

September 15, 2015

Dale Atkinson, Chief Operating Officer/  
Chief Nuclear Officer  
NuScale Power, LLC  
1100 NE Circle Blvd., Suite 200  
Corvallis, Oregon 97330

SUBJECT: RESPONSE TO GAP ANALYSIS SUMMARY REPORT AND ELECTRICAL  
REGULATORY ISSUES

Dear Mr. Atkinson:

By letter dated July 31, 2014, NuScale Power, LLC (NuScale) submitted to the U.S. Nuclear Regulatory Commission (NRC) the "Gap Analysis Summary Report," Revision 1 (hereafter referred to as Report). The stated purpose of the Report was to facilitate discussion on specific regulations listed in Table 3-1 of the Report that warrant further consideration with regard to the NuScale power plant design and to solicit feedback on the utility of the document. The Report provided the results of a regulatory gap analysis performed by NuScale as part of pre-application activities. This analysis documented NuScale's examination of existing light-water reactor regulatory requirements in Title 10 of the *Code of Federal Regulations*, Parts 1 through 199, the guidance stipulated in the "Standard Review Plan (SRP), for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," NUREG-0800, and documents referenced within the SRP guidance in light of the characteristics of the NuScale power plant design. The Report highlights the unique features of the NuScale reactor design that may present novel applications of existing NRC requirements and guidance. NuScale stated in the Report that the intent of highlighting the deviations was to reach consensus with the NRC on the appropriate regulatory process to be used to address the "regulatory gaps" identified in the Report.

As you are aware, the NRC and NuScale staffs have had a number of engagements in the past months that have focused on specific areas identified in the Report to further the NRC staff's understanding of the NuScale design. We acknowledge that it is important that the key regulatory process issues be addressed before NuScale submits a design certification application to facilitate the development of a complete application.

There are two Enclosures to this letter. Enclosure 1 responds to the Report's Table 3-1, Gap 10, "Electric Power Systems," specifically, NuScale's stated intent to depart from the requirements of General Design Criteria (GDC) 17, and Enclosure 2 responds to the regulatory issue regarding NuScale's proposal for non-Class 1E onsite power. These responses are based on information in the Report and from various NuScale meetings, presentations and submitted information. However, as you are aware, there is no licensing action before the NRC staff in these areas, therefore, the NRC cannot perform its detailed technical review to determine if the design will be acceptable in its present form.

D. Atkinson

While the NRC staff looks forward to additional discussion on the design issues, we discuss in the enclosures the appropriate regulatory process that will be used to document the final agency action. Future letters will address other regulatory topics in the Report.

Should you have any questions, please contact Mr. Greg Cranston, Senior Project Manager for the NuScale design certification at (301) 415-0546 or via email at [gregory.cranston@nrc.gov](mailto:gregory.cranston@nrc.gov).

Sincerely,

*/RA/*

Frank Akstulewicz, Director  
Division of New Reactor Licensing  
Office of New Reactors

Project No.: PROJ0769

Enclosures:

1. NRC Response to NuScale's Intent to Depart from Requirements of GDC 17
2. NRC Response to Regulatory Issue Regarding NuScale's non-Class 1E Onsite Power

cc: DC NuScale Power LLC Listserv

D. Atkinson

While the NRC staff looks forward to additional discussion on the design issues, we discuss in the enclosures the appropriate regulatory process that will be used to document the final agency action. Future letters will address other regulatory topics in the Report.

Should you have any questions, please contact Mr. Greg Cranston, Senior Project Manager for the NuScale design certification at (301) 415-0546 or via email at [gregory.cranston@nrc.gov](mailto:gregory.cranston@nrc.gov).

Sincerely,

*/RA/*

Frank Akstulewicz, Director  
Division of New Reactor Licensing  
Office of New Reactors

Project No.: PROJ0769

Enclosures:

1. NRC Response to NuScale's Intent to Depart from Requirements of GDC 17
2. NRC Response to Regulatory Issue Regarding NuScale's non-Class 1E Onsite Power

cc: DC NuScale Power LLC Listserv

**DISTRIBUTION:**

PUBLIC	FAkstulewicz, NRO
LB1 R/F	RidsNroDnrlb1
SBurnell, OPA	RidsNroDnrl
MTonacci, NRO	RidOgcMailCenter
OTabatabai, NRO	GCranston, NRO
JMcLellan, NRO	

