RAIO-107253

September 27, 2021

Docket: 99902078

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
One White Flint North
11555 Rockville Pike
Rockville, MD 20852-2738

SUBJECT: NuScale Power, LLC Response to NRC Request for Additional Information No. 0003 (eRAI No. 9860) on the NuScale Topical Report, "Building Design and Analysis Methodology for Safety-Related Structures," TR-0920-71621, Revision 0

REFERENCES:
1. NRC Letter Final Request for Additional Information No. 0003 (eRAI No. 9860), dated August 6, 2021
2. NuScale Topical Report "Building Design and Analysis Methodology for Safety-Related Structures," TR-0920-71621, Revision 0, dated December 2020 (ML20353A406)

The purpose of this letter is to provide NuScale's response to NRC Request for Additional Information (RAI) No. 0003, eRAI No. 9860, noted in the References above. Responses to individual RAI questions are provided in the attached Enclosures.

This letter contains NuScale's responses to the following RAI Questions from NRC RAI# 9860:

- NTR-25
- NTR-26
- NTR-27
- NTR-28
- NTR-29

Enclosures are grouped with propietary version responses first, followed by nonproprietary version responses. NuScale requests that the proprietary versions be withheld from public disclosure in accordance with the requirements of 10 CFR § 2.390. The enclosed affidavit supports this request.

This letter makes no new regulatory commitments and no revisions to existing regulatory commitments.

Please contact Liz English at 541-452-7333 or at eenglish@nuscalepower.com if you have questions.

Sincerely,

Mark W. Shaver
Manager, Licensing
NuScale Power, LLC

Distribution: Bruce Bavol, NRC
Getachew Tesfaye, NRC
Michael Dudek, NRC
Demetrius Murray, NRC

Enclosure 1: NuScale Response to NRC Request for Additional Information eRAI No. 9860, proprietary

Enclosure 2: NuScale Response to NRC Request for Additional Information eRAI No. 9860, nonproprietary

Enclosure 3: Affidavit of Mark W. Shaver, AF-107254

Enclosure 1:

NuScale Response to NRC Request for Additional Information eRAI No. 9860, proprietary

Enclosure 2:

NuScale Response to NRC Request for Additional Information eRAI No. 9860, nonproprietary

Response to Request for Additional Information
Docket: 99902078

RAI No.: 9860
Date of RAI Issue: 08/06/2021

NRC Question No.: NTR-25

Requirement

10 CFR Part 50, Appendix A, General Design Criteria (GDC) 1, 2 and 4 as it relates to the design of seismic Category I structures, systems, and components.

DSRS 3.8.4, "Other Seismic Category I Structures," (Agencywide Documents Access and Management System (ADAMS) Accession No ML15355A444) states the structural acceptance criteria for seismic Category I structures appear in ACI 349, with additional guidance provided by NRC Regulatory Guide (RG) 1.142 for concrete structures, AISC N690-1994 for steel structures, and DSRS 3.8.4, Subsection II.4.J, for structures that use modular construction methods evaluated on a case-by-case basis.

Issue

In Section 6.7.1.3, "Ductility Ratios," of the TR, the applicant provided a ductility ratio demand limit of 10 for "Flexure-controlled SC walls" in Table 6-4, "Ductility ratio demand." In Item 2 of Section 6.7.1.4, "Response Determination," the applicant stated the plate principal strain can be limited to 0.05 for SC walls subjected to impulsive loads. However, the applicant did not provide the rotational limitation of yield hinge less than or equal to 0.07 radians (4 degrees) as required in provision F.3.4 of ACI 349-13, and as stated in NRC Draft Guide (DG- 1304), proposed new Regulatory Guide 1.243, "Safety-Related Steel Structures and Steel-Plate Composite Walls for Other Than Reactor Vessels and Containments."

