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

October 19, 2020

Mr. Mark D. Sartain
Vice President – Nuclear Engineering
and Fleet Support
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1 – AUDIT RE: PROPOSED LICENSE AMENDMENT REQUEST FOR THE ADDITION OF WESTINGHOUSE TOPICAL REPORT WCAP-16996-P-A, REVISION 1, TO THE CORE OPERATING LIMITS REPORT (EPID L-2020-LLA-0124)

Dear Mr. Sartain:

By letter dated June 4, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML20156A303), Dominion Energy South Carolina (Dominion), submitted a license amendment request for the Virgil C. Summer Nuclear Station (Summer), Unit 1. The proposed amendments request the addition of Westinghouse Topical Report WCAP-16996-P-A, Revision 1,to the Core Operating Limits Report.

The U.S. Nuclear Regulatory Commission (NRC) staff will conduct a regulatory audit to support its review of the proposed license amendments. The audit is planned to be conducted remotely or on-site at Summer to facilitate access to the licensee's probabilistic risk assessment (PRA) models, documentation, and technical experts. The NRC staff intends to start the audit on October 21, 2020, and the logistics and scope of the audit plan is enclosed.

If you have any questions, please contact me by telephone at (301) 415-5897 or by e-mail at Vaughn.Thomas@nrc.gov.

Sincerely,

/RA/

Vaughn V. Thomas, Project Manager
Plant Licensing Branch II-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-395

Enclosures:
(1) Audit Plan
(2) Appendix A: Audit Topics

cc: Listserv

AUDIT PLAN

FULL SPECTRUM LOSS-OF-COOLANT ACCIDENT METHODOLOGY

DOMINION ENERGY SOUTH CAROLINA

VIRGIL C. SUMMER NUCLEAR STATION, UNIT 1

DOCKETS NO. 50-395

1.0 BACKGROUND

By letter dated June 4, 2020, Dominion Energy (the licensee) submitted a license amendment request (LAR) for Summer, Unit 1. The proposed amendments request the addition of Westinghouse Topical Report WCAP-16996-P-A, Revision 1, "Realistic LOCA [loss-of-coolant accident] Evaluation Methodology Applied to the Full Spectrum of Break Sizes (FULL SPECTRUM LOCA Methodology)," to the list of methodologies approved for reference in the Core Operating Limits Report (COLR).

The U.S. Nuclear Regulatory Commission (NRC) staff is currently performing a detailed review of the proposed license amendment requests. Due to the complexity of the proposed amendment, the NRC staff has determined that an audit is needed to help resolve the complex technical issues rather than issuing several rounds of requests for additional information (RAI).

The NRC staff is requesting a regulatory audit in accordance with the Office of Nuclear Reactor Regulation (NRR) Office Instruction LIC-111, "Regulatory Audits," dated October 31, 2019 (ADAMS Accession No. ML19226A274), for the NRC staff to gain a better understanding of the licensee's calculations and other aspects supporting the LAR. The audit is for voluntary submittals pursuant to 10 CFR 50.90 for Summer, Unit 1.

2.0 REGULATORY AUDIT SCOPE

A regulatory audit is conducted with the intent to gain understanding, to verify information and/or to identify information that will require docketing to support the basis for the proposed licensing or regulatory decision.

The regulatory bases for the NRC are the requirements contained in the Title10, "Energy," of the *Code of Federal Regulation* (10 CFR), Section 50.46, "Acceptance criteria for emergency core cooling systems [ECCS] for light-water nuclear power reactors."

3.0 REGULATORY AUDIT SCOPE AND METHODOLOGY

The audit will cover the following documents and topics:

- Calculation notes and related documentation supporting the license amendment requests, and
- Criteria and methods used in the large break loss-of-coolant accident (LBLOCA)

4.0 INFORMATION AND OTHER MATERIAL NECESSARY FOR THE AUDIT

The NRC audit team will require access to personnel knowledgeable in all aspects of the LAR and any documentation which supports the license amendment requests. Specific areas of discussion and relevant questions are included in Appendix A of this audit plan. The NRC staff requests the licensee provide the supporting documents electronically (i.e., internet SharePoint) to support a remote audit. Any information needed to support development of the NRC safety evaluation will be requested for submission on the docket via a request for additional information.

5.0 TEAM ASSIGNMENTS

The audit will be conducted by NRC staff from NRR, Division of Safety Systems (DSS), Nuclear Systems Performance Branch (SNSB). The NRC audit team consists of:

- Reed Anzalone, Technical Reviewer
- Shie-Jeng Peng, Technical Reviewer
- Vaughn Thomas, Project Manager

6.0 LOGISTICS

The Division of Operating Reactor Licensing (DORL) PM will schedule an entrance meeting for this audit and an exit meeting based on a mutually agreed upon date and time. The DORL PM will provide updates to the licensee upon request and facilitate any additional request the NRC staff may have to the licensee.

