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Michael R. Kansler  
President

May 28, 2003  
NL-03-094

U.S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Mail Stop O-P1-17  
Washington, DC 20555-0001

Subject: Indian Point Nuclear Generating Unit No. 3  
Docket No. 50-286  
**Proposed Exemption Request from the Requirements  
of 10 CFR Part 50, Section 50.60 and Appendix G**

Dear Sir:

In accordance with 10 CFR 50.12, this letter requests an exemption from 10 CFR 50.60, "Acceptance Criteria for Fracture Prevention Measures for Light-Water Nuclear Power Reactors for Normal Operation", and Appendix G, "Fracture Toughness Requirements." The exemption request would allow the use of American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Code Case N-640, "Alternative Reference Fracture Toughness for Development of P-T Limit Curves for ASME Section XI, Division 1," for Indian Point 3. This exemption supports an Entergy Nuclear Operations, Inc. proposed license amendment, being submitted with a separate letter, that revises the Pressure-Temperature (P/T) curves in the Indian Point 3 Technical Specifications. The new P/T limits were developed using methodologies in ASME Code Case N-640, instead of the methodologies in 10 CFR Part 50, Appendix G.

10 CFR 50.60 provides that the NRC may grant alternatives to the requirements in Appendix G by using the procedures for exemption specified in 10 CFR 50.12. Exemptions to use Code Case N-640 have been granted for several plants, including Indian Point Unit No. 2, Calvert Cliffs, Brunswick, Fort Calhoun and Monticello. Attachment I to this letter provides a justification for the exemption request.

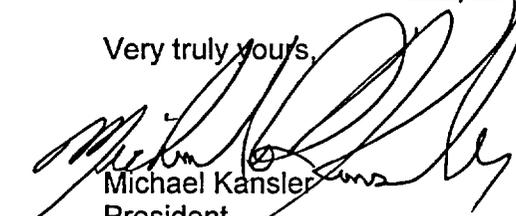
Indian Point 3 is currently operating with Technical Specification requirements, which are valid up to 16.17 EFPYs. Indian Point 3 is expected to exceed 16.17 EFPYs approximately November 30, 2003. Therefore, approval of this proposed amendment is requested by November 15, 2003 to allow time for amendment implementation.

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There are no new commitments identified in this letter. If you have any questions, please contact Ms. Charlene Faison at 914-272-3378.

I declare under penalty that the foregoing is true and correct. Executed on 05/28/03

Very truly yours,



Michael Kansler  
President  
Entergy Nuclear Operations, Inc

Attachment I: As stated

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**ATTACHMENT I**

**REQUEST FOR EXEMPTION FROM THE  
REQUIREMENTS OF 10 CFR PART 50,  
SECTION 50.60 AND APPENDIX G**

**ENTERGY NUCLEAR OPERATIONS, INC.  
INDIAN POINT NUCLEAR GENERATING UNIT NO. 3  
DOCKET NO. 50-286**

## ATTACHMENT I

### Request for Exemption from the Requirements of 10 CFR Part 50, Section 50.60 and Appendix G

In accordance with 10 CFR 50.12, Entergy Nuclear Operations, Inc. (ENO) hereby requests approval of an exemption request from specific requirements of Title 10 of the Code of Federal Regulations (10 CFR) Part 50, Section 50.60, "Acceptance Criteria for Fracture Prevention Measures for Light-Water Nuclear Power Reactors for Normal Operation," and 10 CFR Part 50, Appendix G, "Fracture Toughness Requirements", for Indian Point 3. The requested exemption will permit the use of American Society of Mechanical Engineers (ASME) Code, Section XI, Code Case N-640, "Alternative Reference Fracture Toughness for Development of P-T Limit Curves for Section XI, Division I," in lieu of 10 CFR 50, Appendix G, paragraph IV.A.2.b.

#### Justification for the Use of Code Case N-640

The requested exemption to allow use of ASME Code Case N-640 in conjunction with ASME Code, Section XI, Appendix G, to determine the pressure and temperature (P/T) limits for the reactor pressure vessel meets the criteria of 10 CFR 50.12 as discussed below.

10 CFR 50.12(a) states that the Commission may grant exemptions from the requirements of the regulations of this part, which meet the following criteria:

1. *The requested exemption is authorized by law:*

No law exists which precludes the activities covered by this exemption request. 10 CFR 50.60(b) allows the use of alternatives to 10 CFR Part 50, Appendices G and H when an exemption is granted by the Commission under 10 CFR 50.12.

2. *The requested exemption does not present an undue risk to the public health and safety:*

New P/T limits were developed for Indian Point 3 using the methodologies in Code Case N-640, in lieu of 10 CFR Part 50, Appendix G, paragraph IV.A.2.b. This exemption is needed to allow the use of these new P/T limit curves in the Indian Point Technical Specifications (TS).

Code Case N-640 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. The  $K_{IC}$  fracture toughness curve is shown in ASME Code, Section XI, Appendix A, Figure A-2200-1 (the  $K_{IC}$  fracture toughness curve), and provides greater allowable fracture toughness than the corresponding  $K_{IA}$

fracture toughness curve of ASME Code, Section XI, Appendix G, Figure G-2210-1 (the  $K_{IA}$  fracture toughness curve). The other margins involved with the ASME Code, Section XI, Appendix G process of determining P/T limit curves remains unchanged.

