

## NuScaleDCRaisPEm Resource

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**From:** Chowdhury, Prosanta  
**Sent:** Wednesday, April 11, 2018 11:13 AM  
**To:** Request for Additional Information  
**Cc:** Lee, Samuel; Cranston, Gregory; Kent, Lauren; Scheetz, Maurin; NuScaleDCRaisPEm Resource  
**Subject:** Request for Additional Information No. 414 eRAI No. 9430 (13.05.02.01)  
**Attachments:** Request for Additional Information No. 414 (eRAI No. 9430).pdf

Attached please find NRC staff's request for additional information (RAI) 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.

Prosanta Chowdhury, Project Manager  
Licensing Branch 1 (NuScale)  
Division of New Reactor Licensing  
Office of New Reactors  
U.S. Nuclear Regulatory Commission  
301-415-1647

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## Request for Additional Information No. 414 (eRAI No. 9430)

Issue Date: 04/11/2018

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 13.05.02.01 - Operating and Emergency Operating Procedures

Application Section: SRP 13.5.2.1

### QUESTIONS

13.05.02.01-7

### REGULATORY BASIS REQUIREMENTS

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to "Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... "

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1, "Requirements for Emergency Response Capability," which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, "Operating and Emergency Operating Procedures." Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, "NuScale Generic Technical Guidelines," for docketing.

### ISSUE

The Reactivity Safety Function flowchart in Section 5.2 of the NuScale GTGs depicts the logic and specifies the operator actions necessary to assess and maintain the Reactivity Safety Function. Chapter 7, Section 7.1.1.2.2, "Post-Accident Monitoring," "Type B Variables," Page 7.1-8, states:

*"Type B variables are those that provide primary information to the control room operators to assess the plant's critical safety functions that have been defined for the*

*NuScale power plant. These are accomplishing or maintaining the following three critical safety functions:*

- *Reactivity control*
- *Remove fuel assembly heat*
- *Containment*

*NuScale has selected these three critical safety functions based on the plant design.”*

Chapter 7, Section 7.1.1.2.2, “Post-Accident Monitoring,” “Type B Variables,” “Reactivity Control Safety Function Variables,” Page 7.1-8, states:

*“The Type B variables that provide direct indication and are used to assess the process of accomplishing or maintaining reactivity control are neutron flux and **core inlet and exit temperature.**”*

Chapter 7, Table 7.1-7, “Summary of Type A, B, C, D, and E Variables,” Page 7.1-73, classifies Core Inlet and Exit Temperatures as Type B variables. Core Inlet and Exit Temperatures are not evaluated on the Reactivity Safety Function flowchart. Given that Core Inlet and Exit Temperatures are both identified by Chapter 7 as Type B variables *that provide direct indication and are used to assess the process of accomplishing or maintaining reactivity control*, NRC staff is questioning why these two variables are not utilized as decision variables on the Reactivity Safety Function flowchart to determine whether the “Reactivity Control” Critical Safety Function (CSF) can be met.

## **INFORMATION NEEDED**

NRC staff requests that NuScale: (1) explain why, on the basis of Chapter 7 information provided above, Core Inlet and Exit Temperatures (Post-Accident Monitoring Type B variables) have been excluded from the Reactivity Safety Function flowchart as a means to assess and maintain the “Reactivity Control” CSF, and (2) make any necessary changes to technical report TR-1117-57216 and/or Chapter 7 of the DCD, to ensure the completeness and accuracy of the NuScale GTGs (flowcharts and basis) and Chapter 7 DCD Tier 2 information.

13.05.02.01-8

## **REGULATORY BASIS REQUIREMENTS**

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to “Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... “

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, “Clarification of TMI Action Plan Requirements,” and NUREG-0737, Supplement 1, “Requirements for Emergency Response

Capability,” which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, “Operating and Emergency Operating Procedures.” Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, “NuScale Generic Technical Guidelines,” for docketing.

