



Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 2 of 117

<u>Usage</u>	<u>Table of Contents</u>	<u>Page</u>
1	14.0 Manual Starting of AFW Pump 14(24)	36
	15.0 Filling the AFWST	42
4	15.1 Filling the AFWST From Demineralized Water System	42
1	15.2 Filling The AFWST From The Hotwell	42
1	16.0 ESF Standby Readiness Lineup	45
	17.0 Support Documents	48
1	17.1 AFW Train A Control Panel Lineup (-1)	49
1	17.2 AFW Train A Electrical Lineup (-2)	52
1	17.3 AFW Train B Control Panel Lineup (-3)	54
1	17.4 AFW Train B Electrical Lineup (-4)	57
1	17.5 AFW Train C Control Panel Lineup (-5)	59
1	17.6 AFW Train C Electrical Lineup (-6)	62
1	17.7 AFW Train D Control Panel Lineup (-7)	64
1	17.8 AFW Train D Electrical Lineup (-8)	67
1	17.9 AFWST Valve Lineup (-9)	69
1	17.10 AFWST Valve Pit Lineup (-10)	72
1	17.11 AFW Train A Valve Lineup (-11)	74
1	17.12 AFW Train B Valve Lineup (-12)	79
1	17.13 AFW Train C Valve Lineup (-13)	84
1	17.14 AFW Train D Valve Lineup (-14)	89
1	17.15 AFW Train A Vent Lineup (-15)	96

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 3 of 117

<u>Usage</u>	<u>Table of Contents</u>	<u>Page</u>
1	17.16 AFW Train B Vent Lineup (-16)	99
1	17.17 AFW Train C Vent Lineup (-17)	102
1	17.18 AFW Train D Vent Lineup (-18)	105
1	17.19 Instrument Vent Lineup (-19)	108
1	17.20 Cross-Tie Flow Sweep and AFW Valve Restoration Lineup (-20)	111
1	17.21 AFW Train D Drain Valve Lineup (-21)	115

Usage

- 1 - IN HAND
- 2 - IN HAND CONTROLLING STATION
- 3 - REFERENCED
- 4 - AVAILABLE

1.0 Purpose

This procedure provides instructions for operation of the Auxiliary Feedwater (AFW) System.

2.0 References

2.1 P&IDs

- 2.1.1 5S149F00024, Auxiliary Feedwater
- 2.1.2 5S141(2)F22547, Turbine Driven AFW Pump Lube Oil System
- 2.1.3 5S199F00020, Condensate Storage
- 2.1.4 5S139F00063, Feedwater

2.2 Terry Turbine Manual 4053-011FBT

2.3 Bingham Williamette Motor 4053-01001CBT

2.4 Logic drawings

- 2.4.1 5S-14-9-Z-40131, Motor Driven AFW Pump
- 2.4.2 5S-14-9-Z-40132, AFW Turbine Steam Inlet Valve
- 2.4.3 5S-14-9-Z-40134, AFW Crossover Valves
- 2.4.4 5S-14-9-Z-40135, AFW Pump No. 14(24) Turbine Trip and Throttle Valve
- 2.4.5 5S-14-9-Z-40136, AFW Turbine Pump Isolation Valve
- 2.4.6 5S-14-9-Z-40139, AFW Pump Turbine Trip Solenoid
- 2.4.7 5V-14-9-Z-41634, Main Stm. Iso. Valve Cubicle Vent Fans

2.5 IEN 85-076, Recent Water Hammer Events

2.6 Technical Specifications 3.7.1.2 and 3.7.1.3

2.7 MATS 8601462-860, Instrument venting

- 2.8 SPR 890313, Recirculation piping vibration
- 2.9 IEN 86-14
- 2.10 OPOP02-CD-0001, Condensate System
- 2.11 Memo to D. W. McCallum from M. Pacy, dated 8/6/93, "Guidance For Determining Drain Line Operability"
- 2.12 SER 90-007, "Turbine Driven Auxiliary Feedwater Pump Overspeed Condition Due to Governor Oil Contamination"
- 2.13 1(2)PSP03-AF-0007, Auxiliary Feedwater Pump 14(24) In Service Test

3.0 Prerequisites

- 3.1 Lineups (-1), (-2), (-3), (-4), (-5), (-6), (-7), (-8), (-9), (-11), (-12), (-13) and (-14) are completed. IF the AFWST Valve Pit was opened, THEN Lineup (-10) SHALL be completed.
- 3.2 Steam Generator (SG) 1D(2D) is available to supply steam to AFW pump 14(24) (Section 12.0).
- 3.3 Instrument Air is available to the AFW System.
- 3.4 NOTIFY Chemical Analysis to provide AFW chemical treatment. This should be done prior to normal AFW operation or as soon as possible upon AFW emergency initiation.
- 3.5 The Auxiliary Feedwater Storage Tank (AFWST) is filled to a level of at least 50,000 gallons for adequate system filling and pump operation.
- 3.6 Condensate Transfer System is in service per OPOP02-CD-0001, Condensate System. (Section 15, 16.0)
- 3.7 Hotwell Dump Pump suction header is filled and vented per OPOP02-CD-0001, Condensate System. (Section 15, 16.0)

4.0 Notes and Precautions

- 4.1 WHEN the RCS is below no load T<sub>avg</sub> OR the Reactor is below 5% power, THEN steam usage SHALL be controlled to prevent excessive cooldown of the primary system.
- 4.2 AFW to SG regulating valves are installed with mechanical stops to prevent full closure (with the exception of Unit 2 Train A).
  - 4.2.1 50 to 100 gpm will remain through the valve with full closed indication.
  - 4.2.2 AFW flow to a SG from its respective AFW pump can be isolated by closing the respective AFW OCIV.
  - 4.2.3 AFW flow to a SG from another train's AFW pump, via the AFW pump cross connect valves, can be isolated by closing the applicable SGs AFW OCIV (preferred) OR by closing the applicable AFW pump cross connect valve.
  - 4.2.4 Limit the time AFW flow is below 160 gpm. Low flows cause increased vibration of the recirculation line.
- 4.3 OBSERVE the following motor starting requirements:
  - 4.3.1 With motor Cold - four consecutive starts (no waiting between starts)
  - 4.3.2 With motor at operating Temp - three consecutive starts (no waiting between starts)
  - 4.3.3 IF motor has been running after 4.3.1 OR 4.3.2 are performed, THEN wait 15 minutes between subsequent starts.
  - 4.3.4 IF motor has been idle after 4.3.1 OR 4.3.2 are performed, THEN wait 45 minutes between subsequent starts
- 4.4 The AFW pumps have no loss of suction trip protection on AFWST low level.

4.5 (UNIT 1 ONLY) Low point steam line drains SHALL be verified on Proteus Computer Point T7545 to be between 250°F and 400°F at NOP/NOT conditions prior to starting AFW pump 14. Temperatures outside this band may indicate a failed or plugged steam line drain and overspeed of AFW pump 14 is likely.

4.5.1 IF temperature is NOT within this band, THEN the Shift Supervisor SHALL determine the operability of AFW pump 14.

4.5.2 IF the Shift Supervisor determines AFW pump 14 is inoperable AND should be started, THEN Section 14.0 of this procedure SHALL be used.

4.6 (UNIT 2 ONLY) On Unit 2, Low point steam line drains SHALL be verified on Proteus Computer Point T7545 to be within 25°F of T<sub>sat</sub> for the current P<sub>sat</sub> in the D Steam Header prior to starting AFW pump 24. Temperatures outside this band may indicate a failed or plugged steam line drain and overspeed of AFW pump 24 is likely.

4.6.1 IF temperature is NOT within this band, THEN the Shift Supervisor SHALL determine the operability of AFW pump 24.

4.6.2 IF the Shift Supervisor determines AFW pump 24 is inoperable AND should be started, THEN Section 14.0 of this procedure SHALL be used.

4.7 The following valves SHALL be open to prevent condensate accumulation which could result in a waterhammer condition or possible turbine overspeed due to water induction during start of the turbine driven AFW pump 14(24). (Reference 2.5)

o Condenser Isolation 1(2)-MD-C928 SHALL be open

o (UNIT 1 ONLY) Main Steam Line Drain Bypass 1-MS-0517

o (UNIT 1 ONLY) Main Steam Line Steam Trap Inlet Isol 1-MS-0515

o (UNIT 1 ONLY) Main Steam Line Steam Trap Outlet Isol 1-MS-0516

o (UNIT 2 ONLY) Main Steam Line FO-7537E Inlet Isol 2-MS-0515

o (UNIT 2 ONLY) Main Steam Line FO-7537E Outlet Isol 2-MS-0516

FC 940728

FC 940728

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 8 of 117

FC 94-0728

FC 94-0848

FC 94-0848

- 4.8 IF turbine driven AFW pump 14(24) is started per section 14.0 of this procedure, THEN AFW pump 14(24) should be quickly brought to a discharge pressure of 1150 psig, as measured remotely at PI-7529 on the pump discharge, to avoid damage to pump wearing surfaces.
- 4.9 IF any automatic or remote start (other than local manual starting of turbine driven AFW pump 14(24)) of any AFW pump occurs AND SGs are at normal operating pressure, THEN a pressure of 1150 psig, as measured remotely at PI-7529, should be produced within 30 seconds of pump start. IF pressure is NOT achieved, THEN TRIP the applicable AFW pump immediately to prevent pump damage.
- 4.10 WHEN stopping the turbine driven AFW pump 14(24), THEN AFW pump 14(24) should be tripped to avoid any possibility of operation less than 1150 psig.
- 4.11 IF it is necessary to run an AFW pump at a reduced pump discharge head OR RPM (less than approximately 3000 RPM), THEN the associated flow control valve should be throttled or closed to force flow through the mini flow recirc to generate the necessary DP required per stage. (mini flow is a 1 1/2" line and long path is a 3" line)
- 4.12 Following any trip of the turbine driven AFW pump 14(24), 30 minutes should be allowed before attempting to restart the pump to prevent an overspeed trip. IF the pump is needed sooner than 30 minutes, THEN PERFORM a manual start of AFW pump 14(24) per section 14.0.
- 4.13 IF the Governor Speed Control Knob is rotated to the counterclockwise minimum speed setting, THEN AFW pump 14(24) governor oil pressure should bleed off within 10 seconds.
- 4.14 Changing the Governor Speed Control Knob setting makes the turbine driven Auxiliary Feed Pump 14(24) inoperable. IF the Governor Speed Control Knob has been adjusted, THEN 1(2)PSP03-AF-0007, "Auxiliary Feedwater Pump 14(24) In Service Test" SHALL be performed to verify operability.
- 4.15 Caution should be exercised when using an electronic strobe tachometer to ensure a harmonic is not being observed. A harmonic will make the strobe and the shaft "appear" to be in unison. However, actual speed may be an exact multiple of the objects (bolts on a coupling) being observed as compared to the flash of the strobe.



- 4.16 Caution **SHALL** be exercised during venting evolutions to ensure piping is not hot prior to opening vent valves. Hoses should be attached to the vent points with effluent routed to suitable containers or sumps.
- 4.17 The static vent portions of Sections 5.0, 6.0, 7.0 and 8.0 may be performed concurrently. **DO NOT** perform dynamic venting until all static venting is completed.
- 4.18 Valves located in the AFWST valve pit are not required to be checked unless the security barrier is breached. **IF** the AFWST valve pit security barrier is breached, **THEN** valves in the AFWST valve pit **SHALL** be verified according to the applicable lineup just prior to the final closure of the security barrier.
- 4.19 The AFW System Engineer **SHOULD** be notified if any unexpected speed oscillation are observed during startup and operation of the Turbine Driven AFP. (Reference 2.12)

5.0 Venting AFW Train A Piping

NOTE

The static vent portion of this section is comprised of Steps 5.1 through 5.10.

- 5.1 VERIFY Form (-10) (if required) and Form (-11) are complete. \_\_\_\_\_ |
- 5.2 ENSURE "AFW PUMP 11(21)" is NOT running. (CP006) \_\_\_\_\_
- 5.3 ENSURE all of the following AFW pump cross connect valves are closed: (CP006)
  - 5.3.1 AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_
  - 5.3.2 AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_
  - 5.3.3 AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_
- 5.4 OPEN AFW pump 11(21) cross connect valve "XCONN FV-7517". (CP006) \_\_\_\_\_
- 5.5 UNLOCK and OPEN "1(2)-AF-0040 AFW PUMP 11(21) RECIRC TEST LINE ISOL VLV". (IVC 22 ft A Train) \_\_\_\_\_
- 5.6 IF SG 1A(2A) is NOT aligned for recirculation, THEN OPEN AFW to SG 1A(2A) isolation valve "OCIV MOV-0048". (CP006) \_\_\_\_\_
- 5.7 VENT AFW Train A piping at each location specified on Lineup (-15). \_\_\_\_\_
- 5.8 DIRECT I&C to fill, vent and place in service AFW Train A instrumentation listed on Lineup (-19). \_\_\_\_\_
- 5.9 PLACE AFW to SG 1A(2A) "AFW REG FV-7525" in the FULL CLOSE position. (CP006) \_\_\_\_\_
- 5.10 CLOSE SG 1A(2A) AFW isolation valve "OCIV MOV-0048". (CP006) \_\_\_\_\_

**CAUTION**

The static vent portions of Sections 5.0, 6.0, 7.0 and 8.0 may be performed concurrently. DO NOT perform dynamic venting until all static venting is completed.

- 5.11 START "AFW PUMP 11(21)". (CP006) \_\_\_\_\_
- 5.12 Slowly THROTTLE OPEN AFW to SG 1A(2A) "AFW REG FV-7525" until pump flow is between 550 and 675 gpm as indicated on "FLOW FI-7525". (CP006) \_\_\_\_\_
- 5.13 VENT the system at "1(2)-AF-0359 A TRAIN CROSS CONNECT LINE VENT VALVE". (IVC 22 ft A Train) \_\_\_\_\_
- 5.14 RECORD the venting at "1(2)-AF-0359 A TRAIN CROSS CONNECT LINE VENT VALVE" on Lineup (-15), Dynamic Vent Section. \_\_\_\_\_
- 5.15 Slowly CLOSE AFW to SG 1A(2A) "AFW REG FV-7525" until fully closed. (CP006) \_\_\_\_\_
- 5.16 CLOSE and LOCK "1(2)-AF-0040 AFW PUMP 11(21) RECIRC TEST LINE ISOL VLV". (IVC 22 ft A Train) \_\_\_\_\_
- 5.17 IF this is the last AFW train to be vented, THEN PERFORM Section 9.0, Flow Sweeping the X-CONN Piping. \_\_\_\_\_
- 5.18 IF this is NOT the last AFW train to be vented, THEN STOP "AFW PUMP 11(21)". (CP006) \_\_\_\_\_
- 5.19 CLOSE AFW pump 11(21) cross connect valve "XCONN FV-7517". (CP006) \_\_\_\_\_

6.0 Venting AFW Train B Piping

NOTE

The static vent portion of this section is comprised of Steps 6.1 through 6.10.

- 6.1 VERIFY Form (-10) (if required) and Form (-12) are complete. \_\_\_\_\_ |
- 6.2 ENSURE "AFW PUMP 12(22)" is NOT running. (CP006) \_\_\_\_\_
- 6.3 ENSURE all of the following AFW pump cross connect valves are closed: (CP006)
  - 6.3.1 AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_
  - 6.3.2 AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_
  - 6.3.3 AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_
- 6.4 OPEN AFW pump 12(22) cross connect valve "XCONN FV-7516". (CP006) \_\_\_\_\_
- 6.5 UNLOCK and OPEN "1(2)-AF-0070 AFW PUMP 12(22) RECIRC TEST LINE ISOL VLV". (IVC 22 ft B Train) \_\_\_\_\_
- 6.6 IF SG 1B(2B) is NOT aligned for recirculation, THEN OPEN AFW to SG 1B(2B) isolation valve "OCIV MOV-0065". (CP006) \_\_\_\_\_
- 6.7 VENT AFW Train B piping at each location specified on Lineup (-16). \_\_\_\_\_
- 6.8 DIRECT I&C to fill, vent and place in service the AFW Train B instrumentation listed on Lineup (-19) \_\_\_\_\_
- 6.9 PLACE AFW to SG 1B(2B) "AFW REG FV-7524" in the FULL CLOSE position. (CP006) \_\_\_\_\_
- 6.10 CLOSE SG 1B(2B) AFW isolation valve "OCIV MOV-0065". (CP006) \_\_\_\_\_

**CAUTION**

The static vent portions of Sections 5.0, 6.0, 7.0 and 8.0 may be performed concurrently. **DO NOT** perform dynamic venting until all static venting is completed.

- 6.11 START "AFW PUMP 12(22)". (CP006) \_\_\_\_\_
- 6.12 Slowly THROTTLE OPEN AFW to SG 1B(2B) "AFW REG FV-7524" until pump flow is between 550 and 575 gpm as indicated on "FLOW FI-7524". (CP006) \_\_\_\_\_
- 6.13 VENT the system at "1(2)-AF-0356 AFW PUMP 12(22) B TRAIN X-CONN LINE VENT VLV". (IVC 22 ft B Train) \_\_\_\_\_
- 6.14 RECORD the venting at "1(2)-AF-0356 AFW PUMP 12(22) B TRAIN X-CONN LINE VENT VLV" on Lineup (-16) Dynamic Vent Section. \_\_\_\_\_
- 6.15 Slowly CLOSE AFW to SG 1B(2B) "AFW REG FV-7524" until fully closed. (CP006) \_\_\_\_\_
- 6.16 CLOSE and LOCK "1(2)-AF-0070 AFW PUMP 12(22) RECIRC TEST LINE ISOLATION VLV". (IVC 22 ft B Train) \_\_\_\_\_
- 6.17 IF this is the last AFW train to be vented, THEN PERFORM Section 9.0, Flow Sweeping the X-CONN Piping. \_\_\_\_\_
- 6.18 IF this is NOT the last AFW train to be vented, THEN STOP "AFW PUMP 12(22)". (CP006) \_\_\_\_\_
- 6.19 CLOSE AFW pump 12(22) cross connect valve "XCONN FV-7516". (CP006) \_\_\_\_\_

7.0 Venting AFW Train C Piping

**NOTE**

The static vent portion of this section is comprised of Steps 7.1 through 7.10.

- 7.1 VERIFY Form (-10) (if required) and Form (-13) are complete. \_\_\_\_\_
- 7.2 ENSURE "AFW PUMP 13(23)" is NOT running. (CP006) \_\_\_\_\_
- 7.3 ENSURE all of the following AFW pump cross connect valves are closed: (CP006)
  - 7.3.1 AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_
  - 7.3.2 AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_
  - 7.3.3 AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_
- 7.4 OPEN AFW pump 13(23) cross connect valve "XCONN FV-7515". (CP006) \_\_\_\_\_
- 7.5 UNLOCK and OPEN "1(2)-AF-0092 AFW PUMP 13(23) RECIRC TEST LINE ISOL VLV". (IVC 22 ft C Train) \_\_\_\_\_
- 7.6 IF SG 1C(2C) is NOT aligned for recirculation, THEN OPEN AFW to SG 1C(2C) isolation valve "OCIV MOV-0085". (CP006) \_\_\_\_\_
- 7.7 VENT AFW Train C piping at each location specified on Lineup (-17). \_\_\_\_\_
- 7.8 DIRECT I&C to fill, vent and place in service AFW Train C instrumentation listed on Lineup (-19). \_\_\_\_\_
- 7.9 PLACE AFW to SG 1C(2C) "AFW REG FV-7523" in the FULL CLOSE position. (CP006) \_\_\_\_\_
- 7.10 CLOSE SG 1C(2C) AFW isolation valve "OCIV MOV-0085". (CP006) \_\_\_\_\_

**CAUTION**

The static vent portions of Sections 5.0, 6.0, 7.0 and 8.0 may be performed concurrently. DO NOT perform dynamic venting until all static venting is completed.

- 7.11 START "AFW PUMP 13(23)". (CP006) \_\_\_\_\_
- 7.12 Slowly THROTTLE OPEN AFW to SG 1C(2C) "AFW REG FV-7523" until pump flow is between 550 and 675 gpm as indicated on "FLOW FI-7523". (CP006) \_\_\_\_\_
- 7.13 VENT the system at "1(2)-AF-0360 TRAIN C X-CONN LINE VENT VLV". (IVC 22 ft C Train) \_\_\_\_\_
- 7.14 RECORD the venting at "1(2)-AF-0360 TRAIN C X-CONN LINE VENT VLV" on Lineup (-17) Dynamic Vent Section. \_\_\_\_\_
- 7.15 Slowly CLOSE AFW to SG 1C(2C) "AFW REG FV-7523" until fully closed. (CP006) \_\_\_\_\_
- 7.16 CLOSE and LOCK "1(2)-AF-0092 AFW PUMP 13(23) RECIRC TEST LINE ISOL VLV". (IVC 22 ft C Train) \_\_\_\_\_
- 7.17 IF this is the last AFW train to be vented, THEN PERFORM Section 9.0, Flow Sweeping the X-CONN Piping. \_\_\_\_\_
- 7.18 IF this is NOT the last AFW train to be vented, THEN STOP "AFW PUMP 13(23)". (CP006) \_\_\_\_\_
- 7.19 CLOSE AFW pump 13(23) cross connect valve "XCONN FV-7515". \_\_\_\_\_

8.0 Venting AFW Train D Piping

NOTE

The static vent portion of this section is comprised of Steps 8.1 through 8.10.

- 8.1 VERIFY Form (-10) (if required) and Form (-14) are complete. \_\_\_\_\_ |
- 8.2 ENSURE that "AFW PUMP 14(24)" is NOT running as indicated by the "TURB TRIP/THROT MOV-0514" being closed. (CP006) \_\_\_\_\_
- 8.3 ENSURE all of the following AFW pump cross connect valves are closed: (CP006)
  - 8.3.1 AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_
  - 8.3.2 AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_
  - 8.3.3 AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_
- 8.4 OPEN AFW pump 14(24) cross connect valve "XCONN FV-7518". (CP006) \_\_\_\_\_
- 8.5 UNLOCK and OPEN "1(2)-AF-0037 AFW PUMP 14(24) RECIRC TEST LINE ISOL VLV". (IVC 22 ft D Train) \_\_\_\_\_
- 8.6 IF SG 1D(2D) is NOT aligned for recirculation, THEN OPEN AFW to SG 1D(2D) isolation valve "OCIV MOV-0019". (CP006) \_\_\_\_\_
- 8.7 VENT AFW Train D piping at each location specified on Lineup (-18). \_\_\_\_\_
- 8.8 DIRECT I&C to fill, vent and place in service AFW Train D instrumentation listed on Lineup (-19). \_\_\_\_\_
- 8.9 PLACE AFW to SG 1D(2D) "AFW REG FV-7526" in the FULL CLOSE position. (CP006) \_\_\_\_\_
- 8.10 CLOSE SG 1D(2D) AFW isolation valve "OCIV MOV-0019". (CP006) \_\_\_\_\_



**CAUTION**

The static vent portions of Sections 5.0, 6.0, 7.0 and 8.0 may be performed concurrently. DO NOT perform dynamic venting until all static venting is completed.

