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## **NRC Meeting:** Control Room Staffing (10 CFR 50.54(m))



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# Meeting Agenda

- Introductions
- Purpose & Outcome
- References
- 10 CFR 50.54 Regulation and SMR-160 Approach
- Discussion of Multi-Unit Simulation Requirements
- Discussion of Part 50 Exemption Submittal Process
- Open Forum

## Purpose and Outcome

### ■ PURPOSE

- To provide a high-level overview of the exemption path for 10 CFR 50.54(m).

### ■ OUTCOME

- To obtain feedback from the NRC staff on the exemption plan for the SMR-160 Control Room staffing.

## References

- 10 CFR 50.54
- NUREG-0800 Ch. 18
- NUREG-0711
- NUREG-1791
- NUREG/CR-6838
- SECY-11-0098
- NEI Position Paper “Control Room Staffing for Small Reactors,” 2001

# Current 10 CFR 50.54(m) Regulation



(i) Each licensee shall meet the minimum licensed operator staffing requirements in the following table:

Minimum Requirements<sup>1</sup> Per Shift for On-Site Staffing of Nuclear Power Units by Operators and Senior Operators Licensed Under 10 CFR Part 55

Number of nuclear power units operating <sup>2</sup>	Position	One Unit	Two units		Three units	
		One control room	One control room	Two control rooms	Two control rooms	Three control rooms
None	Senior Operator	1	1	1	1	1
	Operator	1	2	2	3	3
One	Senior Operator	2	2	2	2	2
	Operator	2	3	3	4	4
Two	Senior Operator		2	3	<sup>3</sup> 3	3
	Operator		3	4	<sup>3</sup> 5	5
Three	Senior Operator				3	4
	Operator				5	6

<sup>1</sup>Temporary deviations from the numbers required by this table shall be in accordance with criteria established in the unit's technical specifications.

<sup>2</sup>For the purpose of this table, a nuclear power unit is considered to be operating when it is in a mode other than cold shutdown or refueling as defined by the unit's technical specifications.

<sup>3</sup>The number of required licensed personnel when the operating nuclear power units are controlled from a common control room are two senior operators and four operators.



## SMR-160 Key Attributes

- Passive safety systems
- No credited operator actions during DBAs
- Minimum important human actions (IHAs) expected
  - No PSA-determined IHAs at this time
- Advanced digital system for automated controls reducing licensed operator workload
- Computer-based procedures
- Up to four units monitored from one Control Room

## Initial Staffing Levels

- Based on preliminary analysis on the SMR-160 control scheme from MELCO, JEXK-0135-1019, “System Requirements Specification for Human-System Interface System,” a [[  
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- Initial staffing level goals and staffing roles and responsibilities will be evaluated and modified.
  - iterative process through the SMR-160 design change control process, through the human engineering discrepancy (HED) process, and as information from other HFE elements and S&Q analyses, evaluations, and tests becomes available.

# SMR-160 Anticipated Staffing Levels



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## Task Analysis Approach

- NUREG-0800 Chapter 18 describes the methodology of assessing minimum staffing levels in Appendix B that is rooted in task analysis. It continues to state 5 to 10 scenarios should be sufficient provided they define a set of highest-workload conditions.
- SECY-11-0098 states that identifying these tasks is a major challenge and plans to update guidance in NUREG-0711 to better prescribe the scope of tasks the staff would expect in a thorough task analysis.
- Holtec intends to follow the general guidance to cover multiple operating conditions paired with the outcomes of FRA/FA, TA, and PRA-assisted workload cases.

## Discussion of Multi-Unit Simulation Requirements



- The SMR-160 simulator, at the time submitted for declaration as an approved simulator for operator training, licensing and reactivity manipulations, will represent a multi-unit control room. Minimum staffing validation will contain multi-unit scenarios for work-load evaluation.
- Question: Is there guidance on the scope of multi-unit simulation required for (1) minimum staff validation and (2) operating initial licensing?

## Process for 10 CFR 50.54(m) Exemption Request



- The HFE process continues with submittals of Result Summary Reports (RSRs) for the Operator License Application. The RSRs are not planned to be available by the CPA but would form part of the 10 CFR 50.54(m) exemption justification.
- Question: What are the expectations from the NRC regarding content in the CPA supporting an exemption request given 10 CFR 50.54(m) details licensing conditions for the operating license?

## Discussion on 10 CFR 50.54 Exemption Request



- NUREG-1791 depicts an 11-step approach for determining the acceptability of an exemption request from 10 CFR 50.54(m). Part of this approach incorporates review of HFE milestone, including Operating Experience Review, Functional Requirements Analysis/Function Allocation, and Task Analysis.
- Question: Are the Result Summary Reports sufficient justification or shall the exemption request contain portions of each report itself that supports the minimum staffing analysis?

# Open Forum





## Backup Slides

