

Concept of Operations and Control Room Operator Staffing



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Background

- 10 CFR 50.54(m) does not address NuScale's concept of operations and control room staffing.
- NRC expressed interest in pre-application activities with respect to control room analysis and design.
- "Staff" consists of both human and automated agents for operating a 12-module NuScale nuclear power plant.
 - Small size of each of the reactors
 - Natural circulation in primary coolant
 - State of the art I&C
 - Better understanding of human control of automation
- NUREG-0711 outlines 12 different HFE implementation plans as part of an HFE program.
- NUREG-1791 lists areas of review for an exemption request from 10 CFR 50.54(m).

NUREG-0711 & NUREG-1791

HFE Technical Elements (NUREG-0711)	Exemption Request (NUREG-1791)
	Exemption Scope Statement
Operating Experience Review (OER)	Operational Experience
Functional Requirements Analysis & Function Allocation (FRA & FA)	Functional Requirements Analysis & Function Allocation (FRA & FA) Operational Conditions
Task Analysis (TA)	Task Analysis (TA)
Staffing & Qualifications (S&Q)	Job Definitions Staffing Plan Optional Additional Data
Human Reliability Analysis (HRA)	Optional Additional Data
Human-System Interface Design (HSI)	Concept of Operations Optional Additional Data
Procedure Development	Optional Additional Data
Training Program Development	Optional Additional Data
Human Factors Verification & Validation (V&V)	Staffing Plan Validation
Design Implementation	
Human Performance Monitoring	

Issues

- 10 CFR 50.54(m) does not address
 - Number of reactors controlled in a single control room (more than 2 per control room)
 - Multiple reactors monitored and controlled by one reactor operator
- Plan to develop content and show design adequacy to support an exemption from 10 CFR 50.54(m) using NUREG-1791 guidance

Pre-Application Outcomes

- Scope and level of detail feedback on NUREG-0711 HFE program plans
- Obtain NRC feedback on concept of operations and staffing concept
- Confirm the level of pre-application workshop engagement NRC would like in developing NUREG-1791 supporting information

Pre-Application Engagement

- White paper describing concept of operations, i.e. multi-module control and staffing concept
- Presentation of white paper and discussion of NRC feedback
- HFE program feedback
 - HFE Program Implementation Plan – submitted
 - Analysis Phase Implementation Plan – submitted
 - Design Phase Implementation Plan
 - HFE V&V Implementation Plan
 - HFE Implementation Plan
- Workshop(s) for review of content and design basis of material supporting concept of operations and staffing concept