

June 16, 2016

Docket: PROJ0769

U.S. Nuclear Regulatory Commission
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SUBJECT: NuScale Power, LLC Submittal of White Paper Entitled "Regulatory Process for Addressing Licensed Operator Staffing Regulations in the NuScale Design Certification," Revision 0, for Use During Public Meeting on June 23, 2016 (NRC Project No. 0769)

NuScale Power, LLC (NuScale) has requested a public meeting with the NRC technical and legal staff on June 23, 2016, to discuss the regulatory process for addressing licensed operator staffing regulations in the NuScale design certification. Attachment 1 of this submittal provides the white paper prepared for use during this meeting. Attachment 1 has been determined to be nonproprietary.

This letter and its attachment make no regulatory commitments and no revisions to any existing regulatory commitments.

Please feel free to contact Steve Mirsky, Manager, Regulatory Affairs at 301-770-0472 or at smirsky@nuscalepower.com if you have any questions.

Sincerely,



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Attachment 1: "Regulatory Process for Addressing Licensed Operator Staffing Regulations in the NuScale Design Certification," Revision 0, nonproprietary version



REGULATORY PROCESS FOR ADDRESSING LICENSED OPERATOR STAFFING REGULATIONS IN THE NUSCALE DESIGN CERTIFICATION

White Paper

June 8, 2016

Department of Energy Acknowledgement and Disclaimer

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Introduction and Summary

NuScale anticipates licensees referencing the NuScale design to use control room configurations—numbers of operators per reactor and number of reactors operated from a control room—that differ from existing large reactors and the requirements stated at 10 CFR 50.54(m). While the requirements for minimum licensed operator staffing are a license condition, and thus applicable to a licensee, NuScale will seek to resolve the matter in the NuScale design certification (DC).

This paper therefore addresses two separate but related issues: (1) By what administrative process will NuScale address deviation from *current* licensed operator staffing regulations? (2) And, where will the NuScale DC address *alternative* staffing requirements applicable to the NuScale design?

This paper first concludes that an exemption is not a necessary or appropriate administrative process for the DC to address the staffing regulations in 10 CFR 50.54(m). Next, this paper recommends that the NuScale DC application (DCA) address the NuScale-specific licensed operator staffing rules in the “Applicable Regulations” section of the NuScale Design Certification (i.e., within Section VI of the 10 CFR part 52 appendix certifying the NuScale design). An example of the proposed rule language is included for illustration and discussion purposes. Third, this paper recommends NuScale treat the request for staffing requirements similarly in form and substance to an exemption request. Accordingly, the requested rule language and justification would be included in Part 7 of the NuScale DCA.

If approved by NRC and incorporated in the NuScale DC, the NuScale-specific staffing requirements will apply to plants referencing the NuScale DC in lieu of 10 CFR 50.54(m). As a result, licensed operator staffing requirements would be considered resolved matters and applicants and licensees referencing the NuScale design would need not request an exemption from 10 CFR 50.54(m).

Background

10 CFR 50.54(m) specifies the minimum number of licensed reactor operators for various combinations of control room and reactors. The rules were derived from and aimed at existing plant designs at the time, and thus address up to a total of three reactors at a site. The rules do not specify any requirements for more than three reactors at a site, and does not address use of a single control room for more than two reactors.

The NuScale plant design is based upon the operation of up to twelve small modular reactors (SMRs) from a single main control room (MCR), which is a configuration not specifically addressed by 10 CFR 50.54(m). Also, due to NuScale’s passive safety systems, simplicity of operation, automation, reduced licensed operator workload, limited number of important human actions, and ample time to complete operator actions, the

NuScale plant design is based on fewer licensed operators in the MCR than if 10 CFR 50.54(m) were extrapolated to a twelve-reactor configuration.

NRC Staff anticipated SMRs would seek to include staffing levels commensurate with the advanced design of their facilities. In SECY-11-0098, NRC Staff recommended “a two step approach to address operator staffing requirements for SMRs. In the near-term, applicants can request exemptions to the current operator staffing requirements in 10 CFR 50.54(m) and the staff will review the request using existing or modified guidance.”¹ NuScale is the first SMR vendor to develop a design based on different licensed operator staffing levels and control room configuration than anticipated by 10 CFR 50.54(m), and therefore the first DC applicant to apply the SECY-11-0098 guidance.

