

Nuclear Waste Repositories

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Disposal Subcommittee**

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Questions to be addressed

- Is a disposal facility (or facilities) needed under all foreseeable scenarios?
- If so, what are our alternative approaches for disposal?
- What should the process to develop a US disposal system look like?

Is a facility needed?

- Quick answer – One will be needed eventually.
- More considered answer – Water reactors and dry cask storage work well, so we should not let waste management concerns push us to a nuclear power system that is not economic or technically mature.
- Reprocessing and actinide burning in fast reactors are not economic at the present time.

Current waste management needs

- Need to get spent fuel off sites where power reactors are closed – this could be done by moving spent fuel to operating reactor sites or to a central storage facility.
- Need to continue to convert DOE wastes to stable waste forms.
- Need to create solutions for wastes that have no current disposal options, e.g., mixed wastes, greater-than-Class-C wastes.

What are our alternative approaches for disposal?

- Deep geologic disposal recommended by NAS in 1957; still the top choice around the world.
- Transmutation via accelerators or fast reactors has been proposed; my concern is that if the costs of such systems is to be borne by nuclear power users, the rebirth of nuclear power will be blocked.

What should the process to develop a US disposal system look like?

- Selection of a site with local support worked at WIPP; nuclear waste negotiator efforts to find volunteer HLW site did not.
- Progress in Finland and Sweden is cited, but differences in culture (small homogeneous populations) and political systems (absence of strong state governments) appear to limit the analogy.

Lessons learned from US efforts to open a repository

- The idea that the suitability of a site can be evaluated absent a repository or engineered barrier design was central to the Waste Policy Act. This is not true at most sites considered for HLW disposal. (It may be true at WIPP.)
- Most HLW radionuclides can be retained in the right geologic system, but not all. HLW contains radionuclides that are mobile in most geologic systems; for these radionuclides, strong engineered barriers are needed.

Lessons learned, continued

- When a site is selected, acquire the land. This happened successfully but late in the process at WIPP. It was a major contributing factor in the failure of the proposed California LLW facility at Ward Valley.
- Get a sensible standard before designing a repository. The current Yucca Mountain standard is specific to that site. The standard used for WIPP applies to future repositories. It is based on radionuclide containment rather than doses. This standard is out of step with standards used in the rest of the world.