

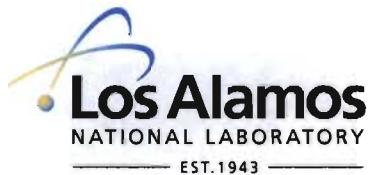
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Title: Los Alamos National Laboratory
Weapons Program Overview
New Mexico Teachers

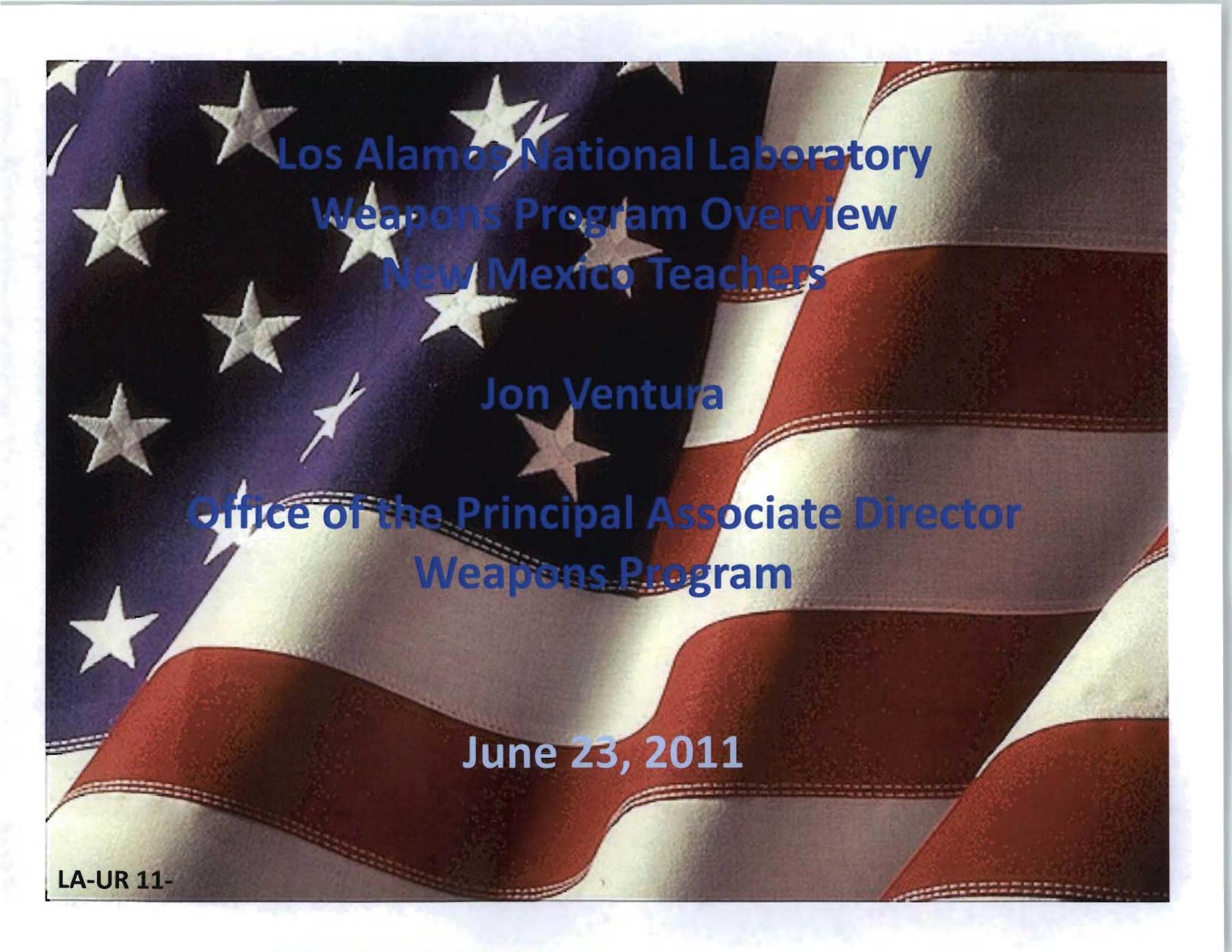
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Intended for: New Mexico Teachers



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The attached brief is a high level summary of weapons programs activities of Los Alamos National Laboratory in support of a meeting of New Mexico teachers. The brief is a condensed version of a talk presented to the Cadets of the West Point Military Academy LA-UR 11-03240

A large, stylized American flag is visible in the background, with stars on the left and stripes on the right.