From a technical standpoint, NuScale plans to provide the technical justification for an alternate staffing approach using existing guidance.² Specifically, NuScale intends that NRC review and approval of its Staffing and Qualification results summary report would constitute the technical justification for the alternate staffing requirements included in the DC rule.³

Separately from the technical approach, though, NuScale revisited the staff’s recommendation in SECY-11-0098 to use an exemption request for addressing licensed operator staffing. This paper provides the conclusion that an exemption from 10 CFR 50.54(m) is not needed for the DC. The legal and administrative issues addressed herein should not be construed to affect or modify the planned technical basis and safety justification for the NuScale staffing proposal.

Analysis

1. *Because 10 CFR 50.54(m) does not directly apply to a DC applicant, an exemption from it is not necessary in the DCA.*

Current regulations concerning licensed operator roles and staffing are found in 10 CFR 50.54(m). Section 50.54 provides “conditions in every combined license issued under part 52,” and does not include an applicability statement for design certifications. As license conditions, the requirements of 10 CFR 50.54 legally apply to any issued license and thereby constitute ongoing requirements for licensees. Thus, the various license conditions including 10 CFR 50.54(m) do not apply to a DC and are not required to be addressed in a DCA.⁴

¹ SECY-11-0098, *Operator Staffing for Small or Multi-Module Nuclear Power Plant Facilities 3* (2011).

² NuScale Power, “NuScale Power, LLC Submittal of Response to NRC’s letter, “NuScale Control Room Configuration and Staffing Levels,” January 14, 2016,” LO-0316-48185, Apr. 8, 2016.

³ *Id.*

⁴ See generally 10 CFR 52.47 (requiring an application to address other substantive provisions of 10 CFR Part 50).

That the staffing rules do not apply directly to a DC is consistent with the structure and intent of Part 52, which generally assigns responsibility for design requirements to a DCA and for operational and programmatic requirements to a COLA.⁵ The provisions on issue resolution evidence this division, wherein the various design certifications state that “the *structures, systems, components, and design features* of the ... design comply with the provisions of the Atomic Energy Act of 1954, as amended, and the applicable regulations identified in Section V of this appendix; and therefore, provide adequate protection to the health and safety of the public.”⁶

Because 10 CFR 50.54(m) is not applicable to a design certification applicant, an exemption from those rules within the DCA is unnecessary. Furthermore, an exemption would not be an appropriate administrative process for a DC applicant. 10 CFR 52.7 authorizes and governs exemptions for Part 52, including DCAs, and provides “The Commission may...grant exemptions from the requirements of the regulations of this part....The Commission’s consideration of requests for exemptions from requirements of the regulations of other parts in this chapter, which are applicable by virtue of this part, shall be governed by the exemption requirements of those parts.” Because there is no citation or applicability statement making the operator staffing requirements of 10 CFR 50.54(m) “applicable by virtue of this part,” an exemption from those requirements is not necessary for a DCA.

Therefore, the NuScale DCA should address expected deviations from 10 CFR 50.54(m) differently than a formal exemption request (as Section 3 addresses below, the DCA would include justification similar in form and substance to an exemption). Notwithstanding the above, SECY-11-0098 and other regulatory history suggests that an exemption from operational requirements may in fact be appropriate for a DCA.⁷ Should NuScale utilize a formal exemption request, the following proposed approach would still apply as NuScale’s desired outcome of that exemption.

2. *Licensed operator staffing for the NuScale design should be addressed in the DC’s “Applicable Regulations” to resolve the matter for future licensees referencing the NuScale design.*

⁵ Compare 10 CFR 52.47 with 10 CFR 52.79; see, e.g., 10 CFR 52.79(a)(21) (requiring an emergency plan in the COLA FSAR), 10 CFR 52.79(a)(26) (requiring a description of applicant’s organizational structure), and 10 CFR 52.79(a)(27) (requiring a description of managerial and administrative controls).

