



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

November 7, 2018

Mr. G. T. Powell  
President and CEO  
STP Nuclear Operating Company  
South Texas Project  
P.O. Box 289  
Wadsworth, TX 77483

SUBJECT: SOUTH TEXAS PROJECT, UNIT 1 - RE: REQUEST FOR RELIEF FROM  
ASME CODE TO EXTEND THE INSERVICE INSPECTION INTERVAL FOR  
CATEGORIES B-N-2 AND B-N-3 EXAMINATIONS (EPID L-2018-LLR-0097)

Dear Mr. Powell:

By letter dated June 25, 2018, as supplemented by letter dated September 26, 2018, STP Nuclear Operating Company (STPNOC, the licensee) requested relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, to extend the inservice inspection (ISI) interval for Categories B-N-2 and B-N-3 examinations for South Texas Project (STP), Unit 1.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.55a(z)(2), the licensee requested to extend the third inservice inspection (ISI) interval from 10 to 20 years for visual (i.e., VT-3) examinations of Categories B-N-2 and B-N-3 from September 25, 2020, to August 20, 2027, on the basis that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The U.S. Nuclear Regulatory Commission (NRC) staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that STPNOC has demonstrated that that proposed alternative provides reasonable assurance of structural integrity or leak tightness of the subject components and that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, the NRC staff authorizes RR-ENG-3-16 at STP, Unit 1, until the end of the fourth ISI interval, which is scheduled to end on August 20, 2027.

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

If you have any questions, please contact the STP Project Manager, Lisa Regner at 301-415-1906 or via e-mail at [Lisa.Regner@nrc.gov](mailto:Lisa.Regner@nrc.gov).

Sincerely,

**/RA/**

Robert J. Pascarelli, Chief  
Plant Licensing Branch IV  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-498

Enclosure:  
Safety Evaluation

cc: Listserv

SUBJECT: SOUTH TEXAS PROJECT, UNIT 1 - RE: REQUEST FOR RELIEF FROM ASME CODE TO EXTEND THE INSERVICE INSPECTION INTERVAL FOR CATEGORIES B-N-2 AND B-N-3 EXAMINATIONS (EPID L-2018-LLR-0097) DATED NOVEMBER 7, 2018

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**ADAMS Accession No. ML18303A206**

\*by memo

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

ALTERNATIVE RELIEF REQUEST RR-ENG-3-16

STP NUCLEAR OPERATING COMPANY

SOUTH TEXAS PROJECT, UNIT 1

DOCKET NO. 50-498

1.0 INTRODUCTION

By letter dated June 25, 2018 (Agencywide Document Access and Management System (ADAMS) Accession No. ML18176A085), as supplemented by letter dated September 26, 2018 (ADAMS Accession No. ML18269A151), STP Nuclear Operating Company (STPNOC, the licensee) requested relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, to extend the inservice inspection (ISI) interval for Categories B-N-2 and B-N-3 examinations for South Texas Project (STP), Unit 1.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) paragraph 50.55a(z)(2), the licensee requested to extend the third ISI interval from 10 to 20 years for visual (i.e., VT-3) examinations of Categories B-N-2 and B-N-3 from September 25, 2020, to August 20, 2027, on the basis that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

2.0 REGULATORY EVALUATION

In accordance with 10 CFR 50.55a(g)(4), "Inservice inspection standards requirement for operating plants," the licensee is required to perform ISI of ASME Code Class 1, 2, and 3 components and system pressure tests during the first 10-year interval and subsequent 10-year intervals that 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(a), subject to the limitations and modifications listed in 10 CFR 50.55a(b).

10 CFR 50.55a(z), "Alternatives to codes and standards requirements," states, in part:

Alternatives to the requirements of paragraphs (b) through (h) of this section [50.55a] or portions thereof may be used when authorized by the Director, Office of Nuclear Reactor Regulation.... A proposed alternative must be submitted and authorized prior to implementation. The applicant or licensee must demonstrate that:

- (1) Acceptable level of quality and safety. The proposed alternative would provide an acceptable level of quality and safety; or
- (2) Hardship without a compensating increase in quality and safety. Compliance with the specified requirements of this section [50.55a] would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.”

