG-1 speed	D1 Engine Control panel [SAT] [UNSAT] **CUE: speed reads 900 rpm**

Termination Criteria: D/G-1 is running at full speed.

JPM No: JPM-0356 (j)

INITIATING CUE: **A station blackout has occurred. D/G-1 did not start and attempts to start D/G-1 from the control room have been unsuccessful.**

You have been directed to start D/G-1 using EOP/AOP Attachment 12.

START

Attachment 12

Emergency Start of Diesel Generator D-1

INSTRUCTIONS	CONTINGENCY ACTIONS
1. Start D-1 by pressing the "DIESEL NORMAL START" push button.	1.1 **IF** D-1 did **NOT** start, **THEN** press the "EMERGENCY START" push button.
2. **IF** D-1 is running, **THEN** GO TO Step 17.	
3. Start D-1 by performing the following steps (Engine Control Panel): a. Place the "ENGINE CONTROL 143/SS" Switch in "LOCAL". b. Press the "NORMAL ENGINE START" push button.	3.1 **IF** D-1 did **NOT** start, **THEN** start D-1 by performing the following steps (Engine Control Panel): a. Place the "ENGINE CONTROL 143/SS" Switch in "EMERG". b. Press the "EMERGENCY ENGINE START" push button.
4. **IF** D-1 is running, **THEN** GO TO Step 16.	

Attachment 12

Emergency Start of Diesel Generator D-1

INSTRUCTIONS	CONTINGENCY ACTIONS

NOTE

A minimum starting air pressure of 157 psig is required to start D-1.

5. **IF** "PRIMARY AIR RECEIVER TANK PRESSURE" or "SECONDARY AIR RECEIVER TANK PRESSURE" is greater than 157 psig (Engine Control Panel),
THEN GO TO Step 14.

6. **IF** the Primary Air Start System is available,
THEN align the Emergency Compressor to the Primary Air Receivers by performing the following steps (D-1 room):

   a. Ensure the "ENGINE CONTROL 143/SS" Switch is in "LOCAL".

   b. Place "SA-2-1 PRIMARY COMPRESSOR 43/AS2" Switch in "OFF".

(continue)

6.1 **IF** the Secondary Air Start System is available,
THEN align the Emergency Compressor to the Secondary Air Receivers by performing the following steps (D-1 room):

   a. Ensure the "ENGINE CONTROL 143/SS" Switch is in "LOCAL".

   b. Place "SA-23-1 SECONDARY COMPRESSOR 43/AS1" Switch in "OFF".

(continue)

Attachment 12

Emergency Start of Diesel Generator D-1

INSTRUCTIONS	CONTINGENCY ACTIONS
6. (continued)	6.1 (continued)
c. Ensure **BOTH** of the following valves are closed:	c. Ensure **BOTH** of the following valves are closed:
• SA-214, "PRESSURE CONTROLLER PC-6040A SECONDARY AIR SYSTEM ROOT VALVE"	• SA-215, "PRESSURE CONTROLLER PC-6040A PRIMARY AIR SYSTEM ROOT VALVE"
• SA-280, "EMERGENCY COMPRESSOR SA-1-1 SECONDARY AIR SYSTEM ISOLATION VALVE"	• SA-204, "EMERGENCY COMPRESSOR SA-1-1 PRIMARY AIR SYSTEM ISOLATION VALVE"
d. Open **BOTH** of the following valves:	d. Open **BOTH** of the following valves:
• SA-215, "PRESSURE CONTROLLER PC-6040A PRIMARY AIR SYSTEM ROOT VALVE"	• SA-214, "PRESSURE CONTROLLER PC-6040A SECONDARY AIR SYSTEM ROOT VALVE"
• SA-204, "EMERGENCY COMPRESSOR SA-1-1 PRIMARY AIR SYSTEM ISOLATION VALVE"	• SA-280, "EMERGENCY COMPRESSOR SA-1-1 SECONDARY AIR SYSTEM ISOLATION VALVE"

Attachment 12

Emergency Start of Diesel Generator D-1

INSTRUCTIONS	CONTINGENCY ACTIONS
7. Unload the compressor by turning the "SA-1-1 UNLOADER CONTROL ASSEMBLY" adjustment nut clockwise (behind compressor).	
8. Ensure the "DECOMP SW" is in "STOP".	
9. Cycle the priming lever a minimum of three times.	
10. Press and hold the "PRE-HEAT SWITCH" push button for one minute.	

Attachment 12

Emergency Start of Diesel Generator D-1

INSTRUCTIONS | CONTINGENCY ACTIONS

11. Start the Diesel Engine by performing the following steps:

    a. Press and hold the "PRE-HEAT SWITCH" push button.

    b. Press the "PUSH TO START" push button.

    c. **WHEN** the diesel reaches full cranking speed,
       THEN release the "PRE-HEAT SWITCH" push button.

    d. Place the "DECOMP SW" in "RUN".

Attachment 12

Emergency Start of Diesel Generator D-1

INSTRUCTIONS	CONTINGENCY ACTIONS
12. **WHEN** Diesel Engine starts, **THEN** release the "PUSH TO START" push button.	
13. Load the compressor by turning the "SA-1-1 UNLOADER CONTROL ASSEMBLY" adjustment nut counterclockwise.	
14. **WHEN** "PRIMARY AIR RECEIVER TANK PRESSURE" or "SECONDARY AIR RECEIVER TANK PRESSURE" is greater than 157 psig (Engine Control Panel), **THEN** ensure the overspeed trip is reset (West end of D-1).	

Attachment 12

Emergency Start of Diesel Generator D-1

INSTRUCTIONS

15. Start D-1 by performing the following steps (Engine Control Panel):

    a. Place the "ENGINE CONTROL 143/SS" Switch in "LOCAL".

    b. Press the "NORMAL ENGINE START" push button.

CONTINGENCY ACTIONS

****

CAUTION

This step may damage the Air Start Motors if the manual override is not released after a few seconds.

****

15.1 **IF** D-1 did **NOT** start,
AND the Primary Air Receivers are pressurized,
THEN manually override SA-142, "DIESEL GENERATOR DG-1 PRIMARY AIR SYSTEM SOLENOID VALVE", using the "T" handle located on top of the valve.

15.2 **IF** D-1 did **NOT** start
AND the Secondary Air Receivers are pressurized,
THEN manually override SA-141, "DIESEL GENERATOR DG-1 SECONDARY AIR SYSTEM SOLENOID VALVE", using the "T" handle located on top of the valve.

Attachment 12

Emergency Start of Diesel Generator D-1

INSTRUCTIONS	CONTINGENCY ACTIONS
16. Ensure the "ENGINE CONTROL 143/SS" Switch in "EMERG" to return D-1 start function to the Control Room.	
17. Check that D-1 is operating at greater than or equal to 900 rpm.	

End of Attachment 12

JOB PERFORMANCE MEASURE

JPM No: JPM-0719M (k)

JPM Title: Startup Containment Hydrogen Purge and Makeup

Location: Aux Building (RCA)

Approximate Time: 15 min Actual Time: ________________

Reference(s): OI-VA-1 Attachment 5A and 5B R57
NRC K/A 028000 A2.02 (RO 3.5 / SRO 3.9)

JPM Prepared by: Jerry Koske Date: 05/10/05

JPM Reviewed by: ______________________ Date: __________

JPM Approved by: ______________________ Date: __________

JPM No: JPM-0719M (k)

JPM Title: Startup Containment Hydrogen Purge and Makeup

Operators' Name: ______________________ Employee # _______________

All Critical Steps (shaded) must be performed or simulated in accordance with the standards contained in this JPM

The Operator's performance was evaluated as (circle one):

SATISFACTORY **UNSATISFACTORY**

Evaluator's Signature: ______________________________ Date: __________

Reason, if unsatisfactory:

Tools & Equipment:	None
Safety Considerations:	Observe industrial and radiological safety practices DO NOT operate any plant equipment
Comments:	This static JPM is conducted inside the RCA

JPM No: JPM-0719M (k)

JPM Title: Startup Containment Hydrogen Purge and Makeup

INITIATING CUE: **A major LOCA occurred several weeks ago. Containment hydrogen concentration has been slowly increasing and has now reached 3%. A release permit has been prepared and approved. You have been directed to complete the Aux building steps of OI-VA-1 attachment 5A to purge hydrogen from containment using VA-80A and attachment 5B to use VA-80B to provide makeup air to containment.**