NRC DG-1304 states in Section 11.1.4 that "*For flexure-controlled SC walls as defined in Section N9.6b of ANSI/AISC N690 18, the permissible displacement ductility ratio demand should satisfy all of the following:*

- *ductility ratio less than or equal to 10,*
- *principal strain of the faceplates less than or equal to 0.05 and*

- *rotational capacity of any yield hinge less than or equal to 0.07 radians (4 degrees)."*

Rotational capacities of SC wall sections can be estimated using the experimental investigations of one-way SC wall section test data presented in the Journal of Structural Engineering article by Bruhl, J. C., and Varma, A. H. (2017), titled: "Experimental Resistance and Available Ductility of Steel-Plate Composite Walls in One-Way Bending." The paper provides moment-curvature results from bending experiments where the SC wall section's rotational capacity can also be estimated. Further, provision F.3.4 of ACI 349-13 states "*When flexure controls design, the rotational capacity rθ in radians of any yield hinge shall be limited to 0.0065(d/c) but shall not exceed 0.07 radians.*"

Request

The staff requests the applicant to describe, when flexure controls the design, why the rotational limitation of yield hinge less than or equal to 0.07 radians (4 degrees), as required in provision F.3.4 of ACI-349-13, and stated in DG-1304, was not considered in the TR. Revise the TR as necessary.

NuScale Response:

Section N9.1.6b of ANSI/AISC N690-18 is based on ACI 349-13, Appendix F, Special Provisions for Impulsive and Impactive Effects. When adopting the ACI 349-13, Appendix F requirements into Section N9.1.6b of ANSI/AISC N690-18 provisions, the code committee implemented revisions to the ACI 349-13 requirements based on test data and analytical research on steel-plate composite (SC) walls to account for the differences in the structural response characteristics of SC and reinforced concrete (RC) members. One of the revisions includes definition of the deformation limit only in terms of displacement ductility for design against impactive and impulsive loads, as opposed to deformation limit based on both displacement ductility and rotational capacity in ACI 349-13. In regards to Reference [1], the commentary Section N9.1.6b of ANSI/AISC N690-18 states: "Plastic hinge rotation capacity need not be checked if the deformation limit is kept to under 10 for flexure-controlled sections."

In flexure-controlled SC walls, the wall section with steel faceplates acts like a doubly-reinforced concrete section with equal reinforcement on either side. This equal reinforcement in SC walls provides significant curvature and rotational ductility capacity as the concrete on the compression side does not reach its crushing strength, which is usually the limiting failure mode for RC members. The test data in References [1] and [2] show that the flexure-controlled SC

walls typically fail with the formation of flexural and shear cracks distributed along the span length and the rupture of the steel faceplate on the tension side after development of large rotation. In general, it can be stated that the displacement ductility ratio as defined in Section N9.1.6b of ANSI/AISC N690-18 controls the failure limit state due to formation of flexural and shear cracks. Similarly, the 0.05 strain limit on the faceplates controls the failure limit state due to rupture of the faceplate on the tension side. The limits on displacement ductility ratio and the strain on faceplates preclude the possibility of reaching the curvature and rotational ductility capacities of SC wall components and, hence, a limit on curvature and rotation is not included in the Topical Report.

1.Varma, A.H., Sener, K.C., Zhang, K., Coogler, K. and Malushte, S.R., “Out-of-Plane Shear Behavior of SC Composite Structures,” SMiRT 21, 2011.

2. Bruhl, J. C., and Varma, A. H., "Experimental Resistance and Available Ductility of Steel-Plate Composite Walls in One-Way Bending," Journal of Structural Engineering, 2017.

Impact on Topical Report:

There are no impacts to Topical Report TR-0920-71621, Building Design and Analysis Methodology for Safety-Related Structures, as a result of this response.

Response to Request for Additional Information
Docket: 99902078

RAI No.: 9860
Date of RAI Issue: 08/06/2021

NRC Question No.: NTR-26

Requirement

10 CFR Part 50, Appendix A, GDC 1, 2 and 4 as it relates to the design of seismic Category I structures, systems and components.

