

The State of High-level Waste Disposal in the U.S. – A Regulatory Perspective



IGD-TP
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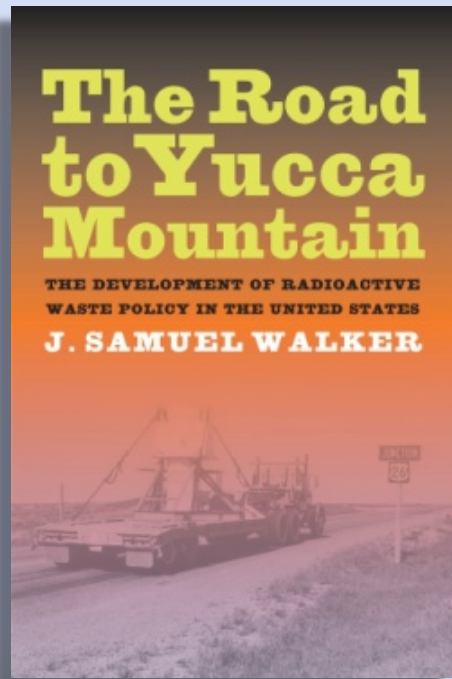
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- Background
- Current NRC Activities
 - Yucca Mountain Review Activities
 - Technical Investigations for Generic Disposal
- Proposed Future Paths for Spent Fuel Management and Disposal in the U.S.



Background: NWPA

- The U.S. Nuclear Waste Policy Act (NWPA) of 1982 established permanent geological disposal as the national policy for spent nuclear fuel and high-level radioactive waste.



- Assigned responsibilities to Department of Energy (DOE), Environmental Protection Agency (EPA), and Nuclear Regulatory Commission (NRC).
 - DOE: repository design and operation
 - EPA: setting protection standards
 - NRC: regulatory licensing and oversight
- Established a Nuclear Waste Fund.
- Amendments in 1987 selected only Yucca Mountain, Nevada, for further site activities.

Background: Regulations

- Disposal of High-Level Radioactive Wastes in Geologic Repositories
 - EPA : 40 CFR Part 191 (1985*)
 - NRC: 10 CFR Part 60** (1981*)
- Disposal of High-Level Radioactive Wastes in a Geologic Repository at Yucca Mountain, Nevada
 - EPA : 40 CFR Part 197 (2001*)
 - NRC: 10 CFR Part 63 (2001*)



* with subsequent revisions

** NRC has recognized that its generic Part 60 requirements will need updating if applied to sites other than Yucca Mountain, Nevada.

License Application Review

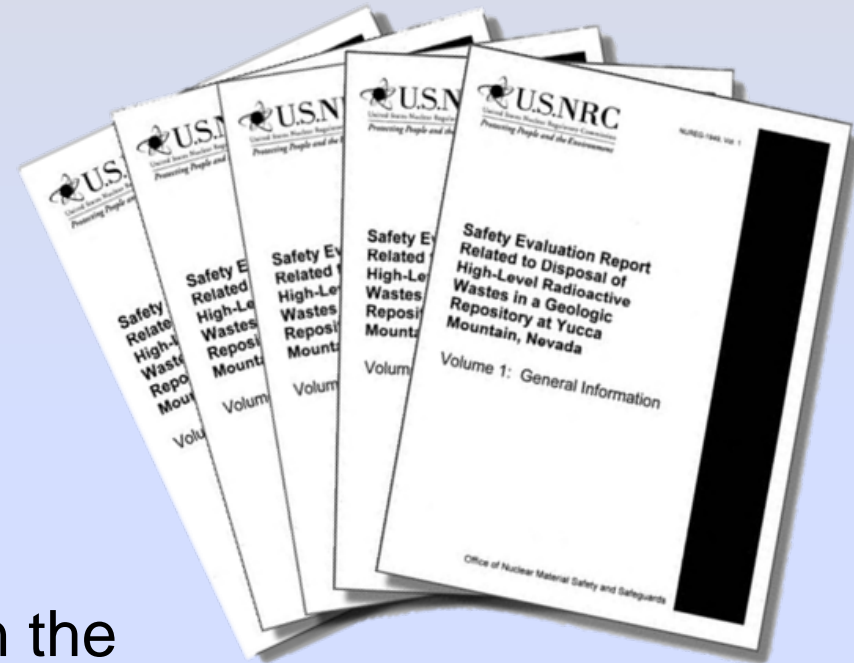
- June 2008 – DOE files its license application for a geologic repository at Yucca Mountain, Nevada.
- September 2008 – NRC staff docket DOE's license application and adopts DOE's Environmental Impact Statements (EIS), with further supplementation needed as identified in NRC's Adoption Determination Report (ADR).
- September 2011 – NRC staff review stopped and adjudication suspended.
- November 2013 – NRC staff review resumes; adjudication remains suspended.
- January 2015 – NRC staff completes the Safety Evaluation Report (SER).

