Fort Calhoun Station – Operations Training

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: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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INITIATING CUE: **The plant is operating at 100% power with all CEAs fully withdrawn.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	Provide a copy of TDB-V.9
2	Obtain a copy of TDB section II, Reactivity Curves.	Obtains copy of TDB-II
3	Determines part I of TDB procedure should be used.	Performs calculation using part 1.
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]
5	Determines if SDM is adequate	Shutdown margin is adequate

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INITIATING CUE: **The plant is operating at 100% power with all CEAs fully withdrawn.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.

   _____% Δp 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 = _____%△ρ + _____%△ρ - _____%△ρ - _____%△ρ = _____%△ρ 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 % Δp
   6

   TDB Figure used: II.B.2.b

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 % 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.

   N/A % 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.

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 (9.f) %Δρ + 1.757 (8) %Δρ - 4.897 (7.c) %Δρ - 3.33 (6) %Δρ = −4.02 (10) %Δρ Total

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

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

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: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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.

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1	Obtains a copy of EOP/AOP attachments.	Locates EOP/AOP attachments
2	Refers to the proper attachment	Refers to the second page of Attachment 26 (EOP/AOP attachments page 149 of 150)
3	Determines required HPSI flow.	Determines that 132 gpm HPSI flow is the minimum required to remove decay heat [values between128 – 136 gpm are acceptable]

Termination Criteria: **Candidate has determined HPSI flow required to remove decay heat.**

JPM No: AJPM-RO-CO-2

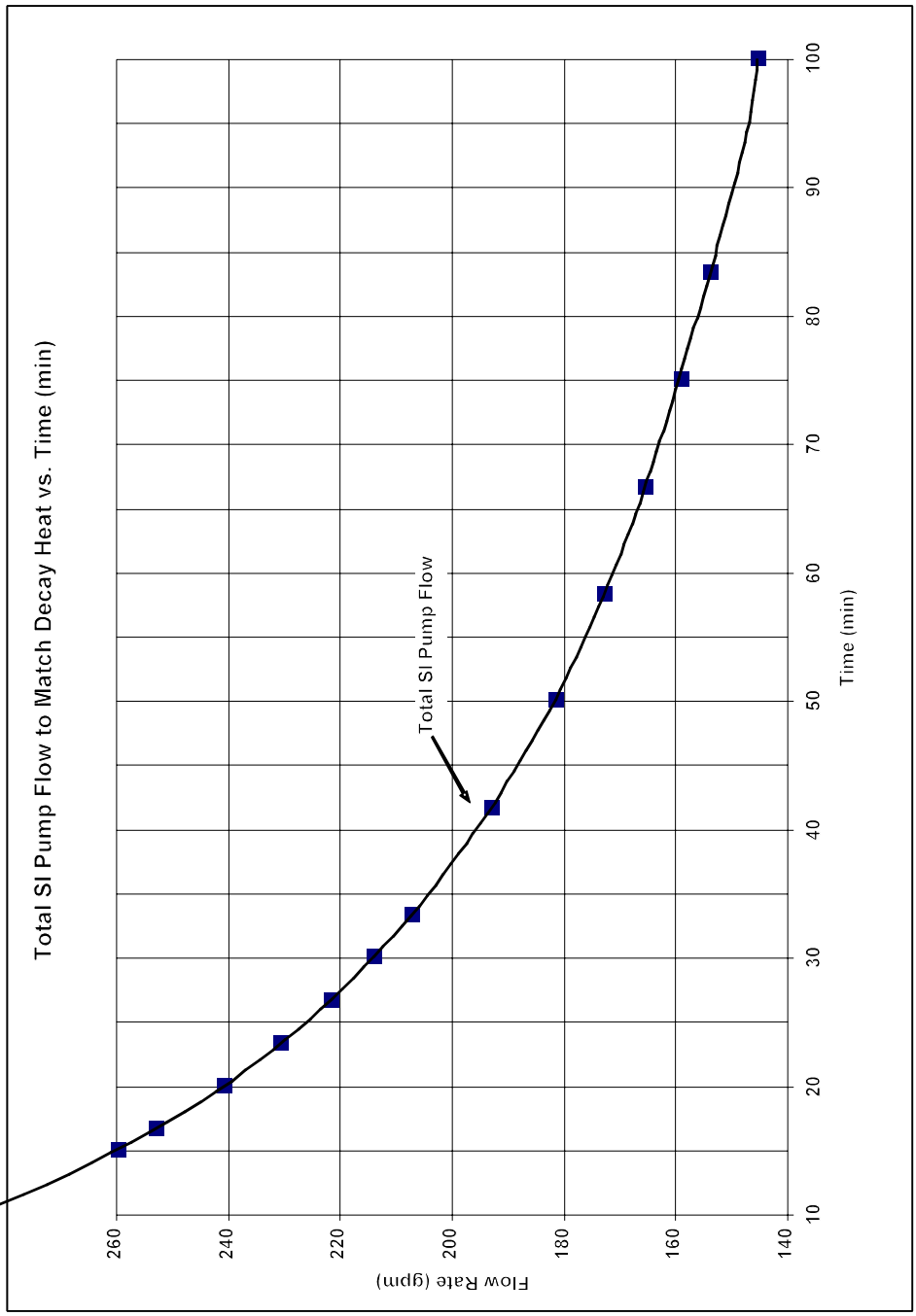
INITIATING CUE: **Following a loss of coolant accident, containment sump blockage has restricted the available HPSI and Containment Spray flow. Efforts are underway to provide makeup water to the SIRWT. The CRS has directed you to determine the minimum HPSI flow required to remove decay heat.**

