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 REQUEST FOR RELIEF
FLORIDA POWER & LIGHT CO.
ST. LUCIE PLANT, UNIT 1
DOCKET NUMBER 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 (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 its facility. NRC guidance contained in Generic Letter (GL) 89-04, "Guidance on Developing Acceptable Inservice Testing Programs," provides alternatives to the Code requirements determined acceptable to the staff without further NRC review. Implementation of the GL 89-04 positions is subject to inspection.

Section 10 CFR 50.55a authorizes the Commission to approve alternatives and to grant relief from ASME Code requirements upon making the necessary findings. The NRC staff's findings with respect to authorizing alternatives and granting or not granting the relief requested as part of the licensee's IST program are contained in this Safety Evaluation (SE).

2.0 DISCUSSION

Florida Power & Light Company's letter dated February 27, 1994, submitted Revision 4 of the Inservice Testing Program for the Second Ten-Year Interval. Changes to the program were described in Attachment 1, "Summary of Changes for St. Lucie Unit 1 Inservice Testing program Revision 4," which indicates that there were two major changes in Revision 4: (1) adoption of ASME/ANSI OM-1987, Part 1, "Requirements for Inservice Performance Testing of Nuclear Power Plant Pressure Relief Devices," for testing safety and relief valves, and (2) addition of a basic scope document which explains the steps taken to review plant systems for inclusion in the IST program. Other changes to the program generally did not affect previously granted relief or authorized alternatives, except for revised Relief Requests VR-29 and VR-30. Deletion of the diesel generator support systems was noted in the summary of changes. Such deletions should have been evaluated against the safety analysis report in accord with 10 CFR 50.59, "Changes, Tests, and Experiments," and the evaluations should be available on site for inspection. Relief requests which are no longer necessary have been deleted for reasons described in the summary.

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Revisions to relief requests that incorporated actions described in NRC Safety Evaluation dated February 26, 1992, are described in the summary. These relief requests were approved with the provision that such actions be taken and the approval remains effective. Relief requests for alternatives presented in GL 89-04 are noted (see Section 3.0 below). VR-2, which was previously approved, has been divided between check valves and motor-operated valves; i.e., the check valves remain in VR-2, but now VR-39 covers the applicable motor-operated valves. VR-39 is considered approved through the approval of VR-2 in the February 26, 1992, NRC safety evaluation, and the relief request is so designated for reference.

Revised Relief Requests VR-29 and VR-30 were included in the submittal. NRC approval was requested for implementing the requirements of a later edition of the ASME Code, specifically the 1989 Edition, incorporated by reference in 10 CFR 50.55a(b). The applicable paragraph of Section 50.55a, specifically paragraph (f)(4)(iv), states that licensees may use later editions of the Code, or portions of later editions (provided related requirements are met) incorporated in paragraph (b) of Section 50.55, subject to Commission approval. Therefore, the use of the 1989 Edition of Section XI of the ASME Code is evaluated for these two relief requests. The second 10-year interval began February 11, 1988, and ends February 10, 1998. The current inservice testing program was developed in accord with the requirements of the 1983 Edition with addenda through the Summer 1983 Addenda. Safety and relief valves are tested in accord with ANSI/ASME OM-1-1987 (see Section 4.0 below).

3.0 RELIEF REQUESTS APPROVED PURSUANT TO GL 89-04

The NRC identified a number of generic deficiencies that affect plant safety and have frequently appeared as IST programmatic weaknesses. These are addressed by Generic Letter 89-04. In that generic letter, the staff delineated positions that described deficiencies and explained alternatives to the ASME Code that the staff considers acceptable. If alternatives are implemented in accordance with the relevant position in the generic letter, the staff has determined, as stated in GL 89-04, that relief should be granted pursuant to 10 CFR 50.55a(g)(6)(i) [now (f)(6)(i) for IST] on the grounds that it is authorized by law, will not endanger life or property or the common defense and security, and is otherwise in the public interest. In making this determination, the staff has considered the burden on the licensee that would result if the requirements were imposed.