CIAS and VIAS were initiated and have not been reset OI-VA-1 is complete through step 6. HC-745 has been placed in HAND

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Ensure VA-411, VA-82 bypass is closed	Corr. 26 IA-VA-411-B1 in FILTERED [SAT] [UNSAT]
2	Ensure VA-291/VA-279 combined remote operator is closed.	Corr 26 VA-291/VA-279 CLOSED [SAT] [UNSAT]
3	Ensure VA-282/VA-284 combined remote operator is closed.	Corr 26 VA-282/VA-284 CLOSED [SAT] [UNSAT]
4	Open hydrogen purge valves for VA-80A: • VA-290 • VA-292 • VA-289	Corr 26 Unlock and OPEN valves [SAT] [UNSAT]

JPM No: JPM-0719M (k)

JPM Title: Startup Containment Hydrogen Purge and Makeup

STEP	ELEMENT	STANDARD
5	Contact Control Room	[SAT] [UNSAT] **CUE: Control room reports procedure steps 8,9 and 10 have been completed**
6	Start hydrogen purge fan, VA-80A	AI-100 Place VA-80A control switch in PULL TO OVERRIDE Red Light ON Green Light OFF [SAT] [UNSAT]
7	Monitor DPI-899D	Corr 26 **CUE: DPI-899D indicates 10"w.g.** [SAT] [UNSAT]
8	Ensure VA-281/VA-283 combined remote operator is closed.	Corr 26 VA-281/VA-283 CLOSED [SAT] [UNSAT]
9	Open VA-282/VA-284 VA-80B suction from Aux Bldg/recirc valve	Corr 26 VA-282/VA-284 OPEN [SAT] [UNSAT]
10	Open VA-280	Corr 26 VA-280 OPEN [SAT] [UNSAT]

JPM No: JPM-0719M (k)

JPM Title: Startup Containment Hydrogen Purge and Makeup

STEP	ELEMENT	STANDARD
11	Record initial hydrogen concentration and sample point in CR log.	Contact Control Room [SAT] [UNSAT] **CUE: Procedure steps 11d through 16 will be performed by Control Room; Proceed with Attachment 5B**

NOTE: Steps 12 and 13 must be done sequentially (within 30 seconds of each other)

12	Start hydrogen purge fan, VA-80B	<u>AI-100</u> Place VA-80B control switch in PULL TO OVERRIDE Red Light ON Green Light OFF [SAT] [UNSAT]
13	Contact control room to place HCV-881 in override.	Contact control room within 30 seconds of starting VA-80B or coordinate with Control Room to ensure step 13 is completed within 30 seconds of completion of step 12. [SAT] [UNSAT] **CUE: The control room has placed HCV-881 in OVERRIDE** **STOP**

JPM No: JPM-0719M (k)

JPM Title: Startup Containment Hydrogen Purge and Makeup

Termination Criteria: **The hydrogen purge system is in operation with VA-80A purging hydrogen from containment and VA-80B supplying makeup air**

JPM No: JPM-0719M (k)

INITIATING CUE:	**A major LOCA occurred several weeks ago. Containment hydrogen concentration has been slowly increasing and has now reached 3%. A release permit has been prepared and approved. You have been directed to complete the Aux building steps of OI-VA-1 attachment 5A to purge hydrogen from containment using VA-80A and attachment 5B to use VA-80B to provide makeup air to containment.** **CIAS and VIAS were initiated and have not been reset OI-VA-1 is complete through step 6. HC-745 has been placed in HAND** **START**

Attachment 5A - Hydrogen Purge Release VA-80A & VA-80B

PREREQUISITES (√) INITIALS

1. Procedure Revision Verification

   Revision No. ____________ Date:____________ ________

2. Plant is in MODE 4 or 5. ________

3. OI-VA-1-CL-A has been completed per OP-1. ________

4. Containment Integrity is not required. ________

5. At least one VA-40 Fan (Aux Bldg Exhaust) is in operation. ________

6. Condenser evacuation discharge is aligned to the normal flow path (Turbine Building Roof). ________

7. No Waste Gas Decay Tank Release is in progress. ________

8. One Noble Gas Radiation Monitor is in operation monitoring the Auxiliary Building Exhaust Stack. (RM-062 or RM-052)(ODCM) ________

9. One Iodine/Particulate Sampler is in service on the Aux Bldg Stack or Auxiliary Sample Collection Equipment is in service. (RM-062 or RM-052 Filter)(ODCM). ________

10. The following recorders are operable or readings will be taken per FC-212 Table I every four hours, per Off-site Dose Calculation Manual (ODCM):

    - RR-049A, Process Rad Mon Rcdr (AI-31E) ___
    - FR-758, Ventilation Stack Total Flow (AI-44) ___
    - PR-745, Post Accident Cntmt Press (AI-44) ___
    - HR-81A(B) H_2 Analyzer VA-81A(B) Recorder (AI-65) ___ ________

11. Electrical power is available to the desired fan(s):

    - VA-80A, Hydrogen Purge Blower, MCC-3C2-C04 ___
    - VA-80B, Hydrogen Purge Blower, MCC-4A2-C01 ___ ________

12. At least VA-81 or VA-81B, Containment Hydrogen Analyzer is in service sampling Containment per OI-VA-6. ________

Attachment 5A - Hydrogen Purge Release VA-80A & VA-80B

PREREQUISITES (continued) (✓) INITIALS

13. Containment Release Permit # __________ is authorized. ________ SM/CRS

PROCEDURE

NOTE

RM-051 and/or RM-052, Cntmt Noble Gas Radiation Monitor and the ERF Computer are not required to be operable during the hydrogen release but are used for conservative monitoring of Containment during the release.

1. Set the FC-212 count rate limit in the ERF Computer or the radiation monitor at the alert limit. (RM-051 or RM-052) ________

NOTE

The radiation monitor is considered inoperable during the check source. Remaining stationed at the monitor AND ensuring the monitor returns to normal before leaving the area administratively replaces the log entry.

2. Perform check source on all operational Auxiliary Building Exhaust Stack Noble Gas Radiation Monitors (RM-062 and/or RM-052). ________

3. Verify all operational RM-062 and/or RM-052, Auxiliary Building Exhaust Stack Noble Gas Radiation Monitors, alert and high alarm setpoints are per TBD-IV.7. ________

4. Ensure Aux Bldg stack flow rate is less than or equal to the FC-212 Value. ________

5. Record FC-212 initial readings and mark the following operable recorders with the date, time, and release number:

   - RR-049A, Process Rad Mon Rcdr (AI-31E) ___
   - FR-758, Ventilation Stack Total Flow (AI-44) ___
   - PR-745, Post Accident Cntmt Press (AI-44) ___
   - HR-81A(B) H_2 Analyzer VA-81A(B) Recorder (AI-65) ___ ________

6. Place HC-745, Post Accident Cntmt Press, to HAND. ________

Attachment 5A - Hydrogen Purge Release VA-80A & VA-80B

PROCEDURE (continued) (✓) INITIALS

7. Perform the following (Corr 26):

a. Ensure VA-411, VA-82 Bypass, is closed (IA-VA-411-B1 in FILTERED). ___

b. Ensure VA-291/VA-279, Cntmt Hydrogen Purge Fan VA-80A Suction Valve from Aux Building/Recirc Valve, combined remote operator is closed. ___

c. Ensure VA-282/VA-284, Cntmt Hydrogen Purge Fan VA-80B Suction Valve from Aux Building/Recirc Valve, combined remote operator is closed. ___

CAUTION

Do not run both VA-80A and VA-80B in the hydrogen purge release mode at the same time.

d. Open the Cntmt Hydrogen Purge valves for the desired unit:

- VA-80A

  VA-290/VA-292, Cntmt Hydrogen Purge Fan VA-80A Suction Valve from Containment/Cntmt Hydrogen Purge Fan VA-80A Discharge Valve ___

  VA-289, Outboard Isolation Valve to Cntmt Hydrogen Purge Fan VA-80A ___

- VA-80B

  VA-281/VA-283, Cntmt Hydrogen Purge Fan VA-80B Suction Valve from Containment/Cntmt Hydrogen Purge Fan VA-80B Discharge Valve ___

  VA-280, Outboard Isolation Valve to Cntmt Hydrogen Purge Fan VA-80B ___ ________

8. Record initial hydrogen concentration and sample point in the CR Log. ________

Attachment 5A - Hydrogen Purge Release VA-80A & VA-80B

PROCEDURE (continued) (✓) INITIALS

9. IF normal startup,
THEN place the H_2 Purge Blower Isolation Valve Inbd Control Switch for the unit to be run to OPEN (AI-43A):