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

START

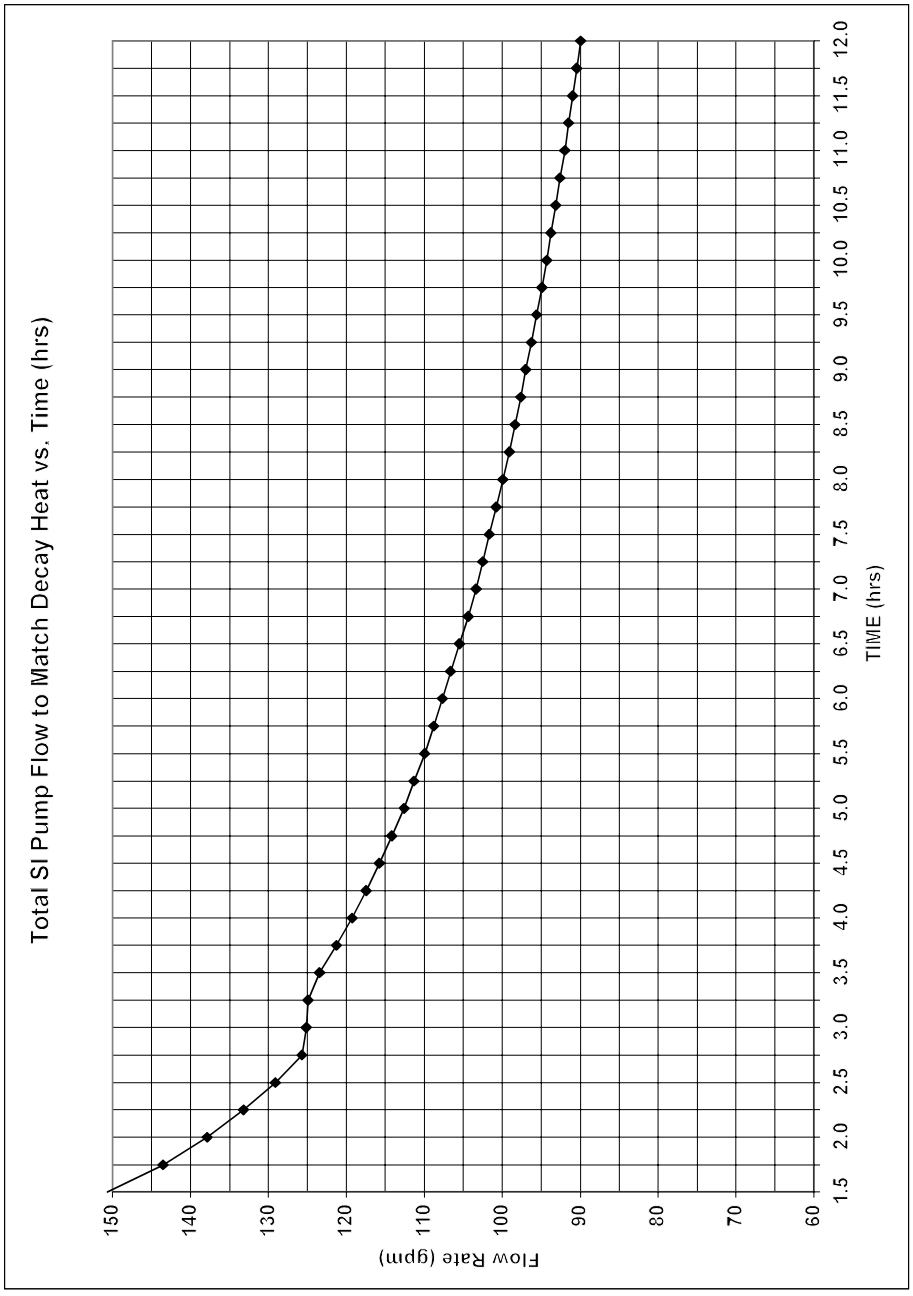
Attachment 26

Total SI Pump Flow to Match Decay Heat vs. Time



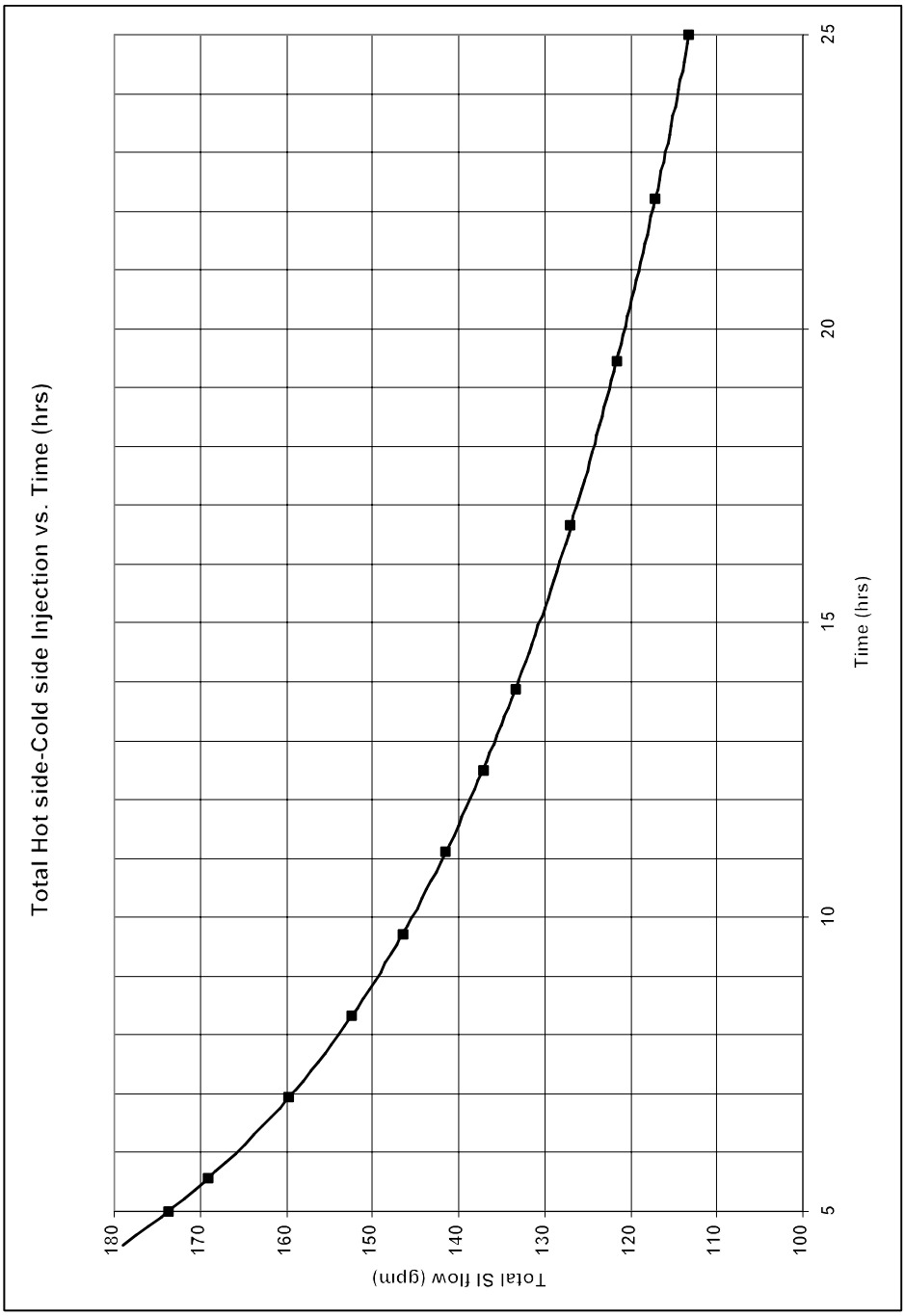
Attachment 26

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: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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 the borated water source(s) and 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-1A and SI-2C.
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

JPM No: AJPM-RO-EC-1

JPM Title: Boration paths with equipment out of service

STEP	ELEMENT	STANDARD
		can be a source by itself, but together they can count as one source.
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.
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 AND CH-11B through CH-1B 2. SIRWT through SI-2B

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 the borated water source(s) and pump for each boration path.

START

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: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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
2	Determine Radiological Conditions in Room 13.	Checks survey maps and/or discusses radiological conditions with RP personnel.
3	Obtains Dosimetry	Verify TLD attached to security badge. Obtain EAD.
4	Sign in on appropriate RWP	Insert EAD in reader. Scan PID and RWP number
5	Enter RCA	RCA entered
6	Enter Room 13	Enters Room 13 **As soon as candidate clears shield wall while entering room 13:** **CUE: Floor covered with water.**

JPM No: AJPM-RO-RC-1

JPM Title: RCA Entry and Exit with spill

STEP	ELEMENT	STANDARD
7	Exits Room and Contacts Control Room.	Leaves Room Immediately and Contacts Control Room. **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 **CUE: All parameters for FW-34A are normal**
9	Exits Room 13	Exits room **Note to Examiner:** In-plant JPMs that are conducted in the RCA may be performed at this time. Steps 10 and 11 are performed during RCA exit.
10	Monitor for personnel contamination prior to exiting RCA	Monitor for contamination using PCM
11	Sign out of RCA	Insert EAD in reader, enter PID number and confirm dose

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: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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
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.

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.

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 / 2 MWD/MTU — 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 / 3.a °F

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

      = 420 / 3.b °F

   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 / 4 ppm — 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 (7.d.(2)) ppm

   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 (7.e) ppm

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.

$$\underset{6}{820} + \underset{7.e}{\emptyset} = \underset{8}{820} \text{ ppm}$$

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

$$\underset{4}{830} - \underset{8}{820} = \underset{9}{10} \text{ ppm}$$

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 7/11/05 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.

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 12/11/05

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.

$$\underset{6}{820} + \underset{7.e}{\cancel{0}30} = \underset{8}{\cancel{820}\ 850}\ \text{ppm}$$

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

$$\underset{4}{830} - \underset{8}{\cancel{820}\ 850} = \underset{9}{\cancel{10}\ -20}\ \text{ppm}$$

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 7/11/05 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: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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

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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

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.
2	Refers to TDB-III.42	Refers to TDB-III.42 and determines that HCV-2974 (SIT Isolation valve) must remain locked open until RCS pressure is below 400 psia.

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

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: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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
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.
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.

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 $\geq$67% and $\leq$ 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
	1900	255	250	265	260	All clear	1912	NS	ST	SM	1900	
MON	0700	250	250	260	255	All clear	0710	DS	ST	SM	0700	MON
	1900	250	250	255	250	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:

- Pressures are ≥240 psig and ≤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 $\geq$ 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	1920	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	1923	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	1922	NS	ST	SM	1900	
MON	0700	1886	1884	1890	1890	6	0720	DS	ST	SM	0700	MON
	1900	1886	1885	1890	1890	5	1926	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	NS	ST	S/A	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	NS	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	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

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

AREA RADIATION MONITORS

SHIFT DATA SHEET

WEEK ENDING:

	INSTRUMENT	RM-091A	RM-091B	TIME	INITIALS	STA	SM		
SUN	Meter Reading R/Hr	0	0	1957	NS	ST	SM	1900	SUN
	Warn S.P. R/Hr	40	40						
MON	Meter Reading R/Hr	0	0	1957	NS	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: 05/17/05

JPM Reviewed by: _____ Date: _____

JPM Approved by: _____ Date: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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-29D 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.
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. Refuses to authorize the release OR corrects the value in line 12 to at least 30 SCFH less than the value in line 11 prior to authorizing release.

JPM No: AJPM-SRO-RC-1

JPM Title: Approve Gas Decay Tank Release

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-29D has been scheduled using OI-WDG-2, Attachment 1. You have been requested to authorize the release.**

START

C
Continuous Use

Attachment 1 - Automatic Waste Gas Release

PREREQUISITES	(✓)	INITIALS
1. Procedure Revision Verification Revision Number 20 Date: 7/11/05	✓	
2. Auxiliary Building Ventilation System is in operation per OI-VA-2.	✓	
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	✓	✓
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	✓	✓
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:

    530 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. ____

C
Continuous Use

Attachment 1 - Automatic Waste Gas Release

PROCEDURE	(✓)	INITIALS

1. Record the following information:

   Permit No. _____

   WGDT to be released:

   - WD-29A ___
   - WD-29B ___
   - WD-29C ___
   - WD-29D ___ _____

2. Complete Checklist OI-WDG-2-CL-A. _____

3. Unlock and open the following Gas Release Header Isolation Valves (Rm 16):

   - WD-150, Gas Decay Tanks WD-29A, B, C & D Gas Release Header Isolation Valve ___
   - WD-167, Waste Gas Decay Tanks WD-29A, B, C & D Gas Release Header Isolation Vlv ___ _____

4. Place FR-532, Waste Gas Release Flow Recorder, Chart Drive Switch in ON. _____

NOTE

When FIC-532 is in MANUAL, the Setpoint indication will automatically track the Process Variable to ensure a bumpless transfer.

5. Ensure FIC-532 is in MANUAL (Display indicates ME) and zero Output is indicated on the Bar Graph and digital displays (AI-100). _____

Attachment 1 - Automatic Waste Gas Release

PROCEDURE (continued) (✓) INITIALS

NOTE

Since there is no flow at this time, A50/A-4, WASTE GAS RELEASE THRU FCV-532C HI-LO Annunciator will alarm when HC-532 is placed in AUTO.

6. Place HC-532, Waste Gas Release Control Switch, in AUTO and verify the following:

   - FCV-532C opens (Red Light on) (AI-100) ___
   - FCV-532A remains closed (Green Light on) (AI-100) ___
   - A50/A-4, WASTE GAS RELEASE THRU FCV-532C HI - LO Annunciator is in alarm (AI-100) ___
   - FCV-532B remains closed (Rm 16) ___ _____

NOTE

If the selected WGDT Outlet to Gas Release Header is opened too fast, FIC-532 will not stabilize (AI-100).