8.11 START one of the motor driven AFW pump that was vented. (CP006)

"AFW PUMP 11(21)" \_\_\_\_\_

"AFW PUMP 12(22)" \_\_\_\_\_

"AFW PUMP 13(23)" \_\_\_\_\_

8.12 OPEN the applicable AFW pump cross connect valve. (CP006)

"AFW Pump 11(21) XCON FV-7517" \_\_\_\_\_

"AFW Pump 12(22) XCON FV-7516" \_\_\_\_\_

"AFW Pump 13(23) XCON FV-7515" \_\_\_\_\_

8.13 Slowly THROTTLE OPEN AFW to SG 1D(2D) "AFW REG FV-7526" until total AFW pump flow per pump is between 550 and 675 gpm as indicated on "FLOW FI-7526". (CP006) \_\_\_\_\_

8.14 VENT the system at "1(2)-AF-0358 TRAIN D XCONN LINE VENT VLV". (IVC 22 ft D Train) \_\_\_\_\_

8.15 RECORD the venting at "1(2)-AF-0358 TRAIN D XCONN LINE VENT VLV" on Lineup (-18), Dynamic Vent Section. \_\_\_\_\_

8.16 Slowly CLOSE AFW to SG 1D(2D) "AFW REG FV-7526" until fully closed. (CP006) \_\_\_\_\_

8.17 CLOSE and LOCK "1(2)-AF-0037 AFW PUMP 14(24) RECIRC TEST LINE ISOL VLV". (IVC 22 ft D Train) \_\_\_\_\_

8.18 IF this is the last AFW train to be vented, THEN PERFORM Section 9.0, Flow Sweeping the X-CONN Piping. \_\_\_\_\_

8.19 IF this is NOT the last AFW train to be vented, THEN STOP the running AFW pump. (CP006)

"AFW PUMP 11(21)" \_\_\_\_\_

"AFW PUMP 12(22)" \_\_\_\_\_

"AFW PUMP 13(23)" \_\_\_\_\_

8.20 CLOSE the applicable AFW pump cross connect valve. (CP006)

"AFW Pump 11(21) XCONN FV-7517" \_\_\_\_\_

"AFW Pump 12(22) XCONN FV-7516" \_\_\_\_\_

"AFW Pump 13(23) XCONN FV-7515" \_\_\_\_\_

9.0 Flow Sweeping the X-CONN Piping

NOTE

Steam Generator feeding SHALL be secured while performing this section.

- 9.1 ENSURE Forms (-11), (-12), (-13) and (-14) are completed. ENSURE Form (-10) (if required) is complete. \_\_\_\_\_
  
- 9.2 ENSURE all of the following AFW to SG isolation valves are closed: (CP006)
  - 9.2.1 AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_
  - 9.2.2 AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_
  - 9.2.3 AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_
  - 9.2.4 AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_
  
- 9.3 ENSURE all of the following AFW to SG regulating valves are closed: (CP006)
  - 9.3.1 AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_
  - 9.3.2 AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_
  - 9.3.3 AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_
  - 9.3.4 AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_
  
- 9.4 ENSURE all of the following AFW pump X-connect valves are open: (CP006)
  - 9.4.1 AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_
  - 9.4.2 AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_
  - 9.4.3 AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_
  - 9.4.4 AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_

**NOTE**

The auto recirc check valve for the operating AFW pump will chatter until the long path recirc isolation is opened.

9.5 IF a motor driven AFW pump is NOT running, THEN START one motor driven AFW pump. (CP006)

"AFW PMP 11(21)" \_\_\_\_\_

"AFW PMP 12(22)" \_\_\_\_\_

"AFW PMP 13(23)" \_\_\_\_\_

9.6 UNLOCK and OPEN "1(2)-AF-0037 AFW PUMP 14(24) RECIRC TEST LINE ISOL VLV". (IVC 22 ft D Train) \_\_\_\_\_

9.7 Slowly THROTTLE OPEN AFW to SG 1D(2D) "AFW REG FV-7526" until total AFW pump flow is between 550 and 675 gpm as indicated on "FLOW FI-7526". (CP006) \_\_\_\_\_

9.8 RECORD the time that flow between 550 and 675 gpm was obtained.

TIME \_\_\_\_\_

9.9 WHEN fifteen minutes has elapsed since the time recorded in Step 9.8, THEN slowly CLOSE AFW to SG 1D(2D) "AFW REG FV-7526". (CP006) \_\_\_\_\_

9.10 RECORD the time that AFW to SG 1D(2D) "AFW REG FV-7526" was closed.

TIME \_\_\_\_\_

9.11 CLOSE and LOCK "1(2)-AF-0037 AFW PUMP 14(24) RECIRC TEST LINE ISOL VLV". (IVC 22 ft D Train) \_\_\_\_\_

- 9.12 IF "AFW PUMP 13(23)" is NOT running, THEN PERFORM the following:
- 9.12.1 UNLOCK and OPEN "1(2)-AF-0092 AFW PUMP 13(23) RECIRC TEST LINE ISOL VLV". (IVC 22 ft C Train) \_\_\_\_\_
  - 9.12.2 Slowly THROTTLE OPEN AFW to SG 1C(2C) "AFW REG FV-7523" until total AFW pump flow is between 550 and 675 gpm as indicated on "FLOW FI-7523". (CP006) \_\_\_\_\_
  - 9.12.3 RECORD the time that flow between 500 and 675 gpm was obtained. \_\_\_\_\_  
TIME \_\_\_\_\_
  - 9.12.4 WHEN fifteen minutes has elapsed since the time recorded in Step 9.12.3, THEN slowly CLOSE AFW to SG 1C(2C) "AFW REG FV-7523". (CP006) \_\_\_\_\_
  - 9.12.5 RECORD time AFW to SG 1C(2C) "AFW REG FV-7523" was closed. \_\_\_\_\_  
TIME \_\_\_\_\_
  - 9.12.6 CLOSE and LOCK "1(2)-AF-0092 AFW PUMP 13(23) RECIRC TEST LINE ISOL VLV". (IVC 22 ft C Train) \_\_\_\_\_
- 9.13 IF "AFW PUMP 12(22)" is NOT running, THEN PERFORM the following:
- 9.13.1 UNLOCK and OPEN "1(2)-AF-0070 AFW PUMP 12(22) RECIRC TEST LINE ISOL VLV". (IVC 22 ft B Train) \_\_\_\_\_
  - 9.13.2 Slowly THROTTLE OPEN AFW to SG 1B(2B) "AFW REG FV-7524" until total AFW pump flow is between 550 and 675 gpm as indicated on "FLOW FI-7524". (CP006) \_\_\_\_\_
  - 9.13.3 RECORD time flow between 550 and 675 gpm was obtained. \_\_\_\_\_  
TIME \_\_\_\_\_
  - 9.13.4 WHEN fifteen minutes has elapsed since the time recorded in Step 9.13.3, THEN slowly CLOSE AFW to SG 1B(2B) "AFW REG FV-7524". (CP006) \_\_\_\_\_

- 9.13.5 RECORD the time that AFW to SG 1B(2B) "AFW REG FV-7524" was closed. TIME \_\_\_\_\_
  
- 9.13.6 CLOSE and LOCK "1(2)-AF-0070 AFW PUMP 12(22) RECIRC TEST LINE ISOLATION VLV". (IVC 22 ft B Train) \_\_\_\_\_
  
- 9.14 IF "AFW PUMP 11(21)" is NOT running, THEN PERFORM the following:
  - 9.14.1 UNLOCK and OPEN "1(2)-AF-0040 AFW PUMP 11(21) RECIRC TEST LINE ISOL VLV". (IVC 22 ft A Train) \_\_\_\_\_
  
  - 9.14.2 Slowly THROTTLE OPEN AFW to SG 1A(2A) "AFW REG FV-7525" until total AFW pump flow is between 550 and 675 gpm as indicated on "FLOW FI-7525". (CP006) \_\_\_\_\_
  
  - 9.14.3 RECORD the time that flow between 550 and 675 gpm was obtained. TIME \_\_\_\_\_
  
  - 9.14.4 WHEN fifteen minutes has elapsed since the time recorded in Step 9.14.3, THEN slowly CLOSE AFW to SG 1A(2A) "AFW REG FV-7525". (CP006) \_\_\_\_\_
  
  - 9.14.5 RECORD the time that AFW to SG 1A(2A) "AFW REG FV-7525" was closed. TIME \_\_\_\_\_
  
  - 9.14.6 CLOSE and LOCK "1(2)-AF-0040 AFW PUMP 11(21) RECIRC TEST LINE ISOL VLV". (IVC 22 ft A Train) \_\_\_\_\_
  
- 9.15 STOP the running AFW pump. (CP006)
  - "AFW PMP 11(21)" \_\_\_\_\_
  - "AFW PMP 12(22)" \_\_\_\_\_
  - "AFW PMP 13(23)" \_\_\_\_\_

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 22 of 117

9.16 ENSURE all of the following AFW pump cross connect valves are closed:  
(CP006)

9.16.1 AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_

9.16.2 AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_

9.16.3 AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_

9.16.4 AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_

9.17 ENSURE Lineup (-20) is complete. \_\_\_\_\_

9.18 NOTIFY Chemical Analysis of possible addition of air to AFWST due  
to flow sweeping. \_\_\_\_\_

10.0 Starting a Motor Driven Pump

NOTE

All components operated from CP006.

10.1 ENSURE the desired AFW to SG isolation valve(s) is closed.

AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_

AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_

AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_

AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_

10.2 CLOSE the desired AFW to SG regulating valve(s).

AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_

AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_

AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_

AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_

10.3 IF cross train flow is desired, THEN OPEN the desired AFW pump cross connect valve(s).

AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_

AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_

AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_

AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_



10.4 START the selected AFW pump.

"AFW PUMP 11(21)" \_\_\_\_\_

"AFW PUMP 12(22)" \_\_\_\_\_

"AFW PUMP 13(23)" \_\_\_\_\_

**CAUTION**

AFW pump flowrate SHALL NOT exceed 675 gpm per pump.

**NOTE**

- o The AFW to SG regulating valves are mechanically stopped to allow approximately 50 to 100 gpm flow when closed (with the exception of Unit 2 Train A.)
- o AFW flow to a SG from its respective AFW pump may be isolated by closing the respective AFW OCIV.
- o AFW flow to a SG from another train's AFW pump, via the AFW pump cross connect valves, may be isolated by closing the applicable SGs AFW OCIV (preferred) OR by closing the applicable AFW pump cross connect valve.

10.5 OPEN the desired AFW to SG isolation valve(s) to establish flow to the associated SG(s).

AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_

AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_

AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_

AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_

10.6 THROTTLE the AFW to SG regulating valve(s) to maintain the selected SG(s) at the desired level.

AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_

AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_

AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_

AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_

10.7 IF it is desired to isolate all flow to a SG(s), THEN CLOSE the associated AFW OCIV(s) (preferred) OR AFW pump cross connect valve(s).

SG 1A(2A)

AFW to SG 1A(2A) "OCIV MOV-0048" (preferred) \_\_\_\_\_

OR

AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_

SG 1B(2B)

AFW to SG 1B(2B) "OCIV MOV-0065" (preferred) \_\_\_\_\_

OR

AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_

SG 1C(2C)

AFW to SG 1C(2C) "OCIV MOV-0085" (preferred) \_\_\_\_\_

OR

AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_

SG 1D(2D)

AFW to SG 1D(2D) "OCIV MOV-0019" (preferred) \_\_\_\_\_

OR

AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_

11.0 Stopping a Motor Driven Pump

NOTE

Components are located on CP006.

11.1 CLOSE the selected AFW OCIV(s).

AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_

AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_

AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_

AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_

11.2 CLOSE the selected AFW pump cross connect valve(s).

AFW pump 12(21) "XCONN FV-7517" \_\_\_\_\_

AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_

AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_

AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_

11.3 STOP the selected AFW pump.

"AFW PUMP 11(21)" \_\_\_\_\_

"AFW PUMP 12(22)" \_\_\_\_\_

"AFW PUMP 13(23)" \_\_\_\_\_

11.4 ENSURE the applicable AFW to SG regulating valve(s) is open.

AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_

AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_

AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_

AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_

12.0 Starting AFW Pump 14(24)

NOTE

Components are located on CP006 unless otherwise noted.

NOTE

- o Condenser Isolation 1(2)-MD-0928 and the following applicable valves SHALL be open to prevent condensate accumulation:
  - o (UNIT 1 ONLY) Main Steam Line Drain Bypass 1-MS-0517, AND Main Steam Line Drain Steam Trap Inlet Isol 1-MS-0515, AND Main Steam Line Drain Steam Trap Outlet Isol 1-MS-0516.
  - o (UNIT 2 ONLY) Main Steam Steam Line Drain FO-7537E Inlet Isol 2-MS-0515, AND Main Steam Line Drain FO-7537E Outlet Isol 2-MS-0516.
- o Condensate accumulation could result in a waterhammer condition or possible turbine overspeed during start of the turbine driven AFW pump 14(24). (Reference 2.5)

FC 94-0728

- 12.1 PERFORM Form (-21), AFW TRAIN D DRAIN VALVE LINEUP. \_\_\_\_\_
- 12.2 VERIFY that "MN STM ISOL MOV-0143" is open. (CP006) \_\_\_\_\_
- 12.3 VERIFY that "MN STM ISOL MOV-0143" has been open for at least 4 hours by performing the following:
  - 12.3.1 CHECK that ERFDADS point AFQD0143, AFW TURB 14(24) STM INL VLV indicates "NORM". \_\_\_\_\_
  - 12.3.2 CHECK that ERFDADS trend point AFZD0143 has NOT changed digital state for the previous 4 hours using the ERFDADS Trend Definition List or an ERFDADS Archival Dump. \_\_\_\_\_
- 12.4 IF "MN STM ISOL MOV-0143" is NOT open OR has been closed within the previous 4 hours, THEN GO TO Section 14.0. \_\_\_\_\_
- 12.5 IF the RCS is below no load Tavg OR the Reactor is below 5% power, THEN MONITOR AFW operation to prevent excessive cooldown of the primary system. \_\_\_\_\_

12.6 ENSURE the applicable AFW to SG isolation valve(s) is closed.

AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_

AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_

AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_

AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_

12.7 CLOSE the desired AFW to SG regulating valve(s).

AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_

AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_

AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_

AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_

12.8 ENSURE AFW pump 14(24) has adequate lubrication as indicated by observing at least twenty-five percent (25%) level in both bearing sight bulbs. (IVC 10 ft D Train) \_\_\_\_\_

12.9 ENSURE AFW pump governor oil is visible in the sightglass (with the pump idle, governor oil will be high) AND the Turbine oil sump (end of turbine) sightglass is between the minimum and maximum marks. (IVC 10 ft D Train) \_\_\_\_\_

12.10 ENSURE AFW pump 14(24) turbine mechanical overspeed trip linkage is latched. (IVC 10 ft D Train) \_\_\_\_\_

**NOTE**

(UNIT 1 ONLY) Low point steam line drains must be between 250°F and 400°F at NOP/NOT conditions prior to starting AFW pump 14. Temperatures outside this band may indicate a failed or plugged steam line drain and overspeed of AFW pump 14 is likely.

FC 94-728

12.11 (UNIT 1 ONLY) VERIFY Proteus Computer Point T7545 "AFW PMP STM TURBINE DRAIN TEMP" is between 250°F and 400°F. \_\_\_\_\_

12.11.1 (UNIT 1 ONLY) IF the Proteus Computer Point T7545 is below the minimum of 250°F, THEN REQUEST PED to perform ultrasonic flow indication testing at FO-7537E. \_\_\_\_\_

12.11.2 **(UNIT 1 ONLY)** IF the Proteus Computer Point T7545 is outside the 250°F and 400°F band, **THEN NOTIFY** the Shift Supervisor to evaluate the operability of AFW pump 14. For plant conditions below NOP/NOT conditions, two-phase flow sonics indicate that the drain line is not clogged.

12.11.3 **(UNIT 1 ONLY)** IF AFW pump 14 is inoperable due to steam turbine drain temperatures **AND** it is desired to operate AFW pump 14, **THEN GO TO** Section 14.0 of this procedure.

**NOTE**

**(UNIT 2 ONLY)** Low point steam line drains must be within 25°F of Tsat for the current Psat in the D Steam Header prior to starting AFW pump 24. Temperatures outside this band may indicate a failed or plugged steam line drain and overspeed of AFW pump 24 is likely.

FC 94-0728

12.12 **(UNIT 2 ONLY)** VERIFY Proteus Computer Point T7545 "AFW PMP STM TURBINE DRAIN TEMP" is within 25°F of Tsat for the current Psat in the D Steam Header using steam tables.

Current Tsat in ( \_\_\_\_ °F) - ( 25 °F) = ( \_\_\_\_ °F) Low Temperature Limit  
D Steam Header

12.12.1 **(UNIT 2 ONLY)** IF the Proteus Computer Point T7545 is below the minimum of (Tsat minus 25°F) for the current Psat in the D Steam Header, **THEN REQUEST PED** to perform ultrasonic flow indication testing at FO-7537E.

12.12.2 **(UNIT 2 ONLY)** IF the Proteus Computer Point T7545 is below the minimum of (Tsat minus 25°F) for the current Psat in the D Steam Header, **THEN NOTIFY** the Shift Supervisor to evaluate the operability of AFW pump 24. Two-phase flow sonics indicate that the drain line is not clogged.



- 12.12.3 (UNIT 2 ONLY) IF AFW pump 24 is inoperable due to steam turbine drain temperatures AND it is desired to operate AFW pump 24, THEN GO TO Section 14.0 of this procedure. \_\_\_\_\_
- 12.13 (UNIT 2 ONLY) CHECK Proteus Computer Point "LD 7600 TDAFWP 24 STM INLET DRN LVL HI". \_\_\_\_\_
- 12.13.1 (UNIT 2 ONLY) IF the Proteus Computer Point "LD 7600 TDAFWP 24 STM INLET DRN LVL HI" is in alarm, THEN NOTIFY the Shift Supervisor to evaluate the operability of AFW pump 24. \_\_\_\_\_
- 12.13.2 (UNIT 2 ONLY) IF Proteus Computer Point "LD 7600 TDAFWP 24 STM INLET DRN LVL HI" is in alarm AND it is desired to operate AFW pump 24, THEN GO TO Section 14.0 of this procedure. \_\_\_\_\_
- 12.14 VERIFY "T & T UNIT TRIP" Annunciator 06M4 Window B7 is extinguished. \_\_\_\_\_
- 12.15 VERIFY "T & T MECH OVERSP TRIP" Annunciator 06M4 Window C8 is extinguished. \_\_\_\_\_

FC 94-0728

NOTE

Following any trip of the turbine driven AFW pump 14(24), allow 30 minutes before attempting to restart the pump to prevent an overspeed trip. A manual start of AFW pump 14(24) may be performed per section 14.0 of this procedure if required during the 30 minute waiting period.

NOTE

The turbine driven AFW pump 14(24) must be rapidly accelerated to operating speed to avoid pump damage.

- 12.16 IF turbine driven AFW pump discharge pressure (as indicated on PI-7529) is less than 1150 psig after 30 seconds following pump start, THEN TRIP the turbine driven AFW pump 14(24) immediately. \_\_\_\_\_
- 12.17 OPEN the "TURB TRIP/THRO" MOV-514" to start AFW pump 14(24). (CP006) \_\_\_\_\_
- 12.18 MONITOR AFW pump 14(24) discharge pressure indicated on PI-7529. \_\_\_\_\_

FC 9A-0728

12.19 IF cross train flow is desired, THEN OPEN the desired AFW pump cross connect valve(s).

AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_

AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_

AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_

AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_

**CAUTION**

AFW pump flowrate SHALL NOT exceed 675 gpm per pump.

**NOTE**

- o The AFW to SG regulating valves are mechanically stopped to allow approximately 50 to 100 gpm flow when closed (with the exception of Unit 2 Train A).
- o AFW flow to a SG from its respective AFW pump may be isolated by closing the respective AFW OCIV.
- o AFW flow to a SG from another train's AFW pump, via the AFW pump cross connect valves, may be isolated by closing the applicable SGs AFW OCIV (preferred) OR by closing the applicable AFW pump cross connect valve.

12.20 OPEN the desired AFW to SG isolation valve(s) to establish flow to the associated SG(s).

AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_

AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_

AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_

AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_

FC 94-0728

12.21 THROTTLE the AFW to SG regulating valve(s) to maintain the selected SG(s) at the desired level.

AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_

AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_

AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_

AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_

12.22 IF it is desired to isolate all flow to a SG(s), THEN CLOSE the applicable AFW to SG isolation valve(s) (preferred) OR AFW pump cross connect valve(s).

SG 1A(2A)

AFW to SG 1A(2A) "OCIV MOV-0048" (preferred) \_\_\_\_\_

OR

AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_

SG 1B(2B)

AFW to SG 1B(2B) "OCIV MOV-0065" (preferred) \_\_\_\_\_

OR

AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_

SG 1C(2C)

AFW to SG 1C(2C) "OCIV MOV-0085" (preferred) \_\_\_\_\_

OR

AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_

SG 1D(2D)

AFW to SG 1D(2D) "OCIV MOV-0019" (preferred) \_\_\_\_\_

OR

AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_

12.23 WHEN the pump run is complete, THEN GO TO Section 13.0, Stopping AFW Pump 14(24), to shutdown the AFW pump. \_\_\_\_\_

13.4 ENSURE the applicable AFW to SG regulating valve(s) is open.

AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_

AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_

AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_

AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_

**NOTE**

Proteus Computer Point "T7601, AFW PMP STM T&T VALVE LEAKBY" may be monitored to check for leakage by MOV-514.

FC 99-0728

13.5 DIRECT the RPO to visually check that the Trip and Throttle Valve is reset (run to minimum) and the solenoid is latched. \_\_\_\_\_

13.6 DIRECT the RPO to remain at AFW pump 14(24) for 30 minutes in case the pump is needed within 30 minutes of shutdown. \_\_\_\_\_

13.7 **IF** AFW pump 14(24) was running per Section 14.0, Manual Starting of AFW pump 14(24), **AND** it is desired to return AFW pump 14(24) to an operable status, **THEN PERFORM** 1(2)PSP03-AF-0007 "Auxiliary Feedwater Pump 14(24) In Service Test" while complying with Step 4.6. \_\_\_\_\_

13.0 Stopping AFW Pump 14(24)

NOTE

Components are located on CP006 unless noted.

13.1 CLOSE the desired AFW to SG isolation valve(s).

AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_

AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_

AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_

AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_

13.2 CLOSE the desired AFW pump cross connect valve(s).

AFW pump 11(21) "XCONN FV-7517" \_\_\_\_\_

AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_

AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_

AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_

NOTE

The turbine driven AFW pump 14(24) should be stopped by tripping the Trip/Throttle valve. This will avoid unnecessary operation at slow speeds (low head).

13.3 TRIP the "TURB TRIP/THROT MOV-514" valve to stop AFW pump 14(24). \_\_\_\_\_

14.0 Manual Starting of AFW Pump 14(24)

**CAUTION**

Operation of AFW pump 14(24) using section 14.0 will make the pump inoperable due to the manipulation of the Governor Speed Control Knob.

