



Identification of Proposed Pre-Application Topical Areas



Dr. José N. Reyes, Jr.
Chief Technical Officer
NuScale Power Inc.

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Outline

- Online Refueling
- Multi-Module Digital I&C and Operations Staffing
- Multi-Module PRA
- Severe Accidents
- Dose Calculations and Emergency Planning
- Codes and Methods



Online Refueling

- Unique NuScale Design Features
 - Individual modules can be taken offline and refueled while other modules continue to operate
 - Containment and reactor are moved to refueling bay
- Key Elements to Address in Topical Report
 - Refueling process and its applicability to existing regulations
 - Decay heat removal system performance
 - Staffing and training



Multi-Module Digital I&C and Operations Staffing

- Unique NuScale Design Features
 - One operator for multiple units
 - Early notification of approach to safety setpoints
 - Automatic safety system actuation
- Key Elements to Address in Topical Report
 - Description of technical bases for 50.54(m) exemption request (NUREG-1791)
 - Integration of human performance data
 - Simulator design and testing program



Multi-Module PRA

- Unique NuScale Design Features
 - Multiple, physically separate 150 MWt power modules
 - Passive safety systems
 - Additional fission product barriers
 - Common cause failures leading to core damage reduced by physical separation and no sharing of safety systems
- Key Elements to Address in Topical Report
 - Multi-module common mode failures (e.g., loss-of-offsite power, fires, floods, etc.)
 - Dominant accident sequences (Level I and II PRA results) for single and multiple units
 - Passive safety system performance/reliability
 - Data quality and applicability



Severe Accidents

- Unique NuScale Design Features
 - Low power core
 - No reactor vessel insulation
 - Evacuated steel containment
 - Passive safety systems
- Key Elements to Address in Topical Report
 - Compliance to existing NRC regulations and Commission policy statements
 - In-vessel retention/ex-vessel cooling strategy
 - No need for combustible gas control in containment



Dose Calculations and Emergency Planning

- Unique NuScale Design Features
 - Small source term, ~5% of a 3000 MWt PWR
 - Additional fission product barriers (e.g., Containment Cooling Pool water, impact/biological shield, reactor building)
 - Severe accidents leading to a larger source term would require multiple simultaneous failures in more than one module
- Key Elements to Address in Topical Report
 - Applicability of existing source term guidance
 - Determination of offsite doses under severe conditions to be used for emergency planning
 - Level II Multi-Module PRA results



Codes and Methods

- Unique NuScale Design Features
 - Small, half-height core
 - Natural circulation under normal operation
 - Passive safety systems
- Key Elements to Address in Topical Report
 - Safety analysis calculational framework
 - Experimental programs and applicability of existing LWR benchmark data
 - Selection of computer codes
 - Verification and validation plans
 - Phenomenon Identification and Ranking Table Results



Proposed Pre-Application Schedule

	FY2008	FY2009		
	4Q	1Q	2Q	3Q
1st Meeting <ul style="list-style-type: none"> NuScale and Design Introduction 	▼			
Submit Design Description Report		▼		
2nd Meeting <ul style="list-style-type: none"> Codes and Methods Topical Report 		▼		
3rd Meeting <ul style="list-style-type: none"> Online Refueling Topical Report Multi-Module I&C and Operations Staffing Topical Report 			▼	
4th Meeting <ul style="list-style-type: none"> Multi-Module PRA Topical Report Severe Accidents Topical Report Dose Calculations and Emergency Planning Topical Report 				▼

