May 2, 2003

Mr. James J. Sheppard
President and Chief Executive Officer
STP Nuclear Operating Company
South Texas Project Electric
Generating Station
P. O. Box 289
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT (STP), UNITS 1 AND 2 - EVALUATION OF RELIEF REQUESTS RELATED TO THE SECOND 10-YEAR INSERVICE TESTING PROGRAM (TAC NOS. MB2136 AND MB2137)

Dear Mr. Sheppard:

By letter dated May 21, 2001, you submitted relief requests for the second 10-year inservice testing program in lieu of requirements in Section XI of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the Code) and applicable addenda. The NRC staff concludes that your proposed alternatives as specified in Valve Relief Requests VRR-01, VRR-02, and Pump Relief Request, PRR-01, are authorized pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50.55a(a)(3)(ii), "Codes and standards," on the basis that compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The staff concludes that your proposed alternative testing will provide reasonable assurance of operational readiness of the valves. The alternatives proposed in the valve Relief Request VRR-03 and Pump Relief Request PRR-02 are authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that they provide an acceptable level of quality and safety. In addition, in its review of the refueling outage justifications, the NRC staff identified one issue that requires NRC approval. ROJ-03 is approved pursuant to 10 CFR 50.55a(f)(4)(iv) because ROJ-03 is using a portion of the Code from a later Edition/Addenda than the Code of record. The enclosure contains the staff's evaluation. This does not contain an evaluation of "STP, Units 1 and 2 Risk-Informed Inservice Testing Program for Pumps and Valves" which is still under review.

Sincerely,

/RA/

Robert A. Gramm, Chief, Section 1
Project Directorate IV
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF RELATED TO SECOND 10-YEAR INTERVAL

INSERVICE TESTING PROGRAM

STP NUCLEAR OPERATING COMPANY, ET AL.

SOUTH TEXAS PROJECT, UNITS 1 AND 2

DOCKET NOS. 50-498 AND 50-499

1.0 INTRODUCTION

By letter dated May 21, 2001, the South Texas Project Nuclear Operating Company (STPNOC), the licensee, proposed several alternatives to the inservice testing (IST) requirements of Section XI of the American Society of Mechanical Engineers (ASME) Code for the South Texas Project Electric Generating Station (STP), Units 1 and 2 related to its second 10-year IST program. The program included Relief Requests VRR-01, VRR-02, VRR-03, PRR-01 and PRR-2, and refueling outage justification ROJ-03.

The NRC's findings with respect to authorizing alternatives and granting the IST program relief requests are given below.

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50.55a, "Codes and Standards," requires that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (the Code) and applicable addenda, except where alternatives have been authorized or relief has been requested by the licensee and granted by the Commission pursuant to Sections (a)(3)(i), (a)(3)(ii), or (f)(6)(i) of 10 CFR 50.55a. In proposing alternatives or requesting relief, the licensee must demonstrate that: (1) the proposed alternatives provide an acceptable level of quality and safety; (2) compliance would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety; or (3) conformance is impractical for the facility. The regulation at 10 CFR 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making necessary findings. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to Code requirements which are acceptable. Further guidance is given in GL 89-04, Supplement 1, and NUREG-1482, "Guidelines for Inservice Testing at Nuclear Power Plants."

Subsection IWV of the 1989 Edition provides the requirements for IST of valves and references Part 10 of the American National Standards Institute (ANSI)/ASME Operation and Maintenance Standards (OM-10) as the rules for IST of valves. OM-10 replaces specific requirements in

previous editions of Section XI, Subsection IWV of the ASME Code. Subsection IWP of the 1989 Edition provides the requirements for IST of pumps and references Part 6 of the ANSI/ASME Operation and Maintenance Standards (OM-6) as the rules for IST of pumps. OM-6 replaces specific requirements in previous editions of Section XI, Subsection IWP of the ASME Code.

During the second 10-year IST interval, which began no later than December 1, 2001, STPNOC continues to comply with the 1989 Edition of the ASME Section XI Code for pumps and valves, including references to the 1987 Edition of the OM standard and the 1988 Addenda. STPNOC proposed several alternatives to the requirements of Section XI of the ASME Code for the second 10-year IST interval. These alternatives are discussed in the following sections.

