VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

November 28, 1990

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Serial No. 90-546
NO/ETSR-2
Docket Nos. 50-280
50-281
License Nos. DPR-32
DPR-37

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
DISPOSITION OF IST SER ANOMALIES

On August 31, 1990, Surry Power Station received the Safety Evaluation Report (SER) for the Units 1 and 2 ASME Section XI Inservice Testing (IST) Program for Pump and Valves. In Appendix C of the accompanying Technical Evaluation Report , fifteen (15) IST Program anomalies were identified. The staff determined that the program and the associated relief requests are acceptable for implementation provided that the anomalies are corrected within 90 days of the receipt of the SER.

Attachment 1 contains a discussion of each anomaly and how the program or relief request was changed to disposition the anomaly. Some of the anomalies were programmatic in nature and required an update of the IST Program. The updated pages for the Units 1 and 2 IST Programs are provided in Attachments 2 and 3, respectively.

Item 3 of the Technical Evaluation Report granted relief from required pump testing provided that instrumentation required to perform the testing is installed during the next refueling outage. Although installation of the instrumentation began during the current Unit 1 refueling outage, some of the required ASME Section XI instrumentation will not be installed. Those instruments which were not installed during the current Unit 1 outage will be installed during the operating cycle, if they can be installed without affecting plant operations. Instruments for those systems which cannot be rendered inoperable during plant operation will be scheduled for installation during the next Unit 1 refueling outage.

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Table 1 of Attachment 1 summarizes the installation status of the instrumentation identified in the NRC's Safety Evaluation Report, Item 3. Attachment 4 provides relief requests for those measurement variables where instrumentation was not installed during the current 1990 Unit 1 refueling outage. These relief requests are necessary to support plant operation until the required instrumentation has been installed. Installation of the instrumentation for the Charging Pump and the Boric Acid Transfer Pumps cannot be completed until the next refueling outage. The instruments that were not installed for the Emergency Diesel Generator Fuel Oil Pumps and the Emergency Service Water Pumps during the Unit 1 refueling outage can be installed non-outage. These instruments will be installed in the first quarter of 1991 during Unit 1 operation.

Installation of the Unit 2 Section XI instrumentation identified in the NRC's SER, is scheduled for implementation during the Unit 2 refueling outage, currently scheduled to begin April 1991. If any unforeseen difficulties are encountered that prevent installation of any instrumentation, appropriate relief requests will be submitted.

Your prompt attention to the relief requests (included in Attachment 4) and any necessary approval is being requested. It is our intent to implement these revised relief requests with the startup of Unit 1, currently scheduled for December 5, 1990. If you have any additional questions, please contact us.

Very truly yours,

W. L. Stewart
Senior Vice President - Nuclear

Attachments

cc: U. S. Nuclear Regulatory Commission
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ATTACHMENT 4

SURRY POWER STATION UNIT 1

ASME SECTION XI INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES

INTERIM RELIEF REQUESTS

INTERIM RELIEF REQUEST P-2

System : Chemical and Volume Control

Pump(s): 1-CH-P-1A
1-CH-P-1B
1-CH-P-1C

Class : 2

Section XI Code Requirements
For Which Interim Relief Is Requested

Frequency of pump testing.

Basis For Interim Request

Flow instrumentation was to be installed on the inlet to the charging pumps during the current Unit 1 outage, as committed to in Revision 4 of the Surry Unit 1, ASME Section XI Inservice Testing Program Plan for Pumps and Valves, submitted on September 30, 1988. Due to instrument availability problems, the flow instruments cannot be installed during this outage. The flow annubars purchased for this application could not be installed due to interference from nearby structures. For this work to be performed, the unit must be in an outage. Therefore, the flow instrument installation will be completed during the next refueling outage.

In the interim, prior to returning the unit to service total flow will be measured for Pumps 1-CH-P-1B and C by summing the flows in the normal charging line and the reactor pump seal coolant lines with the minimum recirculation line isolated. Pump 1-CH-P-1A is currently out of service due to work being performed on the gearbox and it will not be ready for service until after plant startup.

The test to measure flow cannot be performed during normal operation because if the normal charging isolation valve tripped closed, pump recirculation could not be reestablished quickly enough to avoid possible pump damage. Flow to the reactor coolant pump seals would still be available, however, the total seal flow is only a third of the minimum recirculation flow. During normal operation, the pumps will be run on the recirculation paths and differential pressure and vibration will be measured.

Interim Alternate Testing Proposed

Prior to returning the unit to service, flow, inlet pressure, differential pressure and vibration will be measured for Pumps 1-CH-P-1B and C. Prior to returning Pump 1-CH-P-1A to service, it will be run on the recirculation path and inlet pressure, differential pressure and vibration will be measured. The maintenance on this pump does not affect hydraulic performance, therefore, the testing of this pump on the recirculation path, and the ability of the pump to deliver the required normal charging and RCP seal flows verifies that the pump is operable.

Every quarter, the charging pumps will be run on the recirculation paths, and inlet pressure, differential pressure and vibration will be measured. This testing alternative conforms to Generic Letter 89-04, Attachment 1, Position 9. During the next refueling outage for Unit 1, the flow instrumentation will be installed and testing which complies with Section XI will proceed on a quarterly basis.

INTERIM RELIEF REQUEST P-9

System : Chemical and Volume Control

Pump(s): 1-CH-P-2A
1-CH-P-2B

Class : 2

Section XI Code Requirements
For Which Interim Relief Is Requested

Frequency of pump testing.

Measuring inlet pressure.

Basis For Interim Request

Flow and inlet pressure instrumentation were to be installed on the inlet to the boric acid transfer pumps during the current Unit 1 outage, as committed to in Revision 4 of the Surry Unit 1, ASME Section XI Inservice Testing Program Plan for Pumps and Valves, submitted on September 30, 1988. Although the instruments were available for the outage, other supporting materials required to return the system to service such as heat tracing were not available in time. For the flow instruments to be installed, the unit must be in an outage. Completing this work now would delay startup of the unit. Therefore, the flow instrument installation will be completed during the next refueling outage. The inlet pressure instruments will be installed during the first quarter of 1991.

In the interim, prior to returning the unit to service flow will be measured for each pump by establishing a path to the reactor coolant system via either the normal or emergency boration lines. These lines are the only test paths that have permanent flow instrumentation. These paths cannot be used during normal operation for pump testing because sufficient boric acid would be injected into the RCS to result in a reactor power transient.

Per Cold Shutdown Justification CSV-19, the emergency boration path valves are tested with flow during cold shutdowns. However, this test is short in duration to minimize the amount of boric acid injected into the RCS. The pump test requires an extended period of boric acid injection, which would upset the RCS boron balance and possibly impact the ability of the plant to restart. Therefore, this test should only be performed during cold shutdowns on the way to reactor refueling while the RCS is being borated or during reactor refuelings.

Interim Alternate Testing Proposed

Prior to returning the unit to service, flow, discharge pressure and vibration will be measured.

Every quarter, the boric acid charging pumps will be run on the recirculation paths, and discharge pressure and vibration will be measured. After the inlet pressure gauges are installed, inlet pressure and differential pressure will also be measured every quarter. When the inlet gauges are installed, the alternative testing will conform to Generic Letter 89-04, Attachment 1, Position 9. During the next refueling outage for Unit 1, the flow instrumentation will be installed and testing which complies with Section XI will proceed on a quarterly basis.

INTERIM RELIEF REQUEST P-11

System : Service Water

Pump(s): 1-SW-P-1A
1-SW-P-1B
1-SW-P-1C

Class : 3

Section XI Code Requirements
For Which Interim Relief Is Requested

Measure differential pressure.

Basis For Interim Request

Flow and discharge pressure instrumentation were to be installed during the current Unit 1 outage, as committed to in Revision 4 of the Surry Unit 1, ASME Section XI Inservice Testing Program Plan for Pumps and Valves, submitted on September 30, 1988. Flow annubars were installed in 1989 from which flow can be calculated based on the measured differential pressure across the annubars. There are installed discharge pressure instruments, however, these gauges do not meet Section XI accuracy requirements. The flow transmitters and replacement discharge pressure gauges will not be installed before the end of the outage. This equipment can be installed during normal plant operation and will be installed during the first quarter of 1991.

Interim Alternate Testing Proposed

Flow will be calculated from the measured differential across the flow annubars and compared to Section XI acceptance criteria and minimum required flow rate of 15,000 gpm for the system. Inlet pressure will be calculated from river level. Discharge pressure will be measured and trended but not compared to an acceptance criteria because of lack of accuracy. Vibration will be measured.

This test is adequate to verify pump operability. The purpose of the emergency service water pumps is to ensure adequate inventory in the discharge canal during an accident. The discharge canal is the ultimate heat sink.

The instrumentation will be installed during the first quarter of 1991 and testing which complies with Section XI will proceed on a quarterly basis.

