Perspectives on Decommissioning NPPs in Japan

“Sharing Our D&D Lessons Learned with Japan”

Waste Management 2017
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AECOM Management Services

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AECOM

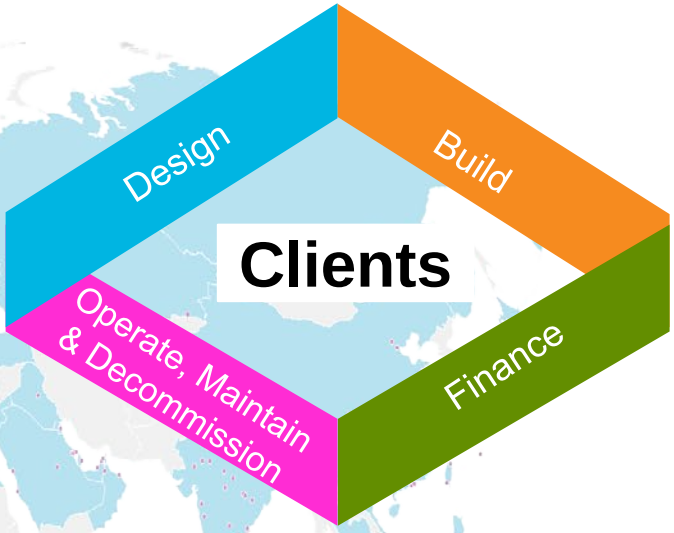
AECOM - A Global, Integrated, Service Provider

150+ Countries

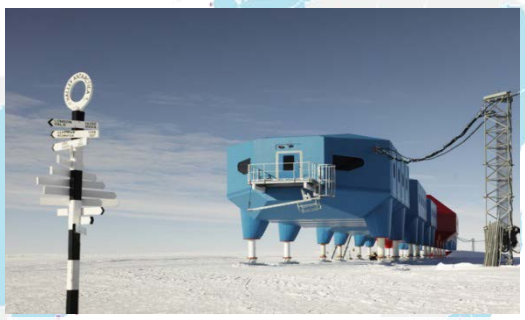
90,000 Employees

US$18 Billion Revenue

“Making the world a better place”



515 cities - we provided construction management to the One World Trade Center



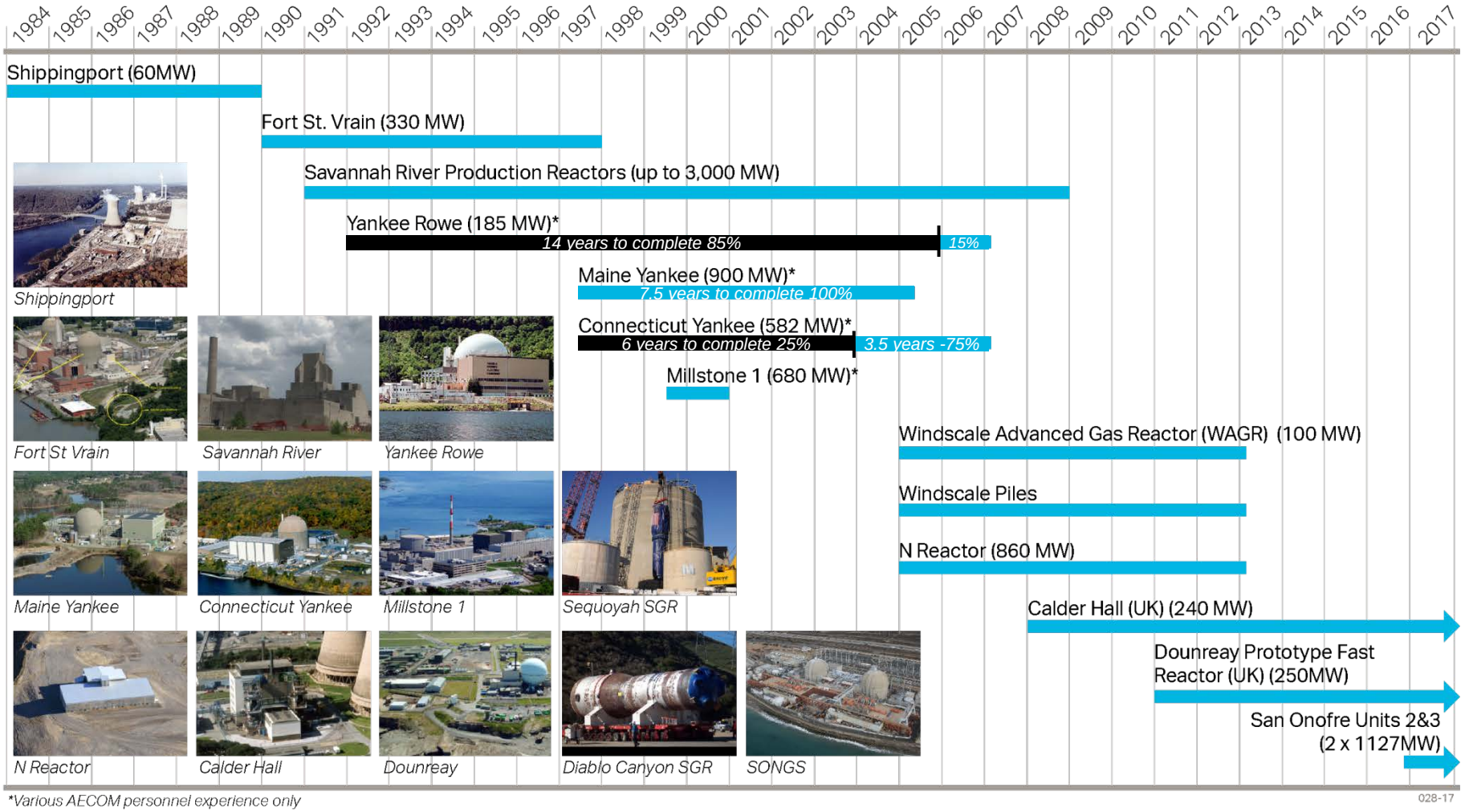
7 continents - we helped design & build the Halley VI Antarctic Research Station

