

Dated: August 13, 2001.

**Judith C. Russell,**

*NCLIS Deputy Director.*

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## NUCLEAR REGULATORY COMMISSION

[Docket No. 50-423]

### Dominion Nuclear Connecticut, Inc., Millstone Nuclear Power Station, Unit No. 3; 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.

For the Nuclear Regulatory Commission.

**John A. Zwolinski,**

*Director, Division of Licensing Project Management, Office of Nuclear Reactor Regulation.*

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## NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-445 AND 50-446]

### TXU Electric, Comanche Peak Steam Electric Station, Units 1 and 2; Notice of Consideration of Approval of Transfer of Facility Operating Licenses and Conforming Amendments, and Opportunity for a Hearing

The U.S. Nuclear Regulatory Commission (NRC or the Commission) is considering the issuance of an order under 10 CFR 50.80 approving the transfer of Facility Operating License Nos. NPF-87 and NPF-89 for Comanche Peak Steam Electric Station (CPSSES),