7. Slowly open the selected WGDT Outlet to Gas Release Header Valve (Rm 16):

   - WD-132, Gas Decay Tank WD-29A Outlet Valve ___
   - WD-143, Gas Decay Tank WD-29B Outlet Valve ___
   - WD-163, Gas Decay Tank WD-29C Outlet Valve ___
   - WD-177, Gas Decay Tank WD-29D Outlet Valve ___ _____

8. Record the Date, Start Time and Permit No. on the following:

   - 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) ___
   - Control Room Log ___ _____

9. Depress F1 or F2, as necessary, to display TOTAL CU FT on FIC-532 (Refer to Figure 1 for pushbutton location). _____

10. Record Start Data on Table 2. _____

Attachment 1 - Automatic Waste Gas Release

PROCEDURE (continued) (✓) INITIALS

11. Depress F1 or F2, as necessary, to display FIC-532 on FIC-532 (Refer to Figure 1). _____

NOTE

Since FT-532 is a high accuracy flow transmitter, flow indications on FR-532 and FIC-532 will oscillate when FCV-532A is first moved off its closed seat and during low flow conditions. Flow indication oscillations should be allowed to dampen between each step change increase.

CAUTION

Automatic functions are bypassed when controller is in MANUAL.

12. Slowly increase the Manual Output using the Right Arrow Key (→) on FIC-532 until flow indication increases on FR-532 and FIC-532. _____

13. Verify the Set point is tracking the Process Variable on FIC-532 (AI-100). _____

NOTE

Step 14 need not be completed prior to performance of subsequent steps.

14. IF FIC-532 flow indication goes to full-scale during the release, THEN perform the following:

    - Place HC-532, Waste Gas Release Control Switch, in CLOSE to immediately terminate the Release ___
    - Verify flow indicator is over the reference mark, ensuring the magnetic coupling on the flow transmitter was not misaligned during the rapid process change ___
    - If not over the reference mark, contact I&C ___ _____

Attachment 1 - Automatic Waste Gas Release

PROCEDURE (continued) (✓) INITIALS

CAUTION

To prevent exceeding the Maximum Release Flowrate specified in FC-213, Waste Gas Release Permit, the FIC-532 Set point should be set at least 30 SCFH below the Maximum Release Flowrate not to exceed the recommended release flowrate.

15. Adjust Waste Gas Release Flow Rate in step changes using Manual Left/Right Arrow Keys (←, →) on FIC-532 until the desired Release Flowrate is reached. _____

NOTE

The flowrate should be maintained at least 5 SCFH below the recommended release flowrate. This controller has a +/- 5 SCFH dead band. If the flowrate goes outside the dead band, the controller will adjust the valve output signal accordingly.

CAUTION

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.

16. WHEN desired Gas Release Flow Rate is stable on FR-532 and FIC-532, THEN place FIC-532 in AUTOMATIC by depressing the Auto/Manual pushbutton (AI-100). _____

17. IF adjustments to flow are needed while FIC-532 is in AUTO, THEN carefully use the Set point Up/Down Arrow Keys (↑, ↓) on FIC-532 until the desired Release flowrate is reached. _____

Attachment 1 - Automatic Waste Gas Release

PROCEDURE (continued) (✓) INITIALS

NOTE

When the selected WGDT is reduced to approximately 2.0 psig, A50/A-4, WASTE GAS RELEASE THRU FCV-532C HI - LO Annunciator will alarm (AI-100).

18. WHEN the selected WGDT has dropped to approximately 2.0 psig or as directed by the Shift Manager,
THEN complete the following (AI-100):

    a. Place HC-532 in CLOSE. ___

    b. Place FIC-532 in MANUAL by depressing the Auto/Manual pushbutton. ___

    c. Adjust waste gas flowrate to zero using the manual Left/Right arrow keys (←,→) on FIC-532. ___ _____

19. Verify the following Gas Release Control Valves are closed:

    - FCV-532A (AI-100) ___
    - FCV-532C (AI-100) ___
    - FCV-532B (Room 16) ___ _____

20. Record the Date, Termination Time and Permit No. on the following:

    - 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) ___
    - Control Room Log ___ _____

21. Record Stop Data on Table 2. _____

22. Close the selected WGDT Outlet to Gas Release Header Valve (Rm 16):

    - WD-132, WD-29A ___
    - WD-143, WD-29B ___
    - WD-163, WD-29C ___
    - WD-177, WD-29D ___ _____

Attachment 1 - Automatic Waste Gas Release

PROCEDURE (continued)

	(✓)	INITIALS
23. Close and lock the following Gas Release Header Isolation Valves (Rm 16):		
• WD-150	___	
• WD-167	___	_____
		_____ Ind Verif
24. Open the selected WGDT Drain Valve (Rm16):		
• WD-136, Gas Decay Tank WD-29A Drain Valve	___	
• WD-149, Gas Decay Tank WD-29B Drain Valve	___	
• WD-169, Gas Decay Tank WD-29C Drain Valve	___	
• WD-180, Gas Decay Tank WD-29D Drain Valve	___	_____
25. Slowly open WD-181, Gas Decay Tanks WD-29A,B,C&D Drain Header Outlet (Rm16).		_____
26. When no water is observed flowing by FI-531, Flow Indicator (Rm 16), close WD-181.		
27. Close the selected WGDT Drain Valve (Rm16):		
• WD-136, Gas Decay Tank WD-29A Drain Valve	___	
• WD-149, Gas Decay Tank WD-29B Drain Valve	___	
• WD-169, Gas Decay Tank WD-29C Drain Valve	___	
• WD-180, Gas Decay Tank WD-29D Drain Valve	___	_____
28. Place FR-532, Waste Gas Release Flow Recorder, Chart Drive Switch in OFF.		_____
29. Attach the completed OI-WDG-2 and this attachment to FC-213.		_____
30. Complete FC-213.		_____

Completed by_____Date/Time_____/_____

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: 05/15/05

JPM Reviewed by: _____ Date: _____

JPM Approved by: _____ Date: _____

ADMINISTRATIVE JOB PERFORMANCE MEASURE

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 is shutdown following a steam generator tube rupture. The ruptured steam generator has been isolated. All safeguards equipment operated as designed. One RCP is operating in each loop. The primary to secondary leakage rate is 54 gpm. RCS Dose equivalent Iodine-131 is 200 uCi/g. 100°F subcooling is indicated on all CETs and RCS RTDs.**

The meteorological indications are as follows:

- **Indicated 10m wind speed – 17 mph, 14 mph**
- **Indicated wind direction – 330°, 330°**
- **Indicated ΔT is -1.7°C/100m, -1.4°C/100m**
- **It is raining, 0.9 inches daily total**

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
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. 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)

JPM No: AJPM-SRO-EP-1

JPM Title: Emergency Classification and PARs

STEP	ELEMENT	STANDARD
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

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 is shutdown following a steam generator tube rupture. The ruptured steam generator has been isolated. All safeguards equipment operated as designed. One RCP is operating in each loop. The primary to secondary leakage rate is 54 gpm. RCS Dose equivalent Iodine-131 is 200 uCi/g. 100°F subcooling is indicated on all CETs and RCS RTDs.**

The meteorological indications are as follows:

- **Indicated 10m wind speed – 17 mph, 14 mph**
- **Indicated wind direction – 330°, 330°**
- **Indicated ΔT is -1.7°C/100m, -1.4°C/100m**
- **It is raining, 0.9 inches daily total**

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		

JGL

FORT CALHOUN STATION
GENERAL FORM

FC-1188
R18

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

JPM Title: Fill Safety Injection Tanks

Location: Simulator

Approximate Time: 18 minutes Actual Time: _____

Reference(s): OI-SI-1 , R77
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

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

JPM No: JPM-0329

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.
2 (2)	Ensure HCV-2983, SI Check valve leakage Header CVCS Isolation valve is closed	AI-30A GREEN light lit
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

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
4 (3.a.2)	Close the leakage cooler discharge valve controller(s): • PCV-2929 • PCV-2909 • PCV-2949 • PCV-2969	AI-30A PCV-2949 POT to 100% output, GREEN light lit PCV-2909 POT to 100% output, GREEN light lit AI-30B PCV-2929 POT to 100% output, GREEN light lit PCV-2969 POT to 100% output, GREEN light lit
5 (3.b)	Start SI-2A	AI-30A SI-2A CS to START and RED light lit Verify amps return to normal after start
6 (3.c)	Recirculate for 15 minutes	CUE: 15 minutes have elapsed
7 (5.a)	Open HCV-545	CB-1,2,3 HCV-545 CS to OPEN, RED light lit
8 (5.b)	Open HCV-312	AI-30B HCV-312 CS held to OPEN until RED light lit
9 (5.c.2)	Throttle open PCV-2909	AI-30A Adjust POT to throttle open
10 (6)	Open SI Tank Drain valve, HCV-2916	CB-1,2,3 HCV-2956 CS to OPEN, RED light lit
11 (7)	Close HCV-545	CB-1,2,3 HCV-545 CS to CLOSE,

