

Continued Storage of Spent Nuclear Fuel (aka Waste Confidence Rule)

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- Holtec International Overview
- Waste Confidence Decision / Rule in a nutshell
- Impact of the Waste Confidence Rule issue on the operation of the dry storage industry
- Technical basis for continued storage of spent nuclear fuel in dry storage
- How has this process changed the industry

Holtec International Overview

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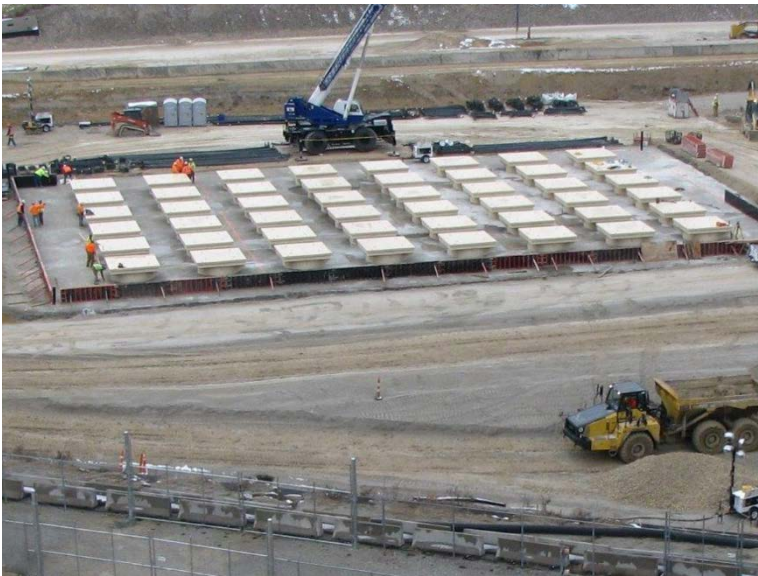
- Established in 1986
- Over 1000 employees
- Eight operations centers in the US and overseas, including 1M Sq. Ft of manufacturing facilities in Pittsburgh, PA and Orrville, Ohio
- Serves 52% of the US Operating fleet Dry Storage needs with over 725 Loaded Canisters and 36,000 assemblies
- Business Mix:
 - 72% Nuclear, 15% Coal, 10% Gas & Renewables, 3% Other
- Vertically Integrated
 - Design, Licensing, Engineering, Procurement, **US Manufacturing**, Construction, Installation, Loading



**Headquarters located
in Jupiter, FL U.S.A**

Waste Confidence Decision/Rule in a Nutshell

- It is **Continued Storage** which applies to the storage of spent fuel *after* the end of the licensed life for operations of a nuclear reactor and *before* final disposal in a permanent repository



