

NUCLEAR POWER BUSINESS UNIT
INSERVICE TESTS

IT 13
MAJOR
Revision 13
January 24, 1997

COMPONENT COOLING WATER PUMPS AND VALVES
(QUARTERLY)
UNIT 2

Date _____
DSS _____

RECC 3

PROCEDURE VERIFIED CURRENT AND CHECKED FOR TEMPORARY CHANGES. IF FIELD
COPIES REQUIRED, USE PBF-00261 TAW NP 1.2.4 AND DO NOT COMPLETE THIS BLOCK.

BY: _____ DATE: _____

1.0 PURPOSE

- 1.1 To perform a quarterly functional test of 2P-11A&B CC pumps as required by ASME Section XI.
- 1.2 To perform a quarterly full stroke of 2CC-724A&B, 2P-11A&B discharge check valves as required by ASME Section XI.
- 1.3 To perform a quarterly full stroke of 2CC-738A&B, CC to HX-11A&B RHR heat exchangers as required by ASME Section XI, and annual stroke to satisfy environmental qualification requirements.
- 1.4 To perform a quarterly non-quantified backleakage evaluation of 2CC-724A&B, 2P-11A&B discharge check valves as required by ASME Section XI.

2.0 PRECAUTIONS AND LIMITATIONS

- 2.1 **IF THERE IS ANY PROBLEM IN PERFORMING THIS TEST, IMMEDIATELY NOTIFY THE DUTY SHIFT SUPERINTENDENT. OPERATION OF THIS EQUIPMENT IS A TECHNICAL SPECIFICATION REQUIREMENT (15.3.3.C).**
- 2.2 Minimum flow required for a component cooling water pump during continuous operation is 100 gpm.
- 2.3 Flow combinations in the component cooling system are shown on Figure 1 of OP 6A. Maximum CC flow rate through a single CC heat exchanger is 7862 gpm.
- 2.4 Care must be exercised when handling the treated component cooling water because it is mildly toxic. Refer to AOP 12A, "Oil and Hazardous Material Spill," and the WE CHES Manual for the Health Hazards of Potassium Chromate.
- 2.5 The dedicated operator that is required for 2CC-824A/B is a level 3 dedicated operator. Upon receipt of a U2 SI signal, the dedicated operator will need to reposition the valve per the local plaque prior to initiating sump recirculation.

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- 2.6 During the shifting of CCW pumps, give special attention to CCW system inventory. The CCW return relief valves for the RCP's (CC-763A, CC-763B) and excess letdown HX. (CC-768) have the potential for lifting.

3.0 INITIAL CONDITIONS

NOTE: *Contact an IST Engineer or OPS Engineer for new Acceptance criteria, if test is being performed following pump maintenance prior to returning to service.*

- 3.1 This test is being performed to satisfy:

_____ The normally scheduled callup. Task Sheet No. _____

_____ Post-maintenance operability test for _____ (equip. ID)
W.O. No.(s) _____
Task Sheet No.(s) _____

_____ Special test - no numbers
Explain _____

INITIALS

- 3.2 Both Unit 2 CC pumps 2P-11A and 2P-11B are operable OR this test is being done to return a pump to service.

- 3.3 The Unit 2 CC system is in operation per OP 6A.

- 3.4 Both Unit 1 CC pumps 1P-11A and 1P-11B are operable for Unit 1 if Unit 1 reactor is critical.

- 3.5 The Unit 2 boric acid evaporator is secured.

- 3.6 Unit 2 RHR system is not in operation.

- 3.7 Two CC HXs are aligned to Unit 2. (Shell side flow)

- 3.8 The Plant Process Computer System is operational and FT619 component cooling system flow has been displayed on trend for the past 20 minutes, or 2FI-619 component cooling system flow indication is operational.

- 3.9 Verify the CCW surge tank at atmospheric pressure by opening 2CC-17.

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- 3.10 CC flow through 2HX-3A&B, non-regenerative HX is as required for one 40 gpm L/D orifice at full power. Note that 2CC-130, 2HX-3A&B non-regenerative HX flow control valve seat leakage provides sufficient cooling with the valve shut. _____

- 3.11 Assemble the following portable test instruments and log their ID numbers here.