For any relief granted pursuant to Generic Letter 89-04 the staff has reviewed the information submitted by the licensee to determine whether the proposed alternative follows the relevant position in the generic letter. If an alternative conforms to a position of the generic letter, it is approved pursuant to Generic Letter 89-04. Relief requests revised and submitted to

the NRC in Revision 4 of the St. Lucie, Unit 1, IST Program, which the staff has determined are approved by GL 89-04, are as follows:

Relief Request	Description	GL 89-04 Position
PR-5	Boric acid makeup pumps 1A and 1B will be tested on minimum recirculation during quarterly inservice testing with measurement of pump differential pressure and vibration. During refueling outages using an instrumented flow path, pump differential pressure, flow rate, and vibration will be measured.	Position 9
VR-40	It is impractical to verify the reverse flow (closure) function of main steam to auxiliary feedwater pump turbine check valves V-08130 and V-08163 during any plant condition. A sample disassembly and inspection of one of the two valves each refueling outage will be performed to verify that the disk will stroke closed. The open function is verified by quarterly partial-stroke exercising and cold shutdown full-open stroke exercising.	Position 2
VR-41	It is impractical to verify the reverse flow (closure) function of main steam check valves V-08372 and V-08373 during any plant condition. A sample disassembly and inspection of one of the two valves each refueling outage will be performed to verify that the disk will stroke closed.	Position 2

4.0 USE OF OM-1-1987 FOR TESTING SAFETY AND RELIEF VALVES

Paragraph IWV-3512 of ASME Section XI, 1983 Edition, with addenda through the Summer 1983 Addenda, requires that safety and relief valves set point be tested in accordance with ASME Performance Test Code (PTC) 25.3-1976. Beginning with the 1986 Edition of ASME Section XI, ANSI/ASME OM-1 is reference as the requirements or set point testing of safety and relief valves. The NRC approved ASME Section XI Code Case N-415, "Alternative Rules for Testing Pressure Relief Devices," which reference OM-1-1981 as acceptable alternative rules, in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability ASME Section XI Division 1." OM-1 was revised in the 1987

addenda of the Operations and Maintenance Standards. The licensee requests approval of the use of OM-1-1987.

In rulemaking to 10 CFR 50.55a effective September 8, 1992 (see Federal Register, Vol.57, No. 152, page 34666), the 1989 Edition of ASME Section XI was incorporated in paragraph (b) of Section 50.55a. The 1989 Edition provides that the rules for inservice testing of valves are as specified in ASME/ANSI OMa-1988 Part 10. The staff imposed no limitations to OMa-1988 Part 10 associated with testing requirements for safety and relief valves as prescribed in accord with OM-1-1987 through reference in OM-10. Section 50.55a (f)(4)(iv) provides that inservice tests of valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of Section 50.55a, subject to the limitations and modifications listed, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met. The staff finds it is acceptable to use the requirements of OM-1-1987 as alternative rules for testing safety and relief valves.

5.0 RELIEF REQUEST VR-29

Check valves V-3101 and V-3103 open to allow flow from the high-pressure safety injection pumps to the refueling water tank for minimum flow through the high-pressure safety injection pumps for condition of low or minimum flow. Section XI, paragraphs IWV-3521 and IWV-3522, require that check valves be exercised at least once every 3 months, except where it is impractical to perform exercising during power operations, deferring exercising to cold shutdown outages. In Position 1 of GL 89-04, the NRC clarified that full-stroke exercising of check valves with flow necessitates passing, at a minimum, design-basis accident flow rate through the valves. Check valves V-3101 and V-3103 are in flowpaths that have no installed flow instrumentation.

5.1 Licensee's Basis for Relief

The licensee states that "there is not flowrate instrumentation available to verify valve full-stroke exercising as required by the Generic Letter 89-04, Position 1."

5.2 Alternative Testing

The licensee states:

> During quarterly pump testing, each of these valves will be partial-stroke exercised via recirculation through the minimum flow test circuits with no flow measurements.
>
> During each reactor refueling outage, these two valves will be full-flow tested. On Unit 1, the HPSI [high pressure safety injection] pumps are capable of taking suction from the discharge of the shutdown cooling heat exchangers. The flowpath will be

from the refueling cavity to the RWT [refueling water tank], via the shutdown cooling system and HPSI pump mini-flow recirculation line. The flowrate will be calculated by measuring the increase in the RWT volume and dividing it by the HPSI pump run time. This test lineup reduces RCS [reactor coolant system] inventory and can only be performed during refueling outages, when the head is off the reactor, permitting refueling cavity inventory to be drained to the RWT.

5.3 Evaluation

Position 1 of GL 89-04 states that "a valid full-stroke exercise by flow requires that the flow through the valve be known." Calculation of the flow by measuring the change in RWT level over time will provide a method of ensuring that the maximum required accident condition flow through the valves is achieved.

ASME Section XI, paragraph IWV-3520, requires check valves to be exercised quarterly, or if impractical, during cold shutdowns. OMa-1988, Part 10, paragraph 4.3.2.2 states that if exercising is not practical during power operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages.

