10 CFR 50.55a(a)(3)

CP&L

Carolina Power & Light Company
Robinson Nuclear Plant
3581 West Entrance Road
Hartsville SC 29550

Serial: RNP-RA/00-0184
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United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2
DOCKET NO. 50-261/LICENSE NO. DPR-23

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION: RELIEF FROM ASME BOILER AND PRESSURE VESSEL CODE, SECTION XI, REGARDING ALTERNATIVE TO FULL FLOW TESTING OF CHECK VALVES

Ladies and Gentlemen:

This letter contains responses to the NRC Request for Additional Information (RAI) regarding Carolina Power & Light (CP&L) Company's request for relief in accordance with 10 CFR 50.55a(a)(3) from the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The relief request involves qualification of an alternative to full flow testing for certain check valves and was submitted by letter dated August 4, 2000.

Attachment I contains the RAI responses in support of qualification of an alternative to full flow testing for three Safety Injection (SI) system check valves. Attachments II, III, and IV contain information only copies of procedures requested in the RAI.

If you have any questions concerning this matter, please contact Mr. H. K. Chernoff.

Sincerely,

(acting)

R. L. Warden
Manager - Regulatory Affairs

A047

ALG/alg

Attachments

I. Response to Request for Additional Information: Relief Request No. SI-VRR-4 Alternative to Full Flow Testing of Check Valves
II. Operational Surveillance Test 255, "RHR and SI System Check Valve Test (Refueling Interval)"
III. Operational Surveillance Test 161, "Accumulator Isolation and Check Valve Operability Test (Cold Shutdown)"
IV. Operational Surveillance Test 160, "Pressure Isolation Check Valve Back Leakage Test (Refueling and Cold Shutdown Interval of Greater Than 48 Hours Unless Performed in Preceding 9 Months)"

c: Mr. L. A. Reyes, NRC, Region II
Mr. R. Subbaratnam, NRC, NRR
NRC Resident Inspector, HBRSEP

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION: RELIEF REQUEST NO. SI-VRR-4
ALTERNATIVE TO FULL FLOW TESTING OF CHECK VALVES

The NRC issued a Request for Additional Information (RAI) regarding Carolina Power & Light (CP&L) Company's request for relief in accordance with 10 CFR 50.55a(a)(3) from the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components." The relief request involves qualification of an alternative to full flow testing for certain check valves. Responses to the RAI in support of qualification of an alternative to full flow testing for three Safety Injection (SI) system check valves are provided below. The alternative method involves measurement of sufficient flow to ensure full disc lift of the check valves without installing additional test equipment to measure disc impact.

NRC Question:

1. Provide a detailed description how these valves are currently tested, e.g., how frequent the reduced flow test is performed, how the test flow is measured, how many valves are subject to non-intrusive test during each test, what method of non-intrusive testing is used and why it was chosen, how many person-hours are needed to perform the non-intrusive test, and how much exposure or dose would occur from each test. A copy of the test procedure would be helpful.

Response:

The current test consists of installation of flow measurement instrumentation, installation of non-intrusive test instruments, establishing a minimum flow, stopping and starting of Residual Heat Removal (RHR) pumps, and verifying impact of the disk with non-intrusive test instrumentation. The proposed alternative would consist of installation of flow measurement instrumentation, installation of non-intrusive test instruments, and establishing a minimum flow to ensure the disk is in the full open position.

The check valves, Safety Injection (SI)-875A, SI-875B, and SI-875C, are forward flow tested at refueling intervals, partial flow tested at cold shutdown intervals, and leakage rate tested at refueling intervals. The procedures used are Operational Surveillance Test (OST)-255, "RHR and SI System Check Valve Test (Refueling Interval)"; OST-161, "Accumulator Isolation and Check Valve Operability Test (Cold Shutdown)"; and, OST-160, "Pressure Isolation Check Valve Back Leakage Test (Refueling and Cold Shutdown Interval of Greater Than 48 Hours Unless Performed in Preceding 9 Months)." Copies of the procedures are provided for information in Attachments II, III, and IV.

Flow rates measured in OST-255 are obtained by installing ultrasonic flow rate measurement devices that are manufactured by the Controlotron Corporation. An instrument is installed and calibrated on the common injection line entering the containment and another instrument is installed on SI-875C. Flow measurement through SI-875B is measured by isolating flow to the remaining valves. Flow measurement through SI-875A is measured by installing the Controlotron instrument on SI-875C and subtracting that flow from the total flow into containment, with SI-875B isolated.

Installation of these units must satisfy certain acceptance criteria in order to be considered valid. Carolina Power & Light (CP&L) Company plans to continue measurement of flow rates for these tests by Controlotron devices or by a similar method where installed instrumentation is not available. Dose estimates vary with the installation of these units, since the amount of dose accrued is dependent on the time necessary to satisfactorily complete the installation procedure. These units must be installed on large bore pipes, and because of the large pipe size, take an appreciable amount of time to align and program. It takes approximately four (4) person-hours at the valve to install each instrument under ideal conditions. The pipe with the most significant dose rate has a contact dose rate of approximately 200 to 250 mrem/hour. Granting of the relief will not affect the occupational dose associated with installation of the Controlotron instruments.

In addition to the flow rate measurements, one valve must be non-intrusively tested each outage, on a rotating basis, by means of acoustic monitoring. A qualified non-intrusive test vendor is contracted to perform this test. The non-intrusive test portion of the test is conducted during refueling cavity flood for optimum outage scheduling; however, outage critical path time may be impacted if test results are not readily interpretable. The non-intrusive test equipment employs the use of accelerometers and magnetic sensors. The impact signal provided by an accelerometer is used to satisfy the ASME B&PV Code requirements for verification of obturator movement. It takes approximately eight (8) additional person-hours to prepare, install, and remove the specialized non-intrusive test equipment. Approximately 50 mrem was expended to install and perform the test with the non-intrusive test equipment during our most recent refueling outage. This occupational dose would be averted if the relief were granted.

The length of time needed to perform the non-intrusive test varies. Safety Injection Valves (SI)-875A and SI-875C are non-isolable. Experience has shown that the non-intrusive test must be repeated several times in order to detect a satisfactory backstop impact. A non-intrusive test of SI-875C on October 2, 1996, took longer than 12 hours to complete. SI-875B is isolable, and is considered to be the easiest of the three valves to test; however, it still took approximately four hours during Refueling Outage (RO)-19 to complete, and the test required several additional pump starts in order to obtain an impact of sufficient magnitude. Typically, the non-intrusive test requires the CP&L representative and vendor to remain in the reactor coolant pump bay incurring occupational radiation dose during the test. The 50 mrem dose discussed above includes the occupational radiation dose incurred during the non-intrusive test.

The most suitable tests for confirming full disk lift are either acoustic measurement or radiography. Radiography would involve the use of a large radioactive source and would require that the pump bay be evacuated while the target is being exposed. During refueling outages, evacuation of this area is not desired since it may adversely impact the outage length. It would take approximately 30 minutes at the prescribed flow rate in order to obtain the picture, and then another 90 minutes to process and read the results. The refueling outage schedule for RO-20 indicates that during the period that the cavity fill is taking place, testing of the Reactor Coolant Pump (RCP) sprinkler system and preparations for replacement of the RCP seals are concurrent with testing of SI-875C. The use of radiography is generally being discouraged in favor of other acceptable non-intrusive tests due to the need for concurrent activities in short outage schedules and the potential for impact on outage schedules when evacuating personnel from affected areas.

Acoustic testing does not require the use of a radiological source; therefore, the negative effects related to the temporary evacuation of personnel and subsequent loss of man-hours would not be incurred. In addition, acoustical results can be read immediately, and may also be capable of providing additional information related to the condition of the valve (disc instability and flutter, hinge pin wear).

NRC Question:

2. Provide details of the methodology used to determine the flow rate for the proposed reduced flow test, by calculation, and previous test results that are indicative that the valve discs are impacting the backstop.

Response:

A minimum flow rate of 3000 gpm was chosen based on limitations in plant design, and the large margin that is afforded by this minimum value over that value calculated to be necessary to achieve a full disc lift (approximately 1700 gpm). The flow rate measurements are obtained by the installation of portable ultrasonic flow measurement devices, and the non-intrusive test is accomplished through the use of acoustics provided by accelerometers temporarily mounted to the valve body. A qualified vendor conducts the non-intrusive test, while the installation of ultrasonic flow measurement devices is accomplished by CP&L in accordance with approved procedures.

The acceptable minimum fluid velocity through the check valves at their inlet was determined by calculation of the flow coefficient multiplied by the square root of the specific volume of the fluid. The flow coefficient provided by the valve manufacturer was 75 $ft^{-1/2}$/sec.

V_{min} = Flow Coefficient • $(v)^{1/2}$ ft/sec

Specific volume (v) = .016204 $ft^3/°F$ at 120°F
Flow coefficient = 75 $ft^{-1/2}$/sec.

The temperature value of 120°F was chosen as an upper bound for accumulator operating temperature.

Therefore:

V_{min} = 9.5 ft/sec.

To convert fluid velocity (V_{min}) to flow rate (Q_{min}):

$Q = V_{min} \bullet A$

where:
A = area of the valve inlet ID, 8.5 inches = $\pi (d)^2 / 4$ = 0.394 ft^2
Q_{min} = 9.5 ft./sec • 0.394 ft^2 = 3.743 ft^3/sec.
Q_{min} = 3.743 ft^3/sec • 7.48 gal./ft^3 • 60 seconds/minute = 1680 gpm

The minimum flow chosen to assure full disk lift is 3000 gpm. Four flow tests and non-intrusive tests conducted since 1995 have successfully demonstrated disk impact.

NRC Question:

3. The licensee states that increase radiation exposure is currently incurred in order to perform the flow test because test equipment must be installed to measure the flow rate. Explain the difference in terms of flow measurements and equipment used between the current test and proposed alterative test, and why increased exposure is currently incurred.

Response:

In the proposed alternative test, the flow measurement verification using portable Controlotron instruments will be continued. If the proposed alternative is approved, the additional dose associated with the non-intrusive test incurred during insulation removal, installation and set-up of the specialized test equipment, data interpretation during the test, removal of equipment, and re-installation of the insulation would be averted. Approximately 50 mrem was expended to accomplish this additional activity during our most recent refueling outage.

NRC Question:

4. The licensee states that to perform the test to verify obturator position, additional operation of safety-related pumps is required. Explain why additional pumps are required for current tests but not for the proposed alternative tests.

Response:

The test is conducted in accordance with OST-255. The RHR pumps are the pumps used to accomplish the non-intrusive test. In order to improve the ability to detect backstop impingement, the pumps are started, and the system is throttled to achieve a target flow rate. Once the flow rate is achieved, the RHR pumps are shutdown. The RHR pumps are then re-started to the pre-set amount of flow in order to swing the obturator through the full range of motion necessary, thereby providing a distinct backstop impact of sufficient magnitude and quality. If the impact signal is determined to be insufficient by the technician, then additional RHR pump starts are required. The proposed alternative method would eliminate the need to shutdown and re-start the RHR pumps to support the non-intrusive test.

United States Nuclear Regulatory Commission
Attachment II to Serial: RNP-RA/00-0184
22 Pages

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

OPERATIONAL SURVEILLANCE TEST 255,
"RHR AND SI SYSTEM CHECK VALVE TEST (REFUELING INTERVAL)"

CP&L

C
Continuous
Use

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3
PART 9

OPERATIONS SURVEILLANCE TEST

OST-255

RHR AND SI SYSTEM CHECK VALVE TEST (REFUELING INTERVAL)

REVISION 16

SUMMARY OF CHANGES
DCF 2000P1375

STEP / SECTION	REVISION COMMENTS
2.13	Added reference to NCR 12629, OST-255 Test Difficulties.
4.5	Added note to identify that this test should be performed at the initial stages of cavity flooding to assure an adequate sound signature for the check valve being tested. Failure to do so could result in having to drain the cavity adding critical path time to the outage. NCR 12629 .
5.4	Corrected attachment reference.
6.2	Deleted one of the Controlotron Flow Measuring Devices from the equipment. An RHR combined discharge line site will be used versus the RCS to Loops "A" & "B" sites.
NOTE prior to 8.1.1	Added note to inform the operator setting up the Controlotron Flow equipment of the importance of insuring the pipe is full of water. OPCF comment.
8.1.1	Deleted Controlotron locations at lines 8-SI-2501R-37 and 8-SI-2501R-38. Added Controlotron location at line 12-AC-601R-8. Reducing the number of locations will save dose during setup of the instruments. All the different individual loop flows can be obtained based on these two locations.
8.2.1.8	Added step to close RHR-743 when performing Diagnostic testing to increase the immediate flow available to the check valves thereby improving the acoustic signal. OPCF comment.
OLD 8.2.12 and 8.2.13	Deleted OLD steps and replaced with new steps 8.2.12, 8.2.13, 8.2.14, & 8.2.15 to record flow rates from the Controlotrons at line locations 12-AC-601R-8 and 10-SI-2501R-54, calculate and record the flow through check valves SI-875A and SI-876A by subtracting the RHR to RCS Loop 3 flow from the RHR combined discharge header flow, and to record the flow rate for check valves SI-875C and SI-876C.
8.2.22	Added step to open RHR-743 if non-intrusive diagnostic testing will not be performed on check valves SI-875B and SI-876B.
8.3.1.8	Added step to verify close RHR-743 when performing Diagnostic testing to increase the immediate flow available to the check valves thereby improving the acoustic signal. OPCF comment.
8.3.9	Added step to record flow rate from Controlotron located on line 12-AC-601R-8.
8.3.10 (OLD 8.3.9)	Revised step to record flow obtained from the Controlotron as the flow rate through check valves SI-875B and SI-876B on Attachment 10.1.
8.3.15	Added step to verify open RHR-743.
Attachment 10.2	Reworded statement for identifying applicable components if this test was performed to satisfy PMT to agree with NGGC-0104 terminology.

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1.0 PURPOSE

1.1 To verify mechanical performance and assess operational readiness of components to fulfill their required safeguard functions.

1.2 To test Check Valves SI-875A, SI-875B, SI-875C, SI-876A, SI-876B, and SI-876C in accordance with ASME Section XI and Relief Requests SI-VRR-4 to satisfy Improved Technical Specifications 5.5.8.

2.0 REFERENCES

2.1 Improved Technical Specifications 5.5.8

2.2 ASME Code, Section XI, 1986 Edition

2.3 NRC Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs

2.4 5379-1082, Safety Injection System Flow Diagrams

2.5 5379-1484, Residual Heat Removal Flow Diagrams

2.6 TMM-004, In-Service Inspection Testing

2.7 Relief Request SI-VRR-4

2.8 OMM-015, Operations Surveillance Testing

2.9 OP-201, Residual Heat Removal System

2.10 PLP-037, Conduct of Infrequently Performed Tests and Evolutions

2.11 ACR 92-325, Starting Duty of Major Plant Motors

2.12 CR 95-01023, As Left Position of Equipment

2.13 NCR 12629, OST-255 Test Difficulties

2.14 Technical Requirements Manual 5.5.8

2.15 ESR 99-00082, Starting RHR Pump at 4200 gpm for OST

2.16 IST Evaluation 99-18, Response to NAS Assessment R-ES-99-01

3.0 RESPONSIBILITIES

N/A

4.0 PREREQUISITES

INIT

4.1 This revision has been verified to be the latest revision available.

Name (Print)	Initial	Signature	Date

4.2 The Superintendent Shift Operations has given his permission to conduct this test.

SSO	Date

4.3 RHR System is aligned for core cooling IAW OP-201. ____

4.4 The Reactor Core has been off loaded to the Spent Fuel Pit. ____

NOTE: To obtain adequate sound signatures for check valve diagnostic testing, this test should be performed at the initial stages of cavity flooding to minimize the back pressure on the check valves. Failure to do this may result in an inadequate sound signature on the check valve(s) being tested, requiring the cavity to be drained and the test re-performed adding critical path time to the outage. NCR 12629

4.5 Reactor Coolant System level is greater than -10 inches. ____

4.6 Personnel are available for installation **AND** operation of flow rate measuring equipment. ____

4.7 Check Valve Diagnostic Test personnel are available for obtaining non-intrusive test measurements. ____

5.0 PRECAUTIONS AND LIMITATIONS

5.1 The performance of this OST shall be coordinated with other plant evolutions such that the minimum equipment operability requirements of the Technical Specifications are met.

5.2 With no flow in the RHR system, an RHR Pump should not be started with FCV-605 in automatic. This could allow runout of the pump before FCV-605 could respond to control flow. However, starting an RHR Pump with the flow control valves set such that flow is limited to 4200 gpm is acceptable to obtain an adequate sound signature for Diagnostic Testing. (ESR 99-00082)

5.3 If the starting limitations stated in the Precautions and Limitations Section of OP-201 are exceeded, motor damage can occur due to motor overheating. (ACR 92-325)

5.4 Any steps not applicable shall be marked N/A and the reason documented in the Comments Section of Attachment 10.2.

5.5 The principles of **ALARA** shall be used when planning and performing work and operations in the Radiation Control Area.

