



Defense Programs Update

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Our core mission is easy to state ...

INNOVATE. COLLABORATE. DELIVER.

Deliver

safe, secure, reliable warheads for an
effective nuclear deterrent

... and challenging to accomplish

We take care of today's warheads

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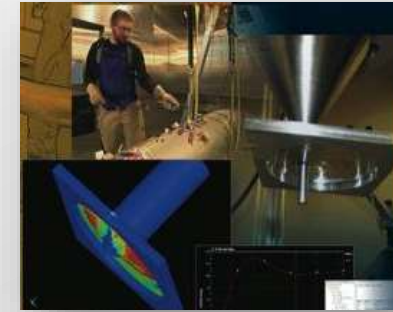
- **All life-cycle activities** to provide a safe, secure, and reliable nuclear weapon stockpile.
- **Strategic planning** for sustainment of the nuclear weapons stockpile, production infrastructure, and nuclear materials availability, storage, and transportation.
- **Surveillance** program for nuclear weapons.
- **Nuclear weapons surety** program including safety, security, use control, and weapons quality.



Weapon Surveillance B61



Testbed Builds for System Lab Tests and Joint Lab Tests with DoD



Safe and Effective Weapon Operations



W78 JTA6R Vibration Test on Superfuge



B61 Cable Pull Down Test



Drop Test for the W88 Alt 370 Program, Performed at Sandia National Laboratories

The U.S. is updating warheads and delivery systems

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CURRENT SYSTEMS

Air-Based

B-52H	B-2	F-15 DCA
ALCM W80-1	B61-7/11 B83-1	B61-3/4

Land-Based

Minuteman III

W87-0	W78
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Sea-Based

Ohio-class SSBN

Trident D-5 LE1

W76-0/1/2	W88
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MODERNIZATION

B61-12 LEP

W80-4 LEP

W87-1 Mod

W88 Alt 370

W93 Program

FUTURE SYSTEMS

Air-Based

B-52H	B-21	F-35A DCA
LRSO W80-4	B61-12	

Land-Based

Sentinel

W87-0	W87-1
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Sea-Based

Columbia-class SSBN

Trident D-5 LE2

W76-1/2	W88	W93
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We are executing five warhead programs

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- Types of modernization activities:
 - Life Extension Programs (LEPs)
 - Alterations (Alts)
 - Modifications (Mods)
 - Weapon Acquisition Programs

- Modernization efforts address:
 - Aging
 - Unavailability of replacement parts
 - Integration with DoD's modernized nuclear weapons delivery systems

Must meet DoD requirements while enhancing safety and security



W88 Alt 370
FPU July 2021

B61-12 LEP
FPU November 2021



W80-4 LEP
FPU FY 2027



W87-1
FPU early 2030s

W93
FPU mid 2030s



Our enterprise is distributed across the U.S.

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LLNL

Weapons Design and Engineering

- Hydrotesting
- Major environmental testing

Research & Development

- Plutonium R&D
- Tritium R&D
- High Explosives R&D

NNSS

Nuclear Testing

- Underground test readiness
- High explosives testing
- Hydrotesting

LANL

Weapons Production

- Plutonium pit production
- Non-nuclear components production

Weapons Design and Engineering

- Hydrotesting
- Major environmental testing

Research & Development

- Plutonium R&D
- High explosives R&D
- Tritium R&D



- ★ **Headquarters**
- ★ **National Security Laboratories**
- ★ **Nuclear Weapons Production Facilities**
- ★ **National Security Site**

SNL

Weapons Production

- Neutron generator design/production

Weapons Design and Engineering

- Non-nuclear components
- Flight testing at Tonopah Test Range
- Major environmental testing
- Rad-hard microelectronics

Research & Development

- High explosives R&D

Pantex

Weapons Production

- Weapons assembly & disassembly
- High explosives production

Research & Development

- High explosives R&D

KCNSC

Weapons Production

- Nonnuclear component manufacturing/procurement

Y-12 NSC

Weapons Production

- Uranium components
- Canned sub-assembly production

Weapons Materials

- Lithium Processing

SRS

Weapons Production

- (Future) Plutonium pit production
- Tritium reservoir change-out

Weapons Materials

- TPBAR extraction

Research & Development

- Tritium R&D

We are rebuilding infrastructure ...

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Project	Site	status
Estimated cost > \$10 B		
Savannah River Plutonium Processing Facility (SRPPF)	SRS	design
Estimated cost \$5-10 B		
Uranium Processing Facility (UPF)	Y-12	execution (construction)
Estimated cost \$1-5 B		
Los Alamos Plutonium Pit Production Project (LAP4)	LANL	execution & design
Chemistry & Metallurgy Research Replacement (CMRR)	LANL	execution & design
Advanced Sources and Detectors (ASD)	NNSS	execution
Lithium Processing Facility (LPF)	Y-12	design

... across the complex

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Project	Site	status
Estimated cost \$0.5-1 B		
U1a Complex Enhancements Project (UCEP) Subproject 020	NNSS	execution
High Explosive Synthesis, Formulation, and Production (HESFP)	PTX	design
Tritium Finishing Facility (TFF)	SRS	design
Estimated cost \$100-500 M		
Calcliner (CALP)	Y-12	execution
West End Protected Area Reduction (WEPAR)	Y-12	execution
High Explosive Science & Engineering (HESE)	PTX	execution
Transuranic Liquid Waste (TLW)	LANL	execution
TA-55 Reinvestment Project Phase 3 (TRP III)	LANL	execution
Electrorefining (ER)	Y-12	execution
Electrical Power Capacity Upgrade (EPCU)	LANL	design
Power Sources Capability (PSC)	Sandia	design
Direct Chip Melt (DCM) Bottom Loading Furnace (BLF)	Y-12	design

We execute secure transportation

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Secure Transportation Asset: enabled by the core components of the STA security concept of specialized vehicles, secure trailers, specially trained Federal Agents, and leading-edge communication systems

- Provide safe and secure transport of nuclear weapons, weapon components, and special nuclear material throughout nuclear security enterprise
- Defend, recapture, and recover nuclear materials in case of an attack
- Ensure convoy safety and security through specialized vehicles, secure trailers, specially trained Federal agents, and leading-edge communication systems



We use experiments, tests, and/or computations for everything we do.

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Inform Decisions, Assess and Certify the Stockpile, and Explore Future Options

Experimental Sciences

Delivers experimental tools and data to assess, certify, life extend, and develop future options for the Nuclear Explosive Package



Advanced Simulation & Computing and Institutional R&D

Provides modeling and computer simulation capabilities required for stockpile stewardship

Engineering & Technology Maturation

Underpins aging assessments, survivability, weapons environment testing, and stockpile responsiveness throughout the weapon lifecycle



I look forward to questions

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Questions?