

1-30-81

CONTROL NO. \_\_\_\_\_  
 PHILADELPHIA ELECTRIC COMPANY  
 FILE NO. Alden PLANT BOTTOM UNITS 2 AND 3  
 CONTRACT NO. \_\_\_\_\_  
 STATION SUPERVISOR \_\_\_\_\_  
SURVEILLANCE TEST

ST 6.11 RCIC PUMP, VALVE, FLOW COOLER

TECHNICAL SPECIFICATION: 4.5.D.1.b, c, d; 4.5.H; TABLE 4.2.B; TABLE 3.7.1;  
3.6.G; 4.6.G

TEST FREQUENCY:

Once/Month

TEST RESULTS:

A. All of the asterisked & ISI-Letter I steps were completed SATISFACTORILY.

PERFORMED BY:

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
TIME/DATE

\_\_\_\_\_  
SIGNATURE (SHIFT SUPERVISION)

\_\_\_\_\_  
TIME/DATE

B. One or more of the asterisked or ISI-Letter I steps was completed UNSATISFACTORILY. Refer to Tech Spec 4.5.D.1.b, c, d and 4.5.H and 4.7.D.2.

MRF \_\_\_\_\_

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
TIME/DATE

\_\_\_\_\_  
SIGNATURE (SHIFT SUPERVISION)

\_\_\_\_\_  
TIME/DATE

IMMEDIATELY NOTIFY PLANT SUPERINTENDENT OR ALTERNATE.

\_\_\_\_\_  
NAME OF PERSON NOTIFIED

\_\_\_\_\_  
TIME/DATE

\_\_\_\_\_  
SIGNATURE OF SHIFT SUPERINTENDENT OR SUPERVISOR

ADDITIONAL ACTION required if other portions of test did not function properly or other discrepancies were noted during test.

1. MRF submitted: MRF \_\_\_\_\_
2. One or more ISI-I steps completed in ALERT RANGE \_\_\_\_\_
3. Other: \_\_\_\_\_

\_\_\_\_\_  
SIGNATURE

\_\_\_\_\_  
DATE

REVIEWED BY:

\_\_\_\_\_  
PLANT STAFF SUPERVISION

\_\_\_\_\_  
DATE

81 07070 435

PURPOSE:

The operability and performance of the RCIC system valves and pump will be tested during this procedure. The RCIC unit cooler operability will also be tested. In addition, this procedure satisfies the PBAPS Technical Specification for inservice inspection (ISI) requirement (1974 ASME B & PV Code Section XI, articles IWP & IWV 3000).

REFERENCES:

1. M-359
2. M-360
3. Technical Specifications
4. FSAR 7.3.4.6

PREREQUISITES:

1. Request permission from Shift Supervision to begin test.
2. Reactor level > -49 inches.
3. Reactor level < +45 inches.
4. Reactor pressure > 105 psig. If at rated press (and on bypass valves) 1/2 bypass valve is required.
5. No surveillance instrument testing is in progress and none shall begin until this test is completed.
6. If this test is not being performed due to an inoperable HPCI, verify HPCI not known to be inoperable.
7. D.C. control power available.
8. RHR available for torus cooling.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

TEST EQUIPMENT REQUIRED:

1. Stop watch.

PROCEDURE FOR VALVE STROKING:

1. Verify that the RCIC system is set-up for automatic operation in accordance with operating procedure S.3.5.A.

\_\_\_\_\_

PERFORM ALL STEPS IN THE SEQUENCE WRITTEN.

- I \* 2. Verify operability of Steam Line Isolation Valve MO-13-15. Maximum stroke time of 15 seconds (Tech Spec) (I Criteria 15 seconds max).

- A. Close MO-13-15
- B. Open MO-13-15
- C. Verify that MO-13-15 is OPEN before proceeding to the next step.

\_\_\_\_\_

\_\_\_\_\_ sec.

\_\_\_\_\_ sec.

