



INFRASTRUCTURE
MINING & METALS
NUCLEAR, SECURITY & ENVIRONMENTAL
OIL, GAS & CHEMICALS

Bechtel Overview

Bechtel Decommissioning and
Dismantlement Experience
and Capabilities

February 2016



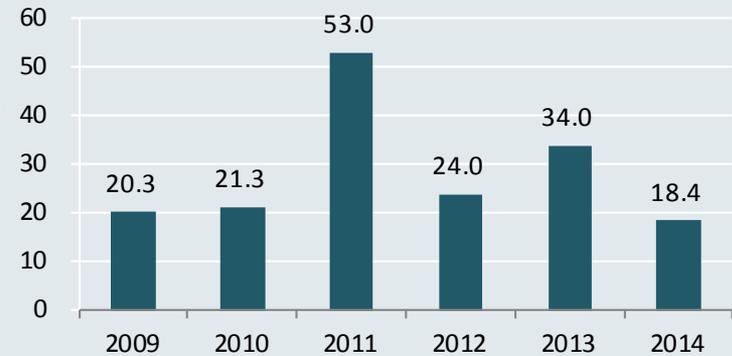
Who We Are

Bechtel... one of the world's most experienced EPC Contractors

- 118 years of experience/privately owned
- 58,000 employees working in 39 countries
- Named one of America's safest companies by *Occupational Hazards* magazine
- Over 74,000 MW of commercial nuclear projects
- Commercial D&D projects: SONGS U1, and CY
- TMI recovery and Chernobyl New Safe Containment
- DOE/DOD D&D of facilities since 1980s including Hanford Pu reactors
- Completed the construction of first US nuclear power plant since 1994

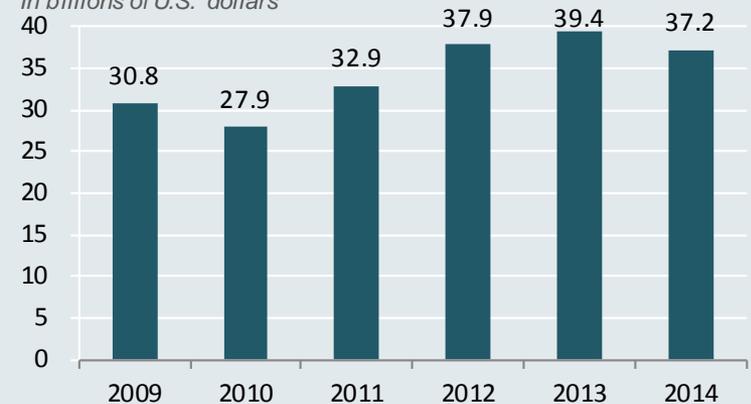
New Work Booked

In billions of U.S. dollars



Revenue

In billions of U.S. dollars





Safety – A Core Value

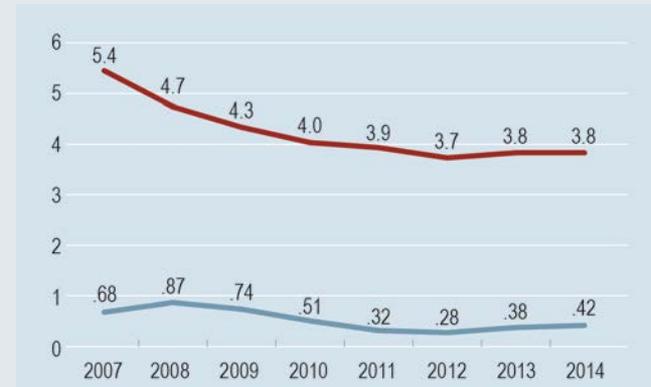
Our Philosophy: Zero Accidents

In 2014:

