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

November 6, 2020

Mr. Don Moul
Executive Vice President, Nuclear
Division and Chief Nuclear Officer
Florida Power & Light Company
Mail Stop: EX/JB
700 Universe Blvd.
Juno Beach, FL 33408

SUBJECT: TURKEY POINT NUCLEAR GENERATING UNIT NO. 3 – APPROVAL OF ALTERNATIVE TO USE ASME CODE SECTION XI IWA-4340 – FOR REPAIRS OF COMPONENT COOLING WATER SYSTEM PIPING (EPID L-2020-LLR-0040)

Dear Mr. Moul:

By letter dated March 30, 2020, as superseded by a letter dated April 13, 2020, and supplemented by letters dated April 15, 2020, and April 19, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML20090K520, ML20104B999, ML20106F200, and ML20110A000, respectively), Florida Power & Light Company (FPL) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for the use of an alternative to certain requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, Section XI, at Turkey Point Nuclear Generating (Turkey Point), Unit No. 3.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(2), FPL requested to use the alternative on the basis that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that FPL has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(z)(2).

The NRC authorizes the use of the proposed alternative in Relief Request No. 6 for Turkey Point, Unit No. 3. All other requirements in ASME BPV Code, Section XI, requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact Turkey Point Senior Project Manager, Eva Brown, at (301) 415-2315 or by e-mail to Eva.Brown@nrc.gov.

Sincerely,

Undine S. Shoop

Digitally signed by Undine S. Shoop
Date: 2020.11.06 08:27:56 -05'00'

Undine S. Shoop, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-250

Enclosure: As stated

cc: Listserv

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

SAFETY EVALUATION BY THE OFFICE NUCLEAR REACTOR REGULATION

RELIEF REQUEST NO. 6

COMPONENT COOLING WATER WELDED REPAIRS FOR EXTERNAL CORROSION

FLORIDA POWER & LIGHT COMPANY

TURKEY POINT NUCLEAR GENERATING UNIT NO. 3

DOCKET NO. 50-250

1.0 INTRODUCTION

By letter dated March 30, 2020, as superseded by a letter dated April 13, 2020, and supplemented by letters dated April 15, 2020, and April 19, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML20090K520, ML20104B999, ML20106F200, and ML20110A000, respectively), Florida Power & Light Company (FPL, the licensee) proposed an alternative to the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPV) Code, Section XI, IWA-4421 and Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(b)(2)(xxv), at Turkey Point Nuclear Generating (Turkey Point) Unit No. 3.

Specifically, pursuant to 10 CFR 50.55a(z)(2), the licensee submitted Relief Request No. 6 for a modification in accordance with ASME Code, Section XI, IWA-4340 to repair certain sections of the degraded Turkey Point component cooling water (CCW) return piping by installing a proprietary repair device without removing the sections of degraded piping. The licensee has determined that removing the degraded portions of piping in accordance with IWA-4421 prior to performing a repair/replacement activity represents a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Verbal Authorization was provided on April 20, 2020 (ADAMS Accession No. ML20111A279).

2.0 REGULATORY EVALUATION

Adherence to Section XI of the ASME BPV Code is mandated by 10 CFR 50.55a(g)(4), which states, in part, that ASME BPV Code Class 1, 2, and 3 components must meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME BPV Code, Section XI.

Paragraph 50.55a(z) of 10 CFR states, in part, that alternatives to the requirements of 10 CFR 50.55a(b)-(h) may be used, when authorized by the Director, Office of Nuclear Reactor

Regulation, if (1) the proposed alternatives would provide an acceptable level of quality and safety or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The licensee has submitted the request on the basis that compliance with the specified requirements of 10 CFR 50.55a would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

3.0 TECHNICAL EVALUATION

3.1 Relief Request No. 6

3.1.1 ASME Code Components Affected

ASME Code Class 3 moderate energy (i.e., ≤200 °Farenheit (93°Celsius) and ≤275 pounds per square inch gauge (1.9 MegaPascal) maximum operating conditions) CCW system Train B return piping, outside containment in the vicinity of the floor penetration in the CCW system heat exchanger room. The subject piping segment is an 18-inch carbon steel seam welded pipe. The CCW system is the heat sink for the residual heat removal system, the chemical and volume control system, the spent fuel cooling loop, and various reactor coolant system components.