INTERIM RELIEF REQUEST P-12

System: Fuel Oil

Pump(s): 1-EE-P-1F

Class : NC

Section XI Code Requirements
For Which Interim Relief Is Requested

Measure Inlet pressure, differential pressure, and flow rate.

Basis For Interim Relief

Flow and inlet pressure instrumentation were to be installed on Pump 1-EE-P-1F pump during the current Unit 1 outage, as committed to in Revision 4 of the Surry Unit 1, ASME Section XI Inservice Testing Program Plan for Pumps and Valves, submitted on September 30, 1988. The Number 3 diesel must be taken out of service before the instrument installation can be performed. However, the Number 3 diesel was required for service during this outage. The installation will be performed during the first quarter of 1991.

Interim Alternate Testing Proposed

This pump will be tested quarterly by observing that the pump performs it's intended function (fuel oil is flowing to the day tank and the day tank level increases when the pump is running). Also, vibration will be measured. This test verifies pump operability.

The instrumentation will be installed during the first quarter of 1991 and testing which complies with Section XI will proceed on a quarterly basis.

INTERIM RELIEF REQUEST V-40

System : CH

Valve(s) : 1-CH-256
1-CH-265
1-CH-274

Category : C

Class : 2

Function : Charging Pump Discharge Recirc Line Check Valves

Section XI Code Requirement
For Which Interim Relief IS Requested

Exercise valves for operability every three months.

Basis For Interim Relief

These check valves cannot be full flow tested because instrumentation is not installed to measure flow or differential pressure.

These 2 inch valves have seal welded bonnets. To disassemble these check valves for inspection, the seal weld must be cut which has in the past resulted in damage to the valve internals.

Flow instrumentation for the charging pumps will be installed during the next refueling outage Refer to Interim Relief Request P-2. To avoid damaging these valves, they will not be disassembled during the current Unit 1 outage, but will be full flow tested when flow instrumentation is installed. They will be partial flow tested every quarter.

Interim Alternate Testing Proposed

These valves will be partial flow tested every three months. During the next refueling outage for Unit 1, the flow instrumentation will be installed and testing which complies with Section XI will proceed on a quarterly basis.

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SURRY POWER STATION UNITS 1 & 2
DISPOSITION OF IST SER ANOMALIES

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ATTACHMENT 1

SURRY POWER STATION UNITS 1 AND 2

ASME SECTION XI INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES

DISPOSITION OF IST PROGRAM ANOMALIES

IST PROGRAM ANOMALIES IDENTIFIED DURING THE NRC REVIEW

The disposition of each anomaly identified by the NRC, during their review of Virginia Electric and Power Company's Inservice Testing Program for Pumps and Valves, is documented below.

1. Section 4.1 (program development philosophy) of the licensee's IST program states "The requirements of Section XI are not interpreted as superseding or adding to any limiting condition for operation." The licensee's meaning is not apparent and this statement should be clarified. However, the following points should be noted: (a) 10 CFR 50.55(a)(5)(ii) states that if the IST program for a facility conflicts with the Technical Specifications, the licensee shall apply to the commission for amendment of the Technical Specifications to conform the Technical Specifications with the revised program, (b) though the licensee is not expected to violate Technical Specifications to perform Section XI testing, the Code requirements in excess of Technical Specifications do apply and should be performed, (c) Technical Specifications should be changed to conform to Section XI requirements unless specific relief from the Code requirements is granted, and (d) if Section XI testing requires a component to be declared inoperable, and the inoperability of this component results in entering a Limiting Condition for Operation, the Technical Specification Limiting Condition for Operation should be followed even if the Technical Specification operability requirements are less stringent.

   Response:

   The statement in Section 4.1 of the IST Program, "The requirements of Section XI are not interpreted as superseding or adding to any limiting condition for operation" was deleted. Surry Power Station conforms to the four points noted above. The updated Section 4 for Unit 1 is in Attachment 2 and the updated Section 4 for Unit 2 is in Attachment 3. Changes to the IST Program are highlighted by a bar in the right hand margin.

2. Section 4.2 (program implementation) of the licensee's IST program states, "Certain valves cannot be full-stroke exercised during normal operation following maintenance. If maintenance cannot be deferred to cold shutdown, then an engineering evaluation must be performed prior to the maintenance being performed to determine the effect on valve operability. If the evaluation shows the operability of the valve will not be affected, then no post maintenance testing will be required. A partial-stroke test will be performed if possible." Section XI, Paragraph IWV-3200, states, "When a valve or its control system has been replaced or repaired or has undergone maintenance (adjustment of stem packing, removal of the bonnet, stem assembly, or actuator, and disconnection of hydraulic or electrical lines are examples) that could affect its performance, and prior to the time it is returned to service, it shall be tested to demonstrate that the performance parameters which could be affected by the replacement, repair, or maintenance are within acceptable limits." If the maintenance could affect the performance of the valve (stroke time, leak rate, etc.) then post maintenance testing must be performed even if the licensee decides that the valve will still be operable. The licensee should change this statement to conform to the Code requirements.

Response:

The word "operability" was replaced by "performance" in Section 4.2. The new statement reads, "If maintenance cannot be deferred to cold shutdown, then an engineering evaluation must be performed prior to the maintenance being performed to determine the effect on valve performance. If the evaluation shows that the performance of the valve will not be affected, then no post maintenance testing will be required".

The intent of this paragraph is to describe the process for determining the applicability of Section XI, Paragraph IWV-3200 in cases where post maintenance testing cannot be performed before returning a component to service. The burden is on the engineer preparing the evaluation to determine that performance is not affected.

3. Relief has been requested for the following pumps because there is no installed instrumentation for the measurement of various test quantities. Relief may be granted provided the required instrumentation is installed during the next refueling outage.

RR No.	Pump Identification	Function	TER Section
P-2	1(2)-CH-P-1A,1B,1C	High head charging	3.2.1.1
P-3	1(2)-SI-P-1A,1B	Low head safety injection	3.4.1.1
P-4	1(2)-RS-P-2A,2B	Outside recirculation spray	3.5.1.1
P-6	1(2)-FW-P-3A,3B,2	Auxiliary feedwater	3.6.1.1
P-9	1(2)-CH-P-2C,2D	Boric acid transfer	3.3.1.1
*P-11	1-SW-P-1A,1B,1C	Service water	3.8.1.1

* Unit 1 only

Response:

Surry Power Station is experiencing difficulty in satisfying the commitment to upgrade the Section XI instrumentation before the end of the current Unit 1 outage. These delays result in part from the long lead times for instrument delivery.

The concern for meeting this commitment was voiced during the August 13, 1990 meeting with the NRC and reiterated in our letter to NRC dated September 21, 1990 (Serial No. 90-569). In this letter, it is stated, "In these cases, where materials become available to support this outage, the activities will be completed during this outage. If the activity is not completed during this outage, it will be accomplished either as a non-outage activity following this outage or during the next Surry Unit 1 refueling outage." The status of the instrumentation upgrade is detailed in Table 1. Revised relief requests (P-2, P-9, P-11, P-12) are being

provided to support operation of Unit 1 until the required instrumentation can be installed.

4. The NRC staff position is that valve disassembly and inspection can be used to verify check valve operability when full-stroke exercising by flow or by the other positive means allowed by IWV-3522 are not practicable. The NRC staff positions regarding disassembly and inspection are explained in detail in Generic Letter 89-04, "Guidance on Developing Acceptable Inservice Testing Programs." Relief may be granted for the listed valves in Relief Requests V-20, V-40, and V-41 provided the licensee complies with these staff positions. (Reference Sections 4.2.1.2, 4.3.1.2, and 4.4.2.2 of this report).

Response:

Relief Requests V-20(20), V-40(40) and V-41(41) for Units 1(2) refer to disassembly and inspection as an alternate means for verifying valve operability. Surry Power Station complies with the positions regarding disassembly and inspection as explained in Generic Letter 89-04.

One benefit of the instrumentation modifications discussed in Item 3 is that flow through the charging pump discharge recirculation line check valves (1(2)-CH-256, 265 and 274) will be measured, thus, disassembly will not be necessary as discussed in Relief Requests V-40(40). These 2 inch valves have seal welded bonnets. Cutting the seal weld has in the past resulted in damage to the valve internals. To avoid damaging these valves, they will not be disassembled during the current Unit 1 outage nor during the next scheduled outage for Unit 2 per Relief Requests V-40(40), but will be full flow tested when flow instrumentation is installed. Until the instrumentation is installed, these valves will be partial flow tested every quarter. Relief Request V-40 for Unit 2 is being withdrawn. The updated page for Relief Request V-40 for Unit 2 is included in Attachment 3. Additionally, an interim relief request, V-40 for Unit 1, is included in Attachment 4. This interim relief request is necessary because the charging pump flow instrumentation was not installed during this refueling outage.

5. The licensee has proposed, in valve relief requests V-5 and V-42, to disassemble and inspect valves to verify their closure capability. Relief may be granted provided the licensee follows the NRC staff guidance on disassembly and inspection in Generic Letter No. 89-04. (Reference Sections 4.2.1.1 and 4.7.1.1 of this report).

