

Holtec International – Central Interim Storage Facility for Spent Fuel and HLW (HI-STORE)

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Agenda

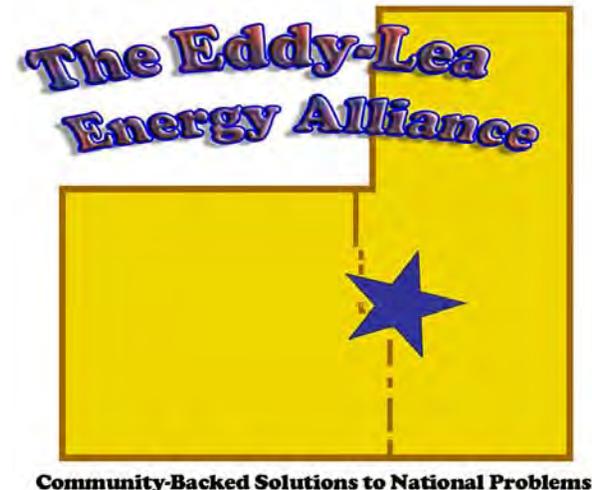
- Overview
- Location
- Facility
- Technology
- Licensing
- Aging Management
- Schedule
- Summary
- Technology, proprietary



Below-grade Storage at Humboldt Bay
Power Plant, in Eureka, CA

Overview

- License, construct and operate a central interim storage (HI-STORE) facility for up to 4000 spent fuel and HLW canisters
- Partnership between Holtec and ELEA
- ELEA (Eddy-Lea Energy Alliance) is an Alliance of the Counties of Eddy & Lea and the Cities of Carlsbad & Hobbs
- License Application is planned for June 2016
- Facility can be operational by 2020

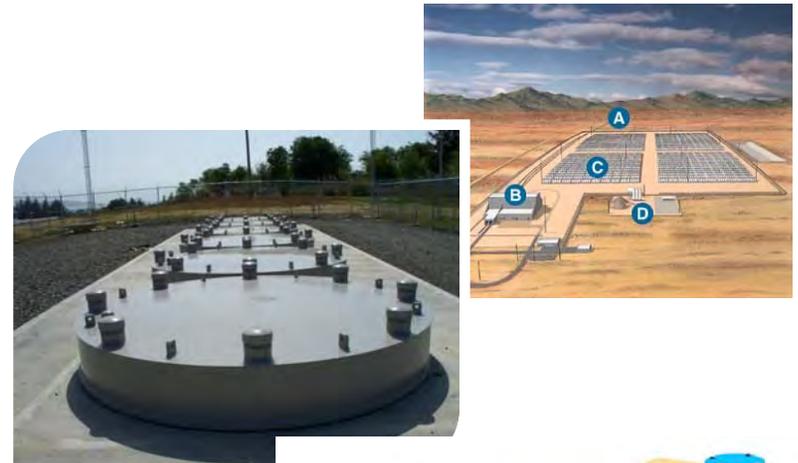


Overview - Holtec Experience



■ Storage Facilities

- ✓ Private Fuel Storage (PFS)
- ✓ Humboldt Bay
- ✓ Trojan
- ✓ Callaway
- ✓ Ukraine Central Storage Facility

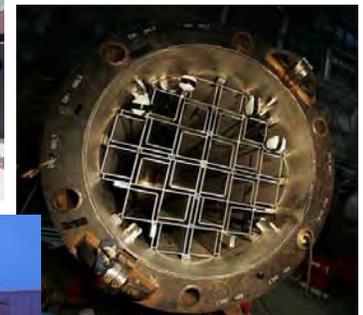


■ Storage Systems

- ✓ HI-STAR 100, HI-STORM 100, FW, UMAX

■ Transport Systems

- ✓ HI-STAR 60, 100, 180, 180D, 190



Location

- ELEA purchased 1,000 acres of land approximately halfway between Carlsbad and Hobbs, N.M. for potential use
- Land studied extensively during Global Nuclear Energy Partnership (GNEP) process
- Remote location, 35 miles from nearest population
- Geologic stability
- Excellent location for future repository nearby
- Dry Area
- Infrastructure present, including rail
- Preexisting robust scientific and nuclear operations workforce
- **STRONG CONSENT FROM THE AREA**

Location (cont.)



