

November 28, 2017

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

FROM: Anthony W. Markley, Senior Project Manager /RA/
Licensing Branch 1
Division of New Reactor Licensing
Office of New Reactors

SUBJECT: SUMMARY OF SEPTEMBER 26, 2017, PUBLIC MEETING WITH
NUSCALE POWER, LLC TO DISCUSS THE NUCLEAR
REGULATORY COMMISSION POSITION REGARDING
NUSCALE'S RESPONSE TO REQUEST FOR ADDITIONAL
INFORMATION 8757, DESIGN BASIS FAILED FUEL FRACTION
(CAC NOS. RA9010 AND RA9011)

On September 26, 2017, representatives of the Nuclear Regulatory Commission (NRC) staff and NuScale Power, LLC held a public meeting at the NRC offices in One White Flint, Rockville, Maryland, 20852 to discuss the NRC position regarding NuScale's response to Request for Additional Information (RAI) 8759, Design Basis Failed Fuel Fraction (DBFFF). The intent of the meeting was to communicate the NRC position on DBFFF and provide an opportunity for discussion and dialogue with NuScale.

The meeting was opened by Anthony Markley and following introductions, the meeting was turned over to Mr. Rob Taylor, Director, Division of Site Safety and Environmental Analysis (DSEA), Office of New Reactors (NRO).

Mr. Taylor provided opening remarks that focused upon:

- The NRC staff's intent to understand NuScale's approach and the long standing concern with the NuScale position on DBFFF,
- Communication that the NuScale response to RAI 8759 was unacceptable and disagreement with NuScale position on Technical Specifications (TSs), and
- Concern for appropriate regulatory controls to preclude operations outside of design basis for shielding and ventilation systems.

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Mr. Taylor turned over the presentation to Mr. Lawrence Burkhart, Chief, Radiation Protection and Accident Consequences Branch, DSEA, NRO. Mr. Burkhart's presentation followed the slides prepared for this meeting and are in Enclosure 1 to this summary. This included a discussion of the NRC staff actions to date, discussion of NuScale's approach to DBFFF, the NRC staff evaluation of NuScale's approach including a comparison graphic of failed fuel percentages, and the NRC staff's conclusion and position. Mr. Burkhart also noted an error in Slide 9 regarding "first of a kind" fuel. It was acknowledged that the proposed fuel for the NuScale design is based upon an AREVA design that is currently used with the operating fleet. The NuScale fuel is half height in comparison to currently used fuel. There is no specific operating experience with half height AREVA fuel although there is considerable operating experience with AREVA fuel.

In summary, NuScale has not provided sufficient information to justify its proposed DBFFF. NuScale's proposal does not provide requisite regulatory controls to ensure that the facility would not be operated in a manner to preclude exceeding the design basis of shielding and ventilation systems. Potential operation of the facility beyond its design basis would place the facility in an unanalyzed condition. Reliance upon operational radiological controls is not a substitute for design and requisite regulatory controls to ensure operational compliance with design and licensing criteria.

Mr. Steve Mirsky, Manager of Regulatory Affairs, and Mr. Tom Bergman, Vice President of Regulatory Affairs of NuScale provided NuScale's presentation and responded to the NRC staff presentation and concerns.

Representatives from NuScale voiced objection to the staff's characterization of the fuel design as "unproven and untested." They noted that this statement appeared to conflict with statements made by the NRO fuels branch during a recent Advisory Committee on Reactor Safeguards hearing regarding the acceptability of existing AREVA fuel design and analysis computer codes to the NuScale fuel design. The staff noted that they had been in contact with the NRC fuels branch, and acknowledged that the NuScale design could better be characterized as novel, rather than "unproven and untested." The staff noted that the statements in this presentation were not made in the context of some fuel design characteristics, such as critical heat flux, peak centerline temperature, etc., but rather in the context of use within the novel NuScale plant design, and how aspects of the design and operation of the novel plant could potentially impact the number of fuel pin failures during normal operation.

NuScale stated that they were trying to understand the NRC concerns. NuScale believed that the data related to operating plant fuel reliability provided to the staff as part of their justification of the assumed proposed realistic failed fuel fraction, in conjunction with aspects of their plant design, such as low reactor coolant system flow rate provided sufficient justification.

NuScale noted that in the late 1970s and early 1980s, some plants had operated with fuel failures beyond the 0.25 percent design basis failed fuel. NuScale disagreed that their approach would permit operation outside of their design basis as operating plants are required to conform to their design basis. The staff noted that according to TS, operation was permitted up to the limits specified in TS.

The NRC recognized that cost and flexibility are considerations in the design that, in addition to meeting safety requirements, are a focus of NuScale. The staff noted that the use of 0.25 percent design basis failed fuel was only one acceptable method for establishing the design basis. NuScale could also either use a lower value with regulatory controls, or provide

sufficient justification for the use of a lower value without additional regulatory controls. But at this point, NuScale had not provided sufficient justification for the use of a lower value without regulatory controls. The staff needs to reach a finding of reasonable assurance during the design review.

If at some point in the future when sufficient NuScale specific operating experience is available, the staff would entertain a request to remove those regulatory constraints.

