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Protecting People and the Environment

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**The Role of Safety Margins In
Licensing Calculations**

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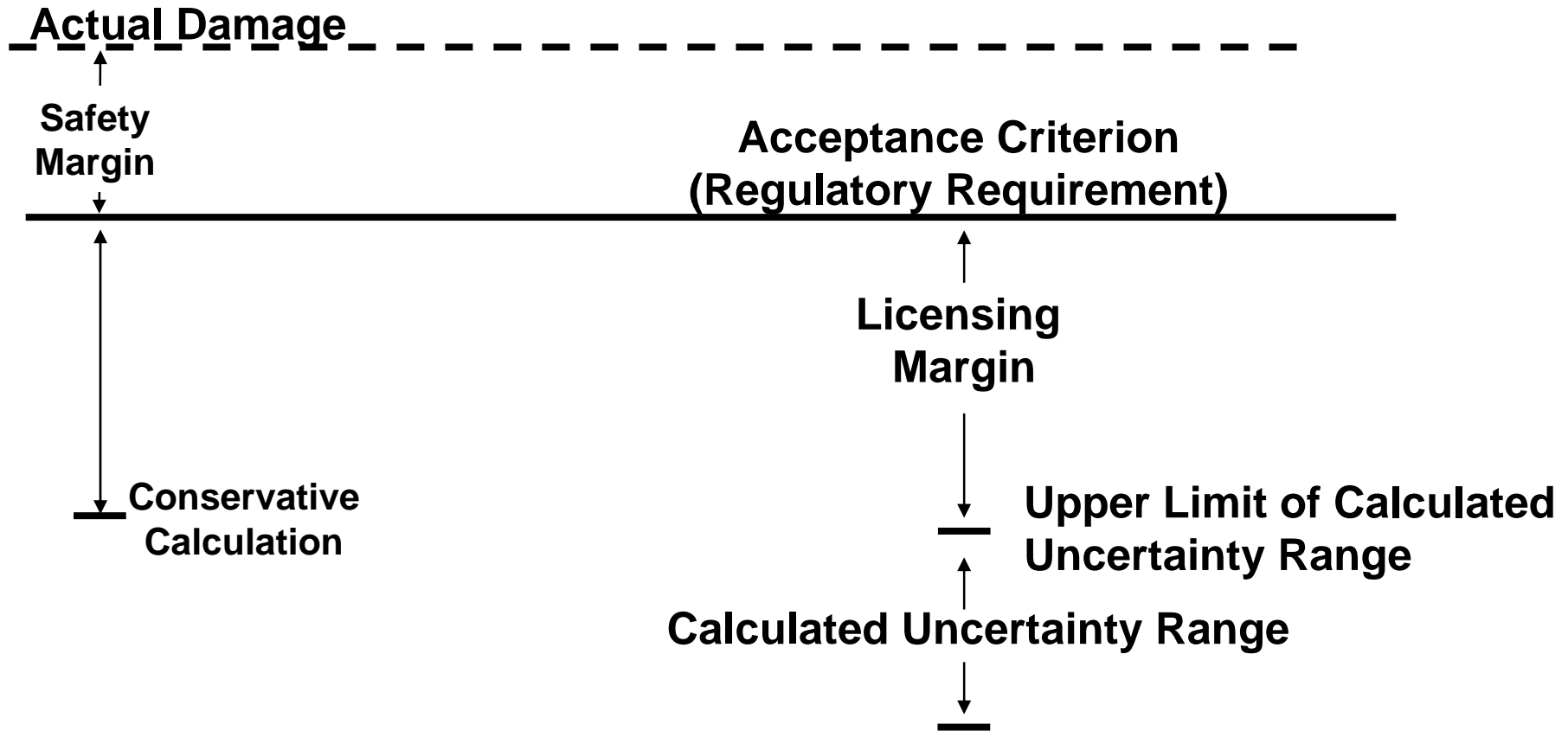
Nuclear Performance and Code Review Branch

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OUTLINE

- Source of Safety Margins in LOCA Analysis
- Safety Margins in LOCA Analysis

LOCA Safety Margin



Safety Margins

- For this discussion, Safety Margin will be limited to differences between calculations and the acceptance criteria.

Source of Safety Margins In LOCA

- Appendix K vs Realistic Analysis
 - Break Flow Model
 - Heat Transfer Correlations
 - Metal-Water Reaction Model
 - Decay Heat Model

Safety Margins in LOCA

- Appendix K vs Realistic Analysis
 - Typically at least 500 °F difference

Additional LOCA Safety Margins

- LOCA analysis today requires Loss-of-Offsite Power and worst single failure – usually is loss of an entire train of ECCS due to diesel generator failure.

Additional LOCA Safety Margins

- Minimum vs Maximum ECCS can result in 50-200 °F in PCT depending on specific plant design.
- Downcomer level determines effectiveness of additional ECCS.

Perceived LOCA Safety Margins

- Acceptance Criteria
 - Benefits of state-of-the-art cladding
 - Reduction due to two-sided oxidation
 - Reduction due to high burnup

Conclusions

- Analysis methods have been designed to include margins for the unknowns
- Acceptance criteria have to be carefully examined to reaffirm margin exists