- 14.1 ENSURE "MN STM ISOL MOV-0143" valve is open. (CP006) \_\_\_\_\_
- 14.2 PERFORM "AFW TRAIN D DRAIN VALVE LINEUP" (-21). \_\_\_\_\_
- 14.3 CHECK the following:
  - 14.3.1 (UNIT 1 ONLY) VERIFY Proteus Computer Point T7545 "AFW PMP STM TURBINE DRAIN TEMP" is between 250°F and 400°F. \_\_\_\_\_
    - 14.3.1.1 (UNIT 1 ONLY) IF Proteus Computer Point T7545 "AFW PMP STM TURBINE DRAIN TEMP" is NOT between 250°F and 400°F prior to starting, THEN NOTIFY the Shift Supervisor to determine if AFW pump 14 can be started. \_\_\_\_\_
  - 14.3.2 (UNIT 2 ONLY) VERIFY Proteus Computer Point T7545 "AFW PMP STM TURBINE DRAIN TEMP" is within 25°F of Tsat for the current Psat in the D Steam Header using steam tables. \_\_\_\_\_
 

Current Tsat in ( \_\_\_\_ °F) - ( 25 °F) = ( \_\_\_\_ °F) Low Temp  
 D Steam Header Limit

    - 14.3.2.1 (UNIT 2 ONLY) IF the Proteus Computer Point T7545 is below the minimum of (Tsat minus 25°F) for the current Psat in the D Steam Header, THEN NOTIFY the Shift Supervisor to determine if AFW pump 14 can be started. \_\_\_\_\_

FC 99-0728

14.3.3 (UNIT 2 ONLY) CHECK Proteus Computer Point "LD 7600 TDAFWP 24 STM INLET DRN LVL HI".

14.3.3.1 (UNIT 2 ONLY) IF the Proteus Computer Point "LD 7600 TDAFWP 24 STM INLET DRN LVL HI" is in alarm, THEN NOTIFY the Shift Supervisor to evaluate the operability of AFW pump 24.

14.4 ENSURE AFW Train D aligned per Lineup (-14).

14.5 NOTIFY the Unit/Shift Supervisor to ENSURE the AFW pump 14(24) is logged as inoperable.

FC 99-0728

NOTE

The number of turns from the minimum speed setting on the Governor Speed Control Knob should be recorded in order to determine any changes in governor behavior or setup.

14.6 ROTATE the Governor Speed Control Knob fully counterclockwise to reset the governor to the minimum setting and bleed off any residual pressure of the governor.

14.6.1 RECORD the number of revolutions required to the nearest tenth of a turn below.

Turns Counterclockwise

14.7 ENSURE AFW pump 14(24) has adequate lubrication as indicated by both pump bearing sight bulbs being approximately twenty-five percent (25%) full. (IVC 10 ft D Train)

- 14.8 ENSURE AFW pump governor oil is visible in the sightglass (with the pump idle, governor oil will be high) AND the Turbine oil sump (end of turbine) sightglass is between the minimum and maximum marks. (IVC 10 ft D Train) \_\_\_\_\_
- 14.9 ENSURE AFW pump 14(24) turbine mechanical overspeed trip linkage is latched. (IVC 10 ft D Train) \_\_\_\_\_
- 14.10 ENSURE AFW pump 14(24) cross connect valve "XCONN FV-7518" is closed. (CP006) \_\_\_\_\_
- 14.11 ENSURE AFW to SG 1D(2D) "OCIV MOV-0019" is closed. (CP006) \_\_\_\_\_
- 14.12 ENSURE the applicable AFW to SG isolation valve(s) is closed.
  - AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_
  - AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_
  - AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_
  - AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_
- 14.13 CLOSE the applicable AFW to SG regulating valve(s). (CP006)
  - AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_
  - AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_
  - AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_
  - AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_
- 14.14 ENSURE all lights on the local "TURBINE AUXILIARY FEEDWATER PUMP 14(24)" control panel illuminate when the "LAMP TEST" pushbutton is depressed. (IVC 10 ft D Train) \_\_\_\_\_
- 14.15 VERIFY the "T & T UNIT TRIP" Annunciator 06M4 Window B7 is extinguished. \_\_\_\_\_
- 14.16 VERIFY the "T & T MECH OVERSP TRIP" Annunciator 06M4 Window C8 is extinguished. \_\_\_\_\_



- 14.17 ENSURE "AFW VENT FAN 11D(21D)" control switch is in the AUTO position. (CP022) \_\_\_\_\_
- 14.18 VERIFY the "LOW OIL PRESSURE" alarm light is illuminated. (IVC 10 ft D Train) \_\_\_\_\_
- 14.19 ESTABLISH communications between the Control Room and AFW pump 14(24). \_\_\_\_\_
- 14.20 IF the RCS is below no load Tavg OR the Reactor is below 5% power, THEN MONITOR AFW system operation to prevent excessive cooldown of the primary system. \_\_\_\_\_

NOTE

- o Limit the time that AFW flow is below 160 gpm to minimize recirculation line vibration.
- o AFW pump 14(24) speed may have to be increased above 2000 rpm to clear the "LOW OIL PRESSURE" red light.
- o Quickly increase AFW pump 14(24) discharge pressure to 1150 psig (as measured at PI-7529) to avoid damage to pump wearing surface.
- o Two RPOs AND a Shift Supervisor OR a Unit Supervisor are required to be present for the performance of the remainder of Section 14.0 OR until the AFW pump is stable.

- 14.21 EITHER OBSERVE the local RPM indication OR USE a calibrated strobe tachometer to determine turbine speed while starting AFW pump 14(24) locally. (this will require a second operator) \_\_\_\_\_
- 14.22 ENSURE 10 seconds have elapsed since rotating the Governor Speed Control Knob fully counterclockwise. \_\_\_\_\_

**NOTE**

The first 2-3 turns of MOV-0514 opens the pilot valve. This is followed by a few turns of low friction. Resistance will increase when the shaft starts to lift the main valve. Care should be exercised to prevent increasing speed too rapidly.

- 14.23 ENGAGE the clutch on MOV-514 motor to enable the valve's manual handwheel. (IVC 10 ft) \_\_\_\_\_
- 14.24 IF the "LOW OIL PRESSURE" light does NOT clear after a maximum speed of 2500 rpm is obtained for 15 seconds, THEN TRIP the "TURB TRIP/THROT MOV-514" valve. \_\_\_\_\_
- 14.25 Manually OPEN the "TURB TRIP/THROT MOV-514" valve slowly until EITHER the governor has taken control of the governor valve OR AFW pump 14(24) is at 2500 RPM. (IVC 10 ft D Train) \_\_\_\_\_
- 14.26 WHEN AFW pump 14(24) has operated for approximately 15 seconds at a maximum speed of 2500 rpm, THEN VERIFY the "LOW OIL PRESSURE" light clears. \_\_\_\_\_
- 14.27 MONITOR the turbine and pump for any unusual noise. \_\_\_\_\_
- 14.28 VERIFY that the governor takes control of AFW pump 14(24) by observing a speed decrease to approximately 1700 to 1900 rpm. \_\_\_\_\_
- 14.28.1 IF the governor DOES NOT take control, THEN DO NOT INCREASE turbine speed above the RPM necessary to provide 1150 psig discharge pressure indicated on PI-7529. \_\_\_\_\_
- 14.28.2 The Shift Supervisor may authorize increasing speed under these conditions. \_\_\_\_\_
- 14.29 IF the governor has taken control of AFW pump 14(24) speed control AND turbine speed is stable, THEN REQUEST the control room to fully OPEN MOV-514 electrically from CP006. \_\_\_\_\_
- 14.29.1 MONITOR pump speed while MOV-514 is opened. \_\_\_\_\_

NOTE

The number of turns from the minimum speed setting on the Governor Speed Control Knob should be recorded in order to determine any changes in governor behavior or setup.

14.30 Slowly ROTATE the AFW pump 14(24) turbine Governor Manual Speed Control Knob clockwise until AFW pump 14(24) speed is between 2000 and 2500 rpm AND the "LOW OIL PRESSURE" red light has cleared. (IVC 10 ft D Train) \_\_\_\_\_

14.30.1 RECORD the number of revolutions required to the nearest tenth of a turn below.

Turns Clockwise \_\_\_\_\_

14.31 VERIFY the "BEARING HEADER OIL PRESSURE NORMAL" amber light is illuminated. (IVC 10 ft D Train) \_\_\_\_\_

14.32 VERIFY the "MAIN OIL PUMP PRESSURE NORMAL" amber light is illuminated. (IVC 10 ft D Train) \_\_\_\_\_

**CAUTION**

AFW flowrate adjustments made by the control room operators SHALL be closely coordinated with the RPO at the local Turbine Driven AFW pump control panel to prevent an overspeed trip or low speed operation of the Turbine Driven AFW pump.

**NOTE**

The point at which the SGs will receive feedwater from AFW pump 14(24) will vary with RPM (discharge head of the pump) and pressure in the SGs. Maximum RPM obtainable using the governor is 3610 RPM.

14.33 INCREASE AFW pump 14(24) speed in increments of 500 rpm at one minute intervals by rotating the Governor Speed Control Knob in the clockwise direction. \_\_\_\_\_

14.33.1 WHEN the desired feed rate is obtained OR AFW pump speed reaches 3600 rpm, THEN STOP the speed increase. \_\_\_\_\_

14.33.2 RECORD the turns open on the Governor Speed Control Knob below. \_\_\_\_\_

Turns Clockwise \_\_\_\_\_

14.34 SET AFW pump 14(24) RPM per the appropriate sections of 1(2)PSP03-AF-0007, "Auxiliary Feedwater Pump 14(24) In Service Test". \_\_\_\_\_

14.35 WHEN the pump run is complete, THEN GO TO Section 13.0, Stopping AFW pump 14(24), to shutdown the AFW pump. \_\_\_\_\_

15.0 Filling the AFWST

15.1 Filling the AFWST From Demineralized Water System

15.1.1 REQUEST Chemical Operations to OPEN 1(2)-LV-7712,  
AFW TK LCV UNIT 1(2). \_\_\_\_\_

15.1.2 WHEN AFWST level is above the low level setpoint, THEN  
REQUEST Chemical Operations to CLOSE 1(2)-LV-7712,  
AFW TK LCV UNIT 1(2). \_\_\_\_\_

NOTE

The condenser hotwell is a secondary source of makeup water to the AFWST. It should be used for makeup when normal demineralized water makeup is unavailable or inadequate.

15.2 Filling The AFWST From The Hotwell

15.2.1 VERIFY there is NOT a vacuum on the condenser as indicated  
on "VAC 11(21) PI-7485A, VAC 12(22) PI-7486A, VAC  
13(23) PI-7488". (CP009) \_\_\_\_\_

15.2.2 REQUEST Chemical Analysis to sample the condenser hotwell  
to VERIFY water chemistry is in spec for use in the AFWST. \_\_\_\_\_

- 15.2.3 OPEN one or more of the following valves:
- o "1(2)-CD-0066 ISOL VALVE TO HOTWELL DUMP LINE". (TGB 29 ft SE CNDSR 11(21) Pit) \_\_\_\_\_
  - o "1(2)-CD-0070 ISOL VALVE TO HOTWELL DUMP LINE". (TGB 29 ft SE CNDSR 11(21) Pit) \_\_\_\_\_
  - o "1(2)-CD-0049 ISOL VALVE TO HOTWELL DUMP LINE". (TGB 29 ft E CNDSR 12(22) Pit) \_\_\_\_\_
  - o "1(2)-CD-0053 ISOL VALVE TO HOTWELL DUMP LINE". (TGB 29 ft E CNDSR 12(22) Pit) \_\_\_\_\_
  - o "1(2)-CD-0036 ISOL VALVE TO HOTWELL DUMP LINE". (TGB 29 ft NE CNDSR 13(23) Pit) \_\_\_\_\_
  - o "1(2)-CD-0040 ISOL VALVE TO HOTWELL DUMP LINE". (TGB 29 ft NE CNDSR 13(23) Pit) \_\_\_\_\_
- 15.2.4 OPEN "1(2)-CD-0115 HOTWELL DUMP PUMP SUCT VALVE". (TGB 29 ft SE CNDSR 13(23) Pit) \_\_\_\_\_
- 15.2.5 OPEN "1(2)-CT-0056 DISCH TO AUX FW TK". (TGB 29 ft SE of CNDSR 13(23)) \_\_\_\_\_
- 15.2.6 START the hotwell dump pump locally. \_\_\_\_\_
- 15.2.7 MAINTAIN condenser hotwell level between 1.25 and 2.25 ft by starting and stopping "HOTWELL MAKEUP PUMP 11(21) or 12(22)". (CP009) \_\_\_\_\_
- 15.2.8 WHEN the AFWST is at the desired level, THEN PERFORM the following:
- 15.2.8.1 STOP the hotwell dump pump locally. \_\_\_\_\_
  - 15.2.8.2 CLOSE "1(2)-CT-0056 DISCH TO AUX FW TK". (TGB 29 ft SE of CNDSR 13(23)) \_\_\_\_\_
  - 15.2.8.3 CLOSE "1(2)-CD-0115 HOTWELL DUMP PUMP SUCT VALVE". (TGB 29 ft SE CNDSR 13(23) Pit) \_\_\_\_\_

- 15.2.8.4 ENSURE "1(2)-CD-0040 ISOL VALVE TO HOTWELL DUMPLINE" valve is closed.  
(TGB 29 ft SE CNDSR 13(23) Pit) \_\_\_\_\_
- 15.2.8.5 ENSURE "1(2)-CD-0036 ISOL VALVE TO HOTWELL DUMPLINE" valve is closed.  
(TGB 29 ft SE CNDSR 13(23) Pit) \_\_\_\_\_
- 15.2.8.6 ENSURE "1(2)-CD-0053 ISOL VALVE TO HOTWELL DUMPLINE" valve is closed.  
(TGB 29 ft E CNDSR 12(22) Pit) \_\_\_\_\_
- 15.2.8.7 ENSURE "1(2)-CD-0049 ISOL VALVE TO HOTWELL DUMPLINE" valve is closed.  
(TGB 29 ft E CNDSR 12(22) Pit) \_\_\_\_\_
- 15.2.8.8 ENSURE "1(2)-CD-0070 ISOL VALVE TO HOTWELL DUMPLINE" valve is closed.  
(TGB 29 ft NE CNDSR 11(21) Pit) \_\_\_\_\_
- 15.2.8.9 ENSURE "1(2)-CD-0066 ISOL VALVE TO HOTWELL DUMPLINE" valve is closed.  
(TGB 29 ft NE CNDSR 11(21) Pit) \_\_\_\_\_

16.0 ESF Standby Readiness Lineup

**NOTE**

Steps 16.1 through 16.10 are recommended and should be performed; however, these steps are NOT required to meet Tech Spec requirements. **IF** it is desired to omit Steps 16.1 through 16.10, **THEN** the steps may be marked N/A.

- 16.1 ENSURE Lineup Forms (-9), (-11), (-12), (-13), (-14), (-19), and (-20) are completed AND all discrepancies are resolved. ENSURE Form (-10) (if required) is complete.
- 16.2 (UNIT 1 ONLY) VERIFY Proteus Computer Point T-7545 "AFW PMP STM TURBINE DRAIN TEMP" is between 250°F and 400°F at NOP/NOT conditions.
  - 16.2.1 (UNIT 1 ONLY) **IF** the Proteus Computer Point T7545 is found outside the temperature band, **THEN** NOTIFY the Shift Supervisor to evaluate the operability of AFW pump 14 due to possible drain blockage.
- 16.3 (UNIT 2 ONLY) VERIFY Proteus Computer Point T7545 "AFW PMP STM TURBINE DRAIN TEMP" is within 25°F of Tsat for the current Psat in the D Steam Header using steam tables.
 

Current Tsat in ( \_\_\_\_ °F) - ( 25 °F) = ( \_\_\_\_ °F) Low Temperature Limit  
D Steam Header

  - 16.3.1 (UNIT 2 ONLY) **IF** the Proteus Computer Point T7545 is below the minimum of (Tsat minus 25°F) for the current Psat in the D Steam Header, **THEN** NOTIFY the Shift Supervisor to evaluate the operability of AFW pump 24 due to possible drain blockage.
- 16.4 (UNIT 2 ONLY) CHECK Proteus Computer Point "LD 7600 TDAFWP 24 STM INLET DRN LVL HI":
  - 16.4.1 (UNIT 2 ONLY) **IF** the Proteus Computer Point "LD 7600 TDAFWP 24 STM INLET DRN LVL HI" is in alarm, **THEN** NOTIFY the Shift Supervisor to evaluate the operability of AFW pump 24 due to possible drain blockage.
- 16.5 VERIFY that "MN STM ISOL MOV-0143" is open. (CP006)

FC 74-0728



16.6 VERIFY that "MN STM ISOL MOV-0143" has been open for at least 4 hours by performing the following:

16.6.1 CHECK that ERFDADS point AFQD0143, AFW TURB 14(24) STM INL VLV indicates "NORM".

16.6.2 CHECK that ERFDADS trend point AFZD0143 has NOT changed digital state for the previous 4 hours using the ERFDADS Trend Definition List or an ERFDADS Archival Dump.

16.7 (UNIT 1 ONLY) VERIFY all of the following valves are open:

o 1-MS-0517 "STEAM LINE DRAIN BYPASS"

o 1-MS-0515 "MAIN STEAM LINE DRAIN STEAM TRAP INLET ISOL"

o 1-MS-0516 "MAIN STEAM LINE DRAIN STEAM TRAP OUTLET ISOL"

16.8 (UNIT 2 ONLY) VERIFY all of the following valves are open:

o 2-MS-0515 "MAIN STEAM LINE DRAIN FO-7537E" "INLET ISOL"

o 2-MS-0516 "MAIN STEAM LINE DRAIN FO-7537E" "OUTLET ISOL"

16.9 VERIFY 1(2)-MD-0928 "AFPT TO CNDSR 13(23) ISOL" is open.

16.10 VERIFY AFW pump 14(24) TRIP AND THROTTLE valve is latched by observing that annunciator 6M04 Window B7 "AFWP 14(24) T & T UNIT TRIP" is extinguished.

16.11 VERIFY AFW pump 14(24) overspeed trip is reset by observing that annunciator 6M04 Window C8 "AFWP 14(24) T & T MECH OVER SP TRIP" is extinguished.

16.12 PERFORM all of the following Lineups:

16.12.1 AFW Train A Control Panel Lineup (-1)

16.12.2 AFW Train A Electrical Lineup (-2)

FC 94-0728

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 47 of 117

FR 94-0728

- 16.12.3 AFW Train B Control Panel Lineup (-3) \_\_\_\_\_
- 16.12.4 AFW Train B Electrical Lineup (-4) \_\_\_\_\_
- 16.12.5 AFW Train C Control Panel Lineup (-5) \_\_\_\_\_
- 16.12.6 AFW Train C Electrical Lineup (-6) \_\_\_\_\_
- 16.12.7 AFW Train D Control Panel Lineup (-7) \_\_\_\_\_
- 16.12.8 AFW Train D Electrical Lineup (-8) \_\_\_\_\_
  
- 16.13 VERIFY CLOSED the AFW to SG isolation valve(s).
  - o AFW to SG 1A(2A) "OCIV MOV-0048" \_\_\_\_\_
  - o AFW to SG 1B(2B) "OCIV MOV-0065" \_\_\_\_\_
  - o AFW to SG 1C(2C) "OCIV MOV-0085" \_\_\_\_\_
  - o AFW to SG 1D(2D) "OCIV MOV-0019" \_\_\_\_\_
  
- 16.14 VERIFY CLOSED the AFW pump cross connect valve(s).
  - o AFW pump 12(21) "XCONN FV-7517" \_\_\_\_\_
  - o AFW pump 12(22) "XCONN FV-7516" \_\_\_\_\_
  - o AFW pump 13(23) "XCONN FV-7515" \_\_\_\_\_
  - o AFW pump 14(24) "XCONN FV-7518" \_\_\_\_\_
  
- 16.15 ENSURE the applicable AFW to SG regulating valve(s) is open.
  - o AFW to SG 1A(2A) "AFW REG FV-7525" \_\_\_\_\_
  - o AFW to SG 1B(2B) "AFW REG FV-7524" \_\_\_\_\_
  - o AFW to SG 1C(2C) "AFW REG FV-7523" \_\_\_\_\_
  - o AFW to SG 1D(2D) "AFW REG FV-7526" \_\_\_\_\_

17.0 Support Documents

- 17.1 AFW Train A Control Panel Lineup (-1)
- 17.2 AFW Train A Electrical Lineup (-2)
- 17.3 AFW Train B Control Panel Lineup (-3)
- 17.4 AFW Train B Electrical Lineup (-4)
- 17.5 AFW Train C Control Panel Lineup (-5)
- 17.6 AFW Train C Electrical Lineup (-6)
- 17.7 AFW Train D Control Panel Lineup (-7)
- 17.8 AFW Train D Electrical Lineup (-8)
- 17.9 AFWST Valve Lineup (-9)
- 17.10 AFWST Valve Pit Lineup (-10)
- 17.11 AFW Train A Valve Lineup (-11)
- 17.12 AFW Train B Valve Lineup (-12)
- 17.13 AFW Train C Valve Lineup (-13)
- 17.14 AFW Train D Valve Lineup (-14)
- 17.15 AFW Train A Vent Lineup (-15)
- 17.16 AFW Train B Vent Lineup (-16)
- 17.17 AFW Train C Vent Lineup (-17)
- 17.18 AFW Train D Vent Lineup (-18)
- 17.19 Instrument Vent Lineup (-19)
- 17.20 Cross-Tie Flow Sweep and AFW Valve Restoration Lineup (-20)
- 17.21 AFW Train D Drain Valve Lineup (-21)

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 49 of 117

AFW TRAIN A CONTROL PANEL LINEUP

OPOP02-AF-0001-1

(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-1) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 50 of 117

AFW TRAIN A CONTROL PANEL LINEUP

OPOP02-AF-0001-1

(Page 2 of 3)

**CAUTION**

AFWST Valve Lineup (-9), AFWST Valve Pit Lineup (-10)(if required), and AFW Train A Valve Lineup (-11) SHALL be completed prior to performing this Lineup.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	AFW PUMP 11(21) (Control Switch)	Control Room CP006	AUTO	(1)		
NONE	OCIV MOV-0048 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	AFW AUTO FLOW CONT AF-FV-7525 (Control Switch)	Control Room CP006	AUTO AFTER FULL OPEN			
NONE	XCONN FV-7517 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	PUMP 11(21) SPLY FAN 11A(21A) HC-VFN001 (Control Switch)	Control Room CP022	AUTO AFTER STOP			
NONE	AFW PUMP 11(21) (Control Switch)	EAB 10 ft ZLP100 (ASP)	MID POSITION			
NONE	OCIV MOV-0048 (Control Switch)	EAB 10 ft ZLP100 (ASP)	MID POSITION			
NONE	AFW PMP 11(21) REG VALVE FV-7525 (Control Switch)	EAB 10 ft ZLP100 (ASP)	MID POSITION			
NONE	OCIV MOV-0048 (Transfer Switch)	EAB 10 ft SWGR Room ZLP-700	CR			