- I \* 3. Verify operability of Steam Line Isolation Valve MO-13-16. Maximum stroke time of 15 seconds (Tech Spec) (I Criteria 15 seconds max).

- A. Close MO-13-16
- B. Open MO-13-16
- C. Verify that MO-13-16 is OPEN before proceeding to the next step.

\_\_\_\_\_

\_\_\_\_\_ sec.

\_\_\_\_\_ sec.

4. Verify operability of the Turbine Trip Throttle Valve. Nominal time of 15 seconds.

\_\_\_\_\_

A. Close Turbine Trip Throttle Valve. \_\_\_\_\_ sec.

IT IS IMPORTANT THAT THIS VALVE REMAINS CLOSED WHILE PERFORMING STEP 5 THRU 8.

B. Verify that Turbine Trip Throttle Valve is CLOSED before proceeding to the next step. \_\_\_\_\_

I 5. Verify operability of Condensate Tank Suction Valve MO-13-18. Nominal stroke time of 30 seconds. (I Criteria  $\leq$  38 seconds).

A. Close MO-13-18 \_\_\_\_\_ sec.

B. Verify that MO-13-18 is CLOSED before proceeding to the next step. \_\_\_\_\_

IT IS IMPORTANT THAT THIS VALVE REMAINS CLOSED WHILE PERFORMING STEPS 6 THRU 11.

I 6. Verify operability of Turbine Steam Supply Valve MO-13-131. OPEN MO-13-131. Nominal stroke time of 15 seconds (FSAR). (I Criteria  $\leq$  19 seconds). \_\_\_\_\_ sec.

I 7. Verify operability of Turbine Steam Supply Valve MO-13-131. Close MO-13-131. Nominal stroke time of 15 seconds. (FSAR). (I Criteria  $\leq$  19 seconds). \_\_\_\_\_ sec.

8. Verify operability of Turbine Trip Throttle Valve. Nominal stroke time of 15 seconds.

A. Open Turbine Trip Throttle Valve. \_\_\_\_\_ sec.

B. Verify that Turbine Trip Throttle Valve is OPEN before proceeding to the next step. \_\_\_\_\_

I 9. Verify operability of Minimum Flow Bypass Valve MO-13-27. Nominal stroke time of 5 seconds (FSAR). (I Criteria  $\leq$  8 seconds.)

A. Open MO-13-27 \_\_\_\_\_ sec.

B. Close MO-13-27 \_\_\_\_\_ sec.

C. Verify that MO-13-27 is CLOSED before proceeding to the next step. \_\_\_\_\_

10. Verify operability of Lube Oil Cooler and Condenser Valve MO-13-132. Nominal stroke time of 5 seconds.

A. Open MO-13-132 \_\_\_\_\_ sec.

B. Close MO-13-132 \_\_\_\_\_ sec.

C. Verify that MO-13-132 is CLOSED before proceeding to the next step. \_\_\_\_\_

I 11. Verify operability of Torus Suction Valve MO-13-39. Nominal stroke time of 30 seconds. (I Criteria  $\leq$  38 seconds).

A. Open MO-13-39 \_\_\_\_\_ sec.

B. Close MO-13-39 \_\_\_\_\_ sec.

C. Verify that MO-13-39 is CLOSED before proceeding to the next step. \_\_\_\_\_

- I 12. Verify operability of Torus Suction Valve MO-13-41. Nominal stroke time of 30 seconds. (I Criteria  $\leq$  38 seconds.)
- A. Open MO-13-41 \_\_\_\_\_ sec.
  - B. Close MO-13-41 \_\_\_\_\_ sec.
  - C. Verify that MO-13-41 is CLOSED before proceeding to the next step. \_\_\_\_\_

- I 13. Verify operability of Condensate Tank Suction Valve MO-13-18. Nominal stroke time of 30 seconds. (I Criteria  $\leq$  38 seconds.)
- A. Open MO-13-18 \_\_\_\_\_ sec.
  - B. Verify that MO-13-18 is OPEN before proceeding to the next step. \_\_\_\_\_

