



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

December 9, 2015

Mr. Mano Nazar  
President and Chief Nuclear Officer  
Nuclear Division  
NextEra Energy  
P.O. Box 14000  
Juno Beach, FL 33408-0420

SUBJECT: TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4 – SAFETY EVALUATION FOR RELIEF REQUEST NO. PR-01, FOR THE FIFTH 10-YEAR INSERVICE TESTING INTERVAL REGARDING REQUIREMENTS FOR THE QUARTERLY TESTING OF THE BORIC ACID TRANSFER PUMPS (CAC NOS. MF6252 AND MF6253)

Dear Mr. Nazar:

By letter dated May 12, 2015, as superseded by letter dated September 25, 2015, Florida Power & Light Company (FPL or the licensee) submitted Relief Request No. PR-01 for the fifth 10-year inservice testing (IST) interval of Turkey Point Nuclear Generating Unit Nos. 3 (Turkey Point Unit 3) and 4 (Turkey Point Unit 4). Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 55a(f)(5)(iii), the licensee requested the U.S. Nuclear Regulatory Commission (NRC) relief pertaining to the requirements for the quarterly testing of the boric acid transfer (BAT) pumps compared to the requirements of Section ISTB-5121(c) of the American Society of Mechanical Engineers (ASME) Code for Operation and Maintenance of Nuclear Power Plants.

Based on the review of the submittals, the NRC staff concluded that compliance with the ASME Code BAT pump quarterly testing is impractical for the configurations identified in the subject relief requests, and that compliance with the specified requirements would result in a burden on FPL. The NRC staff also concluded that the proposed testing provides reasonable assurance that the BAT pumps are operationally ready. Therefore, relief granted pursuant to 10 CFR 55.a(f)(6)(i) 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. Relief is granted for the fifth 10-year IST interval at Turkey Point Unit 3, which began February 22, 2015, and for the fifth 10-year IST interval at Turkey Point Unit 4, which began April 15, 2015.

All other ASME Code, Section XI requirements for which the request was not specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

M. Nazar

- 2 -

If you have any questions regarding this issue, please contact the project manager, Ms. Audrey L. Klett, at (301) 415-0489 or by e-mail at [Audrey.Klett@nrc.gov](mailto:Audrey.Klett@nrc.gov).

Sincerely,

A handwritten signature in black ink that reads "Benjamin G. Beasley". The signature is written in a cursive style with a long, sweeping underline.

Benjamin G. Beasley, Chief  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

Enclosure:  
Safety Evaluation

cc w/encl.: Distribution via Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. PR-01

FOR THE FIFTH 10-YEAR INSERVICE TESTING INTERVAL

FLORIDA POWER & LIGHT COMPANY

TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4

DOCKET NOS. 50-250 AND 50-251

1.0 INTRODUCTION

By letter dated May 12, 2015,<sup>1</sup> as superseded by letter September 25, 2015,<sup>2</sup> Florida Power & Light Company (FPL or the licensee) submitted Relief Request No. PR-01 for the fifth 10-year inservice testing (IST) interval of Turkey Point Nuclear Generating Unit No. 3 (Turkey Point Unit 3) and Turkey Point Nuclear Generating Unit No. 4 (Turkey Point Unit 4).

Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 55a(f)(5)(iii), the licensee requested the U.S. Nuclear Regulatory Commission (NRC) grant relief pertaining to the quarterly testing of the boric acid transfer (BAT) pumps compared to the testing requirements in Section ISTB-5121(c) of the American Society of Mechanical Engineers (ASME) Code for the Operation and Maintenance of Nuclear Power Plants (OM Code). The licensee proposed an alternative as part of the relief request.

2.0 REGULATORY EVALUATION

It specifies in 10 CFR 50.55a(f) that IST of certain ASME Code Class 1, 2, and 3 pumps and valves be performed in accordance with the specified ASME OM Code and applicable addenda incorporated by reference in the regulations.

It specifies in 10 CFR 50.55a(f)(5)(iii) that if the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit the information to support the determination.

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<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Package Accession No. ML15148A536.

