



# **Discussion of NRC's Regulatory Framework for Dry Cask Storage and Transportation of Spent Nuclear Fuel and Related Research Activities**

**Dry Storage Technology Provider's Perspective on SNF  
Licensing Current Topics & Innovations**

**February 11, 2021**

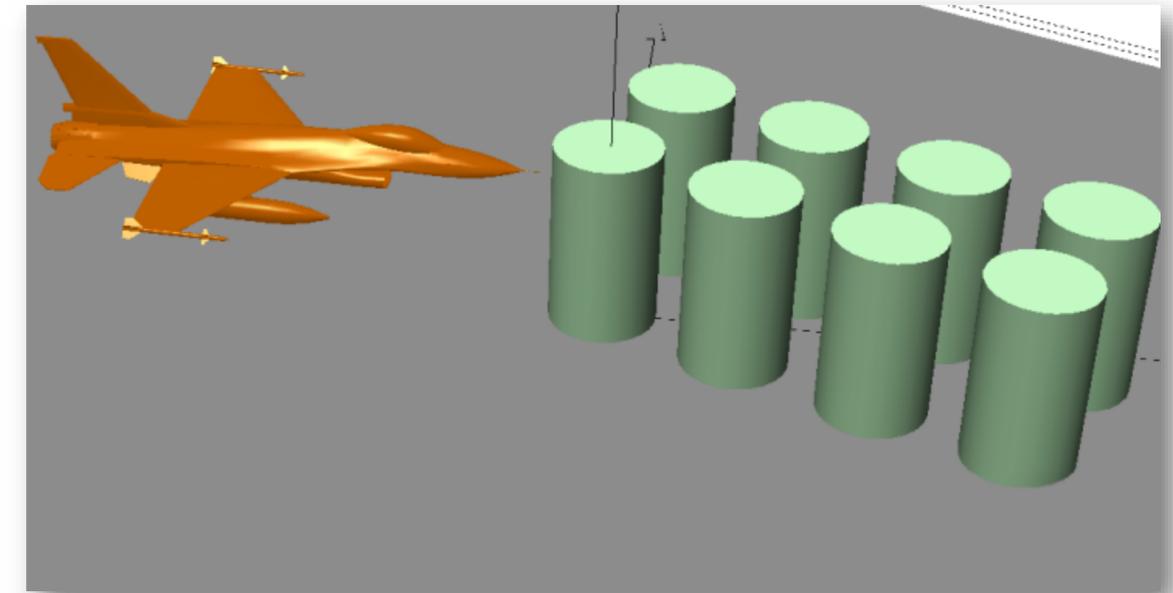
**Dr. Kris Singh  
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# Dry Storage Regulatory Status

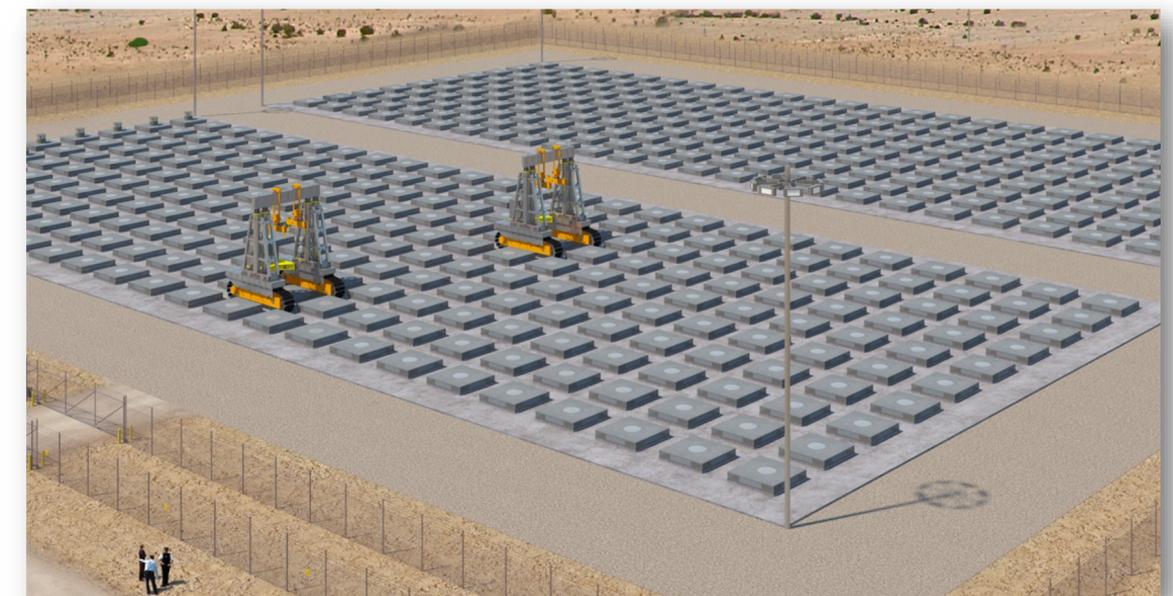
- Since its original evolution in the 1980s, technology for spent fuel storage has advanced immensely and is supported today by a large body of regulatory literature in the form of 10 CFR Part 71 & 72, NUREGs, ISGs, SERs, etc., issued by the USNRC
- The licensing process is efficient and effective; application review is rigorous and disciplined
  - ✓ Each application undergoes an extensive review, ensuring high quality and requiring few revisions
  - ✓ There has not been a single release of radioactive material using U.S. technology; this success speaks to the robustness of the regulatory process and dry storage program in the U.S.
- The industry needs the NRC to continue its rigorous “Risk-Informed Regulation,” which has led to an unbroken string of successful dry storage deployments
- The NRC’s “Rules of Engagement” calls for a science-based process, which has been extremely effective in enabling robust designs

