

Lessons Learned

Activities of the Illinois LLRW Siting Commission

Presented by:

Frederic Snider

**Raytheon Engineers and Constructors
Ebasco Division
Greensboro, NC**

Sponsored by:

**EG&G Idaho
National Low-Level Waste Management Program**

Scope of the Project

- ***Review Report Issued by the Commission***
- ***Identify Major Issues***
- ***Summarize Approach/Conclusions of Commission***
- ***Critique Approach re: State of the Art/Practice***
- ***Identify Applicable Lessons Learned***

The Management Act

- **No LLWR waste disposal facility shall be located in or within 1 1/2 miles of the boundaries of any municipality unless approval is given by the governing body of that municipality.**
 - **The site shall be located so as to consider the distance necessary for the transportation of LLWs so that the impact on existing traffic flows is minimized.**
 - **The site shall be located outside the boundary of the 100 year flood plain as determined by the Department of Transportation.**
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The Management Act

- **The site shall be located so as to minimize the possibility of radioactive releases into groundwaters utilized as public water supplies.**
- **The site shall be located in a suitable geological and hydrological medium.**
- **The site shall be located so that the public health, safety, and welfare will be protected.**



COMMISSION APPROACH TO EACH ISSUE:

- Establish standard as required
- Compile evidence to compare MAS against standard
- Determine compliance



In Search of ... a Safety Criterion

- ◆ Existing regulatory standards considered 'helpful guideposts'
 - ◆ No conclusive statement of 'safe' levels of exposure
 - ◆ No standard on how 'low' is safe
 - ◆ Adopted essentially *zero release* criterion
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MAJOR ISSUE CATEGORIES

- ☞ CALCULATION OF SOURCE TERM
 - ☞ FACILITY DURABILITY
 - ☞ QUALITY ASSURANCE
 - ☞ SEISMICITY
 - ☞ USE OF MODELS
 - ☞ STRATEGY FOR SITE CHARACTERIZATION
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CALCULATION OF SOURCE TERM

- Three independent PA's provided
- Uncertainty in Source Term was major issue
- ◆ **Conclusion:** Uncertainties "robbed the analyses of credibility"
- **Lesson:** Better data and/or probabilistic assessment approach

QUALITY ASSURANCE

- Review and verification of data
 - QA procedures not followed
 - ◆ **Conclusion:** ".. failures of the project's quality assurance and control seriously detracted from the proponents case..."
 - **Lesson:** ANY perceived flaw in QA program / procedures undermines credibility of entire technical process.
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FACILITY DURABILITY

- Long term durability/viability of concrete
- No one could "*prove*" "*leak-tight*" for 500 years
- ◆ **Conclusion:** "..unlikely facility could provide adequate protection against long-lived radionuclides."
- **Lesson:** Pre-establish standard of performance

SEISMICITY

- Application of conservatism
 - Over long facility life, EQ's may accelerate cracking of concrete
 - ◆ **Conclusion:** EQ risk increases likelihood of cracking of concrete and/or liners and may provide pathways for water and contaminants.
 - **Lesson:** Communications of principles of conservatism
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USE OF MODELS

- Groundwater flow model extensively discussed. Validity of each portion of model questioned.
- ◆ **Conclusion:** "..magnitude of potential errors was large." "Site has not been adequately modeled or characterized, and burden of proof was not met that MAS is in suitable geological and hydrological medium.."
- **Lesson:** pre-establish standards

STRATEGY FOR SITE CHARACTERIZATION

- Some programs lacked overall strategy
 - Perceived lack of interdiscipline coordination
 - Undermined credibility and adequacy of technical programs
 - ◆ **Conclusion:** ".. the study produced only limited hydrogeologic data inadequate to resolve critical issues about the site..."
 - **Lesson:** Groundwater and PA models must be integral to characterization process; reduction in uncertainty is paramount.
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GENERAL OBSERVATIONS

- Hearings preceded license application
- Credibility of witnesses critical to decision
- Management Act allowed wide latitude in judgement
- Commission not necessarily held to existing performance standards
- Standard of "*Burden of Proof*" may not be achievable