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Perspectives on NRC Staff's Review of a License Application for a Deep Geologic Repository at Yucca Mountain, U.S.A.

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Disclaimer

- NRC staff views expressed in this presentation are preliminary and do not constitute a final judgment or determination of matters addressed or acceptability of any license application that may be under consideration at NRC.

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Background

- 1987: Yucca Mountain is only candidate site
- 2002: Site Recommendation approved
- 2008: License Application received by NRC
- 2009: Administration considers alternatives

- 2011: NRC Atomic Safety and Licensing Board suspends Yucca Mountain hearings
- 2012: Lawsuit in U.S. Court of Appeals

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Planning Assumptions

- 20+ years of site characterization information
  - Develop an information management system
- Unique characteristics of site and design
  - Staff and contractor expertise
- Conduct review and hearings in 3-4 years
  - Advanced planning and project management skills
- Controversial project
  - Many interveners and issues for a complex hearing
- First implementation of a risk-informed, performance-based review

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Preparations: Staff

- Developed independent technical bases with Center for Nuclear Waste Regulatory Analyses
  - Laboratory and field investigations
  - Detailed process models
  - Risk insights from performance assessment codes
- Review of other license applications
- Develop regulations and implementing guidance
- Interact extensively with DOE and stakeholders
  - Detailed technical reviews
  - Public understanding of NRC's role in licensing

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Preparations: Process

- Project management
  - Organization of project teams and management
  - Detailed project plan
  - Write, review, and publish safety evaluation reports
- Licensing Support Network to manage documents
  - Includes all participants in the hearings
- Standard Review Plan and its implementation
  - Standard format and content, compliance metrics

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What We Received

- License Application in June 2008
  - ~3 million pages of additional information
- 299 Contentions admitted for hearing
- Declining resources and staffing levels

- DOE stopped supporting application review in 2010

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Lessons Learned: Staff

- Dedicated, professional staff resolved all technical issues and completed the review in 3 years
  - Transition from technical to regulatory reviewers
- Essential for lawyers and technical staff to collaborate throughout the review
- Applicant's information must make the safety case, not staff's independent information
- Formal mechanism needed for addressing alternative views and achieving consensus

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Achieving Staff Consensus

1) Existing safety culture encouraged openness
2) Senior Technical Advisors to help resolve within team or with immediate supervisor.
3) Convene Safety Integration Review (SIR) team
   - Supervisors and STAs
   - Staff presentations, discussions
   - Resolution often relied on risk insights
4) Discussion with Division Senior Executives
5) *Formal NRC process outside of Division was available, but not needed.*

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Lessons Learned: Process

- Detailed project management necessary for success, about 1/3 of total staff (full time).
  - More than 600 staff Requests for Additional Information
- Achieve early agreement on structure and level of detail in the Safety Evaluation Report.
- Consensus needed on regulatory concepts, e.g.
  - “Significance”
  - “Conservative”
  - “Uncertainty”

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Conclusions

- NRC staff successfully completed a risk-informed, performance-based technical review of a license application for a 1 Myr deep geologic repository:

  www.nrc.gov/waste/hlw-disposal/yucca-lic-app.html

- Expertise and processes outside of review teams resolved significant technical disagreements
- Independent information can guide key parts of the review, but applicant must demonstrate the safety case