- HCV-882, VA-80A ___
- HCV-881, VA-80B ___ ________

10. IF post accident (SIAS tripped) startup,
THEN place the H_2 Purge Blower Isolation Valve Inbd Control Switch for the unit(s) to be run to OVRD (AI-43A):

- HCV-882, VA-80A ___
- HCV-881, VA-80B ___ ________

11. Perform the following:

a. IF normal startup,
THEN place the Hydrogen Purge Blower Control Switch to AFTER START for the unit to be started (AI-100):

- VA-80A ___
- VA-80B ___

b. IF post accident (SIAS tripped) startup,
THEN place the Hydrogen Purge Blower Control Switch in PULL TO OVERRIDE for the unit to be started (AI-100):

- VA-80A ___
- VA-80B ___

c. Monitor DPI-899D, Filter Unit Va-82 Differential Pressure Indicator, during the release (Corr 26). ___

d. IF DPI-899D reading exceeds 25" w.g.,
THEN perform the following:

1) Notify the Control Room. ___

2) Obtain TSC permission to open VA-411. ___

Attachment 5A - Hydrogen Purge Release VA-80A & VA-80B

PROCEDURE (continued) (✓) INITIALS

11.d 3) Open VA-411, VA-82 Bypass. (IA-VA-411-B1 to NON-FILTERED) ___ ________

12. IF RM-062 and/or RM-052, Auxiliary Building Exhaust Stack Noble Gas Radiation Monitors become inoperable,
THEN immediately secure the hydrogen release. ________

13. IF the ERF becomes inoperable AND the FC-212 count rate limit was set in the ERF,
THEN record RM-051 or RM-052, Cntmt Noble Gas Radiation Monitor, reading as required by FC-212 Table 1 and verify the FC-212 count rate limit is not exceeded until the FC-212 count rate limit is set in the radiation monitor. ________

14. IF the FC-212 Containment radiation monitor becomes inoperable,
THEN notify Chemistry to annotate the release permit. ________

15. IF RM-051 and/or RM-052 Containment Radiation Monitors become inoperable,
THEN secure the hydrogen release. ________

16. During the release, record the following data in FC-212:

   a. Table I inoperable recorder readings every four hours per Off-site Dose Calculation Manual (ODCM). ___

   b. Table II stop and start readings. ___

   c. Table III release flow readings every four hours by logging Containment pressure and stack flow. ___ ________

17. Prior to the release expiration, place the running Hydrogen Purge Blower(s) Control Switch to AFTER STOP (AI-100):

- VA-80A ___
- VA-80B ___ ________

Attachment 5A - Hydrogen Purge Release VA-80A & VA-80B

PROCEDURE (continued) (✓) INITIALS

18. Place the H_2 Purge Blower Isolation Valve Inbd control switches to CLOSE (AI-43A):

    - HCV-882, VA-80A ___
    - HCV-881, VA-80B ___ ________

19. Record the FC-212 final readings and mark the following operable recorders with the date, time, and release number:

    - RR-049A, Process Rad Mon Rcdr (AI-31E) ___
    - FR-758, Ventilation Stack Total Flow (AI-44) ___
    - PR-745, Post Accident Cntmt Press (AI-44) ___
    - HR-81A(B) H_2 Analyzer VA-81A(B) Recorder (AI-65) ___ ________

20. Place HC-745, Post Accident Cntmt Press, to AUTO. ________

21. Log the final hydrogen concentration and sample point in the CR Log. ________

22. Perform the following (Corr 26):

    a. Close the following Cntmt Hydrogen Purge valves:

        - VA-289, Outboard Isolation Valve to Cntmt Hydrogen Purge Fan VA-80A ___
        - VA-290, VA-80A Suction Valve from Cntmt ___
        - VA-292, VA-80A Discharge Valve ___
        - VA-280, Outboard Isolation Valve to Cntmt Hydrogen Purge Fan VA-80B ___
        - VA-281, VA-80B Suction Valve from Cntmt ___
        - VA-283, VA-80B Discharge Valve ___
        - VA-411, VA-82 Bypass (IA-VA-411-B1 to FILTERED) ___

Attachment 5A - Hydrogen Purge Release VA-80A & VA-80B

PROCEDURE (continued) (✓) INITIALS

22 b. Lock closed the Cntmt Hydrogen Purge Outboard Isolation Valves to Cntmt Hydrogen Purge Fans:

- VA-289, VA-80A ___
- VA-280, VA-80B ___ ________

____
Ind Verif

Completed by ____ Date/Time ________/_______

Attachment 5B - Supply of Auxiliary Building Air to Containment VA-80A & VA-80B

PREREQUISITES (√) INITIALS

1. Procedure Revision Verification

   Revision No.___________ Date:____________ ________

2. Plant is in MODE 4 or 5. ________

3. OI-VA-1-CL-A has been completed per OP-1. ________

4. Containment Integrity is not required. ________

5. Electrical power is available to the desired fan:

   - VA-80A, Hydrogen Purge Blower, MCC-3C2-C04 ___
   - VA-80B, Hydrogen Purge Blower, MCC-4A2-C01 ___ ________

6. VA-81A or VA-81B is in service per OI-VA-6. ________

PROCEDURE

NOTE

One VA-80 Blower may be run supplying Auxiliary Building air to Containment while the other is run for Hydrogen Purge Release.

1. Place HC-745, Post Accident Cntmt Press, to HAND. ________

2. Ensure the following valves combined remote operator is closed, for the desired unit (Corr. 26):

   - VA-80A

     VA-290/VA-292, Cntmt Hydrogen Purge Fan VA-80A Suction Valve from Containment/Cntmt Hydrogen Purge Fan VA-80A Discharge Valve ________

   - VA-80B

     VA-281/VA-283, Cntmt Hydrogen Purge Fan VA-80B Suction Valve from Containment/Cntmt Hydrogen Purge Fan VA-80B Discharge Valve ________

Attachment 5B - Supply of Auxiliary Building Air to Containment VA-80A & VA-80B

PROCEDURE (continued) (✓) INITIALS

3. Open the following valves for the desired unit (Corr. 26):

- VA-80A

  VA-291/VA-279, Cntmt Hydrogen Purge Fan VA-80A Suction Valve from Aux Building/recirc Valve ___

  VA-289, Outboard Isolation Valve to Cntmt Hydrogen Purge Fan VA-80A ___ ________

- VA-80B

  VA-282/VA-284, Cntmt Hydrogen Purge Fan VA-80B Suction Valve from Aux Building/recirc Valve ___

  VA-280, Outboard Isolation Valve to Cntmt Hydrogen Purge Fan VA-80B ___ ________

4. Record initial hydrogen concentration and sample point in the CR log. ________

CAUTION

Parts a and b of Step 5 must be performed in sequence and one immediately following the other to avoid a radiological release to Room 59 and possible damage to VA-80A or VA-80B.

5. IF normal startup,
   THEN:

   a. Place the Hydrogen Purge Blower control switch to AFTER START for the unit to be started (AI-100):

      - VA-80A ___
      - VA-80B ___ ________

   b. Place the H_2 Purge Blower Isolation Valve Inbd control switch for the unit to be run to OPEN (AI-43A):

      - HCV-882, VA-80A ___
      - HCV-881, VA-80B ___ ________

Attachment 5B - Supply of Auxiliary Building Air to Containment VA-80A & VA-80B

PROCEDURE (continued) (✓) INITIALS

CAUTION

Parts a and b of Step 6 must be performed in sequence and one immediately following the other to avoid a radiological release to Room 59 and possible damage to VA-80A or VA-80B.

