



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

January 22, 2016

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-02, FOR THE FIFTH 10-YEAR INSERVICE TESTING INTERVAL REGARDING REQUIREMENTS FOR THE QUARTERLY TESTING OF THE RESIDUAL HEAT REMOVAL PUMPS (CAC NOS. MF6388 AND MF6389)

Dear Mr. Nazar:

By letter dated June 10, 2015, as superseded by letter dated September 25, 2015, Florida Power & Light Company (FPL or the licensee) submitted Relief Request No. PR-02 for the fifth 10-year inservice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) relief pertaining to the requirements for the quarterly testing of the residual heat removal (RHR) pumps compared to the requirements of Section ISTB-3510(b)(1) of the American Society of Mechanical Engineers Code for Operation and Maintenance of Nuclear Power Plants (ASME Code).

Based on the review of the submittals, the NRC staff concluded that compliance with the ASME Code RHR 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 RHR pumps are operationally ready. Therefore, relief is 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

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If you have any questions regarding this issue, please contact the Project Manager, Ms. Audrey 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 large, sweeping initial "B".

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-02

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 June 10, 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-02 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) relief pertaining to the quarterly testing of the residual heat removal (RHR) pumps compared to the testing requirements in Section ISTB-3510(b)(1) of the American Society of Mechanical Engineers (ASME) Code for the Operation and Maintenance of Nuclear Power Plants (OM Code).

2.0 REGULATORY EVALUATION

It specifies in 10 CFR 50.55a(f), "Inservice testing requirements," 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. ML15188A030.

<sup>2</sup> ADAMS Accession No. ML15299A350.

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.

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 fifth 10-year IST program intervals began on February 22, 2015, and on April 15, 2015, for Turkey Point Unit 3 and Turkey Point Unit 4, respectively.

The ASME Code components affected are the RHR pumps (3A, 3B, 4A, and 4B). The RHR pump component numbers are 3P210A, 3P210B, 4P210A and 4P210B.

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-3510(b)(1), "Range," where the full-scale range of each analog instrument shall not be greater than three times the reference value.

##### 3.1.3 Licensee's Basis for Requesting Relief

For Group A and Group B tests, the Code requires instrument accuracy to be within 2 percent of full scale and the full scale range of each instrument to be no greater than three times the reference value.

At Turkey Point, the RHR pumps are considered Group A pumps. The installed suction and discharge pressure gauges are sized to accommodate pressures up to 600 pounds per square inch gauge (psig) expected under standby, cold shutdown, and emergency operation modes. The instrument range is 0 to 600 psig for both gauges. During the quarterly testing, the typical RHR pump differential pressure (DP) is approximately 142 psig (discharge pressure approximately 160 psig and suction pressure approximately 18 psig), and as a result, the installed suction and discharge pressure instrument ranges exceed the maximum Code allowed range of three times the reference value for the quarterly surveillances.

FPL requests relief from the instrument range requirements of ISTB-3510(b)(1), which requires that the full scale range of each analog instrument not exceed three times the reference value. Relief is requested for the suction and discharge pressure instruments for the RHR pumps during the quarterly testing.

Compliance with the requirements of ISTB-3510(b)(1) is impractical, because it would require system modifications and installation of new instrumentation to meet the allowed range of three times the reference value.

#### 3.1.4 Licensee's Proposed Alternative

As an alternative, FPL is proposing to use the existing Turkey Point RHR pump instrumentation, without meeting the requirements of ISTB-3510(b)(1), but which exceed the Code required accuracies that will be applied to Group A quarterly tests of the RHR pumps. This relief request does not apply to the comprehensive RHR pump testing.

The installed suction and discharge pressure instruments are calibrated to an accuracy of plus or minus (+/-) 0.25 percent and are of the "twice around" type such that they may accurately indicate pressure over all modes of RHR operations (shutdown cooling and emergency core cooling). The instrument range on the first revolution is 0 to 300 psig and 300 to 600 psig on the second revolution.

Suction pressure measurements are recorded and used to derive the pump DP through calculation. When determining pump DP, the RHR pump DP is approximately 142 psig (discharge pressure approximately 160 psig, while suction pressure is approximately 18 psig). The maximum effect of suction pressure inaccuracies is 0.25 percent x 600 psig, or 1.5 psig. The Code maximum gauge range for this suction pressure reference value (18 psig) would be 0 to 54 psig. The Code accuracy requirement of 2 percent would cause a maximum inaccuracy of 2.0 percent x 54 psig, or 1.1 psig.