⁶ See, e.g., 10 CFR 52, App. D, § VI.A.

⁷ See Licenses, Certifications, and Approvals for Nuclear Power Plants, 72 Fed. Reg. 49352, 49372 (Aug. 28, 2007) (“Moreover, if the nature of the technical requirement is such that a subsequent applicant referencing the design certification would need an exemption from compliance with the requirement as applied to the applicant, then the Commission would include the exemption in the design certification rule itself.”). However, from the context of the Commission’s statement it is unclear that a “technical requirement” was intended to broaden issues for potential issue resolution beyond design features to possibly include operational requirements.

While an exemption from the staffing rules is not the appropriate administrative process for the NuScale DCA to address 10 CFR 50.54(m), it is nevertheless appropriate and desirable for the NuScale DC to address staffing requirements for applicants and licensees referencing the NuScale DC. Aspects of the NuScale design that are within DC scope will depend on staffing levels, such as the sizing of the control room and supporting systems. Also, addressing licensed operator staffing at the DC stage will provide efficiency and certainty for COL applicants referencing the NuScale design.

As to *where* the NuScale DC would address licensed operator staffing, the staffing requirements are not design information that would typically be addressed by the design control document (DCD). Also, the staffing requirements will be comparable to a license condition normally imposed by the regulations of 10 CFR 50.54(m). Thus, it is reasonable and appropriate to include the staffing requirements directly in the DC rule certifying the design (i.e. the new Appendix in Part 52), rather than in the DCD as Tier 1 or Tier 2 information.

Likewise, consideration of issue resolution and finality further dictates that staffing requirements should be addressed in the DC rule. In the SRM to SECY-96-077, as reflected in Section VIII.C of the various DC rules, the Commission decided that operational requirements in the DCD should not be provided with the same special backfit provisions (finality) applicable to certified or approved design information.⁸ To that end, DC rules issued by the NRC have typically excluded operational requirements from the scope of issue resolution provided by a DC,⁹ and operational requirements have separate departure processes than DCD design information.¹⁰ On the other hand, the NRC may treat operational aspects as resolved where the operational information is considered “necessary”¹¹ to approve the related design elements. As noted above, control room staffing is an input to aspects of design elements such as control room sizing, but it is unclear that specific and detailed

⁸ *Staff Requirements – SECY-96-077 – Certification of Two Evolutionary Designs* (1996) (ADAMS Accession No. ML003754873); compare 10 CFR 52, App. D, § VIII.C and § VIII.A.

⁹ *E.g.*, 10 CFR 52, App. D, § VI.C (“The Commission does not consider operational requirements for an applicant or licensee who references this appendix to be matters resolved within the meaning of 10 CFR 52.63(a)(5). The Commission reserves the right to require operational requirements for an applicant or licensee who references this appendix by rule, regulation, order, or license condition.”).

¹⁰ *E.g.*, 10 CFR 52, App. D, § VIII.C.

¹¹ During the ESBWR DC rulemaking, Staff stated: “In the December 6, 1996, SRM (ADAMS Accession No. ML003754873) to SECY-96-077, “Certification of Two Evolutionary Designs,” dated April 15, 1996, the Commission set forth a policy that operational programs should be excluded from finality except where necessary to find design elements acceptable. . . . GEH included, in the DCD, details on two HFE operational program elements (procedures and training) that are not used to determine the adequacy of the HFE. In keeping with the established Commission policy of not approving operational program elements through design certification except where necessary to find design elements acceptable, the NRC is excluding these two HFE operational program elements in the ESBWR DCD from the scope of the design approved in the rule.” *SECY-2014-0081, Final Rule: Economic Simplified Boiling-Water Reactor Design Certification* 8 (2014) (ADAMS Accession No. ML111730346).

staffing requirements analogous to those of 10 CFR 50.54(m) would be strictly necessary to approve the design information.¹² Therefore, licensed operator staffing levels included in the DCD may not yield issue resolution, and a different mechanism is appropriate to resolve licensed operator staffing as part of the NuScale DC.

