

The National Nuclear Security Administration (NNSA) maintains and enhances the safety, security, and effectiveness of the U.S. nuclear weapons stockpile without nuclear explosive testing. The W88 Alteration (Alt) 370 is essential to enabling the NNSA to accomplish its mission of providing safe, secure, and effective nuclear weapon support to meet Department of Defense (DoD) deterrent requirements.

## Overview

The W88 nuclear warhead entered the stockpile in late 1988 and is deployed on the U.S. Navy's Trident II D5 Submarine-Launched Ballistic Missile (SLBM) system, carried onboard Ohio-class ballistic missile submarines. Deployed for almost three decades, the W88 requires several updates to address aging issues and to maintain its current state of readiness. The W88 Alt 370 program replaces the arming, fuzing, and firing subsystem; adds a lightning arrestor connector; and refreshes the conventional high explosives within the weapon to enhance nuclear safety and support future Life Extension Program options. The W88 Alt 370 program is scheduled to be completed concurrent with planned exchanges of limited-life, or routinely replaced, components, including the gas-transfer system and neutron generators. These planned exchanges will not change the military requirements or capabilities of the warhead.



## History & Schedule

The W88 Alt 370 program was in the Development Engineering phase (Phase 6.3) from 2012 to early 2017. During this phase, the NNSA, in coordination with the DoD, conducted experiments, tests, and analyses to validate the design options. Additionally, the NNSA production facilities assessed their ability to produce the proposed design, initiate process development activities, and manufacture test hardware. In 2014, the Nuclear Weapons Council expanded the W88 Alt 370 program to include a refresh of the conventional high explosive in the warhead. NNSA accelerated activities associated with refreshing the conventional high explosive to facilitate entry into Production Engineering on schedule.

NNSA entered the Production Engineering phase (Phase 6.4) in February 2017. During Production Engineering, NNSA has completed the acquisition of capital and equipment; defined and qualified tooling, gauges, handling gear, and testers; and completed the first production units (FPU) for most major components. NNSA has also worked closely with the U.S. Navy to conduct qualification ground and flight tests. In 2019, delivery of the system-level FPU was formally rescheduled because of delays resulting from an issue with capacitors used in three major components. NNSA is currently on schedule to provide the system-level FPU in Fiscal Year 2021 and will complete production in 2025.



## NNSA Nuclear Security Enterprise Roles

**Los Alamos National Laboratory** and **Sandia National Laboratories** are the design and engineering labs for the W88 Alt 370, while multiple Nuclear Security Enterprise facilities are responsible for other aspects of the W88 Alt 370:

- **Sandia National Laboratories** production manufactures integrated circuits and thermal batteries.
- **Los Alamos National Laboratory** production manufactures detonator assemblies.
- **Kansas City National Security Campus** manufactures polymers; foams; gas transfer system components; Joint Test Assembly components; and the arming, fuzing, and firing assembly.

- **Y-12 National Security Complex** manufactures weapon components and performs reacceptance activities.
- **Pantex Plant** is responsible for producing conventional high explosives and final assembly of the complete W88 Alt 370 for delivery to the U.S. Navy.

## Major Accomplishments

The Nuclear Weapons Council approved entry of the W88 Alt 370 program into Production Engineering in February 2017, and in January 2018 the program successfully conducted the system final design review. Since entering the Production Engineering phase, the program has completed three major flight tests: Commander Evaluation Test 1 (CET-1), conducted in June 2018, was the final development flight test; Demonstration and Shakedown Operation 29 (DASO 29), completed in May 2019, was the initial qualification flight test; and CET 2, completed in September 2019, was a qualification flight test.

The W88 Alt 370 program is currently working toward formal authorization to enter the First Production phase (Phase 6.5).



Launch of a Trident II D5 Missile Test (Demonstration and Shakedown Operation 29)