

From: Thomas, Vaughn
Sent: Monday, December 7, 2020 2:14 PM
To: Yan.Gao@dominionenergy.com
Subject: Final RAIs for Summer FS LOCA LAR
Attachments: Final RAIs for the Summer FS LOCA LAR_Dec 7 2020.doc

Yan,

The attached file constitutes the staff's issuance of the final RAI to you. The staff expects your response to the RAI within 30 days from today's date, December 7, 2020.

Thanks

Vaughn Thomas, Project Manager

Plant Licensing Branch II-1

Division of Operating Reactor Licensing

Office of Nuclear Reactor Regulation

Vaughn.Thomas@nrc.gov

301-415-5897

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Recipients:
"Yan.Gao@dominionenergy.com" <Yan.Gao@dominionenergy.com>
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**REQUEST FOR ADDITIONAL INFORMATION
OFFICE OF NUCLEAR REACTOR REGULATION**

Issue Date: December 7, 2020

Summer FS LOCA LAR

South Carolina Electric & Gas

Dockets: 05000395-PWR-Summer

EPIDS: L-2020-LLA-0124

Questions

Question Number: 139

Regulatory Basis

The regulatory bases for the following LOCA related requests for additional information (RAIs) are the requirements contained in 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," insofar as they establish the requirements and acceptance criteria for emergency core cooling system (ECCS) design, and for the evaluation models (EMs) used to evaluate ECCS performance during a hypothetical LOCA. Specific considerations include

10 CFR 50.46(a)(1)(i) requires the use of an acceptable EM to evaluate ECCS performance under the conditions of a hypothetical LOCA, and 10 CFR 50.46(a)(1)(ii) allows for the development of an EM that conforms to the required and acceptable features specified in Appendix K to 10 CFR 50. 10 CFR 50.46(a)(1)(i) also requires ECCS cooling performance to be calculated for a number of postulated LOCAs of different sizes, locations, and other properties sufficient to provide assurance that the most severe hypothetical LOCAs are calculated.

Acceptance criteria set forth in paragraph (b) of 10 CFR 50.46, and the results of the ECCS evaluation must show that the acceptance criteria are met. Among others, these include requirements related to peak cladding temperature (PCT), maximum cladding oxidation, and maximum hydrogen generation.

Background

The licensee planned to transition from the current statistically based Best Estimate Large Break LOCA and deterministically based Small Break LOCA methods to a state-of-the-art, unified, and approved Full Spectrum LOCA approach (Reference 2). The proposed change will involve with a change of VCSNS current Technical Specification 6.9.1.11, "Core Operating Limits Report," analytical methods Item (c). The proposed change in analysis methods also will fulfill the South Carolina Electric and Gas (now Dominion Energy South Carolina) commitment to address fuel pellet thermal conductivity degradation (TCD) as described in Nuclear Regulatory Commission Information Notice 2011-21, by replacing the previous PAD3.4 and PAD4.0 fuel thermal performance codes with the updated and approved PADS code in the LOCA analyses.

The aforementioned Full Spectrum LOCA approach was adopted by Westinghouse to complete an analysis with the FULL SPECTRUM™ loss-of-coolant accident (FSLOCA™) evaluation model (EM) for VCSNS. This LAR requests approval to apply the Westinghouse FSLOCA EM.

RAI-1; Axial Power Difference

VCSNS TS LCO 3.2.1 requires the axial power difference (APD) be maintained within the allowed operational space specified in COLR as based on the Relaxed Axial Offset Control (RAOC) or within the target band specified in the COLR about the target flux difference during base load operation. Based on WCAP-16996 Figure 25.2-13, the staff has a concern that the axial power distributions created in FSLOCA EM library for VCSNS analysis may not sufficiently reflect the VCSNS reactor design. The licensee is requested to provide assurance that the axial power distributions created in FSLOCA EM library for VCSNS analysis are consistent with, or bound, those allowed by VCSNS TS LCO 3.2.1.

Question Number: 140

Regulatory Basis

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Acceptance criteria set forth in paragraph (b) of 10 CFR 50.46, and the results of the ECCS evaluation must show that the acceptance criteria are met. Among others, these include requirements related to peak cladding temperature (PCT), maximum cladding oxidation, and maximum hydrogen generation.

Background

The licensee planned to transition from the current statistically based Best Estimate Large Break LOCA and deterministically based Small Break LOCA methods to a state-of-the-art, unified, and approved Full Spectrum LOCA approach (Reference 2). The proposed change will involve with a change of VCSNS current Technical Specification 6.9.1.11, "Core Operating Limits Report," analytical methods Item (c). The proposed change in analysis methods also will fulfill the South Carolina Electric and Gas (now Dominion Energy South Carolina) commitment to address fuel pellet thermal conductivity degradation (TCD) as described in Nuclear Regulatory Commission Information Notice 2011-21, by replacing the previous PAD3.4 and PAD4.0 fuel thermal performance codes with the updated and approved PADS code in the LOCA analyses.

The aforementioned Full Spectrum LOCA approach was adopted by Westinghouse to complete an analysis with the FULL SPECTRUM™ loss-of-coolant accident (FSLOCA™) evaluation model (EM) for VCSNS. This LAR requests approval to apply the Westinghouse FSLOCA EM.

RAI-2; Operator Action

No operator actions are described in the transient descriptions or sequences of events. The licensee is requested to confirm that all assumed accident mitigation features occur automatically or discuss any operator actions that may be taken during the time spans as considered in the analyses.