The design certification process is initiated by an applicant submitting a DCA, but the NRC completes certification through a rulemaking process.¹³ Accordingly, the NRC has considerable discretion to adopt appropriate provisions in the rulemaking to effectuate the certification and impose requirements on its use. During the early DC rulemakings NRC staff proposed,¹⁴ and the Commission approved,¹⁵ “design-specific rulemakings through individual design certifications to resolve selected technical and severe accident issues.” A DC’s conformance with the design-specific rules would be documented in the DCD FSER, and future changes to, renewals of, and applications referencing the DC would need to demonstrate compliance with those rules.¹⁶ These design-specific issue resolutions were to be designated “applicable regulations” in the DC and constitute review standards for the purposes of 10 CFR 52.48 and 52.63.

In proposing additional applicable regulations, the Staff intended to document the manner in which the new designs resolved outstanding severe accident issues and other Commission policy decisions because regulations against which to review the designs were not in place. By documenting the resolution of technical issues as “applicable regulations,” Staff intended to ensure the NRC had a valid legal basis for requiring compliance with the resolutions agreed upon by a DC applicant. Ultimately, the Commission decided the change control process to be imposed on the DCs was sufficient for controlling approved design information related to resolution of technical and severe accident issues, because “the level of enhanced safety believed to be achieved with these designs will be reasonably maintained for the period they are in effect.”¹⁷

Pursuant to Commission direction, the applicable regulations section has not been used for design-specific rulemakings related to technical and severe accident issues,

¹² For example, the control room design parameters could be based on an assumed staffing level that would envelope actual staffing requirements to be set forth in a COL. Specific staffing levels and roles comparable to 10 CFR 50.54(m) likely go beyond what is needed to verify the adequacy of the related design elements.

¹³ See 10 CFR 52.41(a); 10 CFR 52.45(b); 10 CFR 2.800 *et seq.*

¹⁴ SECY-91-262, *Resolution of Selected Technical and Severe Accident Issues for Evolutionary Light Water Reactor (LWR) Designs 7* (1991) (ADAMS Accession No. ML003707936).

¹⁵ SRM-SECY-91-262, *Resolution of Selected Technical and Severe Accident Issues for Evolutionary Light Water Reactor (LWR) Designs 1* (1992) (ADAMS Accession No. ML003707924); see also SECY-92-287, *Form and Content for a Design Certification Rule*, Encl. 3 (1992) (ADAMS Accession No. ML003707899).

¹⁶ See SECY-92-287, Encl. 3; SECY-92-287A, *Form and Content for a Design Certification Rule*, Encl. 2 (1993) (ADAMS Accession No. ML003707972).

¹⁷ SRM-SECY-96-077 at 4.

but the section is used for other purposes. During the DC format development process, Staff stated that the applicable regulations could also include “other resolutions of issues that deviate from current regulations,”¹⁸ and thus the section documents exemptions granted during the DCA review for a certified design.¹⁹ Addressing licensed operator staffing requirements as an applicable regulation for the NuScale DC would be consistent with the current use of that section.

Accordingly, NuScale should request the NRC to address alternative licensed operator staffing requirements in the applicable regulations section of the NuScale DC. Licensed operator staffing is an issue that will deviate from current regulations, and NRC’s adoption of approved staffing levels as an applicable regulation would provide a standard by which to review COLAs referencing the NuScale design. Such approach would ensure issue resolution of this operational requirement within the DC. The new, NuScale-specific licensed operator staffing requirements would apply to a COLA and COL referencing the NuScale DC, and deviations from the rule would be governed by the 10 CFR 52.7 exemption process. By the terms of the new applicable regulation, the current requirements in 10 CFR 50.54(m) would not apply to such a licensee, and an exemption therefrom would be unnecessary.

Notwithstanding the above, NuScale does not believe it is appropriate to revisit the use of applicable regulations for the purposes which the Commission decided they were unnecessary. Rather, NuScale believes the Applicable Regulations are a reasonable place to address operator staffing for the NuScale design. Such use is comparable to an exemption in that it is initiated at the request of the applicant and addresses compliance with an existing regulation, but would address operational requirements applicable to licensees referencing the design.