5.6 This procedure has been screened IAW PLP-037 criteria and determined to be a Case Three activity. No additional management involvement is required beyond that routinely provided by first line supervision.

6.0 SPECIAL TOOLS AND EQUIPMENT

6.1 Check Valve Diagnostic Equipment

6.2 Verify the following test equipment calibrations are current **AND** record the test equipment identification: (N/A equipment not needed)

	Equipment	ID Number	INIT
-	Controlotron Flow Measuring Device	No. _____	____
-	Controlotron Flow Measuring Device	No. _____	____
-	Diagnostic Test Equipment	No. _____	____

7.0 ACCEPTANCE CRITERIA

7.1 General

7.1.1 The reviewing and approving authorities may accept this test in accordance with provisions set forth in OMM-015.

7.2 Check Valves

7.2.1 Valve disc movement is the acceptance criteria for the check valve portion of this test and will be verified by:

1. Check valves which DO NOT require Non-Intrusive Diagnostic Testing, a flow of greater than or equal to 3000 gpm verifies the full forward flow requirements of the following valves:

   - SI-875A – SI-876A
   - SI-875B – SI-876B
   - SI-875C – SI-876C

2. Check valve(s) which require Non-Intrusive Diagnostic Testing, SI-875A, SI-875B, **OR** SI-875C as determined by Engineering, a flow of greater than or equal to 3000 gpm in conjunction with satisfactory diagnostic test data for the check valve being tested verifies the full forward flow requirements.

7.2.2 The valve shall be declared inoperable if the acceptance criteria as delineated in 7.2.1.1, 7.2.1.2, and in Attachment 10.1 is not met. Prior to the valve being declared operable again, one of the following items shall be completed:

1. A retest showing acceptable operation shall be run following any required corrective action,

   OR

2. An analysis is performed that demonstrates that the valve will still fulfill its safety function.

7.2.3 **IF** the sample valve tested via non-intrusive diagnostic testing fails, **THEN** ALL valves (SI-875A, B, & C) must be tested using non-intrusive techniques during the same outage. Disassembly and inspection may be substituted in lieu of non-intrusive testing. (IST Evaluation 99-18)

INIT

8.0 INSTRUCTIONS

8.1 Initial Conditions

NOTE: Failure to insure the pipe is full of water during Controlotron setup may invalidate the V_s adjustment resulting in an alarm code "E", or provide erroneous data results.

8.1.1 Verify Controlotron Flow Equipment INSTALLED in accordance with EST-099 at the following locations (IST Evaluation 99-18):

- Line 12-AC-601R-8 (Combined RHR Discharge Header)

  ID No. _____ ____

- Line 10-SI-250R-54 (RHR to RCS Loop 3)

  ID No. _____ ____

8.2 Test of Check Valves SI-875A, SI-876A, SI-875C, and SI-876C INIT

NOTE: Normally, Non-Intrusive Diagnostic Testing will only be performed on one check valve, SI-875A, SI-875B, or SI-875C, each outage.

8.2.1 **IF** Non-Intrusive Diagnostic testing will be performed on SI-875A **OR** SI-875C, **THEN** perform the following:

1. Verify RHR PUMP "A" RUNNING. ____
2. Verify RHR PUMP "B" RUNNING. ____
3. Adjust FC-605, RHR HX BYPASS FLOW, to achieve a flow rate of 4000 to 4200 gpm as indicated on FI-605. ____
4. Adjust HIC-758, RHR HX DISCH FLOW, as necessary to control RCS temperature. ____
5. Verify controller FC-605 in manual. ____
6. STOP RHR PUMP "A". ____
7. STOP RHR PUMP "B". ____
8. Close RHR-743, RHR SYSTEM HEATUP LINE ISOLATION. ____

8.2.2 Unlock **AND** close SI-885, RHR PUMPS "A" & "B" TO LOOPS CROSS-CONNECT. ____

8.2.3 Verify OPEN RHR-744A, RHR COLD LEG INJ. ____

8.2.4 Close RHR-744B, RHR COLD LEG INJ. ____

8.2.5 **IF** Non-Intrusive Diagnostic testing will be performed on SI-875A **OR** SI-875C, **THEN** verify Check Valve Diagnostic personnel have zero shifted test equipment and are ready to obtain test data. ____

8.2.6 Verify personnel are ready to take flow measurements for check valves. ____

INIT

CAUTION

With no flow in the RHR system, an RHR Pump should not be started with FCV-605 in automatic. This could allow runout of the pump before FCV-605 could respond to control flow.

8.2.7 **IF** Non-Intrusive Diagnostic testing will be performed on SI-875A **OR** SI-875C, **THEN** simultaneously START BOTH RHR Pumps.

RHR PUMP "A" ____

RHR PUMP "B" ____

8.2.8 **IF** Non-Intrusive Diagnostic testing will **NOT** be performed **AND** BOTH RHR Pumps are stopped, **THEN** perform the following:

1. Verify CLOSED FC-605, RHR HX BYPASS FLOW. ____
2. Verify CLOSED HIC-758, RHR HX DISCH FLOW. ____
3. Start RHR PUMP "A". ____
4. Verify FC-605, RHR HX BYPASS FLOW, adjusted to achieve a flow rate of 3500 to 3700 gpm as indicated on FI-605. ____
5. Adjust HIC-758, RHR HX DISCH FLOW, as necessary to control RCS temperature. ____
6. Start a second RHR Pump **AND** record which pump was started.

RHR Pump _____ Operating ____
("A" **OR** "B")

INIT

8.2.9 Adjust FC-605, RHR HX BYPASS FLOW, to achieve a flow rate of 7000 to 7500 gpm as indicated on FI-605. ____

8.2.10 Adjust HIC-758, RHR HX DISCH FLOW, as necessary to control RCS temperature. ____

8.2.11 Allow flow rate and pumps to stabilize for at least 5 minutes. ____

8.2.12 Record flow rate from Controlotron located at line 12-AC-601R-8 (RHR common discharge header).

12-AC-601R-8 _____ gpm ____

8.2.13 Record flow rate from Controlotron located at line 10-SI-2501R-54 (RHR to RCS Loop 3).

10-SI-2501R-54 _____ gpm ____

NOTE: A flow rate of 3000 gpm or greater will satisfy the full flow exercise requirements for check valve SI-876A.

A flow rate of 3000 gpm or greater will satisfy the full flow exercise requirements for check valve SI-875A when Diagnostic Testing is **NOT** required on SI-875A.

8.2.14 Perform the following to determine flow rate through check valves SI-875A and SI-876A:

1. Subtract RHR to RCS Loop 3 flow rate from the RHR common discharge header flow rate to determine flow rate through check valves SI-875A and SI-876A.

_____ gpm – _____ gpm = _____ gpm ____
12-AC-601R-8 10-SI-2501R-54

2. Record calculated flow rate through check valves SI-875A and SI-876A on Attachment 10.1. ____

INIT VERI

NOTE: A flow rate of 3000 gpm or greater will satisfy the full flow exercise requirements for check valve SI-876C.

A flow rate of 3000 gpm or greater will satisfy the full flow exercise requirements for check valve SI-875C when Diagnostic Testing is **NOT** required on SI-875C.

8.2.15 Record flow rate obtained from Controlotron located at line 10-SI-2501R-54 (RHR to RCS Loop 3) as the flow rate through check valves SI-875C and SI-876C on Attachment 10.1. ____

8.2.16 **IF** Non-Intrusive Diagnostic Testing was performed on SI-875A **OR** SI-875C, **THEN** verify Check Valve Diagnostic Test personnel have completed data collection. ____

8.2.17 Adjust FC-605, RHR HX BYPASS FLOW, to achieve a flow rate of 3500 to 3700 gpm as indicated on FI-605. ____

8.2.18 Stop one RHR Pump **AND** record which one was stopped.

RHR Pump _____ Stopped ____
("A" **OR** "B")

8.2.19 Open RHR-744B, RHR COLD LEG INJ. ____ ____

8.2.20 Re-adjust FC-605, RHR HX BYPASS FLOW, to achieve a flow rate of 3500 to 3700 gpm as indicated on FI-605. ____

8.2.21 Adjust HIC-758, RHR HX DISCH FLOW, as necessary to control RCS temperature. (CR 95-01023) ____

8.2.22 **IF** Non-Intrusive Diagnostic Testing will **NOT** be performed on check valves SI-875B and SI-876B, **THEN** open RHR-743, RHR SYSTEM HEATUP LINE ISOLATION. ____ ____

		INIT	VERI
8.2.23	**IF** check valves SI-875B and SI-876B are not to be tested at this time, **THEN** Lock open SI-885, RHR PUMPS "A" & "B" TO LOOPS CROSS-CONNECT.	____	____
8.2.24	**IF** check valves SI-875B and SI-876B are not to be tested at this time **AND** it is desired to stop the running RHR Pump, **THEN** perform the following:		
	1. Stop the running RHR Pump **AND** record which pump was stopped. RHR Pump _____ ("A" **OR** "B") Stopped ____		
	2. Close FCV-605, RHR HX BYPASS FLOW	____	
	3. Verify CLOSED HIC-758, RHR HX DISCH FLOW	____	
8.2.25	Notify personnel monitoring the flow equipment of completion of this portion of the test.	____	
8.2.26	**IF** Non-Intrusive Diagnostic Testing was performed on check valve SI-875A **OR** SI-875C, **THEN** attach the data to this test.	____	

INIT

8.3 Test of Check Valves SI-875B and SI-876B

NOTE: Normally, Non-Intrusive Diagnostic Testing will only be performed on one check valve, SI-875A, SI-875B, or SI-875C, each outage.

8.3.1 **IF** Non-Intrusive Diagnostic testing will be performed on SI-875B, **THEN** perform the following:

1. Verify RHR PUMP "A" RUNNING. ____
2. Verify RHR PUMP "B" RUNNING. ____
3. Adjust FC-605, RHR HX BYPASS FLOW, to achieve a flow rate of 4000 to 4200 gpm as indicated on FI-605. ____
4. Adjust HIC-758, RHR HX DISCH FLOW, as necessary to control RCS temperature. ____
5. Verify controller FC-605 in manual. ____
6. STOP RHR PUMP "A". ____
7. STOP RHR PUMP "B". ____
8. Verify closed RHR-743, RHR SYSTEM HEATUP LINE ISOLATION. ____

8.3.2 Verify UNLOCK **AND** CLOSED SI-885, RHR PUMPS "A" & "B" TO LOOPS CROSS-CONNECT. ____

8.3.3 Verify OPEN RHR-744B, RHR COLD LEG INJ. ____

8.3.4 Close RHR-744A, RHR COLD LEG INJ. ____

8.3.5 **IF** Non-Intrusive Diagnostic testing will be performed on SI-875B, **THEN** verify Check Valve Diagnostic personnel have zero shifted test equipment and are ready to obtain test data. ____

INIT

8.3.6 Verify personnel are ready to take flow measurements for check valves. ____

CAUTION

With no flow in the RHR system, an RHR Pump should not be started with FCV-605 in automatic. This could allow runout of the pump before FCV-605 could respond to control flow.

8.3.7 **IF** Non-Intrusive Diagnostic testing will be performed on SI-875B, **THEN** perform the following:

1. Simultaneously START BOTH RHR Pumps.

RHR PUMP "A" ____

RHR PUMP "B" ____

2. Adjust FC-605, RHR HX BYPASS FLOW, to achieve a flow rate of 7000 to 7500 gpm as indicated on FI-605. ____

3. Adjust HIC-758, RHR HX DISCH FLOW, as necessary to control RCS temperature. ____

8.3.8 Allow flow rate and pumps to stabilize for at least 5 minutes. ____

INIT

8.3.9 Record flow rate from Controlotron located at line 12-AC-601R-8 (RHR common discharge header).

12-AC-601R-8 _____ gpm ____

NOTE: A flow rate of 3000 gpm or greater will satisfy the full flow exercise requirements for check valve SI-876B. A flow rate of 3000 gpm or greater will satisfy the full flow exercise requirements for check valve SI-875B when Diagnostic Testing is **NOT** required on SI-875B.

8.3.10 Record flow rate obtained from Controlotron located at line 12-AC-601R-8 (RHR common discharge header) as the flow rate through check valves SI-875B and SI-876B on Attachment 10.1. ____

8.3.11 **IF** Non-Intrusive Diagnostic Testing was performed on SI-875B, **THEN** perform the following:

1. Verify Check Valve Diagnostic Test personnel have completed data collection. ____

2. Adjust FC-605, RHR HX BYPASS FLOW, to achieve a flow rate of 3500 to 3700 gpm as indicated on FI-605. ____

3. Stop one RHR Pump **AND** record which one was stopped.

   RHR Pump _____ Stopped ____
   ("A" **OR** "B")

4. Re-adjust FC-605, RHR HX BYPASS FLOW, to achieve a flow rate of 3500 to 3700 gpm as indicated on FI-605. ____

5. Adjust HIC-758, RHR HX DISCH FLOW, as necessary to control RCS temperature. (CR 95-01023) ____

		INIT	VERI
8.3.12	Open RHR-744A, RHR COLD LEG INJ.	____	____
8.3.13	Verify FC-605, RHR HX BYPASS FLOW, ADJUSTED to achieve a flow rate of 3500 to 3700 gpm as indicated on FI-605.	____	
8.3.14	Adjust HIC-758, RHR HX DISCH FLOW, as necessary to control RCS temperature.	____	
8.3.15	Verify open RHR-743, RHR SYSTEM HEATUP LINE ISOLATION.	____	____
8.3.16	Lock open SI-885, RHR PUMPS "A" & "B" TO LOOPS CROSS-CONNECT.	____	____
8.3.17	**IF** it is desired to stop the running RHR Pump, **THEN** perform the following:		
	1. Stop the running RHR Pump **AND** record which pump was stopped. RHR Pump _____ ("A" **OR** "B") Stopped ____		
	2. Close FCV-605, RHR HX BYPASS FLOW	____	
	3. Verify CLOSED HIC-758, RHR HX DISCH FLOW	____	
8.3.18	Notify personnel monitoring the flow equipment of completion of this portion of the test.	____	
8.3.19	**IF** Non-Intrusive Diagnostic Testing was performed on check valve SI-875B, **THEN** attach the data to this test.	____	

9.0 RECORDS

N/A

10.0 ATTACHMENTS

10.1 Valve Data Sheet

10.2 Surveillance Test Procedure Certification and Review Form

VALVE DATA SHEET

VALVE NUMBER	REFERENCE STEP NUMBER	TEST DESCRIPTION	TEST DATA	ACCEPTANCE CRITERIA (1)	TEST RESULTS (2)	
					CIRCLE ONE	INIT/DATE/TIME
SI-875A and SI-876A	8.2.14.2	FULL STROKE FORWARD FLOW		≥ 3000 gpm	SAT/UNSAT	
SI-875C and SI-876C	8.2.15	FULL STROKE FORWARD FLOW		≥ 3000 gpm	SAT/UNSAT	
SI-875B and SI-876B	8.3.10	FULL STROKE FORWARD FLOW		≥ 3000 gpm	SAT/UNSAT	

(1) Check valve(s) which require Diagnostic Testing, SI-875A, SI-875B, OR SI-875C as determined by Engineering, require a flow of greater than or equal to 3000 gpm in conjunction with satisfactory diagnostic test data for the check valve(s) being tested.

(2) Evaluate test results, circle SAT or UNSAT (as applicable) and enter initials, date and time in the Test Results block for each valve.

COMMENTS:_____

ATTACHMENT 10.2
Page 1 of 1

SURVEILLANCE TEST PROCEDURE
CERTIFICATION AND REVIEW FORM

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

_____
_____
_____

IF this test was performed to satisfy PMT, **THEN** list applicable components and W/O Tasks. _____
_____
_____

	Initials	Name (Print)	Date
Test Performed by	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Test Complete: Date_____ Time_____

Test Satisfactory: Yes / No (Circle one)

Reviewed by: _____ _____
Shift Technical Advisor Date

Comments: (Required if results were unsatisfactory)_____
_____
_____
_____

Approved by: _____ _____
Superintendent Shift Operations Date

Reviewed by: _____ _____
IST Date

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

OPERATIONAL SURVEILLANCE TEST 161, "ACCUMULATOR ISOLATION AND CHECK VALVE OPERABILITY TEST (COLD SHUTDOWN)"

AUTHORIZED COPY

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Continuous
Use

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3
PART 9

OPERATIONS SURVEILLANCE TEST

OST-161

ACCUMULATOR ISOLATION AND CHECK VALVE OPERABILITY TEST (COLD SHUTDOWN)

REVISION 16

SUMMARY OF CHANGES

DATE	REVISION #	REVISION COMMENTS
12/02/97	16	Change Purpose 1.1 reference to Improved Technical Specifications 5.5.8
12/02/97	16	Change References 2.1 to Improved Technical Specifications 5.5.8
12/02/97	16	Change References 2.6 to PLP-102, Operability Determination
12/02/97	16	Change Special Tools and Equipment 5.1 to Verify the following test equipment calibrations are current AND record test equipment identification below:
12/02/97	16	Deleted Special Tools and Equipment 5.1.1 Calibration Date
12/02/97	16	Change Acceptance Criteria 6.2.4.2.b reference to PLP-102
12/02/97	16	Change Procedure 7.1 NOTE from 665 psig to 660 psig
12/02/97	16	Change Procedure 7.2 NOTE from 665 psig to 660 psig
12/02/97	16	Change Procedure 7.3 NOTE from 665 psig to 660 psig
12/02/97	16	Change Procedure 7.4 NOTE from 665 psig to 660 psig

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1.0 PURPOSE

1.1 To verify the operability of the SI Accumulator check valves IAW the requirements of Improved Technical Specifications 5.5.8.

