



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

April 6, 2009

Mr. Charles Pardee
President and Chief Nuclear Officer
Exelon Nuclear
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1), RELIEF REQUEST 2008-TMI-01, REGARDING THE USE OF AMERICAN SOCIETY OF MECHANICAL ENGINEERS CODE CASE N-725 DURING FABRICATION OF REPLACEMENT STEAM GENERATORS (TAC NO. ME0047)

Dear Mr. Pardee:

By letter dated October 29, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083090388), AmerGen Energy Company, LLC (the licensee, now Exelon Generation Company, LLC) submitted Relief Request (RR) 2008-TMI-01 for proposed alternatives to certain requirements of the American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code), Section III, 2001 edition through the 2003 addenda, at Three Mile Island, Unit 1 (TMI-1). The request pertains the use of ASME Code Case N-725, "Design Stress Values for UNS [unified number system] N06690 With a Minimum Specified Yield Strength of 35 ksi (240 MPa), Classes 2 and 3 Components, Section III, Division 1," as it relates to proposed materials to be used for the TMI-1 main feedwater (MFW) and emergency feedwater (EFW) riser assemblies in the replacement steam generators. The materials proposed have been chosen for their corrosion resistance as well as their resistance to flow accelerated corrosion damage.

The U.S. Nuclear Regulatory Commission (NRC) staff has completed its review of the proposed alternatives as discussed in the enclosed safety evaluation. Pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Paragraph 50.55a(a)(3)(i), RR 2008-TMI-01 is authorized for the use of this code case on the basis that the proposed alternative will provide an acceptable level of quality and safety. The use of Code Case N-725 is authorized until such time as the code case is published in a future version of NRC Regulatory Guide (RG) 1.84, "Design, Fabrication and Materials Code Case Acceptability, ASME Section III," and incorporated by reference in 10 CFR 50.55a(b). At that time, if the licensee intends to continue implementing this code case, it must follow all provisions of Code Case N-725 with any new conditions as specified in RG 1.84 and any limitations as specified in 10 CFR 50.55a(b)(4), (b)(5), and (b)(6). This proposed alternative is applicable to the TMI-1 replacement steam generator MFW and EFW riser assemblies and is authorized for the lifetime of the component, subject to the considerations in the preceding sentence.

C. Pardee

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If you have any questions, please contact the TMI-1 Project Manager, Mr. Peter J. Bamford, at 301-415-2833.

Sincerely,

A handwritten signature in black ink, appearing to read "Harold K. Chernoff". The signature is fluid and cursive, with a prominent initial "H" and a long, sweeping tail.

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure: As stated

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UNITED STATES
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR RELIEF REGARDING THE USE OF CODE CASE N-725

RELIEF REQUEST NO. 2008-TMI-01

EXELON GENERATION COMPANY, LLC

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

DOCKET NO. 50-289

1.0 INTRODUCTION

By letter dated October 29, 2008 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML083090388), AmerGen Energy Company, LLC, (the licensee)¹ submitted Relief Request (RR) 2008-TMI-01. The submittal proposes an alternative to the requirements of the American Society of Mechanical Engineers *Boiler and Pressure Vessel Code* (ASME Code), Section III, 2001 edition through the 2003 addenda, at TMI-1. The proposed alternative is associated with fabrication of main feedwater (MFW) and emergency feedwater (EFW) riser assemblies of the replacement steam generators for TMI-1. Specifically, the licensee proposes using ASME Code Case N-725, "Design Stress Values for UNS N06690 with a Minimum Specified Yield Strength of 35 ksi (240 MPa), Classes 2 and 3 Components, Section III, Division 1," to permit the use of Unified Number System (UNS) N06690 materials and provide design stress values for fabrication of the MFW and EFW riser assemblies, both of which are ASME Class 2 components. This code case has not yet been formally endorsed by the NRC in Regulatory Guide 1.84, "Design, Fabrication and Materials Code Case Acceptability, ASME Section III."

2.0 REGULATORY EVALUATION

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.55a requires that systems and components of nuclear power plants be designed and constructed in accordance with the rules provided in the ASME Code, Section III. Alternatives to the requirements may be authorized by the U.S. Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(a)(3)(i) or 10 CFR 50.55a(a)(3)(ii). In proposing alternatives, the licensee must demonstrate that: (1) the proposed alternatives would provide an acceptable level of quality and safety; or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. This relief request has been submitted on the basis that the proposed alternative would provide an acceptable level of quality and safety.

¹ The request for relief dated October 29, 2008, was submitted by AmerGen Energy Company, LLC. Effective January 8, 2009, the license for TMI-1 was transferred from AmerGen Energy Company, LLC to Exelon Generation Company, LLC. By letter dated January 9, 2009, (ADAMS Accession No. ML090120538) Exelon Generation Company adopted and endorsed docketed submittals that requested specific licensing actions that were made by AmerGen, and requested that the NRC staff continue to process those pending actions on the schedules previously agreed to by AmerGen.

