

Challenges, Approaches and Achievements in Evolving Lawrence Livermore National Laboratory's Facility Portfolio

058 Panel: NNSA Complex Wide Infrastructure Challenges & Lessons Learned

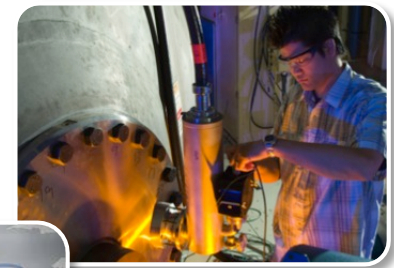
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Waste Management Symposium
Phoenix, Arizona, USA

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Lawrence Livermore National Laboratory is Strategically and Tactically Migrating its Aging Facility Infrastructure

- Established Legacy Stewardship and Risk Reduction Programs Along Industry Best Practices
- Partnering with NNSA on Enterprise Wide Initiatives
- Actively Reducing Risk, Removing Facilities and Building new Mission Capabilities



Anticipate • Innovate • Deliver

Lawrence Livermore National Laboratory

Where new ideas are built on exceptional S&T and executed through disciplined engineering

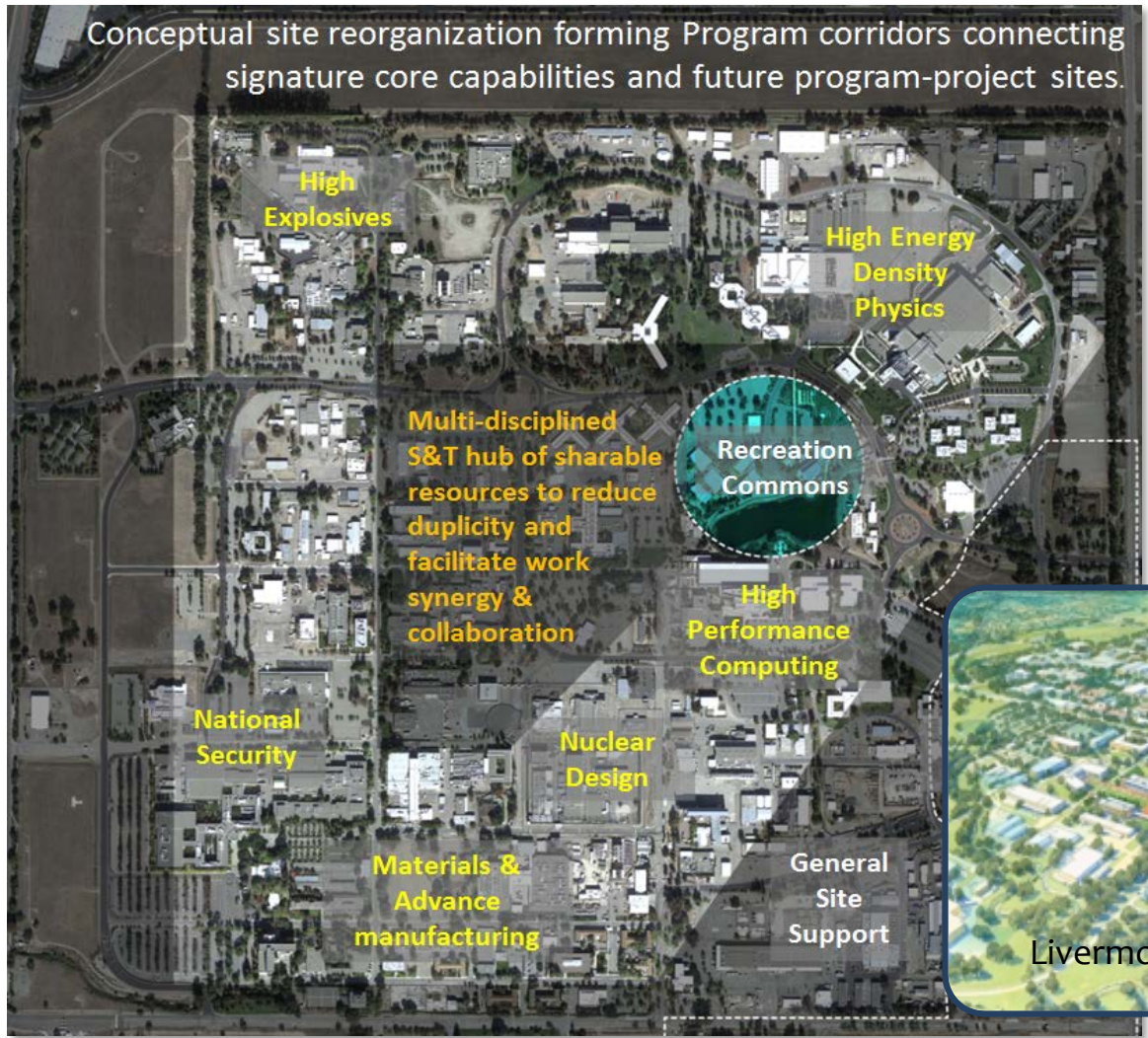


Experimental Test Site
(11 miles² near Tracy, CA)



- Established in 1952
