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ET 14-0039

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Reference: Letter ET 10-0019, dated June 10, 2010, from T. J. Garrett, WCNOG, to USNRC: Docket No. 50-482, "10 CFR 50.55a Request for Alternative to ASME Code Case N-579, "Use of Nonstandard Nuts, Class 1, 2, and 3, MC, CS Components and Supports Construction Section III, Division 1,"" and the associated NRC Safety Evaluation (SE) dated March 21, 2011.

Subject: Docket No. 50-482: 10 CFR 50.55a Request for Alternative to ASME Code Case N-579, "Use of Nonstandard Nuts, Class 1, 2, and 3, MC, CS Components and Supports Construction Section III, Division 1"

Gentlemen:


Pursuant to 10 CFR 50.55a(z)(1), Wolf Creek Nuclear Operating Corporation (WCNOG) hereby requests Nuclear Regulatory Commission (NRC) approval of the attached 10 CFR 50.55a request for the remaining life of the Excess Letdown Heat Exchanger, EBG02, in accordance with 10 CFR 50.55a(b)(4).

The attached 10 CFR 50.55a request proposes an alternative to the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section III, Code Case N-579, "Use of Nonstandard Nuts, Class 1, 2, and 3, MC, CS Components and Supports Construction Section III, Division 1." The proposed alternative provides an acceptable level of quality and safety as required by 10 CFR 50.55a(z)(1).

WCNOG was previously granted approval of a similar request (Reference (1)); however, that request was only granted until September 2, 2015. Therefore, WCNOG requests approval of the attached 10 CFR 50.55a request prior to September 3, 2015.

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4156, or Mr. Steven R. Koenig at (620) 364-4041.

Sincerely,


Jaime H. McCoy

A047
NRR

JHM/rlt

Attachment

cc: M. L. Dapas (NRC), w/a
C. F. Lyon (NRC), w/a
N. F. O'Keefe (NRC), w/a
Senior Resident Inspector (NRC), w/a

Wolf Creek Nuclear Operating Corporation

10 CFR 50.55a Request

Request for Alternative to ASME Code Case N-579, "Use of Nonstandard Nuts, Class 1, 2, and 3, MC, CS Components and Supports Construction Section III, Division 1"

10 CFR 50.55a Request

Request for Alternative to ASME Code Case N-579, "Use of Nonstandard Nuts, Class 1, 2, and 3, MC, CS Components and Supports Construction Section III, Division 1"

Proposed Alternative In Accordance with 10 CFR 50.55a(z)(1) Alternative Provides Acceptable Level of Quality and Safety

1. ASME Code Components Affected

Excess Letdown Heat Exchanger (EBG02) – specifically the channel head flange fastening item (ASME Section III Class 2), SA-540 Grade B23, non-standard nuts.

2. Applicable Code Edition and Addenda

The applicable Construction Code for the Excess Letdown Heat Exchanger is ASME Section III, 1974 Edition including Summer 1974 Addenda.

3. Applicable Code Requirement

This request presents an alternative to the requirements of ASME Section III, Code Case N-579, which may be used for Section III Division 1, Subsection NB, NC, BD, NE, NG components and NF supports. The requested alternative involves Case N-579 requirements that material for nuts shall conform to the requirements of SA-194 (except paragraph 9.1 as stated in SA-194 in ASME BPVC, Section II, 1995 Edition through 1997 Addenda), and that screw threads of nonstandard nuts shall be manufactured to meet the requirements for threads in ASME B1.1.

4. Reason for Request

The Excess Letdown Heat Exchanger (EBG02) cools reactor coolant excess letdown flow. The flow rate is equivalent to the portion of the nominal seal injection flow which flows into the reactor coolant system (RCS) through the reactor coolant pump labyrinth seals. The Excess Letdown Heat Exchanger can be employed either when normal letdown is temporarily out of service to maintain the reactor in operation, to supplement maximum letdown during the final stages of heatup, or to provide a letdown path from the RCS to the pressurizer relief tank. The letdown flows through the tube side of the unit, and component cooling water is circulated through the shell.

The Excess Letdown Heat Exchanger is vertically mounted (with the channel head down) and located in a high radiation area within the reactor coolant loop 4 cubicle inside the secondary shield wall of the reactor building. The channel head to shell joint is a bolted flanged connection with the tube sheet between the head and channel flanges. The assembly is held together by studs (extending through the flanges and tube sheet) and nuts. Due to this design, the heat exchanger flange has had chronic boric acid leakage at various times. Prior efforts to control the leakage with gasket replacement and fastener torquing adjustments have not been successful, which has led to unnecessary radiation exposure to maintenance personnel. The joint has been redesigned to use hydraulic tensioning nuts (Nova Machine Products HydraNuts, SA-540 Grade B23 material) to assure consistent loading around the joint as well as to reduce personnel exposure by reducing maintenance time in the area.