Response:

Relief Requests V-5(5) and V-42(42) for Units 1(2) refer to disassembly and inspection as an alternate means for verifying valve closure. Surry Power Station complies with the positions regarding disassembly and inspection as explained in Generic Letter 89-04.

6. In Valve Relief Request V-1, the licensee proposes that the main steam safety valves be tested in accordance with PTC-25.3-1976, Section 4.091(a)(2), and that all other safety and relief valves be tested in accordance with Section 4.091(c)(1). Section XI, Paragraph IWV-3512, states that safety and relief valve set points shall be tested in accordance with ASME PTC-25.3-1976, "Safety and Relief Valve Performance Test Codes." PTC-25.3-1976, Section 4.091(a)(2) is the test method for system testing to determine set pressure with calibrated hydraulic or pneumatic-assist equipment. PTC-25.3-1976, Section 4.091(c)(1) is the test method for bench testing to determine set pressure and valve leakage. Paragraph IWV-3512 further states that bench testing, or testing in place, with suitable hydraulic or pneumatic assist equipment is an acceptable method under PTC-25.3-1976. Since the licensee's proposed testing is specifically mentioned as being acceptable in the Code, relief is not required. (Reference Section 4.1.2.1 of this report).

Response:

Relief Requests V-1(1) for Units 1(2) indicate which portions of PTC-25.3-1976 (paragraphs 4.091 (a)(2) and 4.091(c)(1)) are applicable to relief valve testing at Surry Power Station. The intent of Relief Request V-1 was to ensure that portions of 25.3-1976 other than the two paragraphs mentioned in the relief request are not applied to the relief valve test program.

Surry Power Station is moving to implement the requirements of OM-1, which has been approved for use by the NRC. Therefore, Relief Request V-1 is being resubmitted to state that relief valve testing will meet the requirements of OM-1 instead of PTC-25.3-1976. Reference to PCT-25.3-1976 was also deleted from Section 4.2. OM-1 will be fully implemented during the next scheduled outage for Unit 2, which begins April 5, 1991.

Note that Surry Power Station Units 1 and 2 start the third inspection interval on December 12, 1992 and May 1, 1993, respectively. When the IST Programs are updated to the new interval, OM-1 will be the required standard for relief valve testing. The updated relief requests for Units 1 and 2 are in Attachments 2 and 3, respectively.

7. Valve Relief Request V-30 states that the following valves are adequately leak rate tested by Technical Specification requirements. These valves are reactor coolant system boundary isolation valves. The failure of these valves could result in a loss of coolant accident. However, since most of these valves are paired in series, the licensee's proposed testing would not demonstrate the leak tightness of each valve as required by the Code. The leak tight integrity of the second valve in the pair cannot be verified unless the first valve has failed or is leaking significantly, therefore, the proposed testing verifies only the leak tight integrity of each pair of valves. Although the Technical Specification requirements mentioned by the licensee do not verify the leak tight integrity of individual valves as required by the Code, system hydrostatic tests and monitoring the total RCS leakage does provide assurance of the leak tight integrity of the valve pairs at the RCS boundary. The licensee's proposed testing combined with the Technical Specification corrective action requirements for excessive leakage would provide some assurance of leak tight integrity. On this basis, the licensee may continue to monitor leakage and perform leak testing in accordance with their plant Technical Specifications until the NRR Inter-System Loss of Coolant Accident (ISLOCA) study is completed, and the results analyzed, to determine if further testing should be required. (Reference Section 4.1.1.1 of this report).

Valve	Function
1-RC-HCV-1556A,B,C 2-RC-HCV-2556A,B,C	Loop fill boundary valves
1(2)-SI-107,109 1(2)-SI-128,130 1(2)-SI-145,147	Accumulator discharge check valves
1(2)-SI-88,91 1(2)-SI-94,238 1(2)-SI-238,240	Combined safety injection isolation check valves to the RCS hot legs
1(2)-SI-235,236,237	High head safety injection isolation check valves to the RCS cold legs
1-RH-MOV-1700,1701 RCS 2-RH-MOS-2700,2701	RHR system suction valves from the
1-RH-MOV-1720A,1720B RCS 2-RH-MOV-2720A,2720B	RHR system discharge valves to the

Response:

No action is required at this time by Surry Power Station concerning leak testing of the valves identified in Relief Requests V-30(30) for Units 1(2). Further action may be required when the NRR Inter-System Loss of Coolant Accident (ISLOCA) study is completed and the results analyzed.

8. In Valve Relief Request V-39, the licensee proposes that containment isolation valves which cannot be individually leak rate tested be tested in groups, with leakage limits assigned to the group which are subject to the acceptance criteria of IWV-3426 and 3427. This test method should provide reasonable assurance of the leak-tight integrity of these valves as long as the assigned limiting leakage rate for each valve grouping is conservative considering the number and sizes of valves in the group. The assigned leakage rates should be based on the smallest valve in the group so that corrective actions are taken whenever the leak-tight integrity of any valve of that group is in question. However, using the licensee's methodology for determining group leakage rates, individual

valve leakage rates could be many times the leakage limit which would be appropriate for that valve, based on IWV-3426(b), before corrective action is required. In some valve groups, leakage through the smallest valve could be a factor of 10 greater than the individual valve leakage limit of IWV-3426(b) before corrective action is required. Significant degradation of the smallest valve could go undetected in a group of otherwise leak tight valves. The licensee should reevaluate this criteria in the light of the service history of these valve groups. The criteria established for these groups should ensure that no valve will become seriously degraded before corrective action is required. Relief may be granted provided the licensee reevaluates the group leakage limits based on the diameter of the smallest valve in each group as discussed above. (Reference Section 4.1.4.1 of this report).

Response:

Surry Power Station has reevaluated group leakage limits applied to the valves in Relief Requests V-39(39) for Units 1(2) to ensure that significant degradation of the smallest valve in a group will not go undetected. Based on past recent test results, new and more stringent leakage limits are being determined to ensure significant degradation of the smallest valve would not go undetected.

9. Valve Relief Request V-26 proposes that the following safety injection system accumulator discharge check valves be full flow tested on a sampling basis at a refueling outage frequency. This would allow the testing of each check valve no more than once every three refueling outage unless failure of one valve occurs during this time period. The licensee has neither demonstrated that this testing frequency would provide reasonable assurance of operational readiness nor that it would be burdensome to test all three sets of check valves each refueling outage. During a conference call with the licensee held on November 21, 1989, the licensee stated that they have not developed definitive acceptance criteria for their proposed testing. The licensee is currently working to demonstrate that the proposed testing is capable of detecting valve degradation, that the results of this test can be extrapolated to

demonstrate a valve's ability to pass design basis flow, and that the acceptance criteria to be adopted would provide reasonable assurance of operational readiness. Prior to the start of the next refueling outage, the licensee should demonstrate that their proposed testing would provide reasonable assurance of operational readiness or adopt another alternative which meets the criteria of Generic Letter NO. 89-04, Position 1 or Position 2. (Reference Section 4.4.1.1 of this report).

1(2)-SI-107	1(2)-SI-109	1(2)-SI-128
1(2)-SI-130	1(2)-SI-145	1(2)-SI-147

Response:

Surry Power Station may evaluate the use of nonintrusive monitoring techniques for verifying full disk travel of the SI accumulator discharge check valves described in Relief Requests V-26(26) for Units 1(2). If the evaluation is not performed or if the evaluation proves to be inconclusive, the valves will be disassembled and inspected per the requirements of Generic Letter 89-04. Relief Requests V-26(26) for Units 1(2) have been changed to indicate disassembly as an alternate testing method. The relief requests are attached.

10. Valve Relief Request V-27 proposes that the following safety injection system check valves to the reactor coolant system be exercised to the closed position in accordance with plant Technical Specifications. Relief may be granted from the Code exercising requirements for valves 1(2)-SI-79, 82, 85, 241, 242, and 243 to the closed position provided they are individually leak rate tested. Interim approval of the licensee's proposed alternative for verifying the closure capability of valves 1(2)-SI-88, 91, 94, 235, 237, 238, 239, and 240 for the leak rate testing requirements of Section XI, IWV-3420, is discussed in Section 4.1.1.1 of this report. (Reference Section 4.4.1.2 of this report).

Valve	Function
1(2)-SI-88,91,94,238,239,240	Combined safety injection isolation check valves to the RCS hot legs
1(2)-SI-235,236,237	High head safety injection isolation check valves to the RCS cold legs
1(2)-SI-241,242,243	Low head safety injection isolation check valves to the RCS cold legs
1(2)-SI-79,82,85	Combined safety injection isolation check valves to the RCS cold legs

Response:

Valves 1(2)-SI-79, 82, 85, 241, 242 and 243 in Relief Requests V-27(27) for Units 1(2) are individually leak rate tested. No action is required at this time by Surry Power Station concerning leak testing of valves 1(2)-SI-88, 91, 94, 235, 236, 237, 238, 239 and 240. Further action may be required when the NRR Inter-System Loss of Coolant Accident (ISLOCA) study is completed and the results analyzed. Note that Relief Request V-27 was resubmitted on November 7, 1990. The updated relief requests for Units 1(2) are attached.