- Approximately 6,500 employees
- 7 million gross square feet, 684 facilities
- Annual federal budget: ~ \$1.7B
- Operated by LLNS, LLC (UC, Bechtel, BWXT, AECOM, Battelle)

Evolving LLNL to Meet Existing and Emerging Mission Needs



Vision: A strategically organized campus that is intuitive to navigate in an engaging work environment reflective of sustainability and excellence in Programs achievements



LLNL has Established a Focused Approach to Facility Disposition Planning and Stewardship

Institutionally Managed Facilities Program
Established to manage LLNL's past mission facilities / legacy at its lowest cost while mitigating risk and advocating for final disposition



Bring closed facilities to their lowest operating and surveillance costs while assuring ES&H and Real Property Asset Management (RPAM) requirements are met

Provide founded risk / cost base information to management in support of making strategic decisions

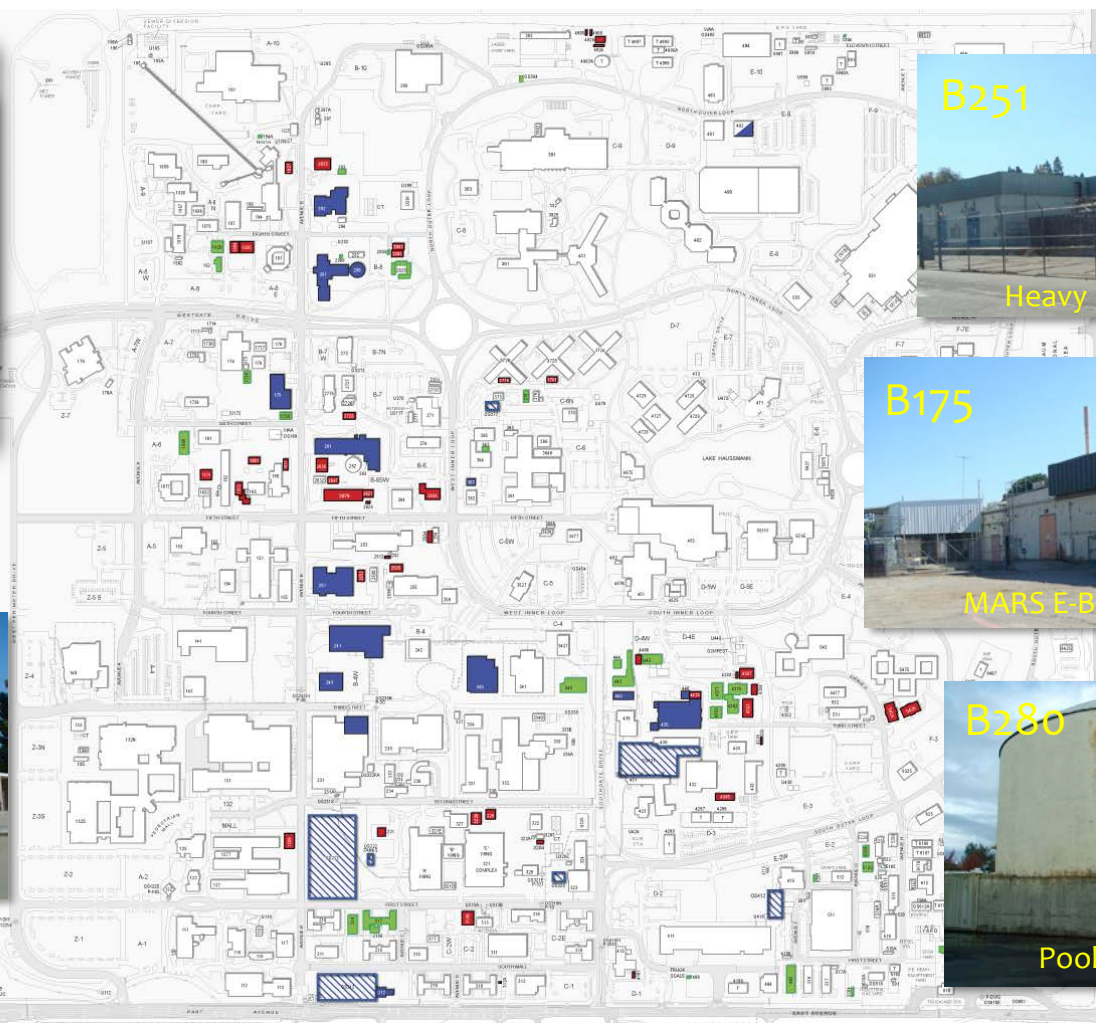
Safely steward facilities while awaiting T&D direction