<sup>2</sup> ADAMS Accession No. ML15299A348.

Pursuant to 10 CFR 50.55a(f)(6)(i), relief to the ASME OM Code may be granted by the NRC if the licensee demonstrates that conformance with the ASME OM Code requirements is impractical for the facility. Paragraph 50.55a(f)(6)(i) states that the Commission may grant relief and may impose such alternative requirements as it determines are authorized by law, will not endanger life or property or the common defense and security, and are 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.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request and the Commission to grant the relief requested by the licensee.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Licensee's Proposed Alternative

##### 3.1.1 ASME Code Components Affected and Applicable Code Edition and Addenda

The ASME Code components affected are the BAT pumps (3A, 3B, 4A, and 4B). The BAT pump component numbers are 3P203A, 3P203B, 4P203A and 4P203B.

For the fifth 10-year interval, the ASME Code of record for Turkey Point Unit 3 and Unit 4 is the 2004 Edition with the 2005 and 2006 Addenda of the ASME OM Code.

##### 3.1.2 ASME Code Requirement for Which Licensee Proposed an Alternative

The licensee requested relief from the requirements of the ASME Code, Section ISTB-5121(c), where it is not practical to vary system resistance, then the flow rate and pressure shall be determined and compared to their respective reference values.

##### 3.1.3 Licensee's Proposed Alternative

In its letter dated September 25, 2015, the licensee proposes to test the BAT pumps every quarter through a fixed resistance flow path without flow instruments and to measure only differential pressure and vibration. As an alternative to measuring differential pressure and flow during the quarterly Group A test, the licensee proposed to only measure differential pressure of a fixed resistance flow path and compare it to its reference value. Additionally, the licensee proposed to record vibration measurements and compare it to its reference values. During the comprehensive pump test when flow, differential pressure, and vibration can be measured, the licensee proposed to perform additional full spectrum vibration analysis above the Code-requirements. The NRC previously authorized the proposed alternative for Turkey Point Units 3 and 4 for the fourth 10-year IST program interval by letter dated October 6, 2004.<sup>3</sup>

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<sup>3</sup> ADAMS Accession No. ML042820470.

### 3.1.4 Licensee's Basis for the Proposed Alternative

The licensee's basis for the proposed alternative is that position 9 of Generic Letter (GL) 89-04, Supplement 1, "Guidance on Developing Acceptable Inservice Testing Programs," dated April 4, 1995,<sup>4</sup> states that in cases where flow can only be established through a non-instrumented flow path during quarterly pump testing and a flow path exists at cold shutdown or refueling outages to perform a test of the pump under full or substantial flow conditions, the increased interval is an acceptable alternative to the Code requirements provided that pump differential pressure, flow rate, and bearing vibration measurements are taken during this testing and that quarterly testing also measuring at least pump differential pressure and vibration is continued.

According to the licensee, the BAT pumps are included in the Turkey Point preventive maintenance (PM) program, which requires a pump inspection and oil analysis to be performed periodically. Based on the PM inspection results, full spectrum analysis, and continued quarterly and comprehensive testing, an assessment of pump health and operational readiness is determined by FPL.

The normal test loop for the BAT pumps consists of fixed resistance flow paths; however, the Code-required flow measuring instruments are not installed in the flow path. Therefore, pump degradation can only be detected by comparing successive measurements of pump differential pressure. An alternate test circuit is available in which flow rate may be measured. However, this flow path requires injection of highly concentrated boric acid solution into the reactor coolant system. During power operation, this test loop is highly impractical since severe power fluctuations would be created that would lead to a potential transient and subsequent trip of the reactor. Using the alternate flow path at cold shutdown intervals would also result in excessive boration of the reactor coolant system (RCS) resulting in potential difficulties and delays in restarting the plant. As such, compliance with the code requirements would require significant system modifications and installation of flow instruments or injection of highly borated water into RCS, which would lead to a potential plant transient, and is impractical.

### 3.1.5 Duration of Proposed Alternative

The licensee requested the NRC staff to authorize the relief for the fifth 10-year IST interval for Turkey Point 3, which began on February 22, 2015, and for the fifth 10-year IST interval for Turkey Point 4, which began on April 15, 2015.

