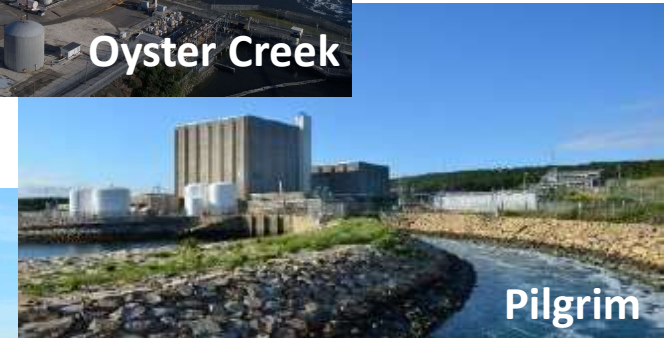


Holtec's Fleet Approach to Decommissioning

**By: Corey E. DeWitt
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June 20, 2019**

Topics:

- Decom Market Overview
- Holtec Nuclear Overview
- Decommissioning Strategy
- Fleet Approach
- Decommissioning Organization
- What is Happening & What is Ahead



Decom Market Overview

Completed Reactors

- Shippingport (1989)
- Shoreham (1994)
- Ft St. Vrain (1996)
- Big Rock Point (2003)
- Trojan (2004)
- Maine Yankee (2005)
- Saxton (2005)
- Yankee-Rowe (2007)
- Conn Yankee (2007)
- Rancho Seco (2009)

Decom in Progress

- LaCrosse (2019)
- Humboldt Bay (2020)
- Zion 1 & 2 (2020)
- Vermont Yankee (2025)
- Ft Calhoun (2025)
- San Onofre 1,2 & 3 (2030)

SAFSTOR

- Peachbottom 1
- Indian Point 1
- Millstone 1
- Dresden 1
- Fermi 1
- Kewaunee
- TMI-2
- Oyster Creek (2027)
- Pilgrim (2027)

Market Overview

Announced Future Shutdowns

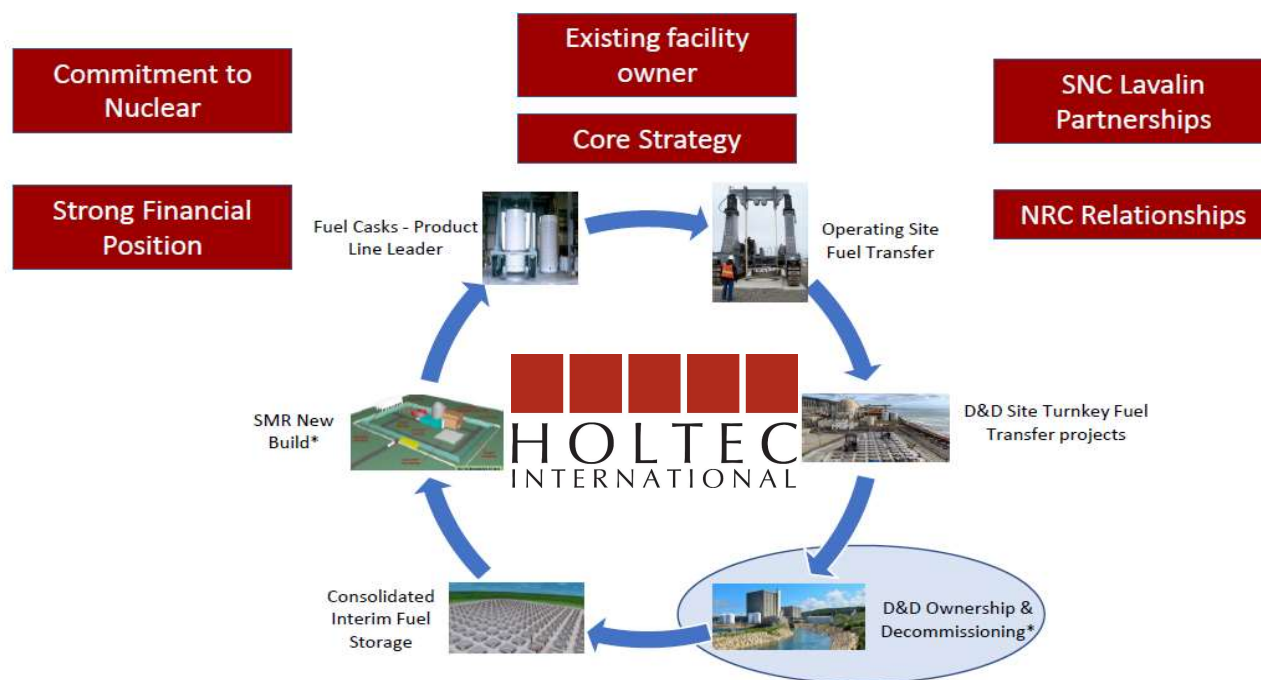
- TMI-1 (2019)
- Davis Besse (2020)
- Duane Arnold (2020)
- Perry (2020)
- Beaver Valley 1 (2020) & 2 (2021)
- Indian Point 2 (2020) & 3 (2021)
- Palisades (2022)
- Diablo Canyon (2024 / 2025)