(1) IF this Lineup is being performed prior to venting AFW Train A, THEN "AFW PUMP 11(21)" Control Switch SHALL be left in the PTL position until it is required to be run by Section 5.0.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 51 of 117

AFW TRAIN A CONTROL PANEL LINEUP

OPOP02-AF-0001-1

(Page 3 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	AFW REG VALVE AF-FV-7525 (Transfer Switch)	EAB 10 ft SWGR Room ZLP-700	CR			
NONE	AFW PUMP 11(21) SPLY FAN 11A(21A) (Motor Control)	EAB 10 ft SWGR Room ZLP-653	MID POSITION			
NONE	AFW PUMP 11(21) SPLY FAN 11A(21A) (Transfer Switch)	EAB 10 ft SWGR Room ZLP-653	CR			
NONE	AFW PUMP 11(21) (Transfer Switch)	EAB 10 ft SWGR Room ZLP-653	CR			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 52 of 117

AFW TRAIN A ELECTRICAL LINEUP

OPOP02-AF-0001-2

(Page 1 of 2)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-2) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 53 of 117

AFW TRAIN A ELECTRICAL LINEUP

OPOP02-AF-0001-2

(Page 2 of 2)

**CAUTION**

AFWST Valve Lineup (-9), AFWST Valve Pit Lineup (-10)(if required), and AFW Train A Valve Lineup (-11) SHALL be completed prior to performing this Lineup.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
E1A(E2A)/8	AFW PUMP 11(21)	EAB 10 ft 4160V SWGR E1A(E2A)	RACKED IN			
E1A1(E2A1)/S2	SG 1A(2A) AFW OCIV 1(2)-AF-MOV-0048	EAB 10 ft MCC E1A1(E2A1)	ON			
E1A1(E2A1)/J2	SG 1A(2A) AFW REG VALVE 1(2)-AF-FV-7525	EAB 10 ft MCC E1A1(E2A1)	ON			
E1A4(E2A4)/B2	AFW PUMP 11(21) AREA SPLY FAN 11A(21A) 1(2)-HC-FN-001A	EAB 10 ft MCC E1A4(E2A4)	ON			
ERR 130A DS 31	AUX FEEDWATER CROSSOVER VALVE 1(2)-AF-FV-7517	EAB 10 ft SWGR Room	CLOSED			
ERR 136 DS 22	AMSAC INTERFACE TRAIN-A	EAB 10 ft SWGR Room	CLOSED			



Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 54 of 117

AFW TRAIN B CONTROL PANEL LINEUP

OPOP02-AF-0001-3

(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-3) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 55 of 117

AFW TRAIN B CONTROL PANEL LINEUP

OPOP02-AF-0001-3

(Page 2 of 3)

**CAUTION**

AFWST Valve Lineup (-9) AFWST Valve Pit Lineup (-10)(if required), and AFW Train B Valve Lineup (-12) SHALL be completed prior to performing this Lineup.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	AFW PUMP 12(22) (Control Switch)	Control Room CP006	AUTO	(1)		
NONE	OCIV MOV-0065 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	AFW REG FV-7524 (Control Switch)	Control Room CP006	AUTO AFTER FULL OPEN			
NONE	XCONN FV-7516 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	PUMP 12(22) SPLY FAN 11B(21B) HC-VFN-002 (Control Switch)	Control Room CP022	AUTO AFTER STOP			
NONE	AFW PMP 12(22) REG FV-7524 (Control Switch)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			
NONE	AFW PMP 12(22) OCIV MOV-0065 (Control SWITCH)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			
NONE	AFW PUMP 12(22) (Control Switch)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			

(1) IF this Lineup is being performed prior to venting AFW Train B, THEN "AFW PUMP 12(22)" control switch SHALL be left in the PTL position until it is required to be run by Section 6.0.

Auxiliary Feedwater

AFW TRAIN B CONTROL PANEL LINEUP

OPOP02-AF-0001-3

(Page 3 of 3)

OPOP02-AF-0001

Rev. 2

Page 56 of 117

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	AFW REG VLV FV-7524 (Transfer Switch)	EAB 35 ft SWGR Room ZLP-701	CR			
NONE	OCIV MOV-0065 (Transfer Switch)	EAB 35 ft SWGR Room ZLP-701	CR			
NONE	AFW PUMP 12(22) SPLY FAN 11B(21B) (Motor Control)	EAB 35 ft SWGR Room ZLP-654	MID POSITION			
NONE	AFW PUMP SPLY FAN 11B(21B) (Transfer Switch)	EAB 35 ft SWGR Room ZLP-654	CR			
NONE	AFW PUMP 12(22) (Transfer Switch)	EAB 35 ft SWGR Room ZLP-654	CR			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 57 of 117

AFW TRAIN B ELECTRICAL LINEUP

CPOP02-AF-0001-4

(Page 1 of 2)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-4) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

AFW TRAIN B ELECTRICAL LINEUP

OPOP02-AF-0001-4

(Page 2 of 2)

OPOP02-AF-0001

Rev. 2

Page 58 of 117

**CAUTION**

AFWST Valve LINEUP (-9) AFWST Valve Pit Lineup (-10)(if required), and AFW Train B Valve Lineup (-12) SHALL be completed prior to performing this Lineup.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
E1B(E2B)/8	AFW PUMP 12(22)	EAB 35 ft 4160V SWGR E1B(E2B)	RACKED IN			
E1B1(E2B1)/R2	SG 1B(2B) AFW OCIV 1(2)-AF-MOV-0065	EAB 35 ft MCC E1B1(E2B1)	ON			
E1B1(E2B1)/J3	SG 1B(2B) AFW REG VALVE 1(2)-AF-FV-7524	EAB 35 ft MCC E1B1(E2B1)	ON			
E1B4(E2B4)/C1	AFW PUMP 12(22) AREA SPLY FAN 11B(21B) 1(2)-HC-FN-002	EAB 35 ft MCC E1B4(E2B4)	ON			
ERR 121B DS-32	AUX FEEDWATER CROSSOVER VALVE 1(2)-AF-FV-7516	EAB 35 ft SWGR Room	CLOSED			
ERR 138 DS-23	AMSAC INTERFACE TRAIN-B	EAB 35 ft SWGR Room	CLOSED			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 59 of 117

AFW TRAIN C CONTROL PANEL LINEUP

OPOP02-AF-0001-5

(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____
_____	_____

Device lineup completed by:

\_\_\_\_\_      \_\_\_\_\_      \_\_\_\_\_  
Operator      Date      Time

Lineup (-5) Reviewed:

\_\_\_\_\_      \_\_\_\_\_  
Unit Supervisor      Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 60 of 117

AFW TRAIN C CONTROL PANEL LINEUP

OPOP02-AF-0001-5

(Page 2 of 3)

**CAUTION**

AFWST Valve Lineup (-9) AFWST Valve Pit Lineup (-10)(if required), and AFW Train C Valve Lineup (-13) SHALL be completed prior to performing this Lineup.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	AFW PUMP 13(23) (Control Switch)	Control Room CP006	AUTO	(1)		
NONE	OCIV MOV-0085 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	AFW REG FV-7523 (Control Switch)	Control Room CP006	AUTO AFTER FULL OPEN			
NONE	XCONN FV-7515 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	PUMP 13(23) SPLY FAN 11C(21C) HC-VFN003 (Control Switch)	Control Room CP006	AUTO AFTER STOP			
NONE	AFW PUMP 13(23) (CONTROL SWITCH)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			
NONE	AFWP 13(23) OCIV MOV-0085 (CONTROL SWITCH)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			
NONE	AFW 13(23) REG VLV AF-FV-7523 (CONTROL SWITCH)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			

(1) IF this Lineup is being performed prior to venting AFW Train C, THEN "AFW PUMP 13(23)" control switch SHALL be left in the PTL position until it is required to be run by Section 6.0.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 61 of 117

AFW TRAIN C CONTROL PANEL LINEUP

OPOP02-AF-0001-5

(Page 3 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	OCIV MOV-0085 (Transfer Switch)	EAB 60 ft SWGR Room ZLP-709	CR			
NONE	AFW REG VALVE FV-7523 (Transfer Switch)	EAB 60 ft SWGR Room ZLP-709	CR			
NONE	AFW PUMP 13(23) (Transfer Switch)	EAB 60 ft SWGR Room ZLP-655	CR			
NONE	AFW PUMP 13(23) SPLY FAN 11C(21C) (Motor Control)	EAB 60 ft SWGR Room ZLP-655	MID POSITION			
NONE	AFW PUMP 13(23) SPLY FAN 11C(21C) (Transfer Switch)	EAB 60 ft SWGR Room ZLP-655	CR			



Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 62 of 117

AFW TRAIN C ELECTRICAL LINEUP

OPOP02-AF-0001-6  
(Page 1 of 2)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

Operator	Date	Time
----------	------	------

Lineup (-6) Reviewed:

Unit Supervisor	Date
-----------------	------

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 63 of 117

AFW TRAIN C ELECTRICAL LINEUP

OPOP02-AF-0001-6

(Page 2 of 2)

**CAUTION**

AFWST Valve Lineup (-9) AFWST Valve Pit Lineup (-10)(if required), and AFW Train C Valve Lineup (-13) SHALL be completed prior to performing this Lineup.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
E1C(E2C)/8	AFW PUMP 13(23)	EAB 60 ft 4160V SWGR E1C(E2C)	RACK IN			
E1C1(E2C1)/F2	SG 1C(2C) AFW OCIV 1(2)-AF-MOV-0085	EAB 60 ft MCC E1C1(E2C1)	ON			
E1C1(E2C1)/G2	SG 1C(2C) AFW REG VALVE 1(2)-AF-FV-7523	EAB 60 ft MCC E1C1(E2C1)	ON			
E1C4(E2C4)/E4	AFW PUMP 13(23) AREA SPLY FAN 11C(21C) 1(2)-HC-FN-003	EAB 60 ft MCC E1C4(E2C4)	ON			
ERR 123C DS 26	AUX FEEDWATER CROSSOVER VALVE AF-FV-7515	EAB 60 ft SWGR Room	CLOSED			
ERR 139 DS 25	AMSAC INTERFACE TRAIN-C	EAB 60 ft SWGR Room	CLOSED			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 64 of 117

AFW TRAIN D CONTROL PANEL LINEUP

OPOP02-AF-0001-7

(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-7) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 65 of 117

AFW TRAIN D CONTROL PANEL LINEUP

OPOP02-AF-0001-7

(Page 2 of 3)

**CAUTION**

AFWST Valve Lineup (-9) AFWST Valve Pit Lineup (-10)(if required), and AFW Train D Valve Lineup (-14) SHALL be completed prior to performing this Lineup.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	TURB TRIP/THROT MOV-0514 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	MN STM ISOL MOV-0143 (Control Switch)	Control Room CP006	AUTO AFTER OPEN			
NONE	OCIV MOV-0019 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	AFW REG FV-7526 (Control Switch)	Control Room CP006	AUTO AFTER FULL OPEN			
NONE	XCONN FV-7518 (Control Switch)	Control Room CP006	AUTO AFTER CLOSED			
NONE	PUMP 14(24) SPLY FAN 11D(21D) HC-VFN004 (Control Switch)	Control Room CP022	AUTO AFTER STOP			
NONE	CONT XFER THROT/TRIP MOV-0514 (Transfer Switch)	EAB 10 ft ZLP-100 (ASP)	CR			
NONE	CONT XFER MS ISOL MOV-0143 (Transfer Switch)	EAB 10 ft ZLP-100 (ASP)	CR			
NONE	MS ISOL MOV-0143 (Control Switch)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			
NONE	TURB THROT MOV-0514 (Control Switch)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 66 of 117

AFW TRAIN D CONTROL PANEL LINEUP

OPOP02-AF-0001-7

(Page 3 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	CONT XFER OCIV MOV-0019 (Transfer Switch)	EAB 10 ft ZLP-100 (ASP)	CR			
NONE	AFW Pmp 14(24) OCIV MOV-0019 (Control Switch)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			
NONE	CONT XFER AFW REG VLV FV-7526 (Transfer Switch)	EAB 10 ft ZLP-100 (ASP)	CR			
NONE	AFW PMP 14(24) REG VLV FV-7526 (Control Switch)	EAB 10 ft ZLP-100 (ASP)	MID POSITION			
NONE	AFW PMP 14(24) SPLY FAN 11D(21D) (Motor Control)	EAB 10 ft SWGR Room ZLP-653	MID POSITION			
NONE	AFW PUMP 14(24) SPLY FAN 11D(21D) (Transfer Switch)	EAB 10 ft SWGR Room ZLP-653	CR			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 67 of 117

AFW TRAIN D ELECTRICAL LINEUP

OPOP02-AF-0001-8

(Page 1 of 2)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-8) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 68 of 117

AFW TRAIN D ELECTRICAL LINEUP

OPOP02-AF-0001-8

(Page 2 of 2)

**CAUTION**

AFWST Valve Lineup (-9) AFWST Valve Pit Lineup (-10)(if required), and AFW Train D Valve Lineup (-14) SHALL be completed prior to performing this Lineup.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
E1A2(E2A2)/K2	AFW PUMP 14(24) AREA SPLY FAN 11D(21D) 1(2)-HC-FN-004	EAB 10 ft MCC E1A2(E2A2)	ON			
E1D11(E2D11)/5C	AFW PMP 14(24) TURB MAIN STM INLET VLV 1(2)-AF-MOV-0143	EAB 10 ft Charger Room 125 VDC SWBD	ON			
E1D11(E2D11)/4C	AFW PUMP 14(24) TURB T AND T VLV 1(2)-AF-MOV-0514	EAB 10 ft Charger Room 125 VDC SWBD	ON			
E1D11(E2D11)/7C	SG 1D(2D) AFW REG VLV 1(2)-AF-FV-7526	EAB 10 ft Charger Room 125 VDC SWBD	ON			
E1D11(E2D11)/6B	SG 1D(2D) AFW OCIV 1(2)-AF-MOV-0019	EAB 10 ft Charger Room 125 VDC SWBD	ON			
ERR 124D DS 21	AUX FEEDWATER CROSSOVER VALVE AF-FV-7518	EAB 10 ft Elec Equip Rm 008A in Charger Room	CLOSED			
ERR 148 DS 1	AFWP 14(24) TURBINE T AND T VALVE MOV-0514	EAB 35 ft Relay Room	CLOSED			
ERR 148 DS 16	AFW FEEDWATER CROSSOVER VALVE MOV-7518	EAB 35 ft Relay Room	CLOSED			
ERR 148 DS 18	AFWP 14(24) TURBINE T&T VALVE MOV-0514	EAB 35 ft Relay Room	CLOSED			
ERR 148 DS 19	AFW TO SG 1D(2D) VALVE FV-7526	EAB 35 ft Relay Room	CLOSED			
ERR 148 DS-20	AFWP 14(24) TURBINE STEAM INLET MOV-0143/FV-0143	EAB 35 ft Relay Room	CLOSED			
ERR 148 DS 21	AFWP 14(24) TURBINE STEAM INLET MOV-0143/FV-0143	EAB 35 ft Relay Room	CLOSED			
ERR 148 DS 22	AFWP 14(24) TURBINE ISOLATION MOV-0019	EAB 35 ft Relay Room	CLOSED			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 69 of 117

AFWST VALVE LINEUP

OPOP02-AF-0001-9

(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-9) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.



Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 70 of 117

AFWST VALVE LINEUP

OPOP02-AF-0001-9

(Page 2 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0357	AFWST EMERG FILL	On Top of AFWST At Center of Tank	CLOSED			
1(2)-CT-0101	PCV-7714B N2 PRESSURIZATION VALVE OUTLET ISOL	AFWST Top	OPEN			
1(2)-CT-0042	PCV-7714A N2 PRESSURIZATION VALVE OUTLET ISOL	AFWST Top	OPEN			
1(2)-CT-0085	N2 PRESS LINE VENT	AFWST Top	CLOSED			
1(2)-DW-1144	DEMIN WTR TO AFWST OVERFLOW LOOP SEAL VENT	AFWST Top	CLOSED			
1(2)-DW-0883	DEMIN WTR TO AFWST OVERFLOW LOOP SEAL FILL ISOL	AFWST Top	OPEN			
1(2)-AF-0321	AFWST OVERFLOW LOOP SEAL DRAIN ISOL	AFWST Top	CLOSED			
1(2)-DW-0064	DEMIN WTR M/U TO AFWST LV-7712 INLET ISOL	AFWST	OPEN			

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 71 of 117

AFWST VALVE LINEUP

OPOP02-AF-0001-9

(Page 3 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-DW-0835	UPSTREAM OF LV-7712 DRAIN VALVE	S End of AFWST Ground Level	CLOSED			
1(2)-DW-0834	DOWNSTREAM OF LV-7712 DRAIN VALVE	S End of AFWST Ground Level	CLOSED			
1(2)-DW-0063	DEMIN WTR M/U TO AFWST LV-7712 OUTLET ISOL	S End of AFWST Ground Level	OPEN			
1(2)-DW-0836	LV-7712 BYPASS	S End of AFWST Ground Level	CLOSED			
2-IA-5004 (UNIT 2 ONLY)	IA ISOL FOR 2-CT-LV-7712	S End of AFWST Ground Level	OPEN	(1)		
1(2)-IA-9011	IA ISOL FOR 1(2)CT-LV-7712	S End of AFWST Ground Level	OPEN			
1(2)-CT-0140	ROOT VALVE FOR PI-7718	NW End of AFWST Ground Level	OPEN			
1(2)-DW-1658	DEMIN WATER TO AFWST OVERFLOW LOOP SEAL FILL ISOL	AFWST	CLOSED			
1(2)-CT-0062	COND HOTWELL DUMP TO AFWST LINE DRAIN	TGB 29 ft Above RCB Chiller 11C(21C)	CLOSED			
1(2)-CT-0123	COND HOTWELL DUMP TO AFWST LINE VENT	TGB 29 ft Above RCB Chiller 11(21)C	CLOSED			

(1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 72 of 117

AFWST VALVE PIT LINEUP  
OPOP02-AF-0001-10  
(Page 1 of 2)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-10) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 73 of 117

AFWST VALVE PIT LINEUP

OPOP02-AF-0001-10

(Page 2 of 2)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0094	AFW STORAGE TANK TO AFW PUMP 11(21)	AFWST Valve Pit	LOCKED OPEN			
1(2)-AF-0095	AFW STORAGE TANK TO AFW PUMP 12(22)	AFWST Valve Pit	LOCKED OPEN			
1(2)-AF-0208	AFWST SEC SAMP ISOL	AFWST Valve Pit	THROTTLED 1/4- 1/2 TURN OPEN			
1(2)-AF-0355	SECONDARY SAMPLE DRAIN LINE ON 1" SS1031WD9	AFWST Valve Pit	CLOSED			
1(2)-AF-0196	AFW STORAGE TANK TO AFW PUMP 13(23)	AFWST Valve Pit	LOCKED OPEN			
1(2)-AF-0093	AFWST ISOLATION	AFWST Valve Pit	LOCKED OPEN			
1(2)-AF-0275	AFWST DRAIN	AFWST Valve Pit	CLOSED			

West Valve Pit

1(2)-AF-0277	DRAIN VALVE ON AFWST	AFWST West Valve Pit	CLOSED			
1(2)-AF-0276	LSH-7716, LSL-7716 ROOT VALVE	AFWST West Valve Pit	OPEN			
1(2)-AF-0278	LT-7748 ROOT VALVE	AFWST West Valve Pit	OPEN			
1(2)-AF-0279	LT-7717 ROOT VALVE	AFWST West Valve Pit	OPEN			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 74 of 117

AFW TRAIN A VALVE LINEUP  
OPOP02-AF-0001-11  
(Page 1 of 5)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-11) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 75 of 117

AFW TRAIN A VALVE LINEUP

OPOP02-AF-0001-11

(Page 2 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0323	AFW PUMP 11(21) RECIRC LINE VENT VALVE	E End of AFWST Near Top	CLOSED			
1(2)-AF-0327	AFW PUMP 11(21) SUCTION LINE VENT VALVE	IVC 22 ft A Train	CLOSED			
1(2)-AF-0031	AFW PUMP 11(21) SUCTION VALVE	IVC 10 ft A Train	LOCKED OPEN			
1(2)-AF-0219	AFWP 11(21) SUCTION LINE DRAIN VALVE	IVC 10 ft A Train	CLOSED			
1(2)-AF-0271	AFWP 11(21) SUCTION LINE TEST CONN VLV	IVC 10 ft A Train	CLOSED			
1(2)-AF-0255	AFWP 11(21) PI-7506 ISOL	IVC 10 ft A Train	CLOSED			
1(2)-AF-0238	1(2)-AF-FV-7517 HEADER DRAIN ISOL VALVE	IVC 10 ft(16 ft) A Train	CLOSED			
1(2)-AF-0041	AFW PUMP 11(21) DISCHARGE VALVE	IVC 22 ft A Train	LOCKED OPEN			
2-AF-0127 (UNIT 2 ONLY)	AFW PUMP 21 VENT VLV	IVC 10 ft A Train	CLOSED	(1)		
2-AF-0128 (UNIT 2 ONLY)	AFW PUMP 21 VENT VLV	IVC 10 ft A Train	CLOSED	(1)		

(1) If lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

8090-A8 ZF

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 76 of 117

AFW TRAIN A VALVE LINEUP  
OPOP02-AF-0001-11  
(Page 3 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1-AF-0034 (UNIT 1 ONLY)	PT-7508 AND PSL-7508 ROOT VALVE	IVC 22 ft A Train	OPEN	(1)		
1(2)-AF-0359	TRAIN A CROSS CONNECT LINE VENT VALVE	IVC 22 ft A Train	CLOSED			
2-AF-0035 (UNIT 2 ONLY)	PT-7508/PSL-7508 ROOT VALVE	IVC 22 ft A Train	OPEN	(2)		
1(2)-AF-0039	AFW PUMP 11(21) AUTO RECIRC ISOL VALVE	IVC 22 ft A Train	LOCKED OPEN			
1(2)-AF-0331	11(21) RECIRC TO AFWST DRAIN VALVE	IVC 16 ft A Train	CLOSED			
1(2)-AF-0187	AFW PUMP 11(21) DISCHARGE VENT ISOL VALVE	IVC 22 ft A Train	CLOSED			
1-AF-0188 (UNIT 1 ONLY)	AFW PUMP 11 DISCHARGE VENT ISOL VALVE	IVC 22 ft A Train	CLOSED	(1)		
1(2)-AF-0236	1(2)AF-FV-7517 DISCH HEADER DRAIN ISOL VALVE	IVC 22 ft A Train	CLOSED			
1-AF-0237 (UNIT 1 ONLY)	1-AF-FV-7517 DISCH HEADER DRAIN ISOL VALVE	IVC 22 ft A Train	CLOSED	(1)		
1(2)-AF-0171	AFW PUMP 11(21) DISCHARGE LINE DRAIN VALVE	IVC 22 ft A Train	CLOSED			
1-AF-0172 (UNIT 1 ONLY)	AFW PUMP 11 DISCHARGE LINE DRAIN VALVE	IVC 22 ft A Train	CLOSED	(1)		
1(2)-AF-0043	SG 1A(2A) AFW REGVLV FV-7525 MANUAL ISOL	IVC 22 ft A Train	LOCKED OPEN			
1(2)-AF-0248	AFW PUMP 11(21) LINE VENT ISOL VALVE	IVC 22 ft A Train	CLOSED			
1(2)-AF-0365	AFWP 11(21) FI-7506 INLET ISOL	IVC 22 ft A Train	OPEN			
1(2)-AF-0366	AFWP 11(21) FI-7506 OUTLET ISOL	IVC 22 ft A Train	OPEN			
1(2)-AF-0040	AFW PUMP 11(21) RECIRC TEST LINE ISOL VALVE	IVC 22 ft A Train	LOCKED CLOSED			