Use of the  $K_{IC}$  curve in determining the lower bound fracture toughness in the development of the P/T operating limits curve is more technically correct than the  $K_{IA}$  curve. The  $K_{IC}$  curve models the slow heatup and cooldown process of a reactor vessel. 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.

Use of this approach is justified by the initial conservatism of the  $K_{IA}$  curve when the curve was codified in 1974. This initial conservatism was necessary due to limited knowledge of reactor pressure vessel (RPV) material fracture toughness. Since 1974, additional knowledge about the fracture toughness of vessel materials and their fracture response to applied loads has been gained. The additional knowledge demonstrates the lower bound fracture toughness provided by the  $K_{IA}$  curve is well beyond the margin of safety required to protect against potential RPV failure. The lower bound  $K_{IC}$  fracture toughness provides an adequate margin of safety to protect against RPV failure and does not present an undue risk to public health and safety.

P/T limit curves based on the  $K_{IC}$  fracture toughness limits will enhance overall plant safety by opening the pressure and temperature operating window. Since the reactor coolant system (RCS) P/T operating window is defined by the P/T operating and test limit curves developed in accordance with ASME Code, Section XI, Appendix G procedure, continued operation of Indian Point 3 with these P/T limit curves without the relief provided by ASME Code Case N-640 would restrict RCS operation so severely as to make heatup and cooldown under normal conditions nearly impossible. Furthermore, the restrictions would apply to the overtemperature protection system (OPS) as well, leading to unnecessary OPS actuations and pressurizer power operated relief valves (PORV) depressurizations.

3. *The requested exemption will not endanger the common defense and security:*

The common defense and security are not endangered by this exemption request.

4. *Special circumstances are present which necessitate the request for an exemption to the regulations of 10 CFR 50.60:*

In accordance with 10 CFR 50.12(a)(2), the NRC will consider granting an exemption to the regulations if special circumstances are present. This requested exemption meets the special circumstances of the following paragraphs of 10 CFR 50.12:

- (a)(2)(ii) - demonstrates the underlying purpose of the regulation will continue to be achieved,

- (a)(2)(iii) - will result in undue hardship or other cost that are significant if the regulation is enforced, and
- (a)(2)(v) - will provide only temporary relief from the applicable regulation and the licensee has made good faith efforts to comply with the regulations.

10CFR50.12(a)(2)(ii): ASME Code, Section XI, Appendix G, provides procedures for determining allowable loading on the RPV and is approved for that purpose by 10 CFR 50, Appendix G. Application of these procedures in the determination of P/T operating and test curves satisfies the underlying requirements that:

1. The reactor coolant pressure boundary be operated in a regime having sufficient margin to ensure, when stressed, the vessel boundary behaves in a ductile manner and the probability of a rapidly propagating fracture is minimized, and
2. P/T operating and test limit curves provide adequate margin in consideration of uncertainties in determining the effects of irradiation on material properties.

The ASME Code, Section XI, Appendix G, procedure was conservatively developed based upon the level of knowledge existing in 1974 concerning RPV materials and the estimated effects of operation. Since 1974, the level of knowledge concerning these topics has greatly expanded. This increased knowledge permits relaxation of the ASME Code, Section XI, Appendix G, requirements via application of ASME Code Case N-640, while maintaining the underlying purpose of the ASME Code and NRC regulations to ensure an acceptable margin of safety.

10 CFR50.12(a)(2)(iii): The reactor coolant system (RCS) pressure-temperature operating window is defined by P/T operating and test limit curves developed in accordance with ASME Code, Section XI, Appendix G procedure. Continued operation of Indian Point 3 with these P/T curves without the relief provided by ASME Code Case N-640 would unnecessarily restrict the P/T operating window.

This constitutes an unnecessary burden that can be alleviated by the application of ASME Code Case N-640 in the development of the proposed P/T curve limits.

Implementation of the proposed P/T limit curves, as allowed by ASME Code Case N-640 does not significantly reduce the margin of safety.

10 CFR50.12(a)(2)(v): The requested exemption provides only temporary relief from the applicable regulation and Indian Point 3 has made a good faith effort to comply with the regulation. Therefore, ENO requests the exemption to be granted until such time that the NRC generically approves ASME Code Case N-640 for use by the nuclear industry.

Code Case N-640 Conclusion for Exemption Acceptability

Compliance with the specific requirement of 10 CFR 50.60(a) will result in hardship and unusual difficulty without a compensating increase in the level of quality and safety. ASME Code Case N-640 allows a reduction in the lower bound fracture toughness used by ASME Code, Section XI, Appendix G, in the determination of reactor coolant P/T limits. This proposed alternative is acceptable, because the ASME Code Case maintains the relative margin of safety commensurate with the margin of safety that existed at the time ASME Code, Section XI, Appendix G, was approved in 1974. Therefore, application of ASME Code Case N-640 for Indian Point 3 ensures an acceptable margin of safety and does not present an undue risk to the public health and safety.