HI-STORE: A Consolidated Interim Storage Facility for Used Nuclear Fuel & HLW

By: Dr. Stefan Anton, Vice President of Engineering, Holtec International
Topics

- Holtec International Overview
- Holtec’s View of CISF
- Holtec International / Eddy Lea Energy Alliance Team
- HI-STORE / HI-STORM UMAX Technologies
- Licensing Approach
- Path Forward
Holtec International: Corporate Profile

- Established in 1986
- Order Book for Future Deliveries: 5.0 Billion USD +
- Impeccable on-time delivery record
- No history of long-term debt
- Self financed company growth
- Highest industrial credit rating [D&B-1R2]

Business Mix:

- 85% Nuclear power & nuclear waste
- 10% Fossil power-combined cycle
- 5% Renewables - solar, wind, etc.

Holtec Technology Center located in Camden, New Jersey, U.S.A

Holtec is a Vertically Integrated, Innovative Technology Leader with Unique Approaches to Design & Manufacturing
Holtec is a Vertically Integrated Turnkey Supplier of Goods and Services to Clients on Six Continents

- Holtec’s vertical integration spans:
  - Design
  - Engineering and Licensing
  - Fabrication
  - Critical Material Supply
  - Site Installation
  - Construction
  - Operations

- This allows for:
  - Coupling of design, fabrication, and construction
  - Control over quality, delivery, and costs
  - Expedited Delivery
  - Integrated solutions for customers
  - Turnkey projects
Holtec Operation Centers Around the Globe

- Holtec International Corporate Headquarters, Jupiter, Florida
- Singh Center for Nanotechnology, Philadelphia, Pennsylvania
- Holtec Technology Campus, Camden, New Jersey
- Holtec Manufacturing Division, Pittsburgh, Pennsylvania
- Orrvilon Manufacturing Center, Orville, Ohio
- Holtec Asia Manufacturing Center, Dahej, India
- Holtec Asia, Pune, India
- Holtec Satellite Office, Sizewell, United Kingdom
- Air Cooled Systems Project Office, San Diego, California
- Holtec Ukraine, Kiev, Ukraine
- Holtec Africa, Ruimsig
- Holtec Arabia, Dubai
HI-STORE: Holtec’s View of a CISF

- Opportunity for DOE to follow through on government’s promise to defuel nuclear plant sites
- Supplements long-term repository
- Allows removal of used fuel from nuclear plant sites sooner than awaiting repository
- Cost efficient away-from-reactor storage
- Eliminate stakeholder & political challenges with fuel storage at reactor plant site by relocating fuel to area with strong local and state support
Holtec’s CIS Expertise:

*Only* world supplier with extensive experience in developing CIS:

1. America’s only licensed CIS (Skull Valley, Utah)

2. Ukraine’s facility in Chernobyl


Ukraine’s Central Storage Facility (in development)
Holtec & ELEA Team – Public Private Partnership

- Eddy-Lea Energy Alliance, LLC
  - Long-standing NM alliance
  - Owners are:
    - Counties of Eddy & Lea
    - Cities of Carlsbad & Hobbs
  - Formed in 2006
  - NM Local Economic Development Act

- Holtec International
  - U.S. company with U.S. manufacturing
  - Vertically Integrated
  - Turnkey Projects
  - Advanced dry storage technology
  - Experience in licensing fuel storage facilities
HI-STORE Utilizes HI-STORM UMAX Technology

HI-STORM UMAX at Callaway, MO
HI-STORM UMAX: Technology

- Below Grade, Vertical, Air Cooled
- Store canisters up to:
  - 75 ¾ in dia / 213 in tall
- Any US-origin commercial nuclear fuel:
  - Packaged in dry storage canisters
  - Stored in fuel pools
- No repackaging required
HI-STORM UMAX: Site Characteristics

- Operational Advantages
  - Universal System
  - Canister placed into storage or removed in less than one shift

- Maximizes Security
  - Facility visually inconspicuous
    - Profile < 2 ft tall
    - No area of obstructed view
  - Less visible from air
  - Reduced visibility from public land

- Maximizes Safety
  - Minimize dose to environment & crew
  - Virtually immune to environmental disasters - hurricanes, floods, tornados, earthquakes
  - Designed to withstand crashing aircraft or on-site fire without any radiological consequences

HI-STORM UMAX at Callaway, MO
HI-STORE Site

- 1,000 acres: geologically stable, dry, elevated land
- Developed infrastructure: electric, water, roads & rail
- Remote location:
  - 35 miles from nearest town
  - Midway between Carlsbad & Hobbs, NM
- Populace: robust scientific & nuclear workforce
- Strong support:
  - Local communities
  - State & Local government
- Total Storage Capacity 10,000 canisters (120,000 MTU)
- Initial Storage Capacity 500 canisters
- Facility utilizes 500 of the 1000 acres available
- Operations could commence 2022
Timeline

Expected Timeline Pending agreements with DOE and Nuclear Utilities:

- Application submitted to USNRC: March 2017
- License issued by the USNRC: 2019
- Construction Start: 2019
- Construction Complete: 2022
- Accept First Shipment: 2022
Approach to Licensing

1. Make HI-STORM UMAX Universal Storage Solution
   - April 2015, Initial Approval of HI-STORM UMAX system
   - August 2016 Submitted HI-STORM UMAX License Amendment:
     - Added NUHOMS 24PT1 canister for vertical storage
     - RSIs received & responded to
   - Once Licensing Strategy Affirmed
     - Update HI-STORM UMAX certificate
     - Add all canisters licensed to store SNF
     - Priority - shutdown / decommissioned plants

2. Apply HI-STORM UMAX to Interim Storage in NM
   - March 2017: Submitted Site Specific License Application
     - Initial application - 500 canisters
     - Reference the HI-STORM UMAX Certificate & FSAR
     - All RSI Responses submitted, awaiting acceptance letter
   - Future Amendments
     - Will reference the amended HI-STORM UMAX CoC & FSAR
     - Amendments for additional canisters up to 10,000
Transportation

- HI-STAR 190 – Universal Transport Cask
  - July 2015: Submitted Application
  - September 2017: Licensed

- MPC-37 (PWR) & MPC-89 (BWR)

- Additional canister types (Holtec & others) will be submitted for certification to meet industry needs
Path Forward

- **Continue Licensing Effort**
  - ✔ Holtec Funding Internally
  - ✔ Goal - License approval 2019

- **Secure Funds for Construction & Operation**
Questions?

Callaway, MO

San Onofre, CA