

July 9, 2020

Docket No. PROJ0769

U.S. Nuclear Regulatory Commission
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SUBJECT: NuScale Power, LLC Submittal of Presentation Materials Entitled “Pre-Application Presentation: NuScale’s Model-Based IV&V Using the Automated Test system (ATS),” PM-0720-70894, Revision 0

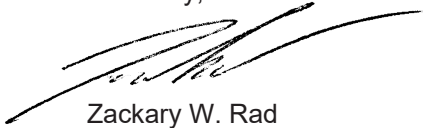
NuScale Power, LLC (NuScale) has requested a meeting with the NRC technical staff on July 15, 2020, to discuss the NuScale model-based independent verification and validation (IV&V) ATS. The purpose of this submittal is to provide presentation materials to the NRC for use during this meeting.

The enclosure to this letter is the nonproprietary presentation entitled “Pre-Application Presentation: NuScale’s Model-Based IV&V Using the Automated Test system (ATS).”

This letter makes no regulatory commitments and no revisions to any existing regulatory commitments.

If you have any questions, please contact John Fields at 541-452-7425 or at JFields@nuscalepower.com.

Sincerely,



Zackary W. Rad
Director, Regulatory Affairs
NuScale Power, LLC

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Enclosure: “Pre-Application Presentation: NuScale’s Model-Based IV&V Using the Automated Test System (ATS),” PM-0720-70894, Revision 0

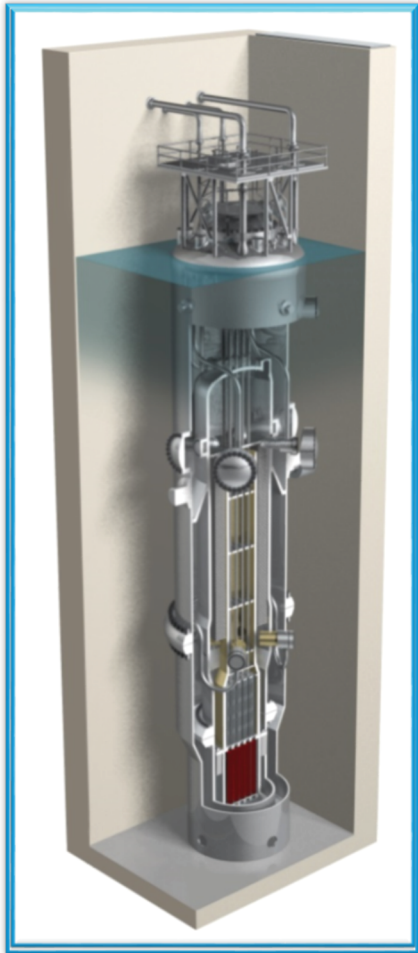
Enclosure:

“Pre-Application Presentation: NuScale’s Model-Based IV&V Using the Automated Test System (ATS),”
PM-0720-70894, Revision 0

Pre-Application Presentation

NuScale's Model-Based IV&V Using the Automated Test System (ATS)

July 15, 2020



Presenters

John Fields

Licensing Project Manager

John Marking

Licensing Topical Report Author

Jorge Bermudez

Model-based Subject Matter Expert

Agenda

- Open Session
 - Introductions / Presenters
 - Overview of ATS Topical Report and Plans
 - Objective of Meeting
- Closed Session
 - Overview of ATS Methodology in Development Lifecycle
 - Tool Selection, Qualification, and Control
 - Model Development and Verification
 - Topical Report Plan and Schedule
 - Summary and Closing

ATS Topical Report Plan

- Topical Report to request approval for Use of ATS Methodology and Models in Safety-Related I&C System Development Lifecycle
 - Approval of Use of ATS Methodology in IEEE Std 1012 Verification and Validation Tasks
 - Approval of ATS Tool Selection, Qualification, and Control processes
- NuScale will also incorporate insights and feedback from pre-application meetings
- Submittal of the ATS Topical Report in November 2020
- Request NRC approval by November 2021