Protect workers, public, and environment from existing hazards and those that may develop over time or under various consequence scenarios

Partner with sponsors on present and future strategic and tactical action

LLNL's Closed Facilities Challenge

# Facilities	Site 200 GSF	Site 300 GSF
116	946,999	92,389
Cool & Dim		
# Facilities	Site 200 GSF	Site 300 GSF
41	173,792	24,862
Cold & Dark		
# Facilities	Site 200 GSF	Site 300 GSF
48	125,054	6,167
Legacy Encumbered		
# Facilities	Site 200 GSF	Site 300 GSF
16	365,601	61,360
Legacy Site		
# Facilities	Site 200 GSF	Site 300 GSF
6	207,073	0
Surge Space		
# Facilities	Site 200 GSF	Site 300 GSF
5	75,475	0



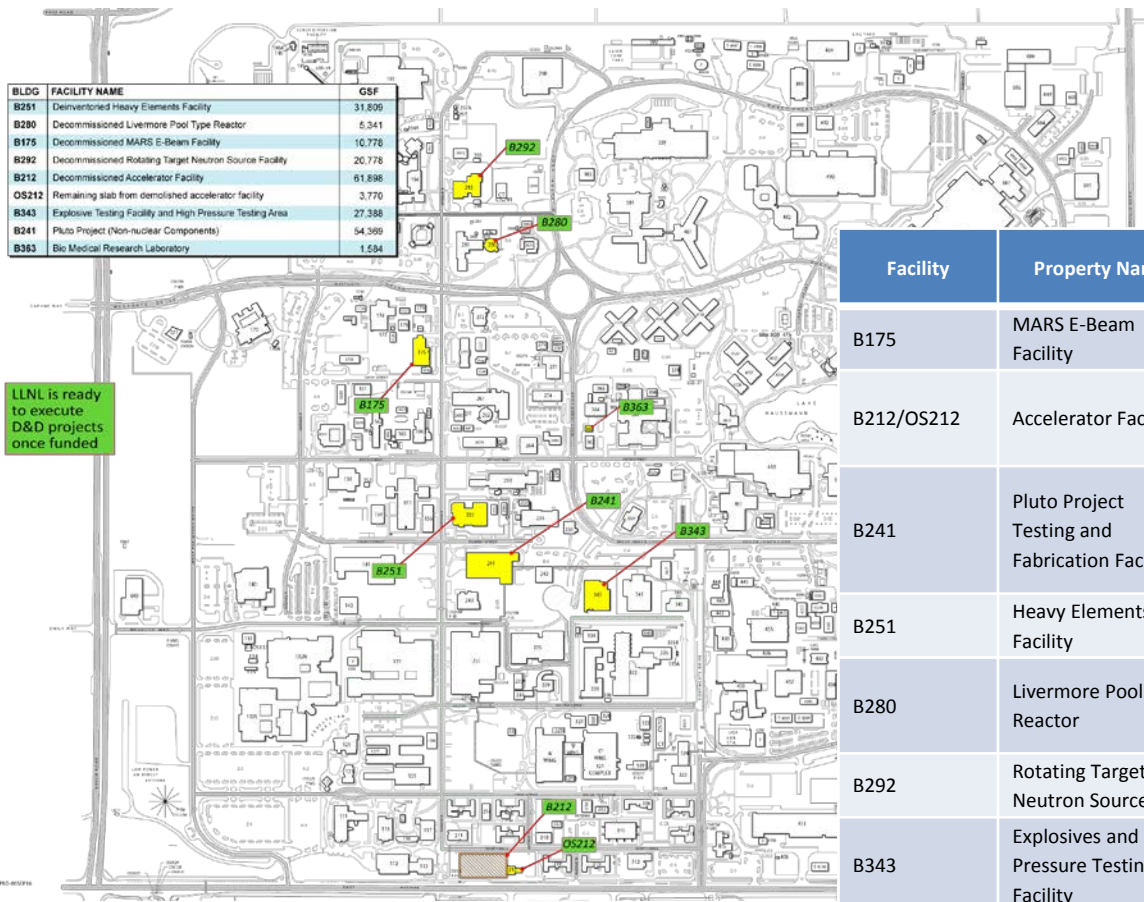
LLNL-MF-LegacySites_30JAN2017

EM & NNSA Joint Walk-Down October 2016

- Prior Walk-Downs conducted in 2008 & 2009
- 2016 Walk-Down
 - Objective - Determine if facilities are ready for transfer to EM once funding has been identified
 - Eight Higher-Risk Facilities tours
 - Outcome:
 - LLNL's Risk Reduction and Stewardship actions are well aligned with both EM & NNSA's expectations
 - Sufficient characterization exists
 - Limited Risk Reduction activities required prior to transfer



EM & NNSA Joint Walk-Down October 2016 (cont.)

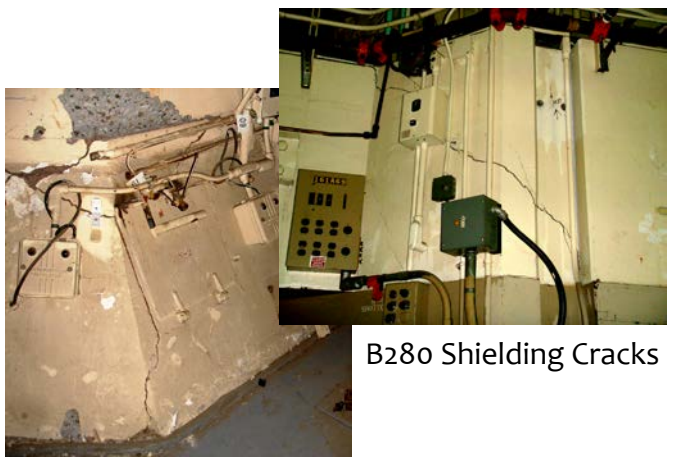
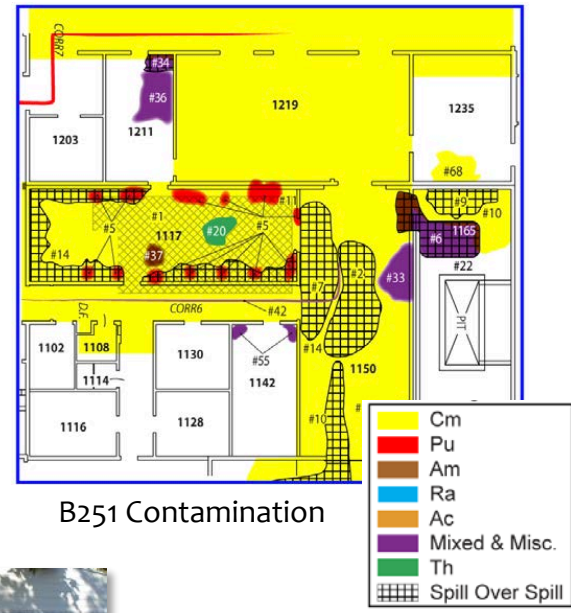