Los Alamos National Laboratory Weapons Program Overview New Mexico Teachers

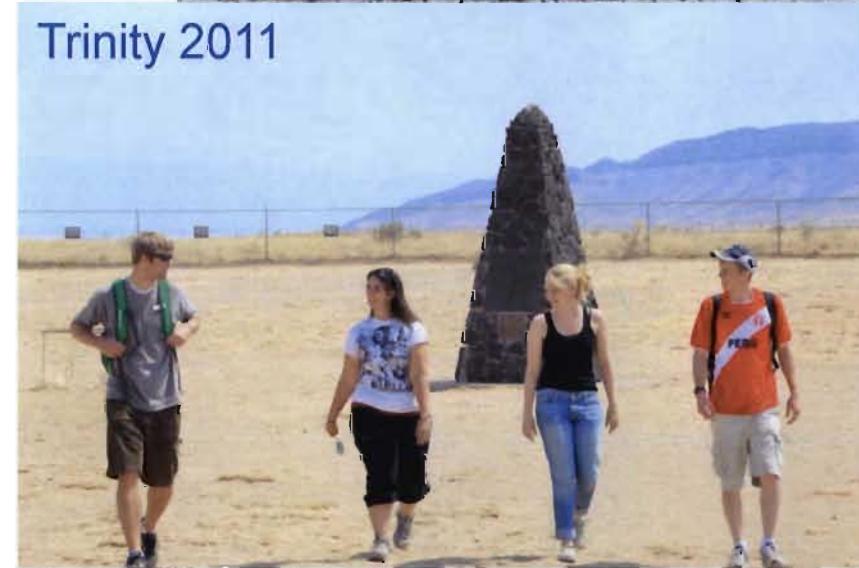
Jon Ventura

Office of the Principal Associate Director
Weapons Program

June 23, 2011

Today's Discussion Topics

- LANL and the Nuclear Enterprise
- Lab Organization Update
- Warhead responsibilities
- Stockpile Stewardship
 - Experimental and computational capabilities
- Improvised Explosive Device work



LANL is part of the nuclear security enterprise that is delivering on its national security commitments

National Laboratories and Test Site



Los Alamos National Laboratory
Los Alamos, New Mexico
Nuclear design lab
(B61, W76, W78, W88)



Lawrence Livermore National Laboratory
Livermore, California
Nuclear design lab
(W80, W87, B83)



Sandia National Laboratories
Systems engineering, neutron generators, and non-nuclear

