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

Mr. Oscar A. Limpias  
Vice President-Nuclear and CNO  
Nebraska Public Power District  
72676 648A Avenue  
Brownville, NE 68321

SUBJECT: COOPER NUCLEAR STATION - REQUEST FOR ADDITIONAL INFORMATION  
RE: CORE PLATE HOLD DOWN BOLT STRESS ANALYSIS (TAC NO. ME9550)

Dear Mr. Limpias:

By letter dated January 16, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12031A248), the Nebraska Public Power District (NPPD, the licensee), submitted a GE-Hitachi Nuclear Energy (GEH) proprietary report, NEDC-33674P, "Cooper Nuclear Station Core Plate Bolt Stress Analysis," Revision 0, October 2011 (non-proprietary version designated as NEDO-33674, Revision 0, available at ADAMS Accession No. ML12031A249). This report was submitted in accordance with License Renewal Commitment NLS2009100-1, as documented in NUREG-1944, "Safety Evaluation Report Related to the License Renewal of Cooper Nuclear Station," September 2010 (ADAMS Accession No. ML103070009), whereby the licensee committed to perform an analysis of the CNS core plate rim bolts to demonstrate the adequacy of the bolts considering the loss of bolt pre-load experienced during the period of extended operation and submit this analysis at least 2 years prior to entering the period of extended operation.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided and determined that additional information is required in order to complete the review. The requests for additional information (RAIs) were transmitted via e-mail April 4 and 19, 2013, to Mr. Edward McCutchen of your staff. As discussed with Mr. McCutchen and others of your staff in a telephone call on May 9 and 17, 2013, the licensee will respond to the RAIs within 45 days of receipt of this letter. The non-proprietary RAIs are provided in Enclosure 1 and the proprietary RAIs are provided in Enclosure 2.

Enclosure 2 to this letter contains Proprietary Information. When separated from Enclosure 2, this letter is DECONTROLLED.

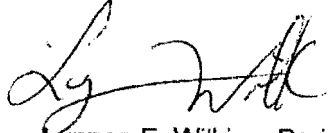
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*LW*

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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](mailto:Lynnea.Wilkins@nrc.gov).

Sincerely,



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

Docket No. 50-298

Enclosures:

1. RAI (non-proprietary)
2. RAI (proprietary)

cc w/Enclosure 1: Distribution via Listserv

*LW*

REQUEST FOR ADDITIONAL INFORMATION  
CORE PLATE HOLD DOWN BOLT STRESS ANALYSIS  
NEBRASKA PUBLIC POWER DISTRICT  
COOPER NUCLEAR STATION  
DOCKET NO. 50-298

By letter dated January 16, 2012 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML12031A248), the Nebraska Public Power District (NPPD, the licensee), submitted a GE-Hitachi Nuclear Energy (GEH) proprietary report, NEDC-33674P, "Cooper Nuclear Station Core Plate Bolt Stress Analysis," Revision 0, October 2011 (non-proprietary version designated as NEDO-33674, Revision 0, available at ADAMS Accession No. ML12031A249). This report was submitted in accordance with License Renewal Commitment NLS2009100-1, as documented in NUREG-1944, "Safety Evaluation Report Related to the License Renewal of Cooper Nuclear Station," dated September 2010 (ADAMS Accession No. ML103070009), whereby the licensee committed to perform an analysis of the CNS core plate rim bolts to demonstrate the adequacy of the bolts considering the loss of bolt pre-load experienced during the period of extended operation (PEO) and submit this analysis at least 2 years prior to entering the PEO.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the information provided and determined that the following additional information is required in order to complete the review:

1. The example stress analysis provided in the Boiling Water Reactor Vessel and Internals Project (BWRVIP)-25, "BWR Core Plate Inspection and Flaw Evaluation Guidelines," is based on an elastic finite element analysis of the core plate and core plate hold down bolts. The information provided in NEDC-33674P, Revision 0, does not state what type of analysis was performed to demonstrate that the CNS core plate hold down bolts (core plate bolts) will remain structurally adequate throughout the PEO, considering a potential loss of preload. Please confirm that the stress analyses performed in NEDC-33674P are consistent with the approach assumed in BWRVIP-25 (i.e., elastic finite element analysis).
2. Section 2.0 of NEDC-33674P notes that a portion of the CNS plant-specific data was not available for this analysis and, subsequently, scaled data from Appendix A of BWRVIP-25 was used in lieu of plant-specific data. Please state what CNS plant-specific data was not available and what corresponding data was used from BWRVIP-25. Further, please provide a technical justification demonstrating that the alternative data provides a sound basis for determining that the core plate bolts will remain structurally adequate during the PEO.

Enclosure 1

3. Section 7.1 of NEDC-33674P discusses the preload which was accounted for in the CNS core plate bolt stress analyses. This section notes that the original preload for each bolt was 300 plus or minus 25 foot-pound force (ft-lbf). However, no references are provided regarding the basis for this value. Please provide the basis for the value of the preload assumed in this analysis.
4. Section 8.1 of NEDC-33674P notes that the analysis performed for CNS core plate bolts calculate the shear loads on the core plate aligner pins using a different method than that used in BWRVIP-25 due to the variance in aligner pin configurations. Please describe the method used to calculate the shear loads for the CNS core plate aligner pins and provide a technical justification for this deviation from BWRVIP-25, which demonstrates that the alternative method provides an accurate means to evaluate the shear stresses imposed on the aligner pins.
5. Section 8.1 of NEDC-33674P provides the results of the stress analyses of the CNS core plate bolts for three distinct scenarios. For each scenario, the bolt stress levels were compared against applicable allowable stress values prescribed by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), depending on the service level considered (i.e., Normal, Upset, Emergency or Faulted). The construction of the core plate results in an uneven distribution of the resultant horizontal and vertical loads supported by the core plate bolts. However, the results presented in Section 8.1 of NEDC-33674P do not specify whether these results apply to the limiting CNS core plate bolt(s). Please confirm that the results presented in this section of NEDC-33674P correspond to the limiting core plate bolt(s) (i.e., those which support the greatest horizontal and/or vertical loads) and demonstrate that these limiting core plate bolt(s) meet the applicable ASME Code allowable stress values. If the results presented in NEDC-33674P do not correspond to the limiting core plate bolts, please present the results of the stress analyses for the limiting core plate bolt(s) which demonstrate that the stresses induced in the limiting core plate bolts meet the applicable ASME Code allowable stress values.

- 2 -

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

Enclosures:

1. RAI (non-proprietary)
2. RAI (proprietary)

cc w/Enclosure 1: Distribution via Listserv

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**ADAMS Accession No.: OUO (Proprietary): ML13133A077; Redacted ML13133A080**

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