

May 30, 2017

MEMORANDUM TO: Samuel Lee, Chief
Licensing Branch 1
Division of New Reactor Licensing
Office of New Reactors

FROM: Bruce Baval, Project Manager **/RA/**
Licensing Branch 1
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE
POWER, LLC TOPICAL REPORT TR-0116-21012, "NUSCALE
POWER CRITICAL HEAT FLUX CORRELATION NSP2," REVISION 0

NuScale Power, LLC (NuScale) submitted by letter dated October 5, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML16279A363), and as supplemented by letter dated December 29, 2016 (ADAMS Accession No. ML17003A004), Topical Report (TR) TR-0116-21012, Revision 0, "NuScale Power Critical Heat Flux Correlation NSP2." The U.S. Nuclear Regulatory Commission (NRC) staff started its detailed technical review of the NuScale TR on February 2, 2017.

The purpose of this audit is to clarify NRC staff's understanding of the calculations used to develop the NSP2 critical heat flux correlation and its associated correlation limit.

The audit will take place at NuScale's offices in Rockville, Maryland. The audit entrance will be held on June 13, 2017. The contents of the audit plan are provided as an enclosure.

Docket No. 52-048

Enclosure:
Audit Plan

cc w/encl.: DC NuScale Power, LLC Listserv

CONTACT: Bruce Baval, NRO/DNRL
301-415-6715

SUBJECT: AUDIT PLAN FOR THE REGULATORY AUDIT OF NUSCALE TOPICAL REPORT TR-0116-21012, "NUSCALE POWER CRITICAL HEAT FLUX CORRELATION NSP2," REVISION 0

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ADAMS Accession No: ML17138A113

***via email**

NRO-002

OFFICE	NRO/DNRL/LB1: PM	NRO/DNRL/LB1: LA	NRO/DNRL/LB1
NAME	BBavol	MBrown	BBavol (signed)
DATE	5/30/2017	5/25/17	5/30/2017

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**UNITED STATES NUCLEAR REGULATORY COMMISSION
AUDIT PLAN FOR THE REGULATORY AUDIT OF
OF NUSCALE TOPICAL REPORT
TR-0116-21012, “NUSCALE POWER CRITICAL HEAT FLUX CORRELATION NSP2”**

DOCKET NO. 52-048

APPLICANT: NuScale Power, LLC

APPLICANT CONTACT: Darrell Gardner

DATE: June 13, 2017 – June 15, 2017

LOCATION: NuScale Power, LLC
Rockville Office
11333 Woodglen Ave., Suite 205
Rockville, Maryland 20852

REVIEWERS: Timothy Drzewiecki (NRO/DSRA/SRSB)
Joshua Kaizer (NRR/DSS/SNPB)
David Heeszal (NRO/DSEA/RGS)

PROJECT MANAGER: Bruce BavoI (NRO/DNRL/LB1)
Marielz Vera Amadiz (NRO/DNRL/LB1)

I. Background

By letter dated October 5, 2016 (Agencywide Documents Access and Management System (ADAMS) Accession No ML16279A363), as supplemented by letter dated December 29, 2016 (ADAMS Accession No. ML17003A004), NuScale Power, LLC (NuScale), submitted Topical Report (TR) TR-0116-21012, Revision 0, “NuScale Power Critical Heat Flux Correlation NSP2,” to the U.S. Nuclear Regulatory Commission (NRC) staff for review. The purpose of TR-0116-21012 is to provide the bases for NRC approval to use the NSP2 critical heat flux (CHF) correlation in VIPRE-01, within its range of applicability, along with its associated correlation limit, for the NuScale Design Certification Application (DCA) and safety analysis of the NuScale Power Module (NPM) with NuFuel-HTP2™ fuel.

The purpose of this audit is to clarify NRC staff’s understanding of the calculations used to develop the NSP2 CHF correlation and its associated correlation limit.

II. Regulatory Audit Bases

Title 10 of the *Code of Federal Regulations* (10 CFR) Part 52, Section 47 and Section 79 require a final safety analysis report (FSAR) to analyze the design and performance of the structures, systems, and components (SSCs). Safety evaluations, performed to support the FSAR, include accident analyses to (1) demonstrate that specified acceptable fuel design limits (SAFDLs) are not exceeded during normal operation, including the effects of anticipated operational occurrences (AOOs), and (2) determine the number of fuel failures associated with CHF that need to be included in the radiological consequences for postulated accidents. An approved CHF correlation is used in establishing a SAFDL for use in such analyses. Thus, an approved CHF correlation is used to

establish a partial basis for demonstrating compliance with the following applicable regulations from 10 CFR which include the General Design Criteria (GDCs) of Appendix A to 10 CFR Part 50:

- GDC 10, “Reactor design,” which requires that the reactor core and associated coolant, control, and protection systems be designed with appropriate margin to assure that SAFDLs are not exceeded during any condition of normal operation, including the effects of AOOs.
- 10 CFR 52.47(a)(2)(iv)(A), 10 CFR 52.47(a)(2)(iv)(B), and GDC 19 as they relate to the evaluation and analysis of the radiological consequences of postulated accidents.

III. Regulatory Audit Scope or Methodology

The audit team will review supporting calculations and conduct confirmatory analyses. The audit team will also meet with subject matter expert(s) to discuss the data reduction and calculation methodologies.

IV. Information and other Material Necessary for Audit

The NRC staff request that the latest versions of the calculations supporting the development of the NSP2 CHF correlation be made available for audit.

V. Audit Team Assignments

The audit team includes:

- Timothy Drzewiecki, NRC Staff (Reactor Systems, Nuclear Performance, and Code Review)
- David Heeszal, NRC Staff (Geosciences and Geotechnical Engineering Branch)
- Joshua Kaizer, NRC Staff (NRR Nuclear Performance and Code Review)
- Bruce Bovol, NRC Staff (Licensing Branch 1)
- Marielz Vera Amadiz, NRC Staff (Licensing Branch 1)

VI. Logistics

Date: June 13, 2017 – June 15, 2017

Location: NuScale Power Rockville Office
11333 Woodglen Ave., Suite 205
Rockville, Maryland 20852

VII. Special Requests

The NRC staff requests that NuScale provide a subject matter expert be made available to discuss the data reduction and analysis supporting the NSP2 CHF correlation.

VIII. Deliverables

An audit report will be prepared and issued in accordance with NRO-REG-108 within 90 days following the completion of the audit. The audit outcome may be used to identify any additional information to be submitted for making regulatory decisions.