1.2 To test the SI Accumulator isolation valves and check valves IAW ASME Code Section XI, Rules for Inservice Inspection of Nuclear Plant Components.

1.3 To verify ERFIS position indication accurately reflects actual component condition. (CR 95-01621)

1.4 This test can be used as a Post Maintenance Test.

2.0 REFERENCES

2.1 Improved Technical Specifications 5.5.8.

2.2 NRC GL 89-04, Guidance on Developing Acceptable Inservice Testing Programs.

2.3 ASME Code Section XI, 1986 Edition

2.4 GP-007, Plant Cooldown From Hot Shutdown to Cold Shutdown

2.5 OMM-015, Operations Surveillance Testing

2.6 PLP-102, Operability Determination

2.7 PLP-037, Conduct of Infrequently Performed Tests or Evolutions

2.8 TMM-004, Inservice Inspection Testing

2.9 Flow diagram 5379-1082, Safety Injection System

2.10 NRC-IN-89-67, Loss of RHR Caused by Accumulator Nitrogen Injection

2.11 CR 95-01621, OST-934 and OST-935 not Completed

INIT

3.0 PREREQUISITES

3.1 This revision has been verified to be the latest revision available.

Name (Print)	Initial	Signature	Date

3.2 The Superintendent Shift Operations has given permission to conduct this test.

SSO	Date

3.3 Plant cooldown or heat-up in progress. ____

3.4 The RCS pressure is greater than highest SI Accumulator pressure. ____

3.5 The SI Accumulator isolation valves have not been closed at 1000 psig AND are open if performed during cooldown as directed by GP-007 OR are closed if performed during heat-up. ____

3.6 Boron concentration in the SI Accumulators has been sampled AND verified to be greater than 1950 ppm. ____

3.7 Operations personnel are available to locally observe stem movement while valves are being stroked and to observe breaker status lights. ____

3.8 An ERFIS Terminal is available to check ERFIS Points. ____

4.0 PRECAUTIONS AND LIMITATIONS

4.1 Subsections of this procedure may be performed in any sequence as long as the steps within each subsection are performed sequentially.

4.2 If the SI Accumulators are to be tested individually during cooldown (Sections 7.2, 7.3 and 7.4), this procedure should be performed starting with the accumulator having the highest indicated pressure and ending with the one having the lowest.

4.3 Any isolation valve or check valve that fails to meet the acceptance criteria shall be reported to the Superintendent Shift Operations and corrective action started as soon as practical.

4.4 The principles of ALARA shall be used in planning and performing work and operations in the Radiation Control Area.

4.5 Any steps not applicable shall be marked N/A and the reason documented in the Comments Section of Attachment 8.4.

4.6 This procedure has been screened IAW PLP-037 criteria and determined to be a Case Three activity. No additional management involvement is required beyond that routinely provided by first line supervision.

4.7 Nitrogen gas could be injected into the RCS during the performance of this test.

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 Verify the following test equipment calibrations are current AND record test equipment identification below:

	Equipment	Identification	INIT
5.1.1	Calibrated Stopwatch	_____	____

6.0 ACCEPTANCE CRITERIA

6.1 General

6.1.1 The reviewing and approving authorities may accept this test in accordance with provisions set forth in OMM-015.

6.1.2 ERFIS indication change corresponding to the associated equipment change satisfies ERFIS point testing. If ERFIS indication fails to exhibit proper equipment position, a Work Request for the Computer Group to check or recalibrate the ERFIS indication shall be written. A retest showing acceptable ERFIS indication shall be performed at the completion of the Work Request. System Components shall not be declared inoperable if ERFIS indication fails to exhibit proper equipment position. (CR 95-01621)

6.2 Valves

6.2.1 Stroke Time

1. For valves required to be stroke timed, the valve shall stroke within the time indicated on the Valve Data Sheet. Valves failing to meet the indicated stroke time shall be declared inoperable. Prior to the valve being declared operable again, one of the following items shall be completed:

   a. A retest showing acceptable operation shall be run following any required corrective action,

   <u>OR</u>

   b. An analysis is performed that demonstrates that the valve will still fulfill its safety function.

2. Stroke time is normally measured from the time the control switch is repositioned to the time the valve is fully stroked by light indication. Any deviations in the timing method shall be specified in the procedure.

6.2.2 Full Stroke Exercise

1. The full stroke exercise requirements are satisfied by the complete cycling of a valve, from closed to open and back to closed OR open to closed and back to open.

2. If a valve fails to exhibit the required change of position, the valve shall be declared inoperable. Prior to the valve being declared operable again, one of the following items shall be completed:

   a. A retest showing acceptable operation shall be run following any required corrective action,

      OR

   b. An analysis is performed that demonstrates that the valve will still fulfill its safety function.

6.2.3 Check Valves

1. Valve disc movement is the acceptance criteria for the check valve portion of this test and will be verified by:

   a. A 5% reduction in accumulator level OR a 10 psig reduction in accumulator pressure verifies the partial flow requirements of the following check valves:

      - SI-875A - SI-875B - SI-875C
      - SI-875D - SI-875E - SI-875F

2. The valve shall be declared inoperable if the acceptance criteria as delineated in 6.2.3.1 and in Attachment 8.1 is not met. Prior to the valve being declared operable again, one of the following items shall be completed:

   a. A retest showing acceptable operation shall be run following any required corrective action,

      OR

   b. An analysis is performed that demonstrates that the valve will still fulfill its safety function.

6.2.4 Position Indication Test (PIT)

1. Each remote indication noted on Attachment 8.3 shall be observed to verify that valve operation is accurately indicated. Valve indication shall be considered accurately indicated when:

   a. The valve indicating lights show mid position while the valve stem or the mechanical position indicator is moving toward the selected position.

   AND

   b. The valve indicating lights show full open or full closed, as appropriate, when the valve stem or the mechanical position indicator has stopped moving.

2. If valve operation is not accurately indicated, the failed portion of the Position Indication System shall be considered inoperable and the following items shall be completed.

   a. A work request (WR) shall be initiated to repair the Position Indicating System. The WR number and a brief description of the malfunction/failure shall be documented in the Comments section of Attachment 8.3.

   b. IF valve operability is in question, THEN initiate a 72 hour operability determination IAW PLP-102 for the failed portion to determine the effect on valve operability and/or the effect on any actuating signal from the Position Indication System.

INIT

7.0 PROCEDURE

NOTE: If the pressures of all three SI Accumulators are within the normal range of 600 to 660 psig AND plant cooldown is in progress IAW GP-007, the check valves may be tested at the same time IAW this section. Sections 7.2 through 7.5 should be marked N/A.

7.1 Simultaneous Test of Accumulator Isolation and Check Valves During Cooldown

7.1.1 Record the initial level and pressure of all three SI Accumulators on Attachment 8.1. ____

7.1.2 Decrease the RCS pressure until all SI Accumulator levels decrease by 5% OR pressures decrease by 10 psig. ____

7.1.3 Increase the RCS pressure to greater than the highest indicated SI Accumulator pressure. ____

7.1.4 Record the final level and pressure of all three SI Accumulators on Attachment 8.1. ____

7.1.5 Complete the Test Results documentation for the SI Accumulator check valves SI-875A, SI-875B, SI-875C, SI-875D, SI-875E, and SI-875F on Attachment 8.1. ____

INIT

NOTE: Stroke time is measured from the time the control switch is repositioned to the time the valve has fully stroked by light indication.

Remote indicating lights accurately reflecting valve stem position changes satisfy the PIT acceptance criteria.

Complete cycling of a valve, from closed to open and back to closed OR from open to closed and back to open, satisfies the full stroke portion of Attachment 8.2.

ERFIS indication change corresponding to the associated equipment change satisfies ERFIS point testing. (CR 95-01621)

7.1.6 Station an Operator to observe the stem of SI-865A, ACCUMULATOR "A" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

7.1.7 Perform the following: (CR 95-01621)

1. Display ERFIS Point SIV8651B on the ERFIS Terminal using the VAL function of ERFIS. ____

2. Check SIV8651B indicates OPEN ____

3. Close SI-865A, DISCH. ____

4. Check ERFIS Point SIV8651B indicates CLOSED. ____

7.1.8 Time the stroking of SI-865A from the CLOSED position to the OPEN position AND record the time in Attachment 8.2. ____

INIT

7.1.9 Close SI-865A AND record the test results in Attachment 8.2. ____

7.1.10 Record PIT results in Attachment 8.3. ____

7.1.11 Station an Operator to observe the stem of SI-865B, ACCUMULATOR "B" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

7.1.12 Perform the following: (CR 94-01621)

1. Display ERFIS Point SIV8652B on the ERFIS Terminal using the VAL function of ERFIS. ____

2. Check SIV8652B indicates OPEN ____

3. Close SI-865B, DISCH. ____

4. Check ERFIS Point SIV8652B indicates CLOSED. ____

7.1.13 Time the stroking of SI-865B from the CLOSED position to the OPEN position AND record the time in Attachment 8.2. ____

7.1.14 Close SI-865B AND record the test results in Attachment 8.2. ____

7.1.15 Record PIT results in Attachment 8.3. ____

INIT

7.1.16 Station an Operator to observe the stem of SI-865C, ACCUMULATOR "C" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

7.1.17 Perform the following: (CR 95-01621)

1. Display ERFIS Point SIV8653B on the ERFIS Terminal using the VAL function of ERFIS. ____

2. Check SIV8653B indicates OPEN ____

3. Close SI-865C, DISCH. ____

4. Check ERFIS Point SIV8653B indicates CLOSED. ____

7.1.18 Time the stroking of SI-865C from the CLOSED position to the OPEN position AND record the time in Attachment 8.2. ____

7.1.19 Close SI-865C AND record the test results in Attachment 8.2. ____

7.1.20 Record PIT results in Attachment 8.3. ____

INIT

NOTE: If the pressures of all three SI Accumulators are NOT within the normal range of 600 to 660 psig OR if all are NOT to be tested at this time AND plant cooldown is in progress IAW GP-007, individual accumulator check valves should be tested separately IAW Sections 7.2, 7.3 and 7.4. Sections 7.1 and 7.5 should be marked N/A.

7.2 Accumulator "A" Check Valve and Isolation Valve Operability Test During Cooldown

7.2.1 Record SI Accumulator "A" initial level and pressure on Attachment 8.1. ____

7.2.2 Decrease the RCS pressure until SI Accumulator "A" level decreases by 5% OR pressure decreases by 10 psig. ____

7.2.3 Increase the RCS pressure to stop SI Accumulator "A" level/pressure decrease. ____

7.2.4 Record SI Accumulator "A" final level and pressure on Attachment 8.1. ____

7.2.5 Complete the Test Results documentation on Attachment 8.1 for SI Accumulator "A" check valves SI-875A and SI-875D. ____

7.2.6 Close SI-865A, DISCH. ____

INIT

7.2.7 Station an Operator to observe the stem of SI-865A, ACCUMULATOR "A" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

7.2.8 Time the stroking of SI-865A from the CLOSED position to the OPEN position AND record the time in Attachment 8.2. ____

NOTE: ERFIS indication change corresponding to the associated equipment change satisfies ERFIS point testing. (CR 95-01621)

7.2.9 Perform the following: (CR 95-01621)

1. Display ERFIS Point SIV8651B on the ERFIS Terminal using the VAL function of ERFIS. ____
2. Check SIV8651B indicates OPEN ____
3. Close SI-865A, DISCH AND record the test results in Attachment 8.2. ____
4. Check ERFIS Point SIV8651B indicates CLOSED. ____

7.2.10 Record PIT results in Attachment 8.3. ____

INIT

NOTE: If the pressures of all three SI Accumulators are NOT within the normal range of 600 to 660 psig OR if all are NOT to be tested at this time AND plant cooldown is in progress IAW GP-007, individual accumulator check valves should be tested separately IAW Sections 7.2, 7.3 and 7.4. Sections 7.1 and 7.5 should be marked N/A.

7.3 Accumulator "B" Check Valve and Isolation Valve Operability Test During Cooldown

7.3.1 Record SI Accumulator "B" initial level and pressure on Attachment 8.1. ____

7.3.2 Decrease the RCS pressure until SI Accumulator "B" level decreases by 5% OR pressure decreases by 10 psig. ____

7.3.3 Increase the RCS pressure to stop SI Accumulator "B" level/pressure decrease. ____

7.3.4 Record SI Accumulator "B" final level and pressure on Attachment 8.1. ____

7.3.5 Complete the Test Results documentation on Attachment 8.1 for SI Accumulator "B" check valves SI-875B and SI-875E. ____

7.3.6 Close SI-865B, DISCH. ____

INIT

7.3.7 Station an Operator to observe the stem of SI-865B, ACCUMULATOR "B" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

7.3.8 Time the stroking of SI-865B from the CLOSED position to the OPEN position AND record the time in Attachment 8.2. ____

NOTE: ERFIS indication change corresponding to the associated equipment change satisfies ERFIS point testing. (CR 95-01621)

7.3.9 Perform the following: (CR 95-01621)

1. Display ERFIS Point SIV8652B on the ERFIS Terminal using the VAL function of ERFIS. ____
2. Check SIV8652B indicates OPEN ____
3. Close SI-865B, DISCH AND record the test results in Attachment 8.2. ____
4. Check ERFIS Point SIV8652B indicates CLOSED. ____

7.3.10 Record PIT results in Attachment 8.3. ____

INIT

NOTE: If the pressures of all three SI Accumulators are NOT within the normal range of 600 to 660 psig OR if all are NOT to be tested at this time AND plant cooldown is in progress IAW GP-007, individual accumulator check valves should be tested separately IAW Sections 7.2, 7.3 and 7.4. Sections 7.1 and 7.5 should be marked N/A.

7.4 Accumulator "C" Check Valve and Isolation Valve Operability Test During Cooldown

7.4.1 Record SI Accumulator "C" initial level and pressure on Attachment 8.1. ____

7.4.2 Decrease the RCS pressure until SI Accumulator "C" level decreases by 5% OR pressure decreases by 10 psig. ____

7.4.3 Increase the RCS pressure to stop SI Accumulator "C" level/pressure decrease. ____

7.4.4 Record SI Accumulator "C" final level and pressure on Attachment 8.1. ____

7.4.5 Complete the Test Results documentation on Attachment 8.1 for SI Accumulator "C" check valves SI-875C and SI-875F. ____

7.4.6 Close SI-865C, DISCH. ____

INIT

7.4.7 Station an Operator to observe the stem of SI-865C, ACCUMULATOR "C" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

7.4.8 Time the stroking of SI-865C from the CLOSED position to the OPEN position AND record the time in Attachment 8.2. ____

NOTE: ERFIS indication change corresponding to the associated equipment change satisfies ERFIS point testing. (CR 95-01621)

7.4.9 Perform the following: (CR 95-01621)

1. Display ERFIS Point SIV8653B on the ERFIS Terminal using the VAL function of ERFIS. ____
2. Check SIV8653B indicates OPEN ____
3. Close SI-865C, DISCH AND record the test results in Attachment 8.2. ____
4. Check ERFIS Point SIV8653B indicates CLOSED. ____

7.4.10 Record PIT results in Attachment 8.3. ____

INIT

NOTE: If plant heatup is in progress, this section should be performed. Sections 7.1 through 7.4 should be marked N/A.

7.5 Accumulator Check Valve and Isolation Valve Operability Test During Heat-Up

NOTE: Subsections 7.5.1, 7.5.2, and 7.5.3 may be performed concurrently to use a single RCS pressure reduction to test all three accumulators.