- 67 projects (75%) finished the year without a lost time incident
- 6 projects reported 5+ million safe jobhours
 - Pueblo Chemical Plant
 - Wheatstone LNG Mod Yard China
 - Caval Ridge
 - GLNG Module Yard
 - Ivanpah Solar Energy
 - Brass LNG PMC
- 11 projects achieved 10+ million safe jobhours without a lost time injury
 - Savannah River
 - Las Bambas
 - OM202 Senimdi Kurily
 - Surmont 2
 - Wheatstone Onslow Site LNG
 - Wheatstone LNG Mod Yard Malaysia
 - Angola LNG
 - Watts Bar Unit 2
 - Ras Al Khair
 - APLNG Module Yard
 - Pascagoula Base Oil

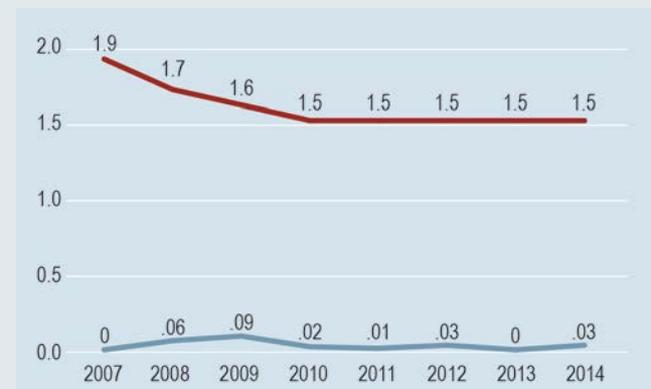
Safety on the job

Number of **recordable incidents** per 100 employees per year



Safety on the job

Number of **lost-time accidents** per 100 employees per year



■ U.S. Industry Average (Bureau of Labor Statistics)
 ■ Bechtel Nuclear (includes Joint Ventures and Subcontractors)



Quality – A Core Value

A Key to Customer Satisfaction

- Delivering performance and results through Bechtel’s Quality Excellence Model
 - Meeting core requirements (e.g., Codes, Standards, Customer Requirements)
 - Planning for Quality and Risk Mitigation
 - Continuous improvement through Six Sigma and Closed Loop Corrective Action
 - Enhancing Bechtel’s and stakeholders’ Quality Culture through People Based Quality and effective communication
- Adhering to “Quality Absolutes”
- Implementing a robust Quality Program
 - ISO-Certified
 - NRC-Approved
 - ASME Section III N-Certificates of Authorization
 - Approved Nuclear Utility EPC Contractor

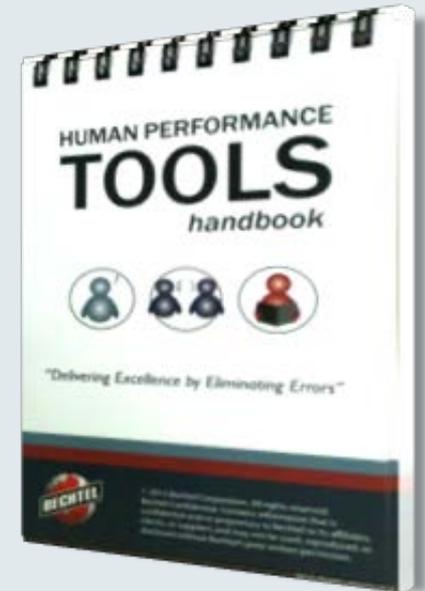


Quality + Safety = Success



Human Performance

- Comprehensive human performance tools training
- Uncompromising commitment to error elimination
 - Getting the job done right the first time
 - Understanding and following core processes and procedures
 - Monitoring and being accountable for our work
 - Using the right tools and equipment for the job
- Attention to the smallest details is the biggest part of the job
 - Maintain a healthy questioning attitude
 - Routine use of three-way communication
 - Validate assumptions prior to starting work
 - Prepare mentally and physically to perform each task
 - Work site review (walk down) to establish normal, off-normal, and environmental conditions that may lead to mistakes
 - Stop when unsure





Sustainability

Planning for the Future

- Support customers' sustainability goals
- Anticipate expectations of community and government
- Develop local workers career skills
- Maximize use of local contractors and suppliers
- Manage land resources
- Leadership in Energy and Environmental Design (LEED)



Ivanpah Solar Electric Generating Facility



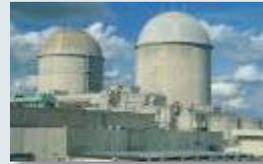
Bechtel Nuclear Decommissioning Experience



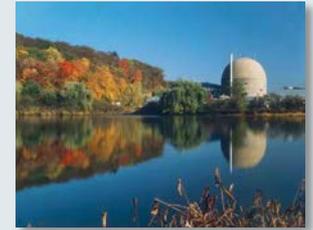
Bechtel D&D Experience



Hanford Plutonium Reactors
WASHINGTON — Developed the Interim Safe Storage process using various D&D techniques.