component
Los Alamos
NATIONAL LABORATORY

EST. 1943

Operated by Los Alamos National Security, LLC for NNSA

UNCLASSIFIED

Operated by Los Alamos National Security, LLC for DOE/NNSA

Production Complex



Pantex Plant
Amarillo, Texas
Weapons assembly/disassembly



Kansas City Plant
Kansas City, Missouri
Nonnuclear manufacturing/
Procurement



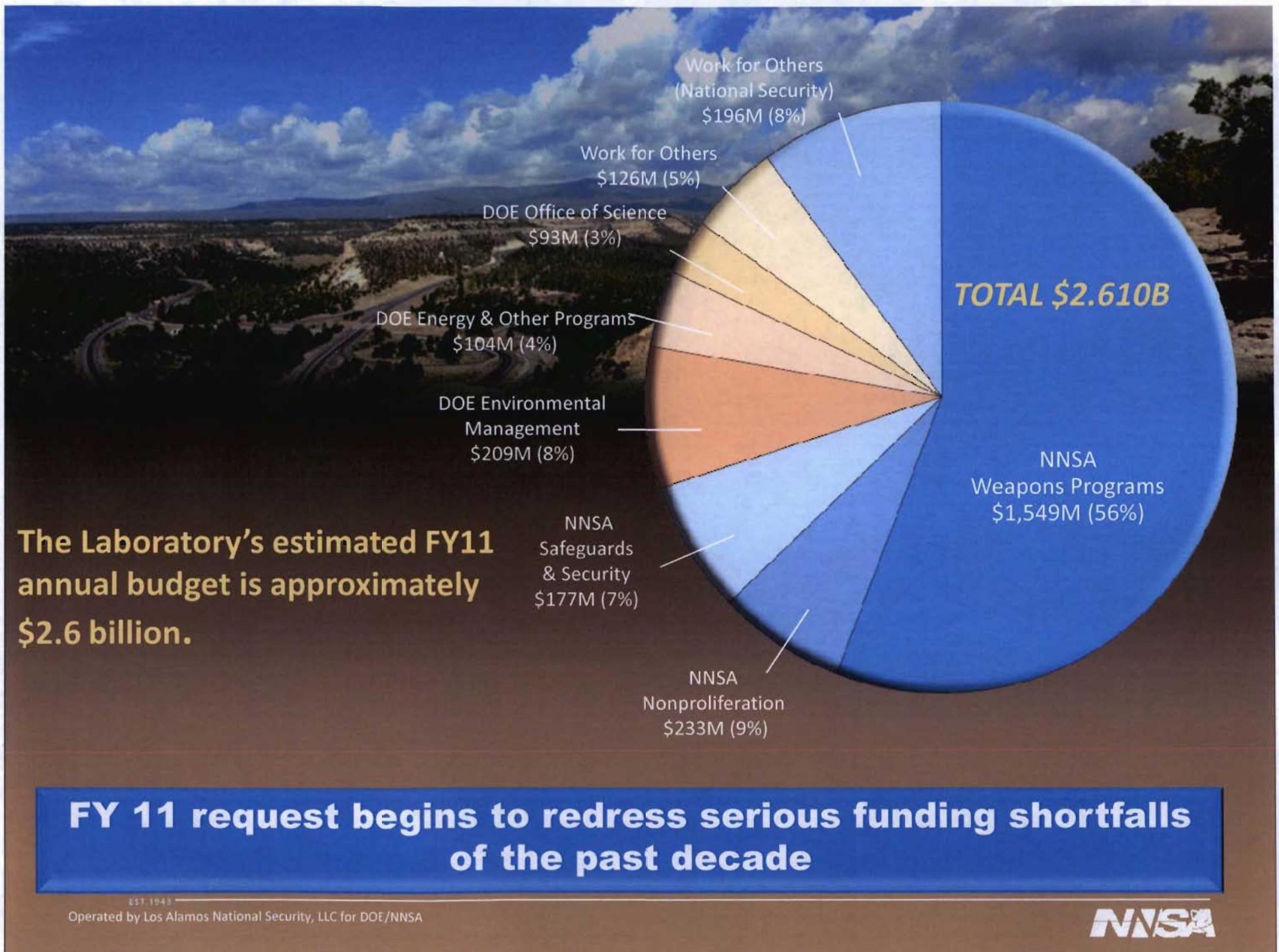
Y-12 National Security Complex
Oak Ridge, Tennessee



Savannah River Site
Aiken, South Carolina
Tritium operations

NNSA





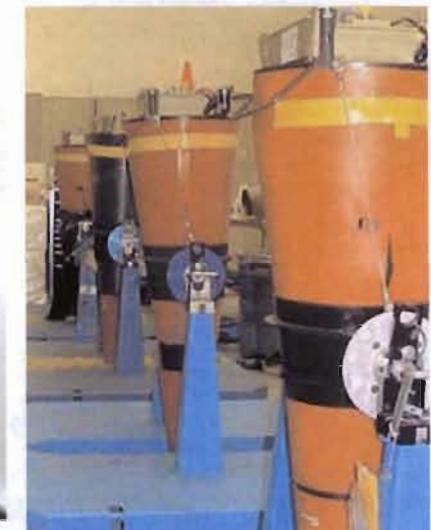
Annual Assessment— A statutory requirement and the highest priority of the Lab Director

- Detailed reports are prepared by lab staff on each warhead
- Lab Director briefed in detail by staff
- Lab Director issues letter to Secretaries of Defense & Energy and Chair of the NWC
- Lab Director briefs the Secretary of Energy
- STRATCOM prepares separate report and briefs the Secretary of Defense
- Secretaries of Defense & Energy brief the President
- President advises Congress



LANL is the design laboratory for the majority of the Nation's deterrent

- LANL is the design laboratory for:
 - W76 SLBM
 - W88 SLBM
 - B61 Gravity bomb
 - W78 ICBM
- Each Triad leg offers complimentary and reinforcing benefits



LANL maintains a carefully balanced three part weapons program to sustain the Nation's deterrent

- **Stockpile management**
 - B61 Life Extension Program (LEP)
 - Support to plants on W76 LEP
 - Complete build of W88 pits begin work on W87 pits
- **Science, technology and engineering investments**
 - Use science tools to generate data to support assessment and resolve stockpile issues
- **Infrastructure investments**
 - Create modern, state-of-the-art facilities to sustain laboratory capabilities
 - Hire and train next generation