## ISSUE

The Core Heat Removal (CHR) Safety Function flowchart in Section 5.3 of the NuScale GTGs depicts the logic and specifies the operator actions necessary to assess and maintain the CHR Safety Function. Chapter 7, Section 7.1.1.2.2, “Post-Accident Monitoring,” “Type B Variables,” Page 7.1-8, states:

*“Type B variables are those that provide primary information to the control room operators to assess the plant’s critical safety functions that have been defined for the NuScale power plant. These are accomplishing or maintaining the following three critical safety functions:*

- *Reactivity control*
- *Remove fuel assembly heat*
- *Containment*

*NuScale has selected these three critical safety functions based on the plant design.”*

Chapter 7, Section 7.1.1.2.2, “Post-Accident Monitoring,” “Type B Variables,” “Remove Fuel Assembly Heat Critical Safety Function Variables,” Pages 7.1-8/9, states:

*“The Type B variables selected that provide direct indication and verification and used to assess the process of accomplishing or maintaining the combined remove fuel assembly heat and RCS integrity critical safety functions are core exit temperature, RPV riser water level, wide range RCS pressure, containment water level, **degrees of subcooling**, and wide range RCS hot temperature.”*

Chapter 7, Table 7.1-7, “Summary of Type A, B, C, D, and E Variables,” Page 7.1-73, classifies Degrees of Subcooling as a Type B variable. Degrees of Subcooling is not evaluated on the Core Heat Removal Safety Function flowchart. Given that Degrees of Subcooling is identified by Chapter 7 as a Type B variable *that provides direct indication and verification and is used to assess the process of accomplishing or maintaining the combined remove fuel assembly heat and RCS integrity critical safety functions*, NRC staff is questioning why this variable is not utilized as a decision variable on the CHR Safety Function flowchart to determine whether the “Remove Fuel Assembly Heat” Critical Safety Function (CSF) can be met.

## INFORMATION NEEDED

NRC staff requests that NuScale: (1) explain why, on the basis of Chapter 7 information provided above, Degrees of Subcooling (a Post-Accident Monitoring Type B variable) has been

excluded from the CHR Safety Function flowchart as a means to assess and maintain the “Remove Fuel Assembly Heat” CSF, and (2) make any necessary changes to technical report TR-1117-57216 and/or Chapter 7 of the DCD, to ensure the completeness and accuracy of the NuScale GTGs (flowcharts and basis) and Chapter 7 DCD Tier 2 information.

13.05.02.01-9

## REGULATORY BASIS REQUIREMENTS

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to “Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... “

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, “Clarification of TMI Action Plan Requirements,” and NUREG-0737, Supplement 1, “Requirements for Emergency Response Capability,” which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, “Operating and Emergency Operating Procedures.” Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, “NuScale Generic Technical Guidelines,” for docketing.

## ISSUE

The Containment Integrity (CI) Safety Function flowchart in Section 5.1 of the NuScale GTGs depicts the logic and specifies the operator actions necessary to assess and maintain the CI Safety Function. Chapter 7, Section 7.1.1.2.2, “Post-Accident Monitoring,” “Type B Variables,” Page 7.1-8, states:

*“Type B variables are those that provide primary information to the control room operators to assess the plant’s critical safety functions that have been defined for the NuScale power plant. These are accomplishing or maintaining the following three critical safety functions:*

- *Reactivity control*
- *Remove fuel assembly heat*
- *Containment*

*NuScale has selected these three critical safety functions based on the plant design.”*

Chapter 7, Section 7.1.1.2.2, “Post-Accident Monitoring,” “Type B Variables,” “Maintain Containment Integrity Critical Safety Function Variables,” Page 7.1-9, states:

*“Maintain Containment Integrity is both a critical safety function and a fission product barrier (Containment) which serves as the primary means to control radioactive effluent releases. The same variables that are used to provide direct indication and support the containment integrity critical safety function are: wide range containment pressure, containment isolation valve position, **containment water level**, and **inside bioshield area radiation monitor**.”*

Chapter 7, Table 7.1-7, “Summary of Type A, B, C, D, and E Variables,” Page 7.1-73, classifies Inside Bioshield Area Radiation Monitor and Containment Water Level as Type B variables. Inside Bioshield Area Radiation Monitor and Containment Water Level are not evaluated on the CI Safety Function flowchart and neither PAM variable is specified in Table 10-2, “List of General Technical Guidelines Decision Variables,” on Page 80 of TR-1117-5726. Given that Inside Bioshield Area Radiation Monitor and Containment Water Level are both identified by Chapter 7 as Type B variables *that are used to provide direct indication and support the containment integrity critical safety function*, NRC staff is questioning why these two variables are not utilized as decision variables on the CI Safety Function flowchart to determine whether the “Containment” Critical Safety Function (CSF) can be met.