>1 planet - we supported the Mars Rover Project

Over 30 Years’ of Experience in Nuclear Decommissioning

AECOM Reactor D&D Experience

Used as Basis for Cost, Schedule and Risk Management Plans



*Various AECOM personnel experience only

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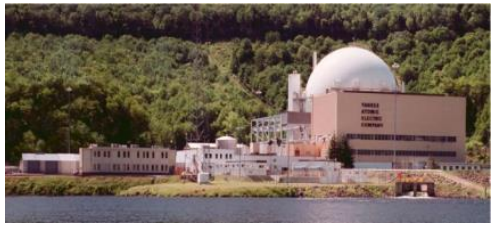
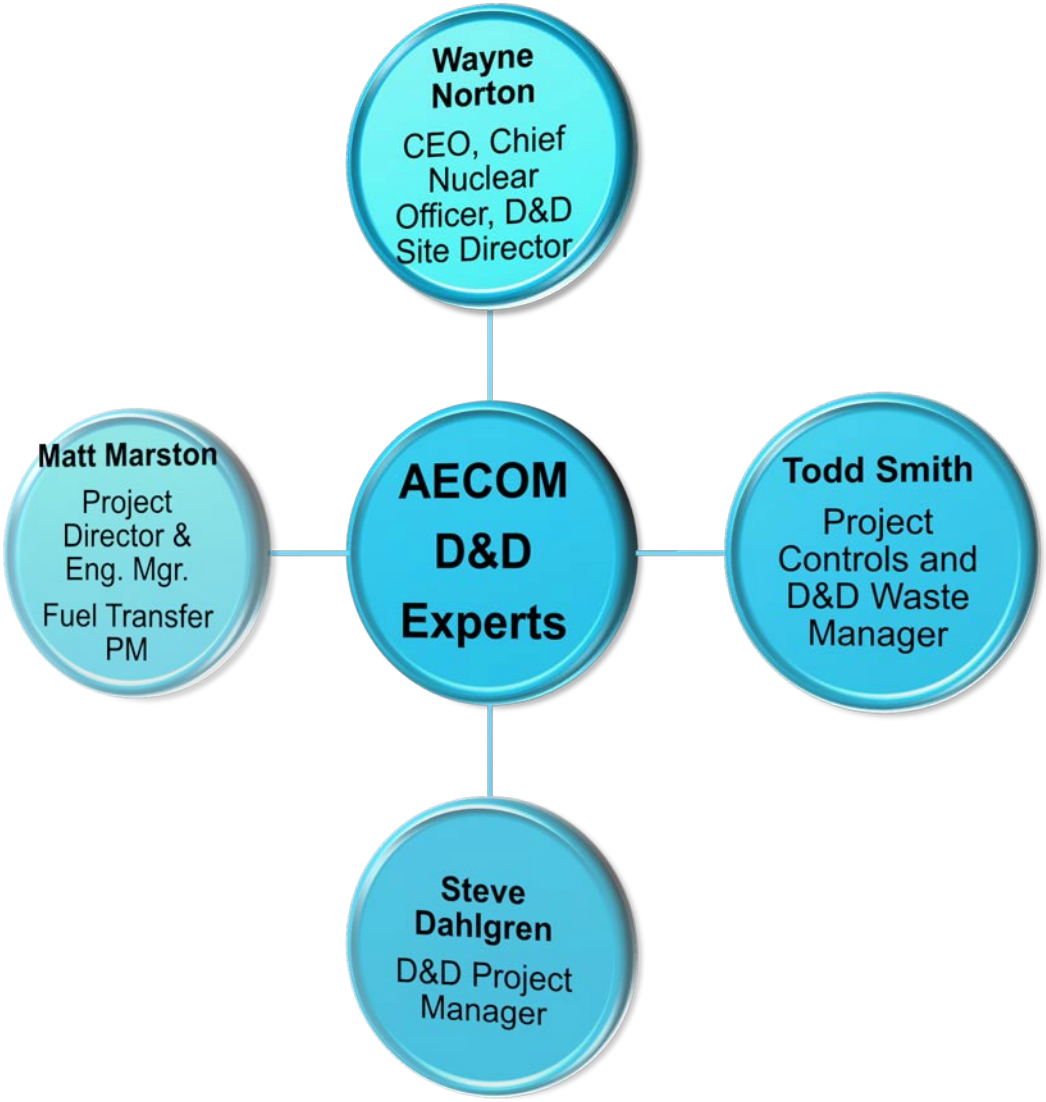
D&D Final Results — Comparisons

