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Overview of T/H Code Benchmarking and Validation for Industrial Application

DOE NEUP FHR IRP Benchmark Workshop
T/H Working Group
April 14-15, 2016

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Our vision is to be the
first to innovate the next
technology, practice or solution that helps us help customers generate safer, cleaner, more reliable energy for more people and a better planet.

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Outline

- Roles of T/H in Reactor Design
- Requirements for Licensing & Industrial Application
- Recommendation on FHR Code V&V and Benchmark

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Roles of T/H in Reactor Design

- Reactor Performance – Provides effective and economical heat removal from nuclear fuel elements and energy transport

- Reactor Safety – Define limits through "Defense in Depth"
  - Accident analyses and mitigation
  - Regulatory compliance (licensing)
  - Adequate margins retained in meeting regulatory, design and operating limits

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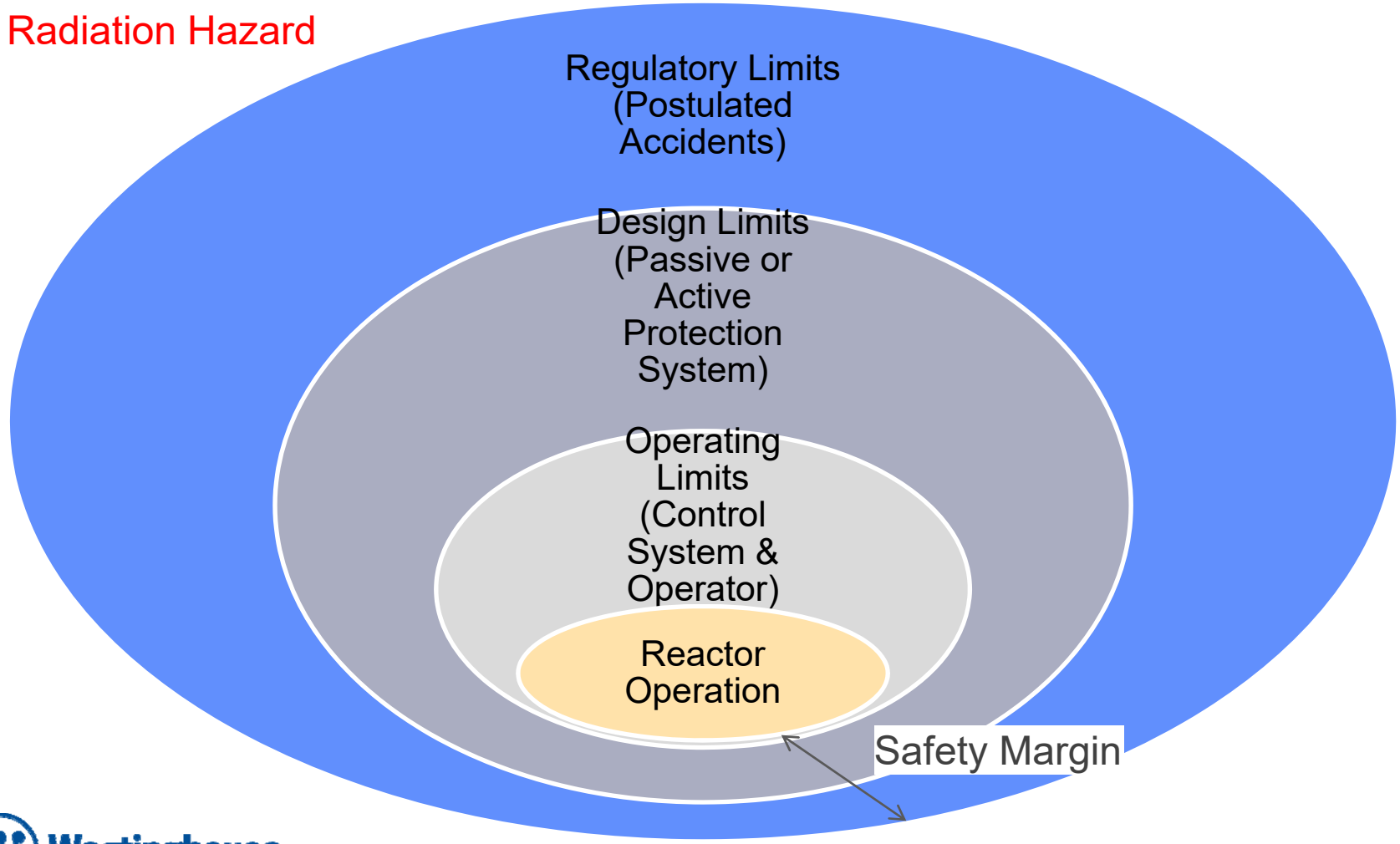
Reactor Safety - Defense in Depth



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Requirements for Licensing & Industrial Application

- Benchmark and validation dependent on test data
  - Single physics components
  - Multi-physics components
  - Scaled prototypes

- Quality Assurance (QA) requirements for commercialization and licensing
  - 10 CFR 50 Appendix B

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Recommendation for FHR Tests & Code Validation

- Consider elements of QA requirements for future commercialization and licensing
  - Traceability (e.g., validation database)
  - Reproducibility (sufficient documentation)
  - Peer review (among students)

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