11. Valve Relief Request V-28 proposes that valve 1(2)-SI-25, a charging pump suction check valve from the refueling water storage tank cross tie, be exempted from exercising to the closed position. Valve 1(2)-SI-25 has a safety function in the closed position to prevent diversion of flow when the other RWST is used as a source for the high head safety injection pumps. The licensee has not provided sufficient technical justification for their claim that performance of this testing would require draining one or both RWSTs. For this reason, and because the licensee has proposed no alternatives to the Code required testing, relief should not be granted. (Reference Section 4.5.1.1 of this report).

Response:

Valves 1(2)-SI-25 in Relief Requests V-28(28) for Units 1(2) will be disassembled and inspected every other refueling outage. There is only one valve in each sample group and per the guidelines of Generic Letter 89-04, these valves would have to be disassembled every refueling outage. However, disassembling these valves every outage represents excessive intrusive maintenance. If inspection results indicate degradation, the disassembly interval will be increased to once every refueling outage. Relief Requests V-28 (28) for Units 1 and 2 have been changed accordingly and are attached.

12. Valve Relief Request V-37 proposes that the following diesel generator air start solenoid valves be demonstrated operable monthly by verifying that the diesel generator starts. However, the only acceptance criteria proposed by the licensee for a successful test is that the diesel engine starts, which would provide no indication of valve degradation. Therefore, the licensee should add additional acceptance criteria to ensure that the proposed testing would provide a reasonable assurance of operational readiness. Measuring the diesel generator start time and assigning a maximum limiting start time for a satisfactory test could provide an indication of degradation if each bank is individually tested. This maximum start time should be less than or equal to the Technical Specification requirement. Relief may be granted provided the licensee's acceptance criteria for the proposed test is expanded to include a maximum limiting start time which is less than or equal to the Technical Specification limit. (Reference Section 4.9.1.1 of this report).

1-EG-SOV-100A	1-EG-SOV-100B	1-EG-SOV-200A
1-EG-SOV-200B	1-EG-SOV-300A	1-EG-SOV-300B

Response:

The time it takes the diesel to reach a predetermined RPM will be recorded and compared to an acceptance criterion. Relief Requests V-37(37) for Units 1(2) have been changed accordingly and are attached. Note that the phrase "stroke tested monthly" in the alternate testing section was changed to "stroke tested quarterly."

13. Cold Shutdown Justification CSV-19 for the following emergency boration system valves states: "Exercising these valves during power operation would allow the injection of boric acid into the reactor coolant system, which would upset the boron concentration in the primary plant water. There is a possibility of discharging an accumulator into the residual heat removal system (RHR) and disabling it. The accumulators are maintained at pressure above the normal operating or shutdown pressure of the RHR system. Opening of these valves would dump accumulator water into the RHR system. This will dilute the boron concentration of the accumulator as well as lower its level and pressure, which is a violation of Technical Specifications. Valves 1-CH-76, 92, 109, and 116 will be partial flow exercised every quarter." The first sentence, by itself, does not provide sufficient detail to justify cold shutdown testing. Exercising emergency boration line valves has no relation to safety injection accumulator pressure or level; nor would it affect the operability of the accumulators or the RHR system. For these reasons, this cold shutdown justification is unacceptable.

1-CH-MOV-1350	2-CH-MOV-2350	1(2)-CH-227
1-CH-76	1-CH-92	1-CH-109
1-CH-116		

Response:

Cold Shutdown Justification CSV-19 has been revised to provide a more detailed technical basis for when these valve should be exercised. To achieve full flow through valves 1(2)-CH-227 and 1-CH-76, 92, 109 and 116, the boric acid transfer pumps must be set at high speed, which could inject enough boric acid into the reactor coolant system to cause a reactor power transient. The motor operated valves 1-CH-MOV-1350 and 2-CH-MOV-2350 will be full stroke exercised, and the check valves 1(2)-CH-227 and 1-CH-76, 92, 109 and 116 will be partial stroke exercised every quarter with the pumps set on low speed when the boric acid concentration is above 100 ppm. During power operation and when the concentration of boric acid in the reactor coolant system is low, the addition of boric acid will produce an undesirable transient in reactor power. Low concentrations of boric acid occur near the end of the fuel

cycle. Cold Shutdown Justifications CSV-19(19) for Units 1(2) have been changed accordingly and are attached.

Boric acid transfer pump discharge check valves 1-CH-76, 92, 109 and 116 will be deleted from CSV-19 when the flow instrumentation discussed in Item 3 is installed. At this time, these valves will be full flow tested every quarter.

14. Cold Shutdown Justification CSV-20 for Unit 2 lists the primary grade water supply to the pressurizer relief tank as 2-RC-20 while the IST program valve table lists this valve as 2-RC-160. This cold shutdown justification also lists the instrument air containment isolation valves as 2-IA-864 and 939 while the valve table lists them as 2-IA-864 and 868. This discrepancy should be corrected.

Response:
The proper valve numbers are 2-RC-160, 2-IA-864 and 2-IA-868. Cold Shutdown Justification CSV-20 has been revised accordingly and is attached.

15. Relief Request V-21 provides the cold shutdown justification for not exercising valves 1(2)-SI-50, 1-SI-58, and 2-SI-327 to the closed position quarterly. Relief is not required to perform cold shutdown testing. Therefore, this portion of the licensee's relief request was not evaluated in Section 4.0 of this report. The licensee's justification for not testing these valves quarterly during power operation is inadequate. The licensee has stated that testing these valves to the closed position quarterly would require isolating the suction line to the low pressure safety injection pumps, which would require them to enter a Technical Specification LCO. However, the licensee currently exercises valves 1(2)-SI-MOV-1862A and B quarterly during power operation. Closing these valves isolates the suction piping for the low pressure safety injection pumps. Therefore, valves 1(2)-SI-50, 1-SI-58, and 2-SI-327 should be tested quarterly during power operation.

Response:

There are significant differences between back seat testing the check valves and stroking the motor operated valves in terms of test complexity and the period of time when the suction piping is isolated. Testing valves 1-SI-50 and 58 for Unit 1 and 2-SI-50 and 327 for Unit 2 to the closed position requires isolating the suction lines to the low head safety injection pumps, venting on the upstream side of the valve being tested, starting the pump on the other path, checking for leakage and then repeating the process for the other valve. This test can take up to a hour to complete and places the unit into a LCO per Technical Specification 3.3 if performed during normal operation. Testing valves 1-SI-MOV-1862A and B, and 2-SI-MOV-2862A and B isolates the suction piping for less than a minute for each test. Relief Requests V-21(21) for Units 1(2) have been changed accordingly and are attached.

TABLE 1

Status of ASME Section XI Instrumentation Identified

in Item 3 of the NRC's SER, for Surry Power Station Unit 1

Pump	Instrument	Status	Expected Completion	Outage Related
Charging Pumps				
1-CH-P-1A,B,C	Inlet Pressure	On Schedule	Current Outage	Yes
	Flow Rate	Delayed	Next Outage	Yes
Safety Injection Pumps				
1-SI-P-1A,B	Inlet pressure	On Schedule	Current Outage	Yes
Recirculation Spray Pumps				
1-RS-P-2A,B	Inlet Pressure	On Schedule	Current Outage	Yes
Auxiliary Feedwater Pumps				
1-FW-P-2	Flow Rate	On Schedule	Current Outage	Yes
1-FW-P-3A,B				
Boric Acid Transfer Pumps				
1-CH-P-2A,B	Inlet Pressure	Delayed	First Qtr 1991	No
	Flow Rate	Delayed	Next Outage	Yes
	Vibration	Completed	NA	
Emergency Service Water Pumps				
1SW-P-1A,B,C	Discharge Pressure	Delayed	First Qtr 1991	No
	Flow Rate* (Transmitter)	Delayed	First Qtr 1991	No
EDG Fuel Oil Pumps				
1-EE-P-1A,D	Inlet Pressure	On Schedule	Current Outage	No
	Discharge Pressure	On Schedule	Current Outage	No
	Flow Rate	On Schedule	Current Outage	No
	Vibration	Completed	NA	
1-EE-P-1F	Inlet Pressure	Delayed	First Qtr 1991	No
	Discharge Pressure	Delayed	First Qtr 1991	No
	Flow Rate	Delayed	First Qtr 1991	No
	Vibration	Completed	NA	

* The Flow elements are installed and the differential pressures are being measured and flow rates manually developed. The flow transmitters will be installed during the operating cycle.