Decommissioning Models

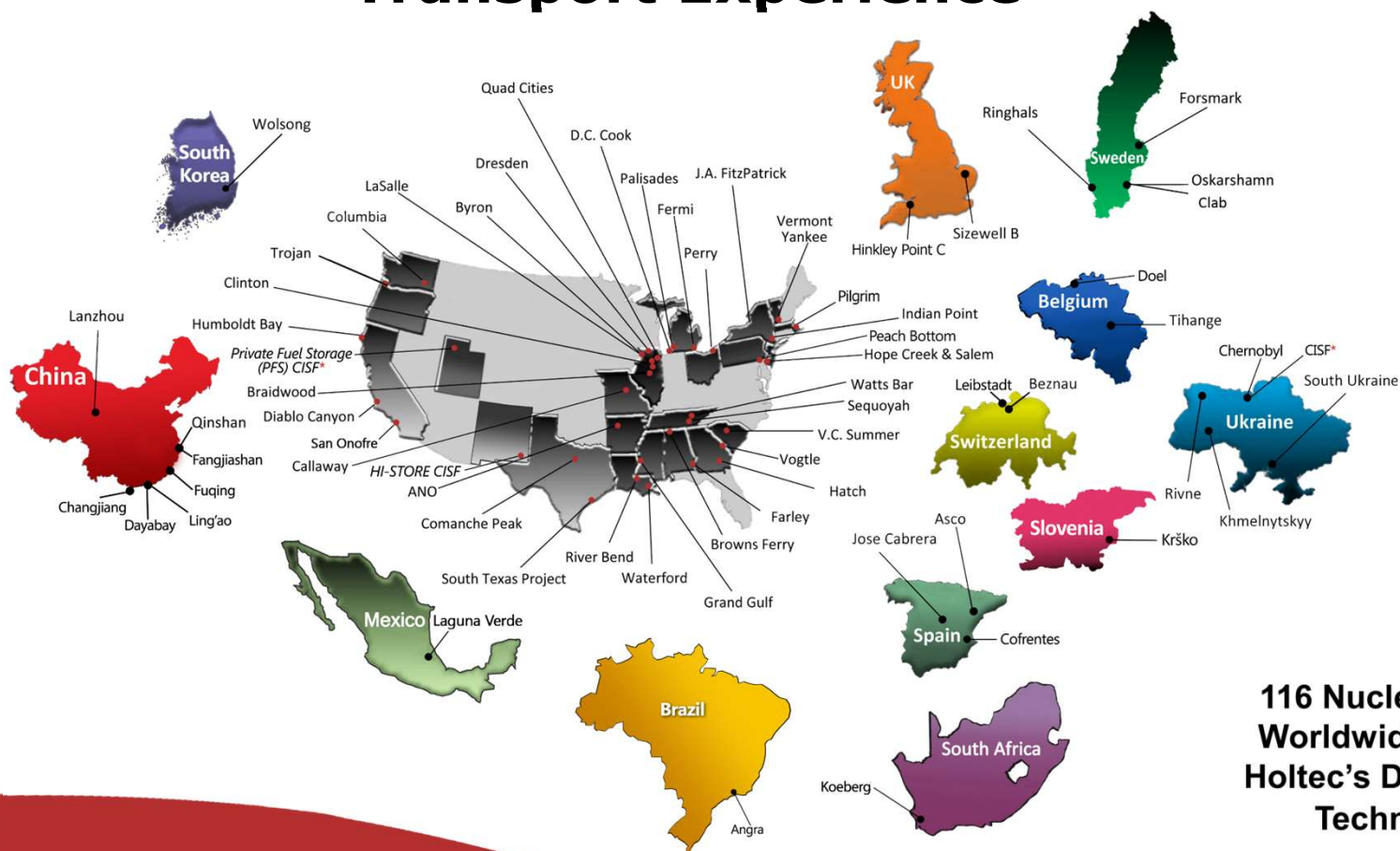
Model Type	Example	Timeframe
<i>Acquisition</i>	Vermont Yankee, Oyster Creek, Pilgrim, Palisades, Indian Point (1-3)	2017 Onwards
<i>License Stewardship</i>	Zion, Lacrosse BWR	2010 - Current
<i>Decommissioning Operations Contractor (DOC or Prime Contract)</i>	San Onofre, and initially Maine Yankee & Connecticut Yankee	2016 - San Onofre 1990's - MY and CY
<i>Self Perform</i>	Big Rock Point, and to conclude Maine Yankee & Connecticut Yankee	1990's - BRP & Trojan Early 2000 - MY and CY