Based on the above, and subject to the following technical evaluation, the U.S. Nuclear Regulatory Commission (NRC) staff finds that the licensee may propose an alternative to ASME Code, Section XI, and the staff has the regulatory authority to authorize the licensee's proposed alternative.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Proposed Alternative RR-ENG-3-16

##### 3.1.1 Description of the Proposed Alternative

In Relief Request RR-ENG-3-16 the licensee proposed to defer the visual examination of the Unit 1 reactor vessel (RV) interior attachments and core support structure (Examination Categories B-N-2 and B-N-3) from the end of the third interval until the Unit 1 RV volumetric examinations scheduled in 2026 during the fourth ISI interval.

##### 3.1.2 Components for Which Alternative is Requested

The affected components are the interior attachments and core support structures of the reactor pressure vessel.

<b>Examination Category</b>	<b>Item No.</b>	<b>Examination Method</b>	<b>Description</b>
B-N-2	B13.60	Visual (VT-3)	Interior Attachments Beyond Beltline Region
B-N-3	B13.70	Visual (VT-3)	Core Support Structure

##### 3.1.3 ASME Code Edition and Addenda of Record

The applicable code for the current third 10-year ISI interval is ASME Code, Section XI, 2004 Edition (no addenda).

##### 3.1.4 Applicable ASME Code Requirements

The IWB-2412, "Inspection Program B," requires that the visual examinations of the RV interior attachments and the core support structure (Examination Categories B-N-2 and B-N-3) be performed once every inspection interval. In its submittal dated June 25, 2018, the licensee stated that these visual examinations are typically performed at the end of the interval when the core barrel is removed to perform the RV volumetric examinations of Categories B-A and B-D welds.

### 3.1.5 Reason for Request

The licensee stated that the proposed alternative results in a significant savings in outage duration, radiation exposure, and avoidance of a lift of a heavy close-fit component that has the potential for inflicting damage to itself and RV surfaces. Further, the licensee stated that the Categories B-N-2 and B-N-3 visual examinations require removal of the core barrel from the RV to gain access to the RV interior attachments and the core support structure. To remove and reinstall the core barrel requires implementation of detailed planning and precision lifts to ensure that the core barrel and RV are not damaged. In addition, the core barrel is highly radioactive, which adds to the complexity when lifting the core barrel in and out of the RV. The removal and reinstallation of the core barrel and the performance of Categories B-N-2 and B-N-3 visual examinations are performed with all fuel removed from the RV.

### 3.1.6 Proposed Alternative and Basis for Use

The proposed ASME Code alternative is to the requirements of IWB-2412, "Inspection Program B," which requires visual examination of the RV interior attachments and core support structure identified in Table IWB-2500-1, Examination Categories B-N-2 and B-N-3, to be performed once each inspection interval. The third 10-year ISI interval for STP Unit 1 is currently scheduled to end in 2020. The visual examinations currently scheduled to be performed before the end of the September 24, 2020, in the third ISI interval, would be performed with the Unit 1 RV volumetric examinations in 2026 during the fourth ISI interval.

The licensee stated, in part, in its submittal dated June 25, 2018, that "[d]uring the ten-year ISI of the RV shell, lower head and nozzle welds performed in 2009 for Unit 1, STPNOC also performed visual examinations of the RV interior attachments and the core support structure. Since the core support structure (core barrel) requires removal to facilitate examination of the RV shell, lower head, and nozzle welds, the visual examinations of Examination Categories B-N-2 and B-N-3 have historically been performed during the same outage at the end of the ISI interval." The licensee also stated that "[t]he visual examinations of the [RV] interior attachments and the core support structure have been performed twice per unit at STPNOC. During the second ten-year ISI interval visual inspection on Unit 1 in 2009, no indications were noted. Additionally, review of industry surveys indicate that these examinations have been performed many times by the industry without any significant findings relevant to the STP RV design."

### 3.1.7 Duration of Proposed Alternative

This request is applicable to the STP Unit 1 ISI program for the third and fourth 10-year inspection intervals. The proposed deferral would allow Examination Categories B-N-2 and B-N-3 visual examinations to be performed during the STP Unit 1, 2026 refueling outage.

## 3.2 NRC Staff Evaluation

### 3.2.1 Hardship or Unusual Difficulty

The licensee explained that Examination Categories B-N-2 and B-N-3 visual examinations require removal of the core barrel from the RV to gain access to the RV interior attachments and the core support structure. The removal and reinstallation of the core barrel requires implementation of detailed planning and precision lifts to ensure that the core barrel and/or RV are not damaged. In addition, the core barrel is extremely radioactive, which adds to the

complexity when lifting the core barrel in and out of the RV. The removal of the RV core barrel is an infrequently performed evolution due to the weight of the component, the tight clearances involved, and the radiation emitted by the assembly.

