Warhead Modernization

National Nuclear Security Administration

Overview

NNSA's warhead modernization activities ensure that the U.S. nuclear weapons stockpile continues to meet Department of Defense (DoD) requirements while enhancing safety and security. NNSA's modernization efforts address aging, unavailability of certain replacement parts, potential deterrence gaps, and integration with DoD's modernized nuclear weapons delivery systems without the need for underground nuclear testing.

Types

NNSA executes **four types** of warhead modernization activities:

Life Extension Programs (LEP): A program to refurbish warheads of a specific weapon type to extend the service life of a weapon. LEPs are designed to extend the life of a warhead by 20 to 30 years while increasing safety and security. NNSA is currently executing two LEPs: the **B61-12**, a gravity bomb for the U.S. Air Force, and the **W80-4** for use in the U.S. Air Force's new Long-Range Standoff (LRSO) cruise missile.

Modifications: A program that changes a current stockpile weapon-type's operational capabilities. A modification may enhance the margin against failure, increase safety, improve security, respond to new DoD requirements, or address identified defects and component obsolescence. NNSA is currently executing a modification program, the **W87-1**, which will replace the legacy W78 to provide continuity for the ground-based U.S. nuclear deterrent. In 2023, NNSA and DoD announced the **B61-13** program to replace some of the B61-7s in the current stockpile to provide the President additional options against certain harder and large-area military targets. The Nuclear-Armed, Sea-Launched Cruise Missile (**SLCM-N**) is currently being pursued as a modification program, but details are still being finalized between NNSA and the DoD.

Alterations (Alt): A material change to, or a prescribed inspection of, a nuclear weapon or major assembly that does not alter the operational capability yet is sufficiently important to the user in terms of assembly, maintenance, storage, or test operations. NNSA is currently executing one major alteration, the **W88 Alt 370**, for the U.S. Navy's Trident II D5 SLBM.

Warhead Acquisition: Acquisition of a warhead to meet military requirements that cannot be met by an existing stockpile warhead but is based on previously tested designs and components that will not require additional explosive nuclear testing to certify and deploy to the active stockpile. NNSA is currently executing one warhead acquisition program, the **W93**, for use by the Navy's ballistic missile submarine force.

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Modernization Milestones

The U.S. nuclear warhead lifecycle begins with Phase One: Concept Study and ends with Phase Seven: Retirement, Dismantlement, and Disposition.

PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 6.1	PHASE 6.2	PHASE 6.2A	PHASE 6.3	PHASE 6.4	PHASE 6.5	PHASE 6.6	PHASE 7
CONCEPT STUDY	FEASIBILITY STUDY AND DESIGN OPTIONS	DEVELOPMENT ENGINEERING	PRODUCTION ENGINEERING	FIRST PRODUCTION	CONCEPT ASSESSMENT	FEASIBILITY STUDY & DOWN SELECT	DESIGN DEFINITION & COST STUDY	DEVELOPMENT ENGINEERING	PRODUCTION ENGINEERING	FIRST PRODUCTION	FULL-SCALE PRODUCTION	RETIREMENT, DISMANTLEMENT AND DISPOSITION
	W93 Entered Phase 2 in FY 2022					SLCM-N To enter Phase 6.2 in FY 2024 following authorization by the Nuclear Weapons Council		W87-1 Entered Phase 6.3 in FY 2023	W80-4 Entered Phase 6.4 in FY 2023		W88/MK5 Entered Phase 6.6 in FY 2022	
								B61-13 Conducting tailored Phase 6.3 and Phase 6.4 approach to First Production Unit			B61-12 Entered Phase 6.6 in FY 2022	

Air-launched cruise missile

Ground-launched intercontinental ballistic missile

Submarine-launched ballistic missile