



# **NUCLEAR AND HIGH HAZARD OPERATIONS AT LOS ALAMOS NATIONAL LABORATORY**

**Charlie Anderson,  
Chris James, James Kuropatwinski**

**Presented to the 2012 Safety Analysis Workshop  
Hilton Hotel at Buffalo Thunder**

**May 8, 2012**

**LA-UR-12-21105**

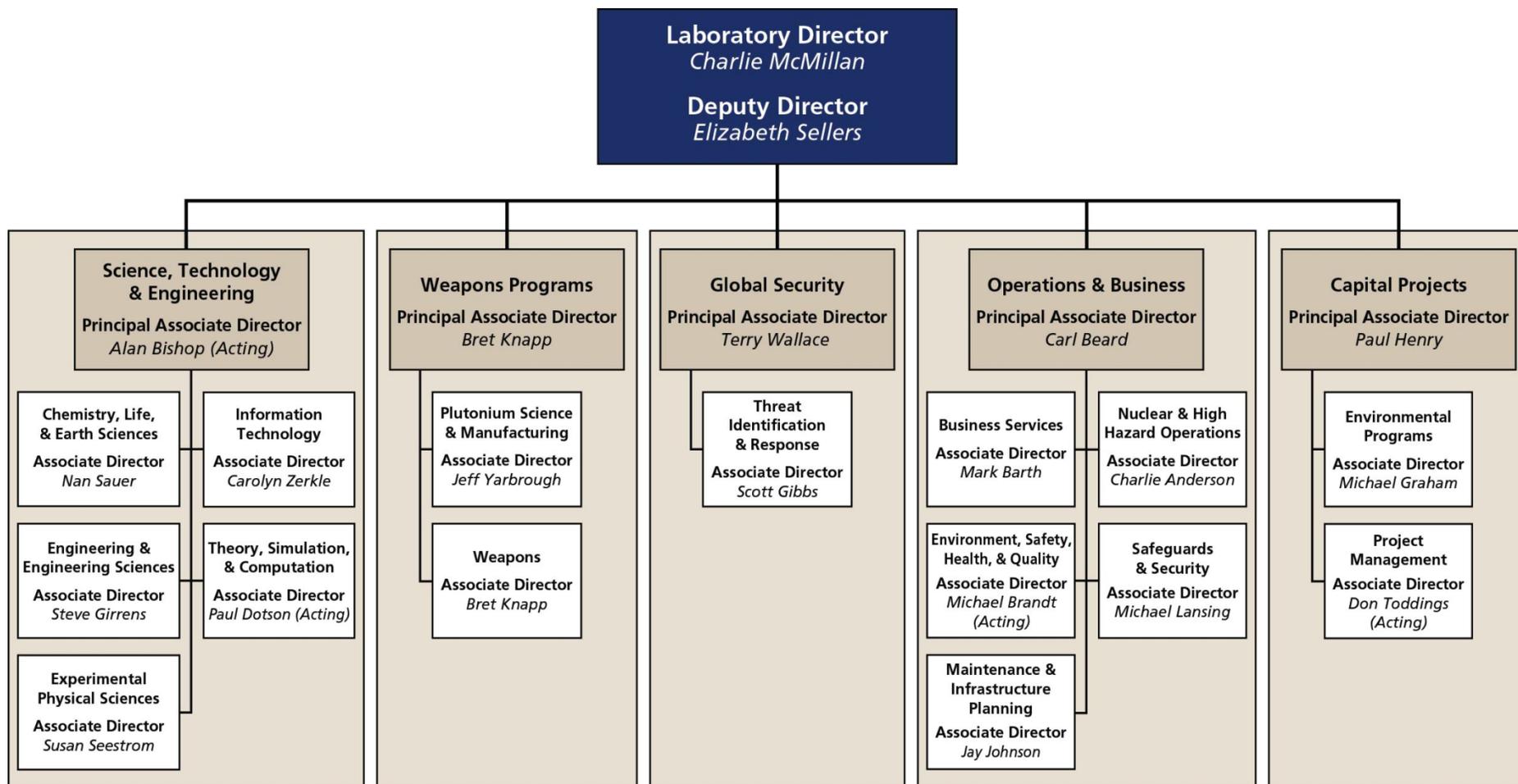
**UNCLASSIFIED**



Operated by Los Alamos National Security, LLC for NNSA

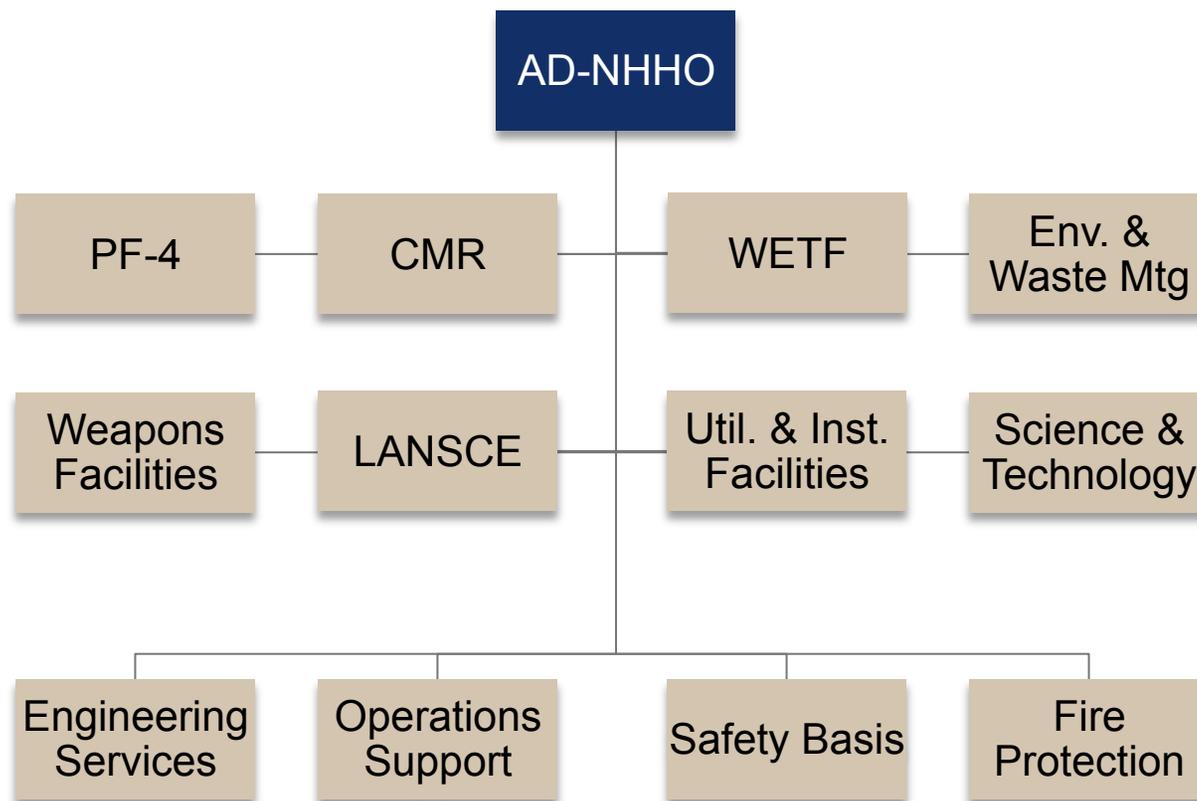


# Los Alamos National Laboratory



03/19/12

# Nuclear and High Hazard Operations Directorate



# Plutonium Capabilities/Activities at LANL

- Provides world-class, safe, secure, and reliable special nuclear material research, process development, technology demonstration, and manufacturing capabilities that support the nation's defense, energy, and environmental needs.



# Radiological, Laboratory, Utility, Office Building (RLUOB)

- 19,500 square feet of radiological lab space
- Centralized utilities/services
- Office space for 350 workers
- Consolidated training facility with mock labs
- Incident command/emergency response
- First LANL building to incorporate and achieve LEED requirements/certification
- Received E-Star award for Environmental Sustainability



# Weapons Engineering Tritium Facility

- The Weapons Engineering Tritium Facility (WETF) performs critical tritium research and development to ensure the safety, security, and effectiveness of gas transfer systems in our nation's enduring stockpile.