Location (cont.)



Site Susceptibility for CISCC (EPRI Report 3002005371)



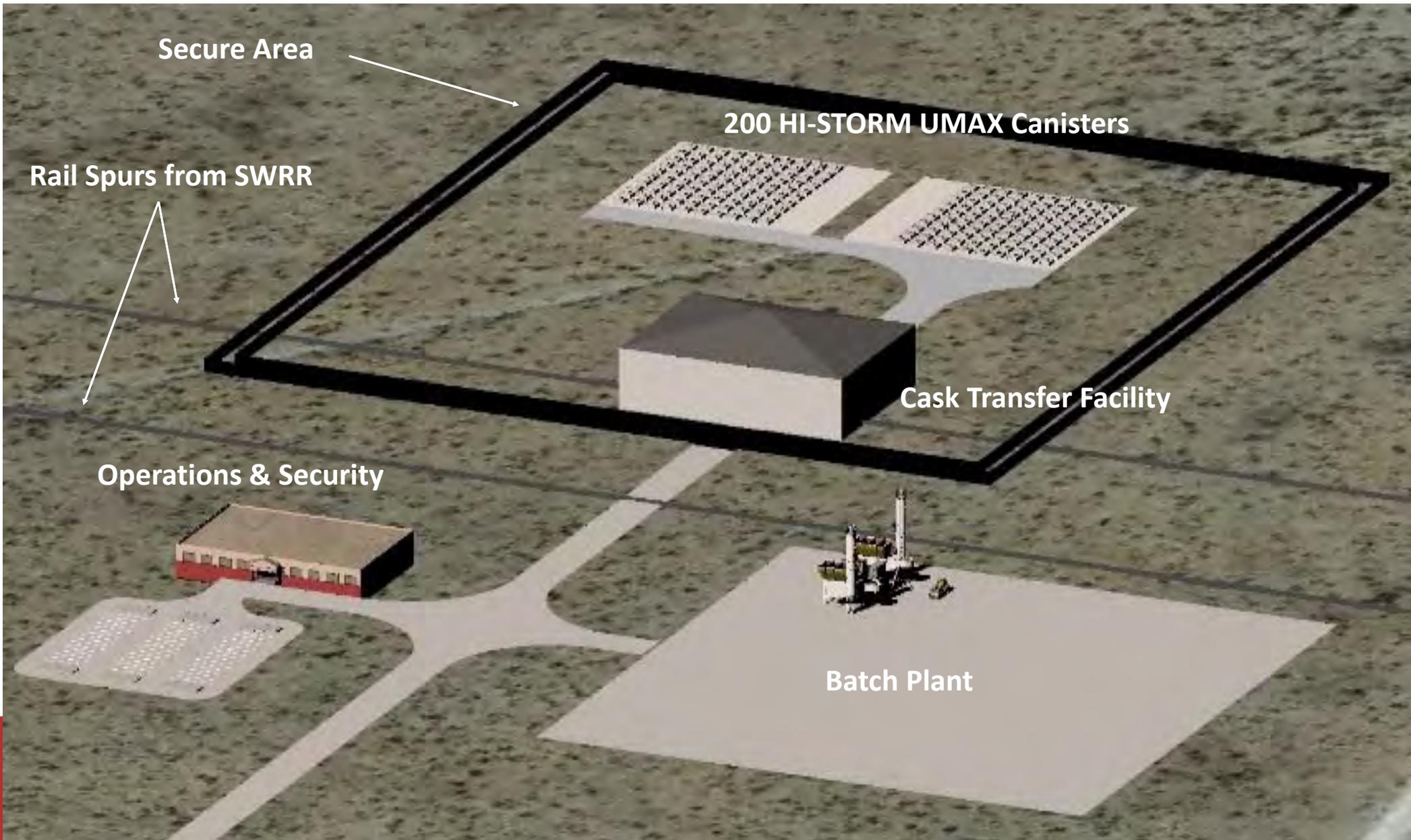
■ Site

✓ Marine Shore	1
✓ Elevation	0
✓ Cooling Tower	0
✓ Salted HW	0
✓ <u>Climate (AH)</u>	<u>-1</u>
✓ Site Total	1 (lowest possible value, Range 1 to 10)