LANL's unique science and engineering infrastructure a critical component of U.S. deterrent



Metropolis Center for Modeling & Simulation



High Explosive laboratories



Los Alamos Neutron Science Center



Plutonium Processing Facility



Chemistry and Metallurgy Building



Dual Axis Radiographic Hydrotest Facility



SIGMA Building



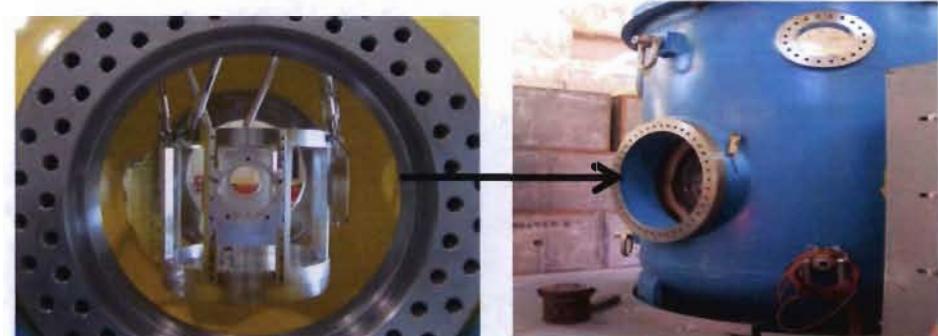
Chemistry & Metallurgy Research Replacement (RLUOB)

DARHT world class imaging in support of the deterrent

- World class X-ray radiography for non-nuclear hydrodynamic tests
- Axis 1 single image, operational since 1999
- Axis 2 up to four images operational 2009
- World's first dual axis experiment December 2009
- Experiments fully contained to reduce environmental impacts and increase shot rate



DARHT Containment System



Supercomputing critical to Stewardship and other scientific missions

- Stockpile challenges are increasingly complex as systems continue to age
- DARHT, LANSCE etc provide large data sets to resolve stockpile challenges
 - Data sets require ever more capable machines that can quickly process information
- Road Runner world's first machine to operate at 1.105 petaflops (million billion calculations per second)
- Cielo on line Feb 2011@ 1.03 petaflops now upgraded to 1.35



TA-55 the Nation's center of plutonium science and manufacturing



LANL's HE science capabilities are being applied to the IED problem

- LANL's HE expertise in the areas of:
 - Homemade explosives - explosives chemists
 - Improvised explosive devices - using HMEs in IED's or EFP's
 - Small scale testing - safety and sensitivity
 - Detection - properly identifying HMEs
 - HME database - information tool for our troops



Realistic training scenarios reinforce class room knowledge to troops



2011 weapons program is meeting key scientific and engineering deliverables to support national security

- **Barolo A and B Subcritical Experiments, and Plutonium Stepwedge Studies** executed at U1a on schedule yielding archival data and completing the Bacchus/Barolo Series
- **Cielo** delivering on applications for all 3 labs; Cielo performance upgrade from 1.03 to 1.37 PF/s completed
- **Critical Experiments Facility (CEF) Line Item Project** received CD-4 & Authorization to start nuclear operations in DAF
- **Complete build of WR 88 pits:** 1st FY 11 WR pit 11/4/10; 2nd pit 3/29/11; 3rd pit 4/29/11; 4th and final W88 WR pit August
- **Working with plants in support of W76-1**
- **W78** close long standing SFI using DARHT experiment data
- **16th Annual Assessment** process underway
- **B61-12** meeting milestones in support of FPU
- **CMRR/NF** supporting a number of independent reviews by Secretary of Energy, Bechtel, DoD, GAO. Lawsuit by Los Alamos Study Group to stop work on CMRR/NF **denied** by Federal Judge



2011 is a challenging year for the program

- **Build upon the technical/programmatic success of the last several years**
 - DARHT experiments
 - Cielo deployment and upgrade to 1.35 petaflops
 - B61 LEP
 - RLUOB and CMRR/NF
 - Provide innovative options for stockpile sustainment
- **Guide lab thru first significant management change since contract transition in 2006**
- **Enhance relationships with DoD and military service customers**
 - STRATCOM, Global Strike, USAF, USN, military academies
- **Sustain and expand Congressional support for Stockpile Stewardship program**
- **Manage budget challenges of FY12**