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U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555-0001

Vogtle Electric Generating Plant, Units 1 and 2  
Proposed Alternative VEGP-ISI-ALT-13 in Accordance with 10 CFR 50.55a(z)(2)  
to Extend B-N-2 and B-N-3 Inservice Inspection Examinations Schedule

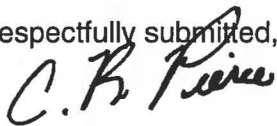
Ladies and Gentlemen:

In accordance with the provisions of 10 CFR 50.55a(z)(2), Southern Nuclear Operating Company (SNC) hereby requests Nuclear Regulatory Commission (NRC) approval of Vogtle Electric Generating Plant (VEGP) Alternative VEGP-ISI-ALT-13. This Alternative requests an extension of the Third Inspection Interval for VEGP Unit 1 and Unit 2 Category B-N-2 and B-N-3 examinations (visual examinations of the reactor vessel interior attachments beyond the beltline region and the core support structure) from 10 to 20 years. As part of this alternative, if there is an opportunity to perform examinations due to removal of the core barrel from the reactor vessel prior to the next scheduled Category B-A and B-D weld examinations, the code required VT-3 examinations will be performed on the core support structure and interior reactor vessel attachments in order to fulfill the exam requirements for the extended interval.

To allow the finalization of the work activities and associated outage planning and preparation needed to prepare for 2R19, NRC approval is requested by August 1, 2017.

This letter contains no NRC commitments. If you have any questions, please contact Ken McElroy at 205.992.7369.

Respectfully submitted,

C. R. Pierce  
Regulatory Affairs Director

CRP/RMJ

Enclosure: Alternative VEGP-ISI-ALT-13

cc: Southern Nuclear Operating Company

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U. S. Nuclear Regulatory Commission

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Vogtle Electric Generating Plant, Units 1 and 2  
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Enclosure

Alternative VEGP-ISI-ALT-13

**Plant Site - Unit:**

Vogtle Electric Generating Plant (VEGP) - Units 1 and 2

**Interval-Interval Dates:**

Third Inspection Interval, May 31, 2007 through May 30, 2017

**Requested Date for Approval and Basis:**

Approval is requested by August 1, 2017 for an extension of the Third Inspection Interval for VEGP Unit 1 and Unit 2, Category B-N-2 and B-N-3 examinations from 10 to 20 years. The VEGP - Unit 2 19<sup>th</sup> Refueling Outage (2R19) is scheduled to start in September of 2017. The requested approval date of August 1, 2017 is needed to allow the finalization of the work activities and associated outage planning and preparation needed to prepare for Refueling Outage 2R19.

**ASME Code Components Affected:**

The affected components are the reactor vessel interior attachments beyond the beltline region and the core support structure at VEGP – Units 1 and 2. The identified examinations are the ASME Code, Section XI, Examination Category B-N-2 and B-N-3, Item Numbers B13.60 and B13.70 examinations.

<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	Removable Core Support Structures

**VEGP - Unit 1 Components:**

<u>Component ID</u>	<u>Description</u>
11201-V6-001-W41	Core Support Lug at 0 Degrees
11201-V6-001-W42	Core Support Lug at 60 Degrees
11201-V6-001-W43	Core Support Lug at 120 Degrees
11201-V6-001-W44	Core Support Lug at 180 Degrees
11201-V6-001-W45	Core Support Lug at 240 Degrees
11201-V6-001-W46	Core Support Lug at 300 Degrees
11201-V6-001-CSS-01	Core Support Structure

**VEGP - Unit 2 Components:**

<u>Component ID</u>	<u>Description</u>
21201-V6-001-W41	Core Support Lug at 0 Degrees
21201-V6-001-W42	Core Support Lug at 60 Degrees
21201-V6-001-W43	Core Support Lug at 120 Degrees
21201-V6-001-W44	Core Support Lug at 180 Degrees
21201-V6-001-W45	Core Support Lug at 240 Degrees
21201-V6-001-W46	Core Support Lug at 300 Degrees
21201-V6-001-CSS-01	Core Support Structure

**Applicable Code Edition and Addenda:**

The applicable Code edition and addenda is ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 2001 Edition with Addenda through 2003.