ATTACHMENT 2

SURRY POWER STATION UNIT 1

ASME SECTION XI INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES

UPDATED PAGES FOR REVISION 4

4.0 VALVE INSERVICE TEST PROGRAM DESCRIPTION

4.1 PROGRAM DEVELOPMENT PHILOSOPHY

Surry Power Station Unit 1 is a Pressurized Water Reactor being operated in compliance with the ASME Boiler and Pressure Vessel Code. The Code requires periodic testing of certain safety related valves in order to verify their operability and physical integrity. The Surry Unit 1 Valve Inservice Test Program satisfies these requirements.

The program will detect potentially adverse changes in the mechanical condition of valves within the scope of Section XI, Subsection IWV of the Code. This includes all valves "which are required to perform a specific function in shutting down a reactor to the cold shutdown condition or in mitigating the consequences of an accident." It is important to note that the scope of ASME Section XI and the Surry Inservice Testing Program for its implementation includes many valves which are not required to operate to meet FSAR license condition of hot shutdown nor limiting conditions in the plant Technical Specifications. In these cases, the requirements of Section XI shall be met except where relief has been granted.

To generate the Surry Unit 1 Valve Program, ASME Class 1, 2 and 3 valves were analyzed to determine their required type and frequency of testing. The valves to be tested under Section XI, Subsection IWV commitments are listed by system and drawing in the Valve Test Tables.

Surry Unit 1 is committed to meeting the leak rate testing requirements of:

1) 10CFR50, Appendix J for containment isolation valves and

2) Section XI for other valves for which seat leakage is limited to a specific maximum amount (i.e. pressure isolation valves) unless relief is specifically requested from Section XI requirements.

Valves subject to leak testing per Appendix J will be tested to the requirements of Section XI, Paragraphs IWV-3426 and 3427. Appendix J satisfies the testing requirements of Section XI, Paragraphs IWV-3421 to 3425.

The Code recognizes that certain of its requirements may be impractical for a specific plant and contains provisions for requesting relief from impractical requirements.

The relief requests for the Valve Inservice Test Program identify testing impracticalities, provide technical basis for the request and propose alternate testing where warranted.

The stroke times of solenoid controlled, air operated valves is both extremely rapid and subject to considerable variation. Exception is taken to complying with stroke time variations defined by Paragraph IWV-3417(a).

Virginia Electric and Power Company is confident that the Surry Unit 1 Valve Inservice Test Program complies with the intent of the applicable codes, regulations and guidelines and that it will make a positive contribution to the safe operation of the plant.

4.2 PROGRAM IMPLEMENTATION

The Valve Inservice Test Program will be executed as part of the normal plant surveillance routine. Three types of tests will be conducted as part of the Valve Test Program:

1) Valve Operability Tests
2) Valve Leakage Tests
3) Safety Valve Tests

The Operability Tests will verify that: 1) the valve responds to control commands, 2) the valve stroke time is within specific limits and 3) remote position indication accurately reflects the observed valve position. Remote valve position indication will be verified every two years.

Fail safe valves will be tested by observing the valve operation upon loss of actuating power. In most cases, this can be accomplished using normal control circuits.

The following clarification shall apply to those valves which are scheduled to be exercised during cold shutdown:

> "Valve testing shall commence not later than 48 hours after reaching cold shutdown and continue until complete or unit is ready to return to power. Completion of the valve

testing is not a prerequisite to return to power. Any testing not completed at one cold shutdown should be performed during the subsequent scheduled cold shutdowns to meet the code specified testing frequency."

Valve Leakage Tests will verify that valves are leak tight in accordance with Appendix J or ASME Section XI. Relief and Safety valves are not required to be leak rate tested (IWV-3512) and are not included as valves to be leak tested.

Certain valves cannot be full stroke exercised during normal operation following maintenance. These valves are described in the relief rquests and cold shutdown justifications. If maintenance cannot be deferred to a shutdown condition, then an engineering evaluation must be performed prior to the maintenance to determine the effect of the maintenance on valve performance. If the evaluation shows that performance will not be affected, then no post maintenance testing will be required. A partial stroke test will be performed if possible.

4.3 PROGRAM ADMINISTRATION

The operations and engineering staffs at Surry Power Station are responsible for administration and execution of the Valve Inservice Test Program. The program was officially implemented on December 22, 1982 and governs valve testing for a 120 month period. Prior the to end of the 120 month period, the program will be reviewed and upgraded to assure continued compliance with 10CFR50.55a(g)(4). The program will be updated a minimum of at least once every 40 months or for a new system, relief request, etc.

4.4 VALVE INSERVICE TEST TABLES

The Valve Inservice Test Tables are the essence of the Valve Program to meet ASME Section XI, Subsection IWV requirements. The tables reflect the positions taken in support of the relief requests. To aid the reader in the interpretation of the tables, brief explanations of the table headings and abbreviations are provided.

1) Valve Number - Each valve in the plant has a unique "tag" number which identifies the system to which the equipment belongs and type of equipment.

2) Drawing Location - The specific coordinates of each valve are supplied to facilitate location of the valves on the flow diagrams provided.

3) Function - A brief description of the function of the valve.

4) Code Class - ASME Code Class of each valve as per 10 CFR 50.55a and Regulatory Guide 1.26.

NOTE: NC is for non-class valves.

5) Category - Categories are defined by ASME Section XI. Subsection IWV. Each valve has specific testing requirements which are determined by the category to which it belongs. Valves marked with an "E" are passive valves.

6) Size - Nominal pipe diameter to which valve connects is given in inches.

7) Valve Type - A brief description of the actuator and valve type.

The following abbreviations are used to describe actuator types. Valves may be actuated in more than one way.

MO - Motor Operated
AO - Pneumatic (Air Operated)
MAN - Manually Operated
SO - Electronic solenoid Operated Valves

8) Isolation Valve Type - Valves that are assigned a maximum leakage. The following abbreviations are used to describe the isolation valve types:

CIV - Containment Isolation Valve subject to Appendix J leakage testing.

PIV - Pressure Isolation Valve which protects low pressure safety related piping from RCS pressure.

RCL - Reactor Coolant Leakage Valve which is considered important for limiting RCS leakage per Technical Specification 3.1.C.

9) Test Position - The following abbreviations are used to describe normal valve positions to which the valves are tested (including the valve safety position):

O - Open
C - Closed
OC - Open and Closed

10) Test Required - Testing requirements identified for the valves are identified here.

ST - Stroke Times shall be measured per Section XI, Subsubarticle IWV-3410 or as modified by a specific relief request.

EV - Exercise Valve for operability at least once every 3 months per Section XI, Subsubarticle IWV-3410 or as modified by a specific relief request or cold shutdown justification.

LT - Leak Test shall be performed per Section XI, Subsubarticle IWV-3420 or as modified by specific relief request.

CV - Check Valves shall be exercised at least once every 3 months per section XI, Subsubarticle IWV-3520 or as modified by a specific relief request or cold shutdown justification.

VP - Valve Position Indication Verification shall be verified per Section XI, Subsubarticle IWV-3300 or as modified by a specific relief request.

SP - Set points of safety and relief valves shall be tested per Section IX, Subsubarticle IWV-3510 or as modified by a specific relief request.

FS - Valves with fail-safe actuators shall be tested by observing the operation of the valves upon loss of the actuator power at least once every 3 months per Section XI, Subsubarticle IWV-3415 or as modified by a specific relief request or cold shutdown justification.

RELIEF REQUEST V-1

System : Various

Valve(s): All safety and relief valves

Category:

Class :

Function:

Section XI Code Requirement
For Which Relief Is Requested

Safety and relief valve setpoints are tested in accordance with PTC-25.3-1976 as directed by IWV-3512.

Basis For Request

The American National Standard, ANSI/ASME OM-1 - 1981, Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices, is approved for use in the 1986 Edition of ASME Section XI, Subsection IWV. OM-1 represents current industry practices for testing relief valves and is a better standard for setpoint testing than PTC-25.3-1976.

Alternate Testing Proposed

Safety and relief valves will be tested in accordance with ANSI/ASME OM-1 - 1981.

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RELIEF REQUEST V-21

System : Safety Injection

Valve(s): Valves affected by this request are identified in Table F.

Category:

Class :

Function:

Section XI Code Requirement
For Which Relief Is Requested

Exercise valves every three months.

Basis For Request

These valves cannot be full stroke exercised during plant power operation. The only full flow path is into the Reactor Coolant System and Low Head Safety Injection pumps cannot overcome Reactor Coolant System operating pressure. These valves will be partially stroked every three months through the pump recirculation line. During cold shutdown, the Reactor Coolant System pressure still prevents full flow testing of the check valve. During cold shutdown, the charging flow could cause an overpressurization condition.

Testing valves 1-SI-50 and 58 to the closed position requires isolating the suction lines to the low head safety injection pumps, venting on the upstream side of the valve being tested, starting the pump on the other path, checking for leakage and then repeating the process for the other valve. This test can take up to a hour to complete and places the unit into a LCO per Technical Specification 3.3 if performed during normal operation.

Alternate Testing Proposed

These valves will be partially stroked every three months and full stroked every refueling.

Valves 1-SI-50 and 58 will be tested to the closed position every cold shutdown.