The code of record for this request for relief is the 2001 edition through 2003 addenda of ASME Section III.

3.0 TECHNICAL EVALUATION

3.1 ASME Code Components Covered by the Proposed Alternative

The components for which relief from the requirements of ASME Section III is requested are the MFW and EFW riser assemblies, component numbers RC-H-1A and RC-H-1B. These components are part of the replacement steam generator assemblies that are being manufactured for TMI-1.

3.2 Applicable Code Edition and Requirements

The replacement steam generator MFW and EFW riser assemblies are being manufactured to the requirements of the ASME Code, Section III, 2001 edition through 2003 addenda, Division 1, Class 2, component piping. The ASME Code, Section III, paragraph NC-3112.4, requires that the allowable stresses for design for materials be listed in ASME Code, Section II, Part D, Subpart 1, Tables 1A, 1B and 3, except for vessels designed to the requirements of NC-3200 where Tables 2A, 2B and 3 are used. In addition, the materials shall not be used at metal and design temperatures above those for which stress or stress intensity values are given.

3.3 Licensee's Reason for Requesting an Alternative

The ASME Code Section III, 2001 edition through 2003 addenda, Division 1, NC-3112.4 requires the use of design stress values listed in the tables of ASME Code Section II, Part D, Subpart 1. ASME Code Section II, Part D, Subpart 1, does not permit the use of UNS N06690, material specification SB-167 for class 2 components, and material specification SB-564 is not listed. The licensee has stated that properties of UNS N06690 material, high resistance to flow accelerated corrosion damage and high corrosion resistance, make it desirable for use in MFW and EFW riser assemblies.

3.4 Licensee's Proposed Alternative and Basis

The licensee proposes using ASME Code Case N-725 in lieu of ASME Code Section III, paragraph NC-3112.4 requirements. This code case gives design stress values for UNS N06690 materials and permits their use provided the following additional requirements are met: (a) the maximum allowable stress values shall be those shown in Table 1 of the code case; and (b) the code case number shall be listed on the Data Report. The licensee's request for relief states that the use of SB-167 material in class 1 applications has already been approved by the NRC.

3.5 NRC Staff Evaluation of Proposed Alternative

Use of UNS N06690 material in the annealed condition with either Material Specification SB-167 or Material Specification SB-564 is permitted for ASME Code Section III, Division 1, Class 1 components, as documented in ASME Code Section II, 2001 edition through 2003 addenda, Part D, Subpart 1, Table 1B. Table 1B specifies a minimum yield strength of 35 ksi and design stress values of 2/3 of the yield strength (23.3 ksi) for design temperatures from -20 °F to 800 °F.

ASME Code Case N-725 permits the use of UNS N06690 Material Specification SB-167 (hot worked, cold worked, or annealed) or Material Specification SB-564 (annealed) material for

fabrication of ASME Code Section III, Division 1, Class 2 components provided the following additional requirements are met: (a) the maximum allowable stress values shall be those shown in Table 1 of the code case; and (b) the code case number shall be listed on the Data Report. The NRC has not yet accepted ASME Code Case N-725 in Regulatory Guide 1.84, through incorporation by reference in 10 CFR 50.55a.

The use of ASME Code Case N-725 for ASME Code Section III, Division 1, Class 2 components is considered to be conservative since the materials and their associated design stress values are identical to those already accepted by the NRC for ASME Code Section III, Division 1, Class 1 components for temperatures up to 400 °F, and the design stress values are less than those for Class 1 components at temperatures above 400 °F. The staff, therefore, concludes that the use of ASME Code Case N-725 provides an acceptable level of quality and safety for fabrication of the replacement steam generator MFW and EFW riser assemblies.

4.0 CONCLUSION

Based on the above review, the NRC staff concludes that the licensee's request for relief, 2008-TMI-01, to use ASME Code Case N-725 for the fabrication of the replacement steam generator MFW and EFW riser assemblies at Three Mile Island Unit 1 provides an acceptable level of quality and safety. Therefore, pursuant to 10 CFR 50.55a(a)(3)(i), the use of the Code Case N-725 is authorized until such time as the code case is published in a future version of NRC RG 1.84 and incorporated by reference in 10 CFR 50.55a(b). At that time, if the licensee intends to continue implementing this code case, it must follow all provisions of Code Case N-725 with any new conditions as specified in NRC Regulatory Guide 1.84 and any limitations as specified in 10 CFR 50.55a(b)(4), (b)(5), and (b)(6).

This authorization is applicable to the TMI-1 replacement steam generator MFW and EFW riser assemblies and is authorized for the lifetime of the component, subject to the considerations of the preceding paragraph. All other ASME Code, Section III requirements for which relief was not specifically requested and authorized remain applicable.

Principal Contributor: J. Wallace

Date: April 6, 2009

C. Pardee

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If you have any questions, please contact the TMI-1 Project Manager, Mr. Peter J. Bamford, at 301-415-2833.

Sincerely,

/ra/

Harold K. Chernoff, Chief
Plant Licensing Branch I-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure: As stated

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