Institutional Choices for Nuclear Waste Management

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Civilian Waste Management Activity Components

- Reactors → SNF
- On reactor site storage a) pools b) dry casks
- Transport (containers)
- [Site, construct & operate consolidated interim storage]
- [Transport]
- [Site, construct & operate reprocessing facility]
  - Fuel components → transport → Site, construct & operate FB Reactors
  - Shorter lived wastes → Storage & Treatment →Disposal
  - Longer lived wastes → Storage & Treatment
- [Transport (containers)]
- Site, construct, operate permanent repository; LTS

Defense Waste Management Activity Components

- HLW & TRU at DOE Facilities → Storage, treatment
- Transportation (containers)
- Site, construct, operate Permanent Repository; LTS

Evolution of Institutional Forms

- **<u>At the beginning: AEC</u>**
- **<u>Today: Institutional Fission:</u>**
  - Utilities
  - DOE (RW)
  - NRC
  - EPA
  - Expert advisory committees (different shapes and sizes)
  - States
  - Localities
  - Tribes
  - Private firms and landowners
  - NGOs and other stakeholders

Basic Institutional Options

- Functional Specialization vs. Integration; Independence vs. Accountability
- Defense vs. Civilian Wastes
- Roles of Federal Government and Firms (Utilities +)
  Allocation of different waste management activities (supra)
  - Waste ownership
  - Financing (polluter pays principle)
- Federal Government Institutional Forms
  - Multi-purpose Department or Agency – Component (DOE-RW)
  - Single purpose agency - -single head (NASA)
  - Single purpose agency – independent agency model (NRC)
  - Government corporation (many shapes and sizes)(TVA)
  - Hybrid public/private corporation (many shapes and sizes)(COMSAT)

EHS Regulatory Institutions

- Separation of regulation and management (IAEA)
- NRC
- EPA
  - Why two different federal regulators? Differences in regulatory paradigms – systems performance versus pollution control
- States (RCRA) - Bane or boon?

Nuclear Waste Regulation Outline

	Defense	**Civilian**
LLW Management, Storage, Disposal	DOE/EPA	NRC/EPA
TRU Management, Storage, Disposal	DOE/EPA	NRC/EPA
HLW Management & Storage	DOE/EPA	NRC/EPA
Interim Storage	DOE/EPA	MRS: DOE/NRC/EPA Private: NRC/EPA
Repository (General)	DOE/EPA/NRC	DOE/EPA/NRC
Repository (Yucca)	DOE/EPA/NRC	DOE/EPA/NRC
Commercial SNF		
Reactor Pool Storage		NRC/EPA
Dry Cask Interim Storage		
-on site		NRC/EPA
-off-site private		EPA/NRC
-off-site federal MRS		DOE/NRC/EPA
Repository (General)		DOE/NRC/EPA
Repository (Yucca)		DOE/NRC/EPA
Mixed Waste	EPA/STATES (RCRA)	EPA/STATES (RCRA)

Federal Waste Management Institution(s)

Responsibilities; Siting, construction, storage, treatment and management operations, transportation, LTS

Carter IRG 1979 -- Requisites:

Well-defined program authority; decision-making process that produces stable operating policies; efficient (business-like) operations; reliable, predictable, transparent funding from utilities.

OTA Assessment 1982 -- Recommendations:

Government corporation with appointed board, financed by utility fees through revolving or trust fund, subject to oversight on PUC regulatory model

DOE Advisory Panel on Alternative Means of Financing and Managing Radioactive Waste Facilities 1985 – Recommendations:

FEDCORP - - Corporation owned by USG. Directors appointed by President, confirmed by Senate, select CEO. Exempt from federal civil service, procurement regulations. NWPA fund removed from federal budget. Could contract for related revenue-generating activities (e.g., reprocessing)

Siting to different entity than operations?

Defense vs. civilian wastes?

Decisional Models for Facility Siting

1. *Status quo default outcome – Accumulation and storage at facilities producing wastes.* Predominates today except TRU.
2. *Top-down science-based central planning* –1982 NWPA (*regional equity)*
3. *Top-down science-based central planning with.* Elements of 1982 NWPA.
4. *Top-down political decision-making*. 1987 NWPA amendments and 1992 EnPA
5. *Federal-state bargaining/contract.* WIPP; Federal Waste Negotiator.
6. *State-state bargaining/contract* within a structure of federally-created incentives. LLRWPA.
7. *Private contract* – SNF and Skull Valley Goshute Tribe (federal regulatory overrides)
8. *Deadlines and liability "hammers" to force repository selection and construction* – NWPA 1998 deadline for federal takeover of SNF; 1985 LLRWPA amendments.
9. *Science-based deliberative consensus* (CRESP)

Requisites for Federal Siting Institution(s)

- Technical proficiency
- Transparency
- Engagement with other federal agencies, states, localities, firms, NGOs, other stakeholders
- Trust

- A separate entity for siting?

Institutional Examples from Europe

- Finland & Sweden: Interim consolidated storage and permanent repository: siting, construction, management by utility-owned private corporation
- Belgium: Government agency assumes ownership of off-reactor SNF and reprocessed HLW; sites and manages interim storage and (planned) final repository; operates through subsidiary industrial corporation. Long term funding by utilities.
- UK:, BNFL, government owned private corporation, owns and manages reprocessed HLW. Government special purpose agency, Nuclear Decommissioning Authority, responsible for long-term disposal (in 50 years) of civilian and defense HLW; financing through government Liabilities Management Agency (£40 billion estimated).
- Germany: Office for Radiation Protection in Federal Environment Ministry both regulates and manages nuclear waste; management, siting, disposal, and operational responsibility contracted to private corporation owned by utilities.