7.5.1 SI Accumulator "A" Valve Testing

1. Verify RCS pressure is greater than SI Accumulator "A" pressure. ____

2. Record SI Accumulator "A" initial level and pressure on Attachment 8.1. ____

3. Station an Operator to observe the stem of SI-865A, ACCUMULATOR "A" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

4. Time the stroking of SI-865A from the CLOSED position to the OPEN position AND record the time in Attachment 8.2. ____

5. Decrease the RCS pressure until SI Accumulator "A" level decreases by 5% OR pressure decreases by 10 psig. ____

7.5.1 (Continued) INIT

NOTE: ERFIS indication change corresponding to the associated equipment change satisfies ERFIS point testing. (CR 95-01621)

6. Perform the following: (CR 95-01621)

   a. Display ERFIS Point SIV8651B on the ERFIS Terminal using the VAL function of ERFIS. ____

   b. Check SIV8651B indicates OPEN ____

   c. Close SI-865A, DISCH AND record the test results in Attachment 8.2. ____

   d. Check ERFIS Point SIV8651B indicates CLOSED. ____

7. Record PIT results in Attachment 8.3. ____

8. Record SI Accumulator "A" final level and pressure on Attachment 8.1. ____

7.5.2 SI Accumulator "B" Valve Testing

1. Verify RCS pressure is greater than SI Accumulator "B" pressure. ____

2. Record SI Accumulator "B" initial level and pressure on Attachment 8.2. ____

3. Station an Operator to observe the stem of SI-865B, ACCUMULATOR "B" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

7.5.2 (Continued) INIT

4. Time the stroking of SI-865B from the CLOSED position to the OPEN position AND record the time in Attachment 8.1. ____

5. Decrease the RCS pressure until SI Accumulator "B" level decreases by 5% OR pressure decreases by 10 psig. ____

NOTE: ERFIS indication change corresponding to the associated equipment change satisfies ERFIS point testing. (CR 95-01621)

6. Perform the following: (CR 95-01621)

   a. Display ERFIS Point SIV8652B on the ERFIS Terminal using the VAL function of ERFIS. ____

   b. Check SIV8652B indicates OPEN ____

   c. Close SI-865B, DISCH AND record the test results in Attachment 8.2. ____

   d. Check ERFIS Point SIV8652B indicates CLOSED. ____

7. Record PIT results in Attachment 8.3. ____

8. Record SI Accumulator "B" final level and pressure on Attachment 8.1. ____

7.5.3 SI Accumulator "C" Valve Testing

1. Verify RCS pressure is greater than SI Accumulator "C" pressure. ____

2. Record SI Accumulator "C" initial level and pressure on Attachment 8.1. ____

7.5.3 (Continued) INIT

3. Station an Operator to observe the stem of SI-865C, ACCUMULATOR "C" DISCHARGE, as it is being stroked in each direction to verify stem movement corresponds to changes in position indicating lights. ____

4. Time the stroking of SI-865C from the CLOSED position to the OPEN position AND record the time in Attachment 8.2. ____

5. Decrease the RCS pressure until SI Accumulator "C" level decreases by 5% OR pressure decreases by 10 psig. ____

NOTE: ERFIS indication change corresponding to the associated equipment change satisfies ERFIS point testing. (CR 95-01621)

6. Perform the following: (CR 95-01621)

   a. Display ERFIS Point SIV8653B on the ERFIS Terminal using the VAL function of ERFIS. ____

   b. Check SIV8653B indicates OPEN ____

   c. Close SI-865C, DISCH AND record the test results in Attachment 8.2. ____

   d. Check ERFIS Point SIV8653B indicates CLOSED. ____

7. Record PIT results in Attachment 8.3. ____

8. Record SI Accumulator "C" final level and pressure on Attachment 8.1. ____

8.0 ATTACHMENTS

8.1 Accumulator Level and Pressure Data Sheet

8.2 Valve Data Sheet

8.3 Position Indication Test (PIT) Data Sheet

8.4 Surveillance Test Procedure Certification and Review Form

ACCUMULATOR LEVEL AND PRESSURE DATA SHEET

REFERENCE STEP NO.	COMPONENT DESCRIPTION	PARAMETER	TEST CONDITIONS		TEST RESULTS(1)	
			INITIAL	FINAL	(CIRCLE ONE)	INIT/DATE/TIME
7.1.1/7.1.4 or 7.2.1/7.2.4 or 7.5.1.2/7.5.1.8	Accumulator "A" SI-875A SI-875D	Level LI-920 or 922			SAT / UNSAT	/ /
		Pressure PI-921 or 923				
7.1.1/7.1.4 or 7.3.1/7.3.4 or 7.5.2.2/7.5.2.8	Accumulator "B" SI-875B SI-875E	Level LI-924 or 926			SAT / UNSAT	/ /
		Pressure PI-925 or 927				
7.1.1/7.1.4 or 7.4.1/7.4.4 or 7.5.3.2/7.5.3.8	Accumulator "C" SI-875C SI-875F	Level LI-928 or 930			SAT / UNSAT	/ /
		Pressure PI-929 or 931				

(1) A 5% reduction in SI Accumulator level OR a 10 psig reduction in SI Accumulator pressure satisfies the partial flow requirements for the check valve.

COMMENTS:

VALVE DATA SHEET

VALVE NUMBER	REFERENCE STEP NO.	TEST DIRECTION	STROKE TIME	ACCEPTANCE CRITERIA	FULL STROKE EXERCISE (1) (CIRCLE ONE)	TEST RESULTS(2) (CIRCLE ONE)	TEST RESULTS(2) INIT/TIME/DATE
SI-865A	7.1.8 OR 7.2.8 OR 7.5.1.4	OPEN		15 SEC	SAT / UNSAT	SAT / UNSAT	/ /
	7.1.9 OR 7.2.9.3 OR 7.5.1.6.3	CLOSED					
SI-865B	7.1.13 OR 7.3.8 OR 7.5.2.4	OPEN		15 SEC	SAT / UNSAT	SAT / UNSAT	/ /
	7.1.14 OR 7.3.9.3 OR 7.5.2.6.3	CLOSED					
SI-865C	7.1.18 OR 7.4.8 OR 7.5.3.4	OPEN		15 SEC	SAT / UNSAT	SAT / UNSAT	/ /
	7.1.19 OR 7.4.9.3 OR 7.5.3.6.3	CLOSED					

(1) Complete cycling of a valve, from closed to open and back to closed or from open to closed and back to open, satisfies the full stroke exercise requirement for the valve.

(2) Test results should be evaluated, SAT or UNSAT circled (as applicable) and initials, date and time entered for each valve tested.

COMMENTS:

POSITION INDICATION TEST (PIT) DATA SHEET

VALVE NUMBER	REFERENCE STEP NUMBER	RTGB STATUS LIGHTS	PINK STATUS LIGHTS	BREAKER STATUS LIGHTS	LOCAL POSITION INDICATION	TEST RESULTS (1)	
		CIRCLE ONE	CIRCLE ONE	CIRCLE ONE	CIRCLE ONE	CIRCLE ONE	INIT/DATE/TIME
SI-865A	7.1.10/7.2.10 7.5.1.7	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	/ /
SI-865B	7.1.15/7.3.10 7.5.2.7	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	/ /
SI-865C	7.1.20/7.4.10 7.5.3.7	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	SAT / UNSAT	/ /

(1) Test results should be evaluated, SAT or UNSAT circled (as applicable) and initials, date and time entered for each valve tested.

COMMENTS:

ATTACHMENT 8.4
Page 1 of 2

SURVEILLANCE TEST PROCEDURE
CERTIFICATION AND REVIEW FORM

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

_____
_____
_____

	Initials	Name (Print)	Date
Test Performed By	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Test Complete: Date_____ Time_____

Test Satisfactory: Yes / No (Circle one)

Reviewed by _____ _____
Shift Technical Advisor Date

Comments: (Required if results were unsatisfactory)

_____
_____
_____
_____

Approved by:_____ _____
Superintendent Shift Operations Date

ATTACHMENT 8.4
Page 2 of 2

SURVEILLANCE TEST PROCEDURE
CERTIFICATION AND REVIEW FORM

INIT

IST's Evaluation

NOTE: This evaluation is to be performed after the test is complete and the Superintendent Shift Operations has completed his review and approved the test.

1. IF the acceptance criteria is greater than 10 seconds, THEN compare the stroke time of each valve with it's previous stroke time to determine if the stroke time has increased 25% or more. _____ IST

2. IF any valves, having an acceptance criteria of greater than 10 seconds, stroke time has increased 25% or more, but meets the acceptance criteria, THEN notify the Manager - Operations to test the valve(s) every 31 days until notified by IST personnel to resume normal frequency. _____ IST

3. IF the Acceptance Criteria is less than or equal to 10 seconds, THEN compare the stroke time of each valve with it's reference stroke time to determine if the stroke time has increased 50% or more. _____ IST

4. IF any valves, having an acceptance criteria of less than or equal to 10 seconds, stroke time has increased 50% or more, but meets the acceptance criteria, THEN notify the Manager - Operations to test the valve(s) every 31 days until notified by IST personnel to resume normal frequency. _____ IST

Reviewed by: _____ Date _____
IST Specialist

United States Nuclear Regulatory Commission
Attachment IV to Serial: RNP-RA/00-0184
86 Pages

H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

OPERATIONAL SURVEILLANCE TEST 160, "PRESSURE ISOLATION CHECK VALVE BACK LEAKAGE TEST (REFUELING AND COLD SHUTDOWN INTERVAL OF GREATER THAN 48 HOURS UNLESS PERFORMED IN PRECEDING 9 MONTHS)"

CP&L

C
Continuous
Use

CAROLINA POWER & LIGHT COMPANY
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT NO. 2

PLANT OPERATING MANUAL

VOLUME 3
PART 9

OPERATIONS SURVEILLANCE TEST

OST-160

PRESSURE ISOLATION CHECK VALVE BACK LEAKAGE TEST (REFUELING AND COLD SHUTDOWN INTERVAL OF GREATER THAN 48 HOURS UNLESS PERFORMED IN PRECEDING 9 MONTHS)

REVISION 30

SUMMARY OF CHANGES
DCF 1999P0020

STEP / SECTION	REVISION COMMENTS
Through Out procedure	• Revised title for the Attachment 8.2 to Valve Leakage Data Sheet. New Attachment 8.3 added as the Valve Data Sheet to document SI-868A, B, & C Full Stroke Exercise test. • Revised calculation for corrected leakage based on OPCF comment from Engineering: Corrected Leakage = $(1.05) \times (\text{Leakage}) \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$
1.2	Split into 1.2 and 1.3. Added Tech Spec frequency requirements for SR 3.4.14.1 and added statement that the Inservice Testing Program requires this surveillance to be performed prior to entering Mode 2 if the unit has been in Cold Shutdown (Modes 5 and 6) for greater than 48 hours.
2.20	Added reference to CR 96-02738.
2.22	Added reference "RNP-M/MECH-1660, Check Valve Leakage Correction Calculation (For Valves Tested IAW OST-160)"
3.7	Changed reference from Valve Data Sheet to Valve Leakage Data Sheet. New Data sheet added to document SI-868A, B, & C full stroke test results which is now the Valve Data Sheet.
6.2	Reformatted acceptance criteria section and added subsection for full stroke exercise to provide acceptance criteria for SI-868A, B, & C.
7.1.3	Added step to insure OST-159 is not performed concurrently with OST-160 to preclude valve misalignment. CR 96-2738
7.3.50, 7.4.52, & 7.5.50	Added new step to record the Full Stroke exercise test results for the respective SI-868A, B, or C valve on Attachment 8.3. OPCF comment to document stroke of these valves for IST.
Attachment 8.3	Added attachment to document full stoke exercise test for SI-868A, B, & C.
Attachment 8.4	Added statement to record applicable components and WR/JOs if test was performed to satisfy PMTR.

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1.0 PURPOSE

1.1 The purpose of this test is to measure the leakrate through the Safety Injection (SI) and Chemical and Volume Control (CVC) pressure isolation check valves which provide a RCS pressure isolation function IAW ASME Code, Section XI, IWV-3423(e).

1.2 This test is performed to ensure compliance with Improved Technical Specifications (ITS) SR 3.4.14.1. Improved Technical Specifications SR 3.4.14.1 identifies the following performance frequencies:

- In accordance with the Inservice Testing Program **AND** 18 months
- Prior to entering Mode 2 whenever the Unit has been in Mode 5 for 7 days or more if leakage testing has not been performed in the previous 9 months
- Within 24 hours following valve actuation due to automatic or manual action or flow through the valve

The Inservice Testing Program requires this surveillance to be performed prior to entering Mode 2 if the unit has been in Cold Shutdown (Mode 5 and 6) for greater than 48 hours

1.3 This test also satisfies ITS SR 3.5.1.1 by verifying the accumulator discharge valves are open prior to removing power from valves.

1.4 This test may be performed during cooldown to identify RCS leakage.

1.5 This test can be used as a post maintenance test.

2.0 REFERENCES

2.1 UFSAR - Sections 6 and 7

2.2 Improved Technical Specifications LCO 3.4.14, LCO 3.5.1 & LCO 3.5.2

2.3 OP-202, Safety Injection and Containment Vessel Spray System

2.4 OP-301, Chemical and Volume Control System (CVCS)

2.5 OST-112, Chemical and Volume Control System Reactor Coolant Pump Seal Check Valve Backseat Test & CVC-312C Leakage Test

2.6 TMM-004, Inservice Inspection Testing

2.7 AP-010, Housekeeping Instructions

2.8 AP-020, Heat Stress Control Procedure

2.9 OMM-015, Operations Surveillance Testing

2.10 PLP-037, Conduct of Infrequently Performed Tests or Evolutions

2.11 SD-002, Safety Injection System

2.12 SD-003, Residual Heat Removal System

2.13 SD-021, Chemical and Volume Control System

2.14 Flow Diagrams:

1. 5379-1082, Safety Injection
2. 5379-1484, Residual Heat Removal
3. 5379-685, Chemical & Volume Control System Purification & Make-Up

2.15 Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs

2.16 ASME Code, Section XI, 1986 Edition

2.17 ACR 93-276, Charging Pump Discharge Valve Lifted During Performance Of OST-160

2.18 CR 95-00763, Technical Specification 4.0 Review Team Improvements

2.19 CR 95-01473, Water Hammer Occurrence During Charging Flow Restoration

2.20 CR 96-02738, Improper Position of SI-865A/B/C

2.21 RNP-M/MECH-1619, Safety Injection Accumulator Volume

2.22 RNP-M/MECH-1660, Check Valve Leakage Correction Calculation (For Valves Tested IAW OST-160)

2.23 ANSE/ASME Oma-1988 Part 10

INIT

3.0 PREREQUISITES

3.1 This revision has been verified to be the latest revision available.

Name (Print)	Initial	Signature	Date

3.2 The Superintendent Shift Operations has given permission to conduct this test.

SSO	Date

NOTE: While performing Section 7.2, RCS pressure shall be greater than or equal to 2200 psig.

While performing Section 7.3 through 7.5, RCS pressure shall be less than 1000 psig.

Sections 7.7 and 7.8 can be performed at any RCS pressure.

While performing Section 7.9, the reactivity addition from Xenon decay shall be less than 1700 pcm and decreasing. (Boron addition concern)

3.3 The Reactor is subcritical (Mode 3)(ALARA Concern) with RCS pressure stable. ____

3.4 The Safety Injection system is lined up IAW OP-202. ____

3.5 CVCS is lined up IAW OP-301 prior to performing test on CVC check valves. ____

3.6 A Radiation Work Permit has been obtained. ____

INIT

3.7 A copy of the Valve Leakage Data Sheet from the last OST-160 performed is available in the Control Room. ____

3.8 An SI Pump is available for testing SI-875D, SI-875E, and SI-875F. ____

4.0 PRECAUTIONS AND LIMITATIONS

4.1 When the system pressure is greater than 1000 psig, the SI Accumulator Motor Operated Isolation Valves are required by ITS LCO 3.5.1 to be open except during periods when they are closed for maintenance or testing requirements. Under this condition one of the valves at a time may be closed or have power returned for no more than 4 hours.

4.2 All water collected is potentially contaminated, therefore, proper radiological practices should be followed to prevent the spread of contamination.

4.3 All steps not applicable shall be marked N/A and the reason documented in the Comments Section of Attachment 8.4.

4.4 The principles of ALARA shall be used in planning and performing work and operations in the Radiation Control Area.

4.5 AP-020, Heat Stress Control Procedure, should be used as guidance due to the potential conditions under which this test is performed.

4.6 At the discretion of the test performer, a crowsfoot and red rubber hose may be used in place of a test rig for depressurization. Clear plastic (tygon) tubing should only be used IAW AP-010.

4.7 The possibility exists to lift the charging pump discharge relief when throttling back charging flow. Caution should be exercised.

4.8 An SI Pump shall not be operated on recirculation for $\geq$ 30 minutes.

5.0 SPECIAL TOOLS AND EQUIPMENT

5.1 1000 ml graduated cylinder or other graduated container for collecting leakage (graduated beaker or bucket, depending on the amount of leakage). (CR 95-00763)

5.2 Chicago fittings

5.3 Locked valve keys

5.4 Hoses

5.5 Six test rigs similar to that illustrated in Attachment 8.1

5.6 Verify the following test equipment calibrations are current AND record the test equipment identification below:

Equipment	Identification	INIT
1) Calibrated Stop Watch	_____	____
2) Calibrated Stop Watch	_____	____
3) Calibrated Stop Watch	_____	____
4) Test Gage (0-3000 psig)	_____	____
5) Test Gage (0-3000 psig)	_____	____
6) Test Gage (0-3000 psig)	_____	____
7) Test Gage (0-1000 psig)	_____	____
8) Test Gage (0-1000 psig)	_____	____
9) Test Gage (0-1000 psig)	_____	____

6.0 ACCEPTANCE CRITERIA

6.1 Valve Leakrate

6.1.1 A corrected leakrate of less than or equal to 1 gpm for each valve verifies the valves will perform their safety function of pressure isolation valves. This test may be performed with the RCS pressure other than 2235 psig and the observed leakage adjusted through calculations to correct the leakrate to an RCS pressure of 2235 psig.

