

Safety Analysis Codes and Methods



Dr. Kent Welter
Senior Safety Analysis Manager

October 2011



Background

- Submitted description of Codes and Methods to NRC (Nov. 2008)
- Pre-app meeting on GOTHIC 8.0 for systems thermal-hydraulics (Dec. 2010)
- NuScale is using a well-established suite of safety analysis codes
- Some code applications are unique (e.g. GOTHIC 8.0)
- Minor code modifications required (e.g. helical coil steam generator heat transfer models)
- Experimental programs focused on confirmation of integral system performance and design-specific components

Principle Safety Analysis Codes

- RADTRAD for radiological consequence analysis
- MCNP for criticality benchmarks
- GOTHIC 8.0 for system transient evaluations
- GOTHIC 8.0 for containment pressure and temperature response
- CASMO5 and SIMULATE5 for core neutronic analysis
- SCANR for thermal margin (based on COBRA), and fuel performance analysis (based on FRAPCON)
- Studsvik S3K for 3D kinetics analysis
- LISNR for analyzing primary system linear stability

Issues

- NRC familiarization and early alignment of new codes and applications
- Schedule considerations for NRC approval of V&V for codes and methods
 - NRC resources to support early review of submittals.
 - Impact on review schedule due to receiving substantial feedback at a late stage of DCA review.

Pre-Application Outcomes

- Familiarize NRC with safety analysis codes and methods used as part of DCA
- NRC feedback on adequacy of V&V program for codes and methods
- NRC feedback on schedule of submittals

Pre-Application Engagement

- Presentation
 - Overview of codes and methods
 - Overview of V&V program
 - Submittal schedule
- Workshop on LOCA PIRT preliminary technical report
- Submit preliminary technical report - Safety Analysis Methods Integration
- Submission of selected technical reports on V&V of codes and methods