RELIEF REQUEST V-21 (Cont.)
TABLE F

Valve	Category	Class	Function
1-SI-46A,B	C	2	Low Head Safety Injection Pump Suction from Refueling Water Storage Tank Check
1-SI-58 1-SI-50	C	2	Low Head Safety Injection Pump Discharge Check

RELIEF REQUEST V-26

System : Safety Injection

Valve(s): 1-SI-107 1-SI-109
1-SI-128 1-SI-130
1-SI-145 1-SI-147

Category: AC

Class : 1

Function: Accumulator Discharge Check

Section XI Code Requirement
For Which Relief Is Requested

Exercise valves every three months.

Basis For Request

These valves cannot be partial or full flow tested during normal operation because the accumulator pressure (600 to 650 psig) is below Reactor Coolant System pressure and the injection of borated water would upset the reactor coolant chemistry. During cold shutdown, the RCS pressure still prevents full flow testing.

To achieve full flow through the valves during reactor refueling, the accumulator would have to be discharged from an initial pressure of 600 psig. Discharging the accumulator from this pressure would stress the piping system and inject nitrogen into the RCS. Nitrogen in the RCS has been linked to gas binding of the RHR pumps.

Alternate Testing Proposed

To verify that these valves will stroke to the open position, they will be placed into two groups and one valve from each group will be disassembled and inspected every refueling outage. Valves 1-SI-130 and 147 are in one group and Valves 1-SI-107, 109, 128 and 145 are in the other group. Because 1-SI-130 and 147 are downstream from where RHR connects to the SI line, they experience different service conditions then the other valves. These valves will be partial flow tested every reactor refueling.

These valves are confirmed closed by monitoring seat leakage from each valve. The leakage is collected in a common header, measured and compared to the criteria in Technical Specification 3.1.C.

Note: The updated Revision 4 alternate method for testing to the open position conforms to Generic Letter 89-04, Position 2.

RELIEF REQUEST V-27

System : Safety Injection

Valve(s): Valves affected by this request are identified in Table G.

Category:

Class :

Function:

Section XI Code Requirement
For Which Relief Is Requested

Exercise valves every three months.

Basis For Request

The valves on the high head injection lines cannot be partial or full stroke exercised during power operation because flow through these valves would thermal shock the injection system and cause unnecessary plant transients. Flow cannot be established in the low head injection lines during power operation. During cold shutdown, the Reactor Coolant System pressure still prevents full design flow. Also, a partial or full stroke test could cause an overpressurization of the Reactor Coolant System and force a safety system to function.

To verify closure, valves 1-SI-79, 82, 85, 241, 242 and 243 must be vented upstream and a leakage test performed. Per Technical Specification Table 4.1-2A, periodic leakage testing on each valve shall be accomplished prior to entering power operation condition after every time the plant is placed in the cold shutdown condition for refueling and after each time the plant is placed in cold shutdown condition for 72 hours if testing has not been accomplished in the proceeding 9 months. No significant increase in safety will be realized by performing the leakage tests every cold shutdown.

Alternate Testing Proposed

There is no installed instrumentation that can measure individual flow rates for Valves 1-SI-79, 82, 85, 88, 91, 94, 238, 239, 240, 241, 242 and 243. These 12 valves will be divided into four groups and one valve from each group will be disassembled and inspected every reactor refueling. The remaining valves will be full stroke exercised using flow every reactor refueling.

Valves 1-SI-79, 82, 85, 241, 242 and 243 will be tested to the closed position per Technical Specification Table 4.1-2A.

Valves 1-SI-88, 91, 94, 235, 236, 237, 238, 239 and 240 are confirmed closed by monitoring leakage from the Reactor Coolant System per Technical Specifications 3.1.C and 4.3. Individual valve verification to the closed position is not possible with the current line configurations.

TABLE G

Valve	Category	Class	Function
1-SI-88, 91 1-SI-94, 238 1-SI-239, 240	AC	1	Safety Injection to RCS Hot Legs
1-SI-235 1-SI-236 1-SI-237	AC	1	High Head Safety Injection to RCS Cold Legs
1-SI-241 1-SI-242 1-SI-243	AC	1	Low Head Safety Injection to RCS Cold Legs
1-SI-224, 225 1-SI-226, 227	C	2	High Safety Injection Check Valves at Containment Penetrations
1-SI-228, 229	C	2	Low Head Safety Injection Check Valves at Containment Penetrations
1-SI-79, 82, 85	AC	1	Safety Injection to RCS Cold Legs

Note: The Updated Revision 4 alternate method for testing Valves 1-SI-79, 82, 85, 88, 91, 94, 238, 239, 240, 241, 242 and 243 to the open position conforms to Generic Letter 89-04, Position 2.

RELIEF REQUEST V-28

System : RWST Cross Tie

Valve(s): 1-SI-25
1-SI-410

Category: C

Class : 2

Function: Charging Pump Suction from RWST Cross Tie

Section XI Code Requirement
For Which Relief Is Requested

Exercise valves for operability every three months.

Basis For Relief

Exercising these valves during power operation would require the charging pump suctions to be aligned with the refueling water storage tank. This would cause a sudden increase in reactor coolant boron inventory.

Full flow for the charging system can only be established during reactor refueling when the RCS is depressurized.

Valve 1-SI-25 must close to preserve inventory from the Unit 2 RWST when the cross tie lines are opened. There are no vents or pressure instrumentation upstream of the valve, therefore, the valve cannot be backseat tested with flow.

Alternate Testing Proposed

These valves will partial flow tested during every cold shutdown and full flow tested during every reactor refueling.

Valve 1-SI-25 will be disassembled and inspected every other refueling outage to verify valve closure. Per the guidelines of Generic Letter 89-04, this valve is the only one in the sample group and is therefore subject to disassembly every outage. However, disassembling this valve every outage represents excessive intrusive maintenance. If inspection results indicate degradation, the disassembly interval will be increased to once every refueling outage.

Note: The updated Revision 4 alternate method for testing Valve 1-SI-25 to the closed position does not conform to Generic Letter 89-04.

RELIEF REQUEST V-37

System : EG

Valve(s) : 1-EG-SOV-100A
1-EG-SOV-100B
3-EG-SOV-300A
3-EG-SOV-300B

Category : B

Class : NC

Function: Diesel Air Start System Solenoid Valves

Section XI Code Requirement
For Which Relief Is Requested

Section XI, IWV-3413 "Power Operated Valves"

Basis For Request

These valves have actuation times considerably under a second and there is no visual reference on the solenoid valve when it has stroked, therefore, the stroke time cannot be measured.

Alternate Testing Proposed

These solenoid valves will be stroke tested quarterly by observing that the solenoid valves perform their intended function, which is to start the diesel engines. Adequate performance of the valves will be verified by recording the time it takes for the diesel engines to reach a predetermined RPM and comparing the time to an acceptance criterion.

Also, the failure of these valves to open will promptly give a diesel engine trouble alarm. Further investigation would identify problems with the operability of these valves.

COLD SHUTDOWN JUSTIFICATION CSV-19

System : Chemical and Volume Control

Valve(s): 1-CH-MOV-1350 1-CH-76
1-CH-227 1-CH-92

Category: B (1-CH-MOV-1350) and C (1-CH-76, 92 and 227)

Class : 2

Function: Emergency Boration Line Isolation Valves

Cold Shutdown Justification

To achieve full flow through Valves 1-CH-76, 92 and 227, the boric acid transfer pumps must be set at high speed, which could inject enough boric acid into the reactor coolant system to cause a reactor power transient. Under normal plant operating conditions or when the plant is shutdown, Valve 1-CH-MOV-1350 can be full stroke exercised and Valves 1-CH-76, 92 and 227 can be part stroked exercised with the boric acid transfer pumps set on low speed to minimize the amount of boric acid injected into the reactor coolant system. However, during power operation when the concentration of boric acid in the reactor coolant system is low, the addition of boric acid will produce an undesirable transient in reactor power. Low concentrations of boric acid occur near the end of the fuel cycle.

Valve 1-CH-MOV-1350 will be full stroke exercised and Valves 1-CH-76, 92 and 227 will be part stroked exercised every quarter during normal operation when the reactor coolant boric acid concentration is above 100 ppm. Valves 1-CH-76, 92 and 227 will be full stroked exercised every cold shutdown.

ATTACHMENT 3

SURRY POWER STATION UNIT 2

ASME SECTION XI INSERVICE TESTING PROGRAM FOR PUMPS AND VALVES

UPDATED PAGES FOR REVISION 2

4.0 VALVE INSERVICE TEST PROGRAM DESCRIPTION

4.1 PROGRAM DEVELOPMENT PHILOSOPHY

Surry Power Station Unit 2 is a Pressurized Water Reactor being operated in compliance with the ASME Boiler and Pressure Vessel Code. The Code requires periodic testing of certain safety related valves in order to verify their operability and physical integrity. The Surry Unit 2 Valve Inservice Test Program satisfies these requirements.

