

DATE: MAY 21 1982

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REVIEWED BY

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MLT

### 1.0 PLANT INITIAL CONDITIONS

- 1.1 This test is to be performed when the plant is shut down for refueling and the reactor coolant pressure is below 380 psi.
- 1.2 The RHR System is not required for decay heat removal during the performance of this test.

### 2.0 PRECAUTIONS

- 2.1 The Wisconsin Public Service Corporation Safety Rules Manual must be observed.
- 2.2 This test requires the shutdown of the RHR System for a short period of time. Reactor coolant and incore temperatures should be monitored while the RHR System is shut down.
- 2.3 When the RHR pumps are stopped, it may be necessary to reduce cooling water to the heat exchanger.
- 2.4 When the RHR pumps are restarted it may be necessary to initiate flow slowly through the RHR loop to avoid thermal shock to the components.
- 2.5 Prior to disconnecting and/or reconnecting external leads, ensure that the power supply for the instrument loop is de-energized by removing the input fuse (fuse F1 for instrument PM-419 and PM-420, current sources).
- 2.6 Process an RWP, if applicable, when removing from service, calibrating, and placing back into service the pressure transmitters.

### 3.0 GENERAL INSTRUCTIONS

- 3.1 All necessary preparations should be made so as to limit the time the RHR System is not in operation.

### 4.0 REFERENCES

- 4.1 X-K100-1742, Foxboro Instrumentation Reference Manual, Vol I.
- 4.2 X-K100-1762, Foxboro Instrumentation Reference Manual, Vol II
- 4.3 X-K100-2036D, Integrated Logic Diagram, Residual Heat Removal System

## 5.0 PROCEDURE

### 5.1 RCS Pressure to RHR System Interlock Test

- 5.1.1 At Mechanical Control Console C, perform or verify the following:
- 5.1.2 If running, stop RHR Pumps 1A and 1B. Observe green indicating light on. Close valves RHR 1A, 1B, 2A, 2B, and 11.
- 5.1.3 On Rack RCS-1 for transmitter PT-420, disconnect the external leads and connect an analog simulator to terminals D-7 and D-8. Observe precaution 2.5. Connect digital voltmeter to TP/PQ 420.
- 5.1.4 On Rack RCS-1 for bistable PC-420, connect voltmeter number one to terminals L-7 and L-8 and voltmeter number two to terminals N-4 and N-5.
- 5.1.5 Adjust the analog simulator for a minimum signal and open valves RHR 1A and RHR 2A. Observe red indicating lights on.
- 5.1.6 Adjust the analog simulator output until valves RHR-1A and RHR-2A close as indicated by a downscale reading on voltmeter number two. Observe green indicating lights on, record value at which valves closed. Manually close RHR-11 if open.
- 5.1.7 Decrease the signal to  $16.5 \pm 0.2$  mA. Verify that valves RHR-11 and RHR-1B closed by green indicating lights on.
- 5.1.8 Attempt to open valves RHR-1A, RHR-1B, and RHR-11 with switches. Observe that the valves do not open as indicated by the green indicating lights remaining on. Record on data sheet.
- 5.1.9 Adjust the analog simulator output until the RCS High Pressure Interlock bistable (PC-420) trips as indicated by an upscale reading on voltmeter number one. Record the value at which the bistable trips.
- 5.1.10 At Mechanical Control Console C, perform or verify the following:  
  
Open valves RHR 1A, RHR 1B, and RHR 11. Observe red indicating lights on. Record on the data sheet.
- 5.1.11 On Rack RCS-1 for bistable PC-420, disconnect the voltmeters from Terminals L-7, L-8, N-4, and N-5.

