

Holtec International

Holtec Technologies for Fukushima Recovery

Fukushima Recovery Forum

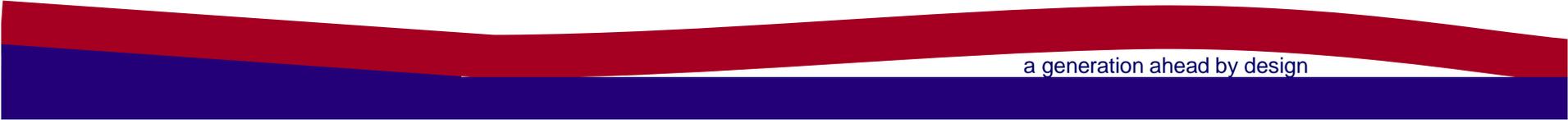
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Presentation by:

Rick Springman, Ph.D.

Director of International Projects

Email: r.springman@holtec.com



a generation ahead by design

***Holtec is a Vertically Integrated, Innovative Technology Leader with
Unique Approaches to Design & Manufacturing***

Holtec International Company Overview



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- **Established in 1986**
- **Backlog: 4.0 Billion USD +**
- **Excellent on-time delivery record**
- **No history of long-term debt**
- **Self financed company growth**
- **Highest industrial credit rating [D&B-5A1]**
- **Operates through eight operations centers**
 - USA, INDIA, UKRAINE, UK
- **Over 750 employees**



**Corporate Technology Center located
in Marlton, New Jersey U.S.A**

Holtec's Customers Span the Globe



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Holtec is a Global Leader in Used Nuclear Fuel and Waste Management Technologies

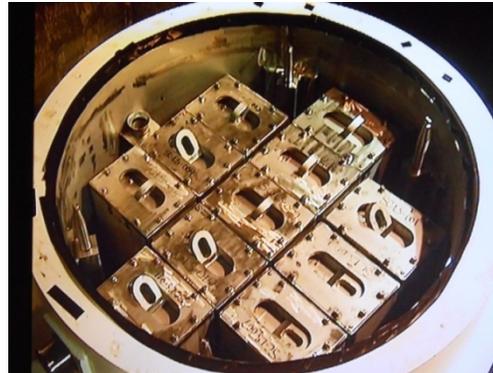


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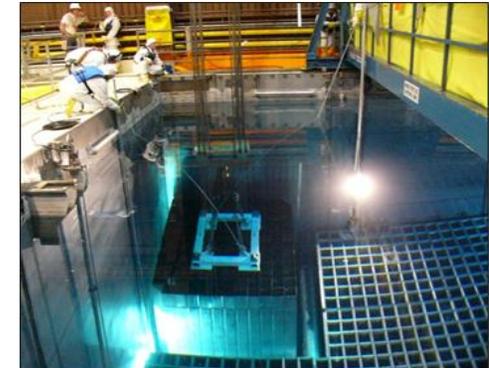
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Nuclear Fuel Storage and Transport
over 600 systems loaded with more than 31,000 SFAs (many more on order)



Operational and Decommissioning Waste Storage and Transport
in use at Jose Cabrera in Spain and LaSalle, Quad Cities, and Dresden in USA



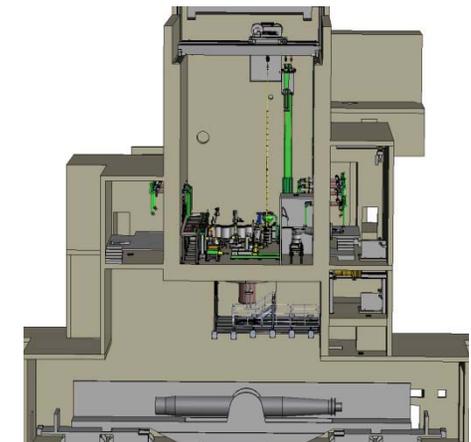
High Capacity Fuel Storage Racks
installed at over 100 NPPs in 7 countries totaling over 170,000 SFAs (AP-1000, ABWR, APWR, APR-1400)



Ancillary Equipment
drying, lifting, handling, operating equipment for nearly all projects



Damaged Fuel and Waste Containers
(made from stainless or neutron absorber) over 100 loaded and 44,000 on order for CHNPP



Hot Cell Facilities and Equipment
contracted for handling and conditioning fuel at Chernobyl NPP

Holtec is a Global Leader in Heat Transfer Technology for Nuclear and Conventional Power Industries