6.1.2 If the leakrate is greater than 1 gpm but less than or equal to 5 gpm, then the following calculation shall be performed:

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

AND

1. If the resultant answer is less than 50% the valve passes.

2. If the resultant answer is equal to or greater than 50% the valve fails.

6.1.3 If the leakrate is greater than 5 gpm, the valve fails.

6.1.4 If any valve fails, ITS LCO 3.4.14 should be referenced.

6.1.5 The IST Pump and Valve Coordinator shall assess the current test results against the criteria specified in OMa-1988 Part 10 Section 4.2.2.3 of the ASME Section XI Code AND determine the need for valve repair or replacement.

6.1.6 Valves which are activated due to automatic or manual actions or flow through the valve shall be leak tested within 24 hours. Valves which present "infinite" test loop are exempt from this retest requirement. (ITS SR 3.4.14.1)

6.2 Full Stroke Exercise

6.2.1 The full stroke exercise requirements shall be satisfied following the complete cycling of a valve, from closed to open and back to closed, or open to closed and back to open.

6.2.2 If a valve fails to exhibit the required change of position, then the valve shall be declared inoperable. Prior to the valve being declared operable again, one of the following items shall be completed:

1. A retest showing acceptable operation shall be run following any required corrective action,

   OR

2. An analysis is performed that demonstrates that the valve will still fulfill its safety function.

6.3 The reviewing and approving authorities may accept this test in accordance with provisions set forth in OMM-015.

INIT

7.0 PROCEDURE

7.1 Initial Conditions

CAUTION

All drain hoses shall be routed higher than the pipe that it is connected to. If possible, the hose should be routed to the second floor grating, then routed down to a first floor drain. This is done to eliminate the possibility of draining the pipe such that the pipe becomes voided. If the pipe becomes voided, a water hammer could occur when the pipe is refilled.

7.1.1 IF Section 7.3, 7.4 OR 7.5 is to be performed, THEN remove pipe cap at SI-876D, RHR TO LOOP "B" DRAIN, AND install a Test Rig as illustrated in Attachment 8.1 with the hose routed to the nearest floor drain. ____

NOTE: The remainder of this procedure has been determined to involve PLP-037 Case II activities. This evolution shall be reviewed and determine if additional management involvement is needed.

7.1.2 IF additional management involvement is needed, THEN a Management Designated Monitor (MDM) shall be assigned AND shall give permission to perform this evolution as documented by having performed the Pre-Job briefing.

_____
Management Designated Monitor signature

7.1.3 Verify OST-159 **IS NOT** in progress **AND** will not be performed concurrently with OST-160. (CR 96-02738) ____

INIT

7.2 Leakage Test of SI-875D, SI-875E, and SI-875F

7.2.1 Verify RCS pressure is greater than or equal to 2200 psig. ____

7.2.2 IF Refueling Water Purification is in progress, THEN perform the following:

1) Stop the Refueling Water Purification pump. ____
2) Close SFPC-805B, RWST RETURN. ____

7.2.3 Verify SI Accumulator "A" level is between 64% and 78%. ____

7.2.4 Verify SI Accumulator "B" level is between 64% and 78%. ____

7.2.5 Verify SI Accumulator "C" level is between 64% and 78%. ____

NOTE: Only one of the ERFIS Points for each SI Accumulator Pressure needs to be documented. Ensure the ERFIS Quality Code is good for the points being recorded.
ERFIS points for the SI Accumulator pressures are as follows:

- Accumulator "A", SIP5315A or SIP5316A
- Accumulator "B", SIP5317A or SIP5318A
- Accumulator "C", SIP5319A or SIP5320A

7.2.6 Record SI Accumulator "A" pressure from ERFIS. _____ psig ____

7.2.7 Record SI Accumulator "B" pressure from ERFIS. _____ psig ____

7.2.8 Record SI Accumulator "C" pressure from ERFIS. _____ psig ____

INIT

7.2.9 Verify closed the following valves.

- SI-851A, MAKEUP ____
- SI-852A, DRAIN ____
- SI-851B, MAKEUP ____
- SI-852B, DRAIN ____
- SI-851C, MAKEUP ____
- SI-852C, DRAIN ____
- PS-955C, ACCUM "A" AIR OPERATED ISOLATION ____
- PS-955D, ACCUM "B" AIR OPERATED ISOLATION ____
- PS-955E, ACCUM "C" AIR OPERATED ISOLATION ____

INIT

7.2.10 IF any SI Accumulator level has varied by ≥ 1% in the past 12 hours as determined by reviewing ERFIS trend data OR ERFIS trend data for the past 12 hours is not available, THEN close the following manual valves in containment.

- SI-882A, ACCUMULATOR "A" DRAIN ____
- SI-883C, ACCUMULATOR "A" FILL LINE ISOLATION ____
- PS-954C, ACCUM "A" MANUAL ISOLATION ____
- SI-882B, ACCUMULATOR "B" DRAIN ____
- SI-883F, ACCUMULATOR "B" FILL LINE ISOLATION ____
- PS-954D, ACCUM "B" MANUAL ISOLATION ____
- SI-882C, ACCUMULATOR "C" DRAIN ____
- SI-883J, ACCUMULATOR "C" FILL LINE ISOLATION ____
- PS-954E, ACCUM "C" MANUAL ISOLATION ____

NOTE: Only one of the ERFIS points for each SI Accumulator needs to be trended. Ensure ERFIS Quality Code is Good for the points selected. ERFIS points for SI Accumulator level are as follows:

- Accumulator "A", SIL5307A or SIL5308A
- Accumulator "B", SIL5309A or SIL5310A
- Accumulator "C", SIL5311A or SIL5312A

INIT

7.2.11 Establish an ERFIS trend plot or group display for SI Accumulators "A", "B", and "C" level(s).

- SI Accumulator "A" ____
- SI Accumulator "B" ____
- SI Accumulator "C" ____

CAUTION

All piping should be assumed to contain high temperature and high pressure fluid. Extreme caution should be exercised when removing pipe caps and opening valves.

7.2.12 Remove pipe cap at SI-875H, ACCUMULATOR "A" DRAIN, AND install a 0-3000 psig test gage. ____

7.2.13 Slowly open SI-875H. ____

INIT

7.2.14 Remove pipe cap at SI-875J, ACCUMULATOR "B" DRAIN, AND install a 0-3000 psig test gage. ____

7.2.15 Slowly open SI-875J. ____

7.2.16 Remove pipe cap at SI-875L, ACCUMULATOR "C" DRAIN, AND install a 0-3000 psig test gage. ____

7.2.17 Slowly open SI-875L. ____

NOTE:	SI Pumps shall not be operated on recirculation for ≥ 30 minutes.

7.2.18 Start an available SI pump. A / B / C ____
(Circle one)

7.2.19 Record start time of SI pump. Time _____ ____

7.2.20 Open SI-870A, BIT OUTLET OR SI-870B, BIT OUTLET.

870A / 870B ____
(Circle one)

7.2.21 Wait greater than or equal to 2 minutes. ____

INIT

7.2.22 Record the initial level and time from the selected ERFIS points for each SI Accumulator.

1. SI Accumulator "A"

   - Time _____

   - Level _____ _____% ____
     ERFIS Pt ID

2. SI Accumulator "B"

   - Time _____

   - Level _____ _____% ____
     ERFIS Pt ID

3. SI Accumulator "C"

   - Time _____

   - Level _____ _____% ____
     ERFIS Pt ID

7.2.23 Record the pressure from test gage at SI-875H. _____ psig ____

7.2.24 Record the pressure from test gage at SI-875J. _____ psig ____

7.2.25 Record the pressure from test gage at SI-875L. _____ psig ____

INIT VERI

7.2.26 AFTER 20 minutes has elapsed from the latest time recorded in Step 7.2.22, THEN record the following accumulator level and times using the same ERFIS point IDs utilized in Step 7.2.22.

1. SI Accumulator "A"

   - Time _____

   - Level _____ _____% ____
     ERFIS Pt ID

2. SI Accumulator "B"

   - Time _____

   - Level _____ _____% ____
     ERFIS Pt ID

3. SI Accumulator "C"

   - Time _____

   - Level _____ _____% ____
     ERFIS Pt ID

7.2.27 Stop the running SI pump. Time_____ ____

7.2.28 Verify CLOSED the BIT Outlet valves.

- SI-870A, BIT OUTLET ____ ____
- SI-870B, BIT OUTLET ____ ____

INIT

7.2.29 Calculate SI-875D leakage as follows using SI Accumulator "A" parameters:

1._____% - _____% = _____% ____
(final level) (initial level) (level change)

2._____% X __7 gal / %__ = _____ gal
(level change) (multiplier) (leakage)

3._____ (gal) ÷ _____ min = _____ gpm
(leakage) (time) (leakrate)

7.2.30 Calculate SI-875E leakage as follows using SI Accumulator "B" parameters:

1._____% - _____% = _____% ____
(final level) (initial level) (level change)

2._____% X __7 gal / %__ = _____ gal
(level change) (multiplier) (leakage)

3._____ (gal) ÷ _____ min = _____ gpm
(leakage) (time) (leakrate)

7.2.31 Calculate SI-875F leakage as follows using SI Accumulator "C" parameters:

1._____% - _____% = _____% ____
(final level) (initial level) (level change)

2._____% X __7 gal / %__ = _____ gal
(level change) (multiplier) (leakage)

3._____ (gal) ÷ _____ min = _____ gpm
(leakage) (time) (leakrate)

INIT

7.2.32 Calculate the corrected pressure corrected leak rate for SI-875D as follows:

1. Calculate SI-875D ΔP. ____

SI-875D ΔP = _____ psig - _____ psig = _____ psid
7.2.23 7.2.6 ΔP

2. Calculate SI-875D pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235\ \text{psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.2.29.3}{\underline{\quad\quad}}\ \text{gpm} \times \sqrt{\frac{2235\ \text{psid}}{\underset{7.2.32.1}{\underline{\quad\quad}}}} = \underline{\quad\quad}\ \text{gpm}$$

3. Record corrected leak rate for SI-875D on Attachment 8.2. ____

7.2.33 Calculate the corrected pressure corrected leak rate for SI-875E as follows:

1. Calculate SI-875E ΔP. ____

SI-875E ΔP = _____ psig - _____ psig = _____ psid
7.2.24 7.2.7 ΔP

7.2.33 (Continued) INIT

2. Calculate SI-875E pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235\ \text{psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.2.30.3}{\underline{\qquad}}\ \text{gpm} \times \sqrt{\frac{2235\ \text{psid}}{\underset{7.2.33.1}{\underline{\qquad}}}} = \underline{\qquad}\ \text{gpm}$$

3. Record corrected leak rate for SI-875E on Attachment 8.2. ____

7.2.34 Calculate the corrected pressure corrected leak rate for SI-875F as follows:

1. Calculate SI-875F ΔP. ____

SI-875F ΔP = $\underset{7.2.25}{\underline{\qquad}}$ psig - $\underset{7.2.8}{\underline{\qquad}}$ psig = $\underset{\Delta P}{\underline{\qquad}}$ psid

2. Calculate SI-875F pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235\ \text{psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.2.31.3}{\underline{\qquad}}\ \text{gpm} \times \sqrt{\frac{2235\ \text{psid}}{\underset{7.2.34.1}{\underline{\qquad}}}} = \underline{\qquad}\ \text{gpm}$$

3. Record corrected leak rate for SI-875F on Attachment 8.2. ____

INIT VERI

CAUTION

Caution shall be used when the test gage is removed, since the portion of pipe between the drain valve and the test gage will be pressurized.

NOTE: Since the test gage will contain pressurized water, the test gage should be bagged to collect the water when removing the test gage.

7.2.35 Perform the following to remove test gages.

1. Close SI-875H. ____ ____
2. Remove test gage from SI-875H. ____
3. Close SI-875J. ____ ____
4. Remove test gage from SI-875J. ____
5. Close SI-875L. ____ ____
6. Remove test gage from SI-875L. ____

7.2.36 Install pipe caps as follows:

1. IF Section 7.3 will not be performed OR has already been performed, THEN install pipe cap at SI-875H. ____ ____
2. IF Section 7.4 will not be performed OR has already been performed, THEN install pipe cap at SI-875J. ____ ____
3. IF Section 7.5 will not be performed OR has already been performed, THEN install pipe cap at SI-875L. ____ ____

INIT

7.2.37 IF the leakrate calculated in Step 7.2. 32 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate: ____

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0- \quad) - (5.0 - \quad)}{(5.0- \quad)} \times 100\% = _____\%$$

7.2.38 IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-875D on Attachment 8.2. ____

7.2.39 IF the leakrate calculated in Step 7.2.33 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate: ____

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0- \quad) - (5.0 - \quad)}{(5.0- \quad)} \times 100\% = _____\%$$

7.2.40 IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-875E on Attachment 8.2. ____

	INIT	VERI
7.2.41 IF the leakrate calculated in Step 7.2.34 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate:	____	

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad) - (5.0\text{-}\quad)}{(5.0\text{-}\quad)} \times 100\% = _____\%$$

7.2.42 IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-875F on Attachment 8.2.	____	
7.2.43 Open the following manual valves in Containment if closed in Step 7.2.10.		
- SI-882A, ACCUMULATOR "A" DRAIN	____	____
- SI-883C, ACCUMULATOR "A" FILL LINE ISOLATION	____	____
- PS-954C, ACCUM "A" MANUAL ISOLATION	____	____
- SI-882B, ACCUMULATOR "B" DRAIN	____	____
- SI-883F, ACCUMULATOR "B" FILL LINE ISOLATION	____	____
- PS-954D, ACCUM "B" MANUAL ISOLATION	____	____
- SI-882C, ACCUMULATOR "C" DRAIN	____	____
- SI-883J, ACCUMULATOR "C" FILL LINE ISOLATION	____	____
- PS-954E, ACCUM "C" MANUAL ISOLATION	____	____

INIT

NOTE: SI-874A and SI-874B can be tested at any RCS pressure AND can be tested together.

7.2.44 IF desired, THEN test SI-874A IAW Section 7.7. ____

7.2.45 IF desired, THEN test SI-874B IAW Section 7.8. ____

INIT

7.3 Leakage Test of SI-873F, SI-876A and SI-875A

CAUTION

All piping should be assumed to contain high temperature and high pressure fluid. Extreme caution should be exercised when removing pipe caps and opening valves.

All drain hoses shall be routed higher than the pipe that it is connected to. If possible, the hose should be routed to the second floor grating, then routed down to a first floor drain. This is done to eliminate the possibility of draining the pipe such that the pipe becomes voided. If the pipe becomes voided, a water hammer could occur when the pipe is refilled.

7.3.1 Verify and maintain RCS Pressure at greater than or equal to 800 psig and less than or equal to 950 psig as indicated on PI-402 and record RCS pressure. _____ psig ____

7.3.2 Verify SI Accumulator "A" level and pressure are as follows.

- Level between 64% and 78% ____
- Pressure between 625 psig and 650 psig ____

7.3.3 Close the breakers for the SI Accumulator Discharge valves.

- SI-865A, ACCUMULATOR "A" DISCHARGE, on MCC-5, CMPT 14F ____
- SI-865B, ACCUMULATOR "B" DISCHARGE, on MCC-6, CMPT 10J ____
- SI-865C, ACCUMULATOR "C" DISCHARGE, on MCC-5, CMPT 9F ____

INIT

7.3.4 Verify the SI Accumulator Discharge valves are aligned as follows.

- SI-865A, DISCH OPEN ____
- SI-865B, DISCH CLOSED ____
- SI-865C, DISCH CLOSED ____

7.3.5 Notify the Control Room that closing SI-868C, HIGH HEAD TO LOOP "A" COLD LEG ISOLATION, places the plant in an LCO condition IAW ITS LCO 3.5.2 ____

7.3.6 Verify OPEN the following valves.

- SI-868A, HIGH HEAD TO LOOP "C" COLD LEG ISOLATION ____
- SI-868B, HIGH HEAD TO LOOP "B" COLD LEG ISOLATION ____

7.3.7 Unlock AND close SI-868C, HIGH HEAD TO LOOP "A" COLD LEG ISOLATION. ____

7.3.8 Remove pipe cap at SI-875H, ACCUMULATOR "A" DRAIN, and install a test gage capable of pressurizing to at least 1000 psig. ____

7.3.9 Open SI-876D, RHR TO LOOP "B" DRAIN, to depressurize the line. ____

7.3.10 Remove pipe cap at SI-873J, LOW HEAD TO LOOP "A" DRAIN (RCP "A" BAY), AND install a Test Rig as illustrated in Attachment 8.1 with the hose routed to the nearest floor drain. ____

INIT

7.3.11 Open SI-873J to depressurize the line. ____

7.3.12 Open SI-875H, ACCUMULATOR "A" DRAIN. ____

7.3.13 Allow pressure to stabilize. ____

7.3.14 Record the pressure indicated on test gage at SI-875H.

_____ psig ____

NOTE: The opening of either of the RHR Cold Leg Injection valves (RHR-744A or 744B) during the following steps will invalidate leakrate determined for SI-876A, RHR TO RC LOOP 1 COLD LEG CHECK.