**ADAMS ACCESSION No.: ML15222A323      \*via email      NRO-002**

<b>OFFICE</b>	NRO/DNRL/LB1:PM	NRO/DNRL/LB1:LA	OGC (NLO)
<b>NAME</b>	OTabatabai	JMcLellan*	Ann Hove*
<b>DATE</b>	08/14/2015	08/10/2015	09/2/2015
<b>OFFICE</b>	NRO/DNRL/LB1:PM	NRO/DNRL/LB1:BC	NRO/DNRL:D
<b>NAME</b>	GCranston	MTonacci*	FAkstulewicz
<b>DATE</b>	08/25/2015	09/2/2015	09/15/2015

**OFFICIAL RECORD COPY**

## **NRC Response to NuScale's Intent to Depart from Requirements of GDC 17**

Summary of NuScale Position: In its "Gap Analysis Summary Report," Revision 1, Table 3-1, Gap 10, NuScale indicated that it intends to pursue a "departure" from the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, Appendix A, "General Design Criteria," (GDC) 17, "Electric Power System." The specific requirement at issue is the specific requirement in GDC 17 for two physically independent offsite power supply circuits. To support its position, NuScale stated that there are precedents where the U.S. Nuclear Regulatory Commission (NRC) staff has granted exemptions to previous design certification applicants with substantively similar justifications to those described in Section A.3 of the NuScale Gap Analysis Report. Additionally, NuScale cited several unique features of its passive safety system design to further support its position and justification for why offsite power, as required by GDC 17, is not needed.

NRC Staff Response: The NRC does not have before it a formal application or submission that describes in detail the current NuScale design. Therefore, the staff is not able to engage with NuScale in a manner that would permit the detailed review necessary to reach resolution on all technical and regulatory issues at this time. The NRC staff held several internal discussions related to this issue and considered the current information obtained from NuScale through meetings, presentations, and submitted information. The NRC staff has concluded that the information now available is not sufficient to support a full exemption to allow no offsite power circuits. Furthermore, the NRC staff believes that given considerations for defense-in-depth, one offsite power circuit meeting the requirements of GDC 17 should be available.

The NRC staff will remain receptive to additional information provided by NuScale. The NRC staff has determined that the exemption process is the necessary licensing process to be used during the design certification review. In addition, the NRC staff is willing to consider the technical merits of the NuScale proposed approach in a separate submission to be referenced by the certification application. We have also concluded that this regulatory question is within the purview of the staff to determine and, therefore, does not rise to the level of a policy issue that warrants Commission involvement.

## **NRC Response to Regulatory Issue Regarding NuScale's non-Class 1E Onsite Power**

Summary of NuScale Position: In its "Gap Analysis Summary Report," Revision 1, Appendix A, and in a meeting held on July 8, 2015 regarding the NuScale electric system design, NuScale has stated that its design does not require onsite Class 1E alternating current (ac) or direct current (dc) power sources to achieve safe shutdown of the reactor in an anticipated operational occurrence or a design basis accident. The NuScale design also does not credit safety-related emergency diesel generators. NuScale stated that the highly reliable dc power system (EDSS) conforms to many of the applicable NRC regulations, guidance documents, and the Institute of Electrical and Electronics Engineers (IEEE) standards. NuScale also stated that, given the augmented design, qualification, and quality assurance provisions applied to the EDSS, the reliability of EDSS is substantively similar to that of a Class 1E dc electrical power system.

Finally, NuScale asserts that to require a Class 1E designation would represent a significant cost impact on NuScale with no significant benefit to public health and safety, and acknowledges the importance of having highly reliable instrumentation following an accident or transient, which would include instrumentation power supplies.

NRC Response: The NRC staff held several internal discussions regarding the NuScale design. The NRC does not have before it a formal application or submission that describes in detail the current NuScale design. Therefore, the NRC staff is not able to engage with NuScale in a manner that would permit the detailed review necessary to reach resolution on all technical and regulatory issues at the time. However, the Office of New Reactors has determined that it is necessary to have sufficient and appropriately qualified electrical power supplies to assure that control room instrumentation and displays will be available to the operators following all accidents or transients until those accidents have been mitigated. As stated in GDC 17, an onsite electric power system shall be provided to permit functioning of structures, systems, and components important to safety. The safety function for each system (assuming the other system is not functioning) shall be to provide sufficient capacity and capability to assure that (1) specified acceptable fuel design limits and design conditions of the reactor coolant pressure boundary are not exceeded as a result of anticipated operational occurrences, and (2) the core is cooled and containment integrity and other vital functions are maintained in the event of postulated accidents.

The NRC staff will remain receptive to additional information provided by NuScale. Additionally, the NRC staff understands that NuScale will be submitting a Topical Report, "Onsite DC Electrical System – Safety Classification, Design, and Licensing Basis," to better describe the NuScale's design and to provide detailed technical information. We have also concluded that this regulatory question is within the purview of the staff to determine and therefore does not rise to the level of a policy issue that warrants Commission involvement.