



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

November 18, 2010

Mr. Matthew W. Sunseri  
President and Chief Executive Officer  
Wolf Creek Nuclear Operating Corporation  
Post Office Box 411  
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION – REQUEST FOR ALTERNATIVE TO  
ASME CODE CASE N-579 ON USE OF NONSTANDARD HYDRAULIC NUTS  
ON THE EXCESS LETDOWN HEAT EXCHANGER (TAC NO. ME4075)

Dear Mr. Sunseri:

By letter dated June 10, 2010, Wolf Creek Nuclear Operating Corporation (the licensee) proposed an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME 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 licensee plans to replace the channel head flange bolting of the Excess Letdown Heat Exchanger under the ASME Code, Section XI in the third 10-year inservice inspection interval (ISI) during the refueling outage 18 at Wolf Creek Generating Station (WCGS). The licensee has requested relief from use of the material specified in Code Case N-579 for the hydraulic nuts and conformance of thread configuration to ASME B1.1.

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the subject relief request. Based on the enclosed safety evaluation, the NRC staff concludes that the proposed alternative to Code Case N-579 stated in licensee's request for relief provides an acceptable level of quality and safety. Therefore, the proposed alternative is authorized pursuant to paragraph 50.55a(a)(3)(i) of Title 10 of the *Code of Federal Regulations* for the third 10-year ISI interval of WCGS. All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this relief request remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

M. Sunseri

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If you have any questions regarding the safety evaluation, please contact Balwant K. Singal at (301) 415-3016.

Sincerely,

A handwritten signature in black ink, appearing to read "Michael T. Markley". The signature is written in a cursive style with a large initial "M".

Michael T. Markley, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosure  
As stated

cc w/encl: Distribution via Listserv



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF ON USE OF NONSTANDARD HYDRAULIC NUTS

ON THE EXCESS LETDOWN HEAT EXCHANGER

DURING THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

WOLF CREEK GENERATING STATION

WOLF CREEK NUCLEAR OPERATING CORPORATION

DOCKET NO. 50-482

1.0 INTRODUCTION

By letter dated June 10, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML101730557), Wolf Creek Nuclear Operating Corporation (the licensee) proposed an alternative to the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME 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 licensee plans to replace the channel head flange bolting of the Excess Letdown Heat Exchanger under the ASME Code, Section XI in the third 10-year inservice inspection (ISI) interval during refueling outage number 18 at Wolf Creek Generating Station (WCGS). Code Case N-579 has been approved by the U.S. Nuclear Regulatory Commission (NRC) and is documented in NRC Regulatory Guide 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III," Revision 35, dated October 2010. The licensee has requested relief from use of the material specified in Code Case N-579 for the hydraulic nuts and conformance of thread configuration to ASME B1.1.

2.0 REGULATORY EVALUATION

The ISI of the ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code and applicable addenda as required by Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g), "Inservice inspection requirements," except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). The regulations in 10 CFR 50.55a(a)(3) state that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Enclosure

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable ISI Code of record for the third 10-year ISI interval of WCGS is the 1998 Edition through the 2000 Addenda of the ASME Code, Section XI.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Applicable Code Edition and Addenda (as stated by the licensee)

The bolting replacement will be performed as a repair/replacement activity under the jurisdiction of the ASME Boiler and Pressure Vessel Code, Section XI. The 1998 Edition through the 2000 Addenda is the applicable Section XI edition and addenda for Wolf Creek Nuclear Operating Corporation's (WCNOC's) third inservice inspection interval. Section XI IWA-4000 requires use of portions of the original Construction Code and allows use of Construction Code, Code Cases. For the Excess Letdown Heat Exchanger, the applicable Construction Code is ASME Section III, 1974 Edition including Summer 1975 Addendum.

Code Case N-579, "Use of Nonstandard Nuts, Class 1, 2, and 3, MC, CS Components and Supports Construction Section III, Division 1," is approved for use by the [NRC] as documented in Regulatory Guide 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III," Revision [35], dated October [2007].

#### 3.2 System/Component(s) for Which Relief is Requested (as stated by the licensee)

The Excess Letdown Heat Exchanger (EBG02) channel head joint flange replacement bolting (ASME Class 2).