7.3.15 Time the collection of leakage from the hose attached to SI-876D, RHR TO LOOP "B" DRAIN. ____

7.3.16 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.3.17 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

INIT

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.3.18 Calculate SI-876A, RHR TO RC LOOP 1 COLD LEG CHECK pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.3.17}{____} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.3.14}{____}}} = _____ \text{ gpm}$$

7.3.19 Record the leakrate for SI-876A on Attachment 8.2. ____

7.3.20 IF the leakrate calculated in Step 7.3.18 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate. ____

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad) - (5.0\text{-}\quad)}{(5.0\text{-}\quad)} \times 100\% = _____\%$$

7.3.21 IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-876A on Attachment 8.2. ____

INIT

7.3.22 Time the collection of leakage from the hose attached to SI-873J, LOW HEAD TO LOOP "A" DRAIN (RCP "A" BAY). ____

7.3.23 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.3.24 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.3.25 Calculate SI-873F, HIGH HEAD TO LOOP 1 COLD LEG CHECK pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.3.24}{____} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.3.14}{____}}} = ____ \text{ gpm}$$

7.3.26 Record the leakrate for SI-873F on Attachment 8.2. ____

		INIT	VERI
7.3.27	IF the leakrate calculated in Step 7.3.25 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate.	____	

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad) - (5.0\text{-}\quad)}{(5.0\text{-}\quad)} \times 100\% = _____\%$$

7.3.28	IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-873F on Attachment 8.2.	____	
7.3.29	Close SI-875H, ACCUMULATOR "A" DRAIN.	____	
7.3.30	Remove the test gage from SI-875H.	____	
7.3.31	Close SI-873J, LOW HEAD TO LOOP "A" DRAIN (RCP "A" BAY).	____	____
7.3.32	Remove test rig from SI-873J.	____	
7.3.33	Install pipe cap at SI-873J.	____	____
7.3.34	IF neither SI-876B, RHR TO RC LOOP 2 COLD LEG CHECK, nor SI-876C, RHR TO RC LOOP 3 COLD LEG CHECK, is to be tested at this time, THEN perform the following:		
	1. Close SI-876D, RHR TO LOOP "B" DRAIN.	____	____
	2. Remove test rig from SI-876D.	____	
	3. Install pipe cap at SI-876D.	____	____

INIT

7.3.35 Close SI-865A, DISCH. ____

7.3.36 Open breaker for SI-865A, ACCUMULATOR "A" DISCHARGE, on MCC-5, CMPT 14F. ____

7.3.37 Perform the following at SI-875H, ACCUMULATOR "A" DRAIN:

1. Install a Test Rig as illustrated in Attachment 8.1. ____
2. Route the hose to the nearest floor drain. ____
3. Slowly open SI-875H to depressurize the line. ____

7.3.38 Verify the following at SI-875G, ACCUMULATOR "A" DRAIN:

1. Pipe cap REMOVED. ____
2. Install a Test Rig as illustrated in Attachment 8.1. ____
3. Route the hose to the nearest floor drain. ____
4. Slowly OPEN SI-875G to depressurize the line. ____

7.3.39 Record the RCS pressure as indicated on ICCM Channel I or II, or PI-402 and identify which indication was used.

RCS pressure _____ psig / Indicated by: _____ ____

NOTE: Some flow is to be expected initially due to system depressurization. Leakage collection should not begin until cessation of initial flow.

7.3.40 WHEN the line has depressurized, THEN time the collection of leakage from the hose attached to SI-875H, ACCUMULATOR "A" DRAIN. ____

INIT

7.3.41 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.3.42 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.3.43 Calculate SI-875A, RHR TO RC LOOP 1 COLD LEG INJ CHECK pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.3.42}{\underline{\quad\quad}} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.3.39}{\underline{\quad\quad}}}} = \underline{\quad\quad} \text{ gpm}$$

7.3.44 Record the leakrate for SI-875A on Attachment 8.2. ____

		INIT	VERI
7.3.45	IF the leakrate calculated in Step 7.3.43 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate.	____	

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad) - (5.0\text{-}\quad)}{(5.0\text{-}\quad)} \times 100\% = _____\%$$

7.3.46	IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-875A on Attachment 8.2.	____	
7.3.47	Perform the following for SI-875H, ACCUMULATOR "A" DRAIN:		
	1. Close SI-875H.	____	____
	2. Remove the Test Rig from SI-875H.	____	
	3. IF Section 7.2 will not be performed OR has already been performed, THEN install pipe cap at SI-875H.	____	____
7.3.48	Perform the following for SI-875G, ACCUMULATOR "A" DRAIN:		
	1. Close SI-875G.	____	____
	2. Remove hose from SI-875G.	____	
	3. Install pipe cap at SI-875G.	____	____

		INIT	VERI
7.3.49	Lock open SI-868C, HIGH HEAD TO LOOP "A" COLD LEG ISOLATION.	____	____
7.3.50	Record Full Stroke exercise test results for SI-868C on Attachment 8.3.	____	
7.3.51	WHEN SI-868C has been independently verified locked open, THEN notify the Control Room that the LCO condition no longer exists.	____	

NOTE: SI-874A and SI-874B can be tested at any RCS pressure AND can be tested together.

7.3.52	IF desired, THEN test SI-874A IAW Section 7.7.	____	
7.3.53	IF desired, THEN test SI-874B IAW Section 7.8.	____	
7.3.54	IF Section 7.4 AND 7.5 have been completed OR will not be performed, THEN perform section 7.6.	____	

INIT

7.4 Leakage Test of SI-873E, SI-876B and SI-875B

CAUTION

All piping should be assumed to contain high temperature and high pressure fluid. Extreme caution should be exercised when removing pipe caps and opening valves.

At least one of the BIT Outlets (SI-870A or SI-870B) shall be open to provide over pressure protection (via SI-857A) for that section of piping between the BIT Outlets and the Cold Leg Injection Isolations (SI-868A, B and C) prior to closing SI-868B.

All drain hoses shall be routed higher than the pipe that it is connected to. If possible, the hose should be routed to the second floor grating, then routed down to a first floor drain. This is done to eliminate the possibility of draining the pipe such that the pipe becomes voided. If the pipe becomes voided, a water hammer could occur when the pipe is refilled.

7.4.1 Verify and maintain RCS Pressure at greater than or equal to 800 psig and less than or equal to 950 psig as indicated on PI-402 and record RCS pressure. _____ psig ____

7.4.2 Verify SI Accumulator "B" level and pressure are as follows.

- Level between 64% and 78% ____
- Pressure between 625 psig and 650 psig ____

INIT

7.4.3 Close the breakers for the SI Accumulator Discharge valves.

- SI-865A, ACCUMULATOR "A" DISCHARGE, on MCC-5, CMPT 14F ____
- SI-865B, ACCUMULATOR "B" DISCHARGE, on MCC-6, CMPT 10J ____
- SI-865C, ACCUMULATOR "C" DISCHARGE, on MCC-5, CMPT 9F ____

7.4.4 Verify the SI Accumulator Discharge valves are aligned as follows:

- SI-865A, DISCH CLOSED ____
- SI-865B, DISCH OPEN ____
- SI-865C, DISCH CLOSED ____

7.4.5 Close the following valves.

- SI-867A, BIT INLET ____
- SI-867B, BIT INLET ____

7.4.6 Open SI-870A, BIT OUTLET, OR SI-870B, BIT OUTLET, AND identify which was opened. SI-870A / SI-870B (Circle one) ____

7.4.7 Notify the Control Room that closing SI-868B, HIGH HEAD TO LOOP "B" COLD LEG ISOLATION, places the plant in an LCO condition IAW ITS LCO 3.5.2 ____

INIT

7.4.8 Verify OPEN the following valves.

- SI-868A, HIGH HEAD TO LOOP "C" COLD LEG ISOLATION ____
- SI-868C, HIGH HEAD TO LOOP "A" COLD LEG ISOLATION ____

7.4.9 Unlock AND close SI-868B, HIGH HEAD TO LOOP "B" COLD LEG ISOLATION. ____

7.4.10 Remove pipe cap at SI-875J, ACCUMULATOR "B" DRAIN, and install a test gage capable of pressurizing to at least 1000 psig. ____

7.4.11 Open SI-876D, RHR TO LOOP "B" DRAIN, to depressurize the line. ____

7.4.12 Remove pipe cap at SI-873H, HIGH HEAD TO LOOP "B" DRAIN (RCP "B" BAY), AND install a Test Rig as illustrated in Attachment 8.1 with the hose routed to the nearest floor drain. ____

7.4.13 Open SI-873H to depressurize the line. ____

7.4.14 Open SI-875J, ACCUMULATOR "B" DRAIN. ____

7.4.15 Allow pressure to stabilize. ____

7.4.16 Record the pressure indicated on test gage at SI-875J.

_____ psig ____

NOTE: The opening of either of the RHR Cold Leg Injection valves (RHR-744A or 744B) during the following steps will invalidate leakrate determined for SI-876B, RHR TO RC LOOP 2 COLD LEG CHECK.

7.4.17 Time the collection of leakage from the hose attached to SI-876D, RHR TO LOOP "B" DRAIN. ____

INIT

7.4.18 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.4.19 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.4.20 Calculate SI-876B, RHR TO RC LOOP 2 COLD LEG CHECK pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.4.19}{\underline{\quad\quad}} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.4.16}{\underline{\quad\quad}}}} = \underline{\quad\quad} \text{ gpm}$$

7.4.21 Record the leakrate for SI-876B on Attachment 8.2. ____

INIT

7.4.22 IF the leakrate calculated in Step 7.4.20 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate. ____

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad) - (5.0\text{-}\quad)}{(5.0\text{-}\quad)} \times 100\% = _____\%$$

7.4.23 IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-876B on Attachment 8.2. ____

7.4.24 Time the collection of leakage from the hose attached to SI-873H, HIGH HEAD TO LOOP "B" DRAIN (RCP "B" BAY). ____

7.4.25 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.4.26 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

INIT

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.4.27 Calculate SI-873E, HIGH HEAD TO LOOP 2 COLD LEG CHECK pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.4.26}{\underline{\quad\quad}} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.4.16}{\underline{\quad\quad}}}} = \underline{\quad\quad\quad} \text{ gpm}$$

7.4.28 Record the leakrate for SI-873E on Attachment 8.2. ____

7.4.29 IF the leakrate calculated in Step 7.4.27 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate. ____

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad\quad) - (5.0\text{-}\quad\quad)}{(5.0\text{-}\quad\quad)} \times 100\% = \underline{\quad\quad\quad}\%$$

7.4.30 IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-873E on Attachment 8.2. ____

7.4.31 Close SI-875J, ACCUMULATOR "B" DRAIN. ____

7.4.32 Remove the test gage from SI-875J. ____

		INIT	VERI
7.4.33	Close SI-873H, HIGH HEAD TO LOOP "B" DRAIN (RCP "B" BAY).	____	____
7.4.34	Remove test rig from SI-873H.	____	
7.4.35	Install pipe cap at SI-873H.	____	____
7.4.36	IF neither SI-876A, RHR TO RC LOOP 1 COLD LEG CHECK, nor SI-876C, RHR TO RC LOOP 3 COLD LEG CHECK, is to be tested at this time, THEN perform the following:		
	1. Close SI-876D, RHR TO LOOP "B" DRAIN.	____	____
	2. Remove test rig from SI-876D.	____	
	3. Install pipe cap at SI-876D.	____	____
7.4.37	Close SI-865B, DISCH.	____	
7.4.38	Open breaker for SI-865B, ACCUMULATOR "B" DISCHARGE, on MCC-6, CMPT 10J.	____	
7.4.39	Perform the following at SI-875J, ACCUMULATOR "B" DRAIN:		
	1. Install a Test Rig as illustrated in Attachment 8.1.	____	
	2. Route the hose to the nearest floor drain.	____	
	3. Slowly open SI-875J to depressurize the line.	____	

INIT

7.4.40 Verify the following at SI-875I, ACCUMULATOR "B" DRAIN:

1. Pipe cap REMOVED. ____

2. Install a Test Rig as illustrated in Attachment 8.1. ____

3. Route the hose to the nearest floor drain. ____

4. Slowly OPEN SI-875I to depressurize the line. ____

7.4.41 Record the RCS pressure as indicated on ICCM Channel I or II, or PI-402 and identify which indication was used:

RCS pressure _____ psig / Indicated by: _____ ____

NOTE: Some flow is to be expected initially due to system depressurization. Leakage collection should not begin until cessation of initial flow.

7.4.42 WHEN the line has depressurized, THEN time the collection of leakage from the hose attached to SI-875J, ACCUMULATOR "B" DRAIN. ____

7.4.43 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.4.44 Perform the following calculations to determine the leakrate in gpm: ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

INIT

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.4.45 Calculate SI-875B, RHR TO RC LOOP 2 COLD LEG INJ CHECK pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235\ \text{psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.4.44}{\underline{\quad\quad}}\ \text{gpm} \times \sqrt{\frac{2235\ \text{psid}}{\underset{7.4.41}{\underline{\quad\quad}}}} = \underline{\quad\quad}\ \text{gpm}$$

7.4.46 Record the leakrate for SI-875B on Attachment 8.2. ____

7.4.47 IF the leakrate calculated in Step 7.4.45 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate: ____

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad\quad) - (5.0\text{-}\quad\quad)}{(5.0\text{-}\quad\quad)} \times 100\% = \underline{\quad\quad}\%$$

7.4.48 IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-875B on Attachment 8.2. ____

		INIT	VERI
7.4.49	Perform the following for SI-875J, ACCUMULATOR "B" DRAIN:		
	1. Close SI-875J.	____	____
	2. Remove the Test Rig from SI-875J.	____	
	3. IF Section 7.2 will not be performed, OR has already been performed, THEN install pipe cap at SI-875J.	____	____
7.4.50	Perform the following for SI-875I, ACCUMULATOR "B" DRAIN:		
	1. Close SI-875I.	____	____
	2. Remove hose from SI-875I.	____	
	3. Install pipe cap at SI-875I.	____	____
7.4.51	Lock open SI-868B, HIGH HEAD TO LOOP "B" COLD LEG ISOLATION.	____	____
7.4.52	Record Full Stroke exercise test results for SI-868B on Attachment 8.3.	____	
7.4.53	WHEN SI-868B has been independently verified locked open, THEN notify the Control Room that the LCO condition no longer exists.	____	
7.4.54	Verify CLOSED the BIT Outlet valves.		
	- SI-870A, BIT OUTLET	____	____
	- SI-870B, BIT OUTLET	____	____

	INIT	VERI
7.4.55 Verify OPEN the BIT Inlet valves.		
- SI-867A, BIT INLET	____	____
- SI-867B, BIT INLET	____	____

NOTE: SI-874A and SI-874B can be tested at any RCS pressure AND can be tested together.

7.4.56 IF desired, THEN test SI-874A IAW Section 7.7.	____
7.4.57 IF desired, THEN test SI-874B IAW Section 7.8.	____
7.4.58 IF Section 7.3 AND 7.5 have been completed OR will not be performed, THEN perform section 7.6.	____

INIT

7.5 Leakage Test of SI-873A&D, SI-876C and SI-875C

CAUTION

All piping should be assumed to contain high temperature and high pressure fluid. Extreme caution should be exercised when removing pipe caps and opening valves.

All drain hoses shall be routed higher than the pipe that it is connected to. If possible, the hose should be routed to the second floor grating, then routed down to a first floor drain. This is done to eliminate the possibility of draining the pipe such that the pipe becomes voided. If the pipe becomes voided, a water hammer could occur when the pipe is refilled.