JPM No: JPM-0329

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
		GREEN light lit
12 (10)	When SI-6C level = 72%: Close PCV-2909	Note: PCV-2909 should be closed before HCV-2916 because HCV-2916 is the last SIT drain valve open AI-30A PCV-2909 POT to 100% output, GREEN light lit
13 (11)	Close HCV-2916	CB-1,2,3 HCV-2916 CS to CLOSE, GREEN light lit
14 (12)	Close HCV-312	AI-30B HCV-312 CS held to CLOSE until GREEN light lit
15 (13)	Stop SI-2A	AI-30A SI-2A CS to STOP and GREEN light lit, GREEN Flag
16 (14)	Open HCV-545	CB-1,2,3 HCV-545 CS to OPEN, RED light lit
17 (15)	Lower leakage cooler pressure to less than 350 psig by cracking open PCV-2949	AI-30A Adjust POT to throttle open until pressure less than 350 psig on PIC-2949
18 (16.a)	Throttle closed PCV-2909	AI-30A PCV-2909 POT to 100% output, GREEN light lit
19 (16.b)	Place PCV-2909 in AUTO	AI-30A Momentarily place PCV-2909 CS in OVERIDE and return to

JPM No: JPM-0329

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
		AUTO, AMBER light lit
20 (17)	Close HCV-545	CB-1,2,3 HCV-545 CS to CLOSE, GREEN light lit
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
22 (19)	Verify Operability of all HPSI loop injection valves by confirming amber light is on: • HCV-314 • HCV-315 • HCV-311 • HCV-312 • HCV-317 • HCV-318 • HCV-320 • HCV-321	AI-30A AMBER lights on for: • HCV-317 • HCV-314 • HCV-320 • HCV-311 AI-30B AMBER lights on for: • HCV-315 • HCV-318 • HCV-312 • HCV-321

JPM No: JPM-0329

JPM Title: Fill Safety Injection Tanks

STEP	ELEMENT	STANDARD
23 (20.b)	When both HPSI header pressures are between 250 psig and 140 psig:	CUE: HPSI header pressures are 200 psig. Tech Spec logging is being performed by another operator
		Provide key for HCV-2928
	Close HCV-2928	AI-128A Place key in HCV-2928 CS and turn to Close position, GREEN light lit
24 (20.c)	Open HCV-2928	AI-128A Place HCV-2928 CS in OPEN position, RED light lit, Remove key
		AI-30A Reset and acknowledge “SI Pumps Valves Off-Normal Alarm”
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

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

JPM No: JPM-0329

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

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. ___

C

Continuous Use

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. _____

C

Continuous Use

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) _____

C

Continuous Use

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 ___ _____

C

Continuous Use

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 ___ _____

C

Continuous Use

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 ___ _____

C

Continuous Use

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

JPM Title: Place a Containment Cooling Unit in Service

Location: Simulator

Approximate Time: 12 minutes Actual Time: _____

Reference(s): OI-VA-1, Attachment 2 R55
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

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

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.
2 (1.a.2)	Ensure HCV-402C is closed	CB-1,2,3 Ensure controller POT in closed position (100% output), GREEN light lit
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
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.
5 (1.a.5)	Monitor the following parameters: • VA-8A Flow • VA-8A Temperature • CCW Discharge Header	CB-1,2,3 • FI-418 • TIC-422 • PI-499

JPM No: JPM-0718

JPM Title: Place a Containment Cooling Unit in Service

STEP	ELEMENT	STANDARD
	Press • CCW Discharge Header Temp	• TIC-2800
6 (1.b)	Start VA-7C	AI-30A VA-7C CS to AFTER-START (Red flag), RED light lit
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

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

JPM No: JPM-0718

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. ___

C

Continuous Use

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. ___

C

Continuous Use

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. ___ _____

C

Continuous Use

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 _____/_____

JOB PERFORMANCE MEASURE

JPM No: JPM-0726

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

Location: Simulator

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

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:	This is an alternate path JPM COP RCCH898A 0% COP RCCH898B 0% Ensure VA-46A & B are tripped

JPM No: JPM-0726

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.**

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 **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
3 (2)	Place Smoke Detector Override switches in override	AI-106A/B HC-VA46A-3 and HC-VA46B-3 in OVERRIDE Acknowledge Smoke Detector Override Annunciators
4.	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

JPM No: JPM-0726

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

CRITICAL STEP	ELEMENT	STANDARD
6 (3)	Verify filter fan control switch position	AI-106A/B HC-VA63A and HC-VA63B in AUTO
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
8 (5.a)	Start VA-46A	AI-106A HC-VA 46A-2 to START then release. RED light lit
9 (5.b)	Verify valve alignment	All of the following are OPEN: AI-106A • PCV 840B (RED Light lit) • PCV-840A-1(RED Light lit) • PCV-840A-2 (RED Light lit) CB-1,2,3 • HCV-2898A (RED Light lit) • HCV-2898B (RED Light lit) **CUE : GREEN lights are ON for HCV-2898A and HCV-2898B. They are closed and will not open.** **When reported, candidate is directed to restore CR cooling using available equipment.**

JPM No: JPM-0726

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

CRITICAL STEP	ELEMENT	STANDARD
10	Shut Down VA-46A	AI-106A HC-VA 46A-2 to STOP and GREEN light lit
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
12 (5.a)	Start VA-46B	AI-106B HC-VA 46B-2 to START then release. RED light lit
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) **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

JPM No: JPM-0726

JPM Title: Restore Control Room Ventilation following Smoke Detector Trip

---

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

JPM No: New CR Vent (rev 1)

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.**

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 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

C

Continuous Use

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. ___

C

Continuous Use

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_____/_____

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_____/_____

JOB PERFORMANCE MEASURE

JPM No: JPM-0778

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

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

JPM No: JPM-0778

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
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
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
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"	CUE: Log entry has been made
6 (1.f)	Bypass RPS TM/LP Trip Unit	AI-30A

JPM No: JPM-0778

JPM Title: RPS T-Cold Calibration

STEP	ELEMENT	STANDARD
	on channel "A"	Insert key in RPS channel "A" Trip Unit #9 bypass switch and place in BYPASS (clockwise) position. AMBER light lit
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	AI-30A 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)
8 (1.h)	Ensure TM/LP Trip unit is reset	AI-30A Place RPS channel "A" Trip Unit #9 bypass switch in RESET (counterclockwise) position. AMBER light off.
9 (1.i)	Remove bypass key	AI-30A Remove key 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	AI-31A/B/C/D For each channel, Select T-Cold on selector switch and record value in procedure
12 (1.m)	Record T-cold cal pot settings for all four channels	AI-31A/B/C/D For each channel, Record POT setting in procedure

JPM No: JPM-0778

JPM Title: RPS T-Cold Calibration

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

JPM No: JPM-0778

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

ATT PURPOSE PAGE

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-0042

JPM Title: Transfer Clutch Power Supply

Location: Simulator

Approximate Time: 12 Minutes Actual Time: _____

Reference(s): OI-EE-4, Attachments 7 and 1 R30
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

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"

JPM No: JPM-0042

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

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. **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)**
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

JPM No: JPM-0042

JPM Title: Transfer Clutch Power Supply

STEP	ELEMENT	STANDARD
3 (7.e.2)	Open I-BUS-AC-2, Instrument Bus C Tie Breaker	AI-40C Instrument Bus "C" tie breaker to OPEN
4 (7.e.3)	Open I-BUS-AC-1, Instrument Bus A Tie Breaker	AI-40A Instrument Bus "A" tie breaker to OPEN
5 (Att-7 1.c)	Verify Clutch Power Supply breaker RPS/CB-CD is closed	AI-57 Breaker in ON position
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)
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
8 (1.g)	Verify all four Clutch Power Supply ammeters read upscale.	AI-3 Ammeters read upscale
9 (1.h)	Verify proper indicating lights in Clutch Power Supply Cabinet are energized.	AI-3 WHITE lights ON
		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

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

START

C

Continuous Use

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

C

Continuous Use

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. ___

C

Continuous Use

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

C

Continuous Use

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.	___	

C

Continuous Use

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). ___

C

Continuous Use

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). ___ _____

C

Continuous Use

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. ___

C

Continuous Use

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. ___

C

Continuous Use

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). ___

C

Continuous Use

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).	___

C

Continuous Use

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. ___

C

Continuous Use

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. ___

C

Continuous Use

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_____/_____

C

Continuous Use

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. ___

C

Continuous Use

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. ___

C

Continuous Use

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. ___

C

Continuous Use

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_____/_____

JOB PERFORMANCE MEASURE

JPM No: JPM-0387

JPM Title: AFW Functional Test of Circuits and Components

Location: Simulator

Approximate Time: 25 minutes Actual Time: _____

Reference(s): OP-ST-AFW-3007 R12
NRC K/A 061000 K4.02 (RO 4.5 / SRO 4.6)

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

JPM Reviewed by: _____ Date: _____

JPM Approved by: _____ Date: _____

JPM No: JPM-0387

JPM Title: AFW Functional Test of Circuits and Components

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: AI-66 Keys

Safety Considerations: None

Comments:

JPM No: JPM-0387

JPM Title: AFW Functional Test of Circuits and Components

INITIATING CUE: **The plant is in cold shutdown. You have been directed to perform a portion of Attachment 1 of OP-ST-AFW-3007, "Auxiliary Feedwater Functional Test of Circuits and Components" starting with step 3 and ending at step 11.**

All prerequisites are met. The keys required for this test have been placed in the appropriate switches. The required jumpers and blocks have been placed on relay A1/RC-2A/AFWS

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1 (3.1)	Reset HCV-1107A	AI-66A HCV-1107A CS to RESET then to AUTO
2 (3.2)	Reset HCV-1107B	AI-66A HCV-1107B CS to RESET then to AUTO
3 (3.3)	Place FW-6 recirculation valve, FCV-1368 in auto	AI-66A FCV-1368 CS in AUTO
4 (3.4)	Place S/G RC-2A Chan "A" auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to normal	AI-66A S/G RC-2A Chan "A" auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to NORMAL
5 (3.5)	Place S/G RC-2B Chan "A" auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to normal	AI-66A S/G RC-2B Chan "A" auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to NORMAL

JPM No: JPM-0387

JPM Title: AFW Functional Test of Circuits and Components

STEP	ELEMENT	STANDARD
6 (3.6)	Place S/G RC-2A Chan A Auto Sig Override Relay Test SW to NORM	AI-66A S/G RC-2A Chan A Auto Sig Override Relay Test SW to NORM
7 (3.7)	Place S/G RC-2B Chan A Auto Sig Override Relay Test SW to NORM	AI-66A S/G RC-2B Chan A Auto Sig Override Relay Test SW to NORM
8 (3.8)	Place Chan A AFW Auto Sig Overide S/G Feed Valves switch to Normal	AI-66A Chan A AFW Auto Sig Overide S/G Feed Valves switch to NORMAL
9 (4.1)	Reset HCV-1108A	AI-66B HCV-1108A CS to RESET then to AUTO
10 (4.2)	Reset HCV-1108B	AI-66B HCV-1108B CS to RESET then to AUTO
11 (4.3)	Reset YCV-1045	AI-66B YCV-1045 CS to RESET then to AUTO
12 (4.4)	Place FW-10 Auto Start Relay Test Switch to Normal	AI-66B FW-10 Auto Start Relay Test Switch to NORMAL
13 (4.5)	Place FW-10 recirculation valve, FCV-1369, in auto	AI-66B FW-10 recirculation valve, FCV-1369, in AUTO
14 (4.6)	Place YCV-1045A Isolation valve override switch to normal	AI-66B YCV-1045A Isolation valve override switch to NORMAL

JPM No: JPM-0387

JPM Title: AFW Functional Test of Circuits and Components

STEP	ELEMENT	STANDARD
15 (4.7)	Place YCV-1045A CS to close then normal	AI-66B YCV-1045A CS to CLOSE then to NORMAL
16 (4.8)	Place YCV-1045B Isolation valve override switch to normal	AI-66B YCV-1045B Isolation valve override switch to NORMAL
17 (4.9)	Place YCV-1045B CS to close then normal	AI-66B YCV-1045B CS to close then NORMAL
18 (4.10)	Place S/G RC-2A Chan “B” auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to normal	AI-66B S/G RC-2A Chan “B” auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to NORMAL
19 (4.11)	Place S/G RC-2B Chan “B” auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to normal	AI-66B S/G RC-2B Chan “B” auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to NORMAL
20 (4.12)	Place S/G RC-2A Chan B Auto Sig Override Relay Test SW to NORM	AI-66B S/G RC-2A Chan B Auto Sig Override Relay Test SW to NORM
21 (4.13)	Place S/G RC-2B Chan B Auto Sig Override Relay Test SW to NORM	AI-66B S/G RC-2B Chan B Auto Sig Override Relay Test SW to NORM
22 (4.14)	Place Chan B AFW Auto Sig Overide S/G Feed Valves switch to Normal	AI-66B Chan B AFW Auto Sig Overide S/G Feed Valves switch to NORMAL

JPM No: JPM-0387

JPM Title: AFW Functional Test of Circuits and Components

STEP	ELEMENT	STANDARD
23 (5)	Place FW-6 control switch in AFTER STOP	CB-10 HC-1367, FW-6 CS [laced in AFTER STOP (Green flag)
24 (6)	Initiate and AFW actuation from AI-66A	AI-66A Place and HOLD S/G RC-2A Chan A Auto Sig Override Relay Test Switch in TEST
25 (7)	Verify actions/indications	AI-66A While holding switch in TEST,verify:
	• HCV-1107A and B open	• RED lights lit
	• FW-6 starts	• RED and WHITE lights lit
	• YCV-1045 opens	• RED light lit
	• YCV-1045A and B open	• RED lights lit
	• AFW flow to RC-2A	• Flow indicated on FI-1109-1
	• AFWS STEAM GEN RC-2A CHANNEL A ACTUATED alarm	• Annuciator A66A, 44 lit
	• AFWS RC-2A CH A MATRIX TS-A/RC-2A/AFWS TEST SWITCH OFF NORMAL alarm	• Annunciator A66A, 24 lit
	• S/G RC-2A Chan A light	• AMBER light lit
	• S/G RC-2A Chan A1 light	• AMBER light lit
26 (8)	Record values:	**CUE: Provide flows from CB-10** **FI-1109 = 295 gpm** **FW-6 amp = 34 amps** **FI-1368 = 300 gpm**

JPM No: JPM-0387

JPM Title: AFW Functional Test of Circuits and Components

STEP	ELEMENT	STANDARD
		AI-66 Reads and records flow from FI-1109-1 (should read approximately 300 gpm)
27 (8.1)	Verifies flow is al least 200 gpm for ISI requirement	Initials procedure step 8.1
29 (9)	Place S/G RC-2A Chan A auto sig Override relay test SW to NORM	AI-66A S/G RC-2A Chan A auto sig Override relay test SW to NORM
30 (10.1)	Place FW-6 CS in pull-to-lock	CB-10 HC-1367, FW-6 CS placed in PULL-TO-LOCK
31 (10.2)	Reset HCV-1107A	AI-66A HCV-1107A CS to RESET then to AUTO
32 (10.3)	Reset HCV-1107B	AI-66A HCV-1107B CS to RESET then to AUTO
33 (10.4)	Reset YCV-1045	AI-66A YCV-1045 CS to RESET then to CLOSE then to RESET then to AUTO
34 (10.5)	Reset YCV-1045A	AI-66A YCV-1045A CS to CLOSE then to NORMAL
35 (10.6)	Reset YCV-1045B	AI-66A YCV-1045B CS to CLOSE then to NORMAL
36 (10.7)	Verify AFWS STEAM GEN RC-2A CHANNEL A ACTUATED	AI-66A Annunciator A66A, 44 OFF

JPM No: JPM-0387

JPM Title: AFW Functional Test of Circuits and Components

STEP	ELEMENT	STANDARD
	alarm is clear	
37 (10.8)	Verify AFWS RC-2A CH A MATRIX TS-A/RC-2A/AFWS TEST SWITCH OFF NORMAL alarm is clear	AI-66A Annunciator A66A, 24 OFF
38 (10.9)	Verify S/G RC-2A Chan A amber light is off	AI-66A S/G RC-2A Chan A amber light is OFF
39 (10.10)	Verify S/G RC-2A Chan A1 amber light is off	AI-66A S/G RC-2A Chan A1 amber light is OFF CUE: Electricians have removed the jumpers and blocks from relay A1/RC-2A/AFWS

Termination Criteria: OP-ST-AFW-3007, Attachment 1, has been completed through step 11

JPM No: JPM-0387

INITIATING CUE: **The plant is in cold shutdown. You have been directed to perform a portion of Attachment 1 of OP-ST-AFW-3007, "Auxiliary Feedwater Functional Test of Circuits and Components" starting with step 3 and ending at step 11.**

All prerequisites are met. The keys required for this test have been placed in the appropriate switches. The required jumpers and blocks have been placed on relay A1/RC-2A/AFWS

START

Fort Calhoun Station
Unit No. 1

OP-ST-AFW-3007

SURVEILLANCE TEST

Title: AUXILIARY FEEDWATER FUNCTIONAL TEST OF CIRCUITS AND COMPONENTS

FC-68 Number: EC 34913

Reason for Change: Add power supplies

Requestor: Christopher Verdoni

Preparer: Daniel A Hochstein

Correction (a): Page 1 (03-08-05)

AUXILIARY FEEDWATER FUNCTIONAL TEST OF CIRCUITS AND COMPONENTS

SAFETY RELATED

1. PURPOSE

1.1 This test is to verify operability of FW-6, through its normal flow paths, in order to satisfy the requirements of Technical Specifications 2.5(1), 2.5(2) and 3.9(5).

1.2 This test shall be performed each Cold Shutdown in accordance with the Fort Calhoun Station (FCS) Inservice Inspection (ISI) Program Plan.

1.3 This test verifies the operability of Auxiliary Feedwater Check Valves FW-163, FW-164 and FW-173 as required in USAR 4.5.6.5.

1.4 The test satisfies the requirements of Technical Specifications 3.1, Table 3-2 Item 23b(1) and 24a, for functional testing of Auxiliary Feedwater initiation circuits each refueling.

2. REFERENCES/COMMITMENT DOCUMENTS

2.1 Technical Specifications

- 2.5, Steam and Feedwater Systems
- 2.15, Instrumentation and Control Systems
- 3.1, Table 3-2: Minimum Frequencies for Checks, Calibrations and Testing of Engineered Safety Features, Instrumentation and Controls
- 3.9, Auxiliary Feedwater System

2.2 USAR 4.5.6.5: In-service Inspection of ASME Code Class 1, Class 2, and Class 3 Components

2.3 Fort Calhoun Station ISI Program Plan

3. DEFINITIONS

None

4. EQUIPMENT LIST

4.1 Tools

- Electrical Jumpers (2)
- Mechanical Blocks (2) (Suitable for preventing HFA relay contact from closing.)
- Digital Multimeter (1)

5. PRECAUTIONS AND LIMITATIONS

5.1 All anomalies and deficiencies shall be reported immediately to the immediate Supervisor and 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.

5.2 The System Engineer shall be notified within 24 hours of the completion of this test, of any marginal, unexpected or unacceptable results.

5.3 If this test cannot be completed by the end of shift, and will not be continued by the next shift, the loop must be placed in a condition as directed by the Shift Manager. All actions taken for temporarily stopping and for resuming the test shall be documented in detail (including SO-O-25 as applicable) on the Comment Sheet.

5.4 The following may alarm during this Surveillance Test.

- **AFWS RC-2A CH A MATRIX TS-A/RC-2A/AFWS TEST SWITCH OFF NORMAL** (AI-66A, A66A, 24)
- **AFWS RC-2B CH A MATRIX TS-A/RC-2B/AFWS TEST SWITCH OFF NORMAL** (AI-66A, A66A, 25)
- **AFWS STEAM GEN RC-2A CHANNEL A ACTUATED** (AI-66A, A66A, 44)
- **AFWS STEAM GEN RC-2B CHANNEL A ACTUATED** (AI-66A, A66A, 45)
- **AFWS RC-2A CH B MATRIX TS-B/RC-2A/AFWS TEST SWITCH OFF NORMAL** (AI-65B, A65B, 21)
- **AFWS RC-2B CH B MATRIX TS-B/RC-2B/AFWS TEST SWITCH OFF NORMAL** (AI-65B, A65B, 22)
- **AFWS STEAM GEN RC-2A CHANNEL B ACTUATED** (AI-65B, A65B, 41)
- **AFWS STEAM GEN RC-2B CHANNEL B ACTUATED** (AI-65B, A65B, 42)
- **FW-10 TURBINE DRIVEN FEEDWATER PUMP TROUBLE** (AI-66B, A66B,18)

6. PREREQUISITES INITIALS/DATE

6.1 Procedure Revision Verification.

Revision No._____ _____/_____

6.2 A Lead Person qualified to a minimum of Electrician category E08C is available for the performance of this test. _____/_____
EM Supv/ Crew Leader

6.3 There is sufficient volume available in the Steam Generators to accept AFW flow. _____/_____

6.4 There is sufficient volume in the Emergency Feedwater Storage Tank to support operation of FW-6. ____/____

6.5 Electrical power is available to FW-6 via 4160 V Bus 1A3. ____/____

6.6 Ensure that BKR 1A3-16, Breaker Unit Auxiliary Feedwater Pump FW-6, is properly racked up. ____/____

6.7 Ensure the 69 Permissive Switch is red flagged with Red or Green light indication and Amber light lit. ____/____

NOTE: During the performance of this test, YCV-1045A and YCV-1045B are actuated open.

6.8 Verify steam is not available to FW-10. ____/____

6.9 Applicable portions of OI-AFW-1-CL-A and OI-AFW-1-CL-B are completed. ____/____

6.10 A prejob briefing has been conducted prior to the start of this test. ____/____

6.11 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. ____/____

6.12 The Shift Manager has authorized the performance of this test.

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 Attachment 1 as required.

ATTACHMENT PAGE

8. RESTORATION

8.1 Shift Manager has been notified this test has been completed.

Shift Manager_____Date/Time_____/_____

9. ACCEPTANCE CRITERIA

9.1 All components and indications functioned as described in the body of this procedure.

10. TEST RECORD

10.1 This entire procedure

11. PERFORMANCE AND REVIEW

11.1 Test data shall be evaluated by the Shift Technical Advisor (STA) and reviewed by the Shift Manager for acceptability within 24 hours of the completion of this test.

Evaluated by_____ Date/Time_____/_____
STA Signature

Reviewed by_____ Date/Time_____/_____
Shift Manager

11.2 The ISI Coordinator is responsible for reviewing the test for compliance with the FCS ISI Program Plan. This test has been reviewed and found acceptable or the deficiencies have been noted in the Comment Sheet.

ISI Coordinator _____ _____/_____
Signature Date Time

11.3 The System Engineer is responsible for reviewing this Surveillance Test. Test data has been evaluated and found to be acceptable, or deficiencies identified and actions taken have been noted on the Comment Sheet.

System Engineer_____ _____/_____
Signature Date Time

Attachment 1 - Aux Feedwater Functional Test of Circuits/Components

PROCEDURE	(√)	INITIALS
1. Obtain appropriate keys, as required for the manipulation of AI-66A and AI-66B switches, from the Shift Managers key lockbox.		_____
2. Place the following jumpers and blocks on relay A1/RC-2A/AFWS (Device 25) in AI-66A:		
• Jumper Contact 1-2		_____ EM _____ Con Verif
• Block Open Contact 3-4		_____ EM _____ Con Verif
• Jumper Contact 5-6		_____ EM _____ Con Verif
• Block Open Contact 11-12		_____ EM _____ Con Verif
3. Align AI-66A as follows:		
3.1 Place HCV-1107A, Aux FW to S/G RC-2A Isolation Valve Inbd, control switch to RESET, then to AUTO.		_____
3.2 Place HCV-1107B, Aux FW to S/G RC-2A Isolation Valve Outbd control switch to RESET, then to AUTO.		_____
3.3 Place FCV-1368, Aux FW Pump FW-6 Recirculation Valve control switch to AUTO.		_____
3.4 Place S/G RC-2A Chan “A” Auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to NORMAL.		_____

Attachment 1 - Aux Feedwater Functional Test of Circuits/Components

PROCEDURE (continued)	(√)	INITIALS
3.5 Place S/G RC-2B Chan A Auto Sig Override SW AFW Pumps FW-6/FW-10 control switch to NORMAL.		
3.6 Place S/G RC-2A Chan A Auto Sig Override Relay Test SW to NORM.		
3.7 Place S/G RC-2B Chan A Auto Sig Override Relay Test SW to NORM.		
3.8 Place Chan A AFW Auto Sig Override S/G Feed Valves switch to NORMAL.		
4. Align AI-66B as follows:		
4.1 Place HCV-1108A, Aux FW to S/G RC-2B Isolation Valve Inbd control switch to RESET, then to AUTO.		
4.2 Place HCV-1108B, Aux FW to S/G RC-2B Isolation Valve Outbd control switch to RESET, then to AUTO.		
4.3 Place YCV-1045, STM to Pump FW-10 Control Valve control switch to RESET, then to AUTO.		
4.4 Place Pump FW-10 Auto Start Relay Test Switch to NORMAL.		
4.5 Place FCV-1369, Aux FW Pump FW-10 Recirculation Valve control switch to AUTO.		
4.6 Place YCV-1045A, Isolation Valve Override switch to NORMAL.		
4.7 Place YCV-1045A, S/G RC-2A STM to FW-10 HDR A Isolation Valve control switch to CLOSE, then to NORMAL.		
4.8 Place YCV-1045B Isolation Valve Override switch to NORMAL.		
4.9 Place YCV-1045B, S/G RC-2B STM to FW-10 HDR B Isolation Valve control switch to CLOSE, then to NORMAL.		
4.10 Place S/G RC-2A Chan B Auto Sig Override SW AFW Pumps FW-6/FW-10 switch to NORMAL.		

Attachment 1 - Aux Feedwater Functional Test of Circuits/Components

PROCEDURE (continued) (√) INITIALS

4.11 Place S/G RC-2B Chan B AFWS Auto Sig Override SW AFW Pumps FW-6/FW-10 switch to NORMAL. _____

4.12 Place S/G RC-2A Chan B Auto Sig Override Relay Test SW to NORM. _____

4.13 Place S/G RC-2B Chan B Auto Sig Override Relay Test SW to NORM. _____

4.14 Place Chan B AFW Auto Sig Override SG Feed Valves switch to NORMAL. _____

5. Place HC-1367, FW-6 Control Switch to AFTER STOP. (CB-10) _____

NOTE: The test switch must be held in the test position until component status is verified.

6. Initiate an AFW actuation from AI-66A by placing and holding the S/G RC-2A Chan A Auto Sig Override Relay Test Switch to TEST. _____

7. Verify the following action/indications occur:

- HCV-1107A and B open. ____
- FW-6 starts. ____
- YCV-1045 opens. ____
- YCV-1045A and B open. ____
- AFW flow to RC-2A is indicated on FI-1109-1. ____
- **AFWS STEAM GEN. RC-2A CHANNEL A ACTUATED** (AI-66A, A66A, 44) is in alarm. ____
- **AFWS RC-2A CH A MATRIX TS-A/RC-2A/AFWS TEST SWITCH OFF NORMAL** (AI-66A, A66A, 24) is in alarm ____
- S/G RC-2A Chan A amber light is on. ____
- S/G RC-2A Chan A1 amber light is on. ____ _____

8. Record following values:

_____gpm _____gpm
FI-1109 (CB-10) FI-1109-1 (AI-66)

_____ _____gpm _____
FW-6 Amps (CB-10) FI-1368 (CB-10)

Attachment 1 - Aux Feedwater Functional Test of Circuits/Components

PROCEDURE (continued) (√) INITIALS

8.1 Flow of 200 gpm satisfies the ISI requirement for opening of AFW check valve FW-164 and FW-173. _____

9. Place S/G RC-2A Chan A Auto Sig Override Relay Test SW to NORM. _____

10. Restore AFW system as follows:

10.1 Place HC-1367, FW-6 Control Switch in PULL TO LOCK (CB-10). _____

10.2 Place HCV-1107A control switch to RESET, then to AUTO. _____

10.3 Place HCV-1107B control switch to RESET, then to AUTO. _____

10.4 Place YCV-1045 control switch to RESET, CLOSE, RESET, and then to AUTO. _____

10.5 Place YCV-1045A control switch to CLOSE, then to NORMAL. _____

10.6 Place YCV-1045B control switch to CLOSE, then to NORMAL. _____

10.7 Verify **AFWS STEAM GEN. RC-2A CHANNEL A ACTUATED** is clear (AI-66A, A66A, 44) _____

10.8 Verify **AFWS RC-2A CH A MATRIX TS-A/RC-2A/AFWS TEST SWITCH OFF NORMAL** is clear (AI-66A, A66A, 24) _____

10.9 Verify S/G RC-2A Chan A amber light is off. _____

10.10 Verify S/G RC-2A Chan A1 amber light is off. _____

Attachment 1 - Aux Feedwater Functional Test of Circuits/Components

PROCEDURE (continued)	(√)	INITIALS

11. Remove the following jumpers and blocks on relay A1/RC-2A/AFWS (Device 25) in AI-66A:

- Jumper Contact 1-2 _____ EM _____ Ind Verif
- Block Contact 3-4 _____ EM _____ Ind Verif
- Jumper Contact 5-6 _____ EM _____ Ind Verif
- Block Contact 11-12 _____ EM _____ Ind Verif

JOB PERFORMANCE MEASURE

JPM No: JPM-0613A

JPM Title: Shutdown a Reactor Coolant Pump

Location: Simulator Control Room

Approximate Time: 8 minutes Actual Time: _____

Reference(s): OI-RC-9, Attachment 2 (R56)
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: _____

JOB PERFORMANCE MEASURE

JPM No: JPM-0613A

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

JPM No: JPM-0613A

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 are 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.	CB-4 Verify all trippable rods are inserted
2 (prereq 3)	Ensure Zero Power Mode Bypass switches are in Bypass	AI-31 A/B/C/D Keys installed and AMBER lights lit
3 (1)	Stop Reactor Coolant Pump RC-3D	CB-1,2,3 RC-3D CS to AFTER-STOP position and release GREEN light lit
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 by placing Oil Lift Pump CS, RC-3D-1, in START position and verifying RED light on.

JPM No: JPM-0613A

JPM Title: Shutdown a Reactor Coolant Pump

STEP	ELEMENT	STANDARD
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. The control switch should be held in the START position until the zero speed light comes on. (approximately 2 minutes)
6 (3)	Ensure Reverse Rotation Annunciator is clear.	CB-1,2,3, A6 D-5 Annunciator is OFF
7 (5)	Confirm Zero Speed light is on	CB-1,2,3 RC-3D GREEN light on
8 (4)	Confirm RCP tachometer indicates zero	**CUE: Local Operator reports RC-3D speed is zero rpm.**
9 (6)	Stop oil lift pump.	CB-1,2,3 Control switch to AFTER-STOP GREEN light lit

Termination Criteria: **Reactor Coolant Pump RC-3D is secured and its Oil Lift pump has been stopped**

JPM No: JPM-0613A

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**

C

Continuous Use

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 ___ _____

C

Continuous Use

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-0627

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 R10
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

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

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.**

All prerequisites are met

START

Critical Steps shown in gray

STEP	ELEMENT	STANDARD
1 (2.a)	Verify PC-103Y is in automatic	CB-1,2,3 PC-103Y controller in AUTO
2 (2.b)	Ensure proportional heaters control switches are in auto.	CB-1,2,3 Group 6 and Group 7 switches in AUTO
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
4 (2.d)	Ensure pressurizer spray valves in auto	CB-1,2,3 PCV-101-1 and PCV-103-2 control switches in AUTO
5 (2.e)	Lower RCS pressure by adjusting setpoint pushbuttons on PC-103Y	CB-1,2,3 Adjust setpoint push buttons in small increments to lower pressure setpoint
6	Determines the pressurizer spray valves are not responding	CB-1,2,3 PCV-101-1 and PCV-103-2 GREEN lights lit

JPM No: JPM-0627

JPM Title: Reduce RCS Pressure using Aux Spray

STEP	ELEMENT	STANDARD
7 (optional)	May attempt to use PC-103X in automatic to lower pressure	CB-1,2,3 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	CB-1,2,3 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%
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
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.

JPM No: JPM-0627

JPM Title: Reduce RCS Pressure using Aux Spray

STEP	ELEMENT	STANDARD
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

Termination Criteria: **The RCS is at 1900 psia and the Aux Spray valves are closed**

JPM No: JPM-0627

INITIATING CUE: **The Plant is in hot shutdown. The CRS has directed you to reduce RCS pressure to 1900 psia using pressurizer spray.**

All prerequisites are met

START

Fort Calhoun Station
Unit No. 1

OI-RC-7

OPERATING INSTRUCTION

Title: REACTOR COOLANT SYSTEM PRESSURE CONTROL NORMAL OPERATION

FC-68 Number: EC 34293

Reason for Change: Clarify Attachments for taking pressure control to automatic.

Requestor: Joseph Braun

Preparer: Daniel A Hochstein

REACTOR COOLANT SYSTEM PRESSURE CONTROL NORMAL OPERATION

SAFETY RELATED

ATT PURPOSE PAGE

PRECAUTIONS

1. Whenever the Pressurizer Heaters are to be energized, the water level in the Pressurizer shall be above an actual level of 41.5%.

2. Reactor Coolant System allowable pressure versus temperature conditions shall be in compliance with Technical Specifications 2.1.2 or TDB-III.7.a and TDB-III.7.d, whichever is more conservative.

3. Power Operated Relief Valve Set points shall be within the limits established in TDB-III.7.a.

4. Pressurizer maximum heat up rate is 100°F/hour and the maximum cooldown rate is 200°F/hour.

PRECAUTIONS (continued)

5. When the differential temperature between the Pressurizer and the Spray Line is greater than 200°F, refer to Attachment 10 of this Operating Instruction.

6. Reactor Coolant System Pressure shall meet the requirements of TDB-III.7.a and/or TDB-III.7.d for Reactor Coolant Pump Operation to satisfy NPSH requirements and less than 250 psia for Shutdown Cooling System operation.

7. Reactor Coolant System pressure of 2750 psia shall not be exceeded with fuel in the Reactor.

8. Reactor Coolant System pressure of 2500 psia shall not be exceeded for Reactor Coolant Pump operation.

9. Any deviations or discrepancies shall be immediately reported to the Shift Manager.

10. Main PZR Spray flow will be reduced with less than four-pump operation. Pressure should be controlled using Main and Auxiliary PZR Spray whenever less than four Reactor Coolant Pumps are in operation.

REFERENCES/COMMITMENTS

1. Technical Specifications:

   - Section 1.2, Safety Limit, Reactor Coolant System Pressure
   - Section 2.1.2, LCO, Reactor Coolant System, Heat up and Cooldown
   - Section 2.1.6, LCO, Reactor Coolant System, Pressurizer and Steam System Safety Valves
   - Section 2.1.7, LCO, Reactor Coolant System, Pressurizer Operability

2. USAR:

   - Section 4.3.7, Reactor Coolant System, Pressurizer
   - Section 7.4.1, Regulating Systems, Reactor Coolant Pressure Regulating System
   - Section 7.4.2, Regulating Systems, Pressurizer Level Regulating System
   - Section 7.5.1, Instrumentation Systems, Process Instrumentation
   - Figure 4.6.1, Reactor Coolant System Pressure-Temperature Limitations During Plant Cooldown and Heat up After 40 Years Integrated Neutron Flux

REFERENCES/COMMITMENTS (continued)

3.

Drawings	File	Description
Figure 8.1-1	12234	Simplified One Line Diagram Plant Electrical System
E-23866-210-110	44479	Reactor Coolant System Diagram

4. Technical Data Book:

- Figure III.6: Pressurizer Pressure Control Program
- Figure III.7.a: RCS Pressure and Temperature Limits
- Figure III.7.d: RCS Pressure and Temperature Limits

5. I&C Equipment List:

- EM-103: Pressurizer Pressure Controls (File No. 1567-1568)

APPENDICES

C

Continuous Use

Attachment 1 - Pressurizer Steam Bubble Formation

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.		_____

C

Continuous Use

Attachment 1 - Pressurizer Steam Bubble Formation

PROCEDURE (✓) INITIALS

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, the Spray Valves will begin to open (when Spray Valve Switches are in AUTO).

3. The Output meter will read approximately 50% when neither Proportional Heaters or Spray Valves receive action signals.

CAUTION

Extreme caution shall be exercised when the RCS is solid in the Pressurizer.

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 ___ _____

   b. Ensure the following RC-4 Spray Valve Control Switches are in CLOSE:

      - 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 are in AUTO:

      - 75 KW Proportional Htrs Bank P1 Group 6 ___
      - 75 KW Proportional Htrs Bank P2 Group 7 ___ _____

   d. Move the Manual Control Lever for the selected controller, PC-103X or PC-103Y, left to raise Proportional Heater Output. _____

C

Continuous Use

Attachment 1 - Pressurizer Steam Bubble Formation

PROCEDURE (continued) (✓) INITIALS

1 e. Energize the Backup Heaters as desired by placing the following Control Switches in 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 ___ _____

f. WHEN the desired RCS pressure is attained AND if required, 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 ___ _____

g. Adjust manual control lever as necessary on the selected controller, PC-103X or PC-103Y, to maintain RCS pressure. _____

2. IF lowering the 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 ___ _____

b. Ensure the following RC-4 Spray Valve Control Switches are in CLOSE:

- PCV-103-1, PZR Spray Valve From Loop 2A ___
- PCV-103-2, PZR Spray Valve From Loop 1B ___ _____

c. IF the Backup Heaters are energized, THEN place the following Backup Heater Control 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 ___ _____

C

Continuous Use

Attachment 1 - Pressurizer Steam Bubble Formation

PROCEDURE (continued) (✓) INITIALS

2 d. Ensure the Proportional Heater Control Switches are in AUTO OR OFF, as required by one of the following conditions:

1) IF the RCS is to remain pressurized,
THEN place the following Proportional Heater Control Switches for RC-4 in AUTO:

- 75 KW Proportional Htrs Bank P1 Group 6 ___
- 75 KW Proportional Htrs Bank P2 Group 7 ___

2) IF the RCS is to be depressurized,
THEN place the following Proportional Heater Control Switches for RC-4 in OFF:

- 75 KW Proportional Htrs Bank P1 Group 6 ___
- 75 KW Proportional Htrs Bank P2 Group 7 ___ _____

e. IF the RCS is to be depressurized OR a rapid depressurization is required,
THEN depressurize the RCS by raising Letdown flow per OI-CH-1 Attachment 3, Increasing Charging and Letdown Flows. _____

f. Move the Manual Control lever on the selected controller, PC-103X or PC-103Y, right until the Proportional Heaters are OFF. _____

g. WHEN the desired pressure is attained,
THEN adjust the Manual Control Lever as necessary on the selected controller, PC-103X or PC-103Y, to maintain RCS pressure. _____

Completed by_____Date/Time_____/_____

C

Continuous Use

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 ___ _____

C

Continuous Use

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 RCS is at less than normal operating pressure, THEN place the following 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 ___ _____

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 ___ _____

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. _____

C

Continuous Use

Attachment 2 - Manual RCS Pressure Control with a Steam Bubble in the Pressurizer

PROCEDURE (continued) (✓) INITIALS

2 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 RCS is at less than normal operating pressure,
THEN place the following 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 ___ _____

f. Adjust Manual Control Lever as necessary on selected controller, PC-103X or PC-103Y, to maintain RCS pressure. _____

Completed by_____Date/Time_____/_____

C

Continuous Use

Attachment 3 - Automatic 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

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 ___ _____

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.