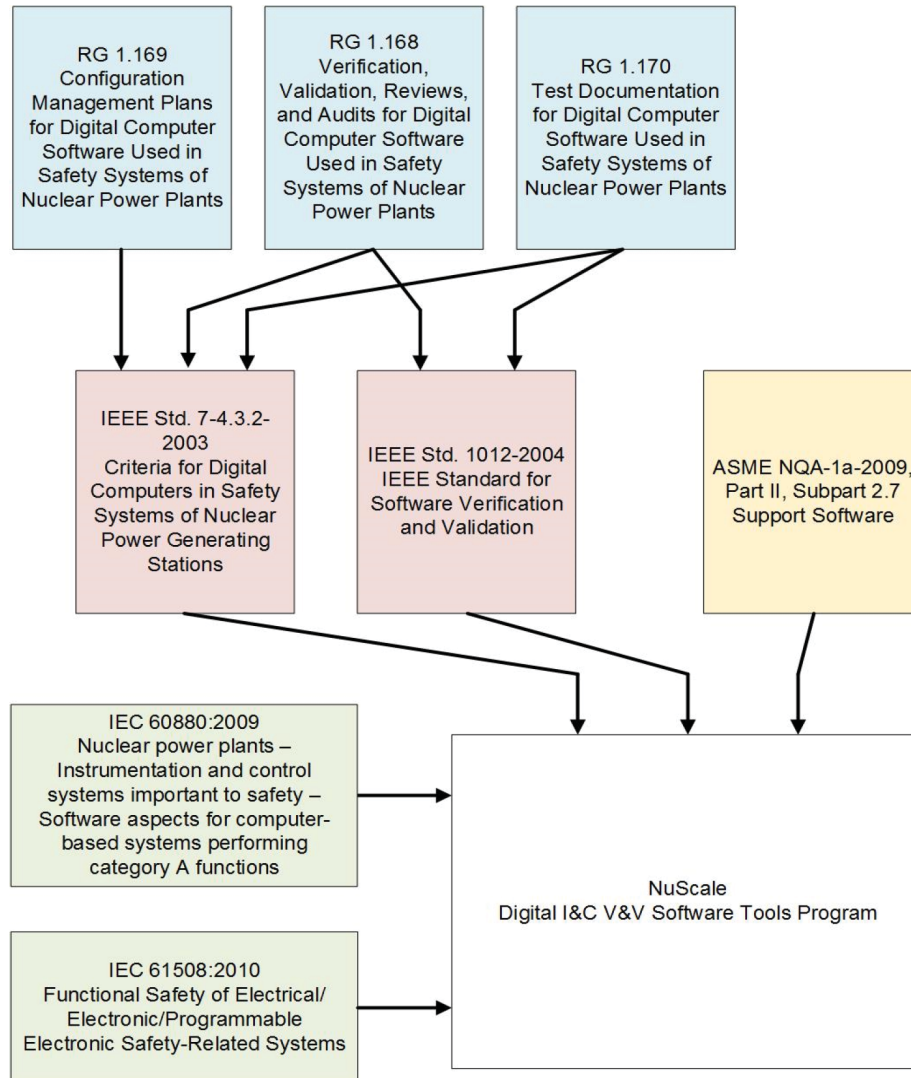
Objective of Meeting

- Provide Overview of ATS Topical Report and Plans to support NRC planning for review
- Describe ATS Methodology and Planned Use in Safety-Related I&C Systems Development Lifecycles
- Describe ATS Tool Selection, Qualification, and Control Processes
- Describe Model Development and Verification for Use in Verification and Validation Testing
- Obtain Feedback from NRC on ATS Methodology and Topical Report Plans

Scope of ATS Topical Report

- Describe *ATS Tools and Methodology* to support NRC review for approval of simulation and target testing of safety-related I&C systems throughout development lifecycle to satisfy IEEE Std 1012 requirements
- Simulation Test Mode
 - Concept Phase
 - Requirements Phase
 - Design Phase
- Target Test Mode
 - Implementation
 - Test
 - Installation and checkout
- Describe ATS Tool Selection, Qualification, and Control processes to support NRC review for approval

Regulatory Alignment for ATS Tool



NRC Endorsed Guidance

- Regulatory Guides point to IEEE 7-4.3.2-2003 and IEEE 1012-2004 for V&V Tool Requirements
- ASME NQA-1a-2009 requirements for software tools also applies

Other Standards Used for Further Software Tool Guidance

- IEC 60880:2006
- IEC 61508:2010
- IEEE 7-4.3.2-2016

Reduce Project Development Risks

- ATS Methodology supports project development risk reduction consistent with IEEE Std 1012 by:
 - Finding and fixing errors early in the lifecycle
 - Providing independent comparison of actual and expected results
 - Leveling testing work throughout development lifecycle, which builds test team knowledge of project and reducing error likely situations in test phase
 - Using *Requirements Models* supports better analysis of requirements
 - Using *Models* to enable more extensive and consistent testing throughout the lifecycle
 - Allowing for early testing of vendor design using proven simulation tools

Reasons for ATS Methodology and Topical Report

Benefits

- Facilitates desktop simulation testing to find and fix errors early in lifecycle
- Build models that are readable and easily traceable
- Provides methods of automation for documentation, traceability and testing
- Faster turnaround time
- Multi-function and scalable tool
- Reusable models and test cases
- Reduces human error potential

Mitigate Regulatory Risks

- Adaptations of typical IEEE Std 1012 tasks for FPGA technology and ATS methodology
- Acceptability of tool qualification and controls for use
- Acceptability of model development methodology
- Provide efficiency and effectiveness for safety-related I&C system ITAAC implementation

Acronyms

ASME	American Society of Mechanical Engineers
ATS	Automated Test System
DUT	Device under test
FPGA	Field Programmable Gate Array
HDL	Hardware Descriptive Language
I/O	Input / Output
I&C	Instrumentation and Control
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers
NRC	Nuclear Regulatory Commission
RG	Regulatory Guide
RTL	Register Transfer Level
IV&V	Independent Verification and Validation

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