3.0 TECHNICAL EVALUATION

3.1 Valve Relief Request No. 01

3.1.1 Code Requirements

Section 4.1 of OM-10 requires that valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated. Where practicable, this local observation should be supplemented by other indications such as use of flow meters or other suitable instrumentation to verify obturator position. These observations need not be concurrent. Where local observation is not possible, other indications shall be used for verification of valve operation.

3.1.2 Specific Relief Requested

Relief is requested from performing the Code requirements of Section 4.1 of OM-10 to observe and verify the remote position indication of reactor coolant system (RCS) hot leg sample valves.

These isolation valves are required to close in response to an Engineered Safety Features signal and remain leak tight Category A (CAT A) to maintain containment integrity.

3.1.3 Bases for Relief

The licensee states that these valves are solenoid valves for which stem movement cannot be directly observed. They are redundant valves in series and operate simultaneously from a single control switch with one set of indication lights.

3.1.4 Alternative Examinations

The licensee proposes that these valves be stroked and timed during normal IST using the remote indicating lights. Open and closed indication is actuated by the limit switches of each valve wired in series, and remote position indication is based on the slowest valve. Since these redundant valves cannot be exercised separately (unless leads are lifted, temporary power supplied to the disabled valve to hold it in the open position, and jumpers placed across the disabled valve’s limit switches), the valves will be stroked simultaneously and remote position indication will be verified by observing that system flow is initiated and then secured.

3.1.5 Staff Evaluation of Valve Relief Request No. 01

The RCS hot leg sample line isolation valves are solenoid valves. The design of these solenoid valves make it difficult to observe actual stem movement locally as required by OM-1, Section 4.1. The valves are redundant valves and cannot be exercised separately unless leads are lifted, temporary power is supplied to the disabled valve to hold it in the open position, and jumpers are placed across the disabled valve's limit switches. Compliance with these Code requirements would create a hardship for the licensee. The Code states that "where local observation is not possible, other indications shall be used for verification of valve operation." The licensee proposes an alternative that these valves be stroked and timed during normal IST using remote indicating lights. The observation of valve position indication will indirectly indicate proper remote position for these valves. The remote position indication will be verified by observing that system flow is initiated and then secured. The alternative testing provides reasonable assurance of operational readiness of valves.

3.1.6 Conclusion

On the basis discussed above, the NRC staff finds that the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The alternative testing provides reasonable assurance of operational readiness of valves.

3.2 Valve Relief Request No. 02

3.2.1 Code Requirements

Section 4.2.1.1 of OM-10 requires that each Cat A valve be tested nominally every 3 months for operational readiness.

3.2.2 Specific Relief Requested

Relief is requested from the Code requirements of Section 4.2.1.1 of OM-10 to test the RCS hot leg sample valves every 3 months for operational readiness.

3.2.3 Bases for Relief

The licensee states these valves are redundant in series and operate simultaneously from a single control switch with one set of indicating lights. These redundant valves cannot be exercised separately (unless leads are lifted, temporary power is supplied to the disabled valve to hold it in the open position, and jumpers are placed across the disabled valve's limit switches).

Based on the guidance in NUREG-1482, an evaluation was performed by the licensee, and it was determined that only one valve is required to satisfy the plant safety analysis. The licensee states that both valves will be included in the IST plan.

3.2.4 Alternative Examinations

The licensee states that these redundant valves cannot be exercised separately. The valves will be stroked simultaneously and timed using the remote position indication of the slowest valve. Failure to meet the stroke time acceptance criteria of Section 4.2.1.8 of OM-10 shall be treated as a failure of a series valve pair and corrective actions will be taken to determine the cause of the failure.

3.2.5 Staff Evaluation of Valve Relief Request No. 02

This valve relief request states that these redundant valves are in series and operate simultaneously from a single control switch with one set of indicating lights. These valves cannot be exercised separately. The valves will be stroked simultaneously and timed using the remote position indication of the slowest valve. Failure to meet the stroke time acceptance criteria of Section 4.2.1.8 of OM-10 shall be treated as a failure of a series valve pair and corrective actions will be taken to determine the cause of the failure.