# Role of Innovation in Protection of Public Health & Safety

- Innovations in dry storage have been focused on protecting the fuel, the workers and the environment, and strengthening storage systems against beyond-design-basis events
- Examples of Innovations:
  - ✓ In 2005, Holtec's HI-STORM dry storage system was licensed by the NRC for a planned *consolidated interim storage* facility in Utah
  - ✓ Today, Holtec's HI-STORE CISF, which uses Holtec's underground storage technology, is undergoing certification for deployment in New Mexico



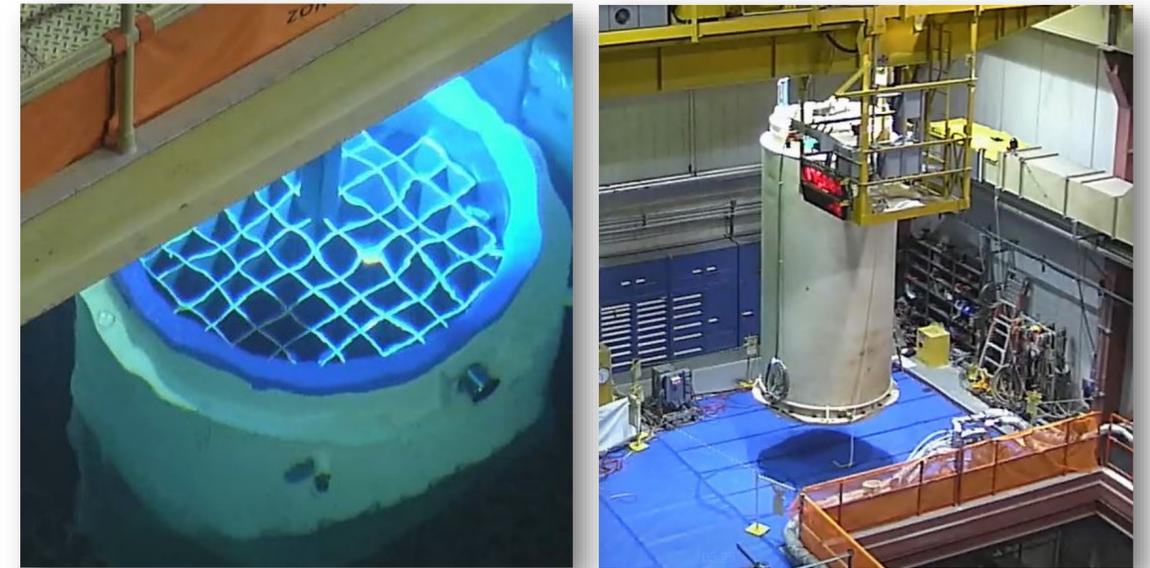
An array of aboveground steel buttressed casks that were shown by complex analysis to be able to survive a crashing F-16 fighter plane