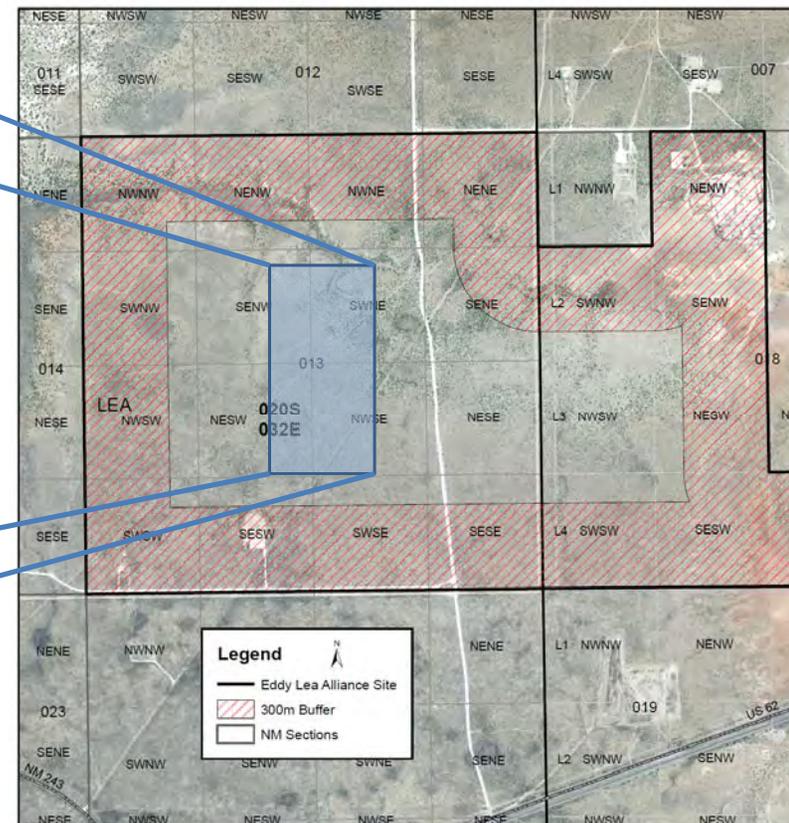
■ Lowest possible CISCC Susceptibility

- ✓ Overall susceptibility will depend on canister condition at the time of transfer to the site