An example of the content of NuScale-specific staffing requirements is included in Appendix A for illustration. The actual requirements are subject to change as NuScale develops its DCA and the technical basis underlying the request. As is depicted, the NuScale staffing requirements would be similar in form to the existing 10 CFR 50.54(m) requirements.

NuScale therefore proposes the adopted requirements should thus be addressed in a new subsection of the applicable regulations (e.g. Section V.C) in the NuScale DC rule. The new requirements could be addressed in the applicable regulations in one of two ways:

- Section V.C directly includes the NuScale-specific staffing requirements as a regulation applicable to applicants and licensees that reference the DC, rather than the requirements of 10 CFR 50.54(m).

¹⁸ SECY-92-287, Encl. 3.

¹⁹ The applicable regulations section has also been used to broadly document the applicable standards applied to the review of a certified design. Specific regulations applicable to the design are then documented in the FSER.

- Section V.C addresses the applicability of 10 CFR 50.54(m) by including a provision that applicants and licensees that reference the DC are subject to the NuScale-specific staffing requirements rather than 10 CFR 50.54(m), but the actual requirements would be found only in the DCD.

In both cases, the requirements would resemble the example contained in Appendix A. The difference would be where the detailed requirements are stated and how they are controlled. NuScale intends to further discuss implementation of the proposal, including these two options, with NRC staff.

3. *The NuScale DCA will include the request and proposed language for staffing requirements in Part 7, similar in form and substance to an exemption request.*

The treatment of staffing requirements within the applicable regulations section will be a first of a kind process. While the NRC has latitude to adopt such provisions as part of the DC rulemaking, NuScale should utilize an appropriate administrative process to identify the proposed staffing requirements and justify NRC's adoption of them.

Under the approach proposed here, NuScale will effectively petition for a rulemaking on NuScale-specific licensed operator staffing within the larger DC rulemaking. As a rulemaking request, as opposed to an exemption request, a petitioner would ordinarily be required to "present the specific problems or issues that the petitioner believes should be addressed through rulemaking," provide "information supporting the petitioner's assertion of the problems or issues," present the proposed solution to the issue, and discuss how the proposed solution solves the identified issue.²⁰

While the provisions of 10 CFR 50.12 are not directly relevant, the NuScale staffing requirements will supplant the current staffing rules for licensees referencing the NuScale design. If a COL applicant or licensee were to deviate from those existing rules, they would have to seek an exemption from 10 CFR 50.54(m). Accordingly, it is appropriate for NuScale to treat the proposed staffing rules analogous to an exemption request by including justification for the request vis-à-vis the elements required under 10 CFR 50.12. NuScale's request should therefore be similar in form and content to a formal exemption request.

NuScale's DCA will follow the format for applications proposed in the draft revision to Regulatory Guide 1.206,²¹ where Part 7 of the DCA will include exemption requests. NuScale should also include in Part 7 a request that the NRC adopt an applicable regulation governing licensed operator staffing for the NuScale design.

²⁰ See 10 CFR 2.802(c).

²¹ U.S. NRC, *Regulatory Guide 1.206, Applications for Nuclear Power Plants*, Draft Rev. Feb. 27, 2015 (ADAMS Accession No. ML15057A165).

Accordingly, the request should include:²²

- a statement of the requirement proposed for inclusion in the NuScale DC,²³
- a description of the regulatory requirements involved,
- the intent of the regulatory requirements,
- why the request is being made,
- justification for the request, including
 - information demonstrating that the proposed requirements, when applied to a licensee referencing the NuScale design, are consistent with law, will not present an undue risk to the public health and safety, and are consistent with the common defense and security, and
 - information demonstrating that special circumstances are present that would justify application of the proposed requirements, rather than the current requirements, to the NuScale design and licensees referencing the NuScale design.

