



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

February 29, 2012

Mr. Brian J. O'Grady
Vice President-Nuclear and CNO
Nebraska Public Power District
72676 648A Avenue
Brownville, NE 68321

**SUBJECT: COOPER NUCLEAR STATION - REQUEST FOR ADDITIONAL INFORMATION
RE: LICENSE AMENDMENT REQUEST TO REVISE TECHNICAL
SPECIFICATION 3.4.9, 'RCS PRESSURE AND TEMPERATURE (P/T) LIMITS'
(TAC NO. ME7324)**

Dear Mr. O'Grady:

By letter dated September 22, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11272A057), Nebraska Public Power District (the licensee) submitted a license amendment request (LAR) to revise the Technical Specifications (TSs) for Cooper Nuclear Station. The proposed LAR would revise TS 3.4.9, "RCS [Reactor Coolant System] Pressure and Temperature (P/T) Limits," to include new pressure-temperature (P-T) limits for heat-up and cool-down operations with the core critical and core not critical, as well as for pressure test conditions. The proposed P-T limits would be valid for 32 effective full power years (EFPY) of facility operation. The proposed revisions to TS 3.4.9 also would revise surveillance requirements for verifying that the reactor vessel flange and reactor vessel head flange temperatures are greater than the revised minimum operating temperature (70 degrees Fahrenheit) specified for the proposed 32 EFPY P-T limits.

The U.S. Nuclear Regulatory Commission staff has reviewed your submittal and determined that additional information is needed for the staff to complete its evaluation. The request for additional information was transmitted via e-mail to Mr. Edward McCutchen of your staff on February 14, 2012. Mr. McCutchen indicated via e-mail on February 15, 2012, that the response would be provided within 30 days of receipt of this letter.

B. O'Grady

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If you have any questions, please contact me at 301-415-1377 or via e-mail at Lynnea.Wilkins@nrc.gov.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lynnea Wilkins', with a stylized flourish at the end.

Lynnea E. Wilkins, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

NEBRASKA PUBLIC POWER DISTRICT

COOPER NUCLEAR STATION

DOCKET NO. 50-298

By letter dated September 22, 2011 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML11272A057), Nebraska Public Power District (the licensee) submitted a license amendment request (LAR) to revise the Technical Specifications (TSs) for Cooper Nuclear Station (Cooper). The proposed LAR would revise TS 3.4.9, "RCS [Reactor Coolant System] Pressure and Temperature (P/T) Limits," to include new pressure-temperature (P-T) limits for heat-up and cool-down operations with the core critical and core not critical, as well as for pressure test conditions. The proposed P-T limits would be valid for 32 effective full power years (EFPY) of facility operation. The proposed revisions to TS 3.4.9 also would revise surveillance requirements for verifying that the reactor vessel (RV) flange and RV head flange temperatures are greater than the revised minimum operating temperature (70 degrees Fahrenheit (°F)) specified for the proposed 32 EFPY P-T limits.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed and evaluated the information provided by the licensee and has determined that the following information is needed in order to complete its review.

1. The proposed 32 EFPY P-T limits for all operating conditions, including pressure test conditions, are based, in part, on the adjusted Reference Temperature of Nil-Ductility Transition (adjusted RT_{NDT} (ART)) for the limiting RV beltline shell material at 32 EFPY. The NRC staff noted discrepancies among the various parts of the submittal regarding the limiting beltline shell ART value. Specifically, Section 3.3 of the LAR (page 5 of 11) states, in part, that "[t]he most limiting beltline material is the Lower Longitudinal Weld with an ART value of 103.5 °F." Cooper Calculation No. NEDC 07-048 (Enclosure to the LAR, page 5 of 7), states, in part, that "[t]he limiting beltline material has an ART value of 103.2°F and 123.5°F for 32 and 54 EFPY, respectively." Also, Structural Integrity Associates (SIA) Calculation Package 1100445.303 (Enclosure to the LAR, page 10 of 40) states, in part that, "the limiting beltline material is the Lower/Intermediate shell plate, which has an ART value of 105.8°F for 32 EFPY and 131.2°F for 54 EFPY."
 - a. Please identify the correct limiting beltline shell material and corresponding ART value for this material at 32 EFPY.
 - b. Please provide the inputs necessary for calculating this ART value, based on NRC Regulatory Guide (RG) 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," May 1988 (ADAMS Accession No. ML003740284), procedures (initial RT_{NDT} , Cu content, Ni content, chemistry factor calculations, 32 EFPY fluence, and margin term calculations).

Enclosure

2. The 32 EFPY P-T limits for core not critical and pressure test conditions are based, in part, on the fracture mechanics calculations for the limiting N16 instrument nozzle. Specifically, SIA Calculation Package 1100445.303 identifies the N16 nozzles as being located in the extended beltline region. The SIA calculation report (Enclosure to the LAR, page 6 of 40) states, in part, that, "[t]he nozzle material is not ferritic and does not need to be specifically evaluated. However, the effect of the [nozzle] penetration on the adjacent [RV beltline] shell must be considered." Accordingly, the SIA report documents P-T limit calculations for the limiting N16 nozzle based on thermal and pressure stress intensity factors, which are determined based on nozzle configuration/geometry and finite element analyses, and a 32 EFPY ART value of 52.4 °F.
 - a. Please identify the RV beltline shell material which contains the N16 nozzle penetrations.
 - b. Please confirm that a 32 EFPY ART value of 52.4 °F is the correct value for the RV plate with the embedded N16 nozzles.
 - c. Please provide the inputs necessary for calculating this ART value, based on RG 1.99, Revision 2 procedures (initial RT_{NDT} , Cu content, Ni content, chemistry factor calculations, 32 EFPY fluence, and margin term calculations).
3. The proposed 32 EFPY P-T limits for heat-up and cool-down operations with the core not critical show a reduction in the minimum operating (bolt-up) temperature requirement from 80 °F (as specified in the current TS P-T limits) to 70 °F. While the NRC staff notes that the new minimum temperature requirement of 70 °F will continue to remain acceptable per the minimum temperature requirements specified in Table 1 of Appendix G, "Fracture Toughness Requirements," to Part 50 of Title 10 of the *Code of Federal Regulations* (10 CFR), the NRC staff could not find an explanation for the change. Please discuss the technical basis for the reduction in the minimum operating (bolt-up) temperature requirement.

B. O'Grady

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If you have any questions, please contact me at 301-415-1377 or via e-mail at Lynnea.wilkins@nrc.gov.

Sincerely,

/RA/

Lynnea E. Wilkins, Project Manager
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-298

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

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ADAMS Accession No.: ML120590085

***via memo dated**

OFFICE	NRR/LPL4/PM	NRR/LPL4/LA	NRR/DE/EVIB/BC	NRR/LPL4/BC	NRR/LPL4/PM
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DATE	2/28/12	2/28/12	1/30/12	2/29/12	2/29/12

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