DOE License Application,
Environmental Impact
Statements, and
supporting documents
June 2008



Safety Evaluation Report

- Vol. 1: General Information
- Vol. 2: Repository Safety Before Permanent Closure
- Vol. 3: Repository Safety After Permanent Closure
- Vol. 4: Administrative and Programmatic Requirements
- Vol. 5: Proposed Conditions on the Construction Authorization and Probable Subjects of License Specifications



Conclusions of the SER

- NRC staff finds that DOE's application meets most, but not all, of the applicable NRC regulatory requirements.
 - Requirements not met are related to certain conditions of land ownership and water rights.
- NRC staff therefore does not recommend issuance of a construction authorization at this time.

<http://www.nrc.gov/waste/hlw-disposal/key-documents.html>

NRC Decision on Construction Authorization

Remaining Steps for a Decision

- Complete the supplement to DOE's Environmental Impact Statements.
- Conduct hearing on contested issues.
- Commission completes its review of contested and uncontested issues.



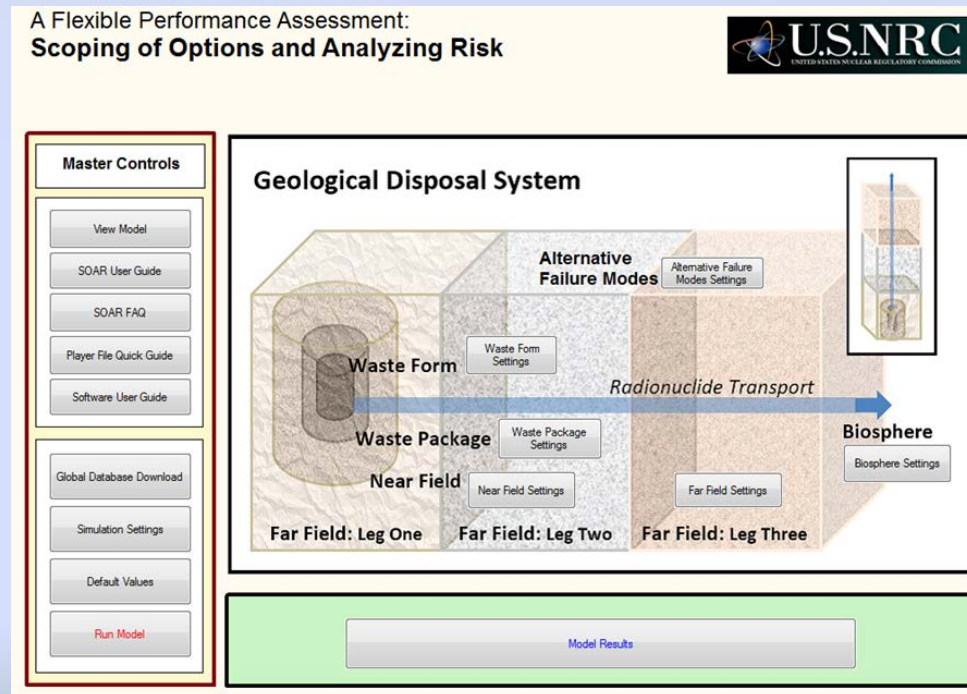
Supplement to DOE's EISs

- Scope of the EIS supplement:
 - Impacts on groundwater beyond the regulatory compliance point
 - Impacts from surface discharge of groundwater beyond the regulatory compliance point
 - Impacts from radiological and nonradiological contaminants
- Draft supplement issued for public comment in August, 2015; comments open until November 20.
- Final supplement expected in first half of 2016.

Current Technical Activities

NRC is maintaining its technical and regulatory preparedness for future activity and potential new approaches in national waste management policy.

- Performance Assessment
 - SOAR
- Technical Areas
 - Engineered Barriers
 - Waste Forms
 - Coupled Processes
- International Activities
 - DECOVALEX-2015
 - IAEA (GEOSAF-II, HIDRA)
 - NEA (RWMC, IGSC, FSC)
 - Bilateral interactions



Proposed Future Paths

- **Geologic Disposal**

- The administration and DOE announced in March, 2015, that a separate geologic repository for defense HLW is needed, and that it could be sited, licensed, constructed, and operated more quickly than a repository for both commercial spent fuel and defense waste.
- DOE continues R&D activities on geologic disposal of HLW and commercial SNF in clay, salt, and crystalline rock.
- DOE is investigating deep boreholes (~5 km) as a possible disposal method for some types of HLW, and is planning to drill test boreholes in 2016.

- **Consolidated Interim Storage**

- DOE is developing plans and designs for consolidated interim storage of commercial SNF, beginning with a pilot facility.
- Two private entities have declared that they will submit license applications to NRC in 2016 for consolidated interim storage facilities.

- NRC is preparing for review of the license applications, and is monitoring DOE's progress in each area.

Conclusions

- Deep geologic disposal remains the position of the U.S. for the ultimate disposition of SNF and HLW.
- NRC's review of the proposed geologic repository at Yucca Mountain, Nevada, has moved forward, but future progress of the review and the repository are uncertain.
- NRC staff are working to maintain and enhance technical and regulatory capabilities for geologic waste disposal.
- DOE has proposed to undertake a consent-based approach for siting new facilities, but processes remain to be defined.
- New approaches for waste management and disposal have been proposed, but require dedicated funding and (in some cases) changes to existing law.