3.1.2 Applicable Code Edition and Addenda

The CCW system piping was constructed to the construction code for pressure piping United States of America Standards Institute (USAS) B31.1-1955 and was later reconciled to the code of record American National Standards Institute (ANSI) B31.1 1973 Edition through Winter 1976 Addenda. The current inservice inspection (ISI) code of record for Turkey Point, Unit 3 is the ASME Code, Section XI, 2007 Edition, with the 2008 Addenda. Turkey Point, Unit 3 is in its fifth 10-year ISI interval, which began on February 22, 2014, and will end on February 21, 2024.

3.1.3 Applicable Code Requirement

For ASME Code Class 3 components, the repair/replacement activity and reexamination shall comply with the requirements of Article IWA -4000 of ASME Code, Section XI. ASME Code, Section XI, IWA-4400 of the 2007 Edition provides requirements for welding, brazing, metal removal, and installation of repair/replacement activities. ASME Code, Section XI, Article IWA-4421, requires that defects be removed in accordance with IWA-4340, IWA-4411, IWA-4412, IWA-4461 or IWA-4462.

3.1.4 Reason for Request

The licensee found piping degradation of the Turkey Point Train ‘B’ CCW system return piping which has been characterized as a through-wall leak caused by external corrosion of the piping. The licensee performed a flaw evaluation in accordance with U.S. Nuclear Regulatory Commission (NRC)-approved ASME Code Case N-513-3, “Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1.” The Code Case N-513-3 evaluation was performed to validate the structural integrity of the as found condition and continued system operation until the repair could be performed. The proposed alternative has been developed because other repair/replacement options that would involve removing the degraded portions of piping in accordance with IWA-4421 prior to performing a

repair/replacement activity create a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The licensee stated that to perform the required ASME Code repair, removal of defective portions of the subject 18-inch piping would require that the piping be isolated and depressurized; however, the subject piping cannot be isolated for the following reasons: (1) previous attempts to close the isolation valves upstream of the repair locations have not provided adequate isolation of the CCW system piping to be able to perform piping repair work; (2) CCW system isolation to allow maintenance work on the leaking upstream valves is operationally not possible due to requirements of the CCW system to remain operational at all plant modes in accordance with plant technical specifications; and (3) installation of a mechanical stop or freeze seal to isolate the 18-inch CCW system piping would require the installation of new supports and reanalysis of the piping.

3.1.5 Alternative and Basis for Use

The licensee proposed the installation of a modification/repair in accordance with ASME Code, Section XI, IWA-4340 to be installed around the circumference of the degraded piping without the removal of the degraded area. The modification/repair proposed by the licensee is to install an encapsulation, which is a welded proprietary repair device, PMCap Restoration Method – US Patent 6,860,297, hereafter referred to as PMCap, over the defect in the subject piping.

The licensee proposed that during the installation of the proposed encapsulation, welding will be performed in accordance with the FPL Welding Control Manual. The licensee stated that the PMCap encapsulation will satisfy the design requirements of ASME/ANSI Code, B31.1-1973, the original construction code of the Turkey Point CCW system piping. The PMCap replaces the degraded pressure boundary material and provides structural integrity of the piping system, such that it no longer relies on the degraded area, including any projected future corrosion.

3.2 NRC Staff Evaluation

The NRC staff evaluated the pre-installation evaluation, design, installation, examination and future ISI of the proposed alternative. The NRC staff also evaluated the licensee's determination that code-compliant repair/replacement of the leaking piping would represent a hardship. The goal of NRC's evaluation is to determine whether the proposed alternative will provide reasonable assurance of the structural integrity and leak tightness of the subject piping after encapsulation.

The licensee supplied the wall thickness readings of the degraded area and the ASME Code, Section XI, Code Case N-513-3 flaw evaluation used to evaluate the structural integrity of the leak location. This information also showed where the proposed encapsulation would be attached to the existing piping. This information allowed the NRC staff to evaluate the flaw evaluation and verify material thickness in the areas of attachment of the PMCap to the 18-inch pipe were adequate for the encapsulation design. Based on this information the NRC staff finds the licensee’s pre-installation evaluation acceptable.