Connecticut Yankee
Connecticut — full-scope Decommissioning Operations Contractor for the single-unit 619-MWPWR.



Fukushima
JAPAN — Provided detailed plans and approaches related to decommissioning the damaged reactors.

SONGS Unit 1
CALIFORNIA — In addition to the large component removal work on SONGS 1, Bechtel performed the balance of the system, structure, and component dismantlement in our role as maintenance and modifications contractor.



K-25 Gaseous Diffusion Plant
TENNESSEE — At 144,000 m², K-25 was one of the largest D&D efforts to date, contaminated with highly enriched uranium.



35 SGRS
11 Head replacements
7 EPUs



Three Mile Island Unit 2
PENNSYLVANIA — Bechtel was immediately requested by the site owner to manage site stabilization, cleanup, and closure.



Chernobyl
RUSSIA — Provided experts in accident recovery, D&D, civil/structural engineering and project management.





D&D Experience and Resources

- Over 6,400 employees with commercial nuclear power, nuclear fuel cycle and Department of Energy D&D experience
- Built more than half the U.S. nuclear fleet; decommissioned over 800 government nuclear facilities, 4 commercial nuclear plants, and 6 plutonium reactors
- Over 1,600 engineering professionals
 - 63 PhDs
 - 711 registered professional engineers
 - 352 technical specialists
 - 278 code committee members
 - 1 ASME Fellow
 - 5 ASCE Fellows
 - 7 Bechtel Fellows

Function	Total
Construction	725
Contracts & Procurement	376
Engineering	1646
ES&H	142
Executive, Finance and Business Management	68
HR	67
IS&T	150
Project Controls	374
Project and Functional Management	115
Quality Services	150
Start up	104



D&D Experience and Resources (cont.)

- Bechtel has performed D&D on both commercial and DOE nuclear facilities
- Bechtel has experience as the Decommissioning Operations Contractor (DOC) on several projects; full-scope EPC capability
- Experience managing the D&D subcontractors
- Decades of experience at SONGS including recent SGRs and LCR projects
- Bechtel has identified and performed innovative D&D approaches / solutions for several projects
- Bechtel has developed or guided development of special tooling for innovative D&D approaches / solutions



Treatment and Disposal of Radioactive Waste



Treatment and Disposal of Radioactive Waste Experiences

- Groundwater remediation
 - Sampling/analysis; source remediation; barrier wall installation; and treatment system EPC
- Landfill design and construction
 - Waste cell design, construction, permitting and expansion.
 - CERCLA Waste Cell experience
- Waste management and waste facility operation
 - Transuranic (TRU) waste and MLLW experience on eight DOE sites
 - Technical development for Yucca Mountain and construction of WIPP

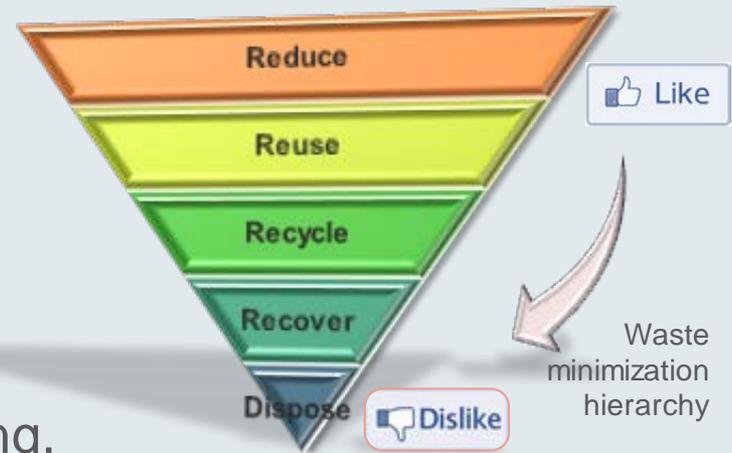
CERCLA Waste Cell	Waste Types	Design Capacity
EMWMF (Oak Ridge)	LLW, MLLW, PCBs, debris, classified	1.7 million yd ³
ERDF (Hanford)	LLW	6.2 million yd ³
ICDF (Idaho)	LLW, MLLW, PCBs	510,000 yd ³
NTS (Nevada)	LLW, classified MLLW	1.3 million yd ³ 28,000 yd ³