6. IF post accident (SIAS or CIAS tripped) startup, THEN:

   a. Place the Hydrogen Purge Blower Control Switch in PULL TO OVERRIDE for the unit to be started (AI-100):

      - VA-80A ___
      - VA-80B ___ ________

   b. Place the H_2 Purge Blower Isolation Valve Inbd Control Switch for the unit to be run to OVRD (AI-43A):

      - HCV-882, VA-80A ___
      - HCV-881, VA-80B ___ ________

7. When termination is desired:

   a. Place the H_2 Purge Blower Isolation Valve Inbd Control Switches to CLOSE (AI-43A):

      - HCV-882, VA-80A ___
      - HCV-881, VA-80B ___ ________

   b. Place the affected Hydrogen Purge Blower Control Switch to AFTER STOP (AI-100):

      - VA-80A ___
      - VA-80B ___ ________

8. Place HC-745, Post Accident Cntmt Press, to AUTO. ________

9. Log the final hydrogen concentration and sample point in CR log. ________

Attachment 5B - Supply of Auxiliary Building Air to Containment VA-80A & VA-80B

PROCEDURE (continued) (✓) INITIALS

10. Close the following valves for the affected unit (Corr. 26):

- VA-80A

  VA-291/VA279, Cntmt Hydrogen Purge Fan VA-80A Suction Valve from Aux Building/recirc Valve ___

- VA-80B

  VA-282/VA-284, Cntmt Hydrogen Purge Fan VA-80B Suction Valve from Aux Building/recirc Valve ___ ________

11. Lock closed the Cntmt Purge Outboard Isolation Valves to Cntmt Hydrogen Purge Fan:

- VA-289, VA-80A ___
- VA-280, VA-80B ___ ________

____
Ind Verif

Completed by ____ Date/Time ________/_______

Facility: Fort Calhoun	Scenario No: 2005 - 1	Op-Test No. ___________

Examiners:	Operators:
______________________________	______________________________
______________________________	______________________________
______________________________	______________________________

Initial Conditions: 100% Power IC#1

{ Preset malfunctions: COP RCAF2U1 0%, COP RCAF2U2 0%, MFP EHC02, MFP ESF02A OFF, MFP ESF02B OFF}
Place protected equipment tags on FW-6 and FW-10. Cover simulator fidelity items.

Turnover: CCW-Pump, AC-3A and Diesel Driven AFW pump FW-54 are tagged out of service
Maintain Power Operations

Event No.	**Malf No.**	**Event Type***	**Event Description**
1 (3:00)	COP T:F212 160	I - ATC	Letdown flow transmitter fails high – letdown isolates
2 (12:00)	COP T:L903X 0% 60 sec ramp	I - BOP	S/G “A” level transmitter fails low – manual FW flow control required
3 (18:00)	COP NCAPCA1C TRIP	C - BOP	IA Compressor trips, standby does not load
4 (24:00)	MFP CRD06 R1G1 Deenergized	C – ATC	Dropped CEA – T/S Entry
5	N/A	R – ATC N - BOP	TS Required power reduction to 70%
6 (40:00)	MFP EDS04B	C - ATC	Instrument Bus Fails – T/S Entry
7 (50:00)	MSS01A 20% 2 min ramp	M - ALL	Main steam line break inside containment
8	Preset	C - BOP	Turbine fails to trip
9	Preset	I – ATC or BOP	CPHS Fails to Actuate

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.:	Scenario No.: 2005-1	Event No.:1	Page 2 of 9
Event Description: Letdown Flow Transmitter Fails High – letdown isolates			

Time	Position	Applicant's Actions or Behavior
	SRO/ATC BOP	Responds to "Letdown High Flow" and "Intermediate Letdown Press HI-LO" alarms Acknowledges alarms
	ATC	Reviews ARP-CB-1,2,3/A2 B1L and A1L for appropriate actions
	ATC	Ensures HCV-204 has automatically closed. Close TCV-202
	ATC	Determines that Flow instrument FI-212 has failed high
	ATC	If XC-105 10 minute average power computer alarm comes in, verify NI and delta-T power.
	SRO	Directs ATC Operator to override flow interlock and restore letdown flow
	ATC	Place HC-204-1 "High Flow interlock Override switch" in DEFEAT
	ATC	Place HC-101-3, Limiter Bypass switch, in BYPASS
	ATC	Place HIC-101-1/101-2 in MANUAL
	ATC	Close LCV-101-1 and/or LCV-101-2
	ATC	Place PIC-210 in Manual and throttle to 10% open
	ATC	Open HCV-204 and TCV-202
	ATC	Initiate letdown flow using HIC-101-1/101-2 while adjusting PCV-210 to maintain letdown pressure approximately 300 psig. Balance charging and letdown flows.
	ATC	Place HC-101-3 in NORMAL
	ATC	Place HIC-101-1/101-2 and PIC-210 in AUTO
	SRO	Notify Work Week Manager or I&C of failure with FI-212
	ATC	Monitor charging and letdown for proper operation

Op-Test No.:	Scenario No.: 2005-1	Event No.: 2	Page 3 of 9

Event Description: Steam Generator “A” level transmitter fails low – manual FW flow control required

Time	Position	Applicant’s Actions or Behavior
	BOP	Identify and communicate lowering indicated level on chart recorder and increased feedwater flow to the “A” steam generator
	SRO	Direct BOP to take manual control of feedwater
	BOP	Take manual control using FIC-1101 and restore steam generator level
	BOP	Identify LT-903X as the failed instrument
	SRO	Inform Work Week Manager or I&C of failed instrument
	BOP	Monitor and control S/G level
	BOP	If reactor trips, manually throttle feedwater control valve, FIC-1101.

Op-Test No.:	Scenario No.: 2005-1	Event No.: 3	Page 4 of 9

Event Description: Instrument Air compressor "C" trips. Standby (B) does not load.

Time	Position	Applicant's Actions or Behavior
	BOP	Respond to "Air Compressors BKR trip" and "Plant Air Pressure Low Alarm" and possibly "Instrument Air Pressure Low" alarm
	ATC/BOP	Refer to ARP CB-10,11 A11 B3L, and A21 B6U (and possibly B6L)
	BOP	Determine and report instrument air pressure is lowering
	SRO	May enter AOP-17
	SRO	Direct BOP to place additional Air Compressor in Service
	BOP	Start Air Compressor CA-1A.
	BOP	Monitor air pressure and report that air pressure is recovering
	BOP	Direct Water Plant Operator to check out CA-1C trip
	SRO	Report Air Compressor failures to Work Week Manager or Maintenance

Op-Test No.:	Scenario No.: 2005-1 Event No.: 4	Page 5 of 9
Event Description: Dropped CEA – Tech Spec Entry		

Time	Position	Applicant's Actions or Behavior
	ATC	Identify event from "Dropped Rod" and other alarms (CB-4 A20 E6, CB-4 A8 A5L, B1U, B1L, B2L, B5L, C1U, C2U, C5L)
	ATC	Determine that only one rod has dropped (rod #1, grp 4)
	SRO	Enter AOP-02 (CEDM Malfunction)
	SRO	Direct BOP Operator to adjust turbine load to match reactor power.
	BOP	Reduce turbine load to match reactor power using T-cold indication
	SRO	Direct ATC to control pressurizer pressure and level
	ATC	Monitor pressurizer pressure and level
	SRO	Direct ATC Operator to reset rod drop bistables
	ATC	Reset rod drop bistables
	SRO	Notify Work Week Manager or Reactor Engineer
	SRO <C>	Enter Tech Spec Section 2.10.2 Reactor power must be reduced to less than 70% within one hour. The CEA must be realigned or declared inoperable within one hour following the power reduction. If the CEA is declared inoperable, the reactor must be in hot shutdown within an additional 5 hours.
	SRO	Inform ATC and BOP operators that Tech Specs require a power reduction to less than 70% within one hour.
	SRO	Notify energy marketing of the impending power reduction
	BOP	Continue manual control of S/G level.

Op-Test No.:	Scenario No.: 2005-1	Event No.: 5	Page 6 of 9

Event Description: Tech Spec required power reduction to 70%

Time	Position	Applicant's Actions or Behavior
	SRO <C>	Direct ATC and BOP to commence a power reduction using AOP-05 or OP-4
	SRO	Direct ATC operator on method of boration to use. Options are: • Normal boration • Aligning charging pumps suction to SIRWT
	ATC	Begin boration using method directed by SRO
	BOP	Reduce turbine load using potentiometer as needed to control RCS T-cold
	ATC	Monitor and control RCS parameters during power reduction
	BOP	Monitor and control secondary parameters, including manual control of S.G "A" level.
	SRO	Direct the shift chemist to sample the RCS due to the power reduction.
	ATC	May contact the Aux Building Operator to verify sufficient tank capacity for power reduction.

Op-Test No.:	Scenario No.: 2005-1 Event No.: 6	Page 7 of 9
Event Description: Instrument Bus Failure – Tech Spec Entry.		

