

## NuScaleDCRaisPEm Resource

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**Sent:** Friday, November 03, 2017 9:08 AM  
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**Cc:** NuScaleDCRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Lupold, Timothy; Tsirigotis, Alexander; Vera Amadiz, Marieliz  
**Subject:** Request for Additional Information No. 274 RAI No. 9137 (3.12)  
**Attachments:** Request for Additional Information No. 274 (eRAI No. 9137).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. 274 (eRAI No. 9137)**

Issue Date: 11/03/2017

Application Title: NuScale Standard Design Certification - 52-048

Operating Company: NuScale Power, LLC

Docket No. 52-048

Review Section: 03.12 - ASME Code Class 1, 2, and 3 Piping Systems and Piping Components and Their Associated Supports

Application Section: 3.12

### QUESTIONS

03.12-10

GDC 14 requires that the reactor coolant pressure boundary (RCPB) being designed, fabricated, constructed, and tested to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture. NRC Bulletin (BL) 88-08, "Thermal Stresses in Piping Connected to Reactor Cooling Systems," issued June 22, 1988, requests licensees to identify and evaluate the piping systems connected to the RCS susceptible to thermal stratification, cycling, and striping (TASCS) to ensure that the piping will not be subjected to unacceptable thermal stresses.

The operating experience described in the bulletin needs to be incorporated in the design in accordance with 10 CFR 52.47(a)(22). SRP Section 3.12 includes criteria related to this bulletin.

FSAR Tier 2, Section 3.12.5.7 shows that according to screening performed the NuScale piping systems connected to the RCS are not susceptible to TASCS. NuScale, piping systems connected to the RCS are not susceptible to TASCS. It is also stated that it used the screening criteria and evaluation methodology of EPRI TR-103581, "Thermal Stratification, Cycling, and Striping (TASCS)" dated July, 1999 to assess unisolable piping connected to RCS to identify TASCS in the NuScale design and that it also used as a supplement "Materials Reliability Program: Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines," EPRI TR-1011955, June 22, 2011.

EPRI TR-103581 was an earlier EPRI report to assist utilities in addressing BL 88-08. According to EPRI TR-1011955, earlier methodology was questionable primarily because it did not exactly predict the cycling location and loadings for the Farley Unit 2 Safety Injection line leak from a circumferential crack that occurred in 1987. EPRI TR-1011955 is an updated ongoing program that licensees and applicants customarily use to manage TASCS. EPRI TR-1011955 provides a model for predicting and evaluating thermal cycling for PWR stagnant lines. The EPRI TR-1011955 model has been shown through benchmarking results to be effective in predicting the location of thermal cycling in lines attached to the RCS.

The applicant is requested to show how its model for TASCS is consistent with the EPRI TR-1011955 model and to identify the differences and provide justifications.