TRU/MMLW	OR	SRR	AMWTP	NTS	LANL	Hanford	SRS	Y-12
Retrieval	■	■	■	■	■	■	■	■
Characterization	■	■	■	■	■	■	■	■
Treatment	■	■	■	■	■	■	■	
Storage	■	■	■	■	■	■	■	■
Packaging/Transportation	■	■	■	■	■	■		■
Disposal	■	■	■	■	■	■	■	■



Planning

- Begin with the end in mind: everything becomes waste
- Apply waste minimization principles
- Identify necessary regulatory framework
- Infrastructure for storage, conditioning, packaging, and transportation
- Integrated Waste Management Plan
- Characterization
- Waste generation forecast
- Resource loaded—staffing, technology, funding



Decontamination of TMI-2 reactor building using recycled water in a high-pressure floor sprayer



Demolition of the K-25 Gaseous Diffusion Plant in Oak Ridge, Tennessee



Waste Generation

- Implement the Waste Management Plan
- Deploy waste management specialists
- Minimize double handling
- Think As Low As Reasonably Achievable—ALARA
- Apply the Waste Acceptance Criteria

Canisters for fuel debris ready for loading in the TMI-2 reactor vessel



Macro-encapsulated mixed waste (Pb & LLRW) boxes being grouted in place at the Oak Ridge disposal facility



Waste Treatment

- Technology and infrastructure driven, on-site and off-site
- Volume reduction or increase
- Waste form stability/durability
- Package for disposal
- Regulator and support agency involvement
- Think ALARA



Cement solidification of sludge at Oak Ridge National Laboratory

Loading High Integrity Container with TMI-2 EPICOR II spent resin into shipping cask

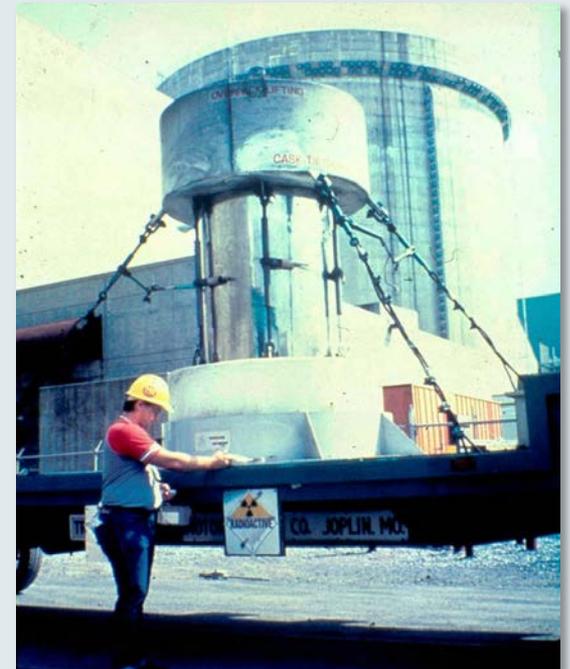




Waste Disposal

- Duration of storage prior to disposal
- Consider means, mode, and route of transportation
- Communication with stakeholders
- Availability of disposal capacity when needed
- Special classifications or waivers

Shipping cask for TMI-2 fuel debris on flatbed rail car



Shipping cask with Submerged Demineralizer System spent resin on flatbed truck