



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

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File No.: M18.5.4
10CFR50.55a
10CFR50.60

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555

South Texas Project
Units 1 and 2
Docket Nos. STN 50-498 and STN 50-499
Request for Exemption to 10CFR50.60,
"Acceptance Criteria for Fracture Prevention for
Lightwater Nuclear Power Reactors for Normal Operation"

STP Nuclear Operating Company (STPNOC) will replace Unit 1 Steam Generators in 2000, and Unit 2 Steam Generators in 2002. STPNOC requests an exemption to 10CFR50.60, "Acceptance Criteria for Fracture Prevention for Lightwater Nuclear Power Reactors for Normal Operation," to apply American Society of Mechanical Engineers Code Case N-514 guidance, "Low Temperature Overpressure Protection," in lieu of those specified by 10CFR50, Appendix G.

This exemption request is made in support of a planned revision to STPNOC's "Proposed Amendment to Technical Specification 3.4.9.3 to Reflect Revised Cold Overpressure Mitigation Curve Associated with Replacement Steam Generators," submitted under STP letter NOC-AE-00203, dated August 31, 1998. It is based on Callaway Plant (Docket No. 50-483) letter number ULNRC-03638, dated August 22, 1997, which requested use of Code Case N-514.

STPNOC urges expedited review of this exemption request in order to enable inclusion of pressure instrument uncertainty in COMS calculation methodology. If there are questions regarding this proposal, please contact Mr. M. E. Kanavos at (512) 972-7181.

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ATTACHMENT 1

10 CFR 50.60 EXEMPTION REQUEST

10CFR50.60 EXEMPTION REQUEST

South Texas Project Nuclear Operating Company (STPNOC) requests exemption from the requirements of 10CFR50.60 in accordance with provisions of 10CFR50.12(a)(2). The granting of this exemption would permit South Texas Project (STP) to use the safety margins recommended by American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Case N-514, "Low Temperature Overpressure Protection," in lieu of the safety margins required by 10CFR50, Appendix G.

To protect against pressure escalation events that threaten Appendix G pressure/temperature (P/T) limits at low temperature, STPNOC has a Cold Overpressure Mitigation System (COMS). When COMS pressure-mitigating device actuation setpoints are exceeded these devices act to prevent pressure in the reactor vessel from exceeding P/T limits. To prevent inadvertent actuation of COMS, the setpoints of the pressure-mitigating devices must be sufficiently high that they will not be challenged by pressure surges encountered during normal operation.

Westinghouse calculated setpoints to include the necessary factors and arrived at a methodology that protects P/T limits and RCP seals, while allowing an adequate operating band, but did not include pressure instrument uncertainty. The resultant methodology was captured in WCAP 13782 and was subsequently reviewed and approved by the NRC for use in calculating STP heatup and cooldown P/T limits. The efficacy of WCAP 13782 has been empirically demonstrated during STP unit operating life through removal and examination of limiting reactor vessel coupons, with no significant indication of reduction in fracture toughness.

Since that time, two important changes to calculation of P/T limits have occurred. The NRC has determined that inclusion of instrument uncertainty in such calculations is necessary and ASME Code Case N-514 has been developed and approved by the NRC on a case by case basis for use in P/T limit calculations. N-514 is also included by reference in the NRC approved methodology described by WCAP-14040NP-A.

To incorporate pressure instrument uncertainty in P/T limit calculations, while providing an operating band that permits system makeup and pressure control, STPNOC requests use of ASME Code Case N-514. ASME Code Case N-514 designates the allowable pressure as 110% of that specified by 10CFR50, Appendix G, and is consistent with guidelines developed by the ASME Working Group on Operating Plant Criteria to define pressure protection (LTOP) events. The defined pressure limits avoid certain unnecessary operational restrictions, provide adequate margins against failure of the reactor pressure vessel, and reduce the potential for unnecessary actuation of pressure-relieving devices used for LTOP. The content of this code case has been incorporated into Appendix G of Section XI of the ASME Code and published in the 1993 Addenda to Section XI, and has been incorporated into the latest draft of Regulatory Guide 1.147 (Draft DG 1050, dated May 1997).

Pursuant to 10CFR50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10CFR50 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. According to 10CFR50.12(a)(2)(ii), special circumstances are present whenever application of the regulation in question is not necessary to achieve the underlying purpose of the rule.

It is our position that per 10CFR50.12(a)(2)(ii), special circumstances are present such that "Application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule..." The underlying purpose of 10CFR50, Appendix G is to establish fracture toughness requirements for ferritic materials of pressure-retaining components of the reactor coolant pressure boundary to provide adequate margins of safety during any condition of normal operation.

Appendix G of ASME Section XI requires that the P/T limits be established (a) using a safety factor of two (2) on the principle membrane (pressure) stresses; (b) assuming a flaw at the surface with a depth of one-quarter (1/4) of the vessel wall thickness and the length of six (6) times its depth; and (c) using a conservative fracture toughness curve that is based on the lower band of static, dynamic, and crack arrest fracture toughness tests on material similar to the STP reactor vessel material.

In determining the setpoint for LTOP events, we propose to use safety margins based on an alternate methodology consistent with the ASME Code Case N-514 guidelines. The ASME Code Case N-514 allows determination of the setpoint for LTOP events such that the maximum pressure in the vessel would not exceed 110% of the P/T limits of the existing ASME Code Appendix G. This results in a safety factor of 1.8 on the principal membrane stresses. All other factors, including assumed flaw size and fracture toughness, remain the same.

Although this methodology would reduce the design margin on the principal membrane stress, the proposed criteria will provide adequate margins of safety on the reactor vessel during LTOP transients and thus will satisfy the underlying purpose of 10CFR50.60 for fracture toughness requirements. Further, by relieving the operational restrictions, the potential for undesirable COMS actuation would be reduced, thereby improving plant safety.