These valves are in Post-Accident Sampling System (PASS) and perform a function of containment isolation. NUREG-1482, Section 4.4.2 states that such valves in the PASS that perform a containment isolation functions are required to be included in the IST program. The licensee states that these redundant valves are in series and both valves are in IST program. NUREG-1482, Section 4.1.1 provides guidelines for testing series check valves without intermediate test connections. Although the valves in series involved with this relief request are not check valves, but rather are solenoid valves, the NRC staff finds that the hardship issue is applicable to two solenoid valves in series as well. The staff further finds that the recommendation in Section 4.1.1 of NUREG-1482 also may be extended to these valves, because the licensee evaluated that only one valve is required to satisfy the plant safety analysis. Therefore, the verification that the pair of valves in series is capable of closing provides reasonable assurance of the valves operation readiness. Also, the licensee states that failure to meet the stroke time acceptance criteria of Section 4.2.1.8 of OM-10 shall be treated as a failure of a series valve pair and corrective actions will be taken to determine the cause of the failure. Therefore, the exercising of these redundant valves separately as required by the Code would place a hardship on the licensee without a compensating increase in level of quality and safety.

3.2.6 Conclusion

On the basis discussed above, the NRC staff finds that the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The alternative testing provides reasonable assurance of operational readiness of valves.

3.3 Valve Relief Request No. 03

3.3.1 Code Requirements

Section 4.3.2.1 of OM-10 requires that check valves shall be exercised nominally every 3 months. Section 4.3.2.2 requires that each check valve be exercised or examined in a

manner that verifies obturator travel to the closed, full-open, or partially open position required to fulfill its function.

3.3.2 Specific Relief Requested

The relief request applies to the (a) High Head Safety Injection Pump Discharge Inside Containment Isolation Valves (Trains A, B, and C); (b) Low Head Safety Injection Pump Discharge Inside Containment Isolation Valves (Trains A, B, and C); (c) Component Cooling Water (CCW) Supply to Residual Heat Removal (RHR) Pump and Heat Exchanger Inside Containment Isolation Check Valves (Trains A, B, and C); and (d) CCW Supply to Reactor Containment Fan Coolers Inside Containment Isolation Check Valve (Trains A, B, and C).

Relief is requested from the Code requirements of Section 4.3.2.1 of OM-10. The Code requires that check valves be exercised nominally every 3 months. Section 4.3.2.2 of OM-10 requires that each check valve be exercised or examined in a manner that verifies obturator travel to the closed, full-open, or partially open position required to fulfill its function.

3.3.3 Bases for Relief

The licensee states that these check valves have a safety function in the closed direction as containment isolation valves. There are no intra or intersystem cross-ties downstream of these valves which would cause a diversion of flow from another pump if the check valves did not close. Due to fact that there are no cross-ties downstream of the valves, the valves lack design provisions for system testing to verify closure capability in any plant condition.

Leak rate testing verifies closure by validating that the valve seats properly and is leak tight, and provides more information about the closed position than a simple backflow test.

NUREG-1482, Section 4.1.4 allows extending of the test interval to refueling outage frequency for check valves where the only practical means of verifying check valve closure is by performing a leak test based on 10 CFR [Part 50], Appendix J. STP has adopted Option B of Appendix J that allows these check valves to be leak tested on a frequency not to exceed once every 5 years.

Disassembly provides limited information on a check valve's ability to seat properly on cessation of flow. Following reassembly, the Code requires a post-assembly test which would reopen the check valve without providing assurance that the disk would return to the closed position. Disassembly of these check valves is not practical due to the design complexity of the check valves, the increased probability of human error during reassembly, foreign material exclusion concerns, and ALARA [as low as reasonably achievable] radiation consideration.

The subject valves have exhibited a history of satisfactory operation. Based on their performance history, the licensee states that the current Probabilistic Risk Assessment (PRA) modeling of the failure rates for these valves is still accurate. Irrespective of the failure rate modeling, the current STPNOC PRA model indicates that the potential failure of these valves to close has no impact on core damage frequency. In addition, the impact on these valves (assuming complete failure) from a Large Early Release Frequency standpoint is minimal.

The licensee states that in the event that containment isolation is necessary, the subject valves will have a high probability of performing their intended safety function. Therefore, the licensee believes that the safety significance and potential consequences of the proposed relief are extremely small.

3.3.4 Alternative Examinations

The licensee states that closure verification of these valves will be performed by leak rate testing in accordance with 10 CFR [Part] 50, Appendix J on a frequency specified by Option B of Appendix J.