## 3.2 NRC Staff's Evaluation

### 3.2.1 Evaluation of Compliance with ASME Code Requirements

Section ISTB-5121(c) specifies that where it is not practical to vary system resistance, then the flow rate and pressure shall be determined and compared to their respective reference values.

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<sup>4</sup> ADAMS Accession No. ML031140075.

### 3.2.2 Evaluation of Impracticality

The ASME OM Code requires that flow rate be measured during a Group A test and that a Group A inservice test be run on each Group A pump quarterly.

At Turkey Point, the normal test loop for the BAT pumps consists of fixed resistance flow paths to limit flow; however, flow measuring instruments are not installed in the flow path. An alternate test circuit is available in which flow rate may be measured; however, this flow path requires injection of highly concentrated boric acid solution into the RCS. This alternate test circuit would result in severe power fluctuations during power operation. This alternate test circuit would result in excessive boration of the RCS during cold shutdown.

Compliance with the ASME Code Section ISTB-5121(c) would require system modifications and installation of flow instruments in the fixed resistance flow path or injection of highly borated water into the RCS if the alternate test circuit was used.

The NRC staff finds that compliance with the ASME Code BAT pump quarterly testing is impractical for the configurations identified in the subject relief request, and that compliance with the specified requirements would result in a burden on FPL.

### 3.2.3 Operational Readiness

FPL proposes to test the BAT pumps every quarter through a fixed resistance flow path without flow instruments and to measure only differential pressure and vibration. Accordingly, differential pressure will be measured and compared to its reference value by the licensee. Since the system resistance is fixed and can be assumed to be constant, pump degradation can be detected by FPL by comparing successive measurements of pump differential pressure. Additionally, vibration measurements will also be recorded by the licensee and compared to its reference values.

During the comprehensive pump test when flow can be measured, full spectrum vibration analysis will be performed by the licensee above the required vibration analysis required by the ASME OM Code. When performing the comprehensive pump test, all required parameters will be measured and compared to their reference values by FPL.

Position 9 of GL 89-04 notes that in cases where flow can only be established through a non-instrumented flow path during quarterly pump testing and a path exists at cold shutdown or refueling outages to perform a test of the pump under full or substantial flow conditions, the comprehensive test combined with quarterly test measuring at least pump differential pressure and vibration is an acceptable alternative to the Code requirements. Furthermore, the BAT pumps are included in the station PM program, which requires a pump inspection and oil analysis to be performed periodically as well as additional full spectrum vibration analysis, and continued quarterly and comprehensive BAT pump testing.

Based on proposed testing by FPL, the NRC staff has reasonable assurance that the BAT pumps are operationally ready.

#### 4.0 CONCLUSION

Based on the review of the submittals, the NRC staff concludes that compliance with the ASME Code BAT pump quarterly testing is impractical for the configurations identified in the subject relief requests, and that compliance with the specified requirements would result in a burden on FPL. The NRC staff also concludes that the proposed testing provides reasonable assurance that the BAT pumps are operationally ready. Therefore, relief granted pursuant to 10 CFR 55.a(f)(6)(i) 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. Relief is granted for the fifth 10-year IST interval at Turkey Point Unit 3, which began February 22, 2015, and for the fifth 10-year IST interval at Turkey Point Unit 4, which began April 15, 2015.

All other ASME Code, Section XI requirements for which the request was not specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: J. Huang

Date: December 9, 2015

M. Nazar

- 2 -

If you have any questions regarding this issue, please contact the project manager, Ms. Audrey L. Klett, at (301) 415-0489 or by e-mail at [Audrey.Klett@nrc.gov](mailto:Audrey.Klett@nrc.gov).

Sincerely,

*/RA/*

Benjamin G. Beasley, Chief  
Plant Licensing Branch II-2  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

Enclosure:  
Safety Evaluation

cc w/encl.: Distribution via Listserv

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**ADAMS Accession No.: ML15328A108**

**\*by e-memo**

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