1 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 ___ _____

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 ___ _____

Attachment 3 - Automatic RCS Pressure Control with a Steam Bubble in the Pressurizer

PROCEDURE (continued) (✓) INITIALS

2 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 ___ _____

NOTE

During normal operation, one bank of pressurizer heaters is usually maintained in the ON position.

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

JPM Title: Initiate Air Compressor Backup Cooling

Location: Room 19

Approximate Time: 8 minutes Actual Time: _____

Reference(s): EOP-20, MVA-IA R14
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

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

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	Place the CA-1A controller switch in the Control Room Start position	Room-19 1SS switch in CS position
2	Ensure that the CA-1A load transfer switch is either position 1 or 2	Room-19 Ensure Compressor load transfer switch in the 1 or 2 position **CUE: CA-1A is not running**
3 (2.1.a.1)	Isolate Bearing Water to CA-1A	Room 19 CLOSE all of the following valves: • AC-584 • AC-588 • AC-586 • AC-589
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

JPM No: JPM-0225

JPM Title: Initiate Air Compressor Backup Cooling

STEP	ELEMENT	STANDARD
		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

Termination Criteria: CA-1A is being cooled by potable water

JPM No: jPM-0225

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

MVA-IA

INSTRUCTIONS

CONTINGENCY ACTIONS

****

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)

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

MVA-IA

INSTRUCTIONS	CONTINGENCY ACTIONS
2. (continued)	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)	(continue)

12.0 MAINTENANCE OF VITAL AUXILIARIES - IA

MVA-IA

INSTRUCTIONS	CONTINGENCY ACTIONS
2. (continued)	2.1.a (continued)
(continue)	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

MVA-IA

INSTRUCTIONS

2. (continued)

(continue)

CONTINGENCY ACTIONS

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"
- 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

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 R17
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

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

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	AI-133A behind small door 143/SS Switch to LOCAL
2 (3.b)	Press the "Normal Engine Start" push button	AI-133A Push NORMAL ENGINE START button **CUE: D/G-1 did not start**
3 (3.1.a)	Place the "Engine Control 143/SS" switch to EMERG	AI-133A behind small door 143/SS Switch to EMERG
4 (3.1.b)	Press the "Emergency Engine Start" push button	AI-133A Push EMERGENCY ENGINE START button **CUE: D/G-1 did not start**
5 (5)	Check primary air receiver tank and secondary air receiver tank pressures.	AI-133A Read indicators **CUE: both pressure indicators "as read"**

JPM No: JPM-0356

JPM Title: Emergency Start of Diesel-Generator D-1

STEP	ELEMENT	STANDARD
6 (14)	Ensure overspeed trip is reset	West end of D/G-1 Ensure trip is reset
7 (15.a)	Place the Engine Control 143/SS switch in LOCAL	AI-133A behind small door Place 143/SS switch in the LOCAL position
8 (15.b)	Press the "Normal Engine Start" pushbutton	AI-133A Press NORMAL ENGINE START pushbutton **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. CUE: D/G-1 has started
10 (16)	Ensure Engine Control 143/SS switch is in the EMERG	AI-133A behind small door 143/SS Switch in EMERG position
11 (17)	Check DG-1 speed	AI-133A CUE: speed reads 900 rpm

Termination Criteria: D/G-1 is running at full speed.

JPM No: JPM-0356

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: • SA-214, "PRESSURE CONTROLLER PC-6040A SECONDARY AIR SYSTEM ROOT VALVE" • SA-280, "EMERGENCY COMPRESSOR SA-1-1 SECONDARY AIR SYSTEM ISOLATION VALVE"	c. Ensure **BOTH** of the following valves are closed: • SA-215, "PRESSURE CONTROLLER PC-6040A PRIMARY AIR SYSTEM ROOT VALVE" • SA-204, "EMERGENCY COMPRESSOR SA-1-1 PRIMARY AIR SYSTEM ISOLATION VALVE"
d. Open **BOTH** of the following valves: • SA-215, "PRESSURE CONTROLLER PC-6040A PRIMARY AIR SYSTEM ROOT VALVE" • SA-204, "EMERGENCY COMPRESSOR SA-1-1 PRIMARY AIR SYSTEM ISOLATION VALVE"	d. Open **BOTH** of the following valves: • SA-214, "PRESSURE CONTROLLER PC-6040A SECONDARY AIR SYSTEM ROOT 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

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 R55
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

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

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 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
2	Ensure VA-291/VA-279 combined remote operator is closed.	Corr 26 VA-291/VA-279 CLOSED
3	Ensure VA-282/VA-284 combined remote operator is closed.	Corr 26 VA-282/VA-284 CLOSED
4	Open hydrogen purge valves for VA-80A: • VA-290 • VA-292 • VA-289:	Corr 26 Unlock and OPEN valves
5	Contact Control Room	**CUE: Control room reports procedure steps 8,9 and 10 have been completed**

JPM No: JPM-0719M

JPM Title: Startup Containment Hydrogen Purge and Makeup

STEP	ELEMENT	STANDARD
6	Start hydrogen purge fan, VA-80A	AI-100 Place VA-80A control switch in PULL TO OVERRIDE Red Light ON Green Light OFF
7	Monitor DPI-899D	Corr 26 **CUE: DPI-899D indicates 10”w.g.**
8	Ensure VA-281/VA-283 combined remote operator is closed.	Corr 26 VA-281/VA-283 CLOSED
9	Open VA-282/VA-284 VA-80B suction from Aux Bldg/recirc valve	Corr 26 VA-282/VA-284 OPEN
10	Open VA-280	Corr 26 VA-280 OPEN
11	Start hydrogen purge fan, VA-80B	AI-100 Place VA-80B control switch in PULL TO OVERRIDE Red Light ON Green Light OFF
12	Contact control room to place HCV-881 in override.	**CUE: The control room has placed HCV-881 in OVERRIDE** **STOP**

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

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 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

C

Continuous Use

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.		_____

C

Continuous Use

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. _____

C

Continuous Use

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. _____

C

Continuous Use

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. ___

C

Continuous Use

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 hourly in 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 ___ _____

C

Continuous Use

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) ___

C

Continuous Use

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 _____/_____

C

Continuous Use

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 _____

C

Continuous Use

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 ___ _____

C

Continuous Use

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}

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 (10:00)	COP T:L903X 0% 60 sec ramp	I - BOP	S/G "A" level transmitter fails low – manual FW flow control required
3 (15:00)	COP NCAPCA1C TRIP	C - BOP	IA Compressor trips, standby does not load
4 (20:00)	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 (35:00)	MFP EDS04B	C - ATC	Instrument Bus Fails – T/S Entry
7 (45:00)	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
	ATC	Determines that Flow instrument FI-212 has failed high
	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-101-1/1-1-2 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 (if needed) 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	Plsce 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
	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	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	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
	SRO	Diagnose event and enter EOP-05

Op-Test No.: Scenario No.: 2005-1 Event No.: 8 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	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	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)

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 25%	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)
	SRO	Enter AOP-15
	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)
	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	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	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	When RCS pressure reaches 1350 psia, ensure no more than 1 RCP operating in each loop
	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)
	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 pisa 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)

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.

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-103X fails high
6 (40:00)	COP T: L906Y 100% 60 sec ramp	I - BOP	S/G “B” level transmitter LT-906X 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 ensure Main Generator Terminal voltage less than 22,000 Volts
	BOP	Verifies Main Generator Terminal Voltage – no adjustment needed
	SRO	Direct BOP to align secondary pumps as needed.
	BOP	Align secondary pumps as directed
	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
	SRO	Direct that signs be placed at entrances to switchgear rooms Review EOP-02, EOP-07 and EOP-20
	SRO	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)
	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	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
	SRO	Enter EOP-20. 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}

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.

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 100% 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 8

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 8

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.
	BOP	If the reactor trips, manually throttle FIC-1101

Op-Test No.: Scenario No.: 2005-4 Event No.: 3 Page 4 of 8

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	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 8

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	Refer to Tech Specs 2.5, 2.15 and 2.01 Plant is in a 6 hour LCO with no operable AFW pumps

Op-Test No.: Scenario No.: 2005-4 Event No.: 5 Page 6 of 8

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 8

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 8

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
	BOP	Establish FW flow to good S/G. May need to manually start AFW pump
	SRO	Direct BOP to establish steam flow from good S/G prior to dryout of affected S/G
	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