Vibration monitor _____
Stopwatch _____

3.12 **Permission to Perform Test**

The conditions required by this test are consistent with required plant conditions including equipment operability. Permission is granted to perform this test.

DSS _____ TIME _____ DATE _____

4.0 PROCEDURE

- 4.1 Indicate CC HXs aligned to Unit 2 and record the service water differential pressure (psid).

2HX-12D _____ SW DPIS-4445 _____
HX-12B _____ SW DPIS-2937 _____
HX-12C _____ SW DPIS-2936 _____

- 4.2 Verify the oil level in CC pumps 2P-11A and B is at or above $\frac{1}{2}$ sight glass level. Contact the DSS/DOS for the type of oil if addition is necessary. _____

INITIALS

NOTE: *If performing post-maintenance testing or operability checks when only one pump requires testing, then proceed to:*

4.30 FOR TESTING 2P-11A ONLY.

4.16 FOR TESTING 2P-11B ONLY.

NOTE: *If performing normal testing and 2P-11B is running, then go to 4.17.*

4.3 Operate 2P-11A for a minimum of 5 minutes.

4.4 Record the as-found position of 2CC-824A, 2HX-11A RHR HX component cooling flow throttle. _____ Degrees Open.

NOTE: *It shall be the responsibility of the U2 control operator to notify the dedicated operator of the required action upon the initiation of a U2 safety injection signal.*

4.5 Assign a dedicated operator to reposition 2CC-824A if required. Repositioning 2CC-824A to its design flow position per the local plaque is required on a U2 safety injection.

4.6 Unlock and adjust 2CC-824A to 30 degrees open.

NOTE: *Observe RCP temperatures/trends during CC system flow adjustments.*

NOTE: *Stroke time is to be taken from control board indication.*

4.7 Full stroke test of 2CC-724A and backleakage test of 2CC-724B.

4.7.1 Position a person locally to observe stroking of 2CC-738A, component cooling to 2HX-11A RHR HX.

4.7.2 Record the stroke time while opening 2CC-738A. 2CC-738A time to open _____ sec. Local position indicates full open. (SAT/UNSAT)

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4.7.3 Adjust 2CC-824A as required to attain 3600 to 3700 gpm total component cooling system flow. Use FT619 (preferred) or 2FI-619, to indicate full stroke of check valve 2CC-724A and acceptable backleakage of 2CC-724B. _____

4.8 Record the position of 2CC-824A. _____ Degrees Open. _____

NOTE: *Indicated flow will oscillate during the following step. Maintain flow within a band of ± 30 gpm of the reference value.*

4.9 Adjust system flow for test.

4.9.1 Adjust 2CC-824A as required to attain a system flow from 3350 gpm to 3500 gpm. _____

4.9.2 Adjust 2CC-748A, B/A evap distillate cooler cc throttle valve, to attain the reference (mean-average) flow of 3500 gpm. _____

4.10 Valve in 2P-11A pump suction gauge 2PI-692A.

4.10.1 Open 2CC-790A _____

4.10.2 Open 2CC-691A _____

4.11 Record the system data required by Attachment A. _____

4.12 Check operability for A Train components 2P-11A and 2CC-724A by comparing the test data obtained in Attachment A, with the limits specified in the IST Program Acceptance Criteria prior to proceeding. _____

NOTE: *Stroke time is to be taken from control board indication.*

4.13 Station an observer at 2CC-738A to check the local position indication, then record the stroke time while shutting 2CC-738A.
2CC-738A time to shut _____ sec.
Local position indicates full shut. (SAT/UNSAT) _____

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- 4.14 Reposition 2CC-824A to its design flow position per the local plaque, and lock. Lock No. _____

4.14.1 Shut 2CC-748A. _____

4.14.2 Independent operator verify that 2CC-824A is in its design flow position per the local plaque, and locked. _____

NOTE: *The dedicated operator for 2CC-824A is no longer required.*

- 4.15 Check operability for A Train component 2CC-738A by comparing the stroke time recorded in Steps 4.7 and 4.13 with the limits specified in the IST Program Acceptance Criteria prior to proceeding. _____

NOTE: *If 2P-11B CC pump test data was taken first, or this test is being performed to demonstrate post-maintenance operability of only 2P-11A, then proceed to Step 4.32.*

NOTE: *If 2P-11B CC pump is running and the auto-start check of the pump is deemed unnecessary to prove operability, then proceed to Step 4.17.*

CAUTION IF THIS IS THE INITIAL START OF THE PUMP AFTER ITS FILL AND VENT, REFER TO OP 6A ATTACHMENT A FOR GUIDANCE.