7.5.1 Verify and maintain RCS Pressure at greater than or equal to 800 psig and less than or equal to 950 psig as indicated on PI-402 and record RCS pressure. _____ psig ____

7.5.2 Verify SI Accumulator "C" level and pressure are as follows.

- Level between 64% and 78% ____
- Pressure between 625 psig and 650 psig ____

7.5.3 Close the breakers for the SI Accumulator Discharge valves.

- SI-865A, ACCUMULATOR "A" DISCHARGE, on MCC-5, CMPT 14F ____
- SI-865B, ACCUMULATOR "B" DISCHARGE, on MCC-6, CMPT 10J ____
- SI-865C, ACCUMULATOR "C" DISCHARGE, on MCC-5, CMPT 9F ____

INIT

7.5.4 Verify the SI Accumulator Discharge valves are aligned as follows:

- SI-865A, DISCH CLOSED ____
- SI-865B, DISCH CLOSED ____
- SI-865C, DISCH OPEN ____

7.5.5 Notify the Control Room that closing SI-868A, HIGH HEAD TO LOOP "C" COLD LEG ISOLATION, places the plant in an LCO condition IAW ITS LCO 3.5.2 ____

7.5.6 Verify OPEN the following valves.

- SI-868B, HIGH HEAD TO LOOP "B" COLD LEG ISOLATION ____
- SI-868C, HIGH HEAD TO LOOP "A" COLD LEG ISOLATION ____

7.5.7 Unlock AND close SI-868A, HIGH HEAD TO LOOP "C" COLD LEG ISOLATION. ____

7.5.8 Remove pipe cap at SI-875L, ACCUMULATOR "C" DRAIN, and install a test gage capable of pressurizing to at least 1000 psig. ____

7.5.9 Open SI-876D, RHR TO LOOP "B" DRAIN, to depressurize the line. ____

7.5.10 Remove pipe cap at SI-873L, LOOP "C" COLD LEG HIGH HEAD INJECTION VENT AND install a Chicago fitting with a hose routed to the nearest floor drain. ____

INIT

7.5.11 Open SI-873L to depressurize the line. ____

7.5.12 Open SI-875L, ACCUMULATOR "C" DRAIN. ____

7.5.13 Allow pressure to stabilize. ____

7.5.14 Record the pressure indicated on test gage at SI-875L.

_____ psig ____

NOTE: The opening of either of the RHR Cold Leg Injection valves (RHR-744A or 744B) during the following steps will invalidate leakrate determined for SI-876C, RHR TO RC LOOP 3 COLD LEG CHECK.

7.5.15 Time the collection of leakage from the hose attached to SI-876D, RHR TO LOOP "B" DRAIN. ____

7.5.16 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.5.17 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

INIT

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.5.18 Calculate SI-876C, RHR TO RC LOOP 3 COLD LEG CHECK pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.5.17}{____} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.5.14}{____}}} = _____ \text{ gpm}$$

7.5.19 Record the leakrate for SI-876C on Attachment 8.2. ____

7.5.20 IF the leakrate calculated in Step 7.5.18 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate. ____

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0- \quad) - (5.0- \quad)}{(5.0- \quad)} \times 100\% = _____\%$$

7.5.21 IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-876C on Attachment 8.2. ____

INIT

7.5.22 Time the collection of leakage from the hose attached to SI-873L, LOOP "C" COLD LEG HIGH HEAD INJECTION VENT. ____

7.5.23 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.5.24 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.5.25 Calculate SI-873A&D, HIGH HEAD TO LOOP 3 COLD LEG CHECKS pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.5.24}{\underline{\quad\quad}} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.5.14}{\underline{\quad\quad}}}} = \underline{\quad\quad} \text{ gpm}$$

7.5.26 Record the leakrate for SI-873A&D on Attachment 8.2. ____

		INIT	VERI
7.5.27	IF the leakrate calculated in Step 7.5.25 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate.	____	

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad) - (5.0\text{-}\quad)}{(5.0\text{-}\quad)} \times 100\% = _____\%$$

7.5.28	IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-873A&D on Attachment 8.2.	____	
7.5.29	Close SI-875L, ACCUMULATOR "C" DRAIN.	____	
7.5.30	Remove the test gage from SI-875L.	____	
7.5.31	Close SI-873L, LOOP "C" COLD LEG HIGH HEAD INJECTION VENT.	____	____
7.5.32	Remove Chicago fitting from SI-873L.	____	
7.5.33	Install pipe cap at SI-873L.	____	____
7.5.34	IF neither SI-876A, RHR TO RC LOOP 1 COLD LEG CHECK, nor SI-876B, RHR TO RC LOOP 2 COLD LEG CHECK, is to be tested at this time, THEN perform the following:		
	1. Close SI-876D, RHR TO LOOP "B" DRAIN.	____	____
	2. Remove test rig from SI-876D.	____	
	3. Install pipe cap at SI-876D.	____	____

INIT

7.5.35 Close SI-865C, DISCH. ____

7.5.36 Open breaker for SI-865C, ACCUMULATOR "C" DISCHARGE, on MCC-5, CMPT 9F. ____

7.5.37 Perform the following at SI-875L, ACCUMULATOR "C" DRAIN:

1. Install a Test Rig as illustrated in Attachment 8.1. ____
2. Route the hose to the nearest floor drain. ____
3. Slowly open SI-875L to depressurize the line. ____

7.5.38 Verify the following at SI-875K, ACCUMULATOR "C" DRAIN:

1. Pipe cap REMOVED. ____
2. Install a Test Rig as illustrated in Attachment 8.1. ____
3. Route the hose to the nearest floor drain. ____
4. Slowly OPEN SI-875K to depressurize the line. ____

7.5.39 Record the RCS pressure as indicated on ICCM Channel I or II, or PI-402 and identify which indication was used:

RCS pressure _____ psig / Indicated by: _____ ____

NOTE: Some flow is to be expected initially due to system depressurization. Leakage collection should not begin until cessation of initial flow.

7.5.40 WHEN the line has depressurized, THEN time the collection of leakage from the hose attached to SI-875L, ACCUMULATOR "C" DRAIN. ____

INIT

7.5.41 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.5.42 Perform the following calculations to determine the leakrate in gpm: ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.5.43 Calculate SI-875C, RHR TO RC LOOP 3 COLD LEG INJ CHECK pressure corrected leak rate. ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.5.42}{\underline{\quad\quad}} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.5.39}{\underline{\quad\quad}}}} = \underline{\quad\quad} \text{ gpm}$$

7.5.44 Record the leakrate for SI-875C on Attachment 8.2. ____

		INIT	VERI
7.5.45	IF the leakrate calculated in Step 7.5.43 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate:	____	

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0\text{-}\quad) - (5.0\text{-}\quad)}{(5.0\text{-}\quad)} \times 100\% = _____\%$$

7.5.46	IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-875C on Attachment 8.2.	____	
7.5.47	Perform the following for SI-875L, ACCUMULATOR "C" DRAIN:		
	1. Close SI-875L.	____	____
	2. Remove the Test Rig from SI-875L.	____	
	3. IF Section 7.2 will not be performed OR has already been performed, THEN install pipe cap at SI-875L.	____	____
7.5.48	Perform the following for SI-875K, ACCUMULATOR "C" DRAIN:		
	1. Close SI-875K.	____	____
	2. Remove hose from SI-875K.	____	
	3. Install pipe cap at SI-875K.	____	____

		INIT	VERI
7.5.49	Lock open SI-868A, HIGH HEAD TO LOOP "C" COLD LEG ISOLATION.	____	____
7.5.50	Record Full Stroke exercise test results for SI-868A on Attachment 8.3.	____	
7.5.51	WHEN SI-868A has been independently verified locked open, THEN notify the Control Room that the LCO condition no longer exists.	____	

NOTE: SI-874A and SI-874B can be tested at any RCS pressure AND can be tested together.

7.5.52	IF desired, THEN test SI-874A IAW Section 7.7.	____	
7.5.53	IF desired, THEN test SI-874B IAW Section 7.8.	____	
7.5.54	IF Section 7.3 AND 7.4 have been completed OR will not be performed, THEN perform section 7.6.	____	

INIT

7.6 Restoration of SI Accumulators

NOTE: This section should be performed after sections 7.3, 7.4 and 7.5 have been completed.

7.6.1 IF this test is being performed during a plant cooldown, THEN verify all SI Accumulator Discharge valves are CLOSED.

- SI-865A, DISCH ____
- SI-865B, DISCH ____
- SI-865C, DISCH ____

NOTE: Accumulator level and pressure may decrease when the associated discharge valve is opened and the accumulator is pressurizing the injection line. The Control Operator should anticipate receipt of Low Level and/or Low Pressure annunciators.

7.6.2 IF this is being performed during a plant heatup, THEN perform the following:

1. Verify the SI Accumulators are at the high end of the level and pressure bands in anticipation of level decrease. ____
2. Align SI Accumulator "A" as follows:
   a. Verify CLOSED, SI-875H, ACCUMULATOR "A" DRAIN. ____
   b. Remove pipe cap at SI-875H and install a test gage capable of pressurizing to at least 1000 psig. ____
   c. Open SI-875H. ____

7.6.2.2 (Continued)

		INIT	VERI
d.	Verify OPEN SI-865A, ACCUMULATOR "A" DISCHARGE breaker on MCC-5, CMPT 14F.	____	
e.	In Containment, slowly manually open SI-865A, ACCUMULATOR "A" DISCHARGE while monitoring pressure indication on gage installed at SI-875H AND when pressure starts to increase OR sounds of water flow occur, STOP opening SI-865A.	____	
f.	WHEN pressure stops increasing, THEN perform the following:		
1)	Close SI-865A breaker.	____	
2)	On the RTGB, open SI-865A, DISCH. (ITS SR 3.5.1.1)	____	____
3)	Open SI-865A breaker.	____	____

7.6.2.2 (Continued) INIT VERI

CAUTION

Caution shall be used when the test gage is removed, since the portion of pipe between the drain valve and the test gage will be pressurized.

NOTE: Since the test gage will contain pressurized water, the test gage should be bagged to collect the water when removing the test gage.

g. Perform the following for SI-875H, ACCUMULATOR "A" DRAIN:

1) Close SI-875H. ____ ____

2) Remove the pressure gage from SI-875H. ____

3) IF Section 7.2 will not be performed, THEN install pipe cap at SI-875H. ____ ____

7.6.2 (Continued)

	INIT	VERI
3. Align SI Accumulator "B" as follows:		
a. Verify CLOSED, SI-875J, ACCUMULATOR "B" DRAIN.	____	
b. Remove pipe cap at SI-875J and install a test gage capable of pressurizing to at least 1000 psig.	____	
c. Open SI-875J.	____	
d. Verify OPEN SI-865B, ACCUMULATOR "B" DISCHARGE breaker on MCC-6, CMPT 10J.	____	
e. In Containment, slowly manually open SI-865B, ACCUMULATOR "B" DISCHARGE while monitoring pressure indication on gage installed at SI-875J AND when pressure starts to increase OR sounds of water flow occur, STOP opening SI-865B.	____	
f. WHEN pressure stops increasing, THEN perform the following:		
1) Close SI-865B breaker.	____	
2) On the RTGB, open SI-865B, DISCH. (ITS SR 3.5.1.1)	____	____
3) Open SI-865B breaker.	____	____

7.6.2.3 (Continued) INIT VERI

CAUTION

Caution shall be used when the test gage is removed, since the portion of pipe between the drain valve and the test gage will be pressurized.

NOTE: Since the test gage will contain pressurized water, the test gage should be bagged to collect the water when removing the test gage.

g. Perform the following for SI-875J, ACCUMULATOR "B" DRAIN:

1) Close SI-875J. ____ ____

2) Remove the pressure gage from SI-875J. ____

3) IF Section 7.2 will not be performed, THEN install pipe cap at SI-875J. ____ ____

4. Align SI Accumulator "C" as follows:

a. Verify CLOSED, SI-875L, ACCUMULATOR "C" DRAIN. ____

b. Remove pipe cap at SI-875L and install a test gage capable of pressurizing to at least 1000 psig. ____

c. Open SI-875L. ____

d. Verify OPEN SI-865C, ACCUMULATOR "C" DISCHARGE breaker on MCC-5, CMPT 9F. ____

7.6.2.4 (Continued)

		INIT	VERI
e.	In Containment, slowly manually open SI-865C, ACCUMULATOR "C" DISCHARGE while monitoring pressure indication on gage installed at SI-875L AND when pressure starts to increase OR sounds of water flow occur, STOP opening SI-865C.	____	
f.	WHEN pressure stops increasing, THEN perform the following:		
1)	Close SI-865C breaker.	____	
2)	On the RTGB, open SI-865C, DISCH. (ITS SR 3.5.1.1)	____	____
3)	Open SI-865C breaker.	____	____

7.6.2.4 (Continued) INIT VERI

CAUTION

Caution shall be used when the test gage is removed, since the portion of pipe between the drain valve and the test gage will be pressurized.

NOTE: Since the test gage will contain pressurized water, the test gage should be bagged to collect the water when removing the test gage.

g. Perform the following for SI-875L, ACCUMULATOR "C" DRAIN:

1) Close SI-875L. ____ ____

2) Remove the pressure gage from SI-875L. ____

3) IF Section 7.2 will not be performed, THEN install pipe cap at SI-875L. ____ ____

7.6.3 Remove from scan the ERFIS trend plot or group display for SI Accumulators "A", "B", and "C". ____

INIT

NOTE:	SI-874A and SI-874B may be tested at the same time if desired.

7.7 Leakage Test of SI-874A

7.7.1 Remove the pipe cap at SI-874D, HIGH HEAD TO "C" HOT LEG VENT. ____

7.7.2 Install a Chicago fitting and hose at SI-874D with the hose routed to the nearest floor drain. ____

7.7.3 Open SI-874D AND allow the pipe to drain. ____

7.7.4 Record the RCS pressure as indicated on ICCM Channel I or II, or PI-402 AND identify which indication was used:

RCS pressure _____ psig / Indicated by: _____ ____

7.7.5 WHEN the line has depressurized, THEN time the collection of leakage from the hose attached to SI-874D, HIGH HEAD TO "C" HOT LEG VENT. ____

7.7.6 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

INIT

7.7.7 Perform the following calculations to determine the leakrate in gpm: ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.7.8 Perform the following calculation to correct the leakrate to 2235 psig: ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.7.7}{\underline{\quad}} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.7.4}{\underline{\quad}}}} = \underline{\quad} \text{ gpm}$$

7.7.9 Record the leakrate for SI-874A, HIGH HEAD TO LOOP 3 HOT LEG, on Attachment 8.2. ____

		INIT	VERI
7.7.10	IF the leakrate calculated in Step 7.7.8 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate.	____	

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0- \quad) - (5.0 - \quad)}{(5.0- \quad)} \times 100\% = _____\%$$

7.7.11	IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-874A on Attachment 8.2.	____	
7.7.12	Close SI-874D, HIGH HEAD TO "C" HOT LEG VENT.	____	____
7.7.13	Remove the hose and Chicago fitting at SI-874D.	____	
7.7.14	Replace the pipe cap at SI-874D.	____	____

INIT

NOTE:	SI-874A and SI-874B may be tested at the same time if desired.

7.8 Leakage Test of SI-874B

7.8.1 Remove the pipe cap at SI-874C, HIGH HEAD TO "B" HOT LEG VENT. ____

7.8.2 Install a Chicago fitting and hose on SI-874C with the hose routed to the nearest floor drain. ____

7.8.3 Open SI-874C AND allow the pipe to drain. ____

7.8.4 Record the RCS pressure as indicated on ICCM Channel I or II, or PI-402 AND identify which indication was used:

RCS pressure _____ psig / Indicated by: _____ ____

7.8.5 WHEN the line has depressurized, THEN time the collection of leakage from the hose attached to SI-874C, HIGH HEAD TO "B" HOT LEG VENT. ____

7.8.6 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

INIT

7.8.7 Perform the following calculations to determine the leakrate in gpm: ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 1 gpm.

7.8.8 Perform the following calculation to correct the leakrate to 2235 psig: ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.8.7}{____} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.8.4}{____}}} = _____ \text{ gpm}$$

7.8.9 Record the leakrate for SI-874B, HIGH HEAD TO LOOP 2 HOT LEG, on Attachment 8.2. ____

		INIT	VERI
7.8.10	IF the leakrate calculated in Step 7.8.8 is greater than 1 gpm but less than 5 gpm, THEN perform the following calculation to determine the reduction of margin between the leakrate and the maximum permissible leakrate:	____	

$$\frac{(5.0\text{-Previous Leakrate}) - (5.0\text{-Measured Leakrate})}{(5.0\text{-Previous Leakrate})} \times 100\%$$

$$\frac{(5.0- \quad) - (5.0 - \quad)}{(5.0- \quad)} \times 100\% = _____\%$$

7.8.11	IF calculated above, THEN record the reduction of margin between the leakrate and the maximum permissible leakrate for SI-874B on Attachment 8.2.	____	
7.8.12	Close SI-874C, HIGH HEAD TO "B" HOT LEG VENT.	____	____
7.8.13	Remove the hose AND Chicago fitting at SI-874C.	____	
7.8.14	Replace the pipe cap at SI-874C.	____	____

INIT

7.9 Leakage Test of CVC-312A, CVC-313/CVC-311 and CVC-312B

CAUTION

The possibility exists to lift the charging pump discharge relief when throttling back charging flow. Caution should be exercised. (Ref ACR 93-276)

NOTE: Charging will be isolated during the performance of Section 7.9. Excess Letdown shall be established while charging is isolated.

