

Risk Informing Decommissioning Regulations

ACRS Subcommittee on Reactor Fuels

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by

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Commission Directives 12/21/99 SRM

- Integrated, risk informed rulemaking addressing EP, FP, Security, Backfit and Operator Training
- Consider all realistic scenarios
- (Later Commission decisions on applicability of m maintenance rule, fitness for duty, station blackout, fire protection, etc. to D&D plants will benefit from risk insights)



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Scope

- Use risk insights to adapt deterministic rules for operating plants to decommissioning plants
- Commission principles on risk informing must be adapted to address
 - Different type of consequences
 - Lower probability
 - Different type of system, e.g., passive, robust, slowly evolving sequences



Objective

- Best Inform Commission to make judgement calls (no magic formula)
 - Provide “apples to apples” type comparison to risk profile presented by operating plants
 - Examine defense in depth in context of simple, passive system where most sequences evolve over very long time frames



Risk treatment

- Best estimates should be used
- Consequences should not be based on phenomena that have not been validated through NRC's severe accident program
- More efforts should be devoted to probability side of risk equation.
- If probability of spent fuel fire is acceptably low there are diminishing returns on efforts to refine consequences



Seismic risk in spent fuel pool risk study

- Huge seismic events that are background risk factors for operating plants, dominate risk profile for decommissioning plants
- Seismic risk should be treated in the same manner for decommissioning plants as for operating plants



Treatment of seismic risk

- Disposition deterministically
 - Screen out using checklist, at 2-3SSE provides large margin
 - Most PRAs screen out at SSE by using seismic experts to establish seismic margins



Commission Policy on Treatment of Seismic Risk

- NUREG 1150:
 - Use of LLNL: rare but large events contribute significantly to risk
 - EPRI and LLNL approaches are fundamentally sound
 - Avoided including offsite consequences and risk from seismic in findings without context
 - Recommend context: reactor induced accident losses be compared to overall losses (report observes nuclear losses likely to be very small)



Defense in Depth Considerations for spent fuel pool

- Draft risk report observes defense in depth provided by:
 - Robustness of Pool Structure
 - Simplicity of operation
 - Slow evolution of all but 2 sequences
- By comparison operating PRA's have 100's of sequences for internal events



Conclusions

- Bounding estimate of seismic risk should not be used to justify retention of operating plant requirements intended for a much broader scope of initiating events
- Overly conservative treatment of seismic risk leads to conclusion that operating plant requirements should be retained



Conclusions (cont.)

- Opportunities to apply practical risk insights are lost if operating plant requirements are retained
- Speculative phenomena should not be used to determine consequences

