

## NuScaleDCRaisPEm Resource

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**From:** Cranston, Gregory  
**Sent:** Friday, January 26, 2018 11:58 AM  
**To:** RAI@nuscalepower.com  
**Cc:** NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Dudek, Michael; Lavera, Ronald; Markley, Anthony  
**Subject:** Request for Additional Information No. 344 RAI No. 9290 (12.3)  
**Attachments:** Request for Additional Information No. 344 (eRAI No. 9290).pdf

Attached please find NRC staff's request for additional information concerning review of the NuScale Design Certification Application.

Please submit your technically correct and complete response within 60 days of the date of this RAI to the NRC Document Control Desk. .

If you have any questions, please contact me.

Thank you.

Gregory Cranston, Senior Project Manager  
Licensing Branch 1 (NuScale)  
Division of New Reactor Licensing  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
301-415-0546

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## Request for Additional Information No. 344 (eRAI No. 9290)

Issue Date: 01/26/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 12.03-12.04 - Radiation Protection Design Features

Application Section: 12.3

### QUESTIONS

12.03-21

#### Regulatory Basis

10 CFR 20.1602, "Control of access to very high radiation areas," requires that, in addition to the requirements in § 20.1601, the licensee shall institute additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source or any surface through which the radiation penetrates.

As provided in accordance with 10 CFR 20.1601(c) the licensee includes proposed Technical Specifications (TS) in TS 5.7.2 in place of the controls required by 10 CFR 20.1601(a) and 10 CFR 20.1601(b). These TSs require in part that areas greater than 1 Rem/hour at 30 centimeters but less than 500 rads/hour at 1 meter be locked, except during periods of personnel or equipment entry or exit. TS 5.7.2(f) states such individual areas that are within a larger area where no enclosure exists for the purpose of locking and where no enclosure can reasonably be constructed around the individual area need not be controlled by a locked door or gate, nor continuously guarded, but shall be barricaded, conspicuously posted, and a clearly visible flashing light shall be activated at the area as a warning device. However, because the dose rates in a Very High Radiation Areas (VHRA) exceed 500 rads/hour at 1 meter, TS 5.7.2 is not applicable to VHRAs and there is no alternative TS in the NuScale for VHRAs.

The guidance in RG 8.38, Regulatory Position 1.5, "Physical Controls," states that to the extent practicable, physical barriers should completely enclose very high radiation areas in a manner that is sufficient to thwart undetected circumvention of the barrier. RG 8.38 Regulatory Position 1.5 also states that controls must be established to prevent personnel from being locked in a high radiation area [10 CFR 20.1601(d)]. For example, if doors are self-locking, personnel must be able to open them from the inside without a key. Regulatory Position 3, "Very High Radiation Areas," states that because of the potential danger of life-threatening overexposures to individuals, extremely tight control must be maintained over any entry to very high radiation areas. According to 10 CFR 20.1602, licensees must institute additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to very high radiation areas.

The acceptance criterion of NuScale Section 12.3-12.4, "Radiation Protection Design Features," states that access control will be judged for acceptability in accordance with the requirements of 10 CFR 20.1601, 10 CFR 20.1602, 10 CFR 20.1901, 10 CFR 20.1902, and 10 CFR 20.1903, or access control alternatives in the NuScale Technical Specifications. The Acceptance Criteria of NuScale DSRS 12.3-12.4 further states facility design should ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source or any surface through which the radiation penetrates (e.g., those adjacent to operating reactors, or irradiated portions or reactor or containment vessels, of shut down reactors).

#### Background

NuScale DCD Section 12.3.1.3.1 provides information on controls and design features for very high radiation areas. This section specifies, among other things, that very high radiation areas either are locked or have alarmed barriers. It also provides COL Item 12.3-2 which specifies that the COL applicant will develop the administrative controls regarding access to very high radiation areas per the guidance of RG 8.38. Table 12.3-3 only identifies one very high radiation area in the NuScale DCD (the Class A/B/C HIC Room in the Radioactive waste Building).

#### Key Issue 1

The Acceptance Criteria of NuScale DSRS 12.3-12.4 states that facility design should ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source or any surface through which the radiation penetrates (e.g., those adjacent to operating reactors, or irradiated portions or reactor or containment vessels, of shut down reactors). Physical controls for known VHRA areas are evaluated as part of the design review.

By stating in the DCD that it is optional for very high radiation areas to be locked appears inconsistent with the intent of 10 CFR 20.1602 and RG 8.38.

## Question 1

Please provide additional information explaining why it is acceptable for known very high radiation areas to be unlocked and how having it optional to lock doors that control access to very high radiation areas meets the requirement of 10 CFR 20.1602 and the guidance of RG 8.38, or provide the specific alternative approaches used and the associated justification.

12.03-22

### Regulatory Basis

10 CFR 20.1602, "Control of access to very high radiation areas," requires that, in addition to the requirements in § 20.1601, the licensee shall institute additional measures to ensure that an individual is not able to gain unauthorized or inadvertent access to areas in which radiation levels could be encountered at 500 rads (5 grays) or more in 1 hour at 1 meter from a radiation source or any surface through which the radiation penetrates.

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### Background

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### Key Issue 2

NuScale DCD Tier 2 Revision 0 Section 12.3-12.4 does not describe the design features or the requirement of the design that prevent personnel from being locked in a high radiation area [10 CFR 20.1601(d)].

### Question 2

- As necessary, revise DCD Section 12.3 to describe the design features provided to prevent personnel from being locked in VHRA, or provide the specific alternative approaches used and the associated justification.