- (1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.  
 (2) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 77 of 117

AFW TRAIN A VALVE LINEUP

OPOP02-AF-0001-11

(Page 4 of 5)

DEVICE NUMBER	COMPONENT NOUN	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0222	AFW PUMP 11(21) LONG PATH RECIRC TEST LINE ISOL DRAIN	IVC 22 ft A Train	CLOSED			
1(2)-AF-FV-7517	AFW CROSS-TIE VALVE LOCAL HANDWHEEL	IVC 22 ft A Train	LOCKED IN NEUTRAL			
1(2)-AF-0046	AFW PUMP 11(21) DISCHARGE FT-7525 ROOT ISOL VALVE	IVC 22 ft A Train	OPEN			
2-AF-0047 (UNIT 2 ONLY)	AFW PUMP 21 DISCHARGE FT-7525 ROOT ISOL VALVE	IVC 22 ft A Train	OPEN	(1)		
1-AF-0044 (UNIT 1 ONLY)	AFW PUMP 11 DISCHARGE FT-7525 ROOT ISOL VALVE	IVC 22 ft A Train	OPEN	(2)		
1-AF-0045 (UNIT 1 ONLY)	AFW PUMP 11 DISCHARGE FT-7525 ROOT ISOL VALVE	IVC 22 ft A Train	OPEN	(2)		
1(2)-AF-0179	AFW PUMP 11(21) LONG PATH RECIRC TEST LINE VENT VALVE	IVC 22 ft A Train	CLOSED			
1-AF-0180 (UNIT 1 ONLY)	AFW PUMP 11 RECIRC TEST LINE VENT VALVE	IVC 22 ft A Train	CLOSED	(2)		
1(2)-AF-0227	AFW PUMP 11(21) LONG PATH RECIRC TEST LINE DRAIN VALVE	IVC 22 ft A Train	CLOSED			
1-AF-0228 (UNIT 1 ONLY)	AFW PUMP 11 RECIRC TEST LINE DRAIN VALVE	IVC 22 ft A Train	CLOSED	(2)		
1(2)-AF-0159	AFW TO 1A(2A) TEST CONNECTION ISOL VALVE	IVC 22 ft A Train	LOCKED CLOSED			
1-AF-0160 (UNIT 1 ONLY)	AFW TO 1A TEST CONNECTION ISOL VALVE	IVC 22 ft A Train	CLOSED	(2)		
1(2)-AF-0283	1A(2A) TO SGRP 11A(21A) ISOL VALVE	IVC 22 ft A Train	LOCKED CLOSED			
1(2)-AF-0282	1A(2A) TO SGRP 11A(21A) ISOL VALVE	IVC 22 ft A Train	CLOSED			
1(2)-AF-0336	AFW SUPPLY TO 1A(2A) DRAIN VALVE	IVC 22 ft A Train	LOCKED CLOSED			

(1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

(2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.



Auxiliary Feedwater

AFW TRAIN A VALVE LINEUP

OPOP02-AF-0001-11

(Page 5 of 5)

OPOP02-AF-0001

Rev. 2

Page 78 of 117

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1-AF-0337 (UNIT 1 ONLY)	AFW SUPPLY TO 1A DRAIN VALVE	IVC 22 ft A Train	CLOSED	(2)		
2-AF-0353 (UNIT 2 ONLY)	SG 2A TO SGRP 21A VENT VALVE	IVC 22 ft A TRAIN	LOCKED CLOSED	(1)		
1-AF-0354 (UNIT 1 ONLY)	SG 1A TO SGRP 11A VENT VALVE	IVC 22 ft A Train	LOCKED CLOSED	(2)		
1(2)-AF-0314	PREHEATER BYPASS LINE DRAIN VALVE	IVC 34 ft A Train	LOCKED CLOSED			
1(2)-IA-7035	IA ISOL FOR AF-FV-7517	IVC 22 ft A Train E Wall on Grating Above AFWP	OPEN			
1(2)-AF-0315	PREHEATER BYPASS LINE DRAIN VALVE	IVC 34 ft A Train	CLOSED			
1(2)-AF-0344	PREHEATER BYPASS LINE VENT VALVE	IVC 34 ft A Train	LOCKED CLOSED			
1-AF-0345 (UNIT 1 ONLY)	VENT VALVE	IVC 34 ft A Train	CLOSED	(2)		
2-AF-0292 (UNIT 2 ONLY)	IRC VENT VALVE	RCB NW Quad Inside SG Cubicle	LOCKED CLOSED	(1)		
2-AF-0293 (UNIT 2 ONLY)	IRC VENT VALVE	RCB NW Quad Inside SG Cubicle	CLOSED	(1)		
1(2)-AF-0294	DRAIN VALVE ON 8" AF1008GA2	RCB NW Quad Inside SG Cubicle	LOCKED CLOSED			
1-AF-0295 (UNIT 1 ONLY)	DRAIN VALVE ON 8" AF1008GA2	RCB N'W Quad Inside SG Cubicle	CLOSED	(2)		
1(2)-AF-0267	1(2)-AF-0119 BYPASS VALVE	RCB NW Quad Inside SG Cubicle	LOCKED CLOSED			

(1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

(2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 79 of 117

AFW TRAIN B VALVE LINEUP

OPOP02-AF-0001-12

(Page 1 of 5)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-12) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 80 of 117

AFW TRAIN B VALVE LINEUP  
OPOP02-AF-0001-12  
(Page 2 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0324	AFW PUMP 12(22) RECIRC RETURN LINE VENT VALVE	AFWST	CLOSED			
1(2)-AF-0328	AFW PUMP 12(22) SUCTION LINE VENT VALVE	IVC 22 ft(10 ft) B Train	CLOSED			
1(2)-AF-0053	AFW PUMP 12(22) SUCTION ISOL VALVE	IVC 10 ft B Train	LOCKED OPEN			
1(2)-AF-0241	1(2)-AF-FV-7516 HEADER DRAIN VALVE	IVC 10 ft B Train	CLOSED			
1(2)-AF-0211	AFW PUMP 12(22) SUCTION LINE DRAIN VALVE	IVC 10 ft B Train	CLOSED			
1(2)-AF-0072	AFW PUMP 12(22) SUCTION LINE TEST CONNECTION ISOL VALVE	IVC 10 ft B Train	CLOSED			
1(2)-AF-0256	AFW PUMP 12(22) P1-7507 ISOL	IVC 10 ft B Train	CLOSED			
2-AF-0125 (UNIT 2 ONLY)	AFW PUMP 22 VENT VALVE	IVC 22 ft B Train	CLOSED	(1)		
2-AF-0126 (UNIT 2 ONLY)	AFW PUMP 22 VENT VALVE	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0057	AFW PUMP 12(22) DISCH PT/PSL-7507 ROOT VALVE	IVC 22 ft B Train	OPEN			

(1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

8010-A6-2

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 81 of 117

AFW TRAIN B VALVE LINEUP

OPOP02-AF-0001-12

(Page 3 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1-AF-0056 (UNIT 1 ONLY)	AFW PUMP 12 DISCH PT/PSL-7507 ROOT VALVE	IVC 22 ft B Train	OPEN	(1)		
1(2)-AF-0067	AFW PUMP 12(22) AUTO RECIRC ISOL VALVE	IVC 22 ft B Train	LOCKED OPEN			
1(2)-AF-0333	RECIRC TO AFWST DRAIN VALVE	IVC 16 ft B Train	CLOSED			
1(2)-AF-0185	AFW PUMP 12(22) DISCHARGE LINE VENT VALVE	IVC 22 ft B Train	CLOSED			
1-AF-0186 (UNIT 1 ONLY)	AFW PUMP 12 DISCHARGE LINE VENT ISOL VALVE	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0059	AFW PUMP 12(22) DISCH MANUAL ISOL VLV	IVC 22 ft B Train	LOCKED OPEN			
1(2)-IA-7048	IA ISOL FOR AF-FV-7516	IVC 22 ft E Wall on Grating B Train Above AFWP	OPEN			
1(2)-AF-0239	1(2)-AF-FV-7516 HEADER DRAIN ISOL VALVE	IVC 22 ft B Train	CLOSED			
1-AF-0240 (UNIT 1 ONLY)	1-AF-FV-7516 HEADER DRAIN ISOL VALVE	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0169	AFW PUMP 12(22) REG VALVE DOWNSTREAM DRAIN ISOL VALVE	IVC 22 ft B Train	CLOSED			
1-AF-0170 (UNIT 1 ONLY)	AFW PUMP 12 DISCHARGE DRAIN ISOL VALVE	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0061	SG 1B(2B) AFW REG VLV FV-7524 MANUAL ISOL VALVE	IVC 22 ft B Train	LOCKED OPEN			
1(2)-AF-0250	AFW PUMP 12(22) DISCHARGE LINE VENT VALVE	IVC 22 ft B Train	CLOSED			
1(2)-AF-0090	AFW PUMP 12(22) DISCH FT-7524 ROOT VLV	IVC 22 ft B Train	OPEN			
1-AF-0062 (UNIT 1 ONLY)	AFW PUMP 12 DISCH FT-7524 ROOT VLV	IVC 22 ft B Train	OPEN	(1)		

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 82 of 117

AFW TRAIN B VALVE LINEUP

OPOP02-AF-0001-12

(Page 4 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-FV-7516	AFW CROSS-TIE VALVE LOCAL HANDWHEEL	IVC 22 ft B Train	LOCKED IN NEUTRAL			
1(2)-AF-0064	AFW PUMP 12(22) DISCH FT-7524 ROOT VLV	IVC 22 ft B Train	OPEN			
1-AF-0063 (UNIT 1 ONLY)	AFW PUMP 12 DISCH FT-7524 ROOT VLV	IVC 22 ft B Train	OPEN	(1)		
1(2)-AF-0177	AFW PUMP 12(22) LONG PATH RECIRC LINE VENT VALVE	IVC 22 ft B Train	CLOSED			
1-AF-0178 (UNIT 1 ONLY)	AFW PUMP 12 RECIRC TEST LINE VENT VALVE	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0230	AFW PUMP 12(22) LONG PATH RECIRC LINE DRAIN VALVE	IVC 22 ft B Train	CLOSED			
1-AF-0229 (UNIT 1 ONLY)	AFW PUMP 12 RECIRC TEST LINE DRAIN ISOL	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0070	AFW PUMP 12(22) RECIRC TEST LINE ISOL	IVC 22 ft B Train	LOCKED CLOSED			
1(2)-AF-0223	LONG PATH RECIRC TEST LINE RETURN TO AFWST DRAIN VALVE	IVC 22 ft B Train	CLOSED			
1(2)-AF-0162	SG 1B(2B) AF TEST CONNECTION ISOL VALVE	IVC 22 ft B Train	LOCKED CLOSED			
1-AF-0163 (UNIT 1 ONLY)	SG 1B AF TEST CONNECTION ISOL VALVE	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0285	SG 1B(2B) TO SGRP 11B(21B) ISOL VLV	IVC 22 ft B Train	LOCKED CLOSED			
1(2)-AF-0284	SG 1B(2B) TO SGRP 11B(21B) ISOL VLV	IVC 22 ft B Train	CLOSED			
1(2)-AF-0338	AFW SUPPLY TO SG 1B(2B) DRAIN ISOL VALVE	IVC 22 ft B Train	LOCKED CLOSED			

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 83 of 117

AFW TRAIN B VALVE LINEUP

OPOP02-AF-0001-12

(Page 5 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0367	AFWP 12(22) FI-7507 INLET ISOL	IVC 22 ft B Train	OPEN			
1(2)-AF-0368	AFWP 12(22) FI-7507 OUTLET ISOL	IVC 22 ft B Train	OPEN			
1-AF-0339 (UNIT 1 ONLY)	AFW SUPPLY TO SG 1B DRAIN ISOL VALVE	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0316	PREHEATER BYPASS DRAIN VALVE	IVC 34 ft B Train	LOCKED CLOSED			
1(2)-AF-0317	PREHEATER BYPASS DRAIN VALVE	IVC 34 ft B Train	CLOSED			
1(2)-AF-0351	SG 1B(2B) TO SGRP 11B(21B) VENT VALVE	IVC 22 ft B Train	LOCKED CLOSED			
1-AF-0352 (UNIT 1 ONLY)	SG 1B TO SGRP 11B VENT VALVE	IVC 22 ft B Train	CLOSED	(1)		
1(2)-AF-0356	AFW PUMP 12(22) X-CONN LINE VENT VALVE	IVC 22 ft B Train	CLOSED			
1(2)-AF-0346	PREHEATER BYPASS VENT VALVE	IVC 34 ft B Train	LOCKED CLOSED			
1-AF-0347 (UNIT 1 ONLY)	PREHEATER BYPASS VENT VALVE	IVC 34 ft B Train	CLOSED	(1)		
1(2)-AF-0296	IRC VENT VALVE ON 8" AF1010GA2	RCB NE Quad Inside SG Cubicle	LOCKED CLOSED			
1-AF-0297 (UNIT 1 ONLY)	IRC VENT VALVE ON 8" AF1010GA2	RCB NE Quad Inside SG Cubicle	CLOSED	(1)		
1(2)-AF-0298	SG 2B DRAIN VALVE ON 8" AF1010GA2	RCB NE Quad Inside SG Cubicle	LOCKED CLOSED			
1-AF-0299 (UNIT 1 ONLY)	IRC DRAIN VALVE ON 8" AF1010GA2	RCB NE Quad Inside SG Cubicle	CLOSED	(1)		
1(2)-AF-0265	1(2)-AF-0120 BYPASS VALVE	RCB NE Quad Inside SG Cubicle	LOCKED CLOSED			

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 84 of 117

AFW TRAIN C VALVE LINEUP

OPOP02-AF-0001-13

(Page 1 of 5)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

Operator	Date	Time
----------	------	------

Lineup (-13) Reviewed:

Unit Supervisor	Date
-----------------	------

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 85 of 117

AFW TRAIN C VALVE LINEUP

OPOP02-AF-0001-13

(Page 2 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0325	AFW PUMP 12(22) AFWST RECIRC RETURN LINE VENT VALVE	AFWST	CLOSED			
1(2)-AF-0329	AFW PUMP 13(23) SUCTION VENT ISOL VALVE	IVC 10 ft C Train	CLOSED			
1(2)-AF-0073	AFW PUMP 13(23) SUCTION ISOL VALVE	IVC 10 ft (22 ft) C Train	LOCKED OPEN			
1(2)-AF-0212	AFW PUMP 13(23) SUCTION LINE DRAIN VALVE	IVC 10 ft C Train	CLOSED			
1(2)-AF-0273	AFW PUMP 13(23) SUCTION LINE TEST CONNECTION ISOL VALVE	IVC 10 ft C Train	CLOSED			
1(2)-AF-0257	AFW PUMP 13(23) PI-7508 ISOL	IVC 10 ft C Train	CLOSED			
2-AF-0123 (UNIT 2 ONLY)	AFW PUMP 23 VENT VALVE	IVC 10 ft C Train	CLOSED	(1)		
2-AF-0124 (UNIT 2 ONLY)	AFW PUMP 23 VENT VALVE	IVC 10 ft C Train	CLOSED	(1)		

8070-1627

(1) If lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.



Auxiliary Feedwater

OPOP02-AF-0001

AFW TRAIN C VALVE LINEUP

Rev. 2

OPOP02-AF-0001-13

Page 86 of 117

(Page 3 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0242	CROSS CONNECT LINE DRAIN VALVE	IVC 10 ft C Train	CLOSED			
1(2)-AF-0077	PT-7506 & PSL-7506 ROOT VALVE	IVC 22 ft C Train	OPEN			
1-AF-0076 (UNIT 1 ONLY)	PT-7506 & PSL-7506 ROOT VALVE	IVC 22 ft C Train	OPEN	(1)		
1(2)-AF-0087	AFW PUMP 13(23) AUTO RECIRC VALVE ISOL	IVC 22 ft C Train	LOCKED OPEN			
1(2)-AF-0330	AFW PUMP 13(23) RECIRC RETURN TO AFWST DRAIN VALVE	IVC 22 ft(16 ft) C Train	CLOSED			
1(2)-AF-0183	AFW PUMP 13(23) DISCHARGE VENT ISOL VALVE	IVC 22 ft C Train	CLOSED			
1(2)-AF-0360	TRAIN C X-CONN LINE VENT VALVE	IVC 22 ft C Train	CLOSED			
1(2)-AF-0078	AFW PUMP 13(23) MANUAL DISCHARGE ISOL VALVE	IVC 22 ft C Train	LOCKED OPEN			
1(2)-IA-7061	IA ISOL FOR AF-FV-7515 AIR SUPPLY FOR FV-7515	IVC 22 ft E Wall on Grating C Train Above AFWP	OPEN			
1(2)-AF-0167	AFW SUPPLY TO SG 1C(2C) DRAIN VALVE	IVC 22 ft C Train	CLOSED			
1-AF-0168 (UNIT 1 ONLY)	AFW SUPPLY TO SG 1C DRAIN VALVE	IVC 22 ft C Train	CLOSED	(1)		
1(2)-AF-0080	AFW PUMP 13(23) FLOW CONTROL MANUAL ISOL VALVE	IVC 22 ft C Train	LOCKED OPEN			
1(2)-AF-0252	AFW SUPPLY TO SG 1C(2C) VENT VALVE	IVC 22 ft C Train	CLOSED			
1-AF-0251 (UNIT 1 ONLY)	AFW SUPPLY TO SG 1C VENT VALVE	IVC 22 ft C Train	CLOSED	(1)		
1(2)-AF-0083	AFW PUMP 13(23) DISCH FT-7523 ROOT VALVE	IVC 22 ft C Train	OPEN			

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 87 of 117

AFW TRAIN C VALVE LINEUP

OPOP02-AF-0001-13

(Page 4 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0084	AFW PUMP 13(23) DISCH FT-7523 ROOT VALVE	IVC 22 ft C Train	OPEN			
1-AF-0081 (UNIT 1 ONLY)	AFW PUMP 13 DISCH FT-7523 ROOT VALVE	IVC 22 ft C Train	OPEN	(1)		
1-AF-0082 (UNIT 1 ONLY)	AFW PUMP 13 DISCHARGE FT-7523 ROOT VALVE	IVC 22 ft C Train	OPEN	(1)		
1(2)-AF-FV-7515	AFW CROSS-TIE VALVE LOCAL HANDWHEEL	IVC 22 ft C Train	LOCKED IN NEUTRAL			
1(2)-AF-0232	AFW PUMP 13(23) LONG PATH RECIRC LINE DRAIN VLV	IVC 22 ft C Train	CLOSED			
1-AF-0231 (UNIT 1 ONLY)	AFW PUMP 13 RECIRC LINE DRAIN VLV	IVC 22 ft C Train	CLOSED	(1)		
1(2)-AF-0092	AFW PUMP 13(23) RECIRC TEST LINE ISOL	IVC 22 ft C Train	LOCKED CLOSED			
1(2)-AF-0224	AFW PUMP 13(23) LONG PATH RECIRC LINE DRAIN VALVE	IVC 22 ft C Train	CLOSED			
1(2)-AF-0243	AFW PUMP 13(23) DISCH LINE DRAIN VLV	IVC 22 ft C Train	CLOSED			
1-AF-0244 (UNIT 1 ONLY)	AFW PUMP 13 DISCH LINE DRAIN VLV	IVC 22 ft C Train	CLOSED	(1)		
1(2)-AF-0165	SG 1C(2C) AFW LINE TEST CONNECTION ISOL VALVE	IVC 22 ft C Train	LOCKED CLOSED			
1-AF-0166 (UNIT 1 ONLY)	SG 1C AFW LINE TEST CONNECTION ISOL VALVE	IVC 22 ft C Train	CLOSED	(1)		
1(2)-AF-0287	SG 1C(2C) TO SGRP 11C(21C) ISOL VALVE	IVC 22 ft C Train	LOCKED CLOSED			
1(2)-AF-0286	SG 1C(2C) TO SGRP 11C(21C) ISOL VALVE	IVC 22 ft C Train	CLOSED			

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 88 of 117

AFW TRAIN C VALVE LINEUP

OPOP02-AF-0001-13

(Page 5 of 5)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0369	AFWP 13(23) FI-7508 INLET ISOL	IVC 22 ft C Train	OPEN			
1(2)-AF-0370	AFWP 13(23) FI-7508 OUTLET ISOL	IVC 22 ft C Train	OPEN			
1(2)-AF-0340	AFW LINE ORC DRAIN ISOL VALVE	IVC 22 ft C Train	LOCKED CLOSED			
1(2)-AF-0318	PREHEATER BYPASS LINE DRAIN VALVE	IVC 37 ft C Train	LOCKED CLOSED			
1(2)-AF-0319	PREHEATER BYPASS LINE DRAIN VALVE	IVC 37 ft C Train	CLOSED			
1(2)-AF-0175	AFW PUMP 13(23) RECIRC TEST LINE VENT VLV	IVC 37 ft C Train	CLOSED			
1-AF-0176 (UNIT 1 ONLY)	AFW PUMP 13 RECIRC LINE VENT VALVE	IVC 34 ft C Train	CLOSED	(1)		
1(2)-AF-0348	PREHEATER BYPASS TO AFW LINE VENT VLV	IVC 37 ft C Train	LOCKED CLOSED			
1-AF-0349 (UNIT 1 ONLY)	PREHEATER BYPASS TO AFW LINE VENT VLV	IVC 37 ft C Train	CLOSED	(1)		
1(2)-AF-0300	VENT VALVE ON 3" AF1064GA2	RCB SE Quad Inside SG Cubicle	LOCKED CLOSED			
1-AF-0301 (UNIT 1 ONLY)	VENT VALVE ON 3" AF1064GA2	RCB SE Quad Inside SG Cubicle	CLOSED	(1)		
1(2)-AF-0302	DRAIN VALVE ON 3" AF1064GA2	RCB SE Quad Inside SG Cubicle	LOCKED CLOSED			
1-AF-0303 (UNIT 1 ONLY)	DRAIN VALVE ON 3" AF1064GA2	RCB SE Quad Inside SG Cubicle	CLOSED	(1)		
1(2)-AF-0263	1(2)-AF-0121 BYPASS VALVE	RCB SE Quad Inside SG Cubicle	LOCKED CLOSED			

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 89 of 117

AFW TRAIN D VALVE LINEUP  
OPOP02-AF-0001-14  
(Page 1 of 7)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-14) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 90 of 117