3.3.5 Staff Evaluation of Valve Relief Request No. 03

The specific functions of these check valves are to be closed and leak tight (CAT A) to maintain containment integrity. STP has adopted Option B of 10 CFR [Part] 50, Appendix J that allows these check valves to be leak tested on a frequency not to exceed once every 5 years.

The valve relief request for the same valves for the STP's first 10-year IST program was previously authorized by NRC in a letter dated June 17, 1999 (Reference 2). Therefore, the licensee's analyses for that relief request is being extended to the same valves for the second 10-year IST interval at STP, Units 1 and 2. The engineering analyses used by the licensee in support of this limited scope relief request adequately assesses the safety and risk significance of the proposed alternative and remains applicable to the second 10-year interval. Furthermore, sufficient component performance is provided to justify the test interval extension. In addition, a process for feedback and corrective action is proposed so that, should unexpected age-related degradation of these containment isolation check valves occur, the test intervals will be shortened. Therefore, the NRC staff concludes that the licensee's proposed alternative will provide an acceptable level of quality and safety.

3.3.6 Conclusion

The licensee requested to extend the Code required closure verification test from each refueling outage to once every 5 years for subjects (a) High Head Safety Injection Pump Discharge Inside Containment Isolation Valves (Trains A, B, and C); (b) Low Head Safety Injection Pump Discharge Inside Containment Isolation Valves (Trains A, B, and C); (c) CCW Supply to RHR Pump and Heat Exchanger Inside Containment Isolation Valves (Trains A, B, and C); and (d) CCW Supply to Reactor Containment Fan Coolers Inside Containment Isolation Check Valve (Trains A, B, and C). Their request is authorized pursuant to 10 CFR 50.55a(a)(3)(i) based on the above stated alternative providing an acceptable level of quality and safety.

3.4 Pump Relief Request PRR-01

3.4.1 Code Requirements

Paragraph 5.2(b) of OM-6 requires the system resistance to be varied until the flow rate equals the reference point. The differential pressure shall be determined and compared to its reference value. Alternatively, the flow rate shall be varied until the differential pressure equals the reference point and the flow rate is then determined and compared to its reference value.

Paragraph 5.2(c) of OM-6 states that where system resistance cannot be varied, flow rate and pressure shall be determined and compared to their respective reference values.

3.4.2 Specific Relief Requested

The licensee requested relief from performing the Code requirements of paragraphs 5.2(b) and 5.2(c) of OM-6 for essential cooling water (ECW) pumps.

3.4.3 Bases for Relief

The licensee states that the ECW System is designed such that total pump flow cannot be readily adjusted to one reference value for testing without adversely affecting the operating system flow balance or utilizing excessive operator resources which would be better utilized to monitor the safe operation of the plant. These pumps must be tested in a manner that does not adversely affect the flow balance and system operability.

The system resistance is not fixed because each load has an acceptable flow range. Adjusting system total flow to meet a specific reference value may change the individual load flow rates and may cause one or more of the loads to move outside its respective operation range possibly requiring an entry into a limiting condition for operation (LCO). Additionally, STP has specific “cold” and “warm” weather lineups for operation of the essential chillers creating a different system resistance. Consequently, adjusting flow to one specific value on a quarterly basis for the performance of pump testing conflicts with system design and challenges the system operability.

3.4.4 Alternative Examinations

The licensee proposes an alternative to the testing requirements of OM-6, paragraph 5.2. STP will assess pump performance and operational readiness through the use of reference pump curves.

Flow rate and pump differential pressure will be measured during IST in the as found condition of the system and compared to an established reference curve. The following elements will be used in the development of the reference pump curves:

- A reference pump curve (flow rate verses differential pressure) will be established for each of the ECW pumps for the data taken when these pumps are known to be operating acceptably.

- Pump curves will be established from measurements taken with instrumentation meeting or exceeding the accuracy requirements of OM-6, paragraph 4.6.1.1.

- Each pump curve will be based on at least 5 points beyond the flat portion of the pump curve in the normal operating range of the pumps (at a flow greater than 15,700 gpm). Rated capacity of these pumps is 19,280 gpm. The pumps will be tested over the range of their full design flow rates, 15,700 gpm minimum to 20,610 gpm maximum.

