



South Texas Project Electric Generating Station P.O. Box 289 Wadsworth, Texas 77483

June 25, 2018
NOC-AE-18003578
10 CFR 50.55a

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

South Texas Project Unit 1
Docket No. STN 50-498
Request for Relief from the Third 10-Year Interval ISI Program ASME Section XI
Code Requirements for Category B-N-2 and B-N-3 Welds
(Relief Request RR-ENG-3-16)

In accordance with the provisions of 10 CFR 50.55a(z)(2), STP Nuclear Operating Company (STPNOC) requests approval for South Texas Project (STP) Unit 1 to extend the Reactor Vessel Inservice Inspection Interval for ASME Section XI Code Requirements for Category B-N-2 Welded Core Support Structures and Interior Attachments to Reactor Vessels and B-N-3 Removable Core Support Structures from 2020 to 2026.

Approval for this extension would allow STP to perform the reactor internal inspection at the same time as the ASME Category B-A and B-D reactor weld inspections thus only having to lift the reactor core barrel once instead of on two separate occasions. The enclosed Relief Request RR-ENG-3-16 provides the basis and supporting information for the proposed alternative.

By extending the inspection interval and not having to make a core barrel lift, STPNOC would reduce radiation exposure to personnel.

STPNOC requests NRC review and approval of this alternative request by June 1, 2019, to support the use of the proposed alternative.

STI: 34674460

There are no commitments in this letter.

If there are any questions, please contact Craig Younger at 361-972-8186, or Kyle Wallis at 361-972-4687.


Michael Page
General Manager, Engineering

rjg

Enclosure:

South Texas Project Unit 1 Request for Relief from the Third 10-Year Interval ISI Program
ASME Section XI Code Requirements for Category B-N-2 and B-N-3 Welds (Relief Request
RR-ENG-3-16)

cc:

(paper copy)

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Enclosure

South Texas Project
Unit 1

Request for Relief from the Third 10-Year Interval ISI Program ASME Section XI
Code Requirements for Category B-N-2 and B-N-3 Welds
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South Texas Project
 Unit 1
 Request for Relief from the Third 10-Year Interval ISI Program ASME Section XI
 Code Requirements for Category B-N-2 and B-N-3 Welds
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A. ASME Code Component(s) Affected

Component: Reactor Pressure Vessel (RPV), specifically the following American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code Section XI examination categories and item numbers covering examinations of the RPV. These examination categories and item numbers are from IWB-2500 and Table IWB-2500-1 of the ASME BPV Code Section XI.

<u>Examination Category</u>	<u>Item No.</u>	<u>Description</u>
B-N-2	B13.60	Interior Attachments Beyond Beltline Region
B-N-3	B13.70	Core Support Structure

B. Applicable ASME Code Edition and Addenda

The applicable code for the current third 10-year inservice inspection (ISI) interval is ASME Section XI, 2004 Edition (no addenda). The applicable code for the fourth ISI Interval will be determined 12 months prior to the start of the fourth ISI interval.

Table 1 - Applicable ASME Code Edition and Addenda

STP Unit 1				
Unit	Interval	Edition	Start	End
Unit 1	3	2004	September 25, 2010	September 24, 2020
Unit 1	4	To Be Determined	September 25, 2020	August 20, 2027

C. Applicable ASME Code Requirement

IWB-2412, Inspection Program B, requires visual examination of the reactor vessel 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. STP Unit 1 third 10-year inservice inspection interval ends in 2020. The applicable Code for the fourth 10-year ISI interval will be selected in accordance with the rules of 10 CFR 50.55a.

D. Reason for Relief from Code Requirements

IWB-2412, Inspection Program B, requires that the visual examinations of the reactor vessel interior attachments and the core support structure (Examination Categories B-N-2 and B-N-3) be performed once every inspection interval. These visual examinations are typically performed at the end of the interval when the core barrel is removed to perform the reactor vessel (RV) volumetric examinations of Category B-A and B-D welds.

The third ISI interval for STP Unit 1 is scheduled to end on September 24, 2020.

Examination Category B-N-2 and B-N-3 visual examinations require removal of the core barrel from the reactor vessel to gain access to the reactor vessel 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/or reactor vessel 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 reactor vessel. The removal and reinstallation of the core barrel and the performance of the category B-N-2 and B-N-3 visual examinations are performed with all fuel removed from the reactor vessel.

The STP Unit 1 core barrel was last removed from the RV during the spring 2017 refueling outage. The removal of the RV core barrel is considered to be an infrequently performed evolution due to the weight of the component, the tight clearances involved, and the radiation emitted by the assembly. Only personnel directly involved with the movement of the internals are typically allowed in the Reactor Containment Building during the evolution. The core barrel lifts are performed remotely using viewing cameras to allow most personnel involved with the lift to be outside of the refueling cavity area to minimize personnel radiation exposure.