AFW TRAIN D VALVE LINEUP

OPOP02-AF-0001-14

(Page 2 of 7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0322	RECIRC FROM AFW PUMP TO AFWST VENT	AFWST	CLOSED			
1(2)-AF-0326	AFW PUMP 14(24) SUCTION LINE VENT	IVC 22 ft D Train	CLOSED			
1(2)-MS-0370	AFW PUMP 14(24) MOV-514 TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0371	AFW PUMP 14(24) MOV-514 TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0372	AFW PUMP 14(24) TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0373	AFW PUMP 14(24) TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0374	AFW PUMP 14(24) TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
2-AF-0129 (UNIT 2 ONLY)	AFW PUMP 24 PUMP VENT ISOL	IVC 10 ft D Train	CLOSED	(1)		
2-AF-0130 (UNIT 2 ONLY)	AFW PUMP 24 PUMP VENT ISOL	IVC 10 ft D Train	CLOSED	(1)		
1(2)-MS-0805	AFW PUMP 14(24) TURB CASING LEAKOFF ISOL	IVC 10 ft D Train	OPEN			
1(2)-MS-0804	AFW PUMP 14(24) INBOARD TURBINE CASE LEAKOFF ISOL	IVC 10 ft D Train	OPEN			
1(2)-MS-0803	AFW PUMP 14(24) OUTBOARD TURBINE CASE LEAKOFF ISOL	IVC 10 ft D Train	OPEN			
1(2)-MS-0802	AFW PUMP 14(24) TURBINE EXHAUST LEAKOFF ISOL	IVC 10 ft D Train	OPEN			
2-MS-0801 (UNIT 2 ONLY)	AFW PUMP 24 T & T VLV STEM LEAKOFF ISOL	IVC 10 ft D Train	OPEN	(1)		
1(2)-MS-0800	AFW PUMP 14(24) GOVERNOR VLV STEM LEAKOFF ISOL	IVC 10 ft D Train	OPEN			

(1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

Auxiliary Feedwater

OPOP02-AF-0001  
 Rev. 2  
 Page 91 of 117

AFW TRAIN D VALVE LINEUP  
 OPOP02-AF-0001-14  
 (Page 3 of 7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0098	AFW PUMP 14(24) TURBINE VENT PI-7537 ROOT VALVE	IVC 10 ft D Train	OPEN			
1(2)-AF-0213	AFW PUMP 14(24) DRAIN ISOL VALVE	IVC 10 ft D Train	CLOSED			
1-AF-0214 (UNIT 1 ONLY)	AFW PUMP 14 DRAIN ISOL VALVE	IVC 10 ft D TRAIN	CLOSED	(1)		
1(2)-AF-0191	AFW PUMP 14(24) DRAIN ISOL VALVE	IVC 10 ft D Train	CLOSED			
1-AF-0192 (UNIT 1 ONLY)	AFW PUMP 14 DRAIN ISOL VALVE	IVC 10 ft D Train	CLOSED	(1)		
1(2)-AF-0254	AFW PUMP 14(24) PI-7530 ISOL	IVC 10 ft D Train	CLOSED			
1(2)-AF-0270	AFW PUMP 14(24) SUCTION LINE TEST CONNECTION	IVC 10 ft D Train	CLOSED			
1(2)-AF-0209	AFW PUMP 14(24) SUCTION DRAIN ISOLATION	IVC 10 ft D Train	CLOSED			
1(2)-AF-0501	LUBE OIL PRESSURE ROOT ISOL FOR PS-7552, PI-7552	IVC 10 ft D Train	OPEN			
1(2)-AF-0502	LUBE OIL PRESSURE ROOT ISOL FOR PS-7553, PI-7550	IVC 10 ft D Train	OPEN			
1(2)-AF-0024	AFW PUMP 14(24) SUCTION VALVE	IVC 10 ft D Train	LOCKED OPEN			
1(2)-AF-0145	AFW PUMP 14(24) TURBINE LUBE OIL DRAIN	IVC 10 ft D Train	CLOSED			
1(2)-AF-0358	TRAIN D X-CONN LINE VENT VALVE	IVC 22 ft D Train	CLOSED			

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

FC 94-0606

FC 94-0608

FC 94-0608

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 92 of 117

AFW TRAIN D VALVE LINEUP

OPOP02-AF-0001-14

(Page 4 of 7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1-AF-0009 (UNIT 1 ONLY)	PT/PSL-7529 ISOL VALVE	IVC 22 ft D Train	OPEN	(1)		
1(2)-AF-0010	PT/PSL-7529 ROOT ISOL VALVE	IVC 22 ft D Train	OPEN			
1(2)-AF-0225	AFW PUMP 14(24) RECIRC TEST LINE DRAIN	IVC 22 ft D Train	CLOSED			
1-AF-0226 (UNIT 1 ONLY)	AFW PUMP 14 RECIRC TEST LINE DRAIN	IVC 22 ft D Train	CLOSED	(1)		
1(2)-AF-0181	AFW PUMP 14(24) RECIRC TEST LINE VENT	IVC 22 ft D Train	CLOSED			
1-AF-0182 (UNIT 1 ONLY)	AFW PUMP 14 RECIRC TEST LINE VENT	IVC 22 ft D Train	CLOSED	(1)		
1(2)-AF-0235	1(2)-AF-FV-7518 X-TIE HEADER DRAIN	IVC 16 ft D Train	CLOSED			
1(2)-IA-7022	IA ISOL FOR AF-FV-7518	IVC 22 ft E Wall on Grating D Train Above AFWP	OPEN			
1(2)-IA-7022A	1(2)-AF-FV-7518 STROKE TIME THROTTLE VALVE	IVC 22 ft D Train Downstream of 1(2)-IA-7022	1/4 TURN OPEN			
1(2)-AF-FV-7518	AFW CROSS-TIE VALVE LOCAL HANDWHEEL	IVC 22 ft D Train	LOCKED IN NEUTRAL			
1(2)-AF-0221	AFW PUMP 14(24) RECIRC TEST LINE DRAIN	IVC 22 ft D Train	CLOSED			
1(2)-AF-0332	AFW PUMP 14(24) RECIRC DRAIN VALVE	IVC 22 ft D Train	CLOSED			
1(2)-AF-0026	AFW PUMP 14(24) ARC ISOL VALVE	IVC 22 ft D Train	LOCKED OPEN			
1(2)-AF-0037	AFW PUMP 14(24) RECIRC TEST LINE ISOL	IVC 22 ft D Train	LOCKED CLOSED			
1-AF-0245 (UNIT 1 ONLY)	AFW PUMP 14 DISCHARGE LINE VENT VALVE	IVC 22 ft D Train	CLOSED	(1)		

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 93 of 117

AFW TRAIN D VALVE LINEUP

OPOP02-AF-0001-14

(Page 5 of 7)

DEVICE NUMBER	COMPONENT NOUN - DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0246	AFW PUMP 14(24) DISCHARGE LINE VENT VALVE	IVC 22 ft D Train	CLOSED			
1(2)-AF-0014	SG 1D(2D) AFW REG VLV FV-7526 MANUAL ISOL VALVE	IVC 22 ft D Train	LOCKED OPEN			
1(2)-AF-0173	AFW PUMP 14(24) DISCH VLV DOWNSTREAM DRAIN LINE ISOL	IVC 22 ft D Train	CLOSED			
1-AF-0174 (UNIT 1 ONLY)	AFW LINE DRAIN ISOL	IVC 22 ft D Train	CLOSED	(2)		
1(2)-AF-0233	AFW PUMP 14(24) 1(2)-AF-FV-7518 DISCH HEADER DRAIN	IVC 22 ft D Train	CLOSED	(2)		
1-AF-0234 (UNIT 1 ONLY)	AFW PUMP 14 1-AF-FV-7518 DISCH HEADER DRAIN	IVC 22 ft D Train	CLOSED			
1(2)-AF-0012	AFW PUMP 14(24) DISCHARGE MANUAL ISOLATION	IVC 22 ft D Train	LOCKED OPEN			
1(2)-AF-0190	AFW PUMP 14(24) DISCHARGE LINE VENT VALVE	IVC 22 ft D Train	CLOSED			
1-AF-0015 (UNIT 1 ONLY)	1-FT-7526 ISOL VALVE	IVC 22 ft D Train	OPEN	(2)		
1(2)-MD-0928	AFPT to CNDSR 13(23) Isol	TGB 39 ft S. End CNDSR 13(23)	OPEN			
1-MD-0848 (UNIT 1 ONLY)	Turbine Driven AFWP 14 Strm Drain Line Vent	TGB 45 ft Above MCC1F1	CLOSED	(2)		
1(2)-MD-0849	Turbine Driven AFWP 14(24) Strm Drain Line Vent	TGB 42 ft Above MCC1F1(2F1)	CLOSED			
1-AF-0016 (UNIT 1 ONLY)	1-FT-7526 ISOL VALVE	IVC 22 ft D Train	OPEN	(2)		
2-AF-0017 (UNIT 2 ONLY)	2-FT-7526 ISOL VALVE FOR FLOW TRANSMITTER	IVC 22 ft D Train	OPEN	(1)		
1(2)-AF-0018	1(2)-FT-7526 ISOL VALVE FOR FLOW TRANSMITTER	IVC 22 ft D Train	OPEN			

(1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

(2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.



Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 94 of 117

AFW TRAIN D VALVE LINEUP

OPOP02-AF-0001-14

(Page 6 of 7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0281	SG 1D(2D) RECIRC PUMP ISOL	IVC 22 ft D Train	LOCKED CLOSED			
1(2)-AF-0280	SG 1D(2D) RECIRC PUMP ISOL	IVC 22 ft D Train	CLOSED			
1(2)-AF-0156	SG 1D(2D) FEED LINE TEST CONN ISOL	IVC 22 ft D Train	LOCKED CLOSED			
1-AF-0157 (UNIT 1 ONLY)	SG 1D FEED LINE TEST CONN ISOL	IVC 22 ft D Train	CLOSED	(1)		
1(2)-AF-0334	AFW TO SG 1D(2D) DRAIN VALVE	IVC 22 ft D Train	LOCKED CLOSED			
1-AF-0335 (UNIT 1 ONLY)	AFW TO SG 1D DRAIN VALVE	IVC 22 ft D Train	CLOSED	(1)		
1(2)-AF-0342	SG 1D(2D) PREHEATER BYPASS VENT VALVE	IVC 34 ft D Train	LOCKED CLOSED			
1-AF-0343 (UNIT 1 ONLY)	SG 1D PREHEATER BYPASS VENT VALVE	IVC 34 ft D Train	CLOSED	(1)		
1(2)-AF-0312	SG 1D(2D) PREHEATER BYPASS DRAIN VALVE	IVC 34 ft D Train	LOCKED CLOSED			
1(2)-AF-0313	SG 1D(2D) PREHEATER BYPASS DRAIN VALVE	IVC 34 ft D Train	CLOSED			
1-MS-0515 (UNIT 1 ONLY)	MAIN STEAM LINE DRAIN STEAM TRAP INLET ISOL	IVC 10 ft D Train	OPEN	(1)		
1-MS-0516 (UNIT 1 ONLY)	MAIN STEAM LINE DRAIN STEAM TRAP OUTLET ISOL	IVC 10 ft D Train	OPEN	(1)		
1-MS-0517 (UNIT 1 ONLY)	MAIN STEAM LINE DRAIN STEAM TRAP BYPASS	IVC 10 ft D Train	OPEN	(1)		
1(2)-MS-0518	MAIN STEAM LINE DRAIN LINE ISOL VALVE	IVC 10 ft D Train	CLOSED			

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

PC 74-0728

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 94a of 117

AFW TRAIN D VALVE LINEUP

OPOP02-AF-0001-14

(Page 6a of 7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
2-MS-0515 (UNIT 2 ONLY)	MAIN STEAM LINE DRAIN FO-7537E INLET ISOL	IVC 10 ft D Train	OPEN	(2)		
2-MS-0516 (UNIT 2 ONLY)	MAIN STEAM LINE DRAIN FO-7537E OUTLET ISOL	IVC 10 ft D Train	OPEN	(2)		
2-MS-0517 (UNIT 2 ONLY)	MAIN STEAM LINE DRAIN FO-7537E BYPASS	IVC 10 ft D Train	CLOSED	(2)		

(2) IE lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

FC 94-0728

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 95 of 117

AFW TRAIN D VALVE LINEUP

OPOP02-AF-0001-14

(Page 7 of 7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0371	AFWP 14(24) FI-7529 INLET ISOL	IVC 22 ft D Train	OPEN			
1(2)-AF-0372	AFWP 14(24) FI-7529 OUTLET ISOL	IVC 22 ft D Train	OPEN			
1(2)-MS-0218	MAIN STEAM LINE DRAIN LINE ISOL VALVE	IVC 10 ft D Train	OPEN			
(UNIT 1 ONLY) 1-MS-0219	MAIN STEAM DRAIN LINE ISOL VALVE	IVC 10 ft D Train	OPEN	(1)		
1(2)-MS-0148	MAIN STEAM LINE DRAIN ROOT ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0369	MAIN STEAM LINE T&T VALVE ROOT ISOL DRAIN	IVC 10 ft D Train	OPEN			
1(2)-MS-0217	MAIN STEAM PRESSURE INST 1(2)-MS-PT-7547 ROOT ISOL VALVE	IVC 55 ft D Train	OPEN			
1(2)-MS-0147	MAIN STEAM PRESSURE INST 1(2)-MS-PT-7547 ROOT ISOL VALVE	IVC 55 ft D Train	OPEN			
1-MS-0606 (UNIT 1 ONLY)	MAIN STEAM LINE DRAIN	IVC 10 ft D Train	CLOSED	(1)		
1(2)-AF-0269	SG 1D(2D) CHECK VALVE BYPASS	RCB SW Quad Inside SG Cubicle	LOCKED CLOSED			
1(2)-AF-0288	AFW TO SG 1D(2D) VENT ISOL	RCB SW Quad inside SG Cubicle	LOCKED CLOSED			
1(2)-AF-0289	AFW TO SG 1D(2D) VENT ISOL	RCB SW Quad Inside SG Cubicle	CLOSED			
1(2)-AF-0290	AFW TO SG 1D(2D) DRAIN ISOL VALVE	RCB SW Quad inside SG Cubicle	LOCKED CLOSED			
1-AF-0291 (UNIT 1 ONLY)	AFW TO SG 1D DRAIN ISOL	RCB SW Quad Inside SG Cubicle	CLOSED	(1)		

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 96 of 117

AFW TRAIN A VENT LINEUP  
OPOP02-AF-0001-15  
(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

Operator	Date	Time
----------	------	------

Lineup (-15) Reviewed:

Unit Supervisor	Date
-----------------	------

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 97 of 117

AFW TRAIN A VENT LINEUP

OPOP02-AF-0001-15

(Page 2 of 3)

Static Vent (Step 5.7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
2-AF-0127 (UNIT 2 ONLY)	AFW PUMP 21 VENT VALVE	IVC 10 ft A TRAIN	(4) CLOSED	(1)		
2-AF-0128 (UNIT 2 ONLY)	AFW PUMP 21 VENT VALVE	IVC 10 ft A TRAIN	(4) CLOSED	(1)		
1(2)-AF-0271	AFWP 11(21) SUCTION LINE TEST CONNECTION	IVC 10 ft A Train	(4) CLOSED			
1(2)-AF-0327	AFW PUMP 11(21) SUCTION LINE VENT VALVE	IVC 22 ft A Train	(4) CLOSED			
1(2)-AF-0359	TRAIN A CROSS CONNECT LINE VENT VALVE	IVC 22 ft A Train	(4) CLOSED			
1(2)-AF-0187	AFW PUMP 11(21) DISCHARGE VENT ISOL VALVE	IVC 22 ft A Train	(4) CLOSED			
1-AF-0188 (UNIT 1 ONLY)	AFW PUMP 11 DISCHARGE VENT ISOL VALVE	IVC 22 ft A Train	(4) CLOSED	(2)		
1(2)-AF-0248	AFW PUMP 11(21) DISCHARGE LINE VENT ISOL VALVE	IVC 22 ft A Train	(4) CLOSED			
1(2)-AF-0179	AFW PUMP 11(21) RECIRC TEST LINE VENT VALVE	IVC 22 ft A Train	(4) CLOSED			
1-AF-0180 (UNIT 1 ONLY)	AFW PUMP 11 RECIRC TEST LINE VENT VALVE	IVC 22 ft A Train	(4) CLOSED	(2)		
2-AF-0353 (UNIT 2 ONLY)	SG 2A TO SGRP 21A VENT VALVE	IVC 22 ft A Train	(4) LOCKED CLOSED	(1)(3)		
1-AF-0354 (UNIT 1 ONLY)	SG 1A TO SGRP 11A VENT VALVE	IVC 22 ft A Train	(4) LOCKED CLOSED	(2)(3)		
2-AF-0292 (UNIT 2 ONLY)	AFW PUMP 22 AFW DISCH IRC VENT VALVE	RCB NW Quad Inside SG Cubicle	(4) LOCKED CLOSED	(1)(3)		
2-AF-0293 (UNIT 2 ONLY)	AFW PUMP 22 AFW DISCH IRC VENT VALVE	RCB NW Quad Inside SG Cubicle	(4) CLOSED	(1)(3)		

- (1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.  
 (2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.  
 (3) IF SG 1A(2A) Recirculation is aligned for operation, THEN DO NOT vent from this location.  
 (4) Final position after venting.

Fc 9v-0728

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 98 of 117

AFW TRAIN A VENT LINEUP

OPOP02-AF-0001-15

(Page 3 of 3)

Static Vent (Step 5.7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0344	PREHEATER BYPASS LINE VENT VALVE	IVC 34 ft A Train	(4) LOCKED CLOSED	(3)		
1-AF-0345 (UNIT 1 ONLY)	PREHEATER BYPASS LINE VENT VALVE	IVC 34 ft A Train	(4) CLOSED	(2)(3)		

(2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

(3) IF SG 1A(2A) Recirculation is aligned for operation, THEN DO NOT vent from this location.

(4) Final position after venting.

Dynamic Vent (Step 5.15)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0359	TRAIN A CROSS CONNECT LINE VENT VALVE	IVC 22 ft A Train	(4) CLOSED			

(4) Final position after venting.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 99 of 117

AFW TRAIN B VENT LINEUP  
OPOP02-AF-0001-16  
(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

Operator	Date	Time
----------	------	------

Lineup (-15) Reviewed:

Unit Supervisor	Date
-----------------	------

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 100 of 117

AFW TRAIN B VENT LINEUP

OPOP02-AF-0001-16

(Page 2 of 3)

Static Vent (Step 6.7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0072	AFW PUMP 12(22) SUCTION LINE TEST CONNECTION ISOL VALVE	IVC 10 ft B Train	(4) CLOSED			
2-AF-0125 (UNIT 2 ONLY)	AFW PUMP 22 VENT VALVE	IVC 10 ft B Train	(4) CLOSED	(1)		
2-AF-0126 (UNIT 2 ONLY)	AFW PUMP 22 VENT VALVE	IVC 10 ft B Train	(4) CLOSED	(1)		
1(2)-AF-0328	AFW PUMP 12(22) SUCTION LINE VENT ISOL VALVE	IVC 22 ft B Train	(4) CLOSED			
1(2)-AF-0185	AFW PUMP 12(22) DISCHARGE LINE VENT ISOL VALVE	IVC 22 ft B Train	(4) CLOSED			
1-AF-0186 (UNIT 1 ONLY)	AFW PUMP 12 DISCHARGE LINE VENT ISOL VALVE	IVC 22 ft B Train	(4) CLOSED	(2)		
1(2)-AF-0250	AFW PUMP 12(22) DISCHARGE LINE VENT VALVE	IVC 22 ft B Train	(4) CLOSED			
1(2)-AF-0177	AFW PUMP 12(22) LONG PATH RECIRC TEST LINE VENT VALVE	IVC 22 ft B Train	(4) CLOSED			
1-AF-0178 (UNIT 1 ONLY)	AFW PUMP 12 LONG PATH RECIRC TEST LINE VENT VALVE	IVC 22 ft B Train	(4) CLOSED	(2)		
1(2)-AF-0356	AFW PUMP 12(22) B TRAIN X-CONN LINE VENT VALVE	IVC 22 ft B Train	(4) CLOSED			
1(2)-AF-0351	SG 1B(2B) TO SGRP 11B(21B) VENT VALVE	IVC 22 ft B Train	(4) LOCKED CLOSED	(3)		
1-AF-0352 (UNIT 1 ONLY)	SG 1B TO SGRP 11B VENT VALVE	IVC 22 ft B Train	(4) CLOSED	(2)(3)		
1(2)-AF-0346	PREHEATER BYPASS VENT VALVE	IVC 34 ft B Train	(4) LOCKED CLOSED	(3)		
1-AF-0347 (UNIT 1 ONLY)	PREHEATER BYPASS VENT VALVE	IVC 34 ft B Train	(4) CLOSED	(2)(3)		

- (1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.  
 (2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.  
 (3) IF SG 1B(2B) Recirculation is aligned for operation, THEN DO NOT vent from this location.  
 (4) Final position after venting.



Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 101 of 117

AFW TRAIN B VENT LINEUP

OPOP02-AF-0001-16

(Page 3 of 3)

Static Vent (Step 6.7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0296	IRC VENT VALVE ON 8" AF 1010GA2	RCB NE Quad Inside SG Cubicle	(4) LOCKED CLOSED	(3)		
1-AF-0297 (UNIT 1 ONLY)	IRC VENT VALVE ON 8" AF 1010GA2	RCB NE Quad Inside SG Cubicle	(4) CLOSED	(2)(3)		

(2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

(3) IF SG 1B(2B) Recirculation is aligned for operation, THEN DO NOT vent from this location.

(4) Final position after venting.

Dynamic Vent (Step 6.15)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0356	AFW PUMP 12(22) B TRAIN X-CONN LINE VENT VALVE	IVC 22 ft B Train	(4) CLOSED			

(4) Final position after venting.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 102 of 117

AFW TRAIN C VENT LINEUP  
OPOP02-AF-0001-17  
(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-16) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 103 of 117

AFW TRAIN C VENT LINEUP

OPOP02-AF-0001-17

(Page 2 of 3)

Static Vent (Step 7.7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0273	AFW PUMP 13(23) SUCTION LINE TEST CONNECTION ISOL VALVE	IVC 10 ft C Train	(4) CLOSED			
2-AF-0123 (UNIT 2 ONLY)	AFW PUMP 23 VENT VALVE	IVC 10 ft C Train	(4) CLOSED	(1)		
2-AF-0124 (UNIT 2 ONLY)	AFW PUMP 23 VENT VALVE	IVC 10 ft C Train	(4) CLOSED	(1)		
1(2)-AF-0329	AFW PUMP 13(23) SUCTION VENT VALVE ISOL	IVC 22 ft C Train	(4) CLOSED			
1(2)-AF-0183	AFW PUMP 13(23) DISCHARGE VENT ISOL VALVE	IVC 22 ft C Train	(4) CLOSED			
1-AF-0251 (UNIT 1 ONLY)	AFW SUPPLY TO SG 1C VENT VALVE	IVC 22 ft C Train	(4) CLOSED	(2)		
1(2)-AF-0252	AFW SUPPLY TO SG 1C(2C) VENT VALVE	IVC 22 ft C Train	(4) CLOSED			
1(2)-AF-0175	AFW PUMP 13(23) RECIRC LINE VENT VALVE	IVC 22 ft C Train	(4) CLOSED			
1-AF-0176 (UNIT 1 ONLY)	AFW PUMP 13 RECIRC LINE VENT VALVE	IVC 22 ft C Train	(4) CLOSED	(2)		
1(2)-AF-0360	TRAIN C X-CONN LINE VENT VALVE	IVC 22 ft C Train	(4) CLOSED			
1(2)-AF-0348	PREHEATER BYPASS TO AFW LINE VENT VALVE	IVC 22 ft C Train	(4) LOCKED CLOSED	(3)		
1-AF-0349 (UNIT 1 ONLY)	PREHEATER BYPASS TO AFW LINE VENT VALVE	IVC 22 ft C Train	(4) CLOSED	(2)(3)		
1(2)-AF-0300	VENT VALVE ON 3" AF1064GA2	RCB SE Quad Inside SG Cubicle	(4) LOCKED CLOSED	(3)		
1-AF-0301 (UNIT 1 ONLY)	VENT VALVE ON 3" AF1064GA2	RCB SE Quad Inside SG Cubicle	(4) CLOSED	(2)(3)		

(1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

(2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

(3) IF SG 1C(2C) Recirculation is aligned for operation, THEN DO NOT vent from this location.

