



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
ADVISORY COMMITTEE ON REACTOR SAFEGUARDS
WASHINGTON, DC 20555 - 0001**

December 19, 2019

MEMORANDUM TO: Peter Riccardella, Chairman
Advisory Committee on Reactor Safeguards

FROM: Peter Riccardella **/RA/**
Lead Reviewer, NuScale DCA Chapter 2
Advisory Committee on Reactor Safeguards

SUBJECT: PROPOSED RECOMMENDATION FOR ACRS REVIEW
OF NUSCALE POWER, LLC, DESIGN CERTIFICATION
APPLICATION – SAFETY EVALUATION WITH NO OPEN
ITEMS FOR CHAPTER 2, “SITE CHARACTERISTICS
AND SITE PARAMETERS”

In response to the Committee’s request, I have reviewed the NRC staff’s safety evaluation report (SER) with no open items for Chapter 2, “Site Characteristics and Site Parameters”, dated November 18, 2019 (ML19284A372). The following is my recommended course of action concerning further review of this chapter of the design certification application and the staff’s associated safety evaluation.

SER Phase 4 Summary

Chapter 2 of the SER documents the staff’s review of Chapter 2, “Site Characteristics and Site Parameters,” of the NuScale Design Certification Application, Part 2, “Final Safety Analysis Report.” The Phase 2 SER for this chapter (ML18214A195) identified one open item which the applicant addressed through information submitted on the docket. The open item has been satisfactorily closed.

The staff’s regulatory findings documented in this SER are based on Revision 3 of the design certification application. Chapter 2 discusses the assumed site envelope for the NuScale small modular reactor design and focuses on the geography and demography, nearby facilities, and postulated site parameters for the design, including meteorology, hydrology, geology, seismology, and geotechnical parameters. A combined license applicant would have to demonstrate that their site falls within this assumed site envelope or demonstrate by other means that the proposed facility is acceptable at the proposed site.

Applicable Concerns from ACRS Phase 3 Letter Report

NuScale has revised its source term methodology documented in TR-0915-17565, "Accident Source Term Methodology." At the time of our Phase 3 review, the staff was evaluating these revisions to the accident source term and the methodology for calculating the offsite χ/Q values used in determining the exclusion area boundary and the low population zone in relation to the NuScale design or in a combined license application referencing the design. This was the substance of the above open item, and our letter concluded that the accident source term methodology for the NuScale design needed to be completed and reviewed by the staff.

We recently met with the applicant and staff to review the revised accident source term methodology, documented in Revision 3 to TR-0915-17565. In the topical report, NuScale defines two different source terms: a design basis source term that includes conservative estimates of radionuclides that could be present in the reactor coolant system under design basis events, and a second core damage source term (CDST) that includes fission products from a postulated core damage event. NuScale proposes to apply these two source terms to meet different sets of regulatory requirements.

We learned during the meeting that NuScale will consider the CDST in offsite dose consequence evaluations related to siting. The staff interprets the use of a source term that considers core melt as part of NuScale's demonstration that the offsite dose consequence requirements of 10 CFR 52.47(a)(2)(iv) are met. The staff found that the methodology to develop the CDST and its use in offsite dose consequence analyses is acceptable within the design and licensing bases for the NuScale design certification.

Staff Response to ACRS Letter Report

In response to our above conclusion regarding our Chapter 2 Phase 3 review, the staff agreed and stated that they plan to complete their review of NuScale's methodologies by the end of the Phase 4 review.

Open Items from Phase 3 Requiring Further ACRS Review

There are no remaining open items requiring ACRS review.

Recommendation

As lead reviewer for NuScale Chapter 2, I recommend that the Committee not perform any additional Phase 5 review of this chapter.

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