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Methodology: Graded Approach Criteria for Improving Certificate of Compliance and Technical Specification

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Purpose of Workshop

Develop alignment on the criteria for determining what considerations and specifications need not be in Certificate of Compliance (CoC) and technical specifications (TS) for dry storage systems (DSS).

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Outline

1. Requirements for safe dry storage of spent fuel
2. Regulatory requirement for certificate of compliance (CoC) and technical specification (TS)
3. Proposed criteria for evaluating conditions and specifications in CoC and TS

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Requirements for safe dry storage of spent fuel

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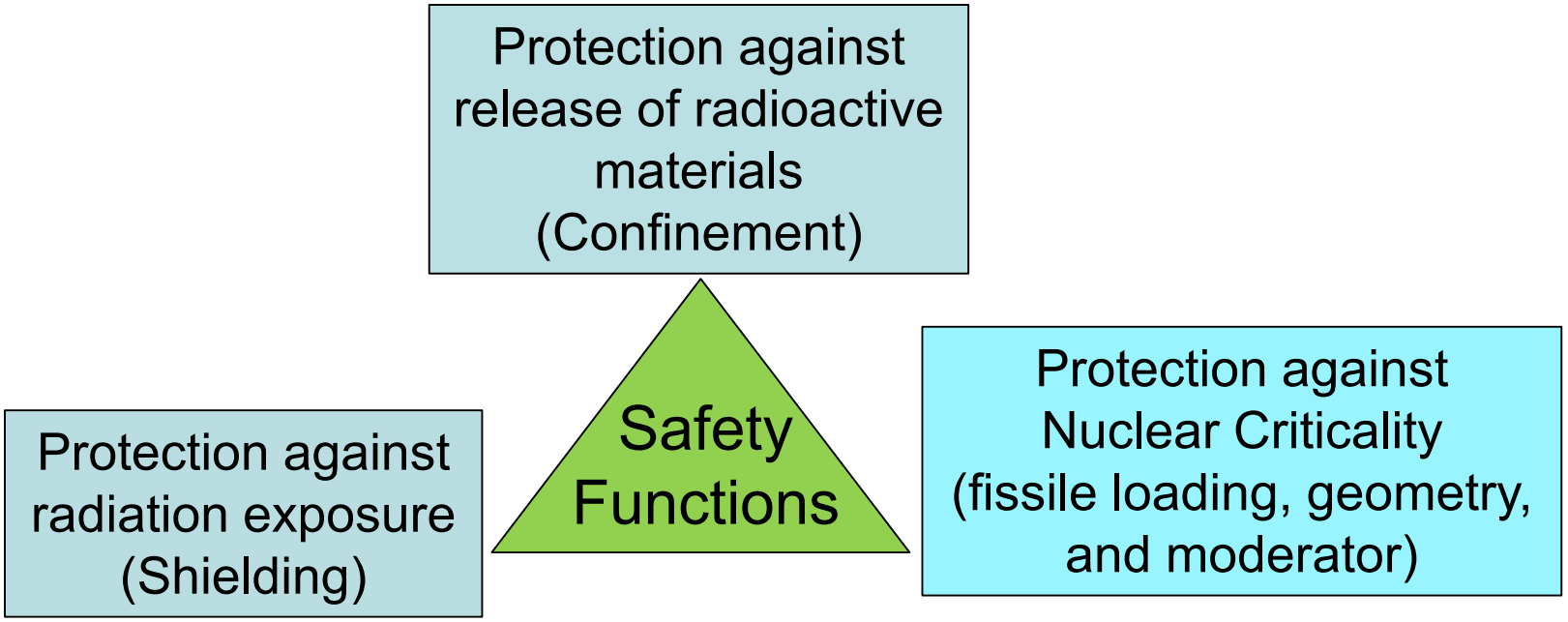
Dry Storage System Safety Functions



Defense-in-Depth

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- Level 1 - Prevention
  - Prevent criticality
  - Prevent radioactive material release
  - Provide shielding to limit radiation exposure
- Level 2 - Mitigation
  - Monitor and assess degradation
  - Perform remedial action
  - Perform repair
- Level 3 - Emergency Actions
  - Accident detection/assessment
  - Notification
  - Protective response

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Regulatory requirement for certificate of compliance (CoC) and technical specification (TS)

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Key Regulatory Requirement in Part 72 for CoC and TS

10 CFR 72.26 Contents of application: Technical specifications.

10 CFR 72.44 License condition.

10 CFR 72.122 Overall requirements.

10 CFR 72.236 Specific requirements for spent fuel storage cask approval and fabrication.

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Guidance Documents for Licensing Activities

- NUREG-1745, Standard Format and Content for Technical Specifications for 10 CFR Part 72 Cask Certificates of Compliance
- NUREG-1536, Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility

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Criteria for Evaluating What is Not Necessary in CoC and TS

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Six Criteria for Grading

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Safety Functions

1. Provide confinement
2. Provide radiation shielding
3. Prevent criticality

Risk Insights

1. Frequency of initiating events
2. Likelihood of reduced safety function
3. Consequence to public health and safety

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Approach for Evaluating What to Include in CoC and TS

- Grading the conditions and specifications against criteria based on safety functions and risk insights from available probabilistic risk assessments (PRA)s.
- Evaluation has to communicate risk insight along with deterministic evaluation to support decisions.

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Risk Insight

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- What can happen?
  - Initiating events (IE) identified by the existing PRAs.
- How likely is it?
  - The likelihood that an IE causes loss of a safety function.
- What are the Consequence?
  - Impact on public health and safety.

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Graded Approach for Evaluating Conditions and Specifications

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	Safety Functions Criteria			Risk Insights Criteria			Result of Evaluation
Specifications	Confine-ment	Prevent Criticality	Shielding	Impact on Frequency of Initiating Event	Impact on Likeli-hood of DSS Failure	Impact on Consequence Of DBA	
1.1.1 DSC Helium backfill pressure	X (Could impact fuel cladding as a barrier to release)			None	None	Yes (Possible loss of cladding as a second barrier.)	Stay
5.2.1 10 CFR 72.48 Evaluation Program				None	None	None	Not Stay
4.3.1 Storage Configuration			**X**	None	**Yes** (Impact likelihood of HSM failure)	None	Stay

References

- Code of Federal Regulations, Title 10, Part 72 – Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste.
- NUREG-1536, Standard Review Plan for Spent Fuel Dry Storage Systems at a General License Facility
- NUREG-1745, Standard Format and Content for Technical Specifications for 10 CFR Part 72 Cask Certificates of Compliance
- NUREG-1864, a PILOT Probabilistic Risk Assessment of a Dry Cask Storage System at a Nuclear Power Plant
- Probabilistic Risk Assessment (PRA) of Bolted Storage Casks: Updated Quantification and Analysis Report, EPRI, Palo Alto, CA: 2004. 1009691.