The program will detect potentially adverse changes in the mechanical condition of valves within the scope of Section XI, Subsection IWV of the Code. This includes all valves "which are required to perform a specific function in shutting down a reactor to the cold shutdown condition or in mitigating the consequences of an accident." It is important to note that the scope of ASME Section XI and the Surry Inservice Testing Program for its implementation includes many valves which are not required to operate to meet FSAR license condition of hot shutdown nor limiting conditions in the plant Technical Specifications. In these cases, the requirements of Section XI shall be met except where relief has been granted.

To generate the Surry Unit 2 Valve Program, ASME Class 1, 2 and 3 valves were analyzed to determine their required type and frequency of testing. The valves to be tested under Section XI, Subsection IWV commitments are listed by system and drawing in the Valve Test Tables.

Surry Unit 2 is committed to meeting the leak rate testing requirements of:

1) 10CFR50, Appendix J for containment isolation valves and

2) Section XI for other valves for which seat leakage is limited to a specific maximum amount (i.e. pressure isolation valves) unless relief is specifically requested from Section XI requirements.

Valves subject to leak testing per Appendix J will be tested to the requirements of Section XI, Paragraphs IWV-3426 and 3427. Appendix J satisfies the testing requirements of Section XI, Paragraphs IWV-3421 to 3425.

The Code recognizes that certain of its requirements may be impractical for a specific plant and contains provisions for requesting relief from impractical requirements.

The relief requests for the Valve Inservice Test Program identify testing impracticalities, provide technical basis for the request and propose alternate testing where warranted.

The stroke times of solenoid controlled, air operated valves is both extremely rapid and subject to considerable variation. Exception is taken to complying with stroke time variations defined by Paragraph IWV-3417(a).

Virginia Electric and Power Company is confident that the Surry Unit 2 Valve Inservice Test Program complies with the intent of the applicable codes, regulations and guidelines and that it will make a positive contribution to the safe operation of the plant.

4.2 PROGRAM IMPLEMENTATION

The Valve Inservice Test Program will be executed as part of the normal plant surveillance routine. Three types of tests will be conducted as part of the Valve Test Program:

1) Valve Operability Tests
2) Valve Leakage Tests
3) Safety Valve Tests

The Operability Tests will verify that: 1) the valve responds to control commands, 2) the valve stroke time is within specific limits and 3) remote position indication accurately reflects the observed valve position. Remote valve position indication will be verified every two years.

Fail safe valves will be tested by observing the valve operation upon loss of actuating power. In most cases, this can be accomplished using normal control circuits.

The following clarification shall apply to those valves which are scheduled to be exercised during cold shutdown:

> "Valve testing shall commence not later than 48 hours after reaching cold shutdown and continue until complete or unit is ready to return to power. Completion of the valve

testing is not a prerequisite to return to power. Any testing not completed at one cold shutdown should be performed during the subsequent scheduled cold shutdowns to meet the code specified testing frequency."

Valve Leakage Tests will verify that valves are leak tight in accordance with Appendix J or ASME Section XI. Relief and Safety valves are not required to be leak rate tested (IWV-3512) and are not included as valves to be leak tested.

Certain valves cannot be full stroke exercised during normal operation following maintenance. These valves are described in the relief rquests and cold shutdown justifications. If maintenance cannot be deferred to a shutdown condition, then an engineering evaluation must be performed prior to the maintenance to determine the effect of the maintenance on valve performance. If the evaluation shows that performance will not be affected, then no post maintenance testing will be required. A partial stroke test will be performed if possible.

4.3 PROGRAM ADMINISTRATION

The operations and engineering staffs at Surry Power Station are responsible for administration and execution of the Valve Inservice Test Program. The program was officially implemented on December 22, 1982 and governs valve testing for a 120 month period. Prior the to end of the 120 month period, the program will be reviewed and upgraded to assure continued compliance with 10CFR50.55a(g)(4). The program will be updated a minimum of at least once every 40 months or for a new system, relief request, etc.

4.4 VALVE INSERVICE TEST TABLES

The Valve Inservice Test Tables are the essence of the Valve Program to meet ASME Section XI, Subsection IWV requirements. The tables reflect the positions taken in support of the relief requests. To aid the reader in the interpretation of the tables, brief explanations of the table headings and abbreviations are provided.

1) Valve Number - Each valve in the plant has a unique "tag" number which identifies the system to which the equipment belongs and type of equipment.

2) Drawing Location - The specific coordinates of each valve are supplied to facilitate location of the valves on the flow diagrams provided.

3) Function - A brief description of the function of the valve.

4) Code Class - ASME Code Class of each valve as per 10 CFR 50.55a and Regulatory Guide 1.26.

NOTE: NC is for non-class valves.

5) Category - Categories are defined by ASME Section XI. Subsection IWV. Each valve has specific testing requirements which are determined by the category to which it belongs. Valves marked with an "E" are passive valves.

6) Size - Nominal pipe diameter to which valve connects is given in inches.

7) Valve Type - A brief description of the actuator and valve type.

The following abbreviations are used to describe actuator types. Valves may be actuated in more than one way.

MO - Motor Operated
AO - Pneumatic (Air Operated)
MAN - Manually Operated
SO - Electronic solenoid Operated Valves

8) Isolation Valve Type - Valves that are assigned a maximum leakage. The following abbreviations are used to describe the isolation valve types:

CIV - Containment Isolation Valve subject to Appendix J leakage testing.

PIV - Pressure Isolation Valve which protects low pressure safety related piping from RCS pressure.

RCL - Reactor Coolant Leakage Valve which is considered important for limiting RCS leakage per Technical Specification 3.1.C.

9) Test Position - The following abbreviations are used to describe normal valve positions to which the valves are tested (including the valve safety position):

O - Open
C - Closed
OC - Open and Closed

10) Test Required - Testing requirements identified for the valves are identified here.

ST - Stroke Times shall be measured per Section XI, Subsubarticle IWV-3410 or as modified by a specific relief request.

EV - Exercise Valve for operability at least once every 3 months per Section XI, Subsubarticle IWV-3410 or as modified by a specific relief request or cold shutdown justification.

LT - Leak Test shall be performed per Section XI, Subsubarticle IWV-3420 or as modified by specific relief request.

CV - Check Valves shall be exercised at least once every 3 months per section XI, Subsubarticle IWV-3520 or as modified by a specific relief request or cold shutdown justification.

VP - Valve Position Indication Verification shall be verified per Section XI, Subsubarticle IWV-3300 or as modified by a specific relief request.

SP - Set points of safety and relief valves shall be tested per Section IX, Subsubarticle IWV-3510 or as modified by a specific relief request.

FS - Valves with fail-safe actuators shall be tested by observing the operation of the valves upon loss of the actuator power at least once every 3 months per Section XI, Subsubarticle IWV-3415 or as modified by a specific relief request or cold shutdown justification.

RELIEF REQUEST V-1

System : Various

Valve(s): All safety and relief valves

Category:

Class :

Function:

Section XI Code Requirement
For Which Relief Is Requested

Safety and relief valve setpoints are tested in accordance with PTC-25.3-1976 as directed by IWV-3512.

Basis For Request

The American National Standard, ANSI/ASME OM-1 - 1981, Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices, is approved for use in the 1986 Edition of ASME Section XI, Subsection IWV. OM-1 represents current industry practices for testing relief valves and is a better standard for setpoint testing than PTC-25.3-1976.

Alternate Testing Proposed

Safety and relief valves will be tested in accordance with ANSI/ASME OM-1 - 1981.

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RELIEF REQUEST V-21

System : Safety Injection

Valve(s): Valves affected by this request are identified in Table F.

Category:

Class :

Function:

Section XI Code Requirement
For Which Relief Is Requested

Exercise valves every three months.

Basis For Request

These valves cannot be full stroke exercised during plant power operation. The only full flow path is into the Reactor Coolant System and Low Head Safety Injection pumps cannot overcome Reactor Coolant System operating pressure. These valves will be partially stroked every three months through the pump recirculation line. During cold shutdown, the Reactor Coolant System pressure still prevents full flow testing of the check valve. During cold shutdown, the charging flow could cause an overpressurization condition.

Testing valves 2-SI-50 and 327 to the closed position requires isolating the suction lines to the low head safety injection pumps, venting on the upstream side of the valve being tested, starting the pump on the other path, checking for leakage and then repeating the process for the other valve. This test can take up to a hour to complete and places the unit into a LCO per Technical Specification 3.3 if performed during normal operation.

Alternate Testing Proposed

These valves will be partially stroked every three months and full stroked every refueling.

Valves 2-SI-50 and 327 will be tested to the closed position every cold shutdown.