Time	Position	Applicant's Actions or Behavior
	BOP/ATC	Identify loss of instrument bus "B" due to "Inverter B Trouble" and "Instrument bus B low voltage" alarms and RPS panel indication (dark panel).
	SRO	Enter AOP-16, Section III "Loss of AI-40B"
	SRO	Notify Manager-FCS, Manager-Operations or Supervisor-Operations that RPS trip units will be bypassed
	SRO	Provide RPS trip unit bypass keys to ATC and direct ATC operator to bypass all RPS Channel B Bistable trip units
	ATC	Bypass all RPS Channel B Bistable trip units
	SRO/ATC	Place HC-111/121 "Reactor REG System Channel selector switch in "A"
	ATC	• Ensure at least 1 CCW pump running with pressure at least 60 psig. • Ensure at least one Raw water pump running
	BOP	Ensure instrument air pressure at least 90 psig
	ATC	• Select pressurizer pressure channel "X" using HC-103 • Place HC-101-1 heater cutout switch in channel "X" position • Manually control pressurizer heaters as needed • Ensure pressure being controlled
	SRO	May direct ATC to close both PORV block valves
	ATC	If directed, close both PORV block valves
	ATC	Verify at least one RCP operating
	BOP	Ensure S/G levels within range. Control FW flow as needed.
	BOP	Confirm containment integrity: • Containment sump • Radiation monitors • Containment pressure • Containment temperature
	SRO	Refer to listed Tech specs and enter tech spec 2.7 One instrument bus may be inoperable for up to 8 hours as long as RPS and ESF functions on all 3 of the other instrument busses remain operable. If not repaired, the plant must be in hot shutdown within the next 12 hours.
	SRO	Notify Work Week Manager or Maintenance of the failure.

Op-Test No.:	Scenario No.: 2005-1 Event No.: 7, 8	Page 8 of 9
Event Description: Main Steam Line Break inside Containment, turbine fails to trip		

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Identify and communicate lowering RCS temperature and lowering primary and secondary pressures.
	SRO	May direct ATC to trip the reactor
	ATC	If directed, trip the reactor
	ATC	Perform Standard Post-Trip Actions: • Verify control rod insertion, power lowering, negative startup rate.
	BOP<C>	• Verify turbine and generator trip. Determine that turbine did not trip Attempt manual turbine trip then place both EHC pumps in pull-to lock
	BOP	• Verify electrical status – 4160, D/G, instrument power, 125V DC • Verify Instrument air status
	ATC	• Verify CCW and Raw water status • Verify RCS inventory control • Verify RCS pressure control • Verify core heat removal
	BOP	• Verify S/G feed -Manually throttle FCV-1101 • Verify S/G pressure and T-cold • Verify containment conditions
	ATC	Verify Emergency Boration Flow
	SRO	Diagnose event and enter EOP-05

Op-Test No.:	Scenario No.: 2005-1	Event No.: 9	Page 9 of 9

Event Description: CPHS fails to actuate

Time	Position	Applicant's Actions or Behavior
	SRO	• Direct chemist to sample both S/G's • Direct BOP to verify proper S/G isolation following SGIS signal
	BOP	Verify SGIS • MSIV's and bypass valves • FW reg and bypass valves • FW reg block valves • FW header isolation valves
	ATC/BOP	Monitor containment pressure and determine that CPHS did not actuate at setpoint
	SRO	Direct ATC or BOP to manually actuate CPHS
	ATC/BOP <C>	Manually actuate CPHS
	ATC	Verify ECCS and Containment Spray flows
	ATC <C>	When RCS pressure reaches 1350 psia, ensure no more than one RCP operating in each loop within 5 minutes
	SRO	Direct BOP to establish steam flow from intact S/G prior to dryout of faulted steam generator
	BOP <C>	Establish steam flow from intact S/G prior to dryout of faulted steam generator
	ATC	Monitor subcooling and pressurizer level and report when "stop and throttle" criteria are met
	SRO	Direct ATC to throttle and/or stop HPSI flow
	ATC <C>	Throttle and/or stop HPSI flow
	SRO	Direct ATC to monitor and control RCS pressure to maintain subcooling between 20° and 200°F.
	ATC	Monitor and control RCS pressure to maintain subcooling between 20° and 200°F.
		SCENARIO ENDS when "stop and throttle" criteria have been met and HPSI flow has been reduced.

Facility: Fort Calhoun	Scenario No: 2005 - 2	Op-Test No. ____________
Examiners: ____________ ____________ ____________	Operators: ____________ ____________ ____________	

Initial Conditions: 100% Power (IC#1)

{PRESET MFP CRD05I untrip, MFP CRD05H untrip, COP T:R057 69, Start CH-1B, Stop CH-1C)
Hang protected equipment tags on FW-6 and FW-10.

Turnover: CCW-Pump, AC-3A and Diesel Driven AFW pump FW-54 are tagged out of service
Maintain Power Operations

Event No.	Malf No.	Event Type*	Event Description
1 (3:00)	MFP NIS04C	I - ATC	Power Range NI Channel “C” Fails – T/S entry
2 (10:00)	COP T:L906X 55%	I - BOP	S/G “B” level transmitter fails to 55%
3 (16:00)	COP NBWPAC9 A trip	C - BOP	Bearing Water Pump AC-9A Trips
4 (20:00)	T:T122H2 665°F	I -ATC	RCS T-hot fails – T/S entry
5 (30:00)	MFP CVC16B	C - ATC	Charging Pump CH-1B degraded performance
6 (40:00)	MFP SGN01A 15% 120s ramp	M - ALL	Steam Generator Tube Rupture
7	Preset	R - ATC	2 CEAs fail to insert – Emergency Boration Required
8	Preset	I - BOP	RM-057 (Condenser offgas radiation monitor) fails “as is” (Aux Steam Isolation valve, RC-978, does not get close signal)

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.:	Scenario No.: 2005-2	Event No.: 1	Page 2 of 8

Event Description: Power range NI Channel C Fails – Tech Spec Entry.

Time	Position	Applicant's Actions or Behavior
	ATC	Identify the failure from the "Nuclear Instrumentation Inoperable" and other alarms (CB-4 A20 A1, A5, B1, B6, B7, D5, E4, E6) May enter ARP
	SRO	Enter AOP-15
<C>	SRO	Enter Technical Specification 2.15 RPS channel "C" trip units 1, 9 and 12 must be placed in bypass within 1 hour. 48 hour LCO for repair of the channel, otherwise channels 1, 9 and 12 must be placed in the tripped condition.
	SRO	Notify Manager – FCS, Manager – Operations or Supervisor – Operation of RPS trip unit bypass
	SRO	Obtain the keys and direct the ATC operator to place the 1, 9 and 12 trip units on channel "C" in bypass
	ATC	Bypass trip units 1, 9 and 12 on RPS channel "C"
	ATC/BOP	Enter channel bypass information in control room log

Op-Test No.:	Scenario No.: 2005-2	Event No.: 2	Page 3 of 8

Event Description: Steam Generator "B" level transmitter fails to 55%.

Time	Position	Applicant's Actions or Behavior
	BOP	Respond to "S/G-2A level low alarm"
	BOP	Identify and communicate lowering FW flows and level in S/G "B"
	SRO	Direct BOP to take manual control of feedwater (FC-1102 in manual)
	BOP	Take manual control and restore feedwater level before level (Respond to RC-2B level high alarm if it occurs, CB-4 A8 C5U)
	BOP	Identify FT-906X as the failed instrument
	SRO	Notify Work Week Manager or I&C of the instrument failure
	BOP	Continue to monitor and control S/G levels
	BOP	If the reactor trips, manually throttle FIC-1102

Op-Test No.:	Scenario No.: 2005-2	Event No.: 3	Page 4 of 8

Event Description: Bearing water pump, AC-9A, trips.

