UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

July 15, 2020

Mr. Michael Yox
Regulatory Affairs Director
Southern Nuclear Operating Company
7825 River Road, Bldg. 302, Vogtle 3&4
Waynesboro, GA 30830

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNIT 3 – NRC INSPECTION REPORT 05200025/2019010

Dear Mr. Yox:

On March 27, 2019, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at the Vogtle Electric Generating Plant, Unit 3. The enclosed inspection report documents the inspection results, which the NRC staff discussed on May 21, 2020, with you and other licensee and contractor staff members.

The inspection examined a sample of construction activities conducted under your Combined License as it relates to safety and compliance with the Commission's rules and regulations and with the conditions of these documents. The NRC staff reviewed selected procedures and records, observed activities, and interviewed personnel.

No findings or violations of more than minor significance were identified during this inspection.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at http://www.nrc.gov/reading-rm/adams.html and at the NRC Public Document Room in accordance with Title 10 of the Code of Federal Regulations 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

Nicole Coovert
Branch Chief
Construction Inspection Branch 1

Docket No.: 5200025
License No: NPF-91
Enclosure: NRC Inspection Report (IR) 05200025/2019010
w/attachment: Supplemental Information

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SUBJECT: VOGTLE ELECTRIC GENERATING PLANT, UNIT 3 – NRC INSPECTION REPORT 05200025/2019010 DATED: JULY 15, 2020

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U.S. NUCLEAR REGULATORY COMMISSION
Region II

Docket Number:	5200025
License Number:	NPF-91
Report Number:	05200025/2019010
Licensee:	Southern Nuclear Operating Company, Inc.
Facility:	Vogtle Unit 3 Combined License
Location:	Waynesboro, GA
Inspection Dates:	March 25, 2019 through March 27, 2019
Inspectors:	A. Ponko, Senior Construction Inspector, DCO S. Smith, Senior Construction Inspector, DCO
Approved by:	Nicole Coovert Branch Chief Construction Inspection Branch 1

SUMMARY OF FINDINGS

Inspection Report (IR) 05200025/2019010; 03/25/2019 through 03/27/2019; Vogtle Unit 3 Combined License inspection report.

This report covers inspection findings by NRC staff of Unresolved Item (URI) 05200025/2018-01, Welded Reinforcing Bar Splices. The U.S. Nuclear Regulatory Commission's program for overseeing the construction of commercial nuclear power reactors is described in Inspection Manual Chapter (IMC) 2506, Construction Reactor Oversight Process General Guidance and Basis Document.

A. NRC-Identified and Self Revealed Findings

None

B. Licensee-Identified Violations

None

REPORT DETAILS

Summary of Plant Construction Status

See the routine integrated inspection report 05200025(26)/2020001 (ML20128J831) for the summary of plant construction status from January 1, 2020 through March 31, 2020.

1. CONSTRUCTION REACTOR SAFETY

Cornerstones: Design/Engineering, Procurement/Fabrication, Construction/Installation, Inspection/Testing

IMC 2504, Construction Inspection Program – Inspection of Construction and Operational Programs

4. OTHER INSPECTION RESULTS

4OA3 Follow-up of Licensee Reports, URIs, NCVs, and VIOs

- 92701 - Followup
- 92701-02.01 - Unresolved Item Followup

a. Inspection Scope

During the week of January 22, 2018, inspectors identified that the licensee was not performing destructive tests and nondestructive examination of welded reinforcing joints for the welded reinforcing steel hoops used in the north wall of the Unit 3 main steam east compartment at column line 11, between elevations 117’-6” and 153’-0”. The additional tests were noted in American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section III, Division 2, as referenced in Section 7.13, “Welded Reinforcing Bar Splices,” of ASME NQA-1-1994 Subpart 2.5, which the licensee committed to, without exception, in their Nuclear Development Quality Assurance Manual (NDQAM). The reinforcing hoops at this location were fabricated with direct butt joints using complete joint penetration groove welds. This issue was documented as Unresolved Item (URI) 05200025/2018-01, Welded Reinforcing Bar Splices, in NRC inspection report 05200025/2018001 (ML18134A348). The URI disposition was pending the inspectors’ review and evaluation of the licensee’s corrective actions, if applicable, and their position paper on the applicability of ASME NQA-1-1994, Subpart 2.5, Paragraph 7.13.

