



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

March 12, 2014

Mr. Timothy S. Rausch  
Senior Vice President and Chief Nuclear Officer  
PPL Susquehanna, LLC  
769 Salem Boulevard  
Berwick, PA 18603-0467

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2 – REQUEST FOR RELIEF 3RR-20 FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS, SECTION XI (TAC NO. MF1756)

Dear Mr. Rausch:

By letter dated May 6, 2013, as supplemented by letter dated June 6, 2013, PPL Susquehanna, LLC (the licensee), requested relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI for Susquehanna Steam Electric Station (SSES), Unit 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(ii), the licensee requested that the U.S. Nuclear Regulatory Commission (NRC) authorize an alternative to the ASME Code requirements to perform a visual (VT-1) examination of 100 percent of the pump flange surface of the SSES, Unit 2 'A' Reactor Recirculating Pump (RRP) during the third 10-year inspection interval, on the basis that performing the required examination would result in hardship or unusual difficulty without a compensating increase of the level of quality and safety.

The NRC staff determined that complying with the ASME Code requirements for 100 percent visual (VT-1) examination coverage of the 'A' RRP flange surface would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(a)(3)(ii) and is in compliance with the requirements of the ASME Code, Section XI. Therefore, the NRC staff authorizes the proposed alternative Relief Request 3RR-20 for the third 10-year inspection interval at SSES, Unit 2.

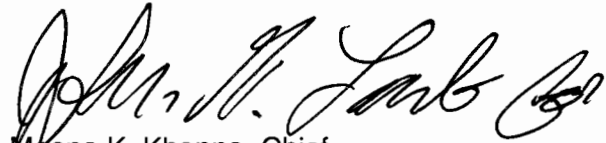
All other ASME Code, Section XI requirements for which relief has not been specifically requested and approved remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

T. Rausch

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If you have any questions, please contact the SSES Project Manager, Jeffrey Whited at (301) 415-4090 or via e-mail at [Jeffrey.Whited@nrc.gov](mailto:Jeffrey.Whited@nrc.gov)

Sincerely,

A handwritten signature in black ink, appearing to read "Meena K. Khanna". The signature is fluid and cursive, with a large initial "M" and "K".

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

Docket No. 50-388

Enclosure:  
Safety Evaluation

cc w/encl: Distribution via ListServ



UNITED STATES  
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUEST 3RR-20

REGARDING VISUAL EXAMINATION OF FLANGE SURFACES

PPL SUSQUEHANNA, LLC

SUSQUEHANNA STEAM ELECTRIC STATION, UNIT 2

DOCKET NUMBER 50-388

1.0 INTRODUCTION

By letter dated May 6, 2013,<sup>1</sup> as supplemented by letter dated June 6, 2013,<sup>2</sup> PPL Susquehanna, LLC (the licensee), requested relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code), Section XI for Susquehanna Steam Electric Station, Unit 2 (SSES).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(ii), the licensee requested that the U.S. Nuclear Regulatory Commission (NRC) authorize an alternative to the requirements of the ASME Code to perform a visual (VT-1) examination of 100 percent of the pump flange surface of the SSES, Unit 2 'A' Reactor Recirculating Pump (RRP) during the third 10-year inspection interval, on the basis that performing the required examination would result in hardship or unusual difficulty without a compensating increase of the level of quality and safety.

2.0 REGULATORY EVALUATION

The regulations in 10 CFR 50.55a(g) specify, in part, that inservice inspection (ISI) of nuclear power plant components shall be performed in accordance with the requirements of the ASME Code.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) must meet the requirements, except the design and access provisions and the pre-service 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 of 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

<sup>1</sup> Agencywide Documents Access and Management System (ADAMS) Accession No. ML13127A199

<sup>2</sup> ADAMS Accession No. ML13157A170

listed therein. The applicable Code of record for the third ISI interval for SSES, Unit 2 is the ASME Code, Section XI, 1998 Edition thru the 2000 Addenda. The SSES, Unit 2 third 10-year inspection interval began June 1, 2004, and is scheduled to end May 31, 2014.

As discussed in 10 CFR 50.55a(g)(5)(iii), if the licensee has determined that conformance with certain code requirements is impractical for its facility, the licensee shall notify the Commission and submit, as specified in 50.4, information to support the determinations.

As discussed in 10 CFR 50.55a(g)(6)(i), the Commission may grant such relief and may impose such alternative requirements as it determines is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest, given the consideration of the burden upon the licensee.

As discussed in 10 CFR 50.55a(a)(3), alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (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.