In rulemaking to 10 CFR 50.55a effective September 8, 1992 (see Federal Register, Vol.57, No. 152, page 34666), the 1989 Edition of ASME Section XI was incorporated in paragraph (b) of § 50.55a. The 1989 Edition provides that the rules for inservice testing of valves are as specified in ASME/ANSI OMa-1988 Part 10. The staff imposed no limitations to OMa-1988 Part 10 associated with deferral of testing to refueling outages. Section 50.55a (f)(4)(iv) provides that inservice tests of valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of Section 50.55a, subject to the limitations and modifications listed, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met.

For check valves, the related requirements of OM-10 are included in paragraph 4.3.2 for test deferral and paragraph 6.2 for the documentation of the test deferral which is met by the relief request. The impracticality of performing the full-stroke exercising during power operations or during cold shutdown outages justifies deferral of testing to refueling outages, with a partial-stroke exercising quarterly. Therefore, the use of the later code requirements is approved pursuant to 10 CFR 50.55a(f)(4)(iv).

6.0 EVALUATION OF RELIEF REQUEST VR-30

Check valves V-3104 and V-3105 open to allow flow from the low-pressure safety injection pumps to the refueling water tank for minimum flow through the high-pressure safety injection pumps for condition of low or minimum flow. The valves close during shutdown cooling and long-term recirculation to prevent backflow through the idle pump(s). Section XI, paragraphs IWV-3521 and IWV-

3522, require that check valves be exercised at least once every 3 months, except where it is impractical to perform exercising during power operations, deferring exercising to cold shutdown outages. In Position 1 of GL 89-04, the NRC clarified that full-stroke exercising of check valves with flow necessitates passing, at a minimum, design-basis accident flow rate through the valves. Check valves V-3104 and V-3105 are in flowpaths that have no installed flow instrumentation.

6.1 Licensee's Basis for Relief

The licensee states that "there is not flowrate instrumentation available to verify valve full-stroke exercising as required by the Generic Letter 89-04, Position 1."

6.2 Alternative Testing

The licensee states:

> During quarterly pump testing, each of these valves will be partial-stroke exercised via recirculation through the minimum flow test circuits with no flow measurements.
>
> During each reactor refueling outage, these two valves will be full-flow tested. The flowpath will be from the refueling cavity to the RWT [refueling water tank], via the shutdown cooling system and LPSI [low pressure safety injection] pump mini-flow recirculation line. The flowrate will be calculated by measuring the increase in the RWT volume and dividing it by the LPSI pump run time. This test lineup reduces RCS [reactor coolant system] inventory and can only be performed during refueling outages, when the head is off the reactor, permitting refueling cavity inventory to be drained to the RWT.

6.3 Evaluation

Position 1 of GL 89-04 states that "a valid full-stroke exercise by flow requires that the flow through the valve be known." Calculation of the flow by measuring the change in RWT level over time will provide a method of ensuring that the maximum required accident condition flow through the valves is achieved.

ASME Section XI, paragraph IWV-3520, requires check valves to be exercised quarterly, or if impractical, during cold shutdowns. OMa-1988, Part 10, paragraph 4.3.2.2 states that if exercising is not practical during power operation or cold shutdowns, it may be limited to full-stroke exercising during refueling outages.

In rulemaking to 10 CFR 50.55a effective September 8, 1992 (see Federal Register, Vol.57, No. 152, page 34666), the 1989 Edition of ASME Section XI was incorporated in paragraph (b) of § 50.55a. The 1989 Edition provides that

the rules for inservice testing of valves are as specified in ASME/ANSI OMa-1988 Part 10. The staff imposed no limitations to OMa-1988 Part 10 associated with deferral of testing to refueling outages. Section 50.55a (f)(4)(iv) provides that inservice tests of valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of Section 50.55a, subject to the limitations and modifications listed, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met.

For check valves, the related requirements of OM-10 are included in paragraph 4.3.2 for test deferral and paragraph 6.2 for the documentation of the test deferral which is met by the relief request. The impracticality of performing the full-stroke exercising during power operations or during cold shutdown outages justifies deferral of testing to refueling outages, with a partial-stroke exercising quarterly. Therefore, the use of the later Code requirements is approved pursuant to 10 CFR 50.55a(f)(4)(iv).

7.0 CONCLUSION

The staff has determined that approval of the revised relief requests pursuant to 10 CFR 50.55a (f)(4)(iv) or Generic Letter 89-04 is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Principal Contributor: Patricia Campbell, NRR/DE/EMEB

Date: