

October 24, 2000

Mr. T. F. Plunkett
President - Nuclear Division
Florida Power and Light Company
P.O. Box 14000
Juno Beach, Florida 33408-0420

SUBJECT: TURKEY POINT UNITS 3 AND 4 - EXEMPTION FROM THE REQUIREMENTS
OF 10 CFR PART 50, SECTION 50.60 AND APPENDIX G (TAC NOS. MA9504
AND MA9505)

Dear Mr. Plunkett:

The Commission has issued the enclosed exemption from certain requirements of Title 10 of the Code of Federal Regulations, Part 50, Section 50.60 and Appendix G. This exemption is in response to your application dated July 7, 2000, as supplemented October 4, 2000, and allows you to apply the methodology of the American Society of Mechanical Engineers Code Cases N-588 and N-641 as the basis for establishing the pressure-temperature limits specified in Technical Specification 3.4.9.1 and in Figures 3.4-2, 3.4-3 and 3.4-4, and the Cold Overpressure Mitigation System (COMS) requirements. The COMS is the Westinghouse version of the Low Temperature Overpressure Protection system.

A copy of the exemption has been forwarded to the Office of the Federal Register for publication.

Sincerely,

/RA/

Kahtan N. Jabbour, Senior Project Manager, Section 2
Project Directorate II
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

Enclosure: Exemption

cc w/encl: See next page

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
FLORIDA POWER AND LIGHT COMPANY	)	Docket Nos. 50-250 and 50-251
	)	
(Turkey Point Plant, Units 3 and 4)	)	

EXEMPTION

I.

Florida Power and Light Company (FPL, the licensee) is the holder of Facility Operating License Nos. DPR-31 and DPR-41 that authorize operation of the Turkey Point Plant, Units 3 and 4, respectively. The licenses provide, among other things, that the facilities are subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (the Commission/NRC) now or hereafter in effect.

The facilities consist of pressurized water reactors located in Dade County, Florida.

II.

Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Appendix G requires that pressure-temperature (P/T) limits be established for reactor pressure vessels (RPVs) during normal operating and hydrostatic pressure or leak testing conditions. Specifically, 10 CFR Part 50, Appendix G states that "The appropriate requirements on both the pressure-temperature limits and the minimum permissible temperature must be met for all conditions." Appendix G of 10 CFR Part 50 specifies that the requirements for these limits are the American Society of Mechanical Engineers (ASME) Code, Section XI, Appendix G Limits.

To address the provisions of proposed license amendments to the technical specification (TS) P/T limits, low temperature overpressure protection (LTOP) system setpoints and LTOP system effective temperature (T_{enable}), the licensee requested in its submittal dated July 7, 2000, as supplemented October 4, 2000, that the staff exempt Turkey Point Units 3 and 4 from application of specific requirements of 10 CFR Part 50, Section 50.60(a) and Appendix G, and substitute use of ASME Code Cases N-588 and N-641. Code Case N-588 permits the use of circumferentially-oriented flaws in circumferential welds for development of P/T limits. Code Case N-641 permits the use of an alternate reference fracture toughness (K_{IC} fracture toughness curve instead of K_{Ia} fracture toughness curve) for reactor vessel materials in determining the P/T limits, LTOP setpoints and T_{enable} . Since the K_{IC} fracture toughness curve shown in ASME Section XI, Appendix A, Figure A-2200-1, provides greater allowable fracture toughness than the corresponding K_{Ia} fracture toughness curve of ASME Section XI, Appendix G, Figure G-2210-1 (the K_{Ia} fracture toughness curve), using Code Case N-641 for establishing the P/T limits, LTOP setpoints and T_{enable} would be less conservative than the methodology currently endorsed by 10 CFR Part 50, Appendix G and, therefore, an exemption to apply the Code Case would be required by 10 CFR 50.60. It should be noted that although the use of the K_{IC} fracture toughness curve in Code Case N-641 was recently incorporated into the Appendix G to Section XI of the ASME Code, an exemption is still needed because the proposed P/T limits, LTOP setpoints and T_{enable} (excluding Code Case N-641) are based on the 1996 edition (and 1997 addenda) of the ASME Code. The licensee uses the Westinghouse version of LTOP which is called Cold Overpressure Mitigation System.

The proposed license amendments will revise both the P/T limits of TS 3/4.4.9.1 related to the heatup and cooldown of the reactor coolant system (RCS), and the LTOP setpoints and T_{enable} of TS 3/4.4.9.3, for operation to 32 effective full power years (EFPY).

Code Case N-588

The licensee has proposed an exemption to allow use of ASME Code Case N-588 in conjunction with ASME Section XI, 10 CFR 50.60(a) and 10 CFR Part 50, Appendix G, to determine P/T limits for Turkey Point Units 3 and 4.

The proposed license amendments to revise the P/T limits for Turkey Point Units 3 and 4 rely, in part, on the requested exemption. These revised P/T limits have been developed using postulated flaws in the circumferential orientation for the circumferential welds in the Turkey Point RPVs, in lieu of postulating axial flaws in the circumferential welds.

