

REQUEST FOR ADDITIONAL INFORMATION  
LICENSE AMENDMENT REQUEST FOR REVISED TECHNICAL SPECIFICATIONS  
PRESSURE-TEMPERATURE LIMITS FOR 32 EFPY  
NEBRASKA PUBLIC POWER DISTRICT  
COOPER NUCLEAR STATION  
DOCKET NO. 50-298  
FACILITY OPERATING LICENSE NO. DPR-46

BACKGROUND

By letter dated September 22, 2011, Nebraska Public Power District (NPPD, the licensee) submitted a license amendment request (LAR) to revise the technical specifications (TS) for Cooper Nuclear Station (Cooper). The proposed LAR would revise TS Section 3.4.9 (TS 3.4.9) 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 include revised surveillance requirements for verifying that the reactor vessel (RV) flange and RV head flange temperatures are greater than the revised minimum operating temperature (70 °F) specified for the proposed 32 EFPY P-T limits.

ISSUE/REQUEST

1. The proposed 32 EFPY P-T limits for all operating conditions, including pressure test conditions, are based, in part, on the adjusted  $RT_{NDT}$  (ART) for the limiting RV beltline shell material at 32 EFPY. The staff noted discrepancies among the various parts of the submittal regarding the limiting beltline shell ART value. Specifically, Section 3.3 (page 5) of the LAR (Attachment 1 of NPPD Letter NLS2011015) states 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 cover letter), page 5, states that the “[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, page 10, states 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 Regulatory Guide (RG) 1.99, Rev. 2 procedures (initial  $RT_{NDT}$ , Cu content, Ni content, chemistry factor calculations, 32 EFPY fluence, and margin term calculations).

ENCLOSURE

2. The 32 EFPT 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 (p. 6) states 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. 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, Rev. 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 staff notes that the new minimum temperature requirement of 70 °F will continue to remain acceptable per the minimum temperature requirements specified in 10 CFR Par 50, Appendix G, Table 1, the 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.