DSRS 3.8.4, "Other Seismic Category I Structures," (ADAMS Accession No ML15355A444) states the structural acceptance criteria for seismic Category I structures appear in ACI 349, with additional guidance provided by RG 1.142 for concrete structures, AISC N690-1994 for steel structures, and DSRS 3.8.4, Subsection II.4.J, for structures that use modular construction methods evaluated on a case-by-case basis.

Issue

NRC DG-1304, Section 11.1.3, states "*In addition to the deformation limits under 11.1.4 to 11.1.7 below, the maximum deformation should not result in the loss of intended function of the structural wall nor impair the safety- related function of other systems and components.*"

In Section 6.7.1.3, "Ductility Ratios," of the TR, the applicant stated that the effects of impactive and impulsive loads are permitted to be determined using inelastic analysis with limits provided in Table 6-4, "Ductility ratio demand." However, it is not clear to the staff whether the maximum deformations will not result in the loss of intended function of the structural wall as well as not impair the safety-related function of other systems and components as required in provision F.3, "Deformation," of ACI 349-13.

Request

The staff requests the applicant to describe how the maximum deformations will not result in the loss of intended function of the structural wall as well as not impair the safety-related function of other systems and components. Revise the TR as necessary.

NuScale Response:

In addition to the deformation limits shown in Topical Report TR-0920-71621-P Table 6-4, the following analysis is performed for the critical impulsive/impactive load-wall combination, to check that the wall's intended function is not impaired:

- A mathematical model of the structural wall subjected to the impactive or impulsive loads is built. The model includes nearby structural members such as perpendicular walls and floor slabs.
- A time-history dynamic analysis is performed considering constitutive material models so that the nonlinear response of the structural members is obtained.
- Based on the internal forces and maximum displacements due to the computed response, the wall's intended function is then evaluated.
- The time history analysis also yield displacement/acceleration time histories throughout the structural model that are used to assess the safety-related function of nearby systems and components.

Impact on Topical Report:

Topical Report TR-0920-71621, Building Design and Analysis Methodology for Safety-Related Structures, has been revised as described in the response above and as shown in the markup provided in this response.

Table 6-4 Ductility ratio demand

Description of Element	Ductility Ratio Demand μ_{dd}
Flexure-controlled SC walls	{{
Shear-controlled SC walls (yielding shear reinforcement spaced ≤ 0.5 section thickness)	
Shear-controlled SC walls (other configurations of yielding or non-yielding shear reinforcement)	
For axial compressive loads *	}}2(a),(c)

Note * Axial stiffness is calculated using the material elastic modulus and the model section thickness calibrated in accordance with Section 6.4.3

6.7.1.4 Response Determination

Response of SC walls subjected to impulsive loads is determined by one of the following methods:

1. The dynamic effects of the impulsive loads are considered by calculating a dynamic load factor. The resistance available for the impulsive load is at least equal to the peak of the impulsive load transient multiplied by the dynamic load factor, where the calculation of the dynamic load factor is based on the dynamic characteristics of the structure and impulsive load transient. System response is determined by either a nonlinear time history analysis or, for well-defined impulse functions, selected from established response charts, such as those in Biggs (Reference 10.1.14).
2. The dynamic effects of impulsive loads are considered by using impulse, momentum, and energy balance techniques. Strain energy capacity is limited by the ductility criteria in Section N9.1.6b of AISC N690-18, or the plate principal strain can be limited to 0.05.
3. The dynamic effects of impulsive loads are considered by performing a time history dynamic analysis. The mass and inertial properties are included as well as the nonlinear stiffness of the structural members under consideration. Simplified bilinear definitions of stiffness are acceptable. The maximum predicted response is governed by the ductility criteria in Section N9.1.6b of AISC N690-18.

