



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

July 14, 2010

Mr. Barry S. Allen
Site Vice President
FirstEnergy Nuclear Operating Company
Davis-Besse Nuclear Power Station
Mail Stop A-DB-3080
5501 North State Route 2
Oak Harbor, OH 43449-9760

SUBJECT: DAVIS-BESSE NUCLEAR POWER STATION, UNIT NO. 1 - REQUEST FOR ADDITIONAL INFORMATION REGARDING DAVIS-BESSE LICENSE AMENDMENT REQUEST TO INCORPORATE THE USE OF ALTERNATIVE METHODOLOGIES FOR THE DEVELOPMENT OF RPV P-T CURVES, AND REQUEST FOR EXEMPTION FROM CERTAIN REQUIREMENTS CONTAINED IN 10 CFR 50.61 AND 10 CFR PART 50, APPENDIX G (TAC NOS. ME1127 AND ME1128)

Dear Mr. Allen:

By letter dated April 15, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML091130228), as supplemented December 18, 2009 (ADAMS Accession No. ML093570103), FirstEnergy Nuclear Operating Company (FENOC), submitted a license amendment request for Davis-Besse Nuclear Power Station, Unit 1, to incorporate the use of alternate methodologies for the development of the reactor pressure vessel pressure-temperature limit curves, and requested exemption from certain requirements contained in 10 CFR 50.61 and 10 CFR Part 50, Appendix G.

The Nuclear Regulatory Commission (NRC) staff is reviewing your submittal and has determined that additional information is required to complete the review. The specific information requested is addressed in the enclosure to this letter. During a discussion with your staff on July 7, 2010, it was agreed that FENOC would provide a response within 45 days from the date of this letter.

The NRC staff considers that timely responses to requests for additional information help ensure sufficient time is available for staff review and contribute toward the NRC's goal of efficient and

B. Allen

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effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-3867.

Sincerely,

A handwritten signature in black ink that reads "Michael Mahoney". The signature is written in a cursive style with a long, sweeping line extending from the end of the name.

Michael Mahoney, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

DAVIS-BESSE NUCLEAR POWER STATION

FIRSTENERGY NUCLEAR OPERATING COMPANY

DOCKET NO. 50-346

By letter dated April 15, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML091130228), as supplemented December 18, 2009 (ADAMS Accession No. ML093570103), FirstEnergy Nuclear Operating Company (FENOC) submitted a license amendment request for Davis-Besse Nuclear Power Station (DBNPS), Unit 1, to incorporate the use of alternate methodologies for the development of the reactor pressure vessel pressure-temperature (P-T) limit curves, and requested exemption from certain requirements contained in 10 CFR 50.61 and 10 CFR Part 50, Appendix G.

To complete its review of the Davis-Besse subject license amendment request and requested exemption, the Nuclear Regulatory Commission (NRC) staff requests the following information.

The alternate methodologies to be used include Babcock & Wilcox Topical Report BAW-2308, "Initial RT_{NDT} of Linde 80 Weld Materials," Revisions 1-A and 2-A, which provide an alternate method to determine the initial reference temperature of the beltline weld materials. The method of Regulatory Guide 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," was used to determine the shift in the reference temperature (ΔRT_{NDT}), which was added to the initial reference temperature along with a margin term to determine the adjusted reference temperature (ART) for the reactor pressure vessel (RPV) beltline weld materials.

In Table 1 of Enclosure B to Reference 2, FENOC provided the material properties for the Linde 80 beltline weld materials in the DBNPS RPV, including the initial reference temperature, ΔRT_{NDT} for the 1/4t (i.e., at 1/4 of the thickness of the RPV wall, measured from the clad-to-base metal interface) and 3/4t (i.e., at 3/4 of the thickness of the RPV wall, measured from the clad-to-base metal interface) locations, and ART for the 1/4t and 3/4t locations. Enclosure B to Reference 2 also stated in reference to the Table 1 data, that the values are valid through 52 effective full power years (EFPY) of operation, although the end of service for the DBNPS is 32 EFPY. The ART values in the table were used to evaluate the low temperature overpressure protection (LTOP) system setpoints for DBNPS, in Enclosure A of Reference 2, and will be used in the future to develop revised P-T limits for DBNPS. The neutron fluence values used to calculate ΔRT_{NDT} were not provided. The staff requires these neutron fluence values in order to perform an independent evaluation of the ΔRT_{NDT} for these materials.

Requested Information

1. Provide the end of license neutron fluence value(s) for the RPV inside diameter (clad-to-base metal interface) used to calculate the ΔRT_{NDT} for the Linde 80 weld materials listed in Table 1 of Enclosure B to Reference 2.
2. Provide the maximum EFPY for which the neutron fluence values are valid.

ENCLOSURE

In Section 3.2 of Enclosure A to Reference 2, an evaluation of the LTOP system effective temperature was provided. The new LTOP system effective temperature was based on the ART at the 1/4t location for weld WF-182-1 (156.2 °F), plus a margin term of 50 °F, plus the temperature difference between the reactor coolant and the 1/4t vessel location. Section 3.2 also indicated that the heatup condition is always controlling with respect to the LTOP system effective temperature. The temperature difference between the reactor coolant and the 1/4t location was given as 28.77 °F.

The staff performed a confirmatory calculation of the reactor coolant to metal temperature difference using the methods of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, Appendix G. The staff determined a significantly lower temperature difference for the 1/4t location and a slightly lower temperature difference for the 3/4t location.

3. Describe how the reactor coolant to RPV metal temperature at the controlling location was calculated; i.e., using ASME Code, Section XI, Appendix G or other method. Provide the inputs used to calculate the temperature difference such as RPV thickness and heatup rate.

References

1. Letter from Barry S. Allen to NRC dated April 15, 2009, Subject: "Davis Besse Nuclear Power Station, Unit No. 1, Docket No. 50-346, License No. NPF-3, License Amendment Request to Incorporate the Use of Alternate Methodologies for the Development of Reactor Pressure Vessel Pressure-Temperature Limit Curves, and request for Exemption from Certain Requirements Contained in 10 CFR 50.61 and 10 CFR 50 Appendix G" (ADAMS Accession No. ML091130228).
2. Letter from Barry S. Allen to NRC dated December 18, 2009, Subject: "Davis Besse Nuclear Power Station, Unit No. 1, Docket No. 50-346, License No. NPF-3, Supplemental Information Related to a License Amendment Request to Incorporate the Use of Alternate Methodologies for the Development of Reactor Pressure Vessel Pressure-Temperature Limit Curves, and request for Exemption from Certain Requirements Contained in 10 CFR 50.61 and 10 CFR 50 Appendix G (ADAMS Accession No. ML093570103).

effective use of staff resources. If circumstances result in the need to revise the requested response date, please contact me at (301) 415-3867.

Sincerely,

/RA/

Michael Mahoney, Project Manager
Plant Licensing Branch III-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-346

Enclosure:
Request for Additional Information

cc w/encl: Distribution via Listserv

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NRR-088

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