## **INFORMATION NEEDED**

NRC staff requests that NuScale: (1) explain why, on the basis of Chapter 7 information provided above, Inside Bioshield Area Radiation Monitor and Containment Water Level (Post-Accident Monitoring Type B variables) have been excluded from the CI Safety Function flowchart as a means to assess and maintain the “Containment” CSF, and (2) make any necessary changes to technical report TR-1117-57216 and/or Chapter 7 of the DCD, to ensure the completeness and accuracy of the NuScale GTGs (flowcharts and basis) and Chapter 7 DCD Tier 2 information.

13.05.02.01-10

## **REGULATORY BASIS REQUIREMENTS**

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to “Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... “

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, “Clarification of TMI Action Plan

Requirements,” and NUREG-0737, Supplement 1, “Requirements for Emergency Response Capability,” which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, “Operating and Emergency Operating Procedures.” Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, “NuScale Generic Technical Guidelines,” for docketing.

## **ISSUE**

The following disparities/inconsistencies were identified with respect to the Post-Accident Monitoring (PAM) instrumentation variable information presented in Chapter 7 of the DCD and the NuScale GTG technical report, TR-1117-57216:

### Containment Isolation Valve (CIV) Position Indication:

1. Chapter 7, Table 7.1-7, “Summary of Type A, B, C, D, and E Variables,” Page 7.1-73, classifies all CIV Position Indication as PAM variable Types B, C, D.

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3. [[

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NRC staff is questioning why the PAM variable designation for Main Steam and Feedwater CIV Position Indication would be different from that of other CIVs.

## **INFORMATION NEEDED**

NRC staff requests that NuScale: (1) explain the PAM variable designation for Main Steam and Feedwater CIV Position Indication, and (2) make any necessary changes to technical report TR-1117-57216, to ensure the completeness and accuracy of the NuScale GTGs.

13.05.02.01-11

## **REGULATORY BASIS REQUIREMENTS**



Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to "Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... "

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1, "Requirements for Emergency Response Capability," which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, "Operating and Emergency Operating Procedures." Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, "NuScale Generic Technical Guidelines," for docketing.

## ISSUE

The following disparities/inconsistencies were identified with respect to the Post-Accident Monitoring (PAM) instrumentation variable information presented in Chapter 7 of the DCD and the NuScale GTG technical report, TR-1117-57216:

### RCS T<sub>HOT</sub>:

1. Chapter 7, Table 7.1-4, "Engineered Safety Feature Actuation System Functions," Pages 7.1-65 to 7.1-68, specifies Narrow Range (**NR**) **RCS T<sub>HOT</sub>** as an actuation parameter for the following ESF Functions:
  - Decay Heat Removal System (DHRS)
  - Demineralized Water System Isolation (DWSI)
2. Chapter 7, Table 7.1-7, "Summary of Type A, B, C, D, and E Variables," Page 7.1-73, specifies Wide Range (**WR**) **RCS T<sub>HOT</sub> only**. NR **RCS T<sub>HOT</sub>** is **not included** in the Table. Table 7.1-7 specifies PAM variable Type B for WR **RCS T<sub>HOT</sub>**.
3. Chapter 7, Section 7.1.1.2.2, "Post-Accident Monitoring," "Type B Variables," Remove Fuel Assembly Heat Critical Safety Function Variables," Pages 7.1-8/9, specifies **WR RCS T<sub>HOT</sub>** in the last line of the following paragraph:

*"The Type B variables selected that provide direct indication and verification and used to assess the process of accomplishing or maintaining the combined remove fuel assembly heat and RCS integrity critical safety functions are core exit*

*temperature, RPV riser water level, wide range RCS pressure, containment water level, degrees of subcooling, and **wide range RCS hot temperature.***"

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5. [[

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#### **INFORMATION NEEDED**

NRC staff requests that NuScale: (1) explain the disparities/inconsistencies associated with the specification of RCS T<sub>HOT</sub> instrumentation ranges identified in the above information, and (2) make any necessary changes to technical report TR-1117-57216 and/or Chapter 7 of the DCD, to ensure the completeness and accuracy of the NuScale GTGs and Chapter 7 DCD Tier 2 information.

13.05.02.01-12

#### **REGULATORY BASIS REQUIREMENTS**

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to "Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... "

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1, "Requirements for Emergency Response

Capability,” which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, “Operating and Emergency Operating Procedures.” Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, “NuScale Generic Technical Guidelines,” for docketing.