- 4.16 Check the auto-start of 2P-11B CC pump and secure 2P-11A CC pump as follows:

4.16.1 Verify 2P-11B control switch is in AUTO, and check the system flow rate on 2FI-619. _____

4.16.2 Place and hold the 2P-11A control switch in OFF. _____

4.16.3 Check for 2P-11B auto start accompanied by audible indication of 2CC-724A closure within five seconds, and that the system flow rate remains as before. _____

4.16.4 Release 2P-11A control switch and allow it to return to AUTO. Verify one CC pump operating and that the system flow rate remains as before. _____

4.16.5 "Match flags" for the operating CC pump by momentarily placing its control switch to START. _____

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INITIALS

4.17 Operate 2P-11B for a minimum of 5 minutes.

4.18 Record the as-found position of 2CC-824B, 2HX-11B RHR HX
component cooling flow throttle. _____ Degrees Open.

NOTE: *It shall be the responsibility of the U2 control operator to notify the
dedicated operator of the required action upon the initiation of a U2
safety injection signal.*

4.19 Assign a dedicated operator to reposition 2CC-824B to its design flow
position per the local plaque, if required. Repositioning 2CC-824B is
required on a U2 safety injection.

4.20 Unlock and adjust 2CC-824B to 30 degrees open.

NOTE: *Observe RCP temperatures/trends during cc system flow
adjustments.*

NOTE: *Stroke time is to be taken from control board indication.*

4.21 Full stroke test of 2CC-724B and backleakage test of 2CC-724A.

4.21.1 Position a person locally to observe stroking of 2CC-738B,
component cooling to 2HX-11B RHR HX.

4.21.2 Record the stroke time while opening 2CC-738B.
2CC-738B time to open _____ sec.
Local position indicates full open. (SAT/UNSAT)

4.21.3 Unlock and adjust 2CC-824B as required to attain 3600 to
3700 gpm total component cooling system flow. Use FT619
(preferred) or 2FI-619, to indicate full stroke of check valve
2CC-724A and acceptable backleakage of 2CC-724A.

4.22 Record the position of 2CC-824B. _____ Degrees Open.

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NOTE: *Indicated flow will oscillate during the following step. Maintain flow within a band of ± 30 gpm of the reference value.*

4.23 Adjust system flow for test.

4.23.1 Adjust 2CC-824B as required to attain a system flow from 3350 gpm to 3500 gpm.

4.23.2 Adjust 2CC-748A, B/A evap distillate cooler cc throttle valve, to attain the reference (mean-average) flow of 3500 gpm.

4.24 Valve in 2P-11B pump suction gauge 2PI-692B.

4.24.1 Oper 2CC-790B

4.24.2 Open 2CC-691B

4.25 Record the system data on Attachment B.

4.26 Check operability for B Train components 2P-11B and 2CC-724B by comparing the test data obtained in Attachment B, with the limits specified in the IST Program Acceptance Criteria prior to proceeding.

NOTE: *Stroke time is to be taken from control board indication.*

4.27 Station an observer at 2CC-738B to check the local position indication, then record the stroke time while shutting 2CC-738B.
2CC-738B time to shut _____ sec.
Local position indicates full shut. (SAT/UNSAT)

4.28 Reposition 2CC-824B to its design flow position per the local plaque, and lock. Lock No. _____

4.28.1 Shut 2CC-748A.

4.28.2 Independent operator verify that 2CC-824B is in its design flow position per the local plaque, and locked.

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INITIALS

NOTE: *The dedicated operator for 2CC-824B is no longer required.*

- 4.29 Check operability for B Train component 2CC-738B by comparing the stroke time recorded in Steps 4.21 and 4.27 with the limits specified in the IST Program Acceptance Criteria prior to proceeding.
- _____