GEIS Evaluation - Bottom Line

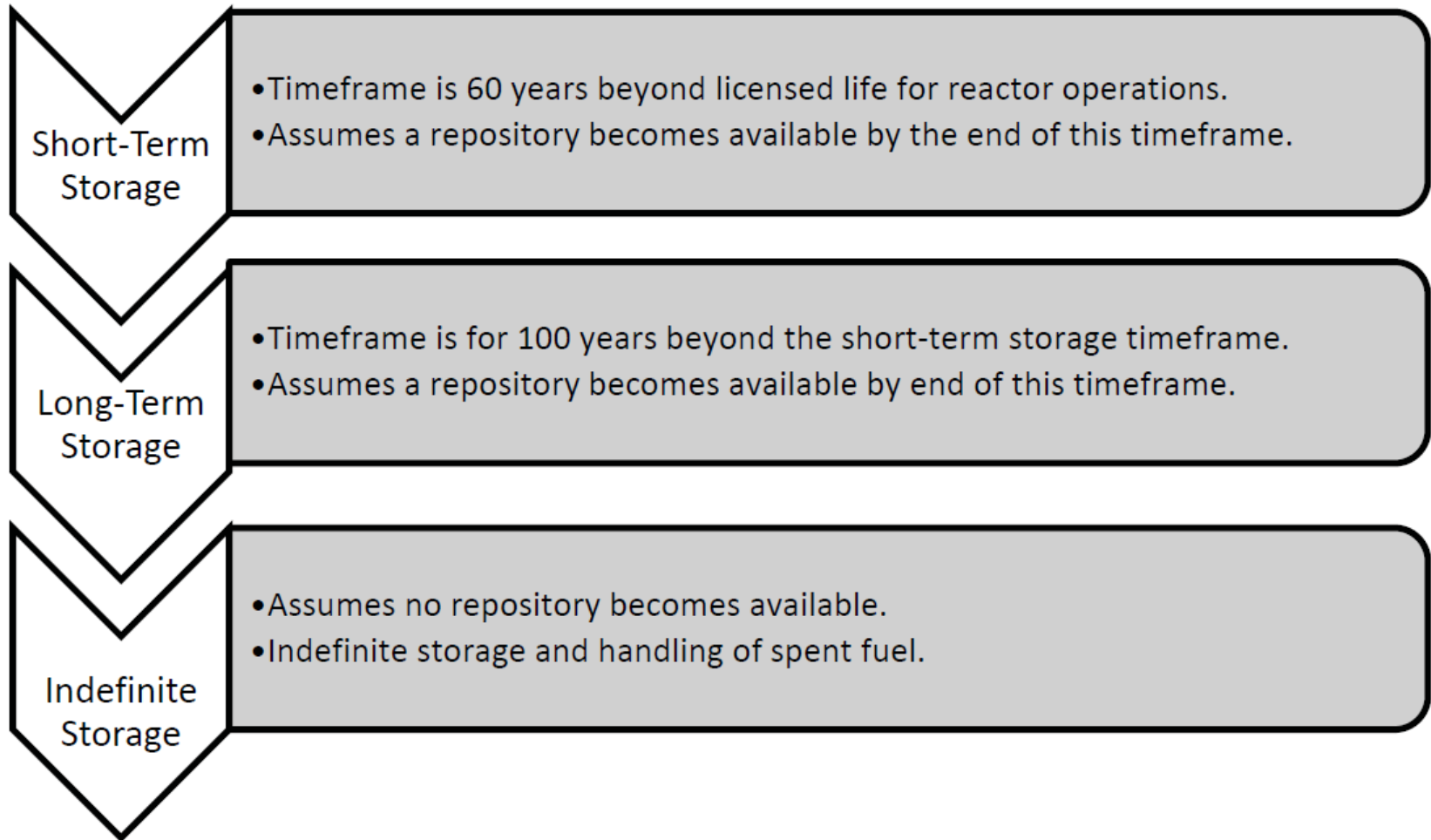


Figure ES-1. Three Storage Timeframes Addressed in this GEIS

Impact of Waste Confidence Rule

- Allows life to go on for New and Operating Plants
- Spent fuel regulatory approvals directly delayed
 - Calvert Cliffs
- High workload on NRC side to resolve the issue within 24 month lead to delays in numerous other spent fuel regulatory activities
- And what happens to the Canisters/Casks and spent fuel?????



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**REMAINS SAFELY STORED
INDEFINITELY!**

- The Industry has Successful Dry Storage Programs
 - Over 1500 Casks/Canisters deployed with over 85,000 fuel assemblies
 - No Adverse Dry Storage issues since inception
 - No problems in the future that can not be managed
 - Continuous Development of Age and Life Cycle Management

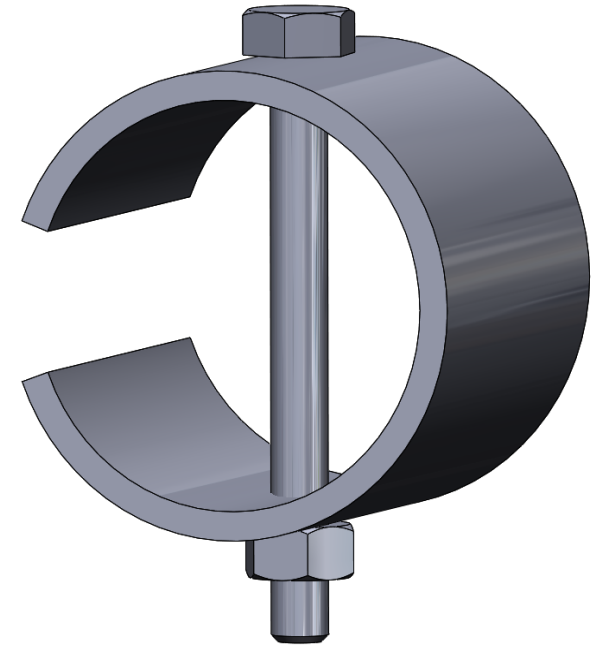
Aging Management Consists of:

