

I. PURPOSE

To provide a detailed instruction for station personnel to perform a control rod drive hydraulic control unit accumulator charging water check valve and scram inlet control valve leakage check.

II. DISCUSSION

The control rod drive hydraulic control units are charged to a pressure of 1400 to 1500 psig, providing a source of water to rapidly insert the control rods upon a signal from both buses of the reactor protection system. At high reactor pressures (~ above 800 psig) the accumulator provides for a rapid initial insertion rate for the control rods. As the accumulator pressure approaches reactor pressure, the control rod insertion continues by reactor pressure internally ported within the control rod drive.

At reactor pressures above 800 psig, required control rod scram times may be met independent of accumulator action. Below 800 psig reactor pressure, accumulator operation is necessary in order to meet the required control rod scram times.

The purpose of this surveillance procedure is to ensure control rod drive hydraulic accumulators are capable of staying pressurized for 20 minutes in the event of loss of capability to charge them, such as a loss of both control rod drive pumps for an extended period of time. A second purpose of this procedure is to determine the leakage path so that proper subsequent repairs may be initiated and post maintenance Q.C. can be addressed.

III. REFERENCE MATERIAL

A. SAR.

1. Volume I, Section III, Subsection 5.0.

B. Flow Diagrams.

1. B & R Drawing 2039; Control Rod Drive Hydraulic System.

C. Vendor Manuals.

1. G.E. Operations and Maintenance Instruction GEK-9688, Volume III, Part I, Subgroup; Control Rod Drive System.
2. Instruction Manual 66-31-24, GEK-9582A; Hydraulic Control Unit.

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Reviewed By/Date

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IV. PREREQUISITES

- A. The reactor in cold shutdown condition.
- B. The control rod drive hydraulic system in operation with normal flows and pressures established.

V. LIMITATIONS

- A. Surveillance Requirements - Technical Specifications.

None.

- B. Administrative Limits.

1. All discrepancies shall be recorded in the Shift Supervisor's log.
2. Attachment "A" shall be used to record the test and filed as part of the station records.
3. Coordinate all testing with the Control Room Operator.
4. This procedure shall be performed each plant refueling outage.

VI. PRECAUTIONS

- A. Any water drained from the control rod drive hydraulic accumulators or its piping should be considered radioactive and proper precautions to prevent spread of contamination observed.

VII. TEST EQUIPMENT

- A. Calibrated stopwatch.

VIII. PROCEDURE

- A. Identification Of Control Rod Drive Hydraulic Accumulators Which Leak Excessively.
 1. Obtain the Shift Supervisor's permission to perform surveillance procedure.
 2. Verify the control rod drive hydraulic control units accumulator nitrogen pressures are reading normal pressure between ~ 1090 and 1140 psig (refer to System Operating Procedure 2.2.8, Appendix C, Figure II, Accumulator Recharge Pressure vs. Ambient Temperature). Recharge any accumulators which are low per System Operating Procedure 2.2.8, Step VIII.E.
 3. With the control rod drive hydraulic system operating normally, secure the operating control rod drive hydraulic pump.

4. Utilizing a stopwatch, monitor the control rod drive accumulator trouble alarm lights on panel 9-5 for 20 minutes.

- a. Record the control rod drive accumulator alarms and the time required from securing of the control rod drive pump until the alarm lights illuminate, on Attachment "A" data sheet.

Note: An alternate method could be to monitor the local hydraulic control units accumulator alarm panels lights.

5. Restart the control rod drive pump and return the control rod drive hydraulic system to normal per System Operating Procedure 2.2.8, Step VIII.
6. Perform Section B., if necessary, to determine leakage path for those accumulators.

B. Determining Accumulator Leakage Paths.

1. With the control rod drive hydraulic system operating normally, verify accumulator trouble alarm lights are all off.
2. Close CRD-29, charging header root valve, and immediately secure the operating control rod drive hydraulic pump.
3. Utilizing a stopwatch, monitor the control rod drive accumulator trouble alarm lights on panel 9-5 for 20 minutes.
 - a. Record the control rod drive accumulator alarms and the time required from closing CRD-29 and securing the control rod drive pump until the alarm lights illuminate, on Attachment "A" data sheet.

Note: An alternate method could be to monitor the local hydraulic control units accumulator alarm panels lights.

4. Open CRD-29 after 20 minutes.
5. Restart the control rod drive pump and return the control rod drive hydraulic system to normal per System Operating Procedure 2.2.8, Step VII.
6. Notify the Shift Supervisor when testing is complete.

Note: Those hydraulic control units accumulators which failed to hold pressure during performance of Section VII.B. have leaking scram inlet control valves.

Those leaking hydraulic control units accumulators identified in Section VIII.A. but did not leak down in Section VIII.B. have leaking charging water check valves.

IX. ATTACHMENTS

- A. Control Rod Drive Hydraulic Control Unit Accumulator Leakage Test Data Sheets.

PROCEDURE	DATA CHECK
A. Identification Of Leaking Accumulators.	☒
1. Obtained permission to perform test.	☒
2. Charged accumulators to normal (1090 to 1140 psig).	☒
3. Secured control rod drive charging pump and recorded time on data sheet.	☒
4. Monitored control rod drives accumulator alarm lights for 20 minutes.	☒
a. Recorded accumulators which alarm and times on data sheet.	☒
5. Restarted control rod drive system and returned to normal per System Operating Procedure 2.2.8.	☒
6. Performed Section B., if necessary.	☒
B. Determining Accumulator Leakage Paths.	☒
1. System operating normally and accumulator alarm lights off.	☒
2. Closed CRD-29, secured control rod drive pump, and recorded time on data sheet.	☒
3. Monitored control rod drives accumulator alarm lights for 20 minutes.	☒
a. Recorded accumulators which alarm and times on data sheet.	☒
4. Opened CRD-29 after 20 minutes.	☒
5. Restarted control rod drive system and returned to normal per System Operating Procedure 2.2.8.	☒
6. Notified Shift Supervisor test is complete.	☒

Acceptance Criteria: No accumulator alarms for 20 minutes.

Test Equipment Number: _____

[illegible]

Discrepancies:

Operator _____ / _____
Date _____

Shift Supervisor _____ / _____ Permission To Start
Date _____

Shift Supervisor _____ / _____ Test Complete And Reviewed
Date _____

Shift Supervisor _____ / _____ NCR Written If Required
Date _____

_____ Work Item(s) Initiated If Required

Reviewed By _____ / _____
Date _____