NuScaleTRRaisPEm Resource

From:	Cranston, Gregory
Sent:	Sunday, January 28, 2018 4:46 PM
To:	RAI@nuscalepower.com
Cc:	NuScaleTRRaisPEm Resource; Lee, Samuel; Chowdhury, Prosanta; Lu, Shanlai; Karas, Rebecca; Schmidt, Jeffrey; Franovich, Rani
Subject:	Request for Additional Information Letter No. 9190 (eRAI No. 9190) Topical Report LOCA
Attachments:	Request for Additional Information No. 9190 (eRAI No. 9190).pdf

Attached please find NRC staff's request for additional information concerning review of the NuScale Topical Report.

Please submit your 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.

Hearing Identifier: NuScale_SMR_DC_TR_Public
Email Number: 69

Mail Envelope Properties (CY4PR09MB1287ACA8BC1423D893D1E8EE90E60)

Subject: Request for Additional Information Letter No. 9190 (eRAI No. 9190) Topical Report LOCA
Sent Date: 1/28/2018 4:46:12 PM
Received Date: 1/28/2018 4:46:19 PM
From: Cranston, Gregory

Created By: Gregory.Cranston@nrc.gov

Recipients:
"NuScaleTRRaisPEm Resource" <NuScaleTRRaisPEm.Resource@nrc.gov>
Tracking Status: None
"Lee, Samuel" <Samuel.Lee@nrc.gov>
Tracking Status: None
"Chowdhury, Prosanta" <Prosanta.Chowdhury@nrc.gov>
Tracking Status: None
"Lu, Shanlai" <Shanlai.Lu@nrc.gov>
Tracking Status: None
"Karas, Rebecca" <Rebecca.Karas@nrc.gov>
Tracking Status: None
"Schmidt, Jeffrey" <Jeffrey.Schmidt2@nrc.gov>
Tracking Status: None
"Franovich, Rani" <Rani.Franovich@nrc.gov>
Tracking Status: None
"RAI@nuscalepower.com" <RAI@nuscalepower.com>
Tracking Status: None

Post Office: CY4PR09MB1287.namprd09.prod.outlook.com

Files	**Size**	**Date & Time**
MESSAGE	301	1/28/2018 4:46:19 PM
Request for Additional Information No. 9190 (eRAI No. 9190).pdf	42401	

Options
Priority: Standard
Return Notification: No
Reply Requested: No
Sensitivity: Normal
Expiration Date:
Recipients Received:

Request for Additional Information No. 9190 (eRAI No. 9190)

Issue Date: 01/28/2018
Application Title: NuScale Topical Report
Operating Company: NuScale
Docket No. PROJ0769
Review Section: 15.06.05 - Loss of Coolant Accidents Resulting From Spectrum of Postulated Piping Breaks Within the Reactor Coolant Pressure Boundary
Application Section: Section 5 of LOCA TR

QUESTIONS

15.06.05-11

Title 10, Part 50, of the Code of Federal Regulations (10 CFR Part 50), "Domestic Licensing of Production and Utilization Facilities," Section 50.34, "Contents of Applications; Technical Information" (10 CFR 50.34), specifies the safety analysis reports must analyze the design and performance of structures, systems, and components, and their adequacy for the prevention of accidents and mitigation of the consequences of accidents. Regulatory Guide 1.203 describes a process that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable for use in developing and assessing evaluation models (EMs) that may be used to analyze transient and accident behavior that is within the design basis of a nuclear power plant.

As stated in RG 1.203, an EM is the calculational framework for evaluating the behavior of the reactor system during a postulated transient or design-basis accident. As such, the EM may include one or more computer programs, special models, and all other information needed to apply the calculational framework to a specific event, as illustrated by the following examples:
(1) Procedures for treating the input and output information (particularly the code input arising from the plant geometry and the assumed plant state at transient initiation)
(2) Specification of those portions of the analysis not included in the computer programs for which alternative approaches are used
(3) All other information needed to specify the calculational procedure

The entirety of an EM ultimately determines whether the results are in compliance with applicable regulations. Therefore, the development, assessment, and review processes must consider the entire EM.

The applicant performed two types of tests to assess the new Helical Coil Steam Generator (HCSG) model added to NRELAP5: (1) NCI-0315-12869, Add Helical Coil Component (May 2015), documents the new HCOIL component added to NRELAP5 for calculating heat transfer to the secondary coolant inside the HCSG tubes and compares this new component to the SIET TF-1 tests, and (2) EC-T050-3638, Assessment of NRELAP5 using SIET Fluid Heated Facility (TF-2) data (November 2015) documents the comparison of the HCOIL component against heated tube bundle tests. NCI-0916-51421, Correct Heat Transfer Coefficient for HCSG (November 2016) documents the correction for an error identified by the applicant in equations 14 and 15 for calculating the laminar HTC as shown in NCI-0315-12869. The incorrect HTC equation was corrected in the NRELAP5 code. However, the applicant did not provide an assessment of the impact of this error on the analyses and data comparisons shown in NCI-0315-12869 or EC-T050-3638 and the initial coolant stored energy.

Provide a comparison between the heat transfer coefficients for the HCSG calculated with the incorrect equations 14 and 15 of NCI-0315-12869 versus the corrected HTC equations as shown in NCI-0916-51421. Justify how the in-vessel initial coolant stored energy predicted by NRELAP-5 code remains conservative.