- I 14. Verify operability of Pump Discharge Valve MO-13-20. Nominal stroke time of 15 seconds (FSAR). (I Criteria  $\leq$  19 seconds.)
- A. Close MO-13-20 \_\_\_\_\_ sec.
- IT IS IMPORTANT THAT PUMP DISCHARGE VALVE MO-13-20 REMAINS CLOSED WHILE PERFORMING STEP 15 THRU 17.
- B. Verify that MO-13-20 is CLOSED before proceeding to the next step. \_\_\_\_\_

TESTING OF AO-13-22 IS ONLY TO BE PERFORMED IF THE DRYWELL IS DE-INERTED AND ACCESSIBLE. IF TESTABLE CHECK VALVE AO-13-22 FAILS TO OPEN DURING STEP 15, VERIFY THAT PUMP DISCHARGE VALVE MO-13-21 IS CLOSED, THEN OPEN THE MANUAL PRESSURE EQUALIZATION VALVE (43) AROUND AO-13-22. CLOSE THE EQUALIZATION VALVE AND REPEAT STEP 15.

- I 15. Verify operability of Testable Check Valve AO-13-22 on the Pump Discharge Line.
- A. Depress the TEST button and observe AO-13-22 OPEN.
  - B. Release the TEST button and observe AO-13-22 CLOSE.
  - C. Verify that AO-13-22 is CLOSED before proceeding to the next step. \_\_\_\_\_

- I 16. Verify operability of Pump Discharge Valve MO-13-21. Nominal stroke time of 15 seconds (FSAR). (I Criteria  $\leq$  19 seconds.)
- A. Open MO-13-21 \_\_\_\_\_ sec.
  - B. Close MO-13-21 \_\_\_\_\_ sec.
  - C. Verify that MO-13-21 is CLOSED before proceeding to the next step. \_\_\_\_\_

- I 17. Verify operability of Test Return Valve to Condensate Storage Tank MO-13-30. Nominal stroke time of 15 seconds) (I Criteria  $\leq$  19 seconds.)
- A. Open MO-13-30 \_\_\_\_\_ sec.
  - B. Close MO-13-30 \_\_\_\_\_ sec.
  - C. Verify that MO-13-30 is CLOSED before proceeding to the next step. \_\_\_\_\_

- I 18. Verify operability of Pump Discharge Valve MO-13-20.  
Nominal stroke time of 15 seconds (FSAR). (I Criteria  
≤ 19 seconds.)
- A. Open MO-13-20
  - B. Verify that MO-13-20 is OPEN before proceeding to the  
next step. \_\_\_\_\_ sec.
- \* 19. Verify operability of Barometric Condenser Pump Discharge Drain  
Isolation Valves AO-13-12 and AO-13-13.
- A. Rotate the control switch, common to both valves, to the  
OPEN position and observe both AO-13-12 and AO-13-13 open. \_\_\_\_\_
  - B. Rotate the control switch to CLOSE and observe AO-13-12 and  
AO-13-13 close. \_\_\_\_\_
  - C. Verify that the control switch is in the CLOSE position and  
that both AO-13-12 and AO-13-13 are CLOSED before proceeding  
to the next step. \_\_\_\_\_
- I \* 20. Verify operability of Steam Line Drain Isolation Valves  
AO-13-34 and AO-13-35.
- A. Rotate the control switch, common to both valves, to the  
CLOSE position and observe both AO-13-34 and AO-13-35  
close. \_\_\_\_\_
  - B. Rotate the control switch to the OPEN position and observe  
both AO-13-34 and AO-13-35 open. \_\_\_\_\_
  - C. Verify that the control switch is in the OPEN position and  
that both AO-13-34 and AO-13-35 are OPEN before proceeding  
to the next step. \_\_\_\_\_
- I 21. Verify the operability of Steam Trap Bypass Valve AO-13-32.
- A. Rotate the control switch to the OPEN position and observe  
AO-13-32 open. \_\_\_\_\_
  - B. Rotate the control switch to the CLOSE position and observe  
AO-13-32 close. \_\_\_\_\_
  - C. Verify that the control switch is in the CLOSE position and  
that AO-13-32 is CLOSED before proceeding to the next step. \_\_\_\_\_
- I Completion of Step 21 satisfies full cycle exercise of AO-13-32.
- I 22. Verify operability of the Turbine Exhaust Condenser Drain  
Isolation Valve AO-13-137.
- A. Turn the control switch to the CLOSE position and observe  
AO-13-137 close. \_\_\_\_\_
  - B. Turn the control switch to the OPEN position and observe  
AO-13-137 open. \_\_\_\_\_
  - C. Verify that AO-13-137 is OPEN before proceeding to the  
next step. \_\_\_\_\_
- I Completion of Step 22 satisfies full cycle exercise of AO-13-137
- I 23. Verify operability of the Turbine Exhaust Condenser Drain  
Isolation Valve AO-13-138.
- A. Turn the control switch to the CLOSE position and observe  
AO-13-138 close. \_\_\_\_\_



- B. Turn the control switch to the OPEN position and observe AO-13-138 open.
- C. Verify that AO-13-138 is OPEN before proceeding to the next step.

- I Completion of Step 23 satisfies full cycle exercise of AO-13-138.
- I 24. Verify operability of vacuum relief discharge valve MO-4244. Norminal stroke time of 10 seconds. (I Criteria 15 seconds).

- A. Turn switch to the CLOSE position and observe MO-4244 close. \_\_\_\_\_ sec.
- B. Turn the switch to the OPEN position and observe MO-4244 open. \_\_\_\_\_ sec.
- C. Verify that MO-4244 is OPEN before proceeding to next step. \_\_\_\_\_

IF THE RCIC PUMP SHOULD TRIP DURING TESTING, AND THE CAUSE IS NORMAL, THE PUMP MUST BE RESTARTED AND THE SYSTEM SHUTDOWN (WHEN TEST STEP 33 CALLS FOR A SHUTDOWN) IN ACCORDANCE WITH S.3.5.D.2 FOR THE TEST TO BE PROPERLY COMPLETED.

If the plant is at power, the RHR cross-tie valve (MO-10-20) must be left closed. The following torus cooling setup will be required:

For Unit 2 only, establish torus cooling by using the 'D' RHR pump and discharging into the torus via the 'B' torus cooling loop.

For Unit 3 only, establish torus cooling by using the 'A' RHR pump and discharging into the torus via the 'A' torus cooling loop.

Observe and record the running RHR pump suction temperature every five minutes until the heat addition is terminated.

PROCEDURE FOR VERIFYING PUMP, COOLER AND TURBINE OPERABILITY

Record all necessary data on attached data sheets.

- 25. Determine which unit cooler switch is in the RUN position. Cooler No. \_\_\_\_\_  
MO-13-27 WILL OPEN AFTER MO-13-131 BEGINS TO OPEN. AO-13-34, AO-13-35, AO-13-12, and AO-13-13 WILL CLOSE, IF OPEN, WHEN MO-13-131 REACHES ITS FULL OPEN POSITION.

- 26. Check oil level of the RCIC pump. Oil level should be visible on the pump oil sight glasses.

- I 27. Prior to starting the RCIC pp record pp suction pressure on the pp and turbine data sheet. Place the RCIC system and torus cooling in operation for full flow test in accordance with operating procedure S.3.5.D. Note: The pump is started via a manual quick start. After the RCIC is started, adjust turbine speed at 3600 RPM and 625 GPM while taking data. Allow system parameters to stabilize and pump to run for a minimum of 5 minutes prior to recording ISI criteria data on Data Sheets 6.11.1 and 6.11.2.

- I Completion of step 27 satisfies the functional operability of VV-13-19, VV-13-29, VV-13-38 and VV-13-50.
- VV-13-19 - Valve opened to permit rated pump flow.
- VV-13-29 - Turbine did not overspeed on start due to lack of minimum flow.
- VV-13-38 - Vacuum pump did not trip due to lack of discharge flow path.
- VV-13-50 - Turbine steam exhaust pressure is satisfactory.

- \* 28. When all ISI data has been recorded and if the turbine steam supply is approximately 1000 psig, raise pump discharge pressure to greater than 1040 psig and adjust turbine speed as necessary to achieve at least 600 GPM flow. (Tech Spec)

DISCHARGE PRESSURE \_\_\_\_\_ PSIG  
 FLOW \_\_\_\_\_ GPM  
 SPEED \_\_\_\_\_ RPM

THERE IS NOT TECH SPEC REQUIREMENT FOR TURBINE SPEED.

- \* 29. Verify that the unit cooler identified in Step 25 starts when MO-13-131 is open. (If this cooler fails, the other cooler should start after a 20 second time delay).

- 30. Turn the switch that is in RUN to the AUTO position. This fan will begin coasting to a stop.

- 31. Verify that BOTH fans restart automatically. (When the fan that was running slows down sufficiently, there is a 20 second time delay from then until when both fans should start).

2(3)AV22  
 2(3)BV22

- I 32. Verify that BOTH cooling water valves opened.

AO-2333A  
 AO-2333B

- 33. Return the switch of the unit cooler listed in Step 25 to the RUN position.

- I 34. Verify that BOTH unit coolers stop after MO-13-131 is closed during Step 34. Verify that BOTH AO-2333A and B close.

- 35. After the RCIC system has been observed in the full flow operation and all required data has been recorded on the attached data sheets, shutdown the system in accordance with operation procedure S.3.5.D.

- I 35a Verify RCIC flow controller is set at 600 GPM & in 'Auto'.  
 Completion of Steps 32 & 34 satisfies the full cycle exercise of AO-2333A & AO-2333B.

- 36. Plot differential pressure from Data Sheet 6.11.1 on the appropriate bar graph on Graph 6.11-1 to determine the I criteria (Acceptable, Alert, or Action). Check the proper block on Graph 6.11.1

- 37. From the results obtained in Step 36 and the definitions below, take further action if required.

DEFINITIONS OF CRITERIA

- a. ACCEPTABLE RANGE: "No further action is required" - the value is satisfactory. Complete Part A of Test Results on pagel.
- b. ALERT RANGE: "No immediate action is required" - complete Part A of Test Results & the additional action section on Page 1. Testing shall be doubled until plant engineering review of the value determines the cause of the deviation & corrects it by either reverifying the existing I criteria values or establishing a new set of values.
- c. REQUIRED ACTION RANGE: "The recorded value of flow for the RCIC pump is unsatisfactory" - Complete Part B of Test Results on Page 1 and notify Plant Superintendent or alternate. The pump shall be declared inoperative until the condition has been corrected and a satisfactory inservice test has been completed.

38. Inform Shift Supervision of the results of this test and fill out the test results section of this test.

PUMP AND TURBINE DATA SHEET

Recorded Parameters	Instrument Number	Acceptable Limit	Test Readings
I Pump Flow	FI-13-91	Must Be 625 GPM	
I Turbine/Pump Speed	SPI-4525 (5525)	Must Be 3600 RPM	
I Pump Suction Pressure Pump Off	PI-13-96		
I Pump Suction Pressure Pump On	PI-13-96	>15" Hg Vac	
Pump Discharge Pressure	PI-13-93		
NOTE 1 I Pump Differential Pressure	_____	See Sheet 7 for ISI-I Criteria	
Turbine Steam Supply Pressure	PI-13-94	150 < P < 1000	
Barometric Condenser Vacuum Tank Pressure	Local	10" Hg Vac. Nominal	
Turbine Steam Exhaust Pressure	PI-13-95	< 20 PSIG	
Lube Oil Cooling Water Pressure	PI-2018 (Local)	60 PSIG Nominal	
Vacuum Pump Exhaust Pressure	Local		

NOTE 1. DIFFERENTIAL PRESSURE = DISCHARGE PRESSURE - SUCTION PRESSURE WITH PUMP ON.