The NRC staff concludes that there is regulatory basis for the licensee to request the use of an alternative and the NRC staff to authorize this alternative, pursuant to the technical evaluation that follows. The information provided by the licensee in support of the request has been evaluated by the NRC staff and the bases for disposition are documented below.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Licensee's Request for Alternative

##### 3.1.1 ASME Code Components Affected

Unit 2 'A' RRP Flange  
Examination Category B-G-1, Pressure Retaining Bolting  
Item No. C6.190 Pump Flange Surface

##### 3.1.2 ASME Code Requirement Affected

ASME Code, Section XI, Table IWB-2500-1, Examination Category B-G-1, Item No. C6.190, requires a visual (VT-1) examination of 100 percent of a one-inch annular surface of the pump flange surrounding each pump stud when the connection is disassembled.

##### 3.1.3 Proposed Alternative

In accordance with 10 CFR 50.55a(g)(3)(ii), the licensee requested the limited visual (VT-1) examination coverage (i.e., 98 percent) of the 'A' RRP flange surface be accepted for the third 10-year inspection interval.

#### 3.1.4 Basis for Request

The SSES, Unit 2 'A' RRP was disassembled during the Unit 2 16<sup>th</sup> Refueling Outage which occurred in the spring of 2013. During the time the pump was disassembled, a visual (VT-3) examination of the pump bowl was performed. However, the required visual (VT-1) examination of the flange surface was not performed.

A visual (VT-1) examination of the reassembled pump flange surface was performed subsequent to the discovery that the examination had not been performed when the pump was disassembled. However, examination coverage of this examination was limited to approximately 98 percent of the required surfaces due to interference from pump internals.

The licensee requested this alternative based on their determination that achieving the 100 percent visual (VT-1) examination coverage required hardship or unusual difficulty once the pump had been reassembled, and would not provide a compensating increase in the level of quality and safety.

#### 3.2 NRC Staff Evaluation

The ASME Code requires visual (VT-1) examination of Category B-G-1, Item Number B6.180 flange surface when the connection is disassembled to detect discontinuities and imperfections on the surface including such conditions as cracks, wear, corrosion or erosion.

The licensee stated in its submittal dated May 6, 2013, that when the pump was disassembled a visual (VT-3) examination of the pump bowl was performed along with visual examinations of the pump surfaces by pump vendor personnel and SSES Quality Control personnel prior to pump reassembly. These exams found the pump acceptable for continued service with no evidence of degradation noted. The visual (VT-1) examination that was performed after the pump was reassembled covered approximately 98 percent of the required surfaces and also was found acceptable.

In the supplemental letter dated June 6, 2013, the licensee responded to the NRC staff's request for additional information about operational experience with leakage from the RRP flange joint, stating that no evidence of damage from leakage has been found at the RRP flange. This submittal also stated that a visual (VT-2) examination was performed on the 'A' RRP flange joint on May 21, 2013, and no leakage was identified.

The licensee's submittal dated June 6, 2013, also provided a sketch which showed the surfaces that were not visual (VT-1) examined due to interferences from pump internal structures. This area was identified as a small area near the inner diameter of the flange surface, 0.75 inches away from the outer diameter of the pump studs. Based on the area that was examined, the NRC staff concludes that the examination that was performed interrogated the higher stressed areas of the required examination surface, which is the area immediately adjacent to the studs. This is the area where one would expect to find cracking, if present, and any wear associated with the removal/replacement of the studs. Based on the operational experience discussed above and the satisfactory VT-2 performed on May 21, 2013, the NRC staff concludes that damage due to corrosion or erosion is also unlikely.

Therefore, based on the visual (VT-1) examination that was performed covering the highly stressed regions of the flange, the operational experience, satisfactory VT-2 and the added assurance of the other visual exams that were performed when the pump was disassembled, the NRC staff concludes the proposed alternative provides reasonable assurance of structural integrity and leak tightness of the 'A' RRP flange joint.

The submittal dated May 6, 2013, stated that in order to achieve the 100 percent visual examination coverage of the pump flange surface, the pump would need to be disassembled. The disassembly of the pump was expected to require an additional 4500 man-hours and expected additional radiation dose of 12.4 person-rem. The NRC staff concludes the additional radiation dose and the personnel safety challenges associated with the disassembly and reassembly of the 'A' RRP represent significant hardship.

Based on the above evaluation, the NRC staff concludes that the visual (VT-1) examination of 98 percent of the 'A' RRP flange joint provides reasonable assurance of the leak tightness and structural integrity of the items, and that compliance with the ASME Code-specified requirements of 100 percent visual examination coverage would result in hardship without a compensating increase in the level of quality and safety.

#### 4.0 CONCLUSION

As set forth above, the NRC staff determined that complying with the ASME Code requirement for 100 percent visual (VT-1) examination coverage of the 'A' RRP flange surface would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes the licensee has adequately addressed all the regulatory requirements set forth in 10 CFR 50.55a(a)(3), and is in compliance with the requirements of the ASME Code. Therefore, the NRC staff authorizes the proposed alternative Relief Request 3RR-20 for the third 10-year inspection interval at SSES, Unit 2. All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in the subject request for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Keith M. Hoffman

Date: March 12, 2014