	Yankee Rowe	Connecticut Yankee	Maine Yankee
	 	 	 
Capacity:	- 165 MWe	- 620 MWe	- 860 MWe
Cost:	- $608M	- $871M	- $568M
Duration:	- 15 years (1992-2007)	- 9 years (1997-2006)	- 7.5 years (1997–2005)
Waste Retrieved:	- 201M lbs.	- 405M lbs.	- 460M lbs.
Fuel Casks:	- 15	- 40	- 60
Canister Type:	- NAC Multi-Purpose Container (MPC)	- NAC Multi-Purpose Container (MPC)	- NAC Multi-Purpose Container (UMS)
Total Dose:	- 594 Person.REM	- 860 Person.REM	- 515 Person.REM
NSS Supplier:	- Westinghouse 4 Loop	- Westinghouse 4 Loop	- Combustion Engineering
Manager:	- Yankees D&D Management Team	- Yankees D&D Management Team	- Yankees D&D Management Team

Yankees D&D Management Team

– An experienced technical group of AECOM Subject Matter Experts and Consultants performing D&D Management Services **exclusively for AECOM.**



Phase 1 — Decommissioning Planning

1. **Detailed Site/Facility Characterization (Pre & Post Shutdown)**
2. Activation Analysis (Pre and Post Shutdown)
3. PSDAR (Post Shut Down Decommissioning Activity Report)
4. Site Specific Cost Estimate and Schedule
5. Funding Evaluation (DECON / SAFSTOR approach)
6. Establish End State Conditions
7. Staffing Plans
8. Waste Management Plans
9. Cold & Dark Strategy
10. Spent Fuel Pool Island Approach (Control Room & security mods)
11. License Termination Plan (in USA, submittal required 2 years prior to license termination)
12. Other planning tasks — (i) flush & drain systems, (ii) access, (iii) technical spec modifications, (iv) system abandonment, (v) document modifications, etc.
13. Evaluate/Select Potential Subcontractors

Phase 1 — Decommissioning Planning

1 Characterization Comparisons and Lessons

Yankee Rowe

- Not comprehensive at the beginning and was implemented on a task basis
- Multiple characterization issues were identified late in the process (e.g. PCB Paint issues on the Vapor Container during demolition)

Connecticut Yankee

- Not initially comprehensive
- Enhanced in 2003 before major dismantling began
- The extensive Cs137/Sr90 groundwater contamination issues from the tank farm were identified late in the process

Maine Yankee

- Comprehensive for the entire site as part of the Phase 1 (Decommissioning Planning) activities
- No unknown contamination was identified at the site

1 Characterization Lessons learned at Connecticut Yankee

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1 Characterization Lessons learned at Connecticut Yankee