NOTE 2. THERE IS NO SPECIFIC ISI-I CRITERIA FOR PUMP SPEED AND SUCTION PRESSURE.





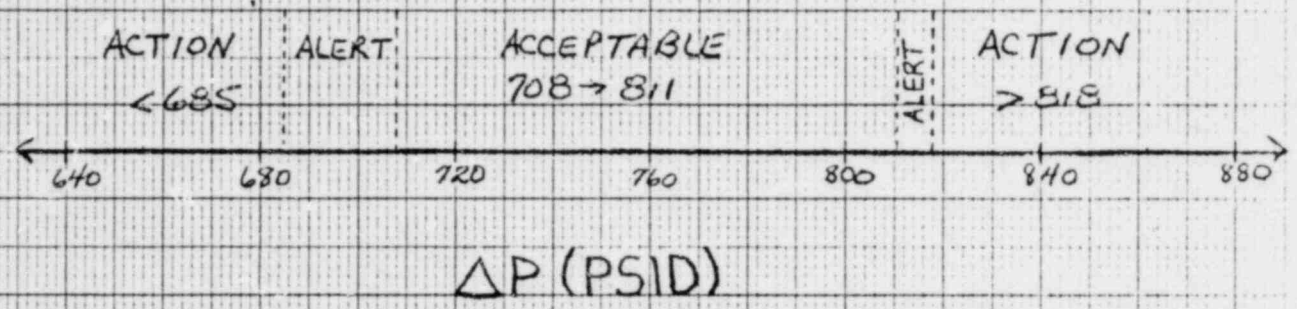
### UNIT 2 RCIC PUMP

FOR 3600 RPM  
625 GPM

ISI CRITERIA:

REF  $\Delta P$  = 779 PSID  
REF FLOW = 625 GPM

- ACCEPTABLE
- ALERT
- ACTION



$\Delta P$  (PSID)

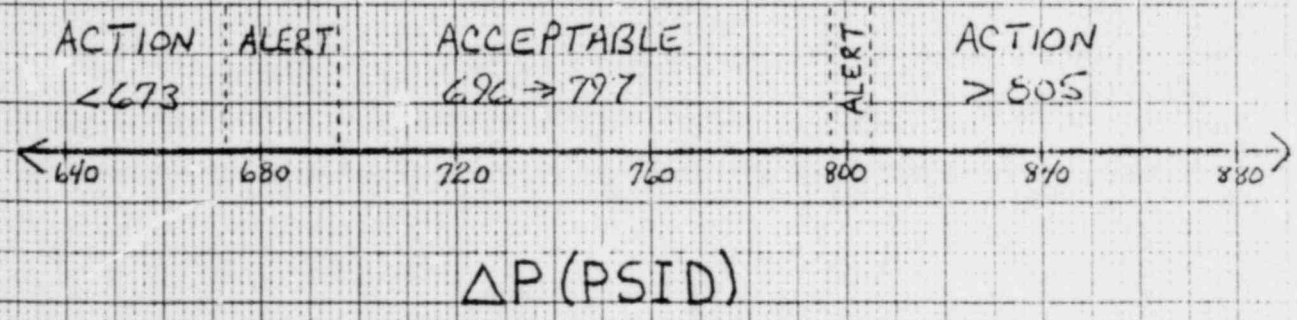
### UNIT 3 RCIC PUMP

FOR 3600 RPM  
625 GPM

ISI CRITERIA:

REF  $\Delta P$  = 766 PSID  
REF FLOW = 625 GPM

- ACCEPTABLE
- ALERT
- ACTION



$\Delta P$  (PSID)

46 1320

K&E  
10 X 10 TO 1/2 INCH 7 X 10 INCHES  
REUFFEL & ESSER CO. MADE IN U.S.A.