**Applicable Code Requirements:**

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. The VEGP - Unit 1 and 2 Third Inspection interval is currently scheduled to conclude on May 30, 2017.

IWA-2430(d)(1) allows the inspection interval to be reduced or extended by as much as one year therefore the existing Code allows the inspection interval to be extended to May 30, 2018. Approval is requested to extend the duration of the Third Inspection Interval for Examination Categories B-N-2 and B-N-3, Item Numbers B13.60 and B13.70, visual examinations from 10 to 20 years. Please note that the NRC granted a five-month deferral of the required Unit 1 examinations on November 23, 2016, such that these examinations are now scheduled to be performed during 1R21 (fall 2018).

**Background and Reason for Request:**

IWB-2412, Inspection Program B, requires that the visual examinations of the reactor vessel interior attachments and the core support structure, required by 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 with the core barrel removed with the reactor vessel volumetric examinations of Category B-A and B-D welds. However, Southern Nuclear Operating Company (SNC) has previously submitted and received approval to extend examination of the reactor vessel Category B-A and B-D welds from 10 years to 20 years for VEGP - Units 1 and 2. As a result, VEGP has no other requirements or activities that require removing the core barrel prior to next Category B-A and B-D weld examinations except for the Category B-N-2 and B-N-3 visual examinations. Correspondence related to the extension of the Category B-A and B-D weld examinations is contained in SNC letters dated August 29, 2012, November 25, 2013, and January 31, 2014 (Agency Document Access and Management System (ADAMS) Accession Numbers ML12243A248, ML13329A494, and ML14031A429 respectively) and in Nuclear Regulatory Commission letter dated March 20, 2014 (ADAMS Accession Number ML14030A570).

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. The core barrel is restrained at the bottom by the clevis inserts/support lugs with a close tolerance fit to the corresponding core barrel radial keys. 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.

Performing these Examination Category B-N-2 and B-N-3 visual examinations and the Examination Category B-A and B-D examinations during the same refueling outage results in

significant savings in outage duration since the same equipment and personnel used for examination of the reactor pressure vessel shell, lower head, and nozzle welds from the reactor pressure vessel interior can implement the examinations of reactor pressure vessel interior attachment welds and core support structure surfaces. Additionally, removing the reactor pressure vessel internals once instead of twice during the proposed 20-year inspection interval to perform these related examinations would result in significant savings in radiation exposure and the avoidance of an infrequently performed lift of a heavy, close fit component that has some potential for inflicting damage to itself, reactor vessel surfaces, and refueling floor structures/liners for the sole purpose of performing the B-N-2 and B-N-3 visual examinations.

**Proposed Alternative and Basis for Use:**

SNC proposes to extend the Third Inspection Interval for the category B-N-2 interior attachment welds beyond the reactor vessel beltline region and the category B-N-3 reactor vessel core support structure surfaces to coincide with the end of the Fourth Inspection Interval which is scheduled to be May 30, 2027. Pending approval of this proposed alternative, the proposed alternative inspection would enable the subject examinations to be performed with the risk-informed extension of the inservice inspection interval for category B-A reactor vessel pressure-retaining welds and category B-D nozzle-to-vessel and inner radius section welds.

The visual examinations of the reactor vessel interior attachments and the core support structure have been performed twice per unit at VEGP. No relevant indications were noted during the First Inspection Interval for the category B-N-2 and B-N-3 examinations on either VEGP unit. No relevant indications were noted during the Second Inspection Interval for the category B-N-2 and B-N-3 examinations on Unit 2. Indications were noted in the Second Inspection Interval for the category B-N-2 and B-N-3 examinations during Unit 1 Refueling Outage 1R13 in 2006.

During the Second Inspection Interval visual examinations on Unit 1 in Refueling Outage 1R13 in 2006 a thin object of approximately 0.375 inch length was observed to be adhered to the bottom surface, on the right-hand side, of the upper core plate clevis insert at the 90-degree location. The foreign object was dislodged in one piece and some slightly disrupted material was noticed on the outside bottom edge of the clevis insert. In addition, a similar indication was observed on the corresponding area on the left-hand side of the same clevis insert. Corresponding slightly disrupted material was observed on the core barrel on both sides of the clevis which matched the locations on the upper core plate clevis insert. These indications were clearly not service related and in fact likely due to core barrel/reactor vessel close fit tolerance for removal and insertion as discussed above. The indications were assessed and determined not to affect the structural integrity of the reactor internals.