Facility, Phase 1

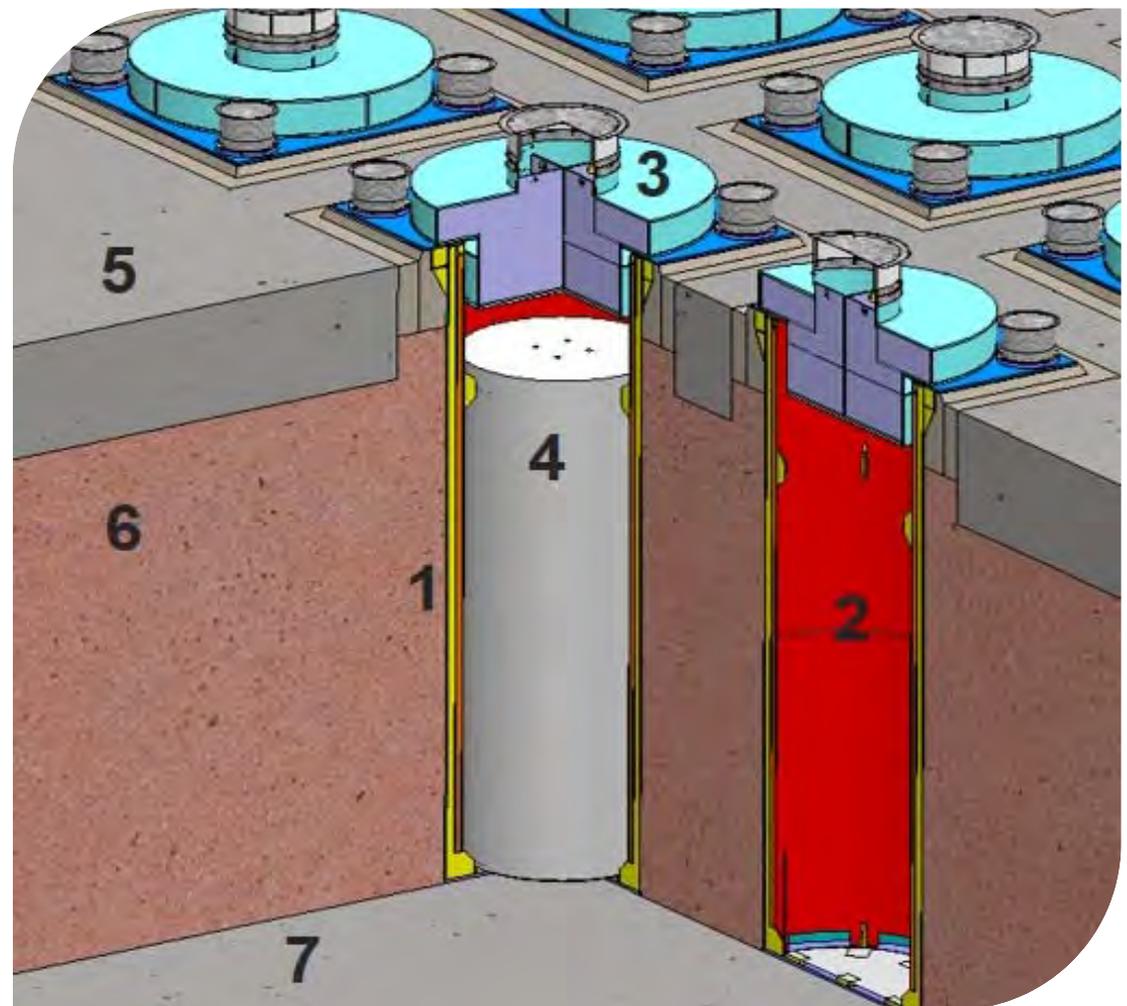


Full Facility, 4000 Canisters



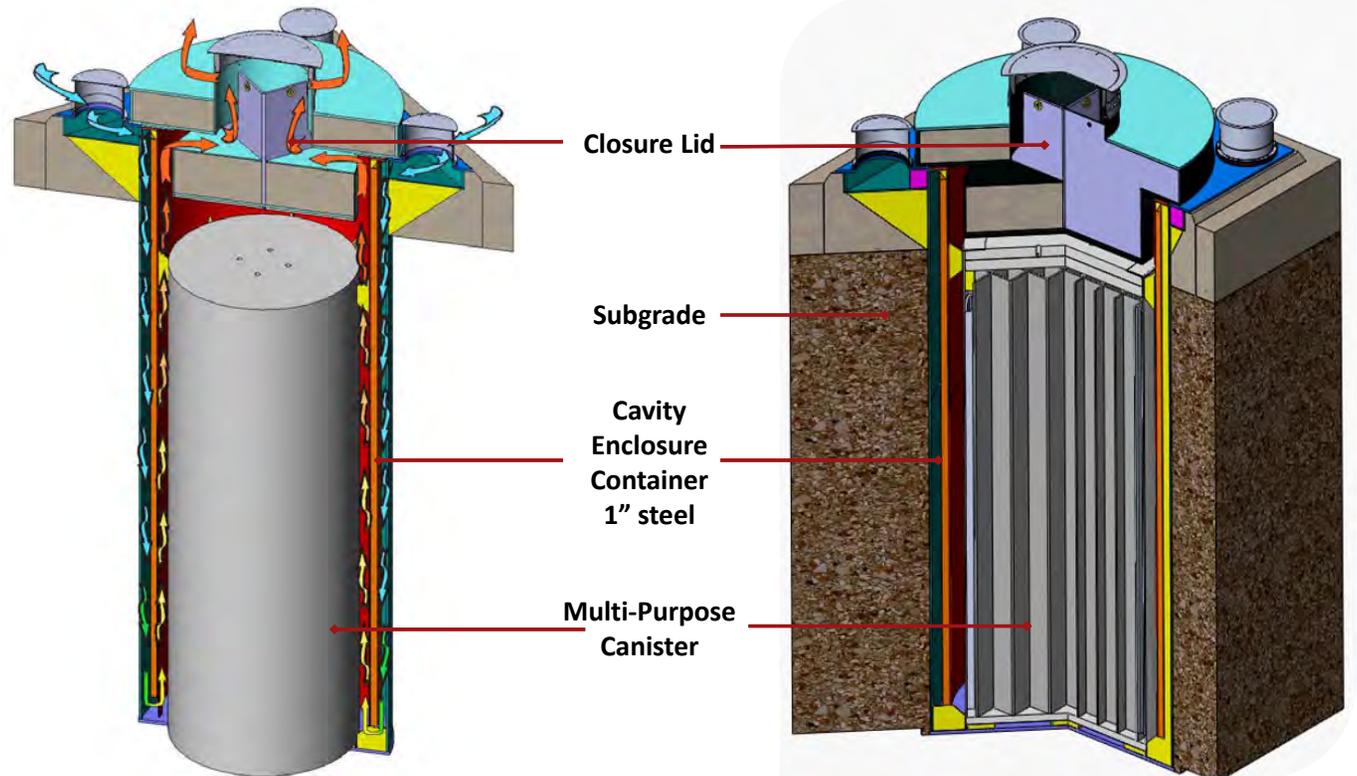
Technology - HI-STORM UMAX

#	Component
1	Cavity Enclosure Container (CEC)
2	Divider Shell
3	Closure Lid
4	Canister
5	Top of Pad
6	Engineered Subgrade
7	Support Foundation Pad (SFP)



Technology - HI-STORM UMAX

- Passive heat rejection
- Canister is entirely below grade
- Size – HI-STORM UMAX is licensed to store canisters up to 75 ¾ inches in diameter, and up to 213 inches tall
- 22 ft. deep x 11 ft. wide



CECs in Storage at Holtec Manufacturing Division (HMD)



Completed HI-STORM UMAX ISFSI



HI-STORM UMAX Capabilities



- HI-STORM UMAX designed to store majority of spent fuel storage canisters currently licensed in the US
 - ✔ Size: Licensed to store canisters up to 75 $\frac{3}{4}$ inches in diameter and up to 213 inches tall
 - ✔ Heat Load: Licensed to store canister heat loads of up to 37 kW with per assembly heat loads up to 1.69 kW
 - ✔ Contents: Licensed to store burnups up to 68.2 GWd/MTU with a minimum fuel cooling time of 3 years
 - ✔ Canister Weight: 90,000 lbs bounding
- These are bounding conditions of canisters stored at shutdown sites – HI-STORM UMAX can store all.

HI-STORE Facility

■ Using the HI-STORM UMAX, the facility will be licensed to storage all priority canisters located at shutdown & near term shutdown sites:

- Connecticut Yankee
- Humboldt Bay
- Kewaunee
- La Crosse
- Maine Yankee
- Millstone Unit 1
- SONGS
- Oyster Creek
- Rancho Seco
- Trojan
- Yankee Rowe
- Zion
- Vermont Yankee

Technical Details

■ HI-STORM UMAX

- ✓ CEC identical for all locations
- ✓ Divider Shell and Lid will be adjusted for each canister type

■ HI-TRAC transfer cask models

- ✓ HI-TRAV VW for MPC-37 and MPC-89
- ✓ HI-TRAC 100/125 for MPCs from HI-STORM 100
- ✓ HI-TRACs will be adjustable and/or separate models will be used for transfer of other vertical and horizontal canisters

Technical Details (cont.)

