

August 14, 2001

Mr. R. P. Necci
Vice President-Nuclear Technical Services
c/o Mr. David A. Smith
Dominion Nuclear Connecticut, Inc.
Rope Ferry Road
Waterford, CT 06385

SUBJECT: MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3, EXEMPTION FROM
THE REQUIREMENTS OF APPENDIX G TO PART 50 OF TITLE 10 OF THE
CODE OF FEDERAL REGULATIONS (TAC NO. MB1811)

Dear Mr. Necci:

The Commission has approved the enclosed exemption from specific requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, Appendix G, for the Millstone Nuclear Power Station, Unit No. 3 (MP3). This action is in response to your letter of April 23, 2001, as supplemented by letters dated June 25 and June 29, 2001, that submitted a request for exemption from the requirements of 10 CFR Part 50, Appendix G, to 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 Pressure-Temperature (P-T) Limit Curves for ASME Section XI, Division 1," for MP3. This exemption would support your application for a license amendment, that was submitted by the same above mentioned letters, to revise the Technical Specifications (TSs) P-T limits for the remainder of operating Cycle 13 and operating Cycle 14. You developed the new P-T limits using the methodology in ASME Code Case N-640, instead of the methodology in 10 CFR Part 50, Appendix G.

Requests for such exemptions are allowed pursuant to 10 CFR 50.60(b), which allows licensees to use alternatives to the requirements of 10 CFR Part 50, Appendices G and H, if an exemption to use the alternatives is granted by the Commission pursuant to 10 CFR 50.12. According to 10 CFR Part 50.12(a)(1), the Commission may grant exemptions to the requirements of 10 CFR Part 50, if the exemptions are authorized by law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security.

We are handling your request for amendment dated April 23, 2000, concurrently with this exemption request, but as a separate action.

R. Necci

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

Sincerely,

/RA/

Victor Nerses, Sr. Project Manager, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-423

Enclosure: Exemption

cc w/encl: See next page

R. Necci

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cc w/encl: See next page

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Millstone Nuclear Power Station
Unit 3

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Millstone Nuclear Power Station
Unit 3

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE NUCLEAR POWER STATION, UNIT NO. 3
DOCKET NO. 50-423
EXEMPTION

1.0 BACKGROUND

The Dominion Nuclear Connecticut, Inc., (the licensee) is the holder of Facility Operating License No. NPF-49 which authorizes operation of the Millstone Nuclear Power Station, Unit No.3 (MP3). The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (the Commission) now or hereafter in effect.

The facility consists of a pressurized water reactor located in New London County, Connecticut.

2.0 REQUEST/ACTION

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 or leak rate testing conditions. Specifically, 10 CFR Part 50, Appendix G states that “[t]he appropriate requirements on...the pressure-temperature limits and 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 provisions of amendments to the technical specifications (TSs) P-T limits in the submittal dated April 23, 2001, the licensee requested that the staff exempt MP3 from application of specific requirements of 10 CFR Part 50, Section 50.60(a) and Appendix G, and substitute use of ASME Code Case N-640. 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. 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, using the K_{Ic} fracture toughness, as permitted by Code Case N-640, in establishing the P-T limits would be less conservative than the methodology currently endorsed by 10 CFR Part 50, Appendix G. Considering this, an exemption to apply the Code Case would be required by 10 CFR 50.60.

The licensee proposed to revise the P-T limits in the TSs for MP3 using the K_{Ic} fracture toughness curve, in lieu of the K_{Ia} fracture toughness curve, as the lower bound for fracture toughness.

Use of the K_{Ic} curve in determining the lower bound fracture toughness in the development of P-T operating limits curve is more technically correct than 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 initial conservatism of the K_{Ia} curve since 1974 when the curve was codified. This initial conservatism was necessary due to the limited knowledge of RPV materials. 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 is well beyond the margin of safety required to protect the public health and safety from

potential RPV failure. In addition, P-T curves 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.

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 Commission concurs that this increased knowledge permits relaxation of the ASME Section XI, Appendix G requirements by applying the K_{Ic} fracture toughness, as permitted by Code Case N-640, while maintaining, pursuant to 10 CFR 50.12(a)(2)(ii), the underlying purpose of the ASME Code and the NRC regulations to ensure an acceptable margin of safety.

3.0 DISCUSSION

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 considers that pursuant to 10 CFR 50.12(a)(2)(ii) special circumstances are present and that an exemption may be granted to allow use of the methodology of Code Case N-640 to revise the P-T limits for MP3 because it would provide an adequate margin of safety against brittle fracture. See the safety evaluation supporting these findings dated August 14, 2001.

4.0 CONCLUSION

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. Also, special circumstances are present.

Therefore, the Commission hereby grants Dominion Nuclear Connecticut, Inc., an exemption from the requirements of 10 CFR 50.60(a) and 10 CFR Part 50, Appendix G, for MP3

Pursuant to 10 CFR 51.32, the Commission has determined that the granting of this exemption will not have a significant effect on the quality of the human environment (66 FR 42567).

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 14th day of August 200 .

FOR THE NUCLEAR REGULATORY COMMISSION

/RA/

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