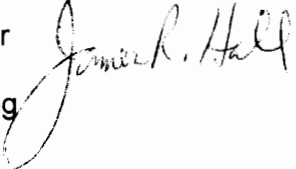




UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

May 17, 2017

MEMORANDUM TO: Michael T. Markley, Chief
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

FROM: James R. Hall, Senior Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation 

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2 – REQUEST
FOR ADDITIONAL INFORMATION, ALTERNATIVE TO REACTOR
VESSEL THREADS IN FLANGE EXAMINATION REQUIREMENTS
(CAC NOS. MF9298 AND MF9299)

The attached draft request for additional information (RAI) was transmitted on May 9, 2017, to Virginia Electric and Power Company (Dominion, the licensee). This information was transmitted in order to clarify the licensee's request for alternative, submitted by Dominion on November 30, 2016 (Agencywide Documents Access Management System Accession No. ML16340B092), for the North Anna Power Station, Units 1, and 2 (NAPS 1 and 2). The requests for alternative are associated with the fourth 10-year Inservice Inspection Intervals at NAPS 1 and 2.

The draft RAI was sent to the licensee to ensure that the questions are understandable, the regulatory basis for the questions is clear, and to determine if the information was previously docketed. This memorandum and the attachment do not convey or represent an NRC staff position regarding the licensee's request. On May 16, 2017, Ms. Diane Aitken of Dominion confirmed that the licensee understood the questions and there was no need for a clarification call with NRC. Ms. Aitken further confirmed that Dominion would respond to the RAI by June 16, 2017. Therefore, this memorandum serves to document the attached RAI as an Official Agency Record.

Docket Nos. 50-338 and 50-339

Attachment:
Request for Additional Information

cc w/attachment: Distribution via Listserv

REQUEST FOR ADDITIONAL INFORMATION

REQUEST FOR ALTERNATIVE NOS. N1-I4-NDE-009 AND N2-I4-NDE-004

REACTOR PRESSURE VESSEL THREADS IN FLANGE

FOURTH 10-YEAR INSERVICE INSPECTION INTERVAL

NORTH ANNA POWER STATION, UNITS 1 AND 2

VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)

DOCKET NOS. 50-338 AND 50-339

CAC NOS. MF9298 AND MF9299

1.0 INTRODUCTION

By letter dated November 30, 2016 (Agencywide Documents Access Management System (ADAMS) Accession No. ML16340B092), Virginia Electric and Power Company (Dominion, the licensee), submitted to the United States Nuclear Regulatory Commission (NRC) request for alternative numbers N1-I4-NDE-009 and N2-I4-NDE-004 for North Anna Power Station, Unit 1 and North Anna Power Station, Unit 2 (NAPS 1 and NAPS 2), pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Paragraph 50.55a(z)(1). These are proposed alternatives to the inservice inspection (ISI) requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) for the threads in the reactor pressure vessel (RPV) flange. Specifically, the licensee proposes to eliminate the volumetric examination requirements of Section XI of the ASME Code threads in the RPV flange (ASME Code, Section XI, Examination Category B-G-1 "Pressure Retaining Bolting, Greater than 2 inches (50 mm) in Diameter," Item No. B6.40) for the remainder of the NAPS 1 and NAPS 2 fourth 10-year ISI intervals, per Section 6, "Duration of Proposed Alternative," of Attachment 1 to the submittal. The technical bases for the licensee's proposed alternative are contained in Electric Power Research Institute (EPRI) report number 3002007626 (ADAMS Accession No. ML16221A068). The NRC staff requires responses to the following request for additional information (RAI) to complete its evaluation of whether the licensee has demonstrated the technical adequacy of the proposed alternative and whether it would provide an acceptable level of quality and safety.

2.0 REQUEST FOR ADDITIONAL INFORMATION

RAI-1

Section 6 of Attachment 1 to the November 16, 2016, submittal states that the proposed alternative is applicable to the fourth 10-year ISI intervals for NAPS 1 and NAPS 2. However, the second sentence of the submittal letter states: "The request is to eliminate the ASME Category B-G-1, Item B6.40, Pressure retaining bolting greater than 2-inches, Reactor Vessel - Threads in Flange volumetric examination..." The NRC staff requests the licensee to confirm that the request is to eliminate the volumetric examination only for the fourth 10-year ISI intervals of NAPS 1 and NAPS 2, as stated in Section 6 of Attachment 1 to the submittal.

RAI-2

The licensee stated on page 3 of Attachment 1 to the submittal that the bolt/stud preload stress was calculated as detailed in the NAPS 1 and NAPS 2 RPV manual. The licensee showed on the same page the preload equation and the resulting bolt/stud preload stress of 42,338 pounds per square inch (psi). This preload stress value is based on the bounding values shown in Table 1 of Attachment 1 to the submittal. The NRC staff requests the licensee to confirm that the actual bolt/stud preload stress applied to the NAPS 1 and NAPS 2 RPV bolt/studs is less than or equal to 42,338 psi.

RAI-3

Table 2 of Attachment 1 to the submittal shows values of applied stress intensity factor (K_I) for two load cases, "Preload" (occurs at the temperature the bolt preload is applied) and "Preload + Heatup + Pressure" (occurs at high or operating temperature). However, the licensee provided a comparison of K_I with the allowable value ($K_{IC}/\sqrt{10}$) only for the "Preload + Heatup + Pressure" case. K_{IC} is defined to be the material fracture toughness of the RPV flange that contains the bolt hole threads. The NRC staff observes that the "Preload" case could be more limiting than the "Preload + Heatup + Pressure" case because: (1) it expects the value of K_{IC} to be lower at the temperature the bolt preload is applied, and (2) most of the applied K_I comes from the "Preload" case. Therefore, the NRC staff requests the licensee to provide a comparison of applied K_I with $K_{IC}/\sqrt{10}$ for the "Preload" case for the NAPS 1 and NAPS 2 threads in RPV flange.

SUBJECT: NORTH ANNA POWER STATION, UNITS 1 AND 2 – REQUEST FOR
ADDITIONAL INFORMATION, ALTERNATIVE TO REACTOR VESSEL
THREADS IN FLANGE EXAMINATION REQUIREMENTS (CAC NOS. MF9298
AND MF9299) DATED MAY 17, 2017

DISTRIBUTION

PUBLIC

RidsNrrDorlDpr Resource

RidsNrrDorlLpl2-1 Resource

LPL2-1 R/F

RidsNrrPMNorthAnna Resource

RidsNrrDeEvib Resource

ADAMS Accession No. ML17137A093

OFFICE	DORL/LPL2-1/PM	DORL/LPL2-1/LA	DORL/LPL2-1/BC	DORL/LPL2-1/PM
NAME	JHall	KGoldstein	MMarkley	JHall
DATE	05/17/2017	05/17/2017	05/17/2017	05/17/2017

OFFICIAL RECORD COPY