Time	Position	Applicant's Actions or Behavior
	BOP	Respond to "Cooling water Pressure Low" alarm (CB-10,11 A11 B6U)
	BOP	Report that AC-9A has tripped
	SRO	Direct BOP to start AC-9B
	BOP<C>	Start AC-9B
	SRO	Direct BOP to verify status of Instrument Air System
	BOP	Ensure that air compressor is operating and instrument air pressure normal or restoring
	SRO	May enter AOP-20

Op-Test No.:	Scenario No.: 2005-2	Event No.: 4	Page 5 of 8

Event Description: RCS Hot Leg RTD fails – Tech Spec Entry

Time	Position	Applicant's Actions or Behavior
	ATC	Responds to numerous alarms on CB-4, panel A-20 and CB-1,2,3, panel A4. Reports that trip units 1, 9 and 12 on channel "A" are tripped.
	ATC/BOP	Reviews ARP
	ATC	Checks power, pressure and temperature indications and determines that the alarm is caused by failed T-hot channel (A/T122H)
<C>	SRO	Enters Tech Spec 2.15 Because trip units 1, 9 and 12 are already bypassed on RPS channel "C". The 1, 9 and 12 trip units on channel "A" must be placed in the tripped condition within one hour. One of the channels must be repaired within 48 hours or else the plant must be placed in hot shutdown within the following 12 hours.
	SRO	Either direct the ATC to use the Channel "A" Power Trip Test Interlock to place the trip units in the tripped condition by placing the test enable switch in ENABLE or else notify I&C to trip the trip units with one hour.
	ATC	If directed, use the channel "A" PTTI to trip the trip units on channel "A" by placing the test enable switch in ENABLE
	SRO	With NI channel "C" trip units 1, 9 and 12 bypassed and Delta-T channel "A" trip units tripped, power must be reduced to less than 70% (no time limit)
	SRO	Notifies Plant or Operations Management and the Work Week Manager or I&C of the failure

Op-Test No.:	Scenario No.: 2005-2	Event No.: 5	Page 6 of 8
Event Description: Charging pump, CH-1B, degraded performance. Tech. Spec Entry			

Time	Position	Applicant's Actions or Behavior
	ATC	Respond to "Charging Low Flow" alarm (CB-1,2,3 A2 A6L)
	ATC	Identifies and reports oscillations in charging flow indication
	SRO	Directs ATC to start another charging pump
	ATC	Starts additional charging pump and monitors charging and letdown
	SRO	Directs ATC to have EONA check out charging pump. (EONA reports flow in the discharge to suction relief valve)
	ATC	Reports open relief valve to SRO
	SRO	Directs ATC to shutdown charging pump
	ATC	Shuts down charging pump
	SRO <C>	Refers to Tech Spec 2.2.4 and Enters Tech Spec 2.15 paragraph 5 for CH-1B 7 day LCO due to charging pump CH-1B controls on alternate shutdown panel

Op-Test No.:	Scenario No.: 2005-2	Event No.: 6, 7	Page 7 of 8
Event Description: Steam Generator Tube Rupture, 2 CEAs fail to insert			

Time	Position	Applicant's Actions or Behavior
	ATC	Identify and report RCS inventory loss
	ATC/BOP	Report rising radiation levels on RM-054A
	SRO	May direct manual reactor trip
	ATC	If directed, manually trip reactor
	ATC<C>	Perform Standard Post-Trip Actions: Verify control rod insertion, power lowering, negative startup rate. Determine that 2 CEAs did not insert and begin Emergency Boration: • Ensure FCV-269X and Y are closed • Open HCV-268, HCV-265 and HCV-258 • Start both Boric Acid Pumps • Start all available charging pumps • Close LCV-218-2 • Ensure LCV-218-3, HCV-257 and HCV-264 are closed
	BOP	• Verify turbine and generator trip • Verify electrical status – 4160, D/G, instrument power, 125V DC • Verify Instrument air status
	ATC	• Verify CCW and Raw water status • Verify RCS inventory control • Verify RCS pressure control • Verify core heat removal
	BOP	• Verify S/G feed -Manually throttle FCV-1102 • Verify S/G pressure and T-cold • Verify containment conditions
	SRO	Diagnose event and enter EOP-04

Op-Test No.:	Scenario No.: 2005-2	Event No.: 8	Page 8 of 8
Event Description: Condenser Offgas Radiation Monitor, RM-057, fails as is (Aux Steam Isolation valve, RC-978, does not get close signal)			

Time	Position	Applicant's Actions or Behavior
	BOP	Determine that RCV-978 did not close
	SRO	Direct BOP to close RCV-978
	BOP<C>	Close RCV-978
	SRO	Direct RCS cooldown – T-hot less than 510°F
	BOP	Cooldown RCS T-hot to less than 510°F
	ATC	Identify and verify PPLS actuation
	ATC <C>	When RCS pressure reaches 1350 psia, ensure no more than 1 RCP operating in each loop
	SRO	Request Chemistry to perform "Rapid Activity Analysis"
	SRO/BOP	Identify most affected S/G as "A"
	SRO	Direct BOP to isolate S/G "A"
	BOP	Isolate S/G "A". Close the following • HCV-1041A (A MSIV) • HCV-1041C (A MSIV bypass) • MS-291 (atmospheric steam safety valve) • FCV-1101 (FW reg valve) • HCV-1105 (FW reg bypass valve) • HCV-1386 (FW header isolation) • HCV-1103 (FW reg block valve) • HCV-1388A&B (blowdown isolation valves) • HCV-1107A&B (AFW isolation) • YCV-1045A (steam supply to AFW pump) Direct the turbine building to close: • MS-298 (MSIV packing leakoff) • FW-266 and FW-268
	SRO	Direct ATC to maintain RCS pressure less than 1000 psia and within 50 psi of ruptured S/G
	ATC	Control RCS pressure less than 1000 psia and within 50 psi or ruptured S/G
		SCENARIO ENDS with S/G "A" isolated and RCS pressure reduction in progress

Facility: Fort Calhoun	Scenario No: 2005 - 3	Op-Test No. ____________
Examiners: ______________ ______________ ______________	Operators: ______________ ______________ ______________	

Initial Conditions: 49% Power (IC#4)

{PRESET RFP CWS10N CLOSED} {Power 1A1 and 1A2 from 22KV, S/D CH-1A)
Protected equipment tag on FW-5B
RunScreens file

Turnover: Heater Drain pumps FW- 5A and FW-5C are tagged out of service. Power held at 50% pending repair of at least one of the heater drain pumps. PCMINT is not available.

Event No.	Malf No.	Event Type*	Event Description
1 (3:00)	MFP DSG06A 100%	C – ATC or BOP	D/G #1 Radiator Leak – T/S Entry
2 (12:00)	COP T:P910 1000 psi	I - BOP	PT-910 Fails High
3 (18:00)	COP T:T2897 50°F	I - ATC	Letdown heat exchanger temperature transmitter fails low
4 (25:00)	MFP SWD02B	C - BOP	Loss of 161 KV – T/S Entry
5 (35:00)	COP T:P103Y 2556 90 sec ramp	I - ATC	Pressurizer pressure transmitter PT-103Y fails high
6 (40:00)	COP T: L906Y 100% 60 sec ramp	I - BOP	S/G "B" level transmitter LT-906Y fails high (Manual control using Aux controller required)
7 (45:00)	MFP RWS01B 25%	C - ATC	Raw Water header leak
8 (55:00)	MFP RCS01C 5%	M - ALL	LOCA with Loss of offsite power
9	Preset	C-BOP	Circulating Water Pump Breaker does not open so the D/G breaker does not close.

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.:	Scenario No.: 2005-3	Event No.: 1	Page 2 of 9

Event Description: Diesel Generator #1 Radiator Water Leak – Tech Spec Entry

Time	Position	Applicant's Actions or Behavior
	ATC	Identify event from "Diesel Trouble" alarm and low water tank level light (takes about two minutes after malfunction initiated)
	ATC/BOP	Refer to ARP AI30A A30 A3U LS-4
	SRO	Direct EONT to check diesel. (EONT reports water on the D/G room floor)
	SRO	Direct ATC to place D/G 1 mode selecter switch in "OFF-AUTO"
	ATC	Place D/G 1 mode selecter switch in "OFF-AUTO"
	SRO	Enter Tech Spec 2.7 D/G-1 must be restored to operable within seven days.
	SRO	Notify Work Week Manager or Maintenance of Diesel problem

Op-Test No.:	Scenario No.: 2005-3	Event No.: 2	Page 3 of 9

Event Description: Steam Header Pressure Transmitter, PT-910, Fails High causing turbine bypass valve to open.

Time	Position	Applicant's Actions or Behavior
	BOP	Identify rapid decrease in RCS T-cold (VOPT ANN will alarm if uncorrected)
	ATC/BOP	If VOPT annunciator alarms, refer to ARP.
	BOP	Determine cause as turbine bypass valve, PCV-910, being open (red light on CB-1,2,3)
	SRO	Direct BOP to take manual control of PCV-910 and close it.
	BOP	Monitor RCS T-cold
	ATC	Monitor and control RCS parameters
	SRO	Notify Work Week Manager or I&C of the failure of PT-910.

Op-Test No.:	Scenario No.: 2005-3	Event No.: 3	Page 4 of 9

Event Description: Letdown heat exchanger temperature transmitter, T-2897, fails low reducing CCW flow to letdown heat exchanger.