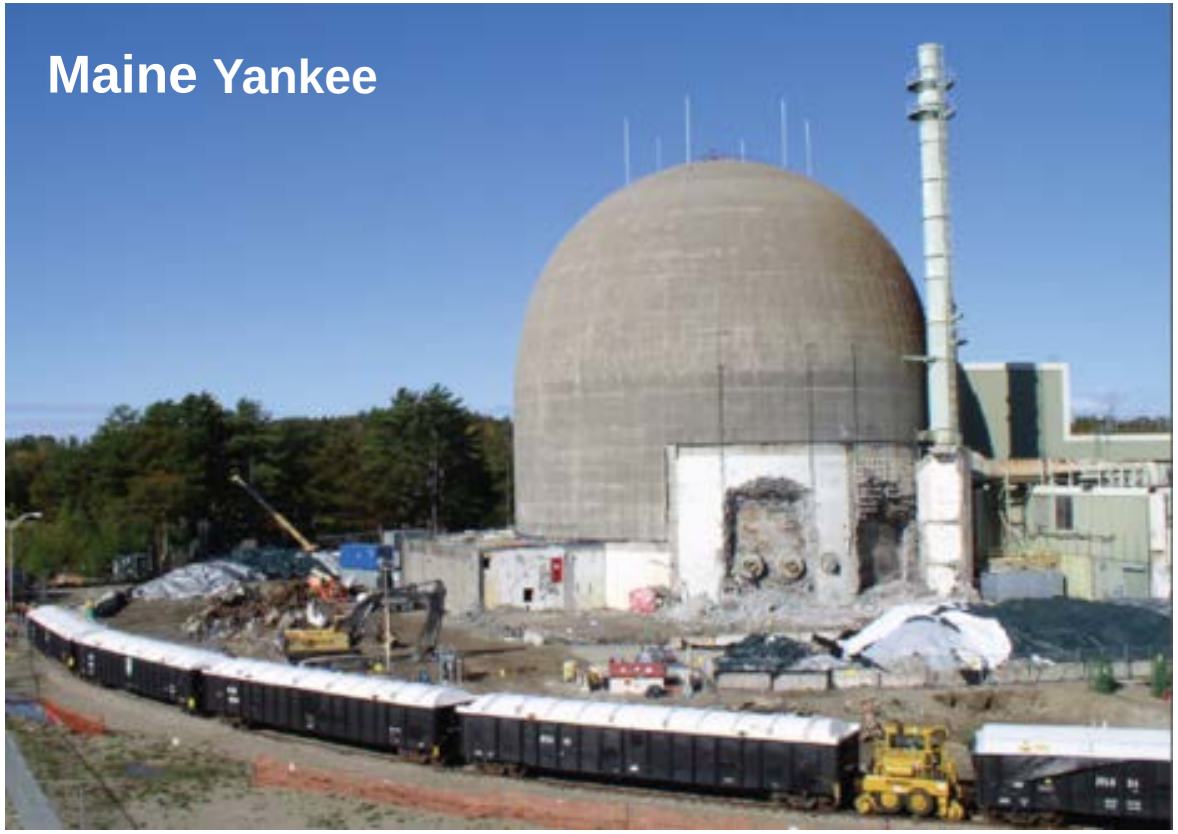

Photos show extensive soil excavation and remediation of below grade contaminated areas under the Primary Auxiliary Bldg (down to bedrock)