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- 5.1.12 On Rack RCS-1 for transmitter PT-420, disconnect the analog simulator and connect the external leads to terminals D-7 and D-8. Observe precaution 2.5. Remove digital voltmeter from TP/PQ-420.
- 5.1.13 On Rack RCS-2 for transmitter PT-419, disconnect the external leads and connect the analog simulator to terminals B-5 and B-6. Observe precaution 2.5. Connect a digital voltmeter to TP/PQ-419.
- 5.1.14 On Rack RCS-2 for bistable PC-419, connect voltmeter number one to terminals R-1 and R-2 and voltmeter number two to terminals R-4 and R-5.
- 5.1.15 Adjust the analog simulator output for minimum signal and verify or open valves RHR 1B and RHR 2B. Observe red indicating lights on.
- 5.1.16 Adjust the analog simulator output until valves RHR 1B and RHR 2B close as indicated by a downscale reading on voltmeter number two. Observe green indicating lights on and record value at which valves closed.
- 5.1.17 Decrease signal to 16.5 mA and attempt to open valves RHR 2A and RHR 2B. Observe that the valves do not open as indicated by the green indicating lights remaining on. Record on data sheet.
- 5.1.18 In RR 147, lift wire 236 on TB 19-11.
- 5.1.19 In RR 147, lift wire 234 on TB 3-11.
- 5.1.20 Adjust the analog simulator to about 15 mA and instruct the operator to open valves RHR 2A and RHR 2B. Verify RHR 1A and 1B open. If not, open them.
- 5.1.21 Verify that alarm 4702331 (RHR improper lineup) is off.
- 5.1.22 Instruct the operator to close valve RHR 1A.
- 5.1.23 Verify alarm 4702331 is on.
- 5.1.24 Instruct the operator to open valve RHR 1A.
- 5.1.25 Verify alarm 4702331 is off.

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- 5.1.26 Instruct the operator to close valve RHR 1B.
- 5.1.27 Verify alarm 4702331 is on.
- 5.1.28 Instruct the operator to open valve RH 1B.
- 5.1.29 Verify alarm 4702331 is off.
- 5.1.30 Instruct the operator to close valve RHR 2A.
- 5.1.31 Verify alarm 4702331 is on.
- 5.1.32 Instruct the operator to open valve RHR 2A.
- 5.1.33 Verify alarm 4702331 is off.
- 5.1.34 Instruct the operator to close valve RHR 2B.
- 5.1.35 Verify alarm 4702331 is on.
- 5.1.36 Instruct the operator to close valves RHR 1A, RHR 1B, and RHR 2A.
- 5.1.37 In RR 147, install a jumper on TB 17, terminal 3 to 4.
- 5.1.38 In RR 147, install a jumper on TB 2, terminal 11 to 12.
- 5.1.39 Adjust the analog simulator to about 48 mA.
- 5.1.40 Verify alarm 4702331 is off.
- 5.1.41 Instruct the operator to open valve RHR 1A.
- 5.1.42 Verify alarm 4702331 is on.
- 5.1.43 Instruct the operator to close valve RHR 1A.
- 5.1.44 Verify alarm 4702331 is off.
- 5.1.45 Instruct the operator to open valve RHR 1B.
- 5.1.46 Verify alarm 4702331 is on.
- 5.1.47 Instruct the operator to close valve RHR 1B.
- 5.1.48 Verify alarm 4702331 is off.

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- 5.1.49 Instruct the operator to open valve RHR 2A.
- 5.1.50 Verify alarm 4702331 is on.
- 5.1.51 Instruct the operator to close valve RHR 2A.
- 5.1.52 Verify alarm 4720331 is off.
- 5.1.53 Instruct the operator to open valve RHR 2B.
- 5.1.54 Verify alarm 4702331 is on.
- 5.1.55 Adjust the analog simulator output until the RCS High Pressure Interlock bistable (PC-419) is reset as indicated by an upscale reading on voltmeter number one. Record value at which the bistable resets.
- 5.1.56 Remove jumper installed at step 5.1.37.
- 5.1.57 Remove jumper installed at step 5.1.38.
- 5.1.58 In RR 147, replace wire 236 on TB 19-11.
- 5.1.59 In RR 147, replace wire 234 on TB 3-11.
- 5.1.60 On Rack RCS-2 for bistable PC-419, disconnect the analog simulator and connect the external leads to terminals B-5 and B-6. Observe precaution 2.5. Remove voltmeters #1 and #2 and the digital voltmeter.
- 5.1.61 Inform the operators they may open valves RHR 1A, RHR 1B, and RHR 2A and start the RHR pmps if plant conditions require their use.

## 6.0 PROBLEMS

Complete a Surveillance Procedure Exception Report for any problems encountered during the test and corrective action taken. For each problem, specify whether followup action is required.