#### 3.3 Code Relief Request (as stated by the licensee)

Relief is requested from the ASME Section XI repair/replacement activity requirements for the replacement bolting in accordance with Code Case N-579. The specific requirements in Code Case N-579 for which relief is requested are the use of SA-194 material specified in Code Case N-579 for the nonstandard hydraulic nuts and conformance of thread configuration to ASME B1.1.

3.4 Proposed Alternative (as stated by the licensee)

SA-540 Grade B23 material meeting the requirements for bolting material in [ASME] Section III, paragraph NC-2127(a), will be used to fabricate the hydraulic nuts for the excess letdown heat exchanger flange instead of the SA-194 material specified in Code Case N-579. No torque wrench is required for installation of bolting since HydraNuts employ a stud tensioning process that tensions all twelve (12) studs simultaneously. The hydraulic nuts will incorporate a proprietary outside thread design providing minimized thread deflection to maximize retained load and allow lower preload to be used in contrast to standard threads manufactured in accordance with ASME B1.1.

...While the inside threads of the hydraulic nuts conform to ASME B1.1, the outside threads have a proprietary thread design developed by the vendor, Nova-Technofast, which minimizes thread deflection between the nut and lock ring and thereby minimizes loss of pre-load.

3.5 Basis for Alternative (as stated by the licensee)

Use of [ASME] Section III approved SA-540 Grade B23 material in lieu of SA-194 material specified in Code Case N-579 will assure adequate strength in the joint. The special thread design of the outside threads of the hydraulic nuts minimizes thread deflection and loss of preload. Use of these nonstandard nuts is expected to eliminate leakage from the joint while reducing radiation exposure to maintenance personnel by reducing maintenance time in the area.

3.6 NRC Staff Evaluation

The NRC staff has reviewed the information related to the request for relief from Code Case N-579 for replacement of bolting in the channel head joint flange of the Excess Letdown Heat Exchanger. The component is located in a high-radiation area in the vicinity of reactor coolant loop 4 inside the secondary shield wall of the reactor building. The Excess Letdown Heat Exchanger flange has had chronic boric acid leakage at various times. Prior efforts to stop the leakage by replacement of the gasket along with adjustment of bolt torque have not been successful and have exposed maintenance personnel to increased occupational radiation exposure. Typical joint design incorporates a tapered geometry and a series of spacer washers that are difficult to maintain. The joint is being redesigned to eliminate the tapered geometry and spacer washer configuration with the use of hydraulic tensioning nuts (HydraNuts) to assure consistent loading around the joint. The new design would provide a safety benefit in reducing occupational radiation exposure by limiting maintenance stay times in the area.

As an alternative to Code Case N-579, SA-540 Grade B23 material was used instead of SA-194 for the manufacture of the hydraulic nuts. The licensee has determined that SA-540 Grade B23 material has sufficient strength for this application. The NRC staff concludes that SA-540 Grade B23 is acceptable for this application because this material is listed as an acceptable material for Class 2 bolting in ASME Code, Section III.

Code Case N-579 requires that the screw threads of nonstandard nuts be manufactured to meet the requirements for threads in ASME B1.1. The hydraulic nuts used by the licensee have a proprietary outside thread design developed by the nut manufacturer which minimizes thread deflection between the nut and the lock ring and thereby minimizes loss of preload. The inside threads of the hydraulic nuts conform to ASME B1.1. The NRC staff concludes the use of the proprietary outside thread design is acceptable because the design would result in minimizing thread deflection between the nut and the lock ring, which would result in reducing the loss of preload.

Therefore, the NRC staff concludes that the use of hydraulic nonstandard nuts provides an equivalent level of quality and safety pursuant to 10 CFR 50.55a(a)(3)(i).

#### 4.0 CONCLUSION

Based on the above evaluation, the NRC staff concludes that the proposed alternative to Code Case N-579 stated in licensee's request for relief provides an acceptable level of quality and safety. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the third 10-year ISI interval of WCGS. All other requirements of the ASME Code, Section XI for which relief has not been specifically requested remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Pat Patnaik

Date: November 18, 2010

M. Sunseri

- 2 -

If you have any questions regarding the safety evaluation, please contact Balwant K. Singal at (301) 415-3016.

Sincerely,

/RA/

Michael T. Markley, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-482

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**ADAMS Accession No.: ML102990132**

\*SE memo dated October 8, 2010

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