The use of circumferential flaws in circumferential welds is more appropriate than the use of axial flaws in circumferential welds. Since the flaws postulated in the development of P/T limits have a through-wall depth of one-quarter of the vessel wall thickness (1.94 inches for the Turkey Point RPVs), the length of the postulated flaw, six times the depth, is more than 11 inches. For the circumferential welds in the Turkey Point RPVs, an axial flaw of this length centered at the weld would place the tips of the postulated flaw within the adjacent base metal above and below the weld. Therefore, the only way to maintain a flaw within the circumferential weld metal is to postulate a circumferential flaw within the weld, as accomplished using Code Case N-588. Note that for the base metals adjacent to the circumferential welds, axial flaws are, and continue to be, postulated for the development of P/T limits.

Code Case N-641

The licensee has proposed an exemption to allow use of ASME Code Case N-641 in conjunction with ASME Section XI, 10 CFR 50.60(a) and 10 CFR Part 50, Appendix G, to determine LTOP system effective temperature, T_{enable} .

The proposed license amendments to revise T_{enable} for Turkey Point Units 3 and 4 rely, in part, on the requested exemption. The revised T_{enable} has been developed using the K_{Ic} fracture toughness curve, in lieu of the K_{Ia} fracture toughness curve, as the lower bound for fracture toughness of the reactor pressure vessel materials.

Use of the K_{Ic} curve in determining the lower bound fracture toughness of RPV steels is more technically correct than use of the K_{Ia} curve since the rate of loading during a heatup or cooldown is slow and is more representative of a static condition than a dynamic condition. The K_{Ic} curve appropriately implements the use of static initiation fracture toughness behavior to evaluate the controlled heatup and cooldown process of a reactor vessel. The staff has required use of the conservatism of the K_{Ia} curve since 1974, when the curve was adopted by the ASME Code. This conservatism was initially necessary due to the limited knowledge of the fracture toughness of RPV materials at that time. Since 1974, additional knowledge has been gained about RPV materials which demonstrates that the lower bound on fracture toughness provided by the K_{Ia} curve greatly exceeds the margin of safety required to protect the public health and safety from potential RPV failure. In addition, P/T curves, LTOP setpoints and T_{enable} based on the K_{Ic} curve will enhance overall plant safety by opening the P/T operating window, with the greatest safety benefit in the region of low-temperature operations.

Since an unnecessarily reduced P/T operating window can reduce operator flexibility without just basis, implementation of the proposed P/T curves, LTOP setpoints and T_{enable} as allowed by ASME Code Cases N-588 and N-641 may result in enhanced safety during critical plant operational periods, specifically heatup and cooldown conditions. Thus, pursuant to 10 CFR 50.12(a)(2)(ii), the underlying purpose of 10 CFR 50.60 and Appendix G to 10 CFR Part 50 will continue to be served.

In summary, the ASME Section XI, Appendix G, procedure was conservatively developed based on the level of knowledge existing in 1974 concerning RPV materials and the estimated effects of operation. Since 1974, the level of knowledge about these topics has been greatly expanded. The NRC staff has determined that this increased knowledge permits relaxation of the ASME Section XI, Appendix G requirements by application of ASME Code Cases N-588 and N-641, while maintaining, pursuant to 10 CFR 50.12(a)(2)(ii), the underlying purpose of the NRC regulations to ensure an acceptable margin of safety.

III.

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR Part 50, when (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present.

The staff has determined that an exemption would be required to approve the use of Code Cases N-588 and N-641. The staff examined the licensee's rationale to support the exemption request and concurred that the use of the Code cases would meet the underlying purpose of these regulations. Based upon a consideration of the conservatism that is explicitly incorporated into the methodologies of 10 CFR Part 50, Appendix G, Appendix G of the Code, and Regulatory Guide 1.99, Revision 2, the staff concludes that application of the Code cases as described would provide an adequate margin of safety against brittle failure of the RPV. This conclusion is also consistent with the determinations that the staff has reached for other licensees under similar conditions based on the same considerations. Therefore, the staff concludes that requesting exemption under the special circumstances of 10 CFR 50.12(a)(2)(ii) is appropriate and that the methodologies of Code Cases N-588 and N-641 may be used to revise the P/T limits, LTOP setpoints and T_{enable} for Turkey Point Units 3 and 4.

IV.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not endanger life or property or common defense and security, and is, otherwise, in the public interest. Therefore, the Commission hereby grants Florida Power and Light Company exemption from the requirements of 10 CFR Part 50, Section 50.60(a) and 10 CFR Part 50, Appendix G, for Turkey Point Units 3 and 4.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not result in any significant effect on the quality of the human environment (65 FR 63265).

This exemption is effective upon issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

John A. Zwolinski, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 24th day of October

IV.

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12(a), the exemption is authorized by law, will not endanger life or property or common defense and security, and is, otherwise, in the public interest. Therefore, the Commission hereby grants Florida Power and Light Company exemption from the requirements of 10 CFR Part 50, Section 50.60(a) and 10 CFR Part 50, Appendix G, for Turkey Point Units 3 and 4.

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not result in any significant effect on the quality of the human environment (65 FR 63265).

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John A. Zwolinski, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Dated at Rockville, Maryland,
this 24th day of October

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Mr. T. F. Plunkett
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