The licensee generated condition report (CR) 10465176 to document this issue but concluded that "the ASME BPVC.III.2 reference in Section 7.13 of NQA-1-1994, Subpart 2.5, identifying additional testing for Welded Reinforcing Bar Splices beyond American Concrete Institute (ACI) 349 required testing, was not appropriate to [VEGP 3/4] and was assessed as such in accordance with the NDQAM." The NRC staff reviewed the licensee's evaluation on the applicability of ASME NQA-1-1994, Subpart 2.5, Paragraph 7.13 and engaged in discussions with technical staff from the Office of New Reactors (NRO) (now merged with the Office of Nuclear Reactor Regulation) to verify the licensee's commitments for required inspection and testing activities for welded reinforcing bar splices.

Minor Violation of 10 CFR Part 50 Appendix B, Criterion II, "Quality Assurance Program"

Following additional inspection conducted on March 25 - 27, 2019, and based on additional discussion and review, the NRC staff determined the licensee's failure to meet a commitment in their quality assurance program, as written, was a performance deficiency related to a construction finding. Specifically, Southern Nuclear Company (SNC) committed to comply with ASME NQA-1-1994, Subpart 2.5, in its NDQAM, without exception, however, additional testing was not performed in accordance with Section 7.13 of Subpart 2.5.

Step 4.1 of Part II, Section 10, "Inspection" of the SNC NDQAM, Version 17.0, states, in part, "that SNC commits to compliance with the requirements of ASME NQA-1-1994, Part II, Subparts 2.5 and 2.8 for establishing appropriate inspection requirements." Under this commitment, the inspectors noted that no exceptions were cited. ASME NQA-1-1994, Part II, Subpart 2.5, Section 7.13 states, in part, that "welded reinforcing bar splices shall be subject to the requirements of para. 8.5, except that provisions of the ASME Boiler and Pressure Vessel Code (BPVC), Section III, Division 2 (ACI Standard 359) shall also apply."

The ASME Code, Section III.2 (2001 Edition with 2003 Addenda), Article XI-1560, "Continuing Joint Performance Tests," requires destructive testing on a sampling basis of welded reinforcement splices to ensure the joints met tensile requirements. Additionally, the ASME Code, Section III.2, Article XI-1600, "Examination of Welded Joints of Reinforcing Bar," requires radiographic testing examination of joint samples to verify weld quality.

The performance deficiency was evaluated against the more-than-minor evaluation questions in Appendix E, "Examples of Minor Construction Issues," of Inspection Manual Chapter (IMC) 0613, "Power Reactor Construction Inspection Reports," dated May 1, 2020. This performance deficiency was determined to be minor because ACI 349-01, "Code Requirements for Nuclear Safety Related Concrete Structures," allowed the use of welded splices, and the licensee was committed to this code in their current licensing basis. Specifically, the subject reinforced concrete wall met the provisions of ACI 349-01 (code of record) for the construction, inspection, and testing of Unit 3 Wall 11, per Updated Final Safety Analysis Report (UFSAR) Subsection 3.8.4.2, "Applicable Codes, Standards, and Specifications," and American Welding Society (AWS) D1.4-98, which is invoked by ACI 349-01.

AWS D1.4 establishes the integrity of the process and certification of the welders to meet the quality standards needed for these structures. AWS D1.4-98 Section 6, "Qualification", establishes the welding procedure specification (WPS) document which provides direction to the welder or welding operators for making sound and quality production welds as per the code. A WPS is supported by a procedure qualification record (PQR). In addition, each welder is qualified, and their work inspected. Since the welders and welding procedures are required to be qualified to AWS D1.4-98, this provides in part, reasonable assurance that the welds have been made to a quality standard.

In addition, the NRC staff determined the following regarding the performance deficiency (PD):

1. the PD did not represent a substantive non-conservative error in a specification, computer program, design report, drawing, calculation or other design document that defines the technical requirements for a structure, system, or component (SSC);
2. the PD did not represent a substantive failure to establish or implement an adequate program, process, procedure, or quality oversight function;
3. the PD did not represent an adverse condition that rendered the quality of an SSC, unacceptable or indeterminate, and require substantive corrective action;
4. the PD did not represent an irretrievable loss or inadequate documentation of a quality assurance record that could preclude the licensee from demonstrating the adequacy of quality or from properly evaluating safety-significant activities;
5. the PD did not adversely affect the associated cornerstone objective listed in IMC 0613; and
6. the PD was not material to the acceptance criteria of an ITAAC (i.e., an ITAAC finding) because the PD did not prevent the licensee from meeting an ITAAC Design Commitment or approved Technical Specification, and the PD did not invalidate the performance of the Inspection, Test, or Analysis described in the ITAAC.