## ISSUE

The following disparities/inconsistencies were identified with respect to the Post-Accident Monitoring (PAM) instrumentation variable information presented in Chapter 7 of the DCD and the NuScale GTG technical report, TR-1117-57216:

### Containment Pressure:

1. Chapter 7, Table 7.1-4, “Engineered Safety Feature Actuation System Functions,” Pages 7.1-65 to 7.1-68, specifies Narrow Range **(NR) Containment Pressure** as an actuation parameter for the following ESF Functions:
  - Decay Heat Removal System (DHRS)
  - Containment System Isolation (CSI) Signal
  - Chemical and Volume Control System Isolation (CVCSI)
  - Demineralized Water System Isolation (DWSI)
2. Chapter 7, Table 7.1-7, “Summary of Type A, B, C, D, and E Variables,” Page 7.1-73, specifies Wide Range **(WR) Containment Pressure** only. NR Containment Pressure is **not included** in the Table. Table 7.1-7 specifies PAM variable Types B, C, D for WR Containment Pressure.
3. Chapter 7, Section 7.1.1.2.2, “Post-Accident Monitoring,” “Type B Variables,” “Maintain Containment Integrity Critical Safety Function Variables,” Pages 7.1-9, specifies **WR Containment Pressure** in the following paragraph:

*“Maintain Containment Integrity is both a critical safety function and a fission product barrier (Containment) which serves as the primary means to control radioactive effluent releases. The same variables that are used to provide direct indication and support the containment integrity critical safety function are: **wide range containment pressure**, containment isolation valve position, containment water level, and inside bioshield area radiation monitor.”*

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5. [[

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6. [[

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#### **INFORMATION NEEDED**

NRC staff requests that NuScale: (1) explain the disparities/inconsistencies associated with the specification of Containment Pressure instrumentation ranges identified in the above information, (2) explain the PAM variable designation of "N/A" for the Safety Function flowchart decision points identified in Items 4 and 5 above, and (3) make any necessary changes to technical report TR-1117-57216 and/or Chapter 7 of the DCD, to ensure the completeness and accuracy of the NuScale GTGs and Chapter 7 DCD Tier 2 information.

13.05.02.01-13

#### **REGULATORY BASIS REQUIREMENTS**

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to "Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... "

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1, "Requirements for Emergency Response

Capability,” which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, “Operating and Emergency Operating Procedures.” Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, “NuScale Generic Technical Guidelines,” for docketing.

## ISSUE

The following disparities/inconsistencies were identified with respect to the Post-Accident Monitoring (PAM) instrumentation variable information presented in Chapter 7 of the DCD and the NuScale GTG technical report, TR-1117-57216:

### Pressurizer Level:

1. Chapter 7, Table 7.1-7, “Summary of Type A, B, C, D, and E Variables,” Page 7.1-73, **does not** specify Pressurizer Level.

2. [[

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3. [[

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## INFORMATION NEEDED

NRC staff requests that NuScale: (1) explain the disparities/inconsistencies associated with the specification of Pressurizer Level and the associated PAM variable classifications identified in the above information, and (2) make any necessary changes to technical report TR-1117-57216 and/or Chapter 7 of the DCD, to ensure the completeness and accuracy of the NuScale GTGs and Chapter 7 DCD Tier 2 information.

13.05.02.01-14

## REGULATORY BASIS REQUIREMENTS

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to "Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... "

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1, "Requirements for Emergency Response Capability," which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, "Operating and Emergency Operating Procedures." Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, "NuScale Generic Technical Guidelines," for docketing.

## ISSUE

The following disparities/inconsistencies were identified with respect to the Post-Accident Monitoring (PAM) instrumentation variable information presented in Chapter 7 of the DCD and the NuScale GTG technical report, TR-1117-57216:

### Neutron Flux:

1. Chapter 7, Table 7.1-7, "Summary of Type A, B, C, D, and E Variables," Page 7.1-73, classifies Neutron Flux as PAM variable Types B and D.

2. **[[**

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3. NuScale DCD Tier 1, Table 2.5-5, "Safety Display and Indication System Accident Monitoring Variables," classifies Source, Intermediate, and Power Range indication

as PAM variable Type B only (Note: DCD Tier 1, Table 2.5-5, variable classifications are limited to Types B and C).

