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Spent Fuel Storage Cask Integration with Repository Operations

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Background

- Fuel to be disposed of in repository in YM-specific waste packages
 - Fuel handling required
- YM aging facility used for thermal management of arriving fuel
- Efficient, cost effective solution required to receive, handle and place waste at the aging facility and transfer into repository waste package
- This requires integration of repository, transportation package, and storage system technologies
- Goals must be defined, questions answered, and choices made

Current Storage Cask Trends

- Many bare fuel casks already deployed at ISFSIs and a small number of bare fuel casks continue to be loaded
 - Some are currently transportable, some are not
- Some storage-only canister-based systems deployed at ISFSIs
 - No more to be loaded
 - Efforts underway to license these canisters for transportation
- Large majority of systems being loaded today are canister-based, dual purpose designs
 - Some are not yet certified for transport



YM Aging Facility Integration Issues

- Options for storage-only bare fuel cask and non-transportable canisters
 - Certify for one-time transport to YM
 - Re-package in transportable bare fuel cask at plants
 - Re-package in transportable canister-based system at plants

Aging Facility Integration Issues (cont'd)

- Transportable bare fuel casks - options
 - Transport to YM and load fuel directly into waste package and emplace in repository
 - License transportable bare fuel casks for deployment directly on aging pad
 - Remove fuel and place in YM-specific bare fuel aging casks
 - Remove fuel and place in YM-specific aging canister for deployment at aging facility in YM cask

Aging Facility Integration Issues (cont'd)

- Options for dual-purpose, canister-based systems
 - Transport to YM in system-specific transport package and either:
 - Open canisters and load fuel into waste package and emplace in repository, or
 - Open canisters and move fuel to YM-specific bare fuel aging casks
 - Deploy canisters directly at aging facility
 - Dual purpose overpacks
 - Design-specific storage casks
 - Unique YM aging storage casks compatible with all canister designs

Aging Facility Integration Issues (cont'd)

- Damaged fuel
 - Plants define in accordance with Part 72 and/or Part 71 CoCs
 - Part 72 damaged fuel performance standards are different than Part 71 and likely Part 63
 - Utilities are not defining damaged fuel to meet Part 63 requirements
 - SFPO links 71/72, but not 63

Aging Facility Integration Issues (cont'd)

○ Thermal/Radiation

- High heat duty storage systems needed for plant onsite fuel management
- High capacity systems *desired* for cost effectiveness, reduced occupational exposure, reduced handling evolutions
- Significant aging time on site required before transportation to meet thermal and dose rate limits on package(10-20 yrs)
- Additional cooling required for emplacement
- Smaller capacity dual-purpose systems will be transportable sooner

Summary (cont'd)

○ Summary

- Plant operators are not repository (or transportation?) focused
- Pragmatism requires that they focus on reactor operation and maintaining SFP storage space via ISFSI
- Storage cask systems, including contents, are varied
- Current trend is dual-purpose, canister-based, high capacity, high heat load storage systems
- Long wait to transport high capacity/high heat systems due to thermal/radiation limits

Summary (cont'd)

- Storage and transport are somewhat integrated (common NRC review team); Part 63 is not
- YM designers should consider using technologies already licensed under Part 72 for direct use at the aging facility
- Other technical issues, such as damaged fuel, need to be discussed and resolved with commercial industry to correctly classify fuel for YM criteria
- Should integration address assigning priority to removal directly from the pools?