Site ownership is an integral part of Holtec's long-term strategy

Holtec Nuclear Overview



Holtec's Worldwide Dry Storage and Transport Experience



**116 Nuclear Plants
Worldwide Rely on
Holtec's Dry Storage
Technology**

Holtec Decommissioning Strategy

Establish, Implement & Advance Industry Decommissioning

Fleet Approach

Based on nuclear industry fleet model

Drive lessons learned across sites

Maximize standardization

Drive technology innovation

Qualified and Experienced Personnel

Existing Holtec nuclear-experienced personnel

Additional nuclear plant experienced personnel

Partner with SNC-Lavalin

Integrate site organization at license transfer

Industry vendors

Procedures & Processes

Adopt NRC-approved site programs, processes and procedures

Maintain compliance with site license & NRC regulations

Maintain, protect & control spent nuclear fuel

Ensure environmental & personnel protection

Decommissioning Organization

- Spent fuel management and nuclear services
- Spent fuel cask/storage vendor
- Permanently Shutdown Plant ownership

Provide resources and oversight to support the safe, compliant operation of the acquired sites



- Wholly-owned Holtec subsidiary

Licensed operator for all decommissioning sites in the Holtec fleet



- Jointly-owned company by Holtec/SNC-Lavalin
- Extensive decommissioning project experience

Decommissioning General Contractor (DGC) for the Holtec fleet



CDI Worldwide D&D Experience

Holtec

- 30 years of safe spent nuclear fuel management
- Expertise in design/build on-site fuel storage installations
- SNF services supplied to over 116 nuclear units worldwide
- Innovative solutions for complex challenges
- Performs all dry storage implementation work with in-house resources

SNC-Lavalin (Atkins)

- Shared heritage of commercial NPP D&D at Big Rock Point, Zion and Magnox
- Over 100 waste cleanup, D&D and government site remediation projects in the US & Canada
- Waste treatment technologies and new storage/disposal canisters at Fukushima
- Multiple research reactor decommissioning projects in Canada

What Is Happening

Site Primary Project Work Streams

Transition/Day 1 Focus Team

- Finalize site organization
- Finalize integration of corporate and site governance
- Focus on successful execution of key transition elements, e.g.:
 - ✓ Staffing including qualifications/training
 - ✓ Programs and procedures to maintain compliance
 - ✓ IT and communications

Decom Project Planning Focus Team

- Develop detailed decommissioning project scope, schedule and cost
- Validate readiness of CDI programs and procedures
- Finalize CDI / vendor contracts for decom activities
- Support the execution of physical plant changes



Decommissioning Quality Assurance Strategy

Adopt existing NRC approved QA Plan

This will cover decommissioning (license termination) and spent fuel management operations

- 10 CFR 50, Appendix B
- 10 CFR 71, Appendix H
- 10 CFR 72, Appendix G

Development of DQAP

- Administrative modifications that reflect post transfer organization
- Modifications / Simplifications through 10 CFR 50.54 (a) process
- Subcontractors work under its approved 10 CFR 50 Appendix B Program (as appropriate)
- HDI / CDI oversight of compliance



Applicability of DQAP

- Safety-related and important to safety functions
- Rad-waste systems including storage systems
- Regulatory programs as defined in the Decommissioning Safety Analysis Report
 - ✓ Fire Protection equipment
 - ✓ Rad waste systems
 - ✓ EP equipment
 - ✓ Area radiation monitors
 - ✓ SFP / ISFSI functions
 - ✓ Met tower
 - ✓ Final Status Survey

What is Ahead

- Obtain NRC approval to transfer Oyster Creek and Pilgrim licenses
- Transaction closure and license transfer execution and successfully transition Oyster Creek and Pilgrim
- Prepare and submit IPEC License Transfer Application and DECON submittals to NRC (shutdown of Unit 2 is April 2020; Unit 3 is April 2021)
- Prepare and submit Palisades License Transfer Application and DECON submittals to NRC (shutdown April 2022)

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