- The reference pump curves will be based on flow rate verses differential pressure. The acceptance criteria (acceptable and required action ranges) curves will be based on the differential pressure limits of OM-6, Table 3b.

- Vibration levels will be measured at each of the reference points. If negligible variation readings are observed over the range of pump conditions, a single reference value may be assigned to each vibration measurement location. If vibration levels change over the range of pump conditions, appropriate acceptance criteria will be assigned to regions of the pump curve.

- After any maintenance or repair that may affect the existing reference pump curve, a new reference curve shall be determined or the existing pump curve revalidated by IST. A new pump curve shall be established based on at least 5 points beyond the flat portion of the pump curve.

3.4.5 Staff Evaluation of Pump Relief Request No. PRR-01

The Code requires that reference values be taken at points of operation that are repeatable. The licensee states that the ECW System is designed such that total pump flow cannot be readily adjusted to one reference value for testing without adversely affecting the operating system flow balance. The system resistance is not fixed since each load has an acceptable flow range. Consequently, adjusting flow to one specific value on a quarterly basis for the performance of pump testing conflicts with system design and challenges the system operability. Consequently, compliance with the Code requirements would result in hardship without a compensating increase in the level of quality and safety.

With respect to the proposed alternative to use reference curves, OM-6, paragraph 5.2(b), requires that the resistance of the system shall be varied until flow rate equals the reference value. OM-6, paragraph 5.2(c) states that where system resistance cannot be varied, flow rate and pressure shall be determined and compared to their respective reference values.
The licensee has demonstrated that it is a hardship to establish a repeatable reference value without a compensating increase in the level of quality and safety. The licensee's proposed alternative to establish a reference curve is consistent with the NRC staff guidance in NUREG-1482, Section 5.2. Therefore, the proposed alternative is acceptable and provides reasonable assurance of operational readiness.

3.4.6 Conclusion

The NRC staff concludes that the licensee's proposed alternative to the requirements of OM-6, paragraphs 5.2(b) and 5.2(c), for testing the ECW pumps using reference curves is authorized pursuant to 10 CFR 50.55a(a)(3)(ii), on the basis that compliance with the specified Code requirements results in hardship without a compensating increase in the level of quality and safety.

3.5 Pump Relief Request No. PRR-02

3.5.1 Code Requirements

Paragraphs 4.6.1.1 and 4.6.1.2 of OM-6 require pressure instrumentation requirements for accuracy and range. Accuracy must be ± 2 percent and full-scale range shall be not greater than three times the reference value.

3.5.2 Specific Relief Requested

Relief is requested from the Code requirements of paragraphs 4.6.1.1 and 4.6.1.2 of OM-6 for CCW pumps 1A(2A), 1B(2B) and 1C(2C).

3.5.3 Bases for Relief

The licensee states the installed suction pressure gauge for the CCW pumps have a range of 160 psig and an accuracy of 0.5 percent. The reference values for suction pressure for these pumps have been as low as 21 psig. The installed suction pressure gauges for CCW pumps have a full-scale range greater than three times the reference value, but have an accuracy of ± 5 percent, which is more conservative than the Code. The combination of the range and accuracy of the installed suction pressure gauge yields a reading at least equivalent to the reading achieved from instruments that meet the Code requirements. The installed suction pressure gauge meets the intent of the Code requirements and provides an acceptable level of quality and safety for IST.

3.5.4 Alternative Examinations

The licensee states that the permanently installed suction gauges for CCW pumps 1A(2A), 1B(2B), and 1C(2C) will be used to obtain test measurements for evaluating pump operability.

3.5.5 Staff Evaluation of Valve Relief Request No. PRR-02

The licensee requests relief from OM-6 paragraphs 4.6.1.1 and 4.6.1.2(a) for the CCW pumps's suction pressure measuring instruments. OM-6, paragraph 4.6.1.1 requires that the instrument accuracy to be ± 2 percent of full-scale, and paragraph 4.6.1.2(a) requires that the full-range of each instrument to be no greater than three times the reference value. The licensee proposes to use instrumentation which does not meet these Code requirements.