The technical justification for the request will, as with exemption requests, reference and rely on information provided in the DCD to justify the proposed requirements. In the case of licensed operator staffing the form and content of such information will be provided in accordance with existing guidance on control room staffing exemptions, as discussed between NuScale and the NRC.²⁴ The technical information supporting the request will thus allow NRC to reach safety findings on the staffing levels described in the DCA, and support the adoption of the alternative staffing rules as an applicable regulation in the DC.

Conclusion

NuScale intends to address within the design certification process licensed operator staffing requirements for licensees operating a NuScale facility. To do so, a formal exemption is not a necessary administrative process for the action. Rather, the NuScale DCA include a request and justification for NuScale-specific licensed operator staffing requirements. Those requirements would then be addressed within the “Applicable Regulations” of the NuScale DC rule, by either including the requirements directly or referencing them. Because an administrative process has not been established for an applicant to propose a new applicable regulation, this paper further recommends

²² See U.S. NRC, *LIC-103, Exemptions from NRC Regulations*, Rev. 1 (2006) (ADAMS Accession No. ML052590073).

²³ If the staffing requirements will be included in the DCD, rather than directly in the applicable regulations, the request would reference the appropriate DCD content.

²⁴ See U.S. NRC to NuScale Power, LLC, “NuScale Control Room Configuration and Staffing Levels,” Jan. 14, 2016 (ADAMS Accession No. ML15302A516); NuScale LO-0316-48185.

NuScale treat the request similarly to an exemption request in form and substance. Accordingly, the requested rule language and justification would be included in Part 7 of the NuScale DCA.

In following the recommended approach, NuScale would request and justify NuScale-specific staffing requirements to apply to plants referencing the NuScale DC in lieu of 10 CFR 50.54(m). If approved by the NRC and incorporated in the DC rule, the staffing requirements would be resolved matters and applicants and licensees referencing the NuScale design would not need to request an exemption from 10 CFR 50.54(m).

Appendix A: Example NuScale-Specific Staffing Requirements

This appendix is an example of the requirements NuScale would include in the DCA. They are included here solely to illustrate the approximate form and content of the expected requirements for discussion purposes. This appendix is not intended to represent the actual requirements, which will be developed as NuScale completes the technical basis underlying the request and will be included in the DCA.

(1) A senior operator licensed pursuant to part 55 of this chapter shall be present at the facility or readily available on call at all times during its operation, and shall be present at the facility during initial start-up and approach to power, recovery from an unplanned or unscheduled shut-down or significant reduction in power, and refueling, or as otherwise prescribed in the facility license.

(2) Licensees referencing the NuScale design certification shall meet the following requirements:

(i) Each licensee shall meet the minimum licensed operator staffing requirements in the following table:

Minimum Requirements¹ Per Shift for On-Site Staffing of Nuclear Power Units by Operators and Senior Operators Licensed Under 10 CFR Part 55

Number of nuclear power units operating ²	Position	One to twelve units
		One control room
None	Senior Operator	1
	Operator	2
One to Twelve	Senior Operator	3
	Operator	3

¹ Temporary deviations from the numbers required by this table shall be in accordance with criteria established in the unit's technical specifications.

² For the purpose of this table, a nuclear power unit is considered to be operating when it is in Mode 1 as defined by the unit's technical specifications.

(ii) Each licensee shall have at its site a person holding a senior operator license for all fueled units at the site who is assigned responsibility for overall plant operation at all times there is fuel in any unit. If a single senior operator does not hold a senior operator license on all fueled units at the site, then the licensee must have at the site two or more senior operators, who in combination are licensed as senior operators on all fueled units.

(iii) When a nuclear power unit is in Mode 1, as defined by the unit's technical specifications, each licensee shall have a person holding a senior operator license for the nuclear power unit in the control room at all times. In addition to this senior operator, a licensed operator or senior operator shall be present at the controls at all times.

(iv) Each licensee shall have present, during alteration or movement of the core of a nuclear power unit (including fuel loading, fuel transfer, or movement of a module that contains fuel), a person holding a senior operator license or a senior operator license limited to fuel handling to directly supervise the activity and, during this time, the licensee shall not assign other duties to this person.