- Pro-active control of causative factors behind canister aging;
- An effective monitoring program; and
- Recovery program

*Aging Management is not a regulatory requirement for the initial 20 year license period of spent fuel storage systems

Canister Integrity Prediction Program EXAMPLE

- **Canister Integrity Prediction Program**
 - Provides early detection of potential threats to confinement integrity.
- **Prediction of Flaw Initiation**
 - Material coupons are placed in the HI-STORM annulus to serve as a pre-cursor of potential canister degradation.
 - Coupons bound the worst-case conditions of canister temperature, stress, and air flow conditions.
 - Periodic Surface Sampling for the presence of contaminants.



**Typical Damage
Predictive Coupon**

***Pre-stressed to induce early
stress corrosion cracking**

- Institutional controls would remain in place.
- Spent fuel canisters and casks would be replaced approximately once every 100 years.
- Independent spent fuel storage installation (ISFSI) and dry transfer system (DTS) facilities would also be replaced approximately once every 100 years.
- A DTS would be built at each ISFSI location for fuel repackaging.
- All spent fuel would be moved from spent fuel pools to dry storage by the end of the short-term storage timeframe (60 years).

What has changed in the industry

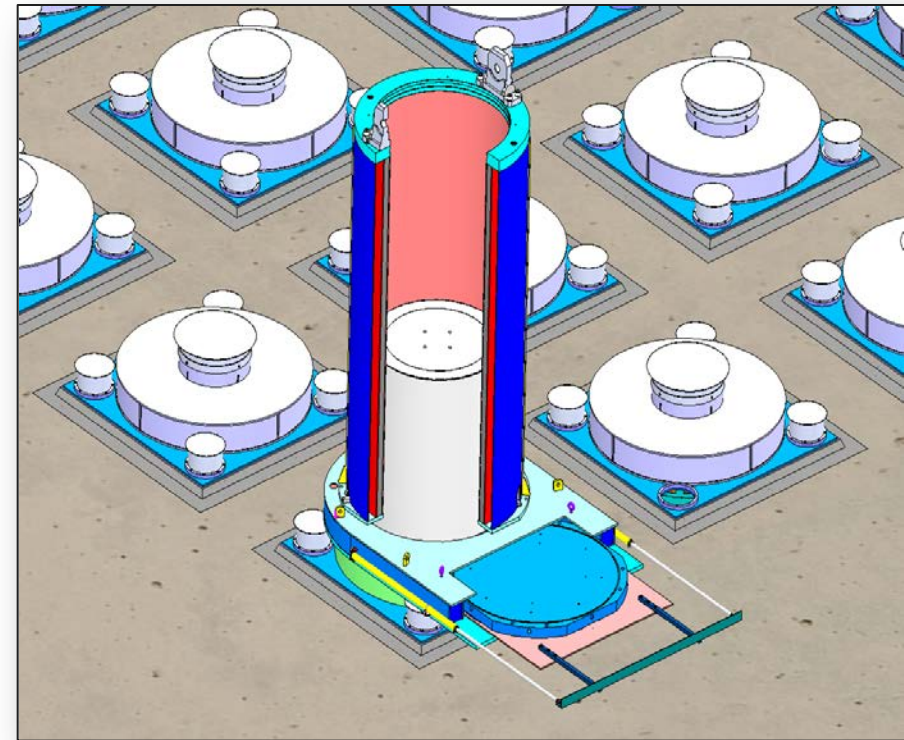
- Developed a more pronounced long-term focus of what happens if fuel stays on site or at a CIS for all three scenarios evaluated in the GEIS.
- Birth of Aging and Life Cycle Management – Very long Age Management
- Yucca Mountain vs other Options



Crystal Ball View



- A Central Interim Storage
- One System fits all
- No Yucca
- Over 100 years of storage, then
- Transfer to WIPP, or
- Store in Place and monitor indefinitely



Holtec UMAX System



Thank You