ASME Code Case N-579 allows the use of non-standard nuts conforming to SA-194 material with threads conforming to ASME B1.1. This 10 CFR50.55a request is for using the SA-540 Grade B23 material in lieu of the SA-194 and for using threads that do not conform to ASME B1.1 as prescribed by the Case.

5. Proposed Alternative and Basis for Use

SA-540 Grade B23 material meeting the requirements for bolting material in Section III, Subparagraph NC-2127(a) and Section II, Table I-7.3, has been used to fabricate the hydraulic nuts currently installed on the Excess Letdown Heat Exchanger flange instead of the SA-194 material specified in Code Case N-579.

Code Case N-579 specifies that the nonstandard nut meet the proof load requirements of SA-194. Nuts meeting SA-194 Grade 2H and SA-194 Grade 7 have the highest proof load requirements in SA-194 with a proof load based on a proof stress of 175,000 psi (reference Table 3 of SA-194). The hydraulic nuts, which are SA-540 Grade B23 material, have been subjected to a proof load of 311,500 lbf based on a proof stress of 175,000 psi for 1-5/8" diameter nuts (Reference Table S5.1 of SA-194, 1995 Edition through 1997 Addenda). The SA-540 Grade B23 material, which is listed in Table I-7.3 of Section II for Class 2 bolting, has been used in lieu of SA-194 for manufacture of the hydraulic nuts currently installed on EBG02 and is shown to have sufficient strength.

Code Case N-579 requires the screw threads of nonstandard nuts to be manufactured to meet the requirements for threads in ASME B1.1. While the inside threads of the hydraulic nuts conform to ASME B1.1, the outside threads currently installed on EBG02 have a proprietary thread design developed by the vendor, Nova Machine Products, which minimizes thread deflection between the nut and lock ring to reduce the loss of preload.

Basis for Use

The SA-540 Grade B23 material currently used for the nonstandard nuts installed on EBG02 is an ASME Code Section III material but Code Case N-579 specifies using SA-194. However, based on the SA-540 Grade B23 material requirement, the material is shown to be of at least equivalent strength as the SA-194 material.

Use of Section III SA-540 Grade B23 material in lieu of the SA-194 material specified in Code Case N-579 has assured adequate strength in the joint. The special thread design of the outside threads of the hydraulic nuts minimizes thread deflection and loss of preload upon tightening of the lock ring and removal of hydraulic pressure. This allows for a lower initial preload to be used in contrast to standard threads manufactured in accordance with ASME B1.1.

The Boric Acid Control (BAC) program requires Wolf Creek Nuclear Operating Corporation (WCNOC) to perform inspections each refueling outage and document any boric acid leakage or corrosion in a condition report. No leakage has been identified in this joint since the original installation of the nonstandard nuts in Refueling Outage 18 (Spring 2011). Use of the hydraulic tensioning process also reduces overall radiation exposure to maintenance personnel by reducing maintenance time in the area. These advantages provide an equivalent level of quality and safety in accordance with 10CFR50.55a(z)(1).

6. Duration of Proposed Alternative

The original alternative request was initially implemented during the Wolf Creek Generating Station (WCGS) Refueling Outage 18 (Spring 2011) and was requested to remain permanently installed in the plant. That alternative was previously approved only through the end of the third Inservice Inspection (ISI) Interval scheduled to end on September 2, 2015 as though it were a Section XI Code Case. However, Case N-579 is a Section III Code Case included in Reg. Guide 1.84, Revision 36, Table 1, Applicable Section III Code Cases. 10 CFR 50.55a(b)(4) does not condition use of Section III Code Cases based on Section XI 10-year intervals. 50.55a(b)(4)(ii) and (iii) state that revised or annulled Cases do not affect the Licensee's continued use of a Section III Code Case until the Licensee updates its Code of Record for the component. WCNOG is not updating its Code of Record for the Excess Letdown Heat Exchanger EBG02. Therefore, WCNOG requests that this request for alternative to Case N-579 be approved for use with EBG02 for the remaining life of the component.

7. Precedents

WCNOG was previously granted a similar request (ML110750069); however, that request was granted only until September 2, 2015 (Reference WCNOG Letter ET 10-0019, dated June 10, 2010, to USNRC: Docket No. 50-482, "10 CFR 50.55a Request for Alternative to ASME Code Case N-579, "Use of Nonstandard Nuts, Class 1, 2, and 3, MC, CS Components and Supports Construction Section III, Division 1,"" and the associated NRC Safety Evaluation (SE) dated March 21, 2011). The WCNOG 10 CFR 50.55a request asked for approval to use hydraulic nuts developed by Nova Machine Products for the Excess Letdown Heat Exchanger. The Nuclear Regulatory Commission (NRC) Safety Evaluation (SE) found the use of SA-540 Grade B23 material acceptable because it is listed as an acceptable material for Class 2 bolting in Section III of the Code. The NRC also found the use of the proprietary outside thread design acceptable because the design minimizes thread deflection between the nut and lock ring and thus the loss of preload is minimized.