UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION RELATED TO THE INSERVICE TESTING PROGRAM REQUESTS FOR RELIEF FLORIDA POWER AND LIGHT COMPANY ST. LUCIE PLANT, UNIT NO. 1 DOCKET NO. 50-335

1.0 INTRODUCTION

The Code of Federal Regulations, 10 CFR 50.55a, requires that inservice testing (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 and applicable addenda, except where relief has been requested and granted or proposed alternatives have been authorized by the Commission pursuant to 50.55a(f)(6)(i), (a)(3)(i), or (a)(3)(ii). In order to obtain authorization or relief, the licensee must demonstrate that: (1) conformance is impractical for its facility; (2) the proposed alternative provides an acceptable level of quality and safety; or (3) compliance would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety. Section 50.55a(f)(4)(iv) provides that inservice tests of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in 50.55a(b), subject to the limitations and modifications listed, and subject to Commission approval. NRC guidance contained in Generic Letter (GL) 89-04, *Guidance on Developing Acceptable Inservice Testing Programs*, provided alternatives to the Code requirements determined to be acceptable to the staff and authorized the use of the alternatives in Positions 1, 2, 6, 7, 9, and 10 provided the licensee follows the guidance delineated in the applicable position. When an alternative is proposed which is in accordance with GL 89-04 guidance and is documented in the IST program, no further evaluation is required; however, implementation of the alternative is subject to NRC inspection.

Section 50.55a authorizes the Commission to grant relief from ASME Code requirements or to approve proposed alternatives upon making the necessary findings. The NRC staff's findings with respect to granting or not granting the relief requested or authorizing the proposed alternative as part of the licensee's IST program are contained in this Safety Evaluation (SE).

In rulemaking to 10 CFR 50.55a effective September 8, 1992, (57 FR 34666), the 1989 edition of ASME Section XI was incorporated in 50.55a(b). The 1989 edition provides that the rules for IST of pumps and valves shall meet the requirements set forth in ASME Operations and Maintenance Standards Part 6 (OM-6), *Inservice Testing of Pumps in Light-Water Reactor Power Plants*, and Part 10 (OM-10), *Inservice Testing of Valves in Light-Water Reactor Power Plants*. Pursuant to 10 CFR50.55a(f)(4)(iv), portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met, and subject to Commission approval. Because the alternatives meet later editions of the Code, relief is not required for those inservice tests that are conducted in accordance with OM-6 and OM-10, or portions thereof, provided all related requirements are met. Whether all related requirements are met is subject to NRC inspection.

2.0 BACKGROUND

Florida Power and Light Company (FPL/the licensee), in their letter of August 12, 1992, responded to anomalies identified in NRC's Safety Evaluation (SE) of February 26, 1992, related to relief requests for the St. Lucie Unit 1 inservice testing (IST) program for pumps and valves. The submittal provided FPL's response to six anomalies for which the staff had requested a response in 180 days from the date of the SE. Additionally, the submittal included a description of the process used in developing and implementing the IST program. The licensee's actions to address these six anomalies were described in their submittal. The staff's review of these actions was provided in a letter to the licensee of January 29, 1993.

FPL responded to the remaining anomalies in their letter of February 26, 1993, and submitted Relief Request VR-22 in their letter of April 19, 1993. The results of the staff's review of these two submittals are provided below.

3.0 REVIEW OF LICENSEE'S ACTIONS TO ADDRESS ANOMALIES

The actions taken to address the remaining anomalies included deletion of relief requests, changes to procedures, revisions to relief requests, reassessment of the Code classification of diesel support systems, and changes to test schedules. The actions adequately address the concerns identified in each of the anomalies; however, for the actions related to revisions in Relief Request VR-11, discussing the frequency of closure verification for the low pressure safety injection header to reactor coolant system injection line check valves, it appears that further NRC evaluation is required.

3.1 Evaluation of Revisions to Relief Request VR-11

The licensee's response indicates that Relief Request VR-11 has been modified to provide additional justification that the pressure isolation valves low pressure safety injection (LPSI) header to reactor coolant system (RCS) injection line check valves cannot be exercised to the closed position, and that the leak testing required by Technical Specifications (TS) is adequate to verify the capability of these valves to close. The following information has been added to VR-11 with the "Alternative Testing" section listing the test frequency for verifying reverse closure as per Technical Specifications:

> The LPSI header to RCS check valves are listed as Pressure Isolation Valves (PIVs) in Technical Specification 4.4.6.2.f, Table 3.4.6-1, Primary Coolant System Pressure Isolation Valves. The valves are required to be leak tested at the following frequency:
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> 1. Prior to entering Mode 2 after refueling.
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> 2. Prior to entering Mode 2, whenever the plant has been in COLD SHUTDOWN for 72 hours or more and if leakage testing has not been performed in the previous 9 months.

3. Prior to returning the valve to service following maintenance, repair or replacement work on the valve.

Data Sheet #25 of AP 1-0010125A is the present test procedure used to measure the leakage rate (reverse flow) of these check valves. The test utilizes the Safety Injection Tank (SIT) volume of pressurized water (200 - 250 psig) to pressurize the downstream side of the check valves. The upstream motor-operated valves (MOV) are closed and the drain lines located between each MOV and check valve pair are opened sequentially. Once the initial trapped volume of water is drained out, the check valve leakage is collected using tygon tubing and poly bottles. The leakage volumes and collection times are used to calculate the check valve leakage rates.