10 CFR Part 50, Appendix B, Criterion II, "Quality Assurance Program," states, in part, a [quality assurance] program shall be documented by written policies, procedures, or instructions and shall be carried out throughout plant life in accordance with those policies, procedures, or instructions. Contrary to above, since the start of construction of Unit 3 Wall 11, the licensee failed to carry out those policies documented in the licensee's NDQAM for Unit 3 Wall 11. Specifically, the licensee committed to comply with ASME NQA-1-1994, Subpart 2.5, in its NDQAM, without exception, however, additional testing was not performed in accordance with Section 7.13 of Subpart 2.5, for welded reinforcing steel hoops used in the Unit 3 north wall of the main steam east compartment at column line 11, between elevations 117'-6" and 153'-0". The licensee initiated CR 50050957 to address the failure to meet a commitment in their quality assurance program, as written. This failure to comply with 10 CFR Part 50 Appendix B, Criterion II, constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

Minor Violation of 10 CFR Part 50 Appendix B, Criterion V, “Instructions, Procedures, and Drawings”

During the URI inspection follow-up activities, the NRC staff identified an additional minor violation of 10 CFR Part 50 Appendix B, Criterion V, “Instructions, Procedures, and Drawings.” The NRC staff determined that the failure to adequately review and reconcile licensing basis impacts for the use of welded rebar splices in a safety related Unit 3 structure was a performance deficiency related to a construction finding. Specifically, VEGP Unit 3 UFSAR Section 3.8.4.6.1.2 states in part that, in areas where reinforcing steel splices are necessary and lap splices are not practical, mechanical connections (e.g. threaded splices, swaged sleeves or cadwelds) are used. UFSAR Section 3.8.4.6.1.2 did not specifically allow for the use of welded reinforcing bar splices. The NRC staff noted that the licensee used welded reinforcing bar splices instead of lap splices or mechanical connections in the hoops around the circular embedment for the main steam line placed in the north wall of the Unit 3 main steam isolation valve east compartment at column line 11 between column lines L and M and elevations 117’-6” to 153’-0”.

The licensee initiated Engineering and Design Coordination Report (E&DCR) SV0-CR01-GEF-000543, “Lap Splice Substitution,” Rev. 0, dated 07/28/2015, which approved the use of welded splices. Form F-APP-GW-GAP-147-1, “Licensing Impact Determination,” concluded “Based on the Current Licensing Basis keywords searched and the Current Licensing Basis document chapters/sections/tables/figures reviewed, no Current Licensing Basis impact is identified.”

The licensee utilized procedures APP-GW-GAP-420, “Engineering and Design Coordination Reports,” Rev. 11, and APP-GW-GAP-147, “AP1000 Current Licensing Basis Review,” Rev. 4 to screen the E&DCR. Step 5.8.4 of procedure APP-GW-GAP-420, states in part, that “the impact to safety margins, structural requirements, functional, and performance requirements shall be identified as part of the justification.” Step 7.6 of APP-GW-GAP-147, states in part, that “Licensing Impact Determinations should be performed from a perspective of verbatim compliance to the certified design.” The NRC staff determined that the licensee did not consider the impacts to the current licensing basis or the verbatim compliance to the certified design with respect to the use of welded splices, which was not specifically approved for use per Section 3.8.4.6.1.2 of the licensee’s UFSAR.

The performance deficiency was evaluated against the more-than-minor evaluation questions in Appendix E of IMC 0613. This performance deficiency was determined to be minor because ACI 349-01 allowed for use of welded splices, and the licensee was committed to this code in their current licensing basis. Specifically, the subject reinforced concrete wall met the provisions of ACI 349-01 (code of record) for the construction, inspection, and testing of Unit 3 Wall 11, per UFSAR Subsection 3.8.4.2 and AWS D1.4-98, invoked through ACI 349-01. AWS D1.4 establishes the integrity of the process and certification of the welders to meet the quality standards needed for these structures. AWS D1.4-98 Section 6, “Qualification”, establishes the WPS document which provides direction to the welder or welding operators for making sound and quality production welds as per the code.

A WPS is supported by a PQR. In addition, each welder is qualified, and their work inspected. Since the welders and welding procedures are required to be qualified to AWS D1.4-98, this provides in part, reasonable assurance that the welds have been made to a quality standard.