**WETF  
Storage  
Vessels**



**Flanged Tritium  
Waste Container  
(FTWC)**

UNCLASSIFIED

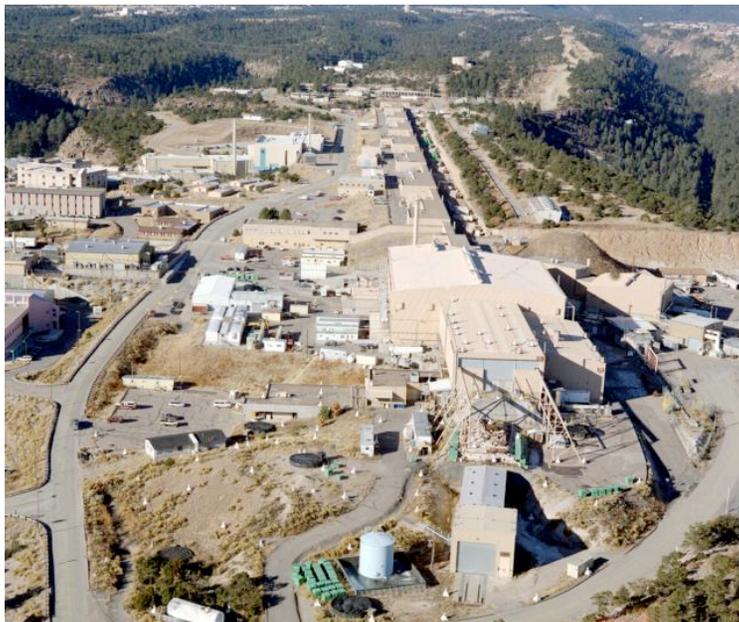
# Waste Operations

- Deliver safe, compliant and environmentally responsible management of Los Alamos National Laboratory wastes. In addition to providing disciplined operations and innovative solutions to waste challenges



# Accelerators at LANL

- **LANSCE provides the scientific community with intense sources of neutrons with the capability of performing experiments supporting civilian and national security research.**
- **DARHT consists of two large linear accelerators that are used to produce freeze-frame X-ray radiographs of materials that implode at speeds greater than 10,000 miles an hour.**



# Science & Technology Facility Operations



- **Sigma Facility supports low-enriched uranium operations**
- **Nonproliferation and International Security Facility supports NHS activities**
- **RC-1 supports medical isotope production**

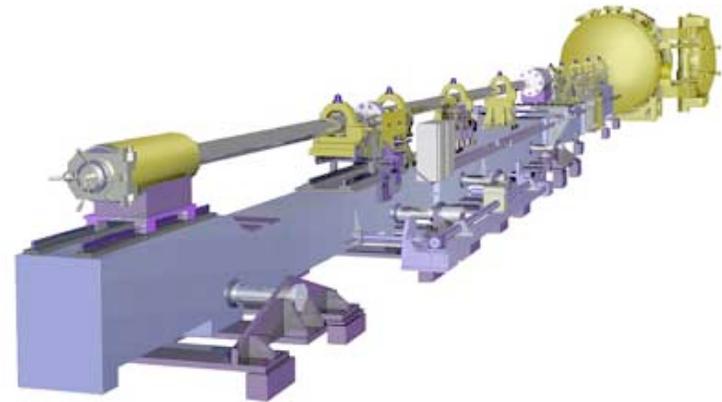


# Emergency Preparedness at LANL



# Nevada National Security Site Activities

- **Maintain the safety, security and effectiveness of the nation's nuclear deterrent without underground nuclear testing.**



# Support of NCERF

## Mission

Nuclear Criticality Safety / Nuclear Material Management

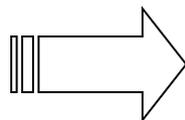
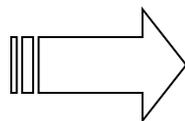
Nuclear Emergency Response

Nuclear Nonproliferation / Safeguards / Arms Control

Support for DHS / DNDO

Support for DTRA / NASA / Naval Reactors / GNEP

Stockpile Stewardship Science



**Common denominator for all programmatic missions is the capability to handle and conduct experiments with large quantities of special nuclear material.**

**4 Critical Assemblies and Lots and Lots of Special Nuclear Material**



# Challenges at LANL – Formality of Operations Maturity

---

- **Procedure Quality and Usability**
- **Procedure Compliance**
- **Cognizant System Engineering Program Maturity**
- **Vital Safety System Assessments**
- **System Health Checks**
- **Master Equipment Lists**
- **Worker Qualification**

# Challenges at LANL – Engineering

- Seismic qualification of Plutonium Facility



Exhaust Fan Pads Mounting Bracket



200 Area Shield Wall Bracing



Laboratory Ceiling Beams (Red)



Reroofing Over Drag Strut