Time	Position	Applicant's Actions or Behavior
	ATC	Respond to "Letdown Heat Exchanger Tube Outlet Temp HI" alarm
	BOP/ATC	Refer to ARP
	ATC	Determine that TCV-211-2 has repositioned to bypass ion exchangers
	ATC	Determine that high letdown temperature was caused by reduced CCW flow to letdown heat exchanger due to closure of TCV-2897
	SRO	Direct ATC to manually control CCW flow to letdown heat exchanger using TCV-2897
	ATC	Manually control TCV-2897 to restore letdown temperature
	SRO	May direct ATC to reposition TCV-211-2 and maintain 100°F – 120°F
	ATC	Reposition TCV-211-2 if directed
	SRO	Report failure of T-2897 to Work Week Manager or I&C

Op-Test No.:	Scenario No.: 2005-3	Event No.: 4	Page 5 of 9

Event Description: Loss of 161 KV offsite power to plant – Tech Spec Entry

Time	Position	Applicant's Actions or Behavior
	BOP	Identify loss of 161 KV from numerous alarms on CB-20. (CB-20 A15 A1, A2, A3) (CB-20 A17 A2, C4, D2) Determine and report that busses 1A3 and 1A4 have fast transferred and are powered.
	SRO	Enter AOP-31, section II "All 4160 busses fed from 22 KV" Direct BOP to verify 1 FW pump, 1 Condensate pump and 1Heater drain pump operating
	BOP	Verify 1 FW pump, 1 Condensate pump and 1, Heater drain pump operating
	SRO	Direct BOP to verify 480 bus voltages greater than 430 volts
	BOP	Verify voltages
	SRO	Direct BOP to match flags on breakers 110, 111, 1A31, 1A33, 1A42, 1A44
	BOP	Match flags on breakers 110, 111, 1A31, 1A33, 1A42, 1A44 (step 5 of AOP-31)
	SRO	Direct that signs be placed at entrances to switchgear rooms Review EOP-02, EOP-07 and EOP-20
	SRO <C>	Enter Tech Spec 2.7 Due to the loss of 161 KV and D/G-1 being inoperable, Tech Spec 2.0.1 must be entered which requires that the plant be placed in hot shutdown within 6 hours. However, taking the main generator off-line will result a loss of offsite power. The NRC Operations center must be notified within four hours due to the loss of 161 KV
	SRO	Report situation to station management.

Op-Test No.:	Scenario No.: 2005-3	Event No.: 5	Page 6 of 9
Event Description: Pressurizer Pressure Transmitter PT-103Y fails high			

Time	Position	Applicant's Actions or Behavior
	ATC	Respond to "Pressurizer Pressure Off-Normal HI/LO Channel Y Alarm"
	ATC	Identify and report high indication on controlling channel and lowering pressure on other channel
	ATC/BOP	Refer to ARP
	SRO	Direct ATC to transfer pressurizer pressure control to channel "X" or take manual control of pressurizer pressure
	ATC	Transfer pressurizer pressure control to channel "X" or take manual control of pressurizer pressure, as directed
	ATC	Monitor and control pressurizer pressure

Op-Test No.:	Scenario No.: 2005-3	Event No.: 6	Page 7 of 9

Event Description: Steam Generator “B” Level Transmitter LT:906Y fails high

Time	Position	Applicant’s Actions or Behavior
	BOP	Responds to “Feedwater Control Steam Generator RC-2B Level HI” alarm
	ATC/BOP	Refers to ARP-CB-4/A8
	BOP	Determines S/G level and trend using LR-906X
	BOP	Identifies and reports that FCV-1102 has closed
	SRO	Directs BOP to reopen FCV-1102 and manually control FW flow
	BOP <C>	Takes manual control of FCV-1102 Auxiliary controller and opens valve as needed to control S/G level.
	SRO	Notifies Work Week Manager or I&C of failure

Op-Test No.:	Scenario No.: 2005-3	Event No.: 7	Page 8 of 9

Event Description: Raw Water Header Leak

Time	Position	Applicant's Actions or Behavior
	ATC	Respond to "Raw Water Pump Room Level Hi" Alarm CB-1,2,3 A2 D6U, D6L
	SRO	Direct Water Plant Operator to check out Raw Water pumps. (Water Plant operator reports water leak downstream of AC-10B's discharge valve, HCV-2851) May enter AOP-18.
	SRO	Direct ATC to trip Raw Water pump, AC-10B. May direct ATC to stop all Raw Water Pumps
	ATC	Stop Raw Water pumps as directed. Ensure pump discharge vales close Knowledge "Raw Water Supply Header Press LO Alarms", if received
	SRO/ATC	Verify CCW temperature is less than or equal to 110°F
	SRO	Direct ATC to isolate the rupture
	ATC<C>	Isolate the rupture by closing: • HCV-2874A/B • HCV-2875A/B
	SRO	Direct the ATC to start (or ensure running) at least one Raw Water Pump other than AC-10B
	ATC	Start raw water Pump(s) as directed
	ATC	Verify "Raw Water Supply Header Pressure LO" alarms have cleared
	SRO <C>	Enter Tech. Spec 2.4 for Raw Water pump AC-10B being inoperable. With D/G-1 inoperable, only one Raw Water would operate in the event of a loss offsite power.
	SRO	Report pipe rupture to Work Week Manager or Maintenance

Op-Test No.:	Scenario No.: 2005-3	Event No.: 8, 9	Page 9 of 9

Event Description: LOCA with a loss of all offsite power, Circulating Water pump breaker fails to open keeping D/G breaker from closing: Station Blackout

Time	Position	Applicant's Actions or Behavior
	ATC	Identify and communicate lowering pressurizer level and pressure
	SRO	May direct ATC to trip the reactor
	ATC	Manually trip the reactor
	ATC	Perform Standard Post-Trip Actions: • Verify control rod insertion, power lowering, negative startup rate.
	BOP	• Verify turbine and generator trip.
	BOP	• Verify electrical status – 4160, D/G, instrument power, 125V DC Report that all 4160V busses are deenergized. D/G #2 is running at 900 RPM but it's breaker has not closed • Verify Instrument air status
	ATC	• Verify CCW and Raw water status • Verify RCS inventory control • Verify RCS pressure control • Verify core heat removal
	BOP	• Verify S/G feed • Verify S/G pressure and T-cold • Verify containment conditions
	ATC	Report PPLS actuated but no SI flow
	BOP <C>	Report that CW-1C breaker failed to trip. (This prevents D/G-2 breaker from closing)
	SRO	Direct EONT to manually trip the breaker for CW-1C (NOTE: EONT will trip breaker 2.5 minutes after being directed)
	SRO	If bus 1A4 is repowered, then enter EOP-03. If bus 1A4 is not powered, then enter EOP-20 and go to MVA-AC
	SRO	When D/G-2 output breaker closes, Direct BOP to verify bus 1A4 voltage
	SRO	Direct ATC and BOP to ensure the following: • CCW and Raw Water Pumps operating • HPSI, LPSI and Containment Spray Pumps Operating • Adequate HPSI and Containment Spray flow • Containment Cooling • Reactor Vessel Level
	ATC/BOP	Ensure the above parameters as directed
		SCENARIO ENDS with bus 1A4 energized and adequate SI flow being injected into RCS

Facility: Fort Calhoun	Scenario No: 2005 – 4 (spare)	Op-Test No. ____________

Examiners:	Operators:
____________________	____________________
____________________	____________________
____________________	____________________

Initial Conditions: 49% Power

{Preset MSS02F 100% E1 30 sec delay} { Place 1A1 and 1A2 on 22 KV, S/D CH-1A}
Protected equipment tags on FW-5B

Turnover: Heater Drain pumps FW- 5A and FW-5C are tagged out of service. Power held at 50% pending repair of at least one of the heater drain pumps. PCMINT is not available.