OM-6 Table 1 (paragraph 4.6.1.1) requires the instrument accuracy to be within 2 percent of full-scale, while OM-6 paragraph 4.6.1.2(a) requires the full-scale range of each instrument to be greater than three times the reference value. The combination of these two requirements results in an effective accuracy ± 6 percent of the reference value. This means that accuracy of the actual measurement may be allowed to vary as much as ± 6 percent, assuming the range of the instrument is extended to the maximum allowed deviation (three times the reference value).

Code Requirement:

Reference value	= 21 psig
Full-scale range (3 x reference value)	= 63 psig
Instrument tolerance (± 2% x 63 psig)	= 1.26 psig

Indicated accuracy:

The CCW pumps' instruments accuracy	= ± 0.5%
Full-scale range of pressure gauge	= 160 psig

Reference value (lowest)	= 21 psig
Therefore, effective accuracy	= (120 psig/21 psig) x 0.5% = ± 3.8%

These instruments yield readings at least equivalent to the reading achieved from instrument that meet Code requirements (i.e., up to ± 6 percent) and, thus, provide an acceptable level of quality and safety.

3.5.6 Conclusion

The NRC staff concludes that the licensee's proposed alternative to the instrument accuracy and full-scale range requirements of OM-6 paragraphs 4.6.1.1 and 4.6.1.2(a) is authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that the alternative provides an acceptable level of quality and safety.

3.6 Refueling Outage Justification Relief Request No. ROJ-03

3.6.1 Code Requirements

Section 4.3.2.1 of OM-10 requires that check valves shall be exercised nominally every 3 months. Section 4.3.2.2 requires that each check valve be exercised or examined in a manner that verifies obturator travel to the closed, full-open, or partially open position required to fulfill its safety function. Section 4.3.2.4(c) of OM-10 requires that each valve be disassembled every refueling outage.

3.6.2 Specific Relief is Requested

The relief request applies to the Safety Injection (SI) Pumps Suction Valves (Trains A, B, and C). The licensee requests relief from the Code requirements of (1) Section 4.3.2.1 of OM-10. The Code requires that check valves be exercised nominally every 3 months; (2) Section 4.3.2.2 of OM-10 requires that each check valve be exercised or examined in a manner that verifies obturator travel to the closed, full-open, or partially open position required to fulfill its safety function; (3) Section 4.3.2.4(c) of OM-10 requires that each valve be disassembled every refueling outage.

3.6.3 Bases for Relief

The licensee states that these check valves can only be exercised, full stroke, by simulating loss of coolant accident conditions and allowing pumps to inject flow into the RCS at zero or a very low pressure. These conditions can only be simulated during a refueling outage with the reactor vessel head off and the containment spray pump on full recirculation.

Closure of these check valves cannot be verified by non-intrusive means. There are no external position indicators on these valves and due to soft closure of these valves, acoustic methods are not conclusive. Magnetic methods are also not conclusive.

Draindown of a portion of the safety injection system is required to perform disassembly and inspection of the valves. Disassembly and inspection can only be accomplished during the 7-day SI LCO window or during refueling outages.

Local leakage rate testing (LLRT) of other SI valves and other maintenance activities are now being conducted during the 7-day system LCO windows. Conducting the disassembly and inspection of these check valves in conjunction with LLRT or other maintenance activities would accomplish the following:

(a) Increase the availability of the SI System during refueling outages which would lower the overall risk during the outages. The online risk should not be increased if performed during the allowed outage time window since the SI Train will already be removed from the service for LLRT or other maintenance.

(b) Radwaste should be reduced as the inspections will be performed with other draindown work during the LCO week.

(c) There will be a reduction in outage manpower and resource requirements for both maintenance and operation personnel.

(d) A reduction in radiation exposure should be realized because personnel will have to perform drain and fill operations only once.

3.6.4 Alternative Examinations

The licensee proposes the use of Section 4.3.2.2(e) of OM-10, that these check valves will be exercised, full stroke, each refueling outage by injecting flow into the RCS with vessel head off and RCS pump on full re-circulation.

For closure verification per Section 4.3.2.2(c) of OM-10, the licensee proposes a sample disassembly and inspection program for check valves to verify valve obturator movement. At least one check valve from the sample group will be verified operable by disassembly and inspection on a nominal refueling cycle frequency of 18 months (± 25 percent). The licensee will ensure that all check valves in this sample group are inspected within 6 years as required by GL 89-04, Position 2. The licensee states that if a generic failure occurs, a plan of action for inspecting the remaining valves will be developed utilizing the Condition Reporting Process and guidance provided in Generic Letter 91-18 ["Information to Licensees Regarding NRC Inspection Manual Section on Resolution of Degraded and Nonconforming Conditions"].