The encapsulation design proposed by the licensee is a 20-inch outside diameter PMCap fabricated from standard weight carbon steel pipe. The licensee stated the design of the PMCap encapsulation is compliant with ASME/ANSI Code B31.1, “Power Piping,” 1973 Edition. In the April 13, 2020, submittal, the licensee described the analysis of the piping supports for the extra weight of the encapsulation and confirmation of the modification’s compliance with

ASME/ANSI Code B31.1. The PMCap has been designed to function as the pressure boundary of the piping system. The CCW system piping system to which the PMCap is welded has been evaluated to qualify the additional loading from the installation of the PMCap without any additional modifications required for the remaining life of the component. The modification includes the application of aluminum oxide thermal spray coating on the exterior and an improved boot seal to prevent further degradation of the exterior of the piping. As discussed in the April 15, 2020, RAI response, the inside surface will be covered by CCW system, which provides corrosion inhibiting chemistry to the area of concern. The licensee proposed that the corrosion mitigation steps taken as part of the modification negates the requirement for future UT thickness examinations described in ASME Code Case N-513-3 and of the current conditions in 10 CFR 50.55a(b)(2)(xxv) on the use of ASME Code, Section XI, IWA-4340. The NRC staff finds that the coating of the exterior of the pipe along with the improved boot seal would eliminate the cause of the degradation of the CCW system return piping. Also, the internals of the piping system will be further protected by chemistry of the CCW system. Based on this information the NRC staff finds the licensee's proposed design for the PMCap encapsulation acceptable for the remaining life of the plant.

The licensee stated that during the installation of the proposed encapsulation, welding will be performed in accordance with the FPL Welding Control Manual. The installation of the encapsulation would be performed in accordance with ASME/ANSI Code B31.1-1973 Edition. The license also stated the PMCap is constructed with all welds being full penetration and are attached with full penetration welds to the existing 18-inch piping. Because the welds will receive visual and surface examinations of the root pass and final pass for all fabrication and installation groove welds, the NRC staff finds the licensee's proposed installation plans acceptable.

The licensee stated that future ISI would be performed in accordance with ASME Code, Section XI, Table IWD-2500-1 for Examination Category D-A components, which requires visual examination of attachment welds. The CCW system would also be subject to the periodic pressure testing of Examination Category D-B components, which requires a system leakage test and visual examination for leakage once per inspection period. Therefore, the NRC staff finds the future ISI examinations of the CCW system acceptable.

The NRC staff finds that the licensee has considered various options of performing the repair in accordance with the ASME Code, Section XI and approved code cases without success. The NRC staff determines that isolating and depressurizing the CCW system to perform a repair in compliance ASME Code, Section XI would result in hardship without a compensating increase in the level of quality and safety.

Based on the review of the information above, the NRC staff finds that there is reasonable assurance of adequate protection based on: (1) the N-513-3 evaluation performed to validate the structural integrity of the as found condition, (2) the PMCap encapsulation will satisfy the design requirements of the original construction code of the Turkey Point CCW system piping, (3) mitigation measures taken to prevent further degradation of the piping, and (4) future ISI exams being performed in accordance with IWD-2500 Examination Category D-A items. Lastly, the NRC staff finds that the licensee's hardship justification is acceptable.

Therefore, the NRC finds that the proposed alternative in Relief Request No. 6 will provide reasonable assurance that structural integrity of the subject CCW system piping and its intended safety function will be maintained in that the piping has been restored to compliance with the original construction code.

4.0 CONCLUSION

The NRC staff concludes that the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the subject CCW system return piping. The NRC staff finds that complying with the requirements of the ASME Code, Section XI would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, the NRC authorizes the use of the proposed alternative in Relief Request No. 6 for Turkey Point, Unit 3. All other requirements in ASME Code, Section XI for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: K. Hoffman, NRR

Date: November 6, 2020

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ADAMS Accession No.: ML20287A551 *by e-mail **by memorandum

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