LLNL is ready to execute D&D projects once funded

Facility	Property Name	PSO	Status (LLNL)	GSF	Hazards Category
B175	MARS E-Beam Facility	NNSA	Legacy Encumbered	16,656	Radiological
B212/OS212	Accelerator Facility	NNSA	Legacy Encumbered / Legacy Site Aspect	2,761	Radiological Lead
B241	Pluto Project Testing and Fabrication Facility	NNSA	Legacy Encumbered	54,369	Radiological Beryllium
B251	Heavy Elements Facility	NNSA	Legacy Encumbered	31,128	Radiological
B280	Livermore Pool Type Reactor	EM (Under Review)	Legacy Encumbered	5,469	Radiological Beryllium
B292	Rotating Target Neutron Source	NNSA	Legacy Encumbered	20,811	Radiological Beryllium
B343	Explosives and High Pressure Testing Facility	NNSA	Legacy Encumbered	27,368	Beryllium
B363	Biomedical Lab	SC	Legacy Encumbered	1,584	Radiological

Risk Reduction

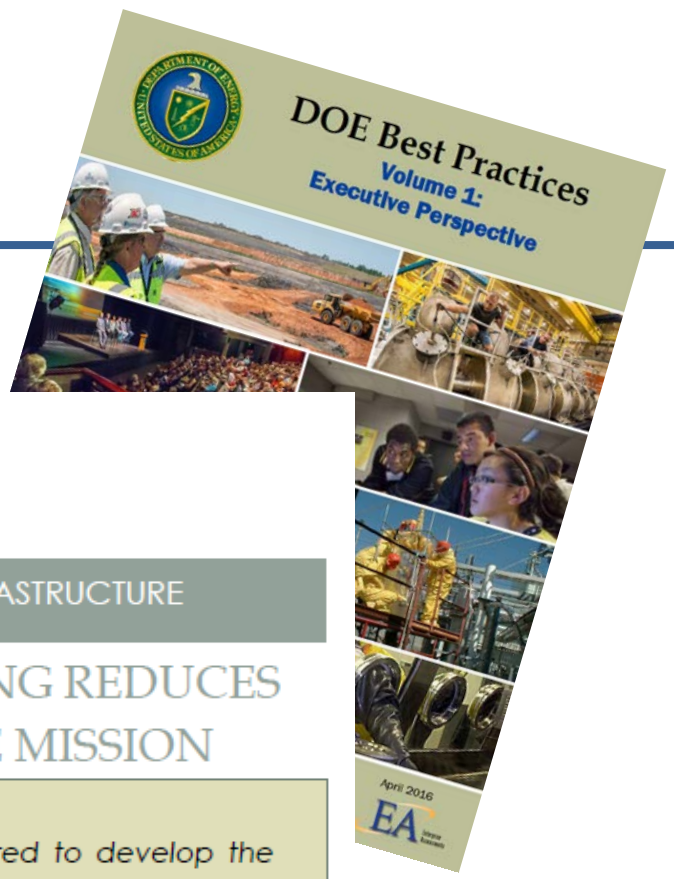
- Continue to reduce the threat presented by legacy process contamination
- Assure safety systems are maintained
- Assure facility envelope is maintained
- Remove facilities