The NRC staff noted that typically, the Categories B-N-2 and B-N-3 visual examinations are aligned with the RV volumetric examinations of Categories B-A and B-D welds activity at the end of the ISI interval, so that the core barrel is removed only once instead of on two occasions, which also reduces radiation exposure to personnel.

By letter dated July 24, 2018 (ADAMS Accession No. ML18177A425) the NRC staff authorized the use of Relief Request RR-ENG-3-14 at STP Unit 1 for the extended third ISI interval for ASME Categories B-A and B-D items until August 20, 2027, such that the ASME Code required examination of the subject items will be performed by August 20, 2027. As a result, the core barrel would need to be removed prior to September 24, 2020, (i.e., end of the third ISI interval) for the sole purpose of performing Categories B-N-2 and B-N-3 examinations.

The licensee's proposed alternative will reduce the risk of component damage and maintain radiation exposure to the workers as low as is reasonably achievable (ALARA). Considering the difficulty associated with the removal of the core barrel for a reduced scope of inspection (i.e., only Categories B-N-2 and B-N-3 examinations instead of Categories B-A, B-D, B-N-2, and B-N-3 examinations), the NRC staff concludes that performing only Categories B-N-2 and B-N-3 examinations presents an unusual difficulty or hardship.

### 3.2.2 Compensating Increase in the Level of Quality and Safety

The licensee stated that the visual examinations of the RV interior attachments and the core support structure have been performed twice per unit at STPNOC (i.e., during the first and second 10-year ISI intervals at each unit). During the second 10-year ISI interval visual inspection on Unit 1 in 2009, no indications were noted. Additionally, the licensee performed a review of industry surveys and determined that these examinations have been performed numerous times by the industry without significant findings relevant to the RV design at STP, Units 1 and 2.

Based on plant-specific and fleet operating experience, the NRC staff finds that there is reasonable assurance that Categories B-N-2 and B-N-3 examinations will show favorable inspection results in the extended fourth ISI interval. Therefore, the NRC staff concludes that following the ASME Code requirements during the third ISI interval would not result in a compensating increase in the level of quality and safety.

### 3.2.3 Opportunistic Inspection if the Core Support Structure is Removed

By letter dated July 24, 2018, the NRC staff authorized the use of Relief Request RR-ENG-3-14 at STP Unit 1 for the extended third ISI interval for ASME Categories B-A and B-D items until August 20, 2027, such that the ASME Code required examination of the subject items will be performed by August 20, 2027. As a result, the core barrel would need to be removed prior to September 24, 2020, (i.e., end of the third ISI interval) for the sole purpose of performing Categories B-N-2 and B-N-3 examinations.

The NRC staff notes that the hardship associated with the Categories B-N-2 and B-N-3 examinations is eliminated if the core barrel is removed from the RV for a reason other than to solely perform these examinations. The licensee did not address this aspect in its proposed

alternative; thus, the staff requested that the licensee address this in a request for additional information (RAI).

In its response to the RAI by letter dated September 26, 2018, the licensee stated that it considers the hardship of Categories B-N-2 and B-N-3 examinations is eliminated if the core barrel is removed from the RV for reasons other than to solely perform the ASME Code, Section XI examinations. Thus, as part of this alternative, if there is an opportunity to perform examinations due to a removal of the core barrel prior to the next scheduled Categories B-A and B-D weld examinations, the ASME Code required VT-3 examinations will be performed on the core support structure and interior RV attachments (i.e., the Categories B-N-2 and B-N-3 components).

The NRC staff considers this aspect of the proposed alternative important because the Categories B-N-2 and B-N-3 examinations interval of 20 years is based on a qualitative analysis considering unusual difficulty and operating experience.

Therefore, if there is an opportunity to remove the core barrel prior to the next scheduled Categories B-A and B-D weld examinations, the licensee will perform the ASME Code required VT-3 examinations on the core support structure and interior RV attachments (i.e., the Categories B-N-2 and B-N-3 components). Thus, the NRC staff determines that the licensee has adequately addressed this aspect of the RR-ENG-3-16 request.

#### 4.0 CONCLUSION

As set forth above, the NRC staff determines that the proposed alternative provides reasonable assurance of structural integrity or leak tightness of the subject components and that complying with the specified requirement 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 the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, the NRC staff authorizes RR-ENG-3-16 at STP Unit 1 until the end of the fourth ISI interval, which is scheduled to end on August 20, 2027.

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

Principal Contributor: On Yee, NRR

Date: November 7, 2018