For STP, removing the core barrel requires that it be raised above the refueling cavity water level during transfer from the reactor vessel to the storage stand location. Due to the complexity of raising the core barrel, this work is considered to be a high radiological risk work activity. As can be expected, the radiation exposure levels for this activity can be high and necessitate unrelated work to stop, evacuation of personnel from containment, and installation of shielding for the polar crane operator(s). If the need arises, the Polar Crane operator is instructed to sit on the floor of the cab or behind shielding and not to raise their head above the cab area of the crane to maintain radiation dose as low as reasonably achievable (ALARA). In addition, the dose rates in the area would increase due to the presence of the core barrel in the temporary storage location. By aligning the B-N-2 and B-N-3 visual examinations with the RV volumetric examinations of Category B-A and B-D welds activity, and performing two work evolutions during the same time period, this would reduce unnecessary radiation exposure to personnel.

Eliminating the need to remove the core barrel during the 2020 refueling outage could save approximately 130.4 mrem of dose. The total dose attributed to removal of the core barrel was estimated based on data from refueling outage, 1RE20 (spring 2017), the most recent outage when the core barrel was removed. The total dose for the actual work activities to remove and install the reactor core barrel during 1RE20 was 80 mrem. The core barrel was transferred to the Lower Internal Storage Area (LISA) where it was stored underwater for six days. The dose rates in the vicinity of the LISA with the core barrel present were compared to the dose rates without the core barrel present. The approximate increase in dose rates in the general area walkway was 0.7 mrem/hour (survey #92754). Dose rates were taken on the south end of the 68' elevation of the Reactor Containment Building (RCB) which is a general area walkway and a common travel path for workers inside containment. During the six days that the core barrel was stored in this area, workers could have received additional dose due to the higher area dose rates totaling approximately 50.4 mrem (see assumptions below). The total estimated dose associated with moving and storing the core barrel and lower internals is 130.4 mrem.

Assumptions:

1. Total time core barrel removed was six days.
2. Estimated 12 person-hours per day spent in the walkways with elevated dose rates. Total estimated time in elevated dose rates of 72 hours.
3. Average increase in dose rates of 0.7 mrem/hr.

Calculation: 72 hours x 0.7 mrem/hr = 50.4 mrem.

Total Dose received on core barrel RWP = 80 mrem.

Total Dose received for core barrel work and elevated dose rates while removed 130.4 mrem.

Allowing STP to have this extension would allow the B-N-2 and B-N-3 visual examinations to be completed with the reactor vessel volumetric examinations of Category B-A and B-D welds. This allows for an increased focus on safety due to not having to make a core barrel lift, and good ALARA practices.

E. Proposed Alternative and Basis for Use:

STPNOC proposes to not perform the ASME Code required visual examination of the Unit 1 reactor vessel interior attachments and core support structure (Examination Category B-N-2 and B-N-3) for the third ISI interval. These examinations would need to be performed in 2020 for Unit 1 without approval of this relief request. If relief is granted, STPNOC will perform the ASME Code required volumetric examination of the Unit 1 reactor vessel interior attachments and core support structure retaining Examination Category B-N-2 and B-N-3 welds for the fourth inservice inspection interval in 2026 for Unit 1.

During 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 RPV 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.

An alternative is requested from the requirement of IWB-2412 Inspection Program B for visual examination of the Unit 1 reactor vessel interior attachments and core support structure (Examination Category B-N-2 and B-N-3) be performed once each ten-year interval. This alternative would be an extension of Examination Category B-N-2 and B-N-3 examinations from the end of Interval 3 to be completed with the Unit 1 reactor vessel volumetric examinations in 2026 during the fourth ISI interval.

The visual examinations of the RPV 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.

Therefore, in accordance with 10 CFR 50.55a(z)(2), an alternate inspection interval is requested on the basis that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

F. Duration of Proposed Alternative

This request is applicable to the STP Unit 1 inservice inspection program for the third and fourth 10-year inspection intervals, (see Table 1 of Section B).

The proposed deferral would allow the category B-N-2 and B-N-3 visual examinations to be performed during the STP Unit 1 2026 refueling outage. Precluding any unforeseen or extended shutdowns, this alternative would result in an approximate extension of six years.

G. Precedents

Similar relief from this examination requirement to apply the proposed alternative at STP Unit 1 was previously approved by the NRC for the following:

Vogtle Electric Generating Plant, Units 1 and 2 – Inservice Inspection Alternative Regarding Category B-N-2 and B-N-3 Welds (VEGP-ISI-ALT-13 (CAC NOS. MF9136 and MF9137), dated June 27, 2017 (ML17171A102)

H. References

ASME Boiler and Pressure Vessel Code, Section XI, 2004 Edition No Addenda, American Society of Mechanical Engineers, New York.