Discharge pressure measurements are also recorded and used to derive the pump DP through calculation. When determining pump DP, typically the RHR pump DP is approximately 142 psig (discharge pressure approximately 160 psig while suction pressure is approximately 18 psig). The maximum effect of the discharge pressure inaccuracies is also 0.25 percent x 600 psig, or 1.5 psig. The Code maximum gauge range for this discharge pressure reference value (160 psig) would be 0 to 480 psig. The Code accuracy requirement of 2 percent would cause a maximum inaccuracy of 2.0 percent x 480 psig, or 9.6 psig.

Based on the inaccuracies of the installed suction and discharge pressure gauges (+/- 1.5 psig each), the largest possible error in the differential pressure calculation is +/- 3 psig. Using gauges with Code required ranges, and applying the Code accuracy requirements, the largest possible inaccuracies would be 1.1 psig + 9.6 psig, or 10.7 psig.

Therefore, the use of the permanently installed pressure instruments would reduce the overall instrument inaccuracies with respect to the DP for the quarterly test from 10.7 psig to 3.0 psig when compared to gauges with the code required ranges.

Note that the proposed alternative has been previously authorized for Turkey Point Units 3 and 4 for the fourth 10-year IST program interval by NRC letter dated October 6, 2004 (ADAMS Accession No. ML042820470).

### 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 Unit 3, which began on February 22, 2015, and for the fifth 10-year IST interval for Turkey Point Unit 4, which began on April 15, 2015.

## 3.2 NRC Staff's Evaluation

### 3.2.1 NRC Staff Evaluation

The licensee requests relief from the instrument range requirements of ISTB-3510(b)(1) for the RHR pump suction and discharge pressure instruments during the quarterly pump test. The Code requires that the full-scale range of each analog instrument shall not be greater than three times the reference value. The licensee proposes to use instruments that do not meet this Code requirement.

For Group A quarterly tests, the Code requires instrument accuracy to be within 2 percent of full-scale and the full-scale range of each instrument be no greater than three times the reference value. The combination of these two requirements results in an effective maximum inaccuracy limit of +/- 6 percent of the reference suction and discharge pressure measurements and an even somewhat higher maximum inaccuracy for the calculated delta pressure value. The licensee has demonstrated that by using gauges with higher accuracy than required by code yet with ranges that would otherwise exceed what the code allows, the overall accuracy required by the code for the combined DP value can still be met and, in fact, exceeded.

In complying with the Code requirements, the licensee would not obtain information that would be more useful than the information that is currently available. For example, installing an analog gauge with a range of three times the reference value (or less) to comply with Code requirements would not yield more accurate readings than those provided by the gauges that are presently installed. This justification is consistent with the long held staff position described in NUREG 1482 Rev. 2, "Guidelines for Inservice Testing at Nuclear Power Plants," concerning pressure gauge ranges and code compliance and, therefore, provides reasonable assurance that the RHR pumps are operationally ready (Reference NUREG 1482 R2, para. 2.5.1.1.).

### 3.2.2 Evaluation of Compliance with ASME Code Requirements

The licensee requests relief from the instrument range requirements of ISTB-3510(b)(1) for the RHR pump suction and discharge pressure instruments during the quarterly pump test. The Code requires that the full-scale range of each analog instrument shall not be greater than three times the reference value. The licensee proposes to use instruments that do not meet this Code requirement.

### 3.2.3 Evaluation of Impracticality

For Group A and Group B tests, the Code requires instrument accuracy to be within 2 percent of full-scale and the full-scale range of each instrument be no greater than three times the reference value. The combination of these two requirements results in an effective accuracy requirement of +/- 6 percent of the reference value.

Compliance with the ASME Code Section ISTB-3510(b)(1) would require system modifications and installation of new instruments to meet the allowed range of three times the reference value.

The NRC staff finds that compliance with the ASME Code RHR 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.

### 3.2.3 Operational Readiness

The maximum inaccuracy of the installed suction and discharge pressure instruments individually is 1.5 psig. The maximum inaccuracy of the combination of suction and discharge pressure readings is 3 psig. The accuracies of the installed RHR pump suction and discharge instruments (+/- 0.25 percent) when combined with the instrument range (600 psig) yield DP readings at least equivalent to the readings achieved from instruments that meet Code requirements.

Based on the overall instrument inaccuracies, the NRC staff has reasonable assurance that the RHR pumps are operationally ready using the proposed alternative of the permanently installed pressure instrumentation.

## 4.0 CONCLUSION

Based on the review of the submittals, the NRC staff concludes that compliance with the ASME Code RHR 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 RHR pumps are operationally ready.

Therefore, relief is 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: John G. Billerbeck

Date: January 22, 2016

M. Nazar

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If you have any questions regarding this issue, please contact the Project Manager, Ms. Audrey 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

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