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## 7.0 ACCEPTANCE CRITERIA

The test will be considered acceptable when the following items have been completed and signed off.

7.1 The test in section 5.0 has been completed and signed off for each valve:

- a. Valve RHR 1A
- b. Valve RHR 1B
- c. Valve RHR 2A
- d. Valve RHR 2B
- e. Valve RHR 11

7.2 All problems encountered during the test have been properly resolved and signed off, except as noted by Surveillance Procedure Exception Report.

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DATA SHEET

The test has been satisfactorily completed for the following channels:

419 Yes \_\_\_\_\_ No \_\_\_\_\_

420 Yes \_\_\_\_\_ No \_\_\_\_\_

Any problems encountered during the test?

Yes \_\_\_\_\_ No \_\_\_\_\_

Exception Report filled out?

Yes \_\_\_\_\_ No \_\_\_\_\_

PERFORMED BY \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

SHIFT SUPERVISOR \_\_\_\_\_ DATE \_\_\_\_\_

GROUP SUPERVISOR \_\_\_\_\_ DATE \_\_\_\_\_

MAINTENANCE SUPT \_\_\_\_\_ DATE \_\_\_\_\_

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DATA SHEET

Date Performed \_\_\_\_\_

Analog Simulator Instrument No.'s \_\_\_\_\_

Voltmeter No.'s \_\_\_\_\_

Digital Voltmeter No.'s \_\_\_\_\_

Procedure Step		Required	Initials
5.1.2	Valve RHR 1A Valve RHR 1B Valve RHR 2A Valve RHR 2B Valve RHR 11  Status of RHR Pump 1A Green indicating light Status of RHR Pump 1B Green indicating light	Close Close Close Close Close  Stopped On Stopped On	
5.1.3	Transmitter PT-420 Terminal D-7  Terminal D-8  Analog Simulator Terminal D-7  Terminal D-8  Digital Voltmeter TP/PQ 420	Disconnected  Disconnected  Connected Connected Connected	
5.1.4	Voltmeter #1 Terminal L-7  Terminal L-8  Voltmeter #2 Terminal N-4  Terminal N-5	Connected Connected  Connected Connected	
5.1.5	Valve RHR 1A Red indicating light Valve RHR 2A Red indicating light	Open On Open On	

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Date Performed \_\_\_\_\_

Procedure Step		Required	Initials
5.1.6	Valve RHR 1A Green indicating light Valve RHR 2A Green indicating light  Voltmeter #2 Reading  (700 psi) TP/PQ 420 readout  As found	Close On Close On  Downscale  19.33+0.2mA (increasing)  _____mAdc	
5.1.7	Analog signal decreased (487.5 psi)  Valve RHR-11 & RHR 1B  Green indicating light	16.5+0.2mAdc  Closed  On	
5.1.8	Valve RHR 1A  Green indicating light  Valve RHR 1B  Green indicating light  Valve RHR 11  Green indicating light	Will not open  On  Will not open  On  Will not open  On	
5.1.9	Voltmeter #1 reading  TP/PQ 420 readout (450 psi)  As found	Upscale  16.0+0.2mAdc  _____mAdc	
5.1.10	Valve RHR 1A Red indicating light Valve RHR 1B Red indicating light Valve RHR 11 Red indicating light	Open On Open On Open On	

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DATA SHEET

Date Performed \_\_\_\_\_

Analog Simulator Instrument No.'s \_\_\_\_\_

Procedure Step		Required	Initials
5.1.11	Voltmeter #1		
	Terminal L-7	Disconnected	
	Terminal L-8	Disconnected	
	Voltmeter #2		
	Terminal N-4	Disconnected	
	Terminal N-5	Disconnected	
5.1.12	Analog Simulator		
	Terminal D-7	Disconnected	
	Terminal D-8	Disconnected	
	Transmitter PT-420		
	Terminal D-7	Connected	
	Terminal D-8	Connected	
5.1.13	Digital Voltmeter at TP/PQ 420	Disconnected	
	Transmitter PT-419		
	Terminal B-5	Disconnected	
	Terminal B-6	Disconnected	
	Analog Simulator		
	Terminal B-5	Connected	
5.1.14	Terminal B-6	Connected	
	Digital Voltmeter at TP/PQ-419	Connected	
	Voltmeter #1		
	Terminal R-1	Connected	
	Terminal R-2	Connected	
	Voltmeter #2		
	Terminal R-4	Connected	
	Terminal R-5	Connected	