T8710 Demolition



LLNL infrastructure initiatives included in DOE Best Practices



INFRASTRUCTURE

LAWRENCE LIVERMORE NATIONAL LABORATORY AND NNSA INFRASTRUCTURE

PRIORITIZED, LONG-TERM ENTERPRISE PLANNING REDUCES RISK AND ALIGNS INFRASTRUCTURE TO THE MISSION

BEST PRACTICE

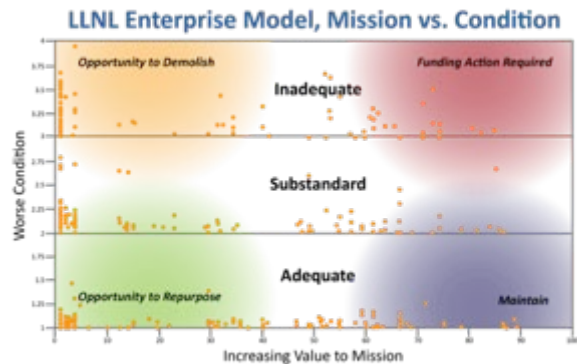
LLNL and NNSA Safety, Infrastructure, and Operations (NA-50) have partnered to develop the methodologies, templates, and tools for NNSA to establish an enterprise-wide infrastructure strategic plan called the Master Asset Plan (MAP). This effort seeks to understand the current, planned, and potential mission requirements; the associated demand placed on infrastructure; and a prioritized infrastructure roadmap to reduce risks to mission execution in the near, mid, and far terms. Building on a successful program for roof replacements, the effort will identify core critical building systems (e.g., HVAC and water distribution systems) that are common across the enterprise in order to achieve acquisition economies of scale and parts/maintenance standardization.

With NNSA, LLNL is developing new tools for the NNSA enterprise

BUILDER: Projecting NNSA requirements

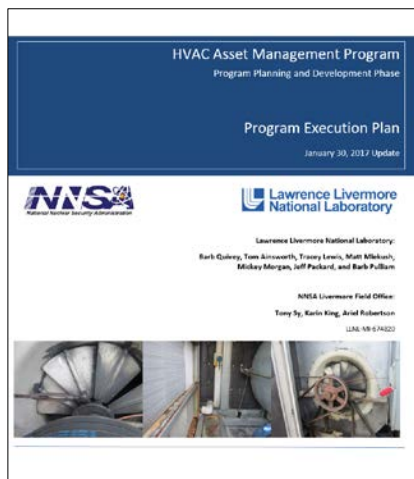
- System developed by the Army Corps of Engineers
- Provides ability to manage NNSA infrastructure as a single integrated enterprise
- Includes condition and functionality of asset portfolios, comparisons to mission requirements, prioritization of resource investments, and forecast of requirements

Mission Dependency Index (MDI)



- Relative importance of assets displayed in relationship to their condition

NNSA Asset Management Program (AMP)



- AMP is a focused investment program for single subsystem replacements
- LLNL is managing all procurements and contracts for HVAC systems in the NNSA complex to increase availability of space