SNC personnel actively participate in key industry groups such as Nuclear Energy Institute, PWR Materials Reliability Program (MRP), and the PWR Owner's Group (PWROG) Subcommittee associated with PWR reactor vessel internals to assess industry operating experience for applicability to VEGP – Units 1 and 2. Two aging management issues are currently a challenge for PWR reactor internals. The two issues are: (1) reactor internals lower support clevis cap screw degradation, and (2) baffle-to-former bolting degradation.

Reactor internals lower support clevis cap screw degradation was discovered at one United States Westinghouse NSSS plant. The industry sponsored evaluations and assessments, documented in a proprietary PWROG report show that the ability of the lower radial support system to perform its intended safety function is unrelated to the integrity of the cap screws

used to hold the clevis insert in place. That is, failure of a cap screw is not expected to result in the complete failure of the lower radial support system. A series of cascading failures would need to occur prior to the safety functions becoming potentially affected.

The VEGP Unit 1 and Unit 2 reactors contain six core support lugs fabricated from Alloy 600 base material which are attached to the RPV wall with alloy 82/132/182 welds. The inlay pad is alloy 82 material, the attachment weld is 132/82, and a lug tie-in weld is alloy 182. The finished lugs and attachment welds received post-weld heat treatment with the entire reactor vessel at the fabricator (Combustion Engineering), which relieves the stresses from the welding operation. SNC is unaware of any industry operating experiencing (OE) related to primary water stress corrosion cracking for similar vessel attachment welds.

The VEGP Unit 1 and Unit 2 six core support lug locations described above have one-piece Alloy 600 (SB-166) clevis inserts interference fit and fastened to the lugs with eight SB-637 Grade 688, type 2 (alloy X-750) cap screws and two alloy 600 dowel pins.

Degradation of baffle-to-former bolting in the United States has been limited to downflow reactor designs with Type 347 bolts. VEGP – Units 1 and 2 are standard upflow reactor designs with Type 316 strain-hardened bolts which based on industry assessment of the operating experience are considered the least susceptible (tier 4) plant designs to have baffle-to-former bolting degradation. Although the susceptibility assessment clearly indicates a low potential for VEGP, detection of degradation similar to the recent operating experience does not require removal of the core barrel in unlikely event of occurrence.

WCAP-17435-NP, Revision 1, "Results of the Reactor Internals Operating Experience Survey Conducted under PWROG Project Authorization PA-MS-0568," dated March 15, 2013, for information, indicated no inspection indications for the Category B-N-2 and B-N-3 components for the domestic fleet of RPVs.

As part of this alternative, if there is an opportunity to perform examinations due to removal of the core barrel from the reactor vessel prior to the next scheduled Category B-A and B-D weld examinations, the code required VT-3 examinations will be performed on the core support structure and interior reactor vessel attachments in order to fulfill the exam requirements for the extended interval.

Therefore, in accordance with 10CFR50.55a(z)(2), SNC requests approval to extend the Third Inspection Interval to May 30, 2027 for category B-N-2 and B-N-3 visual examinations because removal of the core barrel for the sole purpose of performing visual examinations results in a "hardship without a compensating increase in the level of quality or safety".

**Duration of Proposed Alternative:**

The proposed alternative would extend the duration of the Third Inspection Interval for Examination Categories B-N-2 and B-N-3, Item Numbers B13.60 and B13.70, visual examinations to May 30, 2027.

This extension will not affect the start of the Fourth Inspection Interval so it will not impact the overall schedule of other VEGP's ISI examinations.

**Precedent:**

First Energy Nuclear Operating Company submitted a similar request for Beaver Valley Power Station, Unit No. 2, proposing that the visual examinations for Category B-N-2 and B-N-3 components be performed consistent with the proposed inspection interval for Category B-A and B-D volumetric examinations. By letter dated December 27, 2016 (ADAMS Accession Number ML16190A133), the NRC staff authorized use of the alternative.

**Status:**

A similar request was approved by the NRC staff for Beaver Valley Power Station Unit 2 by letter dated December 27, 2016 (ADAMS Accession Number ML16190A133).