Event No.	Malf No.	Event Type*	Event Description
1 (3:00)	COP JLB218LL Fail_set	I - ATC	VCT Level Transmitter Fails Low
2 (8:00)	COP T:L903X 100% 45 sec ramp	I - BOP	S/G "A" Level transmitter fails high
3 (15:00)	COP T:F114YA 0	I - ATC	RCS Flow transmitter failure – T/S Entry
4 (22:00)	MFP AFW05A	I - BOP	Inadvertent AFAS actuation – T/S Entry
5 (30:00)	COP RCAP 849A&B 0%	C - ATC	Instrument air to containment isolates
6 (40:00)	MFP CND01 30% 300 sec ramp	C - BOP	Loss of condenser vacuum
7	N/A	M - ALL	Reactor Trip – no steam dump and bypass valves
8	Preset	C - BOP	S/G safety valve sticks open

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor

Op-Test No.: Scenario No.: 2005-4 Event No.: 1	Page 2 of 9
Event Description: VCT Level Transmitter fails low CB-1,2,3 A2 B2L	

Time	Position	Applicant's Actions or Behavior
	ATC	Respond to "Volume Control Tank Level LO-LO" alarm
	ATC/BOP	Refer to ARP-CB-1,2,3/A2 B2L
	SRO	Direct ATC to check VCT level
	ATC	Report that level on channel LIC-219 is normal
	ATC	Report that charging pump suction swapped to SIRWT
	SRO/ATC	Determine that level switch failed
	SRO	Direct ATC to open LCV-218-2 and close LCV-218-3
	ATC<C>	Open LCV-218-2 and close LCV-218-3
	ATC	Monitor and control primary parameters
	BOP	Monitor and control secondary parameters
	ATC	Optional: may place off-normal placards on LCV-218-2 and LCV-218-3 switches
	SRO	Notify Work Week Manager or I&C of the level switch failure

Op-Test No.:	Scenario No.: 2005-4	Event No.: 2	Page 3 of 9
Event Description: Steam Generator "A" level transmitter 903X fails high.			

Time	Position	Applicant's Actions or Behavior
	BOP	Identify and communicate lowering FW flow and level in S/G "A"
	SRO	Direct BOP to take manual control of feedwater flow
	BOP	Take manual control and restore feedwater flow.
	BOP	Identify LT-903X as the failed instrument
	SRO	Inform Work Week Manager or I&C of the failure of LT-903X
	BOP	Continue to monitor and control S/G level.

Op-Test No.:	Scenario No.: 2005-4	Event No.: 3	Page 4 of 9

Event Description: RCS Flow transmitter failure. Tech Spec entry.

Time	Position	Applicant's Actions or Behavior
	ATC	Responds to "Low Flow Reactor Coolant Channel" trip and pretrip alarms
	ATC/BOP	Refer to ARP-CB-4/A20 A2,B2
	ATC	Verify RCP amps
	ATC	Determines that reactor coolant loop differential pressure transmitter A/114Y on S/G "B" has failed low
	SRO	Enters Tech Spec 2.15 RCS Low Flow trip unit on RPS channel A must be tripped or bypassed within one hour
	SRO	Notifies Manager-FCS, Manager-OPS or Supervisor-OPS that trip unit will be bypassed
	SRO	Obtains key and directs ATC to bypass trip unit #3 (low RCS flow trip) on RPS channel "A"
	ATC	Places "A" Low Flow Trip Unit #3 in bypass
	SRO	Notifies Work Week Manager or I&C of instrument failure

Op-Test No.:	Scenario No.: 2005-4	Event No.:4	Page 5 of 9
Event Description: Inadvertent AFAS actuation – Tech Spec Entry			

Time	Position	Applicant's Actions or Behavior
	BOP	Identify AFAS from numerous alarms A66A C4L, A66B C3M&U
	SRO	Enter AOP-28
	SRO	Direct BOP to isolate AFW to the steam generators
	BOP	Close HCV-1107A&B
	SRO	Direct EONT to bypass the affected AFAS channel (RFP ESF10A bypass)
	SRO	Direct the BOP to secure the AFW pumps
	BOP	Override and Close YCV-1045, YCV-1045A and YCV-1045B to stop FW-10 Place FW-6 switch in pull-to-lock
	SRO <C>	Refer to Tech Specs 2.5, 2.15 and 2.01 Plant is in a 6 hour LCO with no operable AFW pumps
		(Note: if requested, all S/G level indication on AI-179 is reading 80-81%)

Op-Test No.:	Scenario No.: 2005-4	Event No.: 5	Page 6 of 9

Event Description: Instrument Air Containment Isolation valve fails closed.

Time	Position	Applicant's Actions or Behavior
	ATC/BOP	Respond to various alarms, loss of letdown flow and S/G blowdown flow (CB-1,2,3 A1 A6U, A6L, B6U, B6L) (CB-1,2,3 A2 B5U, B5L) (CB-10,11 A21 B2L)
	ATC/BOP	Determine that letdown and blowdown low flow due to closure of the instrument air containment isolation valves
	SRO	May enter AOP-17 or refer to AOP-17, attachment "A" for a list of valves affected
	SRO	Direct ATC to manually control charging pumps to control pressurizer level
	ATC	Manually control charging pump operation as needed
	SRO	Dispatch EONA to check out HCV-1849B
	SRO	Notify Work Week Manager or Maintenance of the problem

Op-Test No.:	Scenario No.: 2005-4	Event No.: 6, 7	Page 7 of 9

Event Description: Loss of Condenser Vacuum, Reactor Trip – no steam dump and bypass valves

Time	Position	Applicant's Actions or Behavior
	BOP	Identifies lowering condenser vacuum from "Condenser A/B pressure low" alarm and/or vacuum indication
	ATC/BOP	Refers to ARP-CB-10,11/A9 A4U, A4L, B6L
	SRO	Dispatches EONT and/or water plant operator to check vacuum pump operation and then look for vacuum leaks
	BOP	Ensures backup vacuum pump started
	SRO	Enters AOP-26
	SRO	Directs plant shutdown using AOP-05 or OP-4
	ATC	Begins boration of the RCS using method directed by SRO Must ensure charging pump is running
	BOP	Reduces turbine load as needed to control RCS T-cold
	SRO	May direct manual reactor trip
	ATC	Trip reactor if directed
	ATC	Perform Standard Post-Trip Actions: • Verify control rod insertion, power lowering, negative startup rate.
	BOP	• Verify turbine and generator trip. • Verify electrical status – 4160, D/G, instrument power, 125V DC • Verify Instrument air status
	ATC	• Verify CCW and Raw water status • Verify RCS inventory control • Verify RCS pressure control • Verify core heat removal
	BOP	• Verify S/G feed -Manually throttle FCV-1102 • Verify S/G pressure and T-cold • Verify containment conditions

Op-Test No.:	Scenario No.: 2005-4	Event No.: 8	Page 8 of 9

Event Description: Steam Generator Safety Valve sticks open

Time	Position	Applicant's Actions or Behavior
	ATC	Identify lowering pressurizer pressure
	BOP	Identify lowering T-cold and S/G pressure
	SRO	Enter EOP-05
	SRO	Provide EOP-05 floating steps to ATC and BOP
	ATC	Report approach to PPLS
	SRO	Direct ATC to verify proper operation of ESF
	ATC	Ensure proper safeguards operation and adequate SI flow
	ATC	If RCS pressure lowers to 1350 psia, ensure no more than one RCP operating in each loop
	ATC <C>	Ensure adequate emergency boration. Will have to reposition LCV-218-2 and LCV-218-3
	SRO/BOP	Identify affected S/G "B"
	SRO	Direct BOP to isolate affected S/G
	BOP	Isolate affected S/G: Close the following • HCV-1042A (B MSIV) • HCV-1042C (B MSIV bypass) • MS-292 (atmospheric steam safety valve) • FCV-1102 (FW reg valve) • HCV-1106 (FW reg bypass valve) • HCV-1385 (FW header isolation) • HCV-1104 (FW reg block valve) • HCV-1387A&B (blowdown isolation valves) • HCV-1108A&B (AFW isolation) • MS-298 (MSIV packing leakoff)
	BOP	Establish FW flow to good S/G. May need to manually start AFW pump and go to override on valves
	SRO	Direct BOP to establish steam flow from good S/G prior to dryout of affected S/G

Op-Test No.: Scenario No.: 2005-4 Event No.: 8 cont Page 9 of 9

Event Description: Steam Generator Safety Valve sticks open

Time	Position	Applicant's Actions or Behavior
	BOP <C>	Begins steaming good S/G prior to dryout of affected S/G
	ATC	Report when "HPSI stop and throttle" criteria are met
	SRO	Direct ATC to perform "HPSI Stop and Throttle"
	ATC <C>	Throttle HPSI loop injection valves and/or stop HPSI pumps as needed Ensure HPSI "Stop and Throttle" criteria continue to be met (20°F subcooling)
		SCENARIO ENDS with HPSI stop and throttle and RCS pressure and temperature under control