



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

October 7, 2019

The Honorable Kristine L. Svinicki
Chairman
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

**SUBJECT: REPORT ON THE SAFETY ASPECTS OF THE SUBSEQUENT LICENSE
 RENEWAL APPLICATION OF THE TURKEY POINT NUCLEAR GENERATING
 UNITS 3 AND 4**

Dear Chairman Svinicki:

During the 666th meeting of the Advisory Committee on Reactor Safeguards (ACRS), September 4-6, 2019, we completed our review of the subsequent license renewal application (SLRA) for Turkey Point Nuclear Generating Units 3 and 4 (Turkey Point), and the associated final safety evaluation report. Our review considered actions by Florida Power and Light Company (FPL) to extend the license of each unit by 20 years beyond 60, thus becoming the first plant in the U.S. to apply for subsequent license renewal.

To conduct a focused review of past, current, and future actions to address subsequent license renewal at Turkey Point, our Plant License Renewal Subcommittee reviewed this matter during a meeting on June 21, 2019. During these reviews, we had the benefit of discussions with representatives of the staff and FPL. We also had the benefit of the referenced documents. This report fulfills the requirement of 10 CFR 54.25 that the ACRS review and report on all license renewal applications.

CONCLUSION AND RECOMMENDATION

1. The programs established and the commitments made by FPL to manage age-related degradation provide reasonable assurance that Turkey Point can be operated in accordance with its licensing basis for the subsequent period of extended operation without undue risk to the health and safety of the public.

2. The FPL application for subsequent license renewal of the operating license for Turkey Point should be approved.

BACKGROUND

Turkey Point Nuclear Generating Units 3 and 4 are located in Miami-Dade County, east of Florida City, FL. Each unit consists of a Westinghouse pressurized-water reactor with licensed thermal power of 2,644 MWt, with a corresponding gross electrical output of approximately

913 MWe and 923 MWe, respectively. The NRC issued the initial operating licenses on July 19, 1972, for Unit 3 and April 10, 1973, for Unit 4. The NRC issued the first renewed operating licenses on June 6, 2002.

In this application, FPL requests renewal of the operating licenses for an additional 20 years beyond the expiration of their current renewed licenses. The licenses would be extended to July 19, 2052, for Unit 3 and to April 10, 2053, for Unit 4.

DISCUSSION

The staff reviewed the FPL License Amendment Request for Subsequent License Renewal (SLR) in accordance with the Generic Aging Lessons Learned (GALL)-SLR and the Standard Review Plan (SRP)-SLR guidance documents. Conformance with this guidance provides bases for a conclusion that an applicant for life extension of 20 additional years beyond 60 years will assure adequate protection to the public through the Subsequent Period of Extended Operation (SPEO).

The most significant generic issues challenging operation beyond 60 years are: reactor pressure vessel embrittlement; irradiation-assisted stress corrosion cracking of reactor internals; concrete structures and containment degradation; and electrical cable environmental qualification, condition monitoring, and assessment. Each of these items has been addressed by FPL and evaluated by the staff through the review process. We agree with the staff's safety evaluation report regarding these issues.

Since our review of the Turkey Point SLRA, new information has been identified regarding the Regulatory Guide 1.99 irradiation embrittlement correlations that suggests they may be inaccurate at high fluence levels such as those expected to be experienced at the Turkey Point Reactor Pressure Vessels (RPVs) as they approach the end of their SPEO. While not an immediate concern for the Turkey Point units, staff and FPL should follow these developments and adjust their RPV irradiation embrittlement Aging Management Program (AMP) accordingly.

In preparation for life extension, FPL completed improvements, upgrades, replacements, and modifications to numerous systems and components. Significant plant modifications since initial license renewal include replacing reactor vessel heads, main and auxiliary transformers, the cask crane structure and crane, high pressure turbine rotors, main condenser tube bundles and water boxes, turbine plant cooling water heat exchangers, and condensate pumps. FPL also performed rehabilitation of the cooling canal and added two emergency diesel generators. Plant modifications currently in progress are replacement of low pressure turbine rotors, containment spray piping replacement, and modifications to the plant structure.