In addition to the deformation limits shown in Table 6-4, the following analysis is performed for the critical impulsive/impactive load-wall combination, to check that the wall's intended function is not impaired:

- A mathematical model of the structural wall subjected to the impactive or impulsive loads is built. The model includes nearby structural members such as perpendicular walls and floor slabs.
- A time-history dynamic analysis is performed considering constitutive material models so that the nonlinear response of the structural members is obtained.
- Based on the internal forces and maximum displacements due to the computed response, the wall's intended function is then evaluated.

- The time history analysis also yield displacement/acceleration time histories throughout the structural model that are used to assess the safety-related function of nearby systems and components.

6.7.2 Evaluation of the Local Response of Steel-Plate Composite Walls to Impactive and Impulsive Loads

The required faceplate thickness of the SC wall is determined to prevent perforation of the SC wall by a missile.

The faceplate thickness required to prevent perforation is at least 25 percent greater than that calculated using rational methods.

Any rational method can be used to calculate the faceplate thickness required to prevent perforation under projectile impact. Section N9.6c of the Commentary of AISC N690-18 presents the following three-step approach to design an individual SC wall for a specific missile. This approach is based on a journal paper by Bruhl, et al. (Reference 10.1.13).

Using the method from Reference 10.1.13, the front surface faceplate is conservatively neglected. Thus, impact of a projectile (missile) on concrete dislodges a conical concrete plug, which, in turn, impacts the rear faceplate. This is illustrated in Figure 6-5. The evaluation and design steps are described in detail as follows.

Response to Request for Additional Information
Docket: 99902078

RAI No.: 9860
Date of RAI Issue: 08/06/2021

NRC Question No.: NTR-27

Requirement

10 CFR Part 50, Appendix A, GDC 1, 2 and 4 as it relates to the design of seismic Category I structures, systems, and components.

DSRS 3.8.4, "Other Seismic Category I Structures," (ADAMS Accession No ML15355A444) states the structural acceptance criteria for seismic Category I structures appear in ACI 349, with additional guidance provided by RG 1.142 for concrete structures, AISC N690-1994 for steel structures, and DSRS 3.8.4, Subsection II.4.J, for structures that use modular construction methods evaluated on a case-by-case basis.

Issue

NRC DG-1304, Section 11.1.6, states, "*The permissible displacement ductility ratio in flexure should not exceed 3.0 for loads such as blast and compartment pressurization, which could affect the integrity of the structure as a whole.*"

Provision F.3.5 in ACI 349-13 states "*The permissible ductility ratio in flexure shall not exceed 3.0 for loads such as blast and compartment pressurization, which could affect the integrity of the structure as a whole.*" In Section 6.7, "*Design for Impactive and Impulsive Loads*," of the TR, the applicant described "*The design of SC walls for safety- related nuclear facilities needs to be checked for impactive loads (such as…blast pressure, and compartment pressurization).*" However, the applicant did not provide the permissible ductility ratio in flexure for blast and compartment pressurization loads in TR.

Request

The staff requests the applicant to provide the permissible ductility ratio in flexure for blast and compartment pressurization loads as required in provision F.3.5 of ACI 349-13. Revise the TR as necessary.

NuScale Response:

As specified in ACI 349-13 Section F.3.5 and commentary RF.3.5, the permissible ductility ratio in flexure for reinforced concrete (RC) walls subject to blast and compartment pressurization loads is limited to 3.0 to minimize permanent deformation as these loads, which could affect the integrity of the structure. This limitation is needed for RC compartment walls because ACI 349-13 does not require special detailing at the compartment walls' connections, and the presence of direct tension and flexure leads to severe cracking and spalling as the rebar undergoes large tensile strains associated with increased ductility ratio. Cracking and spalling degrades the RC compartment walls and may compromise the integrity of the structure.

On the other hand, Section N9.4.2 of AISC N690-18 requires connections to SC walls to develop the expected capacity of the weaker of the connected parts, or develop overstrength with respect to the connection design demand. Also, ties are required across the SC wall panel and are typically more closely spaced within the connection region. Moreover, the thick faceplates effectively confine the concrete infill and prevent spalling under large strains. For these reasons, SC compartment walls need not be subjected to the reduced ductility limitation intended for RC walls.