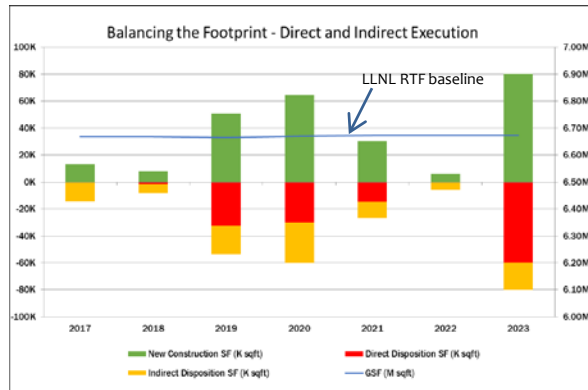
Deep Dive MAP Infrastructure Review



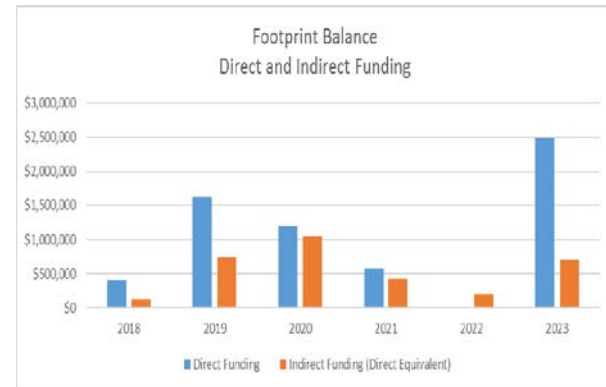
- Initial four-day facility review was held at LLNL
- Created Deep Dive templates and set stage for reviews at other NNSA sites

Scenario Planning and Outcomes

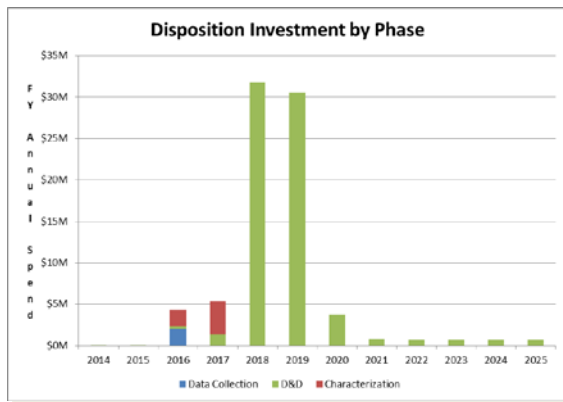
DOE-O 430.01C Requirements



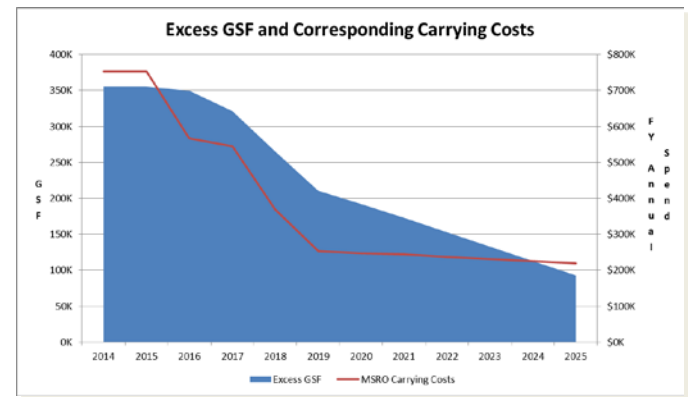
T&D Investments



T&D Investments



Declining M&O Costs



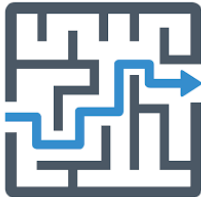
LLNL's Management Approach for High Risk / Cost Projects

Scope



- Define project in totality with end-state in mind
- Establish project priority in context of stakeholders objectives
- Identify critical milestones and barriers to success
- Partner with champions and sponsors

Strategy



- Data capture
- Characterization
- Facility stabilization
- Risk Reduction
- Establish projects priority
- Balance space needs
- Funding
- Demolition / Build

Benefits



- Establishes expectations and deliverables
- Characterizes risks before project execution begins
- Provides stakeholders project responsibility delineation
- Allows for in-process hold points
- Facilitates project funding over multiple years
- Resource leveraging

Building a Strong Operational Stewardship Program

- Lifecycle planning
- Real-time awareness of responsibilities
- Accountability for process costs
- Management commitment
- Risk mitigation and cost reduction efforts
- Leverage resources and brain trusts
- Provide feedback and improvement input
- Ensuring National Mission readiness



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Livermorium

Thank You



E.O. Lawrence, Edward Teller & Herb York
“LLNL’s Founders, 1952”

Q&A



Wall Street Journal, November 2015
“Budget Hobbles Nuclear Cleanup”

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