Used Nuclear Fuel Management Options

FCIX

Rod McCullum, Nuclear Energy Institute

July 1, 2010

NEI
NUCIFAR
ENERGY
INSTITUTE

Used Fuel Management - Principles

- U.S. must have a durable policy to manage used fuel responsibly
- U.S. must have a plan for ultimate disposal
- Ideal technical solution is not required to begin implementation of a new policy direction
  - Evolutionary (and even revolutionary) advances in technology can be incorporated over time without deferring decisions until decades of research are completed
- Non-proliferation goals must be met
- Past lessons learned must be heeded
  - Particularly in facility siting

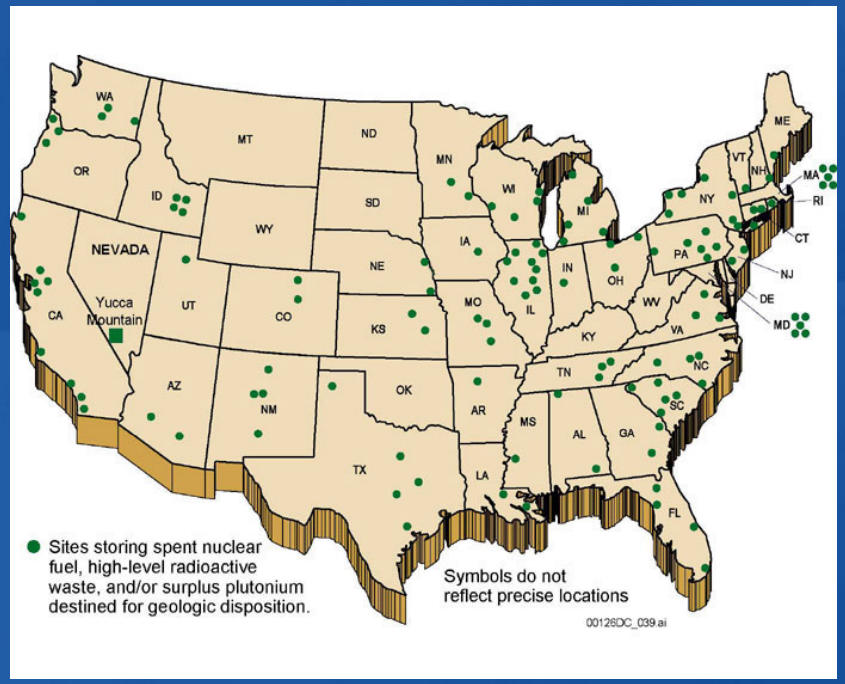
NEI

Integrated Used Fuel Management

- Industry supports a three-pronged approach to used fuel management
  - Interim storage at reactor sites and centralized location(s)
  - Recycling
  - Permanent disposal facility
- Federal approach to date has been inconsistent and has lacked policy and management accountability, impeding ability to pursue needed facilities
- Blue Ribbon Panel considering options
  - Also looking at three-pronged approach

Storage

- Used fuel inventory thru 2009
  - Approximately 62,500 MTU
  - Increases 2 - 2.4k MTU annually
- ISFSI storage thru 2009
  - 14,000 MTU
  - Over 1200 casks/canisters loaded
  - 49 Operating ISFSIs
- ISFSI inventory by 2020
  - Estimating 26,200 MTU
  - 2,600 casks/canisters loaded
  - At 75 ISFSIs
  - Fuel from 118 reactors
  - Harris – lone plant site w/o ISFSI
- ISFSI inventory by 2040
  - Likely to exceed 70,000 MTU



Centralized Interim Storage

- Can provide a safe, near-term solution by consolidating used fuel from shutdown commercial reactor sites and storing used nuclear fuel away from operating sites.
  - Should be licensed by the Nuclear Regulatory Commission, take advantage of past projects, as warranted, and be deployed in a region where it has broad based public and political support
  - Should be used by the federal government to meet its statutory and contractual obligation to accept and remove used nuclear fuel from reactor sites while reducing or eliminating the liability for taxpayers.
  - Could be a complementary, near-term element of disposal, recycling and other advanced fuel cycle technologies.
  - Should be developed in a way that increases public confidence in used fuel management

NEI

Recycling

- Recycling enhances the long term sustainability of nuclear energy
- Recycling technology could be deployed at any time
  - Technology decisions must consider market realities
  - Regulatory uncertainty affects designs and market conditions
- Regulatory infrastructure to support recycling is 1st need
  - Must be available to inform future decision-making
  - Regulatory framework should be built on what we have learned from U.S. and international experience
  - The framework should be structured so that it can evolve to accommodate advanced technologies

NEI

Recycling – Regulatory Infrastructure

- A new rule should be promulgated expeditiously (as proposed in NEI recommended Part 7X)
- Rule should be technology neutral
- Rule should be risk-informed and performance-based
  - approaches are well suited for technology neutrality
- Rule should accommodate potential advanced separations technologies (e.g. via reserved sections and regulatory guidance)
- Rulemaking should advance at pace that will pro-actively inform ongoing decision-making

Disposal

- Geologic disposal is required for the multiple waste forms — including defense material — that already exist and may not be suitable for recycling or other advanced fuel cycle technologies.
- Future disposal efforts should endeavor to build broad based public support (local, state, and national) by considering a step-wise approach to demonstrate the viability of final disposal and cultivate public confidence.
- The licensing process for Yucca Mountain should be completed, even if the facility is not ultimately used, to demonstrate the regulatory process and provide lessons learned for future repository programs.

NEI

Governance

- Nearly 30 years experience with DOE management of used fuel indicates the need for change
  - Excessive exposure to political intervention allowed for termination of Yucca Mountain
- Transformative change needed – e.g. Fed-Corp
  - Effective and stable **leadership** to assure sustained success
  - Access to **funding** sufficient to support sustained long-term commitment
  - **Accountability** to industry, ratepayers and public
  - Operate like a private company, not DOE – driven by **sound business practices**, not political whim

NEI

Governance – Fed-Corp Principles

- Board of Directors appointed by the President with the advice and consent of the Senate
  - Majority of Directors must be industry or PUC
  - Directors approve and authorize all goals and objectives of Fed-Corp
  - Directors appoint the Chief Executive Officer
- Federal compensation and procurement rules do not apply
- DOE liability for judgments/settlements preserved
- Empowered to enter into and administer contracts on behalf of U.S. to provide used nuclear fuel management and related products and services (e.g. manage defense waste)
- Direct access to the Nuclear Waste Fund and accountability for using it to meet the government's statutory and contractual obligations

NEI

Recommendations

1. Success of integrated used fuel management depends on assuring that programs that will take decades to implement are not subject to continual change
2. Program costs must not impose undue burden
3. Geologic disposal will be necessary in any scenario
   - There is value in completing the Yucca licensing review
4. Future efforts should build public support with a step-wise approach
5. Centralized interim storage should be a strategic program element
6. Program management should be transferred to an entity with a stable management and financing structure – e.g. Fed-Corp
7. Neither current nor advanced recycling represent the sole solution – but both can be a strategic program elements with consistent political and policy support
   - Provided non-proliferation goals met
8. RD&D of advanced technologies should be pursued, but real practical approaches are needed
9. Diversity of technologies can enhance benefits

NEI

Conclusion

- Multiple options exist for the safe and effective long-term management of used nuclear fuel
- Dry cask storage will continue to be deployed while options are considered
- Blue Ribbon Commission will provide framework
- A fully integrated suite of options should be pursued
  - Centralized Interim Storage
  - Recycling
  - Disposal
- Efforts should be managed by an independent Fed-Corp

NEI