Holtec’s View on Spent Fuel Transportation

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INMM Spent Fuel Seminar 2018
January 23-25, 2018
Outline

- Holtec International Overview
- Holtec’s Transport Casks
- Licensing Aspects, Transport vs Storage
- High Burnup Fuel in Transportation
- MPC Integrity in Transportation
- Summary
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
- Orvilon 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

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Holtec’s Transport Casks

■ **Perceived Concern:** Not enough transport casks and not enough transport cask experience in the US

■ **Actual Situation (Holtec):**
  - Holtec has a large range of Transport Casks for US and International Clients, both canister-based or Bare Basket
    - HI-STAR 100, 190
      - 24 to 37 PWR assemblies
      - 68 to 89 BWR assemblies
    - HI-STAR 60, 63, 80, 150, 180, 180D, 180L, 190
      - 12 to 37 PWR assemblies
      - 32 to 69 BWR assemblies
      - Candu and VVER fuel
  - There is sufficient transport cask experience in the US
Licensing Aspects Transport vs Storage

- **Perceived Concern:** Transports will be delayed or difficult if the designated content (i.e. assembly type) is not included in the approved certificates.

- **Actual Situation:**
  - Licensing Framework of Storage and Transportation are VERY different, specifically in terms of licensing schedules.
  - Storage (10CFR72, General License)
    - Approvals require update of the regulation through rule-making including public comment period.
    - Minimum schedule for an amendment to an existing storage certificate is more than 1 year.
  - Transportation (10CFR71)
    - After the technical review of an amendment to an existing certificate is finalized, the NRC just issues the revised certificate.
    - Schedule can be as short as 3 months.

- Licensing will easily keep up with the actual transportation need.
High Burnup Fuel

- **Perceived Concern:** It will be difficult to transport High Burnup Fuel (HBF)
- **Actual Technical Situation:**
  - Through the ongoing research on HBF it becomes more and more clear that the so-called HBF does not behave significantly different than non-HBF
  - Nevertheless, transportation cask systems have been developed, and approved by NRC, to transport HBF by addressing the original concerns
    - Second Closure Lid as an additional water barrier
    - MPC qualified as an additional water barrier
- There is no technical reason for a concern about transporting HBF
MPC Integrity

- **Perceived Concern:** MPC integrity issues could result in difficulties for transport

- **Actual technical situation:**
  - In transportation, the cask is the principal containment boundary, not the MPC
  - Original Transport Safety Evaluations did not credit the integrity of the MPC in the containment safety analysis, only the material in the shielding safety analysis
  - Recent considerations for HBF lead to crediting the MPC as secondary barrier for additional assurance of water exclusion, but it is still not the primary containment boundary
  - Even if concerns about MPC integrity and HBF persist, the solution would be a cask with a double lid, which would remove any reliance of MPC integrity during transport altogether

- No reason for a concern with respect to MPC integrity during transport
Summary

- There is sufficient transport cask experience in the US
- Licensing will easily keep up with the actual transportation need.
- There is no technical reason for a concern about transporting HBF
- No reason for a concern with respect to MPC integrity during transport