



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

June 25, 2012

Mr. D. W. Rencurrel  
Chief Nuclear Officer  
STP Nuclear Operating Company  
P.O. Box 289  
Wadsworth, TX 77483

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE SOUTH TEXAS PROJECT, UNITS 1 AND 2, LICENSE RENEWAL APPLICATION – AGING MANAGEMENT, SET 20 (TAC NOS. ME4936 AND ME4937)

Dear Mr. Rencurrel:

By letter dated October 25, 2010, STP Nuclear Operating Company (STPNOC or the applicant) submitted an application pursuant to Title 10 of the *Code of Federal Regulations*, Part 54, to renew Operating Licenses NPF-76 and NPF-80 for South Texas Project, Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). The staff is reviewing the information contained in the license renewal application and has identified, in the enclosure, areas where additional information is needed to complete the review.

These requests for additional information were discussed with Arden Aldridge, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me at 301-415-3873 or by e-mail at [john.daily@nrc.gov](mailto:john.daily@nrc.gov).

Sincerely,

A handwritten signature in black ink that reads "John W. Daily".

John W. Daily, Senior Project Manager  
Projects Branch 1  
Division of License Renewal  
Office of Nuclear Reactor Regulation

Docket Nos. 50-498 and 50-499

Enclosure:  
As stated

cc w/encl: Listserv

SOUTH TEXAS PROJECT, UNITS 1 AND 2  
REQUEST FOR ADDITIONAL INFORMATION  
AGING MANAGEMENT, SET 20  
(TAC NOS. ME4936 AND ME4937)

**RAI 4.2.2.4-1, Pressure-Temperature Limits TLAA (059)**

**Background**

10 CFR Part 50, Appendix G, Paragraph IV.A states that, “*the pressure-retaining components of the reactor coolant pressure boundary [RCPB] that are made of ferritic materials must meet the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code [ASME Code, Section III], supplemented by the additional requirements set forth in [paragraph IV.A.2, “Pressure-Temperature (P-T) Limits and Minimum Temperature Requirements”].*...” Therefore, 10 CFR Part 50, Appendix G requires that P-T limits be developed for the ferritic materials in the reactor vessel (RV) beltline (neutron fluence  $\geq 1 \times 10^{17}$  n/cm<sup>2</sup>, E > 1 MeV), as well as ferritic materials not in the RV beltline (neutron fluence  $< 1 \times 10^{17}$  n/cm<sup>2</sup>, E > 1 MeV). Further, 10 CFR Part 50, Appendix G requires that all RCPB components must meet the ASME Code, Section III requirements. The relevant ASME Code, Section III requirement that will affect the P-T limits is the lowest service temperature requirement for all RCPB components specified in Section III, NB-2332(b).

**Issue**

P-T limit calculations for ferritic RCPB components that are not RV beltline shell materials (neutron fluence  $< 1 \times 10^{17}$  n/cm<sup>2</sup>, E > 1 MeV) may define P-T curves that are more limiting than those calculated for the RV beltline shell materials (neutron fluence  $\geq 1 \times 10^{17}$  n/cm<sup>2</sup>, E > 1 MeV). This may be due to the following factors:

1. RV nozzles, penetrations, and other discontinuities have complex geometries that may exhibit significantly higher stresses than those for the RV beltline shell region. These higher stresses can potentially result in more restrictive P-T limits, even if the reference temperature ( $RT_{NDT}$ ) for these components is not as high as that of RV beltline shell materials that have simpler geometries.
2. Ferritic RCPB components that are not part of the RV may have initial  $RT_{NDT}$  values, which may define a more restrictive lowest operating temperature in the P-T limits than those for the RV beltline shell materials.

Section 4.2.4 (*P-T Limits*) of the license renewal application (LRA) states in part, “The current P-T limit curves and the assumed Adjusted Reference Temperature (ART) values are valid up to 32 EFPY. The effects of extended beltline materials on the P-T curves were also evaluated. The  $RT_{PTS}$  of inlet/outlet nozzles for both units were calculated using conservative assumptions for fluence and material properties, and the results could not demonstrate that these nozzles would not be limiting. Therefore the revision to the P-T curves necessary to extend the P-T curves beyond 32 EFPY and into the period of extended operation will need to demonstrate the nozzles will receive a fluence of less than  $1 \times 10^{17}$  n/cm<sup>2</sup> (E>1.0 MeV) or will need to consider the ART of inlet/outlet nozzles. For Unit 2, the extended beltline material for the bottom head torus, R3020-1, was shown to be the limiting material. Therefore the revision to the P-T curves will need to consider the ART of the bottom head torus.”

ENCLOSURE

**Request**

Revise LRA Section 4.2.4 to describe how the P-T limit curves, and the methodology used to develop these curves, will consider all RV materials (beltline and non-beltline) and the lowest service temperature of all ferritic RCPB materials, consistent with the requirements of 10 CFR Part 50, Appendix G, during the period of extended operation, or provide a justification for how the current LRA Section 4.2.4 will satisfy the requirements of 10 CFR Part 50, Appendix G, during the period of extended operation.

Letter to D. W. Rencurrel from John W. Daily dated June 25, 2012

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John W. Daily, Senior Project Manager  
Projects Branch 1  
Division of License Renewal  
Office of Nuclear Reactor Regulation

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