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Date Performed \_\_\_\_\_

Analog Simulator Instrument No.'s \_\_\_\_\_

Procedure Step		Required	Initials
5.1.15	Valve RHR 1B Red indicating light Valve RHR 2B Red indicating light	Open On Open On	
5.1.16	Valve RHR 1B Green indicating light Valve RHR 2B Green indicating light  Voltmeter #2  TP/PQ 419 readout (700 psig)	Closed On Closed On  Downscale  19.33+0.2mAdc	
5.1.17	Analog signal decreased (487.5 psig)  Valve RHR 2A  Green indicating light  Valve RHR 2B  Green indicating light	16.5+0.2mAdc  Will not open  On  Will not open  On	
5.1.18	Wire 236	Lifted	
5.1.19	Wire 234	Lifted	
5.1.20	Analog simulator  Valve RHR 2A Valve RHR 2B	15.00 mAdc  Open Open	
5.1.21	Alarm 4702331	Off	
5.1.22	Valve RHR 1A	Closed	
5.1.23	Alarm 4702331	On	
5.1.24	Valve RHR 1A	Open	
5.1.25	Alarm 4702331	Off	

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DATA SHEET

Date Performed \_\_\_\_\_

Analog Simulator Instrument No.'s \_\_\_\_\_

Procedure Step		Required	Initials
5.1.26	Valve RHR 1B	Closed	
5.1.27	Alarm 4702331	On	
5.1.28	Valve RHR 1B	Open	
5.1.29	Alarm 4702331	Off	
5.1.30	Valve RHR 2A	Closed	
5.1.31	Alarm 4702331	On	
5.1.32	Valve RHR 2A	Open	
5.1.33	Alarm 4702331	Off	
5.1.34	Valve RHR 2B	Closed	
5.1.35	Alarm 4702331	On	
5.1.36	Valve RHR 1A Valve RHR 1B Valve RHR 2A	Closed Closed Closed	
5.1.37	Jumper	Installed	_____ _____
5.1.38	Jumper	Installed	_____ _____
5.1.39	Analog simulator	48.00 mAdc	
5.1.40	Alarm 4702331	Off	
5.1.41	Valve RHR 1A	Open	
5.1.42	Alarm 4702331	On	
5.1.43	Valve RHR 1A	Closed	
5.1.44	Alarm 4702331	Off	

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Date Performed \_\_\_\_\_

Analog Simulator Instrument No.'s \_\_\_\_\_

Procedure Step		Required	Initials
5.1.45	Valve RHR 1B	Open	
5.1.46	Alarm 4702331	On	
5.1.47	Valve RHR 1B	Closed	
5.1.48	Alarm 4702331	Off	
5.1.49	Valve RHR 2A	Open	
5.1.50	Alarm 4702331	On	
5.1.51	Valve RHR 2A	Closed	
5.1.52	Alarm 4702331	Off	
5.1.53	Valve RHR 2B	Open	
5.1.54	Alarm 4702331	On	
5.1.55	Voltmeter #1 reading	Upscale	
	TP/PQ 410 readout (450 psig)	16.0±0.2mAdc	
	As found	_____mAdc	
5.1.56	Jumper	Removed	_____
5.1.57	Jumper	Removed	_____
5.1.58	Wire 236	Replaced	_____
5.1.59	Wire 234	Replaced	_____
5.1.60	Voltmeter #1		
	Terminal R-1	Disconnected	
	Terminal R-2	Disconnected	

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DATA SHEET

Date Performed \_\_\_\_\_

Analog Simulator Instrument No.'s \_\_\_\_\_

Procedure Step		Required	Initials
	Voltmeter #2		
	Terminal R-4	Disconnected	
	Terminal R-5	Disconnected	
	Analog Simulator		
	Terminal B-5	Disconnected	
	Terminal B-6	Disconnected	
	Transmitter PT-419		
	Terminal B-5	Connected	
	Terminal B-6	Connected	
	Digital Voltmeter	Removed	

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