(4) Final position after venting.

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 104 of 117

AFW TRAIN C VENT LINEUP

OPOP2-AF-0001-17

(Page 3 of 3)

Dynamic Vent (Step 7.15)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0360	TRAIN C X-CONN LINE VENT VALVE	IVC 22 ft C Train	(4) CLOSED			

(4) Final position after venting.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 105 of 117

AFW TRAIN D VENT LINEUP  
OPOP02-AF-0001-18  
(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

Operator	Date	Time
----------	------	------

Lineup (-17) Reviewed:

Unit Supervisor	Date
-----------------	------

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 106 of 117

AFW TRAIN D VENT LINEUP

OPOP02-AF-0001-18

(Page 2 of 3)

Static Vent (Step 8.7)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0270	AFW PUMP 14(24) SUCTION LINE TEST CONNECTION	IVC 10 ft D Train	(4) CLOSED			
2-AF-0129 (UNIT 2 ONLY)	AFW PUMP 24 VENT ISOLATION	IVC 10 ft D Train	(4) CLOSED	(1)		
2-AF-0130 (UNIT 2 ONLY)	AFW PUMP 24 VENT ISOLATION	IVC 10 ft D Train	(4) CLOSED	(1)		
1(2)-AF-0326	AFW PUMP 14(24) SUCTION LINE VENT	IVC 22 ft D Train	(4) CLOSED			
1(2)-AF-0190	AFW PUMP 14(24) DISCHARGE LINE VENT VALVE	IVC 22 ft D Train	(4) CLOSED			
1-AF-0245 (UNIT 1 ONLY)	AFW PUMP 14 DISCHARGE LINE VENT ISOL VALVE	IVC 22 ft D Train	(4) CLOSED	(2)		
1(2)-AF-0246	AFW PUMP 14(24) DISCHARGE LINE VENT ISOL VALVE	IVC 22 ft D Train	(4) CLOSED			
1(2)-AF-0181	AFW PUMP 14(24) RECIRC TEST LINE VENT	IVC 22 ft D Train	(4) CLOSED			
1-AF-0182 (UNIT 1 ONLY)	AFW PUMP 14 RECIRC TEST LINE VENT	IVC 22 ft D Train	(4) CLOSED	(2)		
1(2)-AF-0358	TRAIN D X-CONN LINE VENT VALVE	IVC 22 ft D Train	(4) CLOSED			
1(2)-AF-0342	S/G 1D(2D) PREHEATER BYPASS VENT VALVE	IVC 34 D Train	(4) LOCKED CLOSED	(3)		
1-AF-0343 (UNIT 1 ONLY)	S/G 1D PREHEATER BYPASS VENT VALVE	IVC 34 D Train	(4) CLOSED	(2)(3)		
1(2)-AF-0288	AFW TO SG 1D(2D) VENT ISOL	RCB SW Quad Inside SG Cubicle	(4) LOCKED CLOSED	(3)		
1(2)-AF-0289	AFW TO SG 1D(2D) VENT ISOL	RCB SW Quad Inside SG Cubicle	(4) CLOSED	(3)		

- (1) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.  
 (2) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.  
 (3) IF SG 1D(2D) Recirculation is aligned for operation, THEN DO NOT vent from this location.  
 (4) Final position after venting.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 107 of 117

AFW TRAIN D VENT LINEUP

OPOP02-AF-0001-18

(Page 3 of 3)

Dynamic Vent (Step 8.15)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-AF-0358	TRAIN D X-CONN LINE VENT VALVE	IVC 22 ft D Train	(4) CLOSED			

(4) Final position after venting.

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 108 of 117

INSTRUMENT VENT LINEUP

OPOP02-AF-0001-19

(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

Operator	Date	Time
----------	------	------

Lineup (-18) Reviewed:

Unit Supervisor	Date
-----------------	------

This form, when completed, SHALL be retained for five years.



Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 109 of 117

INSTRUMENT VENT LINEUP

OPOP02-AF-0001-19

(Page 2 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	REQUIRED POSITION	VENTED BY	VERIFIED BY	NEW TAG NEEDED
TRAIN A						
1(2)-AF-PSL-7508	AFW PUMP 11(21) DISCH PRESS SWITCH LOW	IVC 10 ft A Train	IN SERVICE			
1(2)-AF-PT-7508	AFW PUMP 11(21) DISCH PRESSURE TRANSMITTER	IVC 10 ft A Train	IN SERVICE			
1(2)-AF-FT-7525	AFW FLOW TRANSMITTER TO SG 1A(2A)	IVC 10 ft A Train	IN SERVICE			
1(2)-AF-FI-7506	AFW PUMP 11(21) RECIRC FLOW INDICATOR	IVC 22 ft A Train	IN SERVICE			
TRAIN B						
1(2)-AF-PSL-7507	AFW PUMP 12(22) DISCH PRESS SWITCH LOW	IVC 10 ft B Train	IN SERVICE			
1(2)-AF-PT-7507	AFW PUMP 12(22) DISCH PRESSURE TRANSMITTER	IVC 10 ft B Train	IN SERVICE			
1(2)-AF-FT-7524	AFW FLOW TRANSMITTER TO SG 1B(2B)	IVC 10 ft B Train	IN SERVICE			
1(2)-AF-FI-7507	AFW PUMP 12(22) RECIRC FLOW INDICATOR	IVC 22 ft B Train	IN SERVICE			
TRAIN C						
1(2)-AF-PSL-7506	AFW PUMP 13(23) DISCH PRESS SWITCH LOW	IVC 10 ft C Train	IN SERVICE			
1(2)-AF-PT-7506	AFW PUMP 13(23) DISCH PRESSURE TRANSMITTER	IVC 10 ft C Train	IN SERVICE			
1(2)-AF-FT-7523	AFW FLOW TRANSMITTER TO SG 1C(2C)	IVC 10 ft C Train	IN SERVICE			
1(2)-AF-FI-7508	AFW PUMP 13(23) RECIRC FLOW INDICATOR	IVC 22 ft C Train	IN SERVICE			

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 110 of 117

INSTRUMENT VENT LINEUP

OPOP02-AF-0001-19

(Page 3 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	REQUIRED POSITION	VENTED BY	VERIFIED BY	NEW TAG NEEDED
TRAIN D						
1(2)-AF-PSL-7529	AFW PUMP 14(24) DISCH PRESS SWITCH LOW	IVC 10 ft D Train	IN SERVICE			
1(2)-AF-PT-7529	AFW PUMP 14(24) DISCH PRESSURE TRANSMITTER	IVC 10 ft D Train	IN SERVICE			
1(2)-AF-FT-7526	AFW FLOW TRANSMITTER TO SG 1D(2D)	IVC 10 ft D Train	IN SERVICE			
1(2)-AF-FI-7529	AFW PUMP 14(24) RECIRC FLOW INDICATOR	IVC 22 ft D Train	IN SERVICE			
AFWST						
1(2)-AF-LT-7716	AFWST LEVEL TRANSMITTER	AFWST VAULT	IN SERVICE			
1(2)-AF-LT-7717	AFWST LEVEL TRANSMITTER	AFWST VAULT	IN SERVICE			
1(2)-AF-LT-7748	AFWST LEVEL TRANSMITTER	AFWST VAULT	IN SERVICE			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 111 of 117

CROSS-TIE FLOW SWEEP AND  
AFW VALVE RESTORATION LINEUP

OPOP02-AF-0001-20

(Page 1 of 4)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-19) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 112 of 117

CROSS-TIE FLOW SWEEP AND  
AFW VALVE RESTORATION LINEUP

OPOP02-AF-0001-20

(Page 2 of 4)

NOTE

Valves that have not been unlocked and opened should have N/A recorded in the applicable blanks. All valves that were unlocked SHALL be aligned and independently verified to be locked closed.

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY
1(2)-AF-0037	AFW PUMP 14(24) RECIRC TEST LINE ISOL VLV	IVC 22 ft D Train	LOCKED CLOSED		
1(2)-AF-0092	AFW PUMP 13(23) RECIRC TEST LINE ISOL VLV	IVC 22 ft C Train	LOCKED CLOSED		
1(2)-AF-0070	AFW PUMP 12(22) RECIRC TEST LINE ISOL VLV	IVC 22 ft B Train	LOCKED CLOSED		
1(2)-AF-0040	AFW PUMP 11(21) RECIRC TEST LINE ISOL VLV	IVC 22 ft A Train	LOCKED CLOSED		

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 113 of 117

CROSS-TIE FLOW SWEEP AND  
AFW VALVE RESTORATION LINEUP

OPOP02-AF-0001-20

(Page 3 of 4)

AFW TRAIN A

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	XCONN FV-7517	Control Room CP006	AUTO AFTER CLOSED			
NONE	AFW REG FV-7525	Control Room CP006	AUTO AFTER FULL OPEN			
NONE	OCIV MOV-0048	Control Room CP006	AUTO AFTER CLOSED			

AFW TRAIN B

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	XCONN FV-7516	Control Room CP006	AUTO AFTER CLOSED			
NONE	AFW REG FV-7524	Control Room CP006	AUTO AFTER FULL OPEN			
NONE	OCIV MOV-0065	Control Room CP006	AUTO AFTER CLOSED			

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 114 of 117

CROSS-TIE FLOW SWEEP AND  
AFW VALVE RESTORATION LINEUP

OPOP02-AF-0001-20

(Page 4 of 4)

AFW TRAIN C

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	XCONN FV-7515	Control Room CP006	AUTO AFTER CLOSED			
NONE	AFW REG FV-7523	Control Room CP006	AUTO AFTER FULL OPEN			
NONE	OCIV MOV-0085	Control Room CP006	AUTO AFTER CLOSED			

AFW TRAIN D

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
NONE	XCONN FV-7518	Control Room CP006	AUTO AFTER CLOSED			
NONE	AFW REG FV-7526	Control Room CP006	AUTO AFTER FULL OPEN			
NONE	OCIV MOV-0019	Control Room CP006	AUTO AFTER CLOSED			

Unit: 1 2  
(circle one)

Auxiliary Feedwater

OPOP02-AF-0001  
Rev. 2  
Page 115 of 117

AFW TRAIN D DRAIN VALVE LINEUP

OPOP02-AF-0001-21

(Page 1 of 3)

EXCEPTIONS

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	REMARKS

Personnel participating  
in device manipulation:

Name	Initials
_____	_____
_____	_____
_____	_____

Device lineup completed by:

_____	_____	_____
Operator	Date	Time

Lineup (-20) Reviewed:

_____	_____
Unit Supervisor	Date

This form, when completed, SHALL be retained for five years.

Auxiliary Feedwater

OPOP02-AF-0001

Rev. 2

Page 116 of 117

AFW TRAIN D DRAIN VALVE LINEUP

OPOP02-AF-0001-21

(Page 2 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-MS-0370	AFW PUMP 14(24) MOV-514 TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0371	AFW PUMP 14(24) MOV-514 TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0372	AFW PUMP 14(24) TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0373	AFW PUMP 14(24) TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0374	AFW PUMP 14(24) TURBINE DRAIN ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0515	MAIN STEAM LINE DRAIN STEAM TRAP INLET ISOL	IVC 10 ft D Train	OPEN			
1(2)-MS-0516	MAIN STEAM LINE DRAIN STEAM TRAP OUTLET ISOL	IVC 10 ft D Train	OPEN			
1-MS-0517 (UNIT 1 ONLY)	MAIN STEAM LINE DRAIN STEAM TRAP BYPASS	IVC 10 ft D Train	(2) OPEN			
2-MS-0517 (UNIT 2 ONLY)	MAIN STEAM LINE DRAIN FO-7537E BYPASS	IVC 10 ft D Train	(1) CLOSED			
1(2)-MD-0928	AFPT TO CNDSR 13(23) Isol	TGB 39 ft S. End CNDSR 13(23)	OPEN			

(1) IE lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

(2) IE lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

FC 94-0846

FC 94-0846



Auxiliary Feedwater

OPOP02-AF-0001  
 Rev. 2  
 Page 117 of 117

AFW TRAIN D DRAIN VALVE LINEUP

OPOP02-AF-0001-21

(Page 3 of 3)

DEVICE NUMBER	COMPONENT NOUN DESCRIPTION	LOCATION	POSITION REQUIRED	ALIGNED BY	VERIFIED BY	NEW TAG NEEDED
1(2)-MS-0218	MAIN STEAM LINE DRAIN LINE ISOL VALVE	IVC 10 ft D Train	OPEN			
1-MS-0219 (UNIT 1 ONLY)	MAIN STEAM DRAIN LINE ISOL VALVE	IVC 10 ft D Train	OPEN	(1)		
1(2)-MS-0148	MAIN STEAM LINE DRAIN ROOT ISOL VALVE	IVC 10 ft D Train	OPEN			
1(2)-MS-0369	MAIN STEAM LINE T&T VALVE ROOT ISOL DRAIN	IVC 10 ft D Train	OPEN			
1(2)-MS-0805	AFW PUMP 14(24) TURB CASING LEAKOFF ISOL	IVC 10 ft D Train	OPEN			
1(2)-MS-0804	AFW PUMP 14(24) INBOARD TURBINE CASE LEAKOFF ISOL	IVC 10 ft D Train	OPEN			
1(2)-MS-0803	AFW PUMP 14(24) OUTBOARD TURBINE CASE LEAKOFF ISOL	IVC 10 ft D Train	OPEN			
1(2)-MS-0802	AFW PUMP 14(24) TURBINE EXHAUST LEAKOFF ISOL	IVC 10 ft D Train	OPEN			
1(2)-MS-0600	AFW PUMP 14(24) GOVERNOR VLV STEM LEAKOFF ISOL	IVC 10 ft D Train	OPEN			

(1) IF lineup is being performed by Unit 2, THEN RECORD "N/A" in these blanks.

(2) IF lineup is being performed by Unit 1, THEN RECORD "N/A" in these blanks.

FC 97-0896

## QUALITY ASSURANCE SURVEILLANCE REPORT

SURVEILLANCE NO.: 94-002

ACTIVITY DESCRIPTION: Corrective Action Program - Evaluation of Closed Category 1 - 5 Station Problem Reports

SURVEILLANCE DATES: December 16, 1993 - January 14, 1994

SUMMARY:

This surveillance consisted of evaluating a random sample of 255 Category 1 through 5 Station Problem Reports (SPR) which had been closed prior to October 31, 1993. No unaddressed issues which could impact plant restart or sustained operations were identified. However, a number of specific and programmatic issues were identified which confirmed similar findings noted during previous Quality Assurance (QA) assessments of the Corrective Action Program. QA has determined that the majority of the issues noted will require no further action due to having been adequately addressed outside of the SPR process and/or other factors which make the issue irrelevant at this time. Those issues which will require additional actions are provided in this report.

DEFICIENCIES:

1. Corrective actions to revise Plant Operations and Maintenance Department procedures in response to SPR 921204 were not implemented.

SPR 940063 was issued to address this deficiency.

2. The investigation for SPR 931947, regarding damaged battery output breakers, was less than adequate. The generic implications to remaining breakers requires further evaluation.

SPR 940033 was issued to address this deficiency.

3. The changes in the removal schedule for Unit 2 Reactor Vessel Irradiation Capsules, as required by SPR 910163, were not incorporated into the UFSAR or the applicable surveillance procedure.

SPR 940006 was issued to address this deficiency.

CONCERNS:

1. CAG - The rejection rate of SPR investigations and interviews with qualified investigators indicate that line management ownership of the Corrective Action Program is lacking. The Corrective Action Group (CAG) should evaluate whether recently-implemented and imminent enhancements to the program regarding line organization involvement are adequate to ensure program success.

2. CAG - The quality of SPR investigations tends to be category-driven, rather than issue-driven. The CAG must ensure that investigators and line management understand that an adequate investigation is one which provides an appropriate solution to the problem, rather than one which simply meets minimum requirements for the assigned category.

3. SED - OPEP07-AS-0002, Auxiliary Steam Boiler Leak Test, describes an unsatisfactory testing methodology and requires revision.

4. CAG - SPR 930808, regarding the use of an unapproved solvent on motor windings, should be reopened in order to assess generic implications to other motors which may have been cleaned in the same manner.

5. CAG - SPR 920945, regarding the failure of an ESF Diesel Generator relay due to component age, should be reopened and evaluated for generic implications.

QUALITY ASSURANCE SURVEILLANCE REPORT

CONCERNS (Con't):


6. CAG - SPR 921362, describing undocumented breaker repairs and nonconformances, should be re-opened in order to evaluate generic implications to similar breakers.
7. SED - The investigation for SPR 931430 was unable to determine if an incorrect component in the Unit 2 Boron Recycle System had been installed during plant construction. The identical component in Unit 1 should be inspected for proper configuration.
8. Technical Services - A Service Request generated in response to SPR 920111 which would have facilitated monitoring contamination buildup of the Unit 2 MAB exhaust plenum was inadvertently deleted. Technical Services should evaluate if this activity is still desired.
9. CAG - SPR 930118 was closed without the results of a component failure analysis being included in the package. The SPR should be reopened in order to ensure any corrective actions resulting from the failure analysis are adequately documented and resolved.
10. CAG - Maintenance Feedback Forms and similar documents do not constitute an adequate tracking mechanism for SPR corrective actions. The station should not allow line organizations to close SPRs simply by the issuance of these forms.
11. CAG - QA expended significant effort tracking down 'loose ends' during this surveillance. Many of the issues had been properly resolved, but had not been documented in the SPR package. Line organizations should ensure that important details are properly documented in SPR packages submitted to CAG.
12. SED - The Design Engineering Department developed guidelines for operability determinations in response to SPR 91029, which cited the lack of adequate guidance as a contributing cause to a significant event. Remaining engineering disciplines should evaluate these guidelines for adoption.
13. SED - The Power Operated Relief Valve Post-Maintenance Testing Matrix should be revised to include hydraulic pump cycle time testing (SPR 920327).
14. CAG - Sixteen instances were noted where the categories assigned to SPRs in the CAG database were incorrect. The CAG should ensure that the database is updated once an SPR is downgraded.

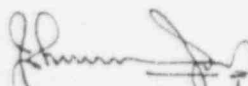
RECOMMENDATIONS:

None

RESULTS DISCUSSION:

The results of this surveillance were discussed with B. Mackenzie, Administrator CAG (Acting); T. J. Jordan, Manager SED; M. E. Kanovas, Manager Mechanical/Civil; T. E. Underwood, Manager Maintenance Support Department; R. S. Hamilton, Manager Plant Operations Support (Acting); and H. W. Bergendahl, Manager Technical Services.

 1/17/94  
 \_\_\_\_\_  
 PERFORMED BY DATE

 1/17/94  
 \_\_\_\_\_  
 REVIEWED BY DATE  
 M.S. MANTREITH

ATTACHMENT A  
QASR 94-002

PURPOSE & SCOPE

This surveillance was performed to determine if Category 1 - 5 Station Problem Reports (SPRs) had been closed without addressing issues which could potentially impact plant restart or sustained operations thereafter.

This assessment was limited to SPRs which had been investigated by the Nuclear Engineering, Maintenance, and Plant Operations Departments. SPRs reviewed were closed no earlier than September 1, 1992 (the inception date of the centralized SPR Program) and no later than October 31, 1993 (at which time site organizations had screened open SPRs for unaddressed restart issues).

Category 1 - 4 SPRs

The statistical random sample of 53 Category 1 - 4 SPRs reviewed was augmented with an additional 58 randomly-selected SPRs. The breakdown of SPRs reviewed by category is as follows:

<u>Cat. 1</u>	<u>Cat. 2</u>	<u>Cat. 3</u>	<u>Cat. 4</u>
0*	5	16	89

Total Reviewed = 110

Total Population = 380

\* No category 1 SPRs were provided in the sort

Category 5 SPRs

A random sample of 88 Category 5 SPRs was initially evaluated. An issue concerning the failure to consider generic implications was noted during this initial review. Although this specific issue was subsequently evaluated as not involving a restart or operability concern, QA expanded the sample as a conservative measure. A second sample of Category 5 SPRs was obtained and evaluated in order to determine if the failure to adequately address generic issues could have resulted in an unaddressed restart issue.

Total Reviewed = 145

Total Population = 1124

SURVEILLANCE RESULTS

The surveillance identified no unaddressed issues which would impact plant restart or sustained operations. However, a number of specific and programmatic issues were identified which confirmed similar findings during previous assessments of the Corrective Action Program. A summary of the issues identified are provided below. The SPR number is followed by the assigned category and the investigating department (D = DED, M = Maintenance, O = POD, and S = SED).

ATTACHMENT A  
QASR 94-002

Miscategorization of SPRs

- a. SPRs 921251 (D/5), 921362 (M/5), 930350 (D/5), 930995 (O/5), and 931934 (D/5), were assigned category 5 despite involving significant issues warranting the assignment of a higher category.
- b. SPRs 930583 (S/5), 931283 (S/5), 931837 (S/5), 931858 (D/5), 931934 (D/5), and 932423 (D/5) were assigned category 5 despite specifically stating that the issue was of a recurring nature.
- c. SPR 931752 (S/5) was assigned category 5 despite specifically requesting the performance of a root cause analysis.
- d. SPRs 930287 (D/5), 930518 (S, O, M/5), 931947 (S/5) were assigned category 5 despite warranting evaluation for generic implications.

