

## **NRR-DMPSPeM Resource**

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**From:** Klett, Audrey  
**Sent:** Tuesday, February 19, 2019 3:26 PM  
**To:** Zaremba, Arthur H.  
**Cc:** Wasik, Christopher J  
**Subject:** NRC Request for Additional Information for Oconee LAR 2018-05 (L-2018-LLA-0300)  
**Attachments:** RAI for Oconee LAR 2018-05.docx

Hi Art,

Attached is the RAI for Oconee LAR 2018-05. NRC is requesting a due date of 30 days from today. Please call me if you have any questions.

**Hearing Identifier:** NRR\_DMPS  
**Email Number:** 813

**Mail Envelope Properties** (Audrey.Klett@nrc.gov20190219152500)

**Subject:** NRC Request for Additional Information for Oconee LAR 2018-05  
(L-2018-LLA-0300)  
**Sent Date:** 2/19/2019 3:25:32 PM  
**Received Date:** 2/19/2019 3:25:00 PM  
**From:** Klett, Audrey

**Created By:** Audrey.Klett@nrc.gov

**Recipients:**  
"Wasik, Christopher J" <Christopher.Wasik@duke-energy.com>  
Tracking Status: None  
"Zaremba, Arthur H." <Arthur.Zaremba@duke-energy.com>  
Tracking Status: None

**Post Office:**

Files	Size	Date & Time
MESSAGE	151	2/19/2019 3:25:00 PM
RAI for Oconee LAR 2018-05.docx		34356

**Options**  
**Priority:** Standard  
**Return Notification:** No  
**Reply Requested:** No  
**Sensitivity:** Normal  
**Expiration Date:**  
**Recipients Received:**

OFFICE OF NUCLEAR REACTOR REGULATION  
REQUEST FOR ADDITIONAL INFORMATION  
LAR 2018-05  
DUKE ENERGY CAROLINAS, LLC  
OCONEE NUCLEAR STATION, UNITS 1, 2, AND 3  
DOCKET NOS. 50-269, 50-270, AND 50-287  
EPID L-2018-LLA-0300

By application dated November 1, 2018 (Agencywide Documents Access and Management System Accession Numbers ML18318A320), Duke Energy Carolinas, LLC (the licensee) proposed changes to the licensing basis for Oconee Nuclear Station, Units 1, 2, and 3 (Oconee). The licensee proposed to revise the facility as described in the updated final safety analysis report (UFSAR) to provide gap release fractions for high-burnup fuel rods (i.e., greater than 54 gigawatt days per metric ton of uranium (GWD/MTU)) that exceed the 6.3 kilowatt per foot (kW/ft) linear heat generation rate (LHGR) limit detailed in Table 3 of Regulatory Guide (RG) 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," dated July 2000.

During the U.S. Nuclear Regulatory Commission (NRC) staff's review the NRC staff determined that more information was needed to complete the review. The staff emailed a draft request for additional information (RAI) to the licensee on February 11, 2019. Based on an email from Mr. Chris Wasik of the licensee's staff dated February 12, 2019, the staff determined that it needed to clarify the RAI. The email correspondence is in ADAMS at Accession No. ML19050A220. As discussed with Mr. Chris Wasik on February 14, 2019, the staff is requesting the licensee to respond to this request within 30 days of receipt.

Regulatory Analysis Basis

Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Section 50.67, "Accident source term," Paragraph (b)(2) states, in part, that the NRC may issue the amendment only if the applicant's analysis demonstrates with reasonable assurance that:

- (i) An individual located at any point on the boundary of the exclusion area for any 2-hour period following the onset of the postulated fission product release, would not receive a radiation dose in excess of 0.25 Sv (25 rem) total effective dose equivalent (TEDE).
- (ii) An individual located at any point on the outer boundary of the low population zone, who is exposed to the radioactive cloud resulting from the postulated fission product release (during the entire period of its passage), would not receive a radiation dose in excess of 0.25 Sv (25 rem) TEDE.
- (iii) Adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions without personnel receiving radiation exposures in excess of 0.05 Sv (5 rem) TEDE for the duration of the accident.

RG 1.183 provides the methodology for analyzing the radiological consequences of several design basis accidents to show compliance with 10 CFR 50.67.

10 CFR 50.36, "Technical specifications," in part, requires that the technical specifications (TSs) be derived from the analyses and evaluation included in the safety analysis report, and

amendments thereto and includes items in following categories: (1) safety limits, limiting safety systems settings, and limiting control settings; (2) limiting conditions for operation; (3) surveillance requirements; (4) design features; (5) administrative controls; (6) decommissioning; (7) initial notifications; and (8) written reports.

### Technical Basis for RAI-1

In its application, the licensee proposed gap release fractions for high-burnup fuel rods (i.e., greater than 54 GWD/MTU) that exceed the 6.3 kW/ft LHGR limit in Footnote 11 of Table 3, "Non-LOCA [loss of coolant accident] Fraction of Fission Product Inventory in Gap," in RG 1.183. The non-LOCA gap fractions stated in Table 3 of RG 1.183 are applied to the non-LOCA accidents if fuel failure occurs during the accident. The following accidents at Oconee assume fuel failure: fuel handling accident, fuel cask handling accident, locked rotor accident, and control rod ejection accident. In its application, the licensee stated that no non-LOCA accidents that may result in departure from nucleate boiling are considered (e.g., locked rotor accident or rod ejection accident) because the fuel cycles for Oconee are designed so that no fuel rod predicted to enter departure from nucleate boiling will have been operated beyond the current limit in RG 1.183, Footnote 11 for maximum LHGR. Because of this, the NRC would be approving a change to the gap fractions for only the FHA. However, the application does not incorporate this new design requirement into the licensing basis as reflected in the UFSAR, nor does it place a requirement in Oconee's TSs, such as Section 5.0, "Design Features," or any other document controlled under 10 CFR 50.59, such as the Core Operating Limits Report (COLR).

The UFSAR currently states that the fuel cycle design ensure that none of these fuel pins experience DNB following any design basis accident. This sentence refers to the non-DNB fuel pins that exceed the rod power/burnup criteria of Footnote 11 in RG 1.183 and the new proposed gap fractions provided in the application, which apply to FHA only. The application does not explicitly state that the fuel cycle design ensures that no fuel rod predicted to experience DNB in any other non-LOCA accidents will have operated beyond the power/burnup criteria of Footnote 11 in Regulatory Guide 1.183 and that the gap fractions used in these non-LOCA accidents analyses remain those stated in Table 3 of RG 1.183. The current UFSAR only explains that the rods will not experience DNB following any DBA, but it does not clearly state that the gap fractions in the locked rotor and rod ejection accident remain those in Table 3 of RG 1.183 and that the exceeding the power/burnup criteria in Footnote 11 in RG 1.183 does not apply to these accidents.

### RAI-1

The staff requests the licensee to either describe how it will incorporate the new design requirement into the Oconee licensing basis, as reflected in the UFSAR, TSs, or any other document controlled under 10 CFR 50.59 (such as the COLR); or provide the revised radiological consequence analyses for the other design basis accidents that assume fuel failure (such as locked rotor accident, control rod ejection accident, etc.) that demonstrate that the regulatory limits will be met with the new proposed gap fractions for high-burnup fuel rods.