In its final safety evaluation report, the staff documented its review of the SLRA and other information submitted by FPL and obtained through staff audits and inspections at the plant site. The staff reviewed the completeness of the identification of structures, systems, and components that are within the scope of license renewal.

FPL will implement 50 AMPs for license renewal, comprised of 36 existing programs and 14 new programs. Of the 14 new programs, 12 are consistent with the GALL-SLR Report, one is consistent with enhancement, and one is plant specific (high-voltage insulators). Of the 36 existing programs, 24 are consistent with enhancements, one is consistent with allowed exceptions, 10 are consistent with enhancements and allowed exceptions, and one is plant

specific (Pressurizer Surge Line Fatigue Program). The SLRA includes eleven programs with allowed exceptions to the GALL-SLR Report. The programs with exceptions and enhancements are acceptable.

FPL has demonstrated the effectiveness of their programs to maintain material condition, to sustain system and equipment performance, and to identify improvements to assure facility safety and reliability. Knowledge transfer will be provided through formal mentoring by SLR program managers and their teams. FPL is implementing lessons learned from both their own license renewal experience as well as those from the industry fleet. Commitments in the SLRA and in FPL responses to the staff audits and inspections provide assurance that these programs will continue throughout the SPEO.

The staff conducted license renewal audits, and the audits verified the appropriateness of the FPL scoping and screening methodology for AMPs, the appropriateness of the aging management review, and the acceptability of the Time Limited Aging Analysis. The staff audit reports confirm the validity of the Turkey Point Aging Management Program. The Post-Approval Site Inspection for License Renewal verified that the license renewal requirements are implemented appropriately. The audits and inspection were comprehensive, and the corresponding reports were thorough.

Based on these audits, inspections, and the staff reviews, the staff concluded that FPL has demonstrated that the effects of aging at Turkey Point will be adequately managed. Safety functions will be maintained consistent with Turkey Point's licensing basis for the SPEO, as required by 10 CFR 54.21(a)(3). The staff's review of the SLRA identified no confirmatory items and one open item relating to the Buried and Underground Piping and Tanks AMP. This open item has subsequently been resolved with an accelerated cathodic protection program and enhanced condition inspections over the 10-year period prior to SPEO. We agree with the staff's conclusion that there are no issues related to the matters described in 10 CFR 54.29(a)(1) and (a)(2) that preclude renewal of the operating license for Turkey Point.

SUMMARY

The programs established and the commitments made by FPL to manage age-related degradation provide reasonable assurance that Turkey Point can be operated in accordance with its licensing basis for the SPEO without undue risk to the health and safety of the public. The FPL application for a SLR of the operating license for Turkey Point should be approved.

Members Riccardella and Sunseri did not participate in portions of the meeting related to fatigue of Class 1 components, environmentally assisted fatigue, and leak before break analysis in the application.

Sincerely,

/RA/

Peter C. Riccardella
Chairman

REFERENCES

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8. U.S. Nuclear Regulatory Commission, "Turkey Point Nuclear Generating Units 3 and 4 - Report for the Irradiated Concrete Audit Regarding the Subsequent License Renewal Application Review (EPID No. L-2018-RNW-0002)," February 1, 2019 (ML19032A536).
9. U.S. Nuclear Regulatory Commission, "Turkey Point Nuclear Generating Station – Nuclear Regulatory Commission Integrated Inspection Report 05000250/2019001 and 05000251/2019001," May 14, 2019 (ML19134A371).
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12. U.S. Nuclear Regulatory Commission, NRC NUREG-1801, Revision 2, "Generic Aging Lessons Learned (GALL) Report," December 2010 (ML103490041).

13. U.S. Nuclear Regulatory Commission, NRC NUREG-2191, Volume 1, "Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report Final Report," July 2017 (ML17187A031).
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17. U.S. Nuclear Regulatory Commission, NRC NUREG-2221, "Technical Bases for Changes in the Subsequent License Renewal Guidance Documents NUREG-2191 and NUREG-2192," December 2017 (ML17362A126).
18. U.S. Nuclear Regulatory Commission, NRC NUREG-2222, "Disposition of Public Comments on the Draft Subsequent License Renewal Guidance Documents NUREG-2191 and NUREG-2192," December 2017 (ML17362A143).
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October 7, 2019

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