NOTE: *If 2P-11A pump data was taken first, or this test is being performed to demonstrate post-maintenance operability of only 2P-11B, Step 4.30 is N/A.*

NOTE: *If 2P-11A CC pump is running and the auto-start check of the pump is deemed unnecessary to prove operability, then Step 4.30 can be marked N/A.*

CAUTION **IF THIS IS THE INITIAL START OF THE PUMP AFTER ITS FILL AND VENT, REFER TO OP 6A ATTACHMENT A FOR GUIDANCE.**

- 4.30 Check the auto-start of 2P-11A CC pump and secure 2P-11B CC pump as follows:

4.30.1 Verify 2P-11A control switch is in AUTO and check the system flow rate on 2FI-619.

4.30.2 Place and hold the 2P-11B control switch in OFF.

4.30.3 Check for 2P-11A auto start accompanied by audible indication of 2CC-724B closure within five seconds, and that the system flow rate remains as before.

4.30.4 Release 2P-11B control switch and allow it to return to AUTO. Verify one CC pump operating and that the system flow rate remains as before.

4.30.5 "Match flags" for the operating CC pump by momentarily placing its control switch to START.

- 4.31 To complete testing of 2P-11A, go to Step 4.3 if required.
- _____

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NOTE: *If only one pump was tested, then step 4.32 or 4.33 can be marked N/A as appropriate.*

4.32 Isolate 2P-11A pump suction gauge 2PI-692A.

4.32.1 Shut 2CC-691A _____

4.32.2 Shut 2CC-790A _____

4.33 Isolate 2P-11B pump suction gauge 2PI-692B.

4.33.1 Shut 2CC-691B _____

4.33.2 Shut 2CC-790B _____

4.34 Close the CCW surge tank vent valve 2CC-17, if required. _____

4.35 Exit the test with the following CCW pump running, or as directed by the DSS.

2P-11A OR 2P-11B (Circle One)
(1st/3rd QTR) (2nd/4th QTR) _____

5.0 ANALYSIS

NOTE: *To be completed within 96 hours by Operations manager or his representative.*

5.1 Comparisons with allowable ranges of test values and analysis of deviations complete. _____

5.2 Any requirements for corrective action:

Yes _____ No _____

(If yes, give details in the remarks section.)

5.3 Data analyzed by _____

Time and date _____

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REMARKS:

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ATTACHMENT A

2P-11A COMPONENT COOLING WATER PUMP

PARAMETERS			INSTRUMENT	UNITS	READING
*CC System Flow			FT619 or 2FI-619	gpm	3500 Ref.
Pump Discharge Pressure			2PI-617A	psig	
Pump Suction Pressure			2PI-692A	psig	
Pump Differential Pressure			Note 1	psid	
Pump Vibration	Inboard Bearing	Vertical C	Note 2, 3	ips	
		Horizontal D	Note 2, 3	ips	
	Outboard Bearing	Vertical A	Note 2, 3	ips	
		Horizontal B	Note 2, 3	ips	
		Axial E	Note 2, 3	ips	
		*CC Surge Tank Level			YYLT618 or 2LI-618B
*CC Suction Header Temperature			T616 or 2TI-616	°F	

*Use PPCS address if available. Circle the indication used during the test.

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ATTACHMENT B

2P-11B COMPONENT COOLING WATER PUMP

PARAMETERS			INSTRUMENT	UNITS	READING
*CC System Flow			FT619 or 2FI-619	gpm	3500 Ref.
Pump Discharge Pressure			2PI-617B	psig	
Pump Suction Pressure			2PI-692B	psig	
Pump Differential Pressure			Note 1	psid	
Pump Vibration	Inboard	Vertical C	Note 2, 3	ips	
	Bearing	Horizontal D	Note 2, 3	ips	
	Outboard	Vertical A	Note 2, 3	ips	
	Bearing	Horizontal B	Note 2, 3	ips	
		Axial E	Note 2, 3	ips	
*CC Surge Tank Level			YYLT618 or 2LI-618B	%	
*CC Suction Header Temperature			T616 or 2TI-616	°F	

*Use PPCS address if available. Circle the indication used during the test.