NuScale provided a brief history related to the current status of TSs, and stated their belief that the staff's position was not supported by the criteria specified in Title 10 of the *Code of Federal Regulations* (10 CFR) 50.36, "Technical specifications". They noted that Criterion 4 did not mention protection of the workers. The staff recognized NuScale's points, but disagreed with their position that 10 CFR 50.36 precluded this type of TS. The staff also noted that the NuScale Design Specific Review Standards, which contains the TS requirement for use of a lower DBFFF, had been submitted for public comment prior to issuance. The staff noted that they would consider other proposals on how to address this issue.

NuScale stated that, because of the requirements of 10 CFR Part 20, "Standards for Protection Against Radiation," if the plant was operated above the DBFFF, the radiation protection program would limit doses to workers and members of the public, the amount of radioactive effluents and dose to plant workers, so no other regulatory controls were required. NuScale also stated that the ALARA and radiation control programs are the appropriate regulatory controls for the DBFFF. The staff noted that the ability to be able to operate the plant within the dose limits and as low as reasonably achievable of 10 CFR Part 20 were part of the design review. Much more data from NuScale and more analysis by the staff would be required to demonstrate that the plant could be operated within the limits of 10 CFR Part 20 while the plant operated at the current TS Design Basis Accident (DBA) limit. Currently, the staff does not have sufficient information to reach a finding of reasonable assurance.

NuScale and two members of the public (a representative from the Nuclear Energy Institute and a representative from Tennessee Valley Authority (TVA)), expressed concerns about the possibility of allowing this addition to the TS being interpreted by the staff as precedence for considering the addition of other TS related to design basis numerical values, as there are likely thousands of such values without an associated TS. They stated that this would impact perceived regulatory stability and thus undermine the ability to market the plants. The staff noted that NuScale had the option of just lowering the existing TS DBA value to a value corresponding to the DBFFF. Since NuScale did not expect any plants to operate outside of their design basis, there should be no effect on plant operation. The staff asked NuScale to identify any operational implications that may have been overlooked by the staff. NuScale did not provide a response to this question.

The representative from TVA indicated that he was confused by the staff presentation. He was not sure if the staff objected to the specific DBFFF assumed by NuScale, or that the value selected by NuScale was not the same as the DBA value, or that the DBFFF was not stated in TS.

With no further discussion, the meeting was adjourned.

The list of meeting attendees is included in the Enclosure 2. The meeting notice and agenda are available in Agencywide Documents Access and Management System (ADAMS) under Accession No. ML17263A583. ADAMS is the system that provides text and image files of

NRC's public documents and can be accessed at the NRC's Electronic Reading Room at <http://www.nrc.gov/reading-rm/adams.html>. If you do not have access to ADAMS or have problems accessing the documents located in ADAMS, contact the NRC Public Document Room staff at (800) 397-4209, (301) 415-4737, or pdr@nrc.gov.

Enclosures:

1. NuScale DC Application Design
Basis Failed Fuel Fraction Issue
2. Meeting Attendees

cc: NuScale ListServ

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|--------|------------------|------------------|------------------|
| OFFICE | NRO/DNRL/LB1: PM | NRO/DNRL/LB1: LA | NRO/DNRL/LB1: PM |
| NAME | AMarkley | SGreen | GCranston |
| DATE | 10/26/2017 | 10/27/2017 | 11/7/2017 |

| | | | |
|--------|-------------------|------------------|------------------|
| OFFICE | NRO/DSEA/RPAC: BC | NRO/DNRL/LB1: BC | NRO/DNRL/LB1: PM |
| NAME | LBurkhart | SLee | AMarkley |
| DATE | 11/7/2017 | 11/28/2017 | 10/26/2017 |

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**LIST OF MEETING ATTENDEES
SEPTEMBER 26, 2017**

**U.S. NUCLEAR REGULATORY COMMISSION
MEETING ATTENDANCE**

| | |
|-----------------------------------|--|
| APPLICANT | NuScale Power, LLC |
| DATE/TIME | September 26, 2017 |
| LOCATION | Conference Room O-3B4 One White Flint Rockville, MD |
| <u>NAME (PLEASE PRINT)</u> | <u>ORGANIZATION</u> |
| Zachary Gran | NRC |
| Ron LaVera | NRC |
| Rich Clement | NRC |
| Steve Williams | NRC |
| Bruce Bavol | NRC |
| Larry Burkhart | NRC |
| Ed Stutzcage | NRC |
| Ryan Nolan | NRC |
| Robert Taylor | NRC |
| Samuel Lee | NRC |
| Andy Campbell | NRC |
| Frank Akstulewicz | NRC |
| Shana Helton | NRC |
| Jennifer Whitman | NRC |
| Chang Li | NRC |
| Clint Ashley | NRC |
| Antonio Dias | NRC |
| Hien Le | NRC |
| Anthony Markley | NRC |
| Steven Mirsky | NuScale |
| Steven Pope | NuScale |
| Larry Losh | NuScale |
| Larry Linik | NuScale |
| Mark Shaver | NuScale |
| John Bristol | NuScale |
| Tom Bergman | NuScale |

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|------------------|----------------------------|
| Jennie Wike | NuScale |
| Ross Snuggerud | NuScale |
| Dustin Greenwood | NuScale |
| Gary Becker | NuScale |
| Karl Gross | NuScale |
| Jim Osborne | NuScale |
| Peter Hastings | Tennessee Valley Authority |
| Thomas Zachariah | Nuclear Energy Institute |