

**From:** Brown, Eva  
**Sent:** Monday, September 27, 2021 1:23 PM  
**To:** Mack, Jarrett  
**Cc:** stavroula.mihalakea@fpl.com; Wrona, David  
**Subject:** Turkey Point Request for Additional Information Concerning Full Spectrum LOCA Methodology - EPID L-2021-LLA-0070  
**Attachments:** 0070 RAI.pdf

Jarrett,

By letter dated April 15, 2021 (the submittal) (Agencywide Document Access and Management System (ADAMS) Accession No. ML20310A324), Florida Power & Light Company submitted a license amendment request for Turkey Point Nuclear Plant, Units 3 and 4. The proposed amendment would revise technical specification (TS) 6.9.1.7 to reflect the adoption of topical report (TR) WCAP-16996-P-A, Revision 1, "Realistic LOCA Evaluation Methodology Applied to the Full Spectrum of Break Sizes (Full Spectrum LOCA Methodology)," (ADAMS Accession No. ML17277A130) as a reference in the Core Operating Limits Report (COLR). The added reference identifies the analytical method used to determine the core operating limits for the large break loss-of-coolant accidents (LOCA) and the small break LOCA events described in the Updated Final Safety Analysis Report. The amendment request also proposes to delete references 1 through 6 in the TS 6.9.1.7 COLR list of analytical methods. The U.S. Nuclear Regulatory Commission staff requires additional information to complete its review of this request as detailed in the attached.

On September 20, 2021 you agreed to provide a response within 60 days from the date of this correspondence. A publicly available version of this final RAI will be placed in the NRC's Agencywide Documents Access and Management System.

Should you have any questions, please feel free to contact me.

Thanks.

Eva Brown  
Senior Project Manager, Turkey Point  
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## REQUEST FOR ADDITIONAL INFORMATION

### TURKEY POINT NUCLEAR PLANT, UNITS 3 AND 4

#### DOCKET NOS. 50-250 AND 50-251

By letter dated April 15, 2021 (the submittal) (Agencywide Document Access and Management System (ADAMS) Accession No. ML20310A324), Florida Power & Light Company (FPL, the licensee) submitted a license amendment request for Turkey Point Nuclear Plant, Units 3 and 4 (Turkey Point). The proposed amendment would revise the Turkey Point Technical Specification (TS) 6.9.1.7 to reflect the adoption of topical report (TR) WCAP-16996-P-A, Revision 1, "Realistic LOCA Evaluation Methodology Applied to the Full Spectrum of Break Sizes (Full Spectrum LOCA Methodology)," (ADAMS Accession No. ML17277A130) as a reference in the Core Operating Limits Report (COLR). The added reference identifies the analytical method used to determine the core operating limits for the large break loss-of-coolant accidents (LOCA) (LBLOCA) and the small break LOCA (SBLOCA) events described in the Turkey Point Updated Final Safety Analysis Report (UFSAR) (ADAMS Accession No. ML21145A288) Sections 14.3.2.1 and 14.3.2.2 respectively. The amendment request also proposes to delete references 1 through 6 in the TS 6.9.1.7 COLR list of analytical methods.

The regulations in Paragraph 50.46(b) Title 10 to the *Code of Federal Regulations* (10 CFR) 50.46(b) require that during LOCA events, the following criteria are met:

- (1) *Peak cladding temperature (PCT)*. The calculated maximum fuel element cladding temperature shall not exceed 2200° Fahrenheit.
  - (2) *Maximum cladding oxidation*. The calculated total oxidation of the cladding shall nowhere exceed 0.17 times the total cladding thickness before oxidation.
  - (3) *Maximum hydrogen generation*. The calculated total amount of hydrogen generated from the chemical reaction of the cladding with water or steam shall not exceed 0.01 times the hypothetical amount that would be generated if all of the metal in the cladding cylinders surrounding the fuel, excluding the cladding surrounding the plenum volume, were to react.
  - (4) *Coolable geometry*. Calculated changes in core geometry shall be such that the core remains amenable to cooling.
1. In Attachment 1 to the submittal, Limitation and Condition 2, under "Compliance", the licensee refers to Westinghouse letters LTR-NRC-18-30, "U.S. Nuclear Regulatory Commission 10 CFR 50.46 Annual Notification and Reporting for 2017" and LTR-NRC-19-6, "U.S. Nuclear Regulatory Commission 10 CFR 50.46 Annual Notification and Reporting for 2018," (ADAMS Accession Nos. ML19288A174 and ML19042A378, respectively), which report "impact of changes or errors" in the emergency core cooling system (ECCS) evaluation models. These letters LTR-NRC-18-30 and LTR-NRC-19-6 report an "Estimated Effect" on the PCT due to the changes and errors noted in years 2017 and 2018 respectively.

- a. Discuss whether the FSLOCA EM code was revised by incorporating the changes or correction of errors reported in LTR-NRC-18-30 and LTR-NRC-19-6, and the SBLOCA and LBLOCA results reported in Table 8 of Attachment 1 to the submittal were quantitatively determined using the revised code instead of a qualitatively estimated effect.
  - b. Discuss whether the error that impacts the gamma energy redistribution reported in an August 31, 2020 Virginia Electric and Power Company letter to NRC (ADAMS Accession No. ML20244A336) occurred during the implementation of the FSLOCA evaluation model for the Turkey Point FSLOCA analysis.
2. In Section 3.0 of Attachment 1 to the submittal, the description of Region II analysis does not provide the LBLOCA break spectrum scenarios that were analyzed. Provide the break spectrum, i.e., the PCTs versus break areas, maximum local oxidation, and core-wide oxidation versus PCT, that were analyzed from which the limiting results reported in Table 8 were obtained.
  3. Define the SBLOCA (Region I) range of breaks that were analyzed. Identify the break size for which the time sequence of events and results given in Tables 9 and 8 respectively of Attachment 1 to the submittal represents.
  4. Considering both the current and the proposed LOCA analyses are best-estimate, differences were noted in some of the input parameters in the current analysis documented in the UFSAR and the proposed analysis as shown in the table below. Address the differences between the submittal and the UFSAR parameter values in the table below and list any other parameters in the proposed analyses which are different from the current analysis. Provide justification for the differences.

Parameter	Attachment 1		UFSAR	
	Value	Table	Value	Table
Accumulator temperature ( $T_{ACC}$ )	$80^{\circ}\text{F} \leq T_{ACC} \leq 130^{\circ}\text{F}$	1	$85^{\circ}\text{F} \leq T_{ACC} \leq 126^{\circ}\text{F}$	14.3.2.1-8
Steam generator tube plugging	$\leq 15\%$	1	$\leq 5\%$	14.3.2.1-1
Initial spray temperature	$34^{\circ}\text{F}$	2	$39^{\circ}\text{F}$	14.3.2.1-2
RWST Temperature	$34^{\circ}\text{F}$	2	$39^{\circ}\text{F}$	14.3.2.1-2
Minimum initial containment pressure at full power operation	14.1 psia	2	13.26 psia	14.3.2.1-2
Minimum initial containment temperature at full power operation	$80^{\circ}\text{F}$	2	$90^{\circ}\text{F}$	14.3.2.1-2

5. Paragraph 50.46(b)(4) to 10 CFR on Coolable Geometry states that:

[c]alculated changes in core geometry shall be such that the core remains amenable to cooling.

Section 4.0 of Attachment 3 of the submittal states:

Inboard grid deformation due to combined LOCA and seismic loads is not calculated to occur for Turkey Point Units 3 and 4.

Discuss why inboard grid deformation due to combined LOCA and seismic loads is not expected.