NOTE 1: Differential pressure = running pump discharge pressure (2PI-617A/B) minus pump suction pressure (2PI-692A/B).

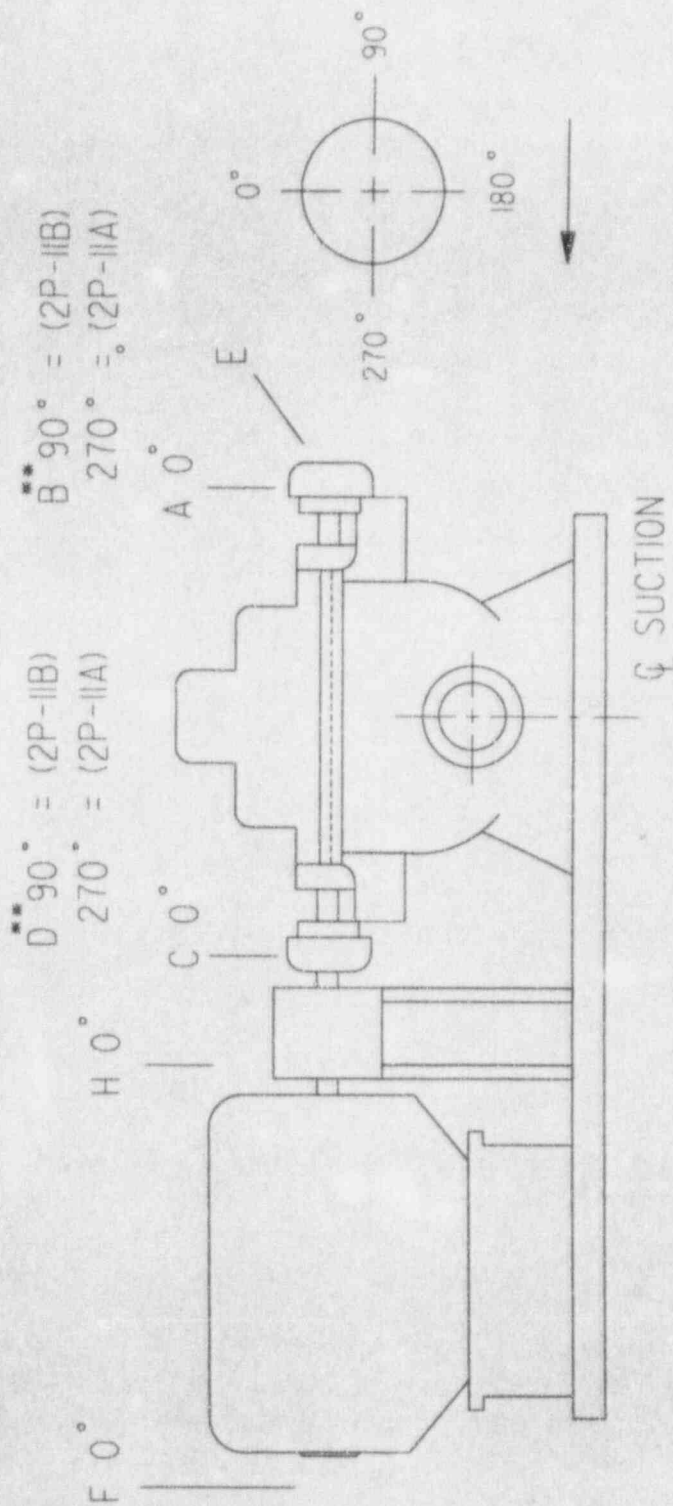
NOTE 2: Log the identification number of the portable instruments.

NOTE 3: Vibration readings are taken at locations A, B, C, D, and E as shown on Figure 1.

NOTE 4: Bearing temperature data is not required to assess pump operability per ASME, Section XI. If bearing temperature is required as a post-maintenance test, then the temperature monitoring point should be as shown on Figure 1 for locations B, D, F, and H. Ambient air temperature should be measured at approximately one foot above the pump inboard bearings.

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FIGURE 1



** Vibration for points "B" and "D" are taken at 270° for 2P-IIA.
Vibration for points "B" and "D" are taken at 90° for 2P-IIB.

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132A