

## **NuScaleDCRaisPEm Resource**

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**From:** Chowdhury, Prosanta  
**Sent:** Saturday, March 10, 2018 10:13 PM  
**To:** Request for Additional Information  
**Cc:** Lee, Samuel; Cranston, Gregory; Murray, Demetrius; Martinez Navedo, Tania; Ray, Sheila; NuScaleDCRaisPEm Resource  
**Subject:** Request for Additional Information No. 383 eRAI No. 9336 (14.2)  
**Attachments:** Request for Additional Information No. 383 (eRAI No. 9336).pdf

Attached please find NRC staff's request for additional information (RAI) concerning review of the NuScale Design Certification Application.

Please submit your technically correct and complete response within 60 days of the date of this RAI to the NRC Document Control Desk.

If you have any questions, please contact me.

Thank you.

Prosanta Chowdhury, Project Manager  
Licensing Branch 1 (NuScale)  
Division of New Reactor Licensing  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
301-415-1647

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## **Request for Additional Information No. 383 (eRAI No. 9336)**

Issue Date: 03/10/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 14.02 - Initial Plant Test Program - Design Certification and New License Applicants

Application Section: 14.2

### QUESTIONS

#### 14.02-7

The regulations in 10 CFR 50.34(b)(6)(iii) and 10 CFR 52.79(a)(28) require, in part, that the OL or COL applicant include "Plans for preoperational testing and initial operations" in the FSAR. For design certification (DC) and Standard design approval (SDA) applicants, 10 CFR 52.47 and 10 CFR 52.137 do not require plans for an initial test program (ITP). However, DC and SDA applicants have previously submitted plans for an ITP in their applications to assist the COL applicant that references those SDAs or DCs to meet the requirement in 10 CFR 52.79(a)(28) to include plans for an ITP in its application.

These requirements are discussed in detail in Regulatory Guide (RG) 1.68, "Initial Test Programs for Water-Cooled Nuclear Power Plants," in Appendix A, "Initial Test Program," Section A-1.g, which discusses pre-operational testing of electrical systems. Specifically, Section A-1.g states, "Tests should demonstrate that the integrated system will perform as designed in response to simulated partial and full losses of offsite power sources. Tests also should demonstrate degraded protection systems designed to transfer from offsite to onsite power sources during degraded voltage conditions." FSAR Tier 2, Section 14.2.7, "Test Programs Conformance with Regulatory Guides," states that the initial test program conforms to RG 1.68, Revision 4 except for aspects that address specific SSC design features not in the design."

FSAR Tier 2, Section 14.2.1.2, "Preoperational Test Phase Objectives," states that objectives of the preoperational test phase are for the COL applicant to 1) demonstrate that SSC will perform their functions in accordance with their design during the preoperational test phase, 2) verify and demonstrate expected operation following a loss of power sources and in degraded modes for which the systems are designed to remain operational, and 3) test the proper functioning of controls, permissives, interlocks, and equipment protective devices for which malfunction or premature actuation may shut down or defeat the operation of systems or equipment. FSAR Tier 2, Table 14.2-54, "13.8kV and Switchyard System Test," FSAR Tier 2, Table 14.2-55, "Medium Voltage AC Electrical Distribution System Test," FSAR Tier 2, Table 14.2-56, "Low Voltage AC Electrical Distribution System Test," provides the preoperational tests for the AC electrical systems.

FSAR Tier 2, Table 14.2-57, "Highly Reliable DC Power System Test," and FSAR Tier 2, Table 14.2-58, "Normal DC Power System Test" provides the preoperational tests for DC systems.

In RAI 8978, Question 14.02-2, the staff requested that the applicant describe how the above-mentioned preoperational tests for the AC and DC systems verify and demonstrate expected operation in degraded modes. In response dated November 2, 2017 (ML17306B390), the

applicant stated that “since the design of the offsite power system, including the degraded voltage setpoint, the switchyard, and the connections are site-specific and are COL items, then the details of testing associated with degraded conditions would be provided by the COL applicant.” FSAR Tier 2, Section 8.2.2, “Switchyard,” includes COL Item 8.2-1, which states that “the design of the switchyard and the connections to an offsite power system are site-specific and are the responsibility of the combined license (COL) applicant. A COL applicant that references the NuScale Power Plant design certification will describe the site-specific switchyard layout and design, including offsite power connections, control and indication, characteristics of circuit breakers and buses, protective relaying, power supplies, lightning and grounding protection equipment, and conformance with GDC 5.”

FSAR Tier 2, Section 8.2.3.2, “Analysis of Offsite Power System Conformance with Regulatory Framework” includes COL Item 8.2-3, which states that “a COL applicant that references the NuScale Power Plant design certification will describe the testing of the switchyard and the connections to an offsite power system, if provided, consistent with Regulatory Guide 1.68, Revision 3.”

Question:

Since the applicant stated in its response that the details of testing associated with degraded conditions would be provided by the COL applicant, please specify where in the FSAR are the details of testing associated with degraded conditions? If not in the FSAR, please provide a COL item or revise COL item 8.2-1 or COL item 8.2-3, as applicable, to indicate that the COL applicant would also provide the details of initial testing associated with degraded conditions