## **INFORMATION NEEDED**

NRC staff requests that NuScale: (1) explain the disparities/inconsistencies associated with classification of the PAM variable Type for Neutron Flux identified in the above information, and (2) make any necessary changes to technical report TR-1117-57216 and/or Chapter 7 of the DCD, to ensure the completeness and accuracy of the NuScale GTGs and Chapter 7 DCD Tier 2 information.

13.05.02.01-15

## **REGULATORY BASIS REQUIREMENTS**

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to "Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... "

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1, "Requirements for Emergency Response Capability," which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, "Operating and Emergency Operating Procedures." Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.

By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, "NuScale Generic Technical Guidelines," for docketing.

## **ISSUE**

The following disparities/inconsistencies were identified with respect to the Post-Accident Monitoring (PAM) instrumentation variable information presented in Chapter 7 of the DCD and the NuScale GTG technical report, TR-1117-57216:

Internal MPS Timer:

1. Chapter 7, Table 7.1-7, "Summary of Type A, B, C, D, and E Variables," Page 7.1-73, **does not** specify the Low Voltage AC Electrical Distribution System (ELVS) 24-Hour Internal MPS Timer.
2. []

]].

## INFORMATION NEEDED

NRC staff requests that NuScale: (1) explain the disparities/inconsistencies associated with specification of the Internal MPS Timer and the associated PAM variable classification identified in the above information, and (2) make any necessary changes to technical report TR-1117-57216 and/or Chapter 7 of the DCD, to ensure the completeness and accuracy of the NuScale GTGs and Chapter 7 DCD Tier 2 information.

13.05.02.01-16

## REGULATORY BASIS REQUIREMENTS

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 52.47(a)(8) requires an applicant for a design certification to provide an FSAR (Final Safety Analysis Report) which includes the information necessary to demonstrate compliance with any technically relevant portions of the Three Mile Island requirements set forth in 10 CFR 50.34(f), with certain exceptions. Section 10 CFR 50.34(f)(2)(ii) requires an applicant to "Establish a program, to begin during construction and follow into operation, for integrating and expanding current efforts to improve plant procedures. The scope of the program shall include emergency procedures, ... "

TMI Action Plan Item I.C.1, a Post-TMI requirement approved by the Commission for implementation, requires the preparation of emergency procedure technical guidelines for development of the Emergency Operating Procedures (EOPs). Preparation of the technical guidelines is conducted in accordance with NUREG-0737, "Clarification of TMI Action Plan Requirements," and NUREG-0737, Supplement 1, "Requirements for Emergency Response Capability," which also specify submittal of the technical guidelines to the NRC for review and approval.

Meeting the requirements of TMI Action Plan Item I.C.1 as prescribed in NUREG-0737, Section I.C.1, and Supplement 1 to NUREG-0737, Section 7, is acceptance criteria in SRP 13.5.2.1, "Operating and Emergency Operating Procedures." Design-specific Generic Technical Guidelines (GTGs), otherwise referred to as the Emergency Operating Guidelines (EOGs), will be used by COL applicants to develop their Plant-Specific Technical Guidelines (P-STGs), from which their EOPs will be developed, and are the responsibility of the DC applicant.



By letter dated November 30, 2017 (ADAMS Accession No. ML17334B822) NuScale submitted technical report TR-1117-57216, "NuScale Generic Technical Guidelines," for docketing.

## **ISSUE**

The Containment Integrity Safety Function flowchart in Section 5.1 of the NuScale GTGs depicts the logic and specifies the operator actions necessary to assess and maintain the Containment Integrity (CI) Safety Function. The CI Safety Function Bases discussion for decision point [[

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[[

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In addition, the Setpoint Basis paragraph on Page 29 discusses sensor capabilities for measuring hydrogen concentration, but does not provide a comparable discussion with respect to sensor capabilities for measuring oxygen concentration.

## **INFORMATION NEEDED**

NRC staff requests that NuScale: (1) explain omission of the "Containment H<sub>2</sub>" parameter from Table 10-2 of the GTGs, (2) explain the discrepancy noted in the Setpoint Basis paragraph associated with sensor capabilities for measuring oxygen concentration, and (3) make any necessary changes to technical report TR-1117-57216 to ensure the completeness and accuracy of the NuScale GTGs.