

**Enclosure 2:**

ACRS Presentation, "Safety Classification of Passive Nuclear Power Plant Electrical Systems," PM-0317-53444, Revision 0, nonproprietary version

# ACRS Presentation: Topical Report Overview

Open Session

TR-0815-16497

## Safety Classification of Passive Nuclear Power Plant Electrical Systems

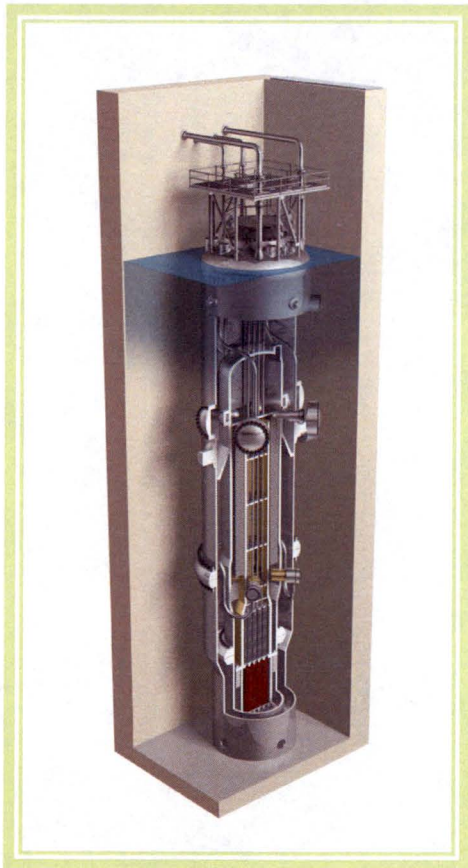
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# Acknowledgement and Disclaimer

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# Abbreviations

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- GDC – general design criteria
- IEEE – Institute of Electrical and Electronics Engineers
- RG – regulatory guide



# Purpose

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- To provide an overview of topical report, Safety Classification of Passive Nuclear Power Plant Electrical Systems (TR-0815-16497)
  - regulatory requirements
  - conditions of applicability

# Topical Report

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- Purpose

Request Nuclear Regulatory Commission (NRC) review and approval of what are termed as “conditions of applicability,” and the methodology and bases used in their development

- Scope

The conditions of applicability and augmented provisions for which NRC review and approval are sought via this topical report are specific to the safety classification of reactor plant electrical systems, as follows:

- off-site and on-site alternating current (AC) electrical power systems
- on-site direct current (DC) electrical power systems

- Not in scope

- instrumentation and control (I&C) equipment and circuits



# Regulatory Requirements

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- The existing regulatory requirements
  - GDCs—many apply since this concept involves the entire plant design (not just electrical)
  - IEEE Std. 603, IEEE Std. 308 (IEEE Std. 946), RG 1.32, RG 1.81, IEEE Std. 497, RG 1.97
- The plant design must support the concept of no electrical energy to accomplish any safety-related functions
- The plant safety analysis must support the safety classification
- The plant design must support and confirm those functions that use electrical energy to accomplish required functions

# Definition of Class 1E

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- Regulatory definition of Class 1E
  - Class 1E

*The safety classification of the electric equipment and systems that are essential to emergency reactor shutdown, containment isolation, reactor core cooling, and containment and reactor heat removal or that are otherwise essential in preventing significant release of radioactive material to the environment.\**

*\*Class 1E is a functional term. Equipment and systems are to be classified Class 1E only if they fulfill the functions listed in the definition. Identification of systems or equipment as Class 1E based on anything other than their function is an improper use of the term and should be avoided.*

--IEEE Std. 308-2001, as endorsed by RG 1.32, Revision 3



# Definition of Safety Function

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- Regulatory definition of Safety Function

- *Safety function*

*One of the processes or conditions (e.g., emergency negative reactivity insertion, post-accident heat removal, emergency core cooling, post-accident radioactivity removal, containment isolation) essential to maintain plant parameters within acceptable limits established for a design basis event. \*\**

*\*\*A safety function is achieved by the completion of all required protective actions by the reactor trip system and the engineered safety features, or both, concurrent with the completion of all required protective actions by the auxiliary supporting features.*

--IEEE Std. 308-2001, as endorsed by RG 1.32, Revision 3

# Topical Report Summary

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- This topical report
  - presents a structured review of the regulatory requirements associated with classification of electrical systems in a nuclear power plant.
  - presents a structured methodology that may be used to determine that Class 1E power is not required.
  - furthers the design of nuclear power plants in a manner that enhances nuclear safety and utilizes lessons learned from the Fukushima event.
- The conditions of applicability are deemed proprietary and will be discussed in further detail in the closed session.





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