7.9.1 Communications will be established between the Control Room and the Charging Pump Room during those times that operations are being performed in the Charging Pump Room. (Ref ACR 93-276) ____

7.9.2 Place Excess Letdown in service IAW OP-301. ____

7.9.3 Lower Pressurizer level by performing the following:

1. IF RCP "B" is the only running pump, AND Pressurizer level is less than or equal to 30%, THEN GO TO Step 7.9.4. ____

2. IF RCP "B" is not the only running pump AND Pressurizer level is less than or equal to 24%, THEN GO TO Step 7.9.4. ____

3. Increase normal letdown flow. ____

4. Throttle charging flow to be less than letdown flow. ____

7.9.3 (Continued) INIT

5. WHEN Pressurizer level meets one of the following conditions, THEN remove Letdown from service IAW OP-301. ____

   - 30% IF RCP "B" is the only running pump.
   - Less than 24% for any other pump combination.

7.9.4 Verify seal injection flow to all three RCP's is between 15 to 20 gpm each: (ACR 93-276) ____

- RCP "A" FI-130 _____ gpm
- RCP "B" FI-127 _____ gpm
- RCP "C" FI-124 _____ gpm

7.9.5 Isolate Charging by performing the following:

1. Close HIC-121, CHARGING FLOW. ____
2. Close CVC-202B, HCV-121 INLET ISOLATION. ____
3. Verify CLOSED CVC-309A, HCV-121 BYPASS. ____

7.9.6 Without decreasing below 10 gpm on any RCP seal injection flow AND without exceeding 2400 psi on Charging Pump discharge pressure, Throttle RCP seal injection flows to between 10 and 12 gpm. (Ref ACR 93-276) ____

- Final Charging Pump Discharge Pressure _____ psi
- RCP "A" FI-130 _____ gpm
- RCP "B" FI-127 _____ gpm
- RCP "C" FI-124 _____ gpm

INIT

7.9.7 Verify OPEN CVC-310B, LOOP 2 COLD LEG CHG. ____

7.9.8 Verify CLOSED CVC-311, AUX PZR SPRAY. ____

7.9.9 Verify CLOSED CVC-310A, LOOP 1 HOT LEG CHG. ____

7.9.10 Unlock AND close CVC-312, CVC-310A BYPASS. ____

CAUTION

All piping should be assumed to contain high temperature and high pressure fluid. Extreme caution should be exercised when removing pipe caps and opening valves.

NOTE: Hoses should be routed over high point of the line which they drain to form a loop seal and will prevent excessive draining which could result in false data.

The following step is a continuous action step. The intent is to restore Charging and Letdown to reestablish an acceptable Pressurizer level. Documenting this in the Comments section will provide a history of actions performed.
(Ref ACR 93-276)

7.9.11 IF at any time during the performance of this section, the Pressurizer level increases to 80% as indicated on an in service Pressurizer Level Indicator, THEN go to Step 7.9.37 to secure from this section. (Ref ACR 93-276) ____

INIT

7.9.12 Remove pipe cap at CVC-310D, CHARGING TO LOOP "B" COLD LEG DRAIN (O/S MB), AND install a Test Rig as illustrated in Attachment 8.1 with hose routed to nearest floor drain OR attach red rubber hose with crowsfoot and route to nearest drain. ____

7.9.13 Unlock AND slowly open CVC-310D to depressurize the line upstream of CVC-310A to ensure other line leakage is not affecting this test. ____

7.9.14 Remove pipe cap at CVC-310C, DRAIN DOWNSTREAM CVC-310A CHARGING TO LOOP "A" HOT LEG, AND install a Test Rig as illustrated in Attachment 8.1 with hose routed to nearest floor drain OR attach red rubber hose with crowsfoot and route to nearest drain. ____

7.9.15 Unlock AND slowly open CVC-310C to depressurize the line. ____

7.9.16 Record the RCS pressure as indicated on ICCM Channel I or II, or PI-402 AND identify which indicator was used.

RCS pressure _____ psig / Indicated by: _____ ____

7.9.17 WHEN the line has depressurized, THEN time the collection of leakage from the hose attached to CVC-310C. ____

INIT

7.9.18 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.9.19 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 5 gpm.

7.9.20 Perform the following calculation to correct the leakrate to 2235 psig: ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.9.19}{\underline{\quad\quad}} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.9.16}{\underline{\quad\quad}}}} = \underline{\quad\quad} \text{ gpm}$$

7.9.21 Record the corrected leakrate for CVC-312A on Attachment 8.2. ____

INIT

7.9.22 Open CVC-310A, LOOP 1 HOT LEG CHG. ____

7.9.23 Close CVC-310B, LOOP 2 COLD LEG CHG. ____

7.9.24 Record the RCS pressure as indicated on ICCM Channel I or II, or PI-402 AND identify which indicator was used:

RCS pressure _____ psig / Indicated by: _____ ____

7.9.25 WHEN the line has depressurized, THEN time the collection of leakage from the hose attached to CVC-310D. ____

7.9.26 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

7.9.27 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

INIT

NOTE: The acceptance criteria will be met if the leakrate calculated below is less than or equal to 5 gpm.

7.9.28 Perform the following calculation to correct the leakrate to 2235 psig: ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235\ \text{psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.9.27}{\underline{\quad\quad}}\ \text{gpm} \times \sqrt{\frac{2235\ \text{psid}}{\underset{7.9.24}{\underline{\quad\quad}}}} = \underline{\quad\quad\quad}\ \text{gpm}$$

7.9.29 Record the corrected leakrate for CVC-312B on Attachment 8.2. ____

7.9.30 Record the RCS pressure as indicated on ICCM Channel I or II, or PI-402 AND identify which indicator was used:

RCS pressure _____ psig / Indicated by: _____ ____

7.9.31 WHEN the line has depressurized, THEN time the collection of leakage from the hose attached to CVC-310C. ____

7.9.32 Record the volume of the leakage collected and the time to collect the leakage. ____

_____ minutes _____ ml
(time) (volume)

INIT

7.9.33 Perform the following calculations to determine the leakrate in gpm. ____

_____ ml ÷ _____ minutes = _____ ml/min
(volume) (time)

_____ ml/min X $\frac{1 \text{ gpm}}{3785 \text{ ml/min}}$ = _____ gpm
(leakrate) (leakrate)

7.9.34 Perform the following calculation to correct the leakrate to 2235 psig: ____

$$\text{Corrected Leakage} = (1.05) \times \text{Leakage} \times \sqrt{\frac{2235 \text{ psid}}{\Delta P}}$$

$$= (1.05) \times \underset{7.9.33}{\underline{\quad}} \text{ gpm} \times \sqrt{\frac{2235 \text{ psid}}{\underset{7.9.30}{\underline{\quad}}}} = \underline{\quad} \text{ gpm}$$

NOTE: The acceptance criteria for the combination of CVC-313 AND CVC-311 will be met if the leakrate calculated below is less than or equal to 5 gpm. This will satisfy the leak rate test for the first RCS boundary isolation for this line (CVC-312C serves as the second boundary and is tested by OST-112).

7.9.35 Determine the corrected leakrate for CVC-313/CVC-311 by subtracting the corrected leakrate calculated for CVC-312A in Step 7.9.20 from that calculated in Step 7.9.34. ____

_____ gpm - _____ gpm = _____ gpm
(Step 7.9.34) (Step 7.9.20)

7.9.36 Record the corrected leakrate for CVC-313/CVC-311 on Attachment 8.2. ____

		INIT	VERI
7.9.37	Lock closed CVC-310C, DRAIN DOWNSTREAM CVC-310A CHARGING TO LOOP "A" HOT LEG.	____	____
7.9.38	Remove Test Rig OR red rubber hose from CVC-310C.	____	
7.9.39	Replace pipe cap at CVC-310C.	____	____
7.9.40	Lock closed CVC-310D, CHARGING TO LOOP "B" COLD LEG DRAIN (O/S MB).	____	____
7.9.41	Remove Test Rig OR red rubber hose from CVC-310D.	____	
7.9.42	Replace pipe cap at CVC-310D.	____	____
7.9.43	Open CVC-310B, LOOP 2 COLD LEG CHG.	____	____
7.9.44	Close CVC-310A, LOOP 1 HOT LEG CHG.	____	____
7.9.45	Lock open CVC-312, CVC-310A BYPASS.	____	____

CAUTION

The line downstream of HCV-121, CHARGING FLOW, has been partially drained. Establishing flow too quickly may cause a water hammer.

Seal injection flows may change as charging line flow is re-established.

7.9.46	While maintaining normal seal injection flows 8 to 13 gpm, slowly throttle open CVC-309A, HCV-121 BYPASS, to fill charging line downstream of HCV-121. (CR 95-01473)	____	
7.9.47	Open CVC-202B, HCV-121 INLET.	____	____
7.9.48	Slowly throttle open HIC-121, CHARGING FLOW, as required by plant conditions.	____	____

		INIT	VERI
7.9.49	Close CVC-309A, HCV-121 BYPASS.	____	____
7.9.50	Place Letdown in service IAW OP-301.	____	
7.9.51	Remove Excess Letdown from service IAW OP-301.	____	
7.9.52	IF Charging and Letdown was restored due to a high Pressurizer level AND all testing in Section 7.9 has not been completed, THEN perform the following: (Ref ACR 93-276)		
	1. WHEN Pressurizer level is at programmed level, perform another Section 7.9 using N/A for any testing that was successfully completed during this evolution.	____	
	2. Attach the additional Section 7.9 to this procedure.	____	

8.0 ATTACHMENTS

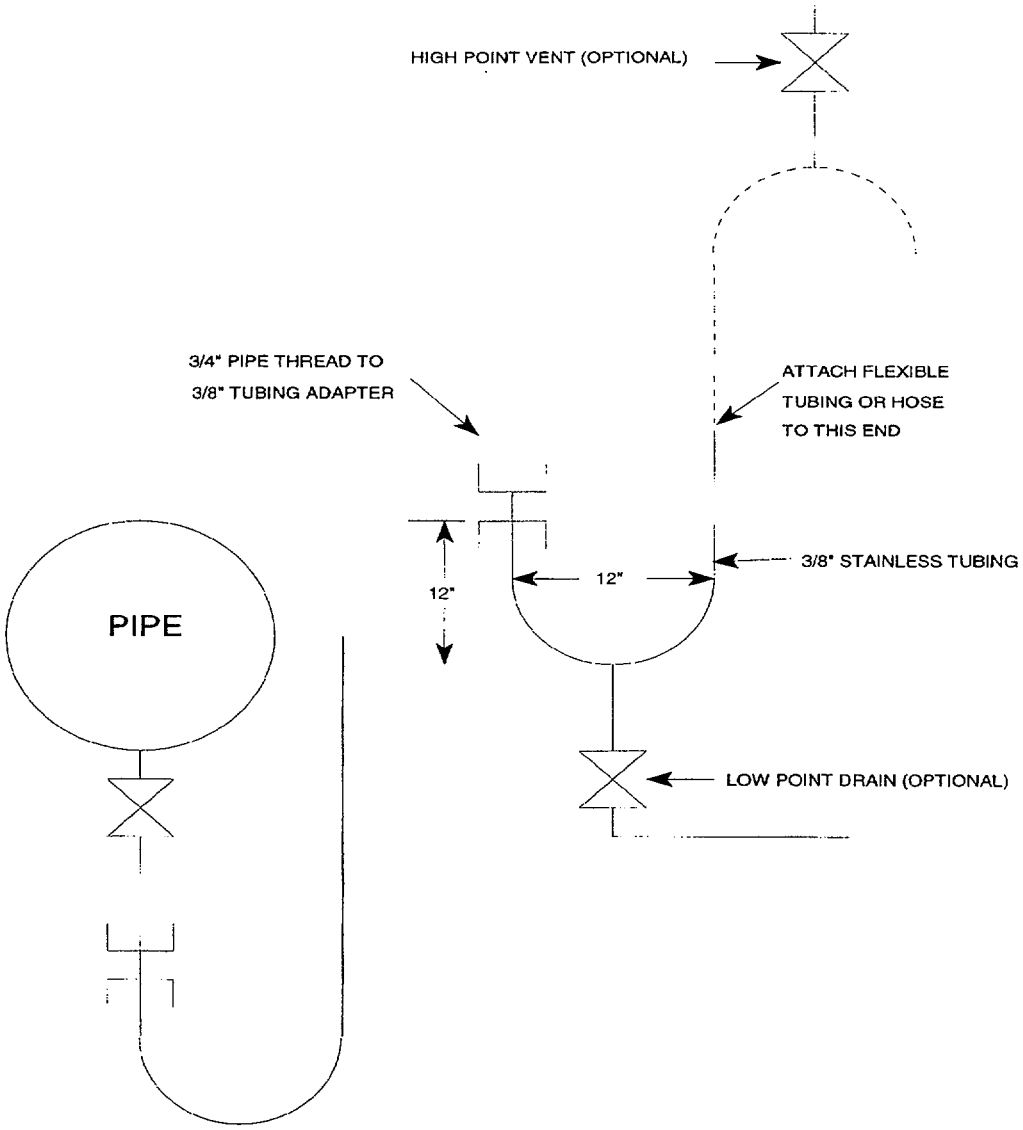
8.1 Test Rig

8.2 Valve Leakage Data Sheet

8.3 Valve Data Sheet

8.4 Surveillance Test Procedure Certification and Review Form

ATTACHMENT 8.1
Page 1 of 1
TEST RIG



ATTACHMENT 8.2
Page 1 of 2

VALVE LEAKAGE DATA SHEET

VALVE NUMBER	STEP NUMBER	LEAK RATE	REDUCTION OF MARGIN	ACC CRIT	TEST RESULTS (1)	
					SAT	UNSAT
SI-875D	7.2.32.3		N/A	≤1 gpm		
	7.2.38	N/A		<50%		
SI-875E	7.2.33.3		N/A	≤1 gpm		
	7.2.40	N/A		<50%		
SI-875F	7.2.34.3		N/A	≤1 gpm		
	7.2.42	N/A		<50%		
SI-876A	7.3.19		N/A	≤1 gpm		
	7.3.21	N/A		<50%		
SI-873F	7.3.26		N/A	≤1 gpm		
	7.3.28	N/A		<50%		
SI-875A	7.3.44		N/A	≤1 gpm		
	7.3.46	N/A		<50%		
SI-876B	7.4.21		N/A	≤1 gpm		
	7.4.23	N/A		<50%		
SI-873E	7.4.28		N/A	≤1 gpm		
	7.4.30	N/A		<50%		
SI-875B	7.4.46		N/A	≤1 gpm		
	7.4.48	N/A		<50%		

VALVE LEAKAGE DATA SHEET

VALVE NUMBER	STEP NUMBER	LEAK RATE	REDUCTION OF MARGIN	ACC CRIT	TEST RESULTS (1)	
					SAT	UNSAT
SI-876C	7.5.19		N/A	≤1 gpm		
	7.5.21	N/A		<50%		
SI-873A & D	7.5.26		N/A	≤1 gpm		
	7.5.28	N/A		<50%		
SI-875C	7.5.44		N/A	≤1 gpm		
	7.5.46	N/A		<50%		
SI-874A	7.7.9		N/A	≤1 gpm		
	7.7.11	N/A		<50%		
SI-874B	7.8.9		N/A	≤1 gpm		
	7.8.11	N/A		<50%		
CVC-312A	7.9.21		N/A	≤5 gpm		
CVC-312B	7.9.29		N/A	≤5 gpm		
CVC-313/ CVC-311	7.9.36		N/A	≤5 gpm		

(1) Evaluate test results and initial and date appropriate box.

Comments:

_____

_____

_____

_____

ATTACHMENT 8.3
Page 1 of 1
VALVE DATA SHEET

VALVE NUMBER	REFERENCE STEP NUMBER	TEST DIRECTION	FULL STROKE (1)	TEST RESULTS (2)	
			CIRCLE ONE	CIRCLE ONE	INIT / DATE / TIME
SI-868A	7.5.7	CLOSED	SAT / UNSAT	SAT / UNSAT	
	7.5.49	OPEN			
SI-868B	7.4.9	CLOSED	SAT / UNSAT	SAT / UNSAT	
	7.4.51	OPEN			
SI-868C	7.3.7	CLOSED	SAT / UNSAT	SAT / UNSAT	
	7.3.49	OPEN			

(1) Complete cycling of a valve, from closed to open AND back to closed OR from open to closed AND back to open, satisfies the full stroke exercise requirements for the valve.

(2) Evaluate test results AND initial, date, and time the appropriate box for each valve AND N/A blocks not completed.

ATTACHMENT 8.4
Page 1 of 1

SURVEILLANCE TEST PROCEDURE
CERTIFICATION AND REVIEW FORM

Scheduled / Unscheduled (Circle one)

(If unscheduled, state reason for test and the page numbers included in partial test)

_____

_____

IF this test was performed to satisfy PMTR, THEN list applicable components and WR/JOs.

_____

_____

	Initials	Name (Print)	Date
Test Performed By:	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

Test Complete: Date _____ Time _____

Test Satisfactory: Yes / No (Circle one)

Reviewed by: _____ _____
Shift Technical Advisor Date

Comments: (Required if results were unsatisfactory)

_____

_____

_____

Approved by: _____ _____
Superintendent Shift Operations Date

Reviewed by: _____ _____
IST Date