RELIEF REQUEST V-21 (Cont.)
TABLE F

Valve	Category	Class	Function
2-SI-46A,B	C	2	Low Head Safety Injection Pump Suction from Refueling Water Storage Tank Check
2-SI-50 2-SI-327	C	2	Low Head Safety Injection Pump Discharge Check

RELIEF REQUEST V-26

System : Safety Injection

Valve(s): 2-SI-107 2-SI-109
2-SI-128 2-SI-130
2-SI-145 2-SI-147

Category: AC

Class : 1

Function: Accumulator Discharge Check

Section XI Code Requirement
For Which Relief Is Requested

Exercise valves every three months.

Basis For Request

These valves cannot be partial or full flow tested during normal operation because the accumulator pressure (600 to 650 psig) is below Reactor Coolant System pressure and the injection of borated water would upset the reactor coolant chemistry. During cold shutdown, the RCS pressure still prevents full flow testing.

To achieve full flow through the valves during reactor refueling, the accumulator would have to be discharged from an initial pressure of 600 psig. Discharging the accumulator from this pressure would stress the piping system and inject nitrogen into the RCS. Nitrogen in the RCS has been linked to gas binding of the RHR pumps.

Alternate Testing Proposed

To verify that these valves will stroke to the open position, they will be placed into two groups and one valve from each group will be disassembled and inspected every refueling outage. Valves 2-SI-130 and 147 are in one group and Valves 2-SI-107, 109, 128 and 145 are in the other group. Because 2-SI-130 and 147 are downstream from where RHR connects to the SI line, they experience different service conditions then the other valves. These valves will be partial flow tested every reactor refueling.

These valves are confirmed closed by monitoring seat leakage from each valve. The leakage is collected in a common header, measured and compared to the criteria in Technical Specification 3.1.C.

Note: The updated Revision 4 alternate method for testing to the open position conforms to Generic Letter 89-04, Position 2.

RELIEF REQUEST V-27

System : Safety Injection

Valve(s): Valves affected by this request are identified in Table G.

Category:

Class :

Function:

Section XI Code Requirement
For Which Relief Is Requested

Exercise valves every three months.

Basis For Request

The valves on the high head injection lines cannot be partial or full stroke exercised during power operation because flow through these valves would thermal shock the injection system and cause unnecessary plant transients. Flow cannot be established in the low head injection lines during power operation. During cold shutdown, the Reactor Coolant System pressure still prevents full design flow. Also, a partial or full stroke test could cause an overpressurization of the Reactor Coolant System and force a safety system to function.

To verify closure, valves 2-SI-79, 82, 85, 241, 242 and 243 must be vented upstream and a leakage test performed. Per Technical Specification Table 4.1-2A, periodic leakage testing on each valve shall be accomplished prior to entering power operation condition after every time the plant is placed in the cold shutdown condition for refueling and after each time the plant is placed in cold shutdown condition for 72 hours if testing has not been accomplished in the proceeding 9 months. No significant increase in safety will be realized by performing the leakage tests every cold shutdown.

Alternate Testing Proposed

There is no installed instrumentation that can measure individual flow rates for Valves 2-SI-79, 82, 85, 88, 91, 94, 238, 239, 240, 241, 242 and 243. These 12 valves will be divided into four groups and one valve from each group will be disassembled and inspected every reactor refueling. The remaining valves will be full stroke exercised using flow every reactor refueling.

Valves 2-SI-79, 82, 85, 241, 242 and 243 will be tested to the closed position per Technical Specification Table 4.1-2A.

Valves 2-SI-88, 91, 94, 235, 236, 237, 238, 239 and 240 are confirmed closed by monitoring leakage from the Reactor Coolant System per Technical Specifications 3.1.C and 4.3. Individual valve verification to the closed position is not possible with the current line configurations.

TABLE G

Valve	Category	Class	Function
2-SI-88, 91 2-SI-94, 238 2-SI-239, 240	AC	1	Safety Injection to RCS Hot Legs
2-SI-235 2-SI-236 2-SI-237	AC	1	High Head Safety Injection to RCS Cold Legs
2-SI-241 2-SI-242 2-SI-243	AC	1	Low Head Safety Injection to RCS Cold Legs
2-SI-224, 225 2-SI-226, 227	C	2	High Head Safety Injection Check Valves at Containment Penetrations
2-SI-228, 229	C	2	Low Head Safety Injection Check Valves at Containment Penetrations
2-SI-79, 82, 85	AC	1	Safety Injection to RCS Cold Legs

Note: The Updated Revision 4 alternate method for testing Valves 2-SI-79, 82, 85, 88, 91, 94, 238, 239, 240, 241, 242 and 243 to the open position conforms to Generic Letter 89-04, Position 2.

RELIEF REQUEST V-28

System : RWST Cross Tie

Valve(s): 2-SI-25
2-SI-400

Category: C

Class : 2

Function: Charging Pump Suction from RWST Cross Tie

Section XI Code Requirement
For Which Relief Is Requested

Exercise valves for operability every three months.

Basis For Relief

Exercising these valves during power operation would require the charging pump suctions to be aligned with the refueling water storage tank. This would cause a sudden increase in reactor coolant boron inventory.

Full flow for the charging system can only be established during reactor refueling when the RCS is depressurized.

Valve 2-SI-25 must close to preserve inventory from the Unit 1 RWST when the cross tie lines are opened. There are no vents or pressure instrumentation upstream of the valve, therefore, the valve cannot be backseat tested with flow.

Alternate Testing Proposed

These valves will partial flow tested during every cold shutdown and full flow tested during every reactor refueling.

Valve 2-SI-25 will be disassembled and inspected every other refueling outage to verify valve closure. Per the guidelines of Generic Letter 89-04, this valve is the only one in the sample group and is therefore subject to disassembly every outage. However, disassembling this valve every outage represents excessive intrusive maintenance. If inspection results indicate degradation, the disassembly interval will be increased to once every refueling outage.

Note: The updated Revision 4 alternate method for testing Valve 2-SI-25 to the closed position does not conform to Generic Letter 89-04.

RELIEF REQUEST V-37

System : EG

Valve(s) : 2-EG-SOV-200A
2-EG-SOV-200B

Category : B

Class : NC

Function: Diesel Air Start System Solenoid Valves

Section XI Code Requirement
For Which Relief Is Requested

Section XI, IWV-3413 "Power Operated Valves"

Basis For Request

These valves have actuation times considerably under a second and there is no visual reference on the solenoid valve when it has stroked, therefore, the stroke time cannot be measured.

Alternate Testing Proposed

These solenoid valves will be stroke tested quarterly by observing that the solenoid valves perform their intended function, which is to start the diesel engines. Adequate performance of the valves will be verified by recording the time it takes for the diesel engines to reach a predetermined RPM and comparing the time to an acceptance criterion.

Also, the failure of these valves to open will promptly give a diesel engine trouble alarm. Further investigation would identify problems with the operability of these valves.

RELIEF REQUEST V-40

Relief Request Withdrawn

COLD SHUTDOWN JUSTIFICATION CSV-19

System : Chemical and Volume Control

Valve(s): 2-CH-MOV-2350 1-CH-109
2-CH-227 1-CH-116

Category: B (2-CH-MOV-2350) and C (1-CH-109, 116, and 2-CH-227)

Class : 2

Function: Emergency Boration Line Isolation Valves

Cold Shutdown Justification

To achieve full flow through Valves 1-CH-109 and 116, and 2-CH-227, the boric acid transfer pumps must be set at high speed, which could inject enough boric acid into the reactor coolant system to cause a reactor power transient. Under normal plant operating conditions or when the plant is shutdown, Valve 2-CH-MOV-1350 can be full stroke exercised and Valves 1-CH-109 and 116, and 2-CH-227 can be part stroked exercised with the boric acid transfer pumps set on low speed to minimize the amount of boric acid injected into the reactor coolant system. However, during power operation when the concentration of boric acid in the reactor coolant system is low, the addition of boric acid will produce an undesirable transient in reactor power. Low concentrations of boric acid occur near the end of the fuel cycle.

Valve 1-CH-MOV-1350 will be full stroke exercised and Valves 1-CH-109 and 116, and 2-CH-227 will be part stroked exercised every quarter during normal operation when the reactor coolant boric acid concentration is above 100 ppm. Valves 1-CH-109 and 116, and 2-CH-227 will be full stroked exercised every cold shutdown.

COLD SHUTDOWN JUSTIFICATION CSV-20

System : Various

Valve(s): Valves affected by this justification are identified by Table D.

Category:

Class :

Function:

Cold Shutdown Justification

These check valves must close for isolation. The only method to verify valve closure is to perform a local leak rate test. Because the valves are located inside containment, a local test cannot be performed during normal operation.

COLD SHUTDOWN JUSTIFICATION CSV-20 (Cont'd)
TABLE D

Valve	Category	Class	Function
2-IA-864 2-IA-868	AC	2	Instrument Air Containment Isolation
2-CH-309	AC	2	Normal Charging Containment Isolation
2-RC-160	AC	2	Primary Grade Water to Pressurizer Relief Tank, Containment Isolation
2-RM-3	AC	2	Containment Isolation on Monitor Return Line
2-SI-234	AC	2	Nitrogen Accumulators N_2 Supply, Containment Isolation