3.6.5 Staff Evaluation of Refueling Outage Justification Relief Request No. ROJ-03

The licensee requested relief for its SI pump suction check valves (Trains A, B, and C). Paragraph 4.3.2 of OM-10 requires check valves to be exercised nominally every 3 months or, when impractical, on a refueling outage basis. As an alternative to demonstrating valve obturator movement, the Code also allows in paragraph 4.3.2.4(c) disassembly of check valves every refueling outage to determine operability of the valves. The licensee proposes, as an alternative, to disassemble and inspect at least one check valve in each group on a sampling basis every refueling outage. The check valve to be tested will alternate every refueling outage.

The NRC staff's Position 2 of GL 89-04 allows for the employment of a sample disassembly and inspection plan for groups of identical valves in similar applications. The sample disassembly and inspection plan involves grouping similar valves and testing one valve in each group during each refueling outage. Further guidance for this approach is provided in Appendix A of NUREG-1482.

The sampling approach requires that each valve in the group be of the same design and have the same service including valve orientation. Additionally, for each disassembly the licensee must verify that the disassembled valve is capable of full-stroking and that the internals of the valve are structurally sound. Also, if the disassembly is to verify the full-stroke capability of the valve, the disc should be manually exercised.

A different valve of each group is required to be disassembled, inspected, and manually full-stroke exercised at each successive refueling outage, until the entire group has been tested. If the disassembled valve is not capable of being full-stroke exercised or there is binding or failure of valve internals, the remaining valves in that group must also be disassembled, inspected, and manually full-stroke exercised during the same outage. Once this is complete, the sequence of disassembly must be repeated.

It should be noted that the licensee's Code of record for IST is the 1989 Edition of ASME Code, Section XI. This Code Edition does not allow for a sample disassembly and inspection program. However, the 1995 ASME OM Code, paragraph ISTC 4.5.4.c allows for a sample disassembly examination program to be used to verify valve obturator movement. The 1995 ASME Code has been incorporated by reference into 10 CFR 50.55a(b). The 1995 Code requires that the sample disassembly examination program group check valves of similar design, application, and service condition and requires a periodic examination of one valve from each group. The licensee's proposed alternative is consistent with Position 2 of GL 89-04 and meets the requirements in the 1995 ASME OM Code, paragraph ISTC 4.5.4.c. Also, the licensee states that if a generic failure occurs, a plan of action for inspecting the remaining valves will be developed utilizing the Condition Reporting Process and guidance provided in GL 91-18.

3.6.6 Conclusion

On the basis that the licensee's alternative meets the guidance in NUREG-1482, Position 2 of GL 89-04, and the requirements of the 1995 OM Code paragraph ISTC 4.5.4.c., the licensee's Refueling Outage Justification (ROJ-03) is approved pursuant to 10 CFR 50.55a(f)(4)(iv).

4.0 CONCLUSION

Based on information provided in relief requests, the NRC staff concludes that the licensee's proposed alternatives as specified in relief requests VRR-01, VRR-02 and PRR-01 are authorized pursuant to 10 CFR 50.55a(a)(3)(ii) on the basis that compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The licensee's proposed alternatives will provide reasonable assurance of operational readiness of the valves. The alternatives proposed in the relief request VRR-03 and PRR-02 are authorized pursuant to 10 CFR 50.55a(a)(3)(i) on the basis that they provide an acceptable level of quality and safety. In addition, Refueling Outage Justification ROJ-03 is approved pursuant to 10 CFR 50.55a(f)(4)(iv).

5.0 REFERENCES

1. Letter, T. J. Jordan, STP to NRC, "Request to Implement a Risk-Informed Inservice Testing Program for Pumps and Valves Beginning the Second 10-Year Interval (Relief Request RR-ENG-IST-2-01)," dated May 21, 2001.

2. Safety Evaluation for Relief Requests RR-56 and RR-52 by the Office of NRR related to IST Program, STP Nuclear Operating Company, South Texas Project Electric Generating Station, Units 1 and 2 (Docket Number 50-498 and 50-499) dated June 17, 1999.

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