ACI 349-13 Section F3.3 permits a ductility limit of 10.0 for doubly-reinforced RC sections (except for compartment walls as stated above). The increase in compression reinforcement increases ductility of a given RC beam section. The SC walls are effectively doubly reinforced sections with equal reinforcement amount on both faces. Since SC compartment walls subject to increased ductility levels do not have the detriment behavior observed in RC walls, a ductility limit of 10.0 is considered adequate and conservative.

Impact on Topical Report:

There are no impacts to Topical Report TR-0920-71621, Building Design and Analysis Methodology for Safety-Related Structures, as a result of this response.

Response to Request for Additional Information
Docket: 99902078

RAI No.: 9860
Date of RAI Issue: 08/06/2021

NRC Question No.: NTR-28

Requirement

10 CFR Part 50, Appendix A, GDC 1, 2 and 4 as it relates to the design of seismic Category I structures, systems, and components.

DSRS 3.8.4, "Other Seismic Category I Structures," (ADAMS Accession No ML15355A444) states the structural acceptance criteria for seismic Category I structures appear in ACI 349, with additional guidance provided by RG 1.142 for concrete structures, AISC N690-1994 for steel structures, and DSRS 3.8.4, Subsection II.4.J, for structures that use modular construction methods evaluated on a case-by-case basis.

Issue

Provision B3.13, "Design for Corrosion Effects," of ANSI/AISC 360-16 states, *'Where corrosion could impair the strength or serviceability of a structure, structural components shall be designed to tolerate corrosion or shall be protected against corrosion."* However, the applicant did not describe in the TR the effects of corrosion in the design requirements of SC walls. It should be noted that DG-1304 does not address design considerations for corrosion effects.

Request

The staff requests the applicant to describe why the corrosion effects in the design requirements of SC walls were not described in the TR as required in provision B3.13 of ANSI/AISC 360-16. Revise the TR as necessary.

NuScale Response:

Mitigation of corrosion effects will be tailored to site-specific factors. In order to address design for corrosion effects, NuScale plans to implement a defense-in-depth approach depending on the severity of site-specific environmental conditions as well as exposure and performance requirements of SC walls.

For SC walls in a below-grade external environment, also considering the possibility of plant life extension of up to 80 years, a graded approach is followed as inservice inspection and inservice repair of these components would be impractical. Exterior SC walls below grade are designed to be protected from corrosion using a graded approach as follows:

- As a minimum, a coal tar epoxy system coating specifically suited for below-grade protection of carbon steel.

- Additional protection such as Controlled Low Strength Material or shotcrete may be employed as a cementitious material only for environments with high chloride or hydrogen sulfide.
- Finally, backfill with controlled pH and chloride limits governed by site-specific conditions is placed and thoroughly compacted to reduce impact from corrosive properties of soil.

For SC walls in an above-grade external environment, a coating specifically suited for above-grade protection of carbon steel is applied. If additional protection is deemed necessary, a concrete coating, or vinyl or aluminum siding may be employed.

Impact on Topical Report:

Topical Report TR-0920-71621, Building Design and Analysis Methodology for Safety-Related Structures, has been revised as described in the response above and as shown in the markup provided in this response.

6.0 Design Methodology for Steel-Plate Composite Walls

This section develops the strength design methodology for application of SC walls. The design methodology is based on the requirements of ANSI/AISC N690-18 (Reference 10.1.3) and ANSI/AISC 360-16 (Reference 10.1.15), as required by ANSI/AISC N690-18.

Design and detailing of the SC wall connections are included in Section 7.0 of this document.