The drain valves for these tests are located along the north and south walls of the west end of the pipe tunnel in the Unit 1 Reactor Auxiliary Building (RAB). This area of the RAB is designated as a high radiation area. The general area radiation levels vary from 20 to 30 mRem/hr in the center of the hallway. Along the walls of the pipe tunnel where the drain valves are located, the contact radiation levels range from 200 mRem/hr to 1,600 mRem/hr (radiation survey HPS-38 dated 3/31/92). The test requires at least 3 test personnel for 1 to 2 hours to properly perform the procedure. In addition, the test personnel must handle up to several gallons of contaminated water per test, some of which could be under pressure when first vented. Due to the potential for contaminations, the personnel performing the test usually wear a rain suit in addition to full PCs [personnel contamination clothing]. The plastic rain suit and the heat in the area cause the heat stress levels to be high.

The intent of the Code requirement for exercising check valves is to periodically verify the capability of a check valve to open with flow and to close on reverse flow. The subject valves perform a safety function to open to provide flowpaths from LPSI to the RCS in the event of a loss-of-coolant accident. The valves also provide an isolation function between the high pressure RCS and the low pressure SI system and are considered PIVs with specific TS requirements for ensuring the capability to perform the isolation function.

These check valves are exercised open during cold shutdowns due to the impracticality of performing the test during power operations (safety injection flow would not overcome reactor coolant pressure, the valves are isolation boundaries and opening restrictions apply to prevent intersystem loss-of-coolant accidents). Because of design limitations, the only practical means of verifying the valve's capability to close is by performing a leakage rate test. Though leak testing is possible during cold shutdown conditions, as required by TS if in COLD SHUTDOWN for 72 hours or more and if leakage testing has not been performed in the previous 9 months, the testing involves extensive setup and results in high exposures for the test engineers and could extend a cold shutdown solely to complete testing. Therefore, imposition of

IST for closure at each cold shutdown is not practical. Based on the requirements to periodically verify leak-tightness, and because leakage testing is the only means to also verify closure, the frequency specified in the TS is acceptable for meeting the requirements of IST and will provide reasonable assurance of the operational readiness of these valves to isolate and prevent backflow into the low pressure systems.

The latest edition of Section XI incorporated into 10 CFR 50.55a(b) references the requirements of OM-10 for IST of valves. OM-10, Paragraph 4.3.2, "Exercising Tests for Check Valves," recognizes that there are limitations that do not allow full-stroke exercising of check valves during power conditions, or during cold shutdown conditions. Based on the part-stroke exercise performed during cold shutdowns for the subject valves, Paragraph 4.3.2.2(d) applies:

> 4.3.2.2(d) If exercising is not practicable during plant operation and full-stroke during cold shutdown is also not practicable, it may be limited to part-stroke during cold shutdowns, and full-stroke during refueling outages.

OM-10, Paragraph 4.3.2.4(a), further indicates that seat leakage testing is an acceptable means to demonstrate that the obturator travels to the seat on cessation or reversal of flow. Therefore, the proposed test frequency and test method for verifying closure of the LPSI header to RCS check valves meets the requirements of OM-10 and the St. Lucie-1 Technical Specifications. OM-10, Paragraph 6.2, requires that the owner maintain a record of the justification for deferral of stroke testing in accordance with paragraph 4.3.2.2, which the licensee meets with the revised Relief Request VR-11. Accordingly, the staff finds the test frequency and test method for the LPSI to RCS check valves acceptable and approves the use of OM-10 for IST of valves at St. Lucie, Unit 1, pursuant to 10 CFR 50.55a(f)(4)(iv). The licensee's program incorporates the related requirements; however, the continued implementation of these requirements is subject to NRC inspection.

4.0 RELIEF REQUEST VR-22

The licensee has modified Relief Request VR-22 to stipulate that the containment spray header to spray additive eductors check valves have a safety function to close as well as a safety function to open. In the Safety Evaluation of February 26, 1992, it was noted that VR-22 was approved by GL 89-04 based on the disassembly and inspection of these check valves meeting the guidance in GL 89-04, Attachment 1, Position 2. Position 2 indicated that "[t]he NRC staff position is that valve disassembly and inspection can be used as a positive means of determining that a valve's disk will full-stroke exercise open or of verifying closure capability, as permitted by IWV-3522."

A full flow test cannot be performed for these valves to verify the full-opening capability. Performing closure verification by reverse flow, or leakage testing, for these valves is not practical due to the lack of design features to perform such a test, radiation levels in the area around these valves, the length of piping that would require draining (greater than 220 feet of 12" piping), and the processing of the borated, contaminated water

that would result (2600 gallons) if such a test was attempted. Alternatively, the valves will be partial-stroke exercised quarterly in conjunction with testing of the containment spray pumps. Additionally, each refueling outage at least one of the two valves will be disassembled, inspected, and manually stroked to verify both the open and close capability of the valve. The disassembly and inspection will not require draining the upstream piping out to the heat exchangers, but rather the check valves could be isolated using valves V-07271 and V-07272. Should a valve under inspection be found to be inoperable, the other valve will be inspected during the same refueling outage, with the rotational inspection schedule re-initiated at the next refueling outage, consistent with the guidance delineated in GL 89-04, Attachment 1, Position 2.

Therefore, in accordance with GL 89-04, provided the licensee continues to implement the disassembly and inspection of these check valves in accordance with the guidance delineated in Position 2, the revised relief request is acceptable. The implementation of the Position 2 guidance is subject to NRC inspection to ensure compliance.

5.0 CONCLUSION

The staff has concluded that the actions taken to address concerns identified in the previous Safety Evaluation are adequate. The staff has determined that the relief granted for Relief Request VR-22 in accordance with GL 89-04 and the approval of VR-11 pursuant to 10 CFR 50.55a(f)(4)(iv) are authorized by law and will not endanger life or property, or the common defense and security, and are otherwise in the public interest.

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