Phase 3 — Radiological Decommissioning

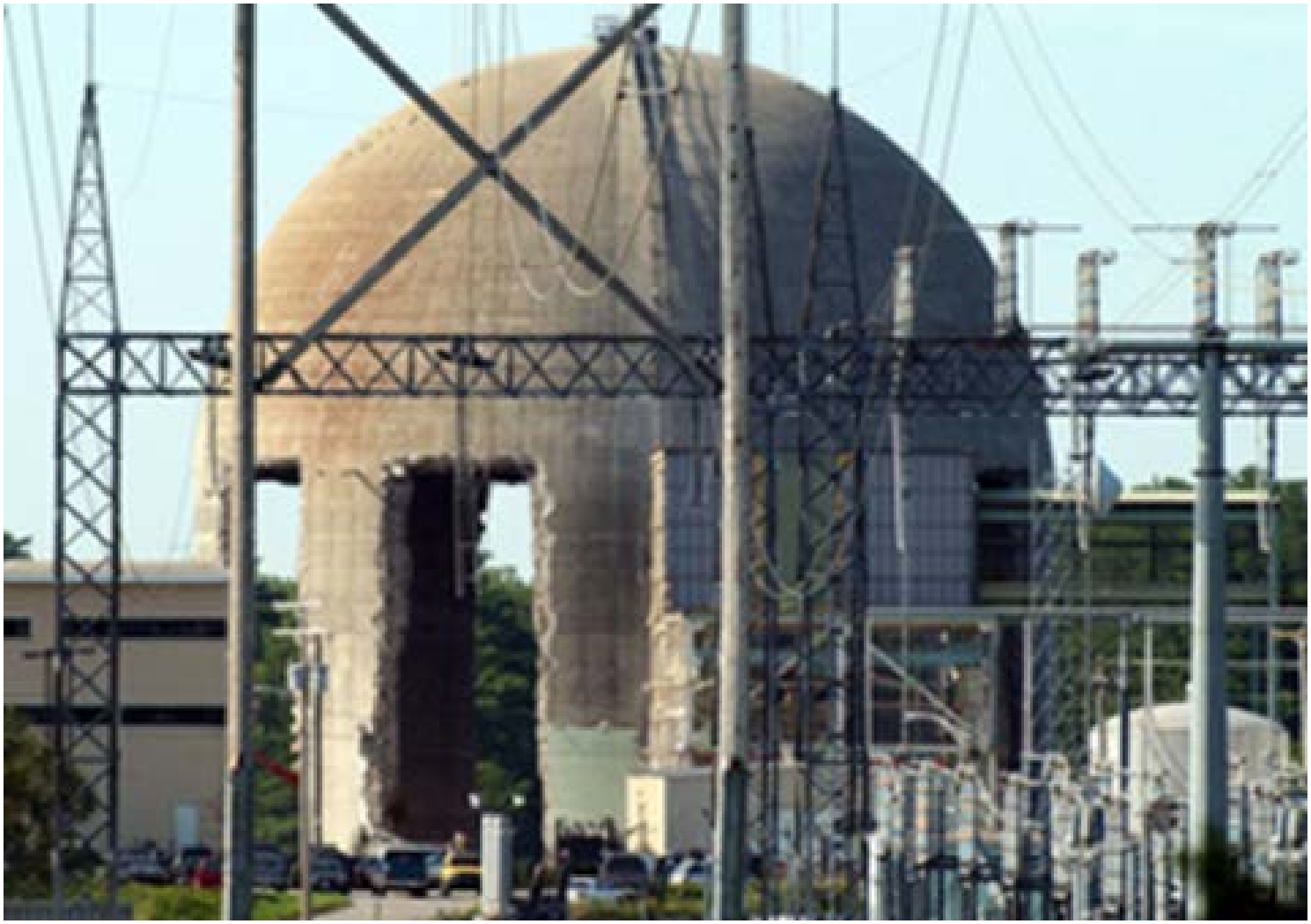
1. RPV Internals (> Class C to ISFSI Pad) – classification dependent on designated country classification regulations – for BWRs, due to no transfer cavity – will need room in SFP for segmentation operations
2. Large Component Removal (SGs, Pzr, Turbine Rotors, Pumps, RPV)
3. **Contaminated Systems Removal (potentially allow open air demolition) – "surgical removal", systems, structure, and component decontamination**
4. Controlled Demolition of Contaminated Structures PWR — Containment (PWR/BWR), Auxiliary Bldg (PWR), RW Bldg (BWR), Turbine Building (BWR), etc.
5. Packaging, Shipment (Road, Rail and Water) and Disposition of Radioactive Waste:
   BSFR – Bulk Survey for Release (Exempt - < 10 µSv/annum to member of general public)

Phase 3 — Radiological Decommissioning

3 Contaminated Systems Removal (to potentially allow open air demolition) – “surgical removal”, systems, structure and component decontamination



Maine Yankee Containment Demolition



Containment being prepared for demolition

Maine Yankee Containment Demolition

Explosive Demo of Containment

Maine Yankee Containment Building Demo Video

Maine Yankee Containment Demolition

Containment following explosive demo

Phase 3 — Radiological Decommissioning

3 Contaminated Systems Removal (to potentially allow open air demolition) – “surgical removal”, systems, structure and component decontamination

Connecticut Yankee

Connecticut Yankee

Connecticut Yankee

Connecticut Yankee

Connecticut Yankee

Connecticut Yankee

3 Contaminated Systems Removal – Lessons Learned

Maine Yankee Reactor Building Demolition

- Containment Building Demolition was Successful
- Planning and Demolition with Explosives Took 6 Months

Connecticut Yankee Reactor Building Demolition

- Containment Building Demolition was Successful
- Explosives Were Not Utilized
- Demotion Took Approximately 2 Months
- Much Less Cost

Same Demolition Contractor used at both Sites

AECOM Goal

Apply D&D Experiences from the US and Europe through the Alliance with Toshiba, IHI, & WEJ

Visit Toshiba, IHI, & AECOM booth in the Japan Pavilion

to find more Technology and Capability!

どうもありがとうございます

Thank you