~~Design and application specific criteria for the use of SC walls in certain locations or conditions (i.e., below grade) are not addressed in this topical report.~~

~~This report does not define the installation or application criteria for exterior SC walls below grade including defense-in-depth controls and coatings. Internal procedures for the installation or application of exterior SC walls below grade will be included as part of the inspections and installations discussion in the design application.~~

Mitigation of corrosion effects will be tailored to site-specific factors. In order to address design for corrosion effects, NuScale plans to implement a defense-in-depth approach depending on the severity of site-specific environmental conditions as well as exposure and performance requirements of SC walls.

For SC walls in a below-grade external environment, also considering the possibility of plant life extension of up to 80 years, a graded approach is followed as inservice inspection and inservice repair of these components would be impractical. Exterior SC walls below grade are designed to be protected from corrosion using a graded approach as follows:

- As a minimum, a coal tar epoxy system coating specifically suited for below-grade protection of carbon steel.
- Additional protection such as Controlled Low Strength Material or shotcrete may be employed as a cementitious material only for environments with high chloride or hydrogen sulfide.
- Finally, backfill with controlled pH and chloride limits governed by site-specific conditions is placed and thoroughly compacted to reduce impact from corrosive properties of soil.

For SC walls in an above-grade external environment, a coating specifically suited for above-grade protection of carbon steel is applied. If additional protection is deemed necessary, a concrete coating, or vinyl or aluminum siding may be employed.

6.1 Applicability

The methodology applies to straight SC walls (refer to note in Section N9.1 of AISC N690-18 and its Commentary), SC walls with steel-headed stud anchors (refer to Section 6.3.3.1), and structures designed using load and resistance factor design.

Response to Request for Additional Information
Docket: 99902078

RAI No.: 9860
Date of RAI Issue: 08/06/2021

NRC Question No.: NTR-29

Requirement

10 CFR Part 50, Appendix A, GDC 1, 2 and 4 as it relates to the design of seismic Category I structures, systems, and components.

DSRS 3.8.4, "Other Seismic Category I Structures," (ADAMS Accession No ML15355A444) states the structural acceptance criteria for seismic Category I structures appear in ACI 349, with additional guidance provided by RG 1.142 for concrete structures, AISC N690-1994 for steel structures, and DSRS 3.8.4, Subsection II.4.J, for structures that use modular construction methods evaluated on a case-by-case basis.

Issue

NRC DG-1304, Section 11.5, states, *"Appendix N9 does not include design provisions for attachments to SC walls."* Additionally, Section 11.5. states, *"The effects of elevated temperature in the concrete due to the welding of attachments to the faceplate after the concrete has cured should also be considered."*

The staff noted that the TR does not provide any information related to welding of attachments to SC walls and the effects of elevated temperature in the concrete due to welding.

Request

The staff requests the applicant to provide information related to attachments to SC walls and the effects of elevated temperature in the concrete due to the welding. Revise the TR as necessary.

NuScale Response:

The effects of elevated temperature in concrete due to welding is not unique to SC walls. It is present in welding to plates embedded in concrete in both nuclear and commercial structures. NuScale design will employ a defense-in-depth control, based on industry wide engineering practices and more recent design experience related to installation of SC walls.

Most of the attachments to SC walls are planned to be installed in the shop during fabrication or in the field prior to concrete placement. For instances when attachments are needed after concrete is placed, the effects of elevated temperature from welding in the concrete are minimized by following these generic industry guidelines:

- The minimum faceplate thickness is limited to half an inch.
- The minimum concrete age is 21 days. This requirement assures the concrete has enough strength before the welding process.
- Heat input to the concrete is controlled by setting the maximum base metal temperature to 25°F above the minimum preheat temperature, or a calculation is performed to provide specific allowances.

Impact on Topical Report:

There are no impacts to Topical Report TR-0920-71621, Building Design and Analysis Methodology for Safety-Related Structures, as a result of this response.