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- Equipment supplied to over 200 plants in 35 countries
- Heat Exchangers (ASME III, VIII, EN)
- Feedwater Heaters
- Steam Generators
- Superheaters
- Preheaters
- Water Cooled Condensers
- Air Cooled Condensers
- Air Cooling Units (ASME III)
- Pool Heat Exchangers
(*Passive and Active*)



MSR, Crystal River NPP



Air Cooler, Point Beach NPP



Component Cooling HX, Vogtle NPP



Condenser, Fossil Plant



Steam Generator, Solar Plant



Air Cooled Condenser

Holtec offers the Full Range of Product Support Services for Core Business Areas



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- **Civil design and construction**
 - Dry Storage Facilities
 - Hot cell processing centers
 - Plant Modifications
 - Crane upgrades (single failure proof)
- **Design, fabrication, installation of site equipment**
 - Impact drop pads
 - Seismic support devices
 - Cask transfer facilities
 - Radiation Shielding and Waste Handling Equipment
- **Waste and Fuel Handling Services**
 - Now provide complete services for over 50% of US dry storage clients (over 100 systems & growing)
 - Training of personnel for our clients (training facility at our factory with mock-up equipment)
- **Turnkey Equipment Supply**
 - Dry and Wet Storage Program Implementation
 - Heat Exchanger Installation or Replacement



Comanche Peak ISFSI



Loading Services



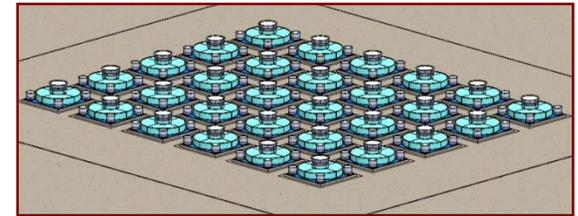
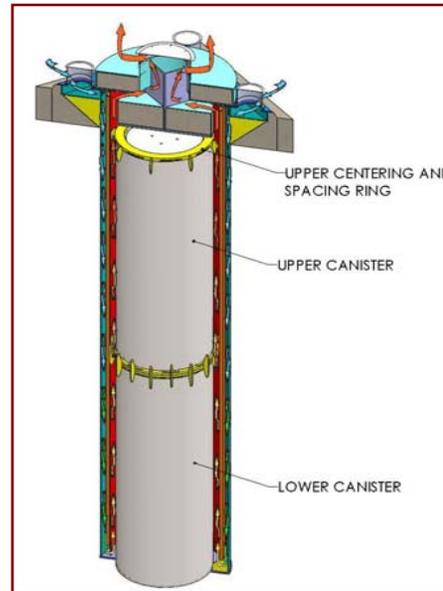
Training Facility

Key Technologies and Experience Areas for Fukushima Recovery

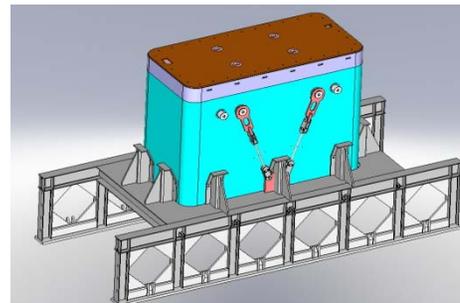
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- Consolidated Underground Waste and Fuel Storage for Long-term Storage
- Forced Gas Drying Technology (FGD) for damaged fuel, debris, and waste
- Damaged Fuel and Waste Licensing Experience and Technologies
- Waste Storage and Transport Casks (Dual-Purpose and Canister-based)
- Hot Cell Equipment for handling fuel and waste (Chernobyl Experience)
- Air Cooler Units for Emergency Cooling (Nuclear Grade)
- Passive and Active Residual Heat Removal Systems



HI-STORM Consolidated Interim Storage



HI-STAR Waste Cask



Chernobyl Damaged Fuel Basket

Advanced Technology from International Market is the Key to Safe & Efficient Recovery

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Example:

- 1553 Spent Fuel Assemblies in Unit 4
- Current Cask
 - Weight = 91 MT
 - Capacity = 22 Assemblies

→ 71 trips into the Building
- Holtec Offers High-Capacity Casks
 - Weight = 90 MT
 - Capacity = 32 Assemblies

→ 49 trips into the Building
- Advanced Technology
 - More efficient
 - Improved safety
 - Lower costs
 - Shorter schedule



**Spent Fuel Removal at Fukushima
Nuclear Power Plant Unit 4**

Courtesy of TEPCO, <http://spectrum.ieee.org>