In addition, the NRC staff determined the following regarding the PD:

1. the PD did not represent a substantive non-conservative error in a specification or other design document that defines the technical requirements for a SSC;
2. the PD did not represent a substantive failure to establish or implement an adequate program, process, procedure, or quality oversight function;
3. the PD did not represent an adverse condition that rendered the quality of an SSC, unacceptable or indeterminate, and require substantive corrective action;
4. the PD did not represent an irretrievable loss or inadequate documentation of a quality assurance record that could preclude the licensee from demonstrating the adequacy of quality or from properly evaluating safety-significant activities;
5. the PD did not adversely affect the associated cornerstone objective listed in IMC 0613; and
6. the PD was not material to the acceptance criteria of an ITAAC (i.e., an ITAAC finding) because the PD did not prevent the licensee from meeting an ITAAC Design Commitment or approved Technical Specification, and the PD did not invalidate the performance of the Inspection, Test, or Analysis described in the ITAAC.

10 CFR Part 50, Appendix B, Criterion V, “Instructions, Procedures, and Drawings,” states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to above, since the start of construction of Unit 3 Wall 11, a seismic Category I structure, the licensee failed to accomplish activities affecting quality in accordance with procedures. Specifically, the licensee failed to adequately review and reconcile licensing basis impacts in accordance with corrective action program and associated screening procedures for the use of welded reinforcing bar splices in a safety-related Unit 3 structure. The licensee initiated CR 50050960 to reconcile the differences in the UFSAR and the as-built plant configuration with respect to the use of welded reinforcing bar splices. This failure to comply with 10 CFR Part 50, Appendix B, Criterion V, constitutes a minor violation that is not subject to enforcement action in accordance with the NRC’s Enforcement Policy.

b. Findings

No findings were identified.

4. OTHER INSPECTION RESULTS

4OA6 Meetings, Including Exit

.1 Exit Meeting.

On May 21, 2020, the inspectors presented the inspection results to Mr. M. Yox, Regulatory Affairs Director, Vogtle 3 & 4, and other licensee and contractor staff members.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensees and Contractor Personnel

K. Roberts, SNC Licensing Manager
C. Castel, SNC Licensing

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Item Number	Type	Status	Description
05200025/2018-01	URI	Closed	Welded Reinforcing Bar Splices (Section 4OA3)

LIST OF DOCUMENTS REVIEWED

Section 4OA3
Documents Reviewed:

APP-GW-GAP-140, “AP1000 Licensing Applicability Determination and 10 CFR 50.59/10 CFR 52 Appendix D Section VIII Screening,” Rev. 1

APP-GW-GAP-142, “AP1000® 10 CFR 52 Appendix D Section VIII ‘Processes for Changes and Departures’ Evaluations,” Rev 0,

APP-GW-GAP-147, “AP1000® Current Licensing Basis Review,” Rev. 4
Form F-APP-GW-GAP-147-1, “Licensing Impact Determination”

APP-GW-GAP-420, “Engineering and Design Coordination Reports,” Rev. 11

ND-AD-002, “Nuclear Development Corrective Action Program,” Version 27.0

ND-LI-VNP-002, “Applicability Determination and 50.59 / Departure Screening for VEGP 3&4,” Version 16.1

Nuclear Development Quality Assurance Manual (NDQAM), Version 17.0

E&DCR SV0-CR01-GEF-000543, “Lap Splice Substitution,” Rev. 0, dated 07/28/2015

CR/CAPAL Written

CR 10465176, CR 50050957, CR 50050960

LIST OF ACRONYMS

ACI	American Concrete Institute
ASME	American Society of Mechanical Engineers
AWS	American Welding Society
BPVC	Boiler and Pressure Vessel Code
CFR	Code of Federal Regulations
CR	Condition Report
E&DCR	Engineering & Design Coordination Report
IMC	Inspection Manual Chapter
IR	Inspection Report
ITAAC	Inspections, Tests, Analysis, and Inspection Criteria
NDQAM	Nuclear Development Quality Assurance Manual
NQA	Nuclear Quality Assurance
NRC	Nuclear Regulatory Commission
NRO	Office of New Reactors
PD	Performance Deficiency
PQR	Procedure Qualification Record
SNC	Southern Nuclear Company
SSC	Structures, Systems, and Components
URI	Unresolved Item
UFSAR	Updated Final Safety Analysis Report
VEGP	Vogtle Electric Generating Plant
WPS	Welding Procedure Specification

ITAAC INSPECTED

No.	ITAAC No.	Design Commitment	Inspections, Tests, Analysis	Acceptance Criteria

Not Applicable