

July 11, 2016

Dr. Dennis C. Bley, Chairman  
Advisory Committee on Reactor Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555-0001

SUBJECT: NUSCALE POWER, LLC LICENSING TOPICAL REPORT, "RISK SIGNIFICANCE DETERMINATION"

Dear Dr. Bley:

I am responding to the four recommendations noted in the Advisory Committee on Reactor Safeguards (ACRS or Committee) letter dated May 18, 2016 (Agencywide Document Access and Management System (ADAMS) Accession No. ML16130A373), regarding the ACRS review of NuScale Power, LLC (NuScale) licensing topical report (TR), "Risk Significance Determination." We appreciate the time and effort that the ACRS has devoted to this important subject, as reflected in meetings held with the ACRS Subcommittee for Future Plant Designs on March 1, 2016, and the ACRS Full Committee on May 5, 2016.

#### **ACRS RECOMMENDATIONS AND THE U.S. NUCLEAR REGULATORY COMMISSION STAFF RESPONSES**

**Recommendation 1:** The staff continues to deal with criteria for determining risk significance in a case-by-case manner and this can lead to inconsistencies in regulatory positions.

**Staff Response:** The staff agrees that it would be advantageous to have a set of numerical criteria for determining risk significance that can apply generically rather than to develop and apply criteria on a case-by-case basis (see response to Recommendation 2). In the absence of generic criteria, the applicants for certification of the Economic Simplified Boiling Water Reactor (ESBWR) design and NuScale submitted design specific risk significance criteria for review and approval because the risk profiles for these designs are substantially different from those of operating reactors on which established criteria given in Regulatory Guide (RG) 1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," Rev. 2 (Mar. 2009), are based. Although there are differences in the numerical values of the risk significance criteria used for the ESBWR and NuScale, the staff found the criteria in each case to be acceptable on a design-specific basis because the criteria were capable of and appropriate for performing the intended function of identifying the candidate risk significant structures, systems, and components.

**Recommendation 2:** The staff should develop a consistent approach by adopting a continuous scale to determine quantitative risk significance criteria, with more margin allowed for plants with lower risk.

**Staff Response:** The staff agrees with the ACRS recommendation. As stated in the staff's letter to the ACRS dated August 28, 2014, titled, "Standard Review Plan Chapter 19 and Section 17.4" (ADAMS Accession No. ML14220A470), the staff intends to pursue a revision of the quantitative risk significance criteria to make them consistent with a broad spectrum of designs and absolute levels of overall plant risk as it reviews applicable industry and regulatory guidance. The numerical criteria will be scalable based on applicable base risk metrics (i.e., core damage frequency (CDF), large release frequency (LRF), and large early release frequency) and anchored to thresholds for risk significance that conform with guidelines for determining acceptable and unacceptable increases in risk established in RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis." Accordingly, the criteria would complement existing criteria referenced in RG 1.200 being used by current operating plants that have risk profiles higher than those of new reactor designs. The criteria would be presented to users in graphical form. In developing the criteria, the staff will consider the approach outlined by the ACRS in letters dated April 26, 2012, and July 16, 2014.

Categorizing structures, systems, and components (SSC) according to risk using probabilistic risk assessment (PRA) is a key part of several risk-informed regulatory applications. These applications also apply deterministic considerations in reaching a final categorization of SSCs. Due to the wide use of SSC categorization in risk informed applications, guidance for implementing categorization, including the quantitative aspects, is contained in several different documents which vary in level of detail. The staff believes that it would be advantageous to have a single document contain the technical guidance for using PRA to rank SSCs according to risk (i.e., the quantitative ranking step), including the scalable criteria and guidance for applying those criteria. Application-specific guidance documents could then simply reference this technical guidance. However, this approach of revising multiple guidance documents is not currently practical because of resource limitations. Therefore, the staff has initiated an effort to draft a single guidance document for using PRA to rank SSCs according to risk. This guidance would include the following:

1. the scalable criteria that are consistent with a broad spectrum of designs and absolute levels of overall plant risk, as discussed above;
2. a reference to applicable Sections of NEI 00-04, "10 CFR 50.69 SSC Categorization Guideline, Revision 0," which contains additional complementary technical guidance that is currently endorsed by the U.S. Nuclear Regulatory Commission<sup>1</sup> for using the PRA to rank SSCs according to risk; and

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<sup>1</sup> The guidance in NEI 00-04 (Revision 0) has been endorsed in Regulatory Guide 1.201, "Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to their Safety Significance," for implementing Title 10 of the *Code of Federal Regulations*, Section 50.69,

3. a list of risk-informed applications for which the guidance applies.

Once this guidance is finalized, the staff will consider revising the existing guidance documents discussed above as resources permit.

**Recommendation 3:** The approach proposed by NuScale is reasonable provided that the CDF or large release frequency LRF remains consistent with their current estimates in the licensing topical report.

**Staff Response:** The staff agrees with the ACRS recommendation. The staff appreciates having the benefit of the Future Plant Design Subcommittee and full Committee's review of the NuScale licensing TR.

**Recommendation 4:** The staff will need to address the multi-module aspects of the NuScale design that could alter the CDF and LRF risk estimates and associated SSCs classification.

**Staff Response:** The staff agrees with the ACRS recommendation. The extent to which multi-module aspects of the NuScale design alter the CDF and LRF risk estimates and associated categorization of SSCs and the impact of any such changes will be considered by the staff as part of its review of Section 17.4 of the NuScale design certification application, "Reliability Assurance Program."

Recommendations 2 and 4 involve issues that extend beyond the specific issues presented in the NuScale licensing TR. We look forward to future interactions with the Committee to discuss specific issues associated with these recommendations.

Sincerely,

*/RA Michele Evans for/*

Victor M. McCree  
Executive Director  
for Operations

Project No.: PROJ0769

cc: Chairman Burns  
Commissioner Svinicki  
Commissioner Baran  
SECY

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Recommendations 2 and 4 involve issues that extend beyond the specific issues presented in the NuScale licensing TR. We look forward to future interactions with the Committee to discuss specific issues associated with these recommendations.

Sincerely,  
**/RA Michele Evans for/**  
 Victor M. McCree  
 Executive Director  
 for Operations

Project No.: PROJ0769

cc: Chairman Burns  
 Commissioner Svinicki  
 Commissioner Baran

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