■ Cask Transfer Facility

- ✓ Standard Below-Ground Cask Transfer Facility (CTF) for all vertical canisters
 - Up-end transport cask
 - Place transport cask into CTF (see Diablo Canyon CTF)
 - Place cask-specific mating device onto transport cask
 - Place HI-TRAC onto mating device
 - Pull Canister into HI-TRAC
 - Move HI-TRAC to storage area and place canister into UMAX VVM
- ✓ Transfer operation for horizontal canisters (proprietary)

Two Part Approach to Licensing

- Amend HI-STORM UMAX Certificate:
 - ✔ Add additional Holtec canisters
 - ✔ Add canisters from shutdown / decommissioned plants – Priority Waste
 - ✔ Future: Update General License for all canisters projected to store SNF
- License HI-STORE under a 10 CFR 72 site-specific license
 - ✔ Initial application will request 500 canisters - Priority Waste
 - ✔ Future amendments for additional canisters up to 4000
 - ✔ Reference the amended HI-STORM UMAX Certificate and FSAR for technical details

HI-STORE Site Specific License Application



- License Application will utilize PFS SAR and NUREG 1657
- Part 72 Site Specific License Contents
 - ✓ General / Financial Information about Holtec
 - ✓ Technical Information – Safety Analysis Report (SAR)
 - ✓ Site Environmental Report
 - ✓ Procedures
 - ✓ QA and Training Programs
 - ✓ Security and Emergency Plans
 - ✓ Inventory and Records Requirements
 - ✓ Decommissioning Plan

HI-STORE Site Specific License Application



- 40 year license
- Aging Management Plan for UMAX and all canisters
 - ✔ For each canister the aging management must be initiated once the canister reaches its initial licensed lifetime (e.g. 20 years). When that happens at the HI-STORE facility depends on the initial loading date of the canister.
 - ✔ Additional accessibility and monitoring options will be incorporated in the UMAX design
- Cask Receipt Inspection
 - ✔ Receipt inspection to ensure every canister meets the site specific requirements
 - Generate Baseline for future inspections. Full Surface inspection (inspection ring) is being considered
 - ✔ Canister history and previous inspections are considered
- Possession / Title / Ownership
 - ✔ DOE
- Tech Specs
 - ✔ Only spent fuel canisters already loaded under a general or site specific license will be stored
 - ✔ Duplication of TS information should be avoided

Environmental Report

- Report will:
 - ✓ Cover full CISF content (4000 canisters)
 - ✓ Will utilize data from well-characterized area
 - WIPP, URENCO Enrichment Facility, GNEP, WCS
 - ✓ Additional (new) environmental data may not be needed
- Holtec will partner to develop report
 - ✓ Reviewing Proposals
 - ✓ Will select partner in short order
- Holtec participant on Part 72 site-specific license for PFS, including environmental report

Amend HI-STORM UMAX General License



■ Final Safety Analysis Report (FSAR)

- ✔ Generic HI-STORM UMAX FSAR already contains all the overall system information
- ✔ Holtec will obtain amendment to generic CoC to include additional canisters, both Holtec fabricated and other systems
- ✔ This generic CoC and associated supporting FSAR will be incorporated into the site-specific 10CFR72 license
- ✔ This is consistent with the approach at PFS

Project Timeline



Phases	Activities	2015	2016	2017	2018	2019	2020
Pre-Application	LOI Issued to NRC – 3 Aug 2015	◆					
	First NRC Pre-Application Meeting – Dec 2015	◆					
	Second NRC Pre-Application Meeting – Mar 2016		◆				
Licensing	Generic UMAX Application Submittal – Jun 2016		◆				
	Generic UMAX Application NRC Review		—				
	Generic UMAX Amendment Effective – Dec 2018				◆		
	Submit Site-Specific License Application – Jun 2016		◆				
	RSI Period		—				
	License Application Accepted for Review – Sept. 2016		◆				
	Technical Review / RAI Period		—				
	SER Issued – October 2018				◆		
	License Application Approved – June 2019					◆	
Future License Amendment Submitted						◆	
Construction	Begin Construction Design			◆			
	Begin Detailed Design			—			
	Begin Construction				◆		
	Construction Phase 1				—		
	Begin Operations/Receipt of first UNF Shipments						◆

HI-STORE Summary

- Under the partnership with ELEA, a 1000 acre area is available for the projected HI-STORE Central Interim Storage Facility in New Mexico
- Facility uses the HI-STORM UMAX system
- Facility will be available for all spent fuel and HLW canisters
- Licensing effort is well underway for submittal to USNRC in June 2016