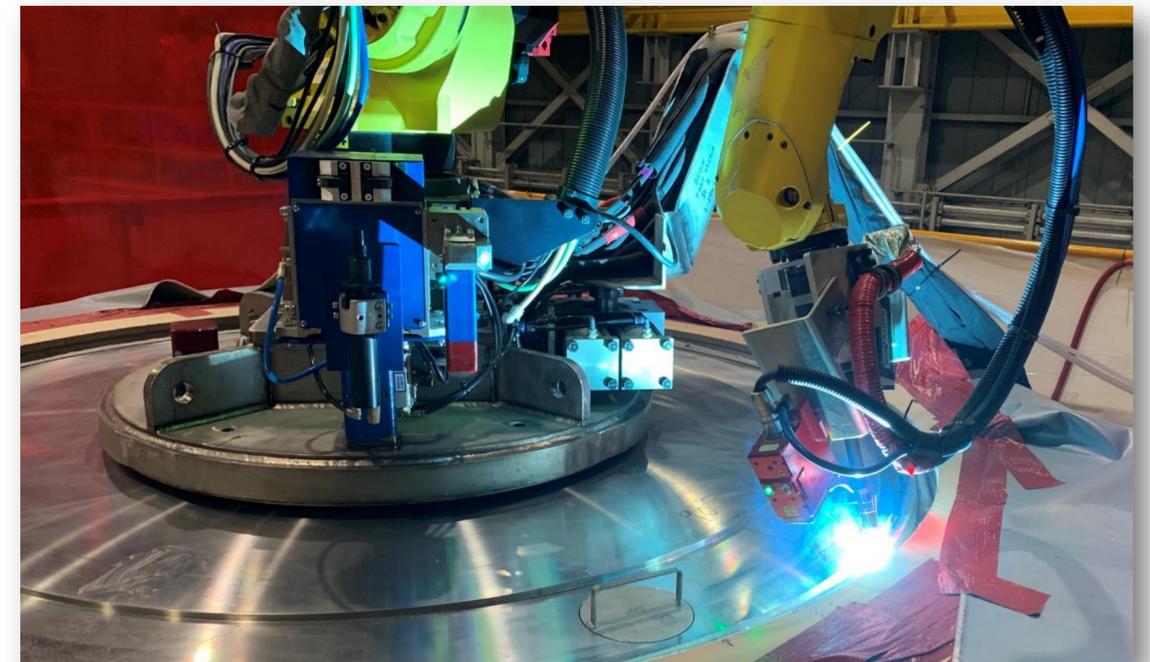
As a subterranean fortress, HI-STORM UMAX denies access to manned/unmanned missiles, provides nearly complete radiation blockage and is indestructible under any terrestrial earthquake recorded

# Holtec Innovations (Cont'd)

- ✓ In the 1990s, the shortest duration after which a plant could move spent fuel from wet storage pools into dry storage was 7 years; Today, it is less than 3 years
  - This means at least 4 years of enhanced safety for spent fuel storage at a decommissioning site
- ✓ Through technology innovation, we have drastically reduced the fuel temperature in a fuel pool under dry pool conditions, which is a vast improvement in nuclear safety at decommissioning sites
- ✓ Robust robotic welder was developed and deployed, which has significantly reduced the dose received during loading campaigns



Pool to Pad Transfer at Holtec's Pilgrim Decommissioning Site

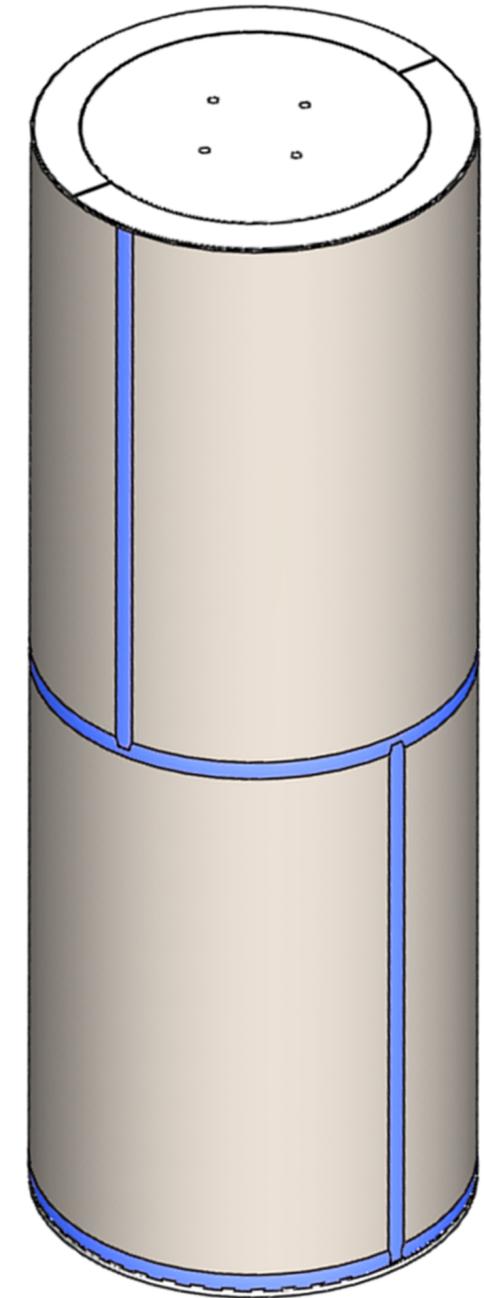


Holtec's Portable Robotic Welder

# Holtec Innovations (Cont'd)

- ✓ Extending the MPC's service life
  - Technologies are available to inspect the canisters for potential degradation under aging management program
  - Robust manufacturing processes are employed
  - Laser Peening of the weld seams, a 21<sup>st</sup> century innovation, eliminates a root cause of canister stress corrosion at marine sites
- ✓ New technologies unveiled to arrest the aging of the canister pressure boundary such as progressive constriction of air flow vents

*Numerous other innovations are being developed and used in the industry to further protect the fuel from degradation in storage, and to protect the workers and the public*



**MPC Weld Seam Shown in Blue -  
Laser Peened for Use at SONGS**