7.0 DELIVERABLES

A regulatory audit summary will be issued within 60 days after the completion of the audit and exit meeting with the licensee. The summary will use the NRR Office Instruction, LIC-111, *"Regulatory Audits."* Any additional information needed to support the safety evaluation that was identified from the audit will be transmitted to the licensee from DORL as requests for additional information.

8.0 REFERENCES

1. Sartain, Mark, Vice President, Dominion Energy South Carolina, letter to U.S. NRC, "Dominion Energy South Carolina (DESC), Virgil C. Summer Nuclear Station (VCSNS), Unit 1 License Amendment Request Update of Analytical Method to the Core Operating Limits Report With The Full Spectrum Loss of Coolant Accident Approach," dated June 4, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML20156A303).

2. U.S. NRC Office Instruction, LIC-111, Revision 1, "Regulatory Audits, dated October 31, 2019 (ADAMS Accession No. ML19226A274).

3. Westinghouse, Nuclear Safety Advisory Letter, "Relaxed Axial Offset Control F_Q Technical Specification Actions," NSAL-09-5, Revision 1 (ADAMS Accession No. ML17167A233)

Appendix A: Audit Topics

Power Distribution Modeling

WCAP-16996 Section 25.2.1.4 prescribed power distribution modeling assumptions used in FSLOCA EM [Full Spectrum Loss-of-Coolant Accident Evaluation Model]. Provide verification results or justification that the following assumptions meet Virgil C. Summer Nuclear Station, Unit 1 (VCSNS) design and operation conditions including:

1. The average hot assembly power is below the maximum hot rod value by a specific amount of value as specified in WCAP-16996-P-A,
2. The power selected for Low Power Region reflects the current VCSNS core design and operation conditions, and
3. The hot channel factor data, FQ and FΔH generated from FSLOCA EM for VCSNS analysis are compared satisfactorily to VCSNS Power Distribution Monitoring System data.

Limiting Break Size in Region I

Based on the FSLOCA EM methodology, there should be a limiting break size due to the peak clad temperature (PCT) determined from Region I (SBLOCA) break spectrum analysis (see SE of WCAP-16996 Section 4.6). Please clarify the extent to which the limiting break size was reported in both LAR and WCAP-16996.

Demonstration of Statistical Analysis and Compliance with 10 CFR 50.46 Acceptance Criteria

WCAP-16996, Section 31, shows how the FSLOCA analysis methodology using the statistical method and WCOBRA/TRAC-TF2 code determine the 95/95 (95% probability/95% confidence) figures of merit (PCT), Maximum Local Oxidation (MLO), and Core-Wide Oxidation (CWO)) and uses them to demonstrate the compliance of the 10 CFR 50.46 acceptance criteria. Please clarify the extent to which this information is provided in LAR or WCAP-16996 for VCSNS. Please provide similar demonstration as those in Sections 31.3, 31.4 and 31.5 for VCSNS.

Impact of NSAL-95-1 on the Application of FSLOCA to VCSNS

NSAL-09-5 (Reference 3) indicates that the peaking factor basis assumed in the licensing basis analysis may not be maintained under all conditions if the transient FQ limit is not met. Since VCSNS employed RAOC methodology and was listed as an affected plant in NSAL-09-5, provide information regarding whether the impact of NSAL-09-5 on the application of FSLOCA EM to VCSNS, especially, if NSAL-09-5 Safety Significance Items 4 and 5, has been evaluated and dispositioned.

Modeling of Main Steam Safeties

To verify compliance with Full Spectrum LOCA Limitation and Condition 12, please provide access to input decks and calculation notes documenting how the main steam system is modeled up to the main steam safety valves.

Modeling of Upper Head Spray Nozzles

To verify compliance with Full Spectrum LOCA Limitation and Condition 13, please provide access to input decks and calculation notes documenting how the upper head spray nozzle loss coefficients were determined.

Documentation for Uncertainty Analyses

Please provide access to the documentation discussed in Full Spectrum LOCA Limitation and Condition 11 related to the statistical sampling for the Region I and II uncertainty analyses.

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SPeng, NRR
RAnzalone, NRR

ADAMS Accession No.: ML20265A125 ***via e-mail**

OFFICE	NRR/DORL/LPL2-1/PM*	NRR/DORL/LPL2-1/LA*	NRR/DSS/SNSB/BC*
NAME	VThomas	KGoldstein	SKrepel
DATE	09/18/2020	09/22/2020	09/24/2020
OFFICE	NRR/DORL/LPL2-1/BC*	NRR/DORL/ LPL2-1/PM*	
NAME	MMarkley	VThomas	
DATE	09/29/2020	10/19/2020	

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