Enclosure 3:

Affidavit of Mark W. Shaver, AF-107254

NuScale Power, LLC

AFFIDAVIT of Mark W. Shaver

I, Mark W. Shaver, state as follows:

1. I am the Manager, Licensing of NuScale Power, LLC (NuScale), and as such, I have been specifically delegated the function of reviewing the information described in this Affidavit that NuScale seeks to have withheld from public disclosure, and am authorized to apply for its withholding on behalf of NuScale.
2. I am knowledgeable of the criteria and procedures used by NuScale in designating information as a trade secret, privileged, or as confidential commercial or financial information. This request to withhold information from public disclosure is driven by one or more of the following:
   a. The information requested to be withheld reveals distinguishing aspects of a process (or component, structure, tool, method, etc.) whose use by NuScale competitors, without a license from NuScale, would constitute a competitive economic disadvantage to NuScale.
   b. The information requested to be withheld consists of supporting data, including test data, relative to a process (or component, structure, tool, method, etc.), and the application of the data secures a competitive economic advantage, as described more fully in paragraph 3 of this Affidavit.
   c. Use by a competitor of the information requested to be withheld would reduce the competitor's expenditure of resources, or improve its competitive position, in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.
   d. The information requested to be withheld reveals cost or price information, production capabilities, budget levels, or commercial strategies of NuScale.
   e. The information requested to be withheld consists of patentable ideas.
3. Public disclosure of the information sought to be withheld is likely to cause substantial harm to NuScale's competitive position and foreclose or reduce the availability of profit-making opportunities. The accompanying Request for Additional Information response reveals distinguishing aspects about the methodology by which NuScale develops its building design and analysis.

   NuScale has performed significant research and evaluation to develop a basis for this methodology and has invested significant resources, including the expenditure of a considerable sum of money.

   The precise financial value of the information is difficult to quantify, but it is a key element of the design basis for a NuScale plant and, therefore, has substantial value to NuScale.

   If the information were disclosed to the public, NuScale's competitors would have access to the information without purchasing the right to use it or having been required to undertake a similar expenditure of resources. Such disclosure would constitute a misappropriation of NuScale's intellectual property, and would deprive NuScale of the opportunity to exercise its competitive advantage to seek an adequate return on its investment.

4. The information sought to be withheld is in the enclosed response to NRC Request for Additional Information RAI Set Number 0003, eRAI No. 9860. The enclosure contains the designation "Proprietary" at the top of each page containing proprietary information. The information considered by NuScale to be proprietary is identified within double braces, "{{ }}" in the document.
5. The basis for proposing that the information be withheld is that NuScale treats the information as a trade secret, privileged, or as confidential commercial or financial information. NuScale relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC § 552(b)(4), as well as exemptions applicable to the NRC under 10 CFR §§ 2.390(a)(4) and 9.17(a)(4).
6. Pursuant to the provisions set forth in 10 CFR § 2.390(b)(4), the following is provided for consideration by the Commission in determining whether the information sought to be withheld from public disclosure should be withheld:
    a. The information sought to be withheld is owned and has been held in confidence by NuScale.
    b. The information is of a sort customarily held in confidence by NuScale and, to the best of my knowledge and belief, consistently has been held in confidence by NuScale. The procedure for approval of external release of such information typically requires review by the staff manager, project manager, chief technology officer or other equivalent authority, or the manager of the cognizant marketing function (or his delegate), for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside NuScale are limited to regulatory bodies, customers and potential customers and their agents, suppliers, licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or contractual agreements to maintain confidentiality.
    c. The information is being transmitted to and received by the NRC in confidence.
    d. No public disclosure of the information has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or contractual agreements that provide for maintenance of the information in confidence.
    e. Public disclosure of the information is likely to cause substantial harm to the competitive position of NuScale, taking into account the value of the information to NuScale, the amount of effort and money expended by NuScale in developing the information, and the difficulty others would have in acquiring or duplicating the information. The information sought to be withheld is part of NuScale's technology that provides NuScale with a competitive advantage over other firms in the industry. NuScale has invested significant human and financial capital in developing this technology and NuScale believes it would be difficult for others to duplicate the technology without access to the information sought to be withheld.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 27, 2021.

Mark W. Shaver

Mark W. Shaver