Less Than Adequate Investigations

- a. Incorrect apparent causes were determined for SPRs 921554 (S/4), 930578 (S/5), and 931817 (S/4).
- b. No apparent cause determination was performed for SPR 930266 (S/4).
- c. The remedial/corrective actions developed for SPRs 920393 (S/4), 920664 (S/4), 921496 (M/5), 921545 (S/5), 921554 (S/4), 931569 (D/5), 930594 (D/4), 930815 (S/4), 931520 (M/4), and 931817 (S/4) did not fully address the problems identified.
- d. The investigations for SPRs 910295 (S/4), 920110 (D/4), 920945 (S/5), 921362 (M/5), 930287 (D/5), 930808 (M/5), 931430 (M/5), and 931947 (S/5) failed to address obvious generic implications.
- e. The investigation for SPR 930342 (O/4) incorrectly concluded that survey results indicating that nearly 14% of those polled had performed or been directed to perform undocumented minor maintenance on safety-related systems did not constitute a generic problem.
- f. The speculative conclusions for SPR 931817 (S/4) indicate that the investigator did not interview the craftsmen directly responsible in the human performance issue cited by the SPR.
- g. The investigations for SPRs 930978 (S/5) and 931947 (S/5) failed to address all the issues raised by the initiator.
- h. The investigator for SPR 930978 (S/5) identified generic implications, but did not initiate appropriate actions in response.

ATTACHMENT A  
QASR 94-002

Less Than Adequate Resolution of Corrective Actions

- a. Corrective actions for SPRs 910163 (S/4), 920111 (D/4), 921204 (M/5), and 931569 (D/5) were not fully implemented.
- b. The corrective actions for SPRs 910331 (S/4), 910485 (M/4), and 932423 (D/5) were not implemented in a timely manner.
- c. Corrective actions for SPR 931423 (S/4) were tracked under the 1993 Master Operating Plan, which has since been deleted.
- d. SPRs 921624 (S/4) and 930118 (S/4) were closed with open-ended actions requiring the performance of a component failure analysis. The results of the failure analysis and any necessary corrective actions should be part of, and tracked by, the original SPR.
- e. The lone corrective action in SPR 921062 (S/5) related to the apparent cause was revised out of the SPR package.
- f. SPRs 931274 (O/5), and 931678 (O/5) were improperly closed prior to the completion of all actions they tracked.
- g. SPRs 931197 (M/5), and 931752 (S/5) were closed without adequately documenting the justification for closure.
- h. SPR actions are frequently closed with actions tracked by a form which provides no guarantee of implementation (e.g. Maintenance Feedback Forms). These mechanisms do not constitute a suitable tracking system for SPR closure purposes.

Other Issues

- a. Comments by two investigators contacted during this surveillance indicated that the quality of an SPR investigation is driven by the category assigned, rather than the significance of the issue. Additional interviews confirmed that this is a generic issue. Line management must convey to investigators that an adequate investigation is one which provides an appropriate solution to the problem, rather than one which simply meets minimum requirements for the assigned category.
- b. QA expended significant effort tracking down "loose ends" during this surveillance. Many of the issues had been properly resolved, but had not been documented in the SPR package. SPRs should answer questions concerning problem resolutions, rather than create them. Line organizations should ensure that important details are properly documented in SPR packages submitted to CAG.

ATTACHMENT A  
QASR 94-002

Other Issues (Con't)

c. The following problems concerning the CAG database were noted:

- 1) Sixteen instances were noted where the CAG database did not reflect that an SPR had been downgraded. The CAG has been provided with the specific examples.
- 2) The initial computer sort of SPRs provided to QA for this activity contained only a fraction of those which were applicable.

ACTION/CONCLUSIONS

This surveillance did not identify any unaddressed issues which would impact plant restart or sustained operation thereafter. QA concludes, based on statistical probability, that SPRs closed between the period of September 1, 1992 and October 31, 1993, should not contain significant unaddressed issues of this nature.

The primary purpose of this activity, which was to identify any unaddressed restart issues, confined the SPRs reviewed to those closed prior to October 31, 1993. Therefore, the findings of this surveillance should not be construed as painting an accurate portrait of the Corrective Action Program as it stands now.

QA was able to determine that the majority of specific issues actually will require no further action. This conclusion is based on various circumstances, which include prior resolution of the issue outside of the SPR process and/or other factors which make the issue irrelevant at this time. Representatives of the affected organizations have concurred with these determinations. Specific issues which will require additional followup are listed in the accompanying surveillance report. The fact that the issues were limited to Category 4 and 5 SPRs is indicative of the increased attention placed on higher category SPRs.

The majority of the programmatic issues (e.g. less than adequate investigations) identified during this surveillance confirm the findings of previous assessments performed by QA and other site organizations. Several enhancements have been implemented recently or are forthcoming in response to previous assessments which will address most of the programmatic weaknesses. However, gaps remain which should be addressed. Two examples are provided below:

- a. The development of the Problem Review Group was intended to reduce the miscategorization of SPRs, thereby ensuring that significant issues will receive greater attention. However, interviews with investigators and observations during this surveillance do not provide confidence that investigators will seek a higher category assignment, or provide closer scrutiny, when an investigation for a lower category SPR reveals that the issue is more significant than originally thought. The quality of the investigation tends to be category-driven, rather than issue-driven.

ACTION/CONCLUSIONS (Con't)

- b. Many actions are planned or have occurred which will significantly improve the performance of the Corrective Action Group. An improvement in the ability of CAG to oversee this program is indicated by an increase in the rejection rate for SPR responses during the last few months. While CAG performance improvements are important, it is worth noting that CAG functions primarily as a "back-end" reviewer. If an inadequate investigation is rejected by CAG, then a significant delay in the resolution of the issue has resulted. Improvements in CAG performance must be accompanied by improvements in the product delivered to them by line organizations for the overall Corrective Action Program to function effectively.

Process enhancements should focus on improving the performance of the line organizations. The enhancements mentioned may eventually result in overall improvement in line organizations, as CAG expectations become evident via rejected responses and the subsequently increased attention of upper management. However, it is clear that the quality and efficiency of the process rests with the line organizations. The CAG should assess if planned or current enhancements will be adequate to instill line management ownership of the Corrective Action Program.



# Houston Lighting & Power Company

## OFFICE MEMORANDUM

*To* Corrective Action Group Jan. 18, 1994  
*From* R. W. Pell *RWP* ST-HS-HS-27600  
File No.: U11  
*Subject* Response to Quality Assurance Surveillance 94-002

Surveillance 94-002 identified that a Service Request, generated as part of corrective action for SPR92-0111, was inadvertently deleted. This service request (VE-179086) would have facilitated monitoring contamination build-up of the U-2 MAB Exhaust Plenum. The QA surveillance identified a need for Technical Services to evaluate and determine if this activity is still desired. While investigating it was determined the follow up monitoring for Unit-1 was performed well in advance of the required 6 month interval.

Two new service request SR#313030 and SR#313031 were generated in order to complete the actions required by SPR92-0111 for both units (Corrective action #4). Recommended time for inspection and survey should be April for Unit-1 and July for Unit-2.

If you have any questions please contact R. W. Pell \*7710.

RWP/hrw

c: R. L. Foote  
 H. W. Bergendahl  
 Correspondence

*Accepted.*  
*RWP 1/21/94*

## Houston Lighting &amp; Power Company

## OFFICE MEMORANDUM

**To** M. S. Monteith  
**From** T. J. Jordan *EAH for TJJ*  
**Subject** QA Surveillance Report 94-002

February 18, 1994

Concern # 3

QA Surveillance Report 94-002 identified an issue related to procedure OPEP07-AS-0002. According to this report, procedure OPEP07-AS-0002 uses unsatisfactory testing methodology and requires revision.

Procedure OPEP07-AS-0002 is a procedure to detect auxiliary boiler leaks using forced feed. This methodology is typically not performed and therefore this procedure is not used. For leak detection on the auxiliary boilers, the following actions are performed: A service request is initiated and a water column check, an air drop check or a hydrostatic test is used to identify leaks as part of the work package. Since OPEP07-AS-0002 is typically not used, and leak detection can be accomplished and adequately controlled through written work instructions, then this procedure will be deleted by Systems Engineering Department (SED).

This completes any action for SED regarding Concern 3 of QASR 94-002. Except for deleting procedure OPEP07-AS-0002, no further action is required.

EDH:tms

pc: T. M. Stroschein

*Accept response 2/24/94  
 D.J. Loubser  
 Concern remains open  
 Deleted  
 D.J. Loubser 2/24/94*

Houston Lighting & Power Company

OFFICE MEMORANDUM

To J. Johnson

Feb. 23, 1994

From

H. W. Bergendahl *HWB*

ST-HS-HS-027922

Subject

Response to Quality Assurance Surveillance 94-002

Quality Assurance Surveillance #94-002 Concern #8 identified a service request generated in response to SPR 920111 which would have facilitated monitoring contamination buildup of the Unit 2 MAB exhaust plenum was inadvertently deleted. This concern was evaluated and two new service requests were written. The concern was addressed in a memo from R. W. Pell to the Corrective Action Group dated January 18, 1994. (See attached)

If you have any questions please contact Scott Torrey at Ext. 7875.

HWB/hrw

cc: R. W. Pell *rot*  
S. E. Torrey  
B. S. Stone  
Correspondence

Concern Response accepted 3/14/94  
*Deborah Louie*

Need to supplement SPR 920111 with  
this information DT 3/14/94.

G went to CAG 3/14/94 to Supplement ~~PR~~ 920111  
DT 3/14/94

17 1038A

# Houston Lighting & Power Company

## OFFICE MEMORANDUM

*To* Corrective Action Group Jan. 18, 1994  
*From* R. W. Pell <sup>g.s.</sup><sub>k.h.p.</sub> ST-HS-HS-27600  
*Subject* Response to Quality Assurance Surveillance 94-002 File No.: U11

Surveillance 94-002 identified that a Service Request, generated as part of corrective action for SPR92-0111, was inadvertently deleted. This service request (VE-179086) would have facilitated monitoring contamination build-up of the U-2 MAB Exhaust Plenum. The QA surveillance identified a need for Technical Services to evaluate and determine if this activity is still desired. While investigating it was determined the follow up monitoring for Unit-1 was performed well in advance of the required 6 month interval.

Two new service request SR#313030 and SR#313031 were generated in order to complete the actions required by SPR92-0111 for both units (Corrective action #4). Recommended time for inspection and survey should be April for Unit-1 and July for Unit-2.

If you have any questions please contact R. W. Pell \*7710.

RWP/hrw

c: R. L. Foote  
H. W. Bergendahl  
Correspondence

**SOUTH TEXAS PROJECT ELEC SERVICE**

THIS PORTION SHALL BE ATTACHED TO SR

ION

**SECTION 1 DEFECT/REQUEST IDENTIFICATION**

SR/WR TAG # 313030

SYSTEM VE UNIT 2 TAGTPNS 9V102VXV024

EQUIPMENT DESCRIPTION HVAC Plenum

BLDG MAB ELEV 60 ROOM 327 AZIMUTH N/A COLUMN/LINE N/A

REFERENCE DOC. SR-179086 + 178112

COMMITMENT/DUE DATE July 31, 1994

DEFECT / REQUEST Inspect, clean, and survey the inside of MAB Exhaust HVAC Plenum 9V102VXV024 To determine the effectiveness of dust cleaning per SR-HM-178112. Schedule this activity for July 31, 1994

NPRDS DISCOVERY CODES: STATUS A SYMPTOM U DETECTION E

ORIGINATOR (PRINT) Harrell Williamson PHONE \*7518 DATE/TIME 1-17-94 17:00 MAIL CODE N2008

**SECTION 2 EVALUATION**

PRIORITY \_\_\_\_\_ NEED DATE \_\_\_\_\_ OTL# \_\_\_\_\_ CRA DUE DATE/TIME \_\_\_\_\_

LCO (Y/N) \_\_\_\_\_ WSA \_\_\_\_\_ MLST \_\_\_\_\_ MODE \_\_\_\_\_ WORK GROUP \_\_\_\_\_

LCO EXP. DATE/TIME \_\_\_\_\_ SPECIAL PROGRAM \_\_\_\_\_ WORK TYPE \_\_\_\_\_  
(MCB,IAFO,IAFT,CHM)

SELECT ONE

VOID	
WORK ORDER	
MINOR MAINT.	
INVALID	

COMMENTS/RECOMMENDED ACTIONS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

REVIEWED/AUTHORIZED FOR INPUT \_\_\_\_\_ WAN \_\_\_\_\_  
(OWCG SUPV./SS) (INITIAL) DATE

FOR MINOR MAINTENANCE WSA NOTIFIED:

START \_\_\_\_\_ #MEN \_\_\_\_\_ CLOSEOUT \_\_\_\_\_

COMPL. \_\_\_\_\_ HOURS \_\_\_\_\_ (SIGNATURE)  
NAME (PRINT) DATE/TIME

SR RETENTION AFTER ENTRY INTO WMS IS NOT REQUIRED UNLESS WORK IS DOCUMENTED DURING PRELIMINARY INVESTIGATION OR AS MINOR WORK

EQUIPMENT NO. 9V10/VXV024  
[Signature] 1700 1/17/94  
SIGNATURE TIME / DATE  
THIS PORTION SHALL BE ATTACHED TO SR

SOUTH TEXAS I

RATING STATION

SECTION 1 DEFECT/REQUEST IDENTIFICATION

SR/WR TAG # 313031

SYSTEM VE UNIT 1 TAGTPNS 9V10/VXV024

EQUIPMENT DESCRIPTION HVAC Plenum

BLDG MAB ELEV 60 ROOM 327 AZIMUTH N/A COLUMN/LINE N/A

REFERENCE DOC. SR155043, SR179085

COMMITMENT/DUE DATE 04-01-94

DEFECT / REQUEST Inspect, clean and survey the inside of MAB exhaust HVAC Plenum to determine the effectiveness of duct cleaning

NPRDS DISCOVERY CODES: STATUS A SYMPTOM D DETECTION E

Douglas Huberack 7931 1-17-94/1650 N2008  
ORIGINATOR (PRINT) PHONE DATE/TIME MAIL CODE

SECTION 2 EVALUATION

PRIORITY \_\_\_\_\_ NEED DATE \_\_\_\_\_ OTL# \_\_\_\_\_ CRA DUE DATE/TIME \_\_\_\_\_

LCO (Y/N) \_\_\_\_\_ WSA \_\_\_\_\_ MLST \_\_\_\_\_ MODE \_\_\_\_\_ WORK GROUP \_\_\_\_\_

LCO EXP. DATE/TIME \_\_\_\_\_ SPECIAL PROGRAM \_\_\_\_\_ WORK TYPE \_\_\_\_\_  
(MCB,IAFO,IAFT,CHM)

SELECT ONE

VOID	
WORK ORDER	
MINOR MAINT.	
INVALID	

COMMENTS/RECOMMENDED ACTIONS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

REVIEWED/AUTHORIZED FOR INPUT \_\_\_\_\_ WAN \_\_\_\_\_  
(OWCG SUPV./SS) (INITIAL) DATE

FOR MINOR MAINTENANCE WSA NOTIFIED:

START \_\_\_\_\_ #MEN \_\_\_\_\_ CLOSEOUT \_\_\_\_\_  
(SIGNATURE)

COMPL. \_\_\_\_\_ HOURS \_\_\_\_\_  
NAME (PRINT) DATE/TIME

Houston Lighting & Power Company

OFFICE MEMORANDUM

To D. A. Daniels

March 29 , 1994

From D. R. Keating



Subject Overdue Responses to Quality Assurance Surveillance Report (QASR) Concerns

The following QASR concerns have not been responded to by the Corrective Action Group:

93-167 - Concerns 1, 7, 8, and 9 (due 1/18/94)

94-002 - Concerns 1, 2, 4, 5, 6, 9, 10, 11, and 14 (due 2/28/94)

Please respond to these concerns by April 15, 1994. Attached is a copy of both QASRs for your reference. If you have any questions regarding this matter, please contact D. I. Towler at extension 7222.

 DIT/kmw

Attachments: QASRs 93-167 and 94-002

# Houston Lighting & Power Company

## OFFICE MEMORANDUM

TO D.R. Keating 28 February, 1994

FROM T.J. Jordan *TJJ*

SUBJECT Quality Assurance Surveillance Report 94-002 Corrective Action Program

Several concerns were identified as a result of the above surveillance of which the Systems Engineering Department was responsible for four items. Please see the response to each concern as it is listed below.

*Concern remains open until procedure is deleted DT 3/14/94*

Concern 3: OPEP07-AS-0002, Auxiliary Steam Boiler Leak Test, describes an unsatisfactory testing methodology and requires revision.

SED response is shown on attached memo.

Concern 7: The investigation for SPR 931430 was unable to determine if an incorrect component in the Unit 2 Boron Recycle System had been installed during plant construction. The identical component in U-1 should be inspected for proper configuration.

*Response accepted #7 DT 3/14/94*

SED response: The U-1 air supply regulator was inspected by Ron Olmstead and was confirmed to be a Cono-Flow model FH-20. The stamp on the bottom of the regulator indicated that a 125# spring was installed. A review of the WMS revealed no work which would have changed this spring.

Concern 12: The Design Engineering Department developed guidelines for operability determinations in response to SPR 91029, which cited the lack of adequate guidance as a contributing cause to a significant event. Remaining Engineering disciplines should evaluate these guidelines for adoption.

SED Response: The Systems Engineering Department is in the process of conducting internal training on the proposed change to OPGP03-ZX-0002 which added an addendum for operability guidance. The internal training is expected to be complete by 4 March, 1994.

*Response accepted #12 DT 3/14/94 when open until training complete*

*Talked to B. Long - Eng Training Coord Training not done yet TJJ Rdy*



# Houston Lighting & Power Company

## OFFICE MEMORANDUM

pg. 2

Concern 13: The Power Operated Relief Valve Post Maintenance Testing Matrix should be revised to include hydraulic pump cycle time testing (SPR 920327).

*Response accepted  
3/25/94 DT*

SED Response: A specific matrix for PMT's associated with the steam generator PORV's does not exist. Currently the PMT reference manual, which is a guide for maintenance planning, utilizes a generic matrix (3.26) for hydraulic valves. Maintenance has indicated that it is not desirable to create specific PMT guidance for the SG PORV's and will therefore utilize another device such as the Master Equipment Database to ensure the proper PMTs are selected. Further recommended changes to the PMT manual should be discussed with the Work Control Center Managers.

If there are any other questions associated with these concerns, please contact E.D. Halpin at extension 7849.

c: E.D. Halpin  
E.L. Stansel  
A.P. Kent  
R.L. Foote *N4006*  
System Engineer Section Supervisors

## Houston Lighting &amp; Power Company

## OFFICE MEMORANDUM

**To** M. S. Monteith  
**From** T. J. Jordan *TJJ*  
**Subject** QA Surveillance Report 94-002

February 18, 1994

QA Surveillance Report 94-002 identified an issue related to procedure OPEP07-AS-0002. According to this report, procedure OPEP07-AS-0002 uses unsatisfactory testing methodology and requires revision.

Procedure OPEP07-AS-0002 is a procedure to detect auxiliary boiler leaks using forced feed. This methodology is typically not performed and therefore this procedure is not used. For leak detection on the auxiliary boilers, the following actions are performed: A service request is initiated and a water column check, an air drop check or a hydrostatic test is used to identify leaks as part of the work package. Since OPEP07-AS-0002 is typically not used, and leak detection can be accomplished and adequately controlled through written work instructions, then this procedure will be deleted by Systems Engineering Department (SED).

This completes any action for SED regarding Concern 3 of QASR 94-002. Except for deleting procedure OPEP07-AS-0002, no further action is required.

EDH:tms

pc: T. M. Stroschein

*Answer to Concern  
# 3*

# Houston Lighting & Power Company

## OFFICE MEMORANDUM

pg. 2

Concern 13: The Power Operated Relief Valve Post Maintenance Testing Matrix should be revised to include hydraulic pump cycle timing testing (SPR 920327).

SED Response: A specific matrix for PMT's associated with the steam generator PORV's does not exist. Currently the PMT reference manual, which is a guide for maintenance planning, utilizes a generic matrix (3.26) for hydraulic valves. Maintenance has indicated that it is not desirable to create specific PMT guidance for the SG PORV's and will therefore utilize another device such as the Master Equipment Database to ensure the proper PMTs are selected. Further recommended changes to the PMT manual should be discussed with the Work Control Center Managers.

If there are any other questions associated with these concerns, please contact E.D. Halpin at extension 7849.

c: E.D. Halpin  
E.L. Stansel  
A.P. Kent  
R.L. Foote *N4006*  
System Engineer Section Supervisors

*This is a good answer  
Havell 3/8/94*

# Houston Lighting & Power Company

OFFICE MEMORANDUM

To D. A. Daniels September 1, 1994  
From D. R. Keating   
Subject Overdue Responses to Quality Assurance Surveillance Report (QASR) Concerns

The following QASR concerns have not been responded to by the Corrective Action Group.

94-002 - Concerns 1, 2, 4, 5, 6, 9, 10, 11, and 14 (due 02/28/94)

Please respond to these concerns by October 15, 1994. Attached is a copy of the QASR for your reference. If you have any questions regarding this matter, please contact R. M. Barr at extension 8327, or T. N. Lucas at extension 8874.

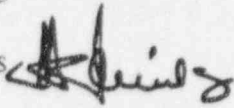
RMB/kmw

Attachment: QASR 94-002

## Houston Lighting &amp; Power Company

## OFFICE MEMORANDUM

To D.R. Keating

From D.A. Daniels 

Subject QA Surveillance Report 94-0002 Concerns, Response to

April 28, 1994  
CAG944052  
Page 1 of 2

Concern 1

Line management ownership has, and is continuing to improve since the inception of the Problem Review Group (PRG). The Corrective Action Program is being enhanced in definitive steps or stages and is scheduled to be ~~in~~ place by July 31, 1994.

Concern 2

Under the current methodology, the SPR category is determined by the issue for which the SPR was initiated. The category determines the required depth of investigation by procedure. The CAG or QA investigation and closure reviews are to determine the adequacy of the required investigations and attendant remedial and corrective actions. These reviews are accomplishing their prescribed purpose as witnessed by the SPRs returned to the investigator for additional action.

Concern 4

Although cleaning of motor windings with "varsol" is not a recommended practice, the SPR review meeting (prior to PRG establishment) determined that the deleterious effects would be minimal and that any emerging problems, if any, would be resolved when they are discovered. To reopen SPR 930808 to further assess generic implications and to determine which motors may be involved would not be cost effective.

Concern 5

SPR 920945 was a Category 5 as determined by the SPR Review Group. The SPR investigation was performed by PED. There is a continuing effort to increase the reliability of the diesels and replacement of aged components is considered. An SPR which has been closed since November 1992 does not warrant being reopened. If the problem recurred, a new SPR would have been initiated. If the problem has not recurred there is a good probability that this was an isolated event.

Concern 6

SPR 921362 was closed in December 1992. Concern 5 Response applies.

Concern 9

Corrective Action C-2 was closed based on an action completion verification for submitted by PED and SPR 930118 was closed. The action to evaluate Westinghouse failure reports

now resides as Corrective Action C-1 on SPR 931425 with a due date of 05/17/94. A supplement has been written to SPR 930118 to identify this action completion information. (Memo CAG944050)

Concern 10

CAG agrees with this concern and the condition has been corrected. Reference OPGP03-ZX-0002 rev. 4 paragraph 4.8.2 for Category 5 SPRs.

Concern 11

Current instructions for CAG Review of SPRs will preclude continuance of this condition.

Concern 14

CAG personnel have been directed to pay closer attention to SPR category changes approved by the PRG.

CLH/tas