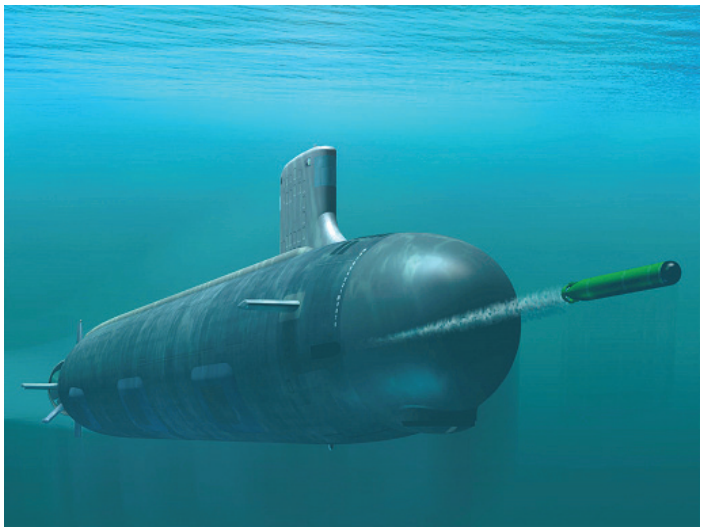
MK 48 Torpedo Modifications

Executive Summary
- The Navy commenced operational test of the MK 48 torpedo with Advanced Processor Build (APB-5) software in FY18, specifically APB-5 torpedo capability against threat submarines. The Navy used an integrated testing approach and completed the following test events:
  - Three developmental test events that incorporated operational test objectives.
  - One dedicated operational test event.
- The Navy deferred operational test of APB-5 torpedo capability against surface ships pending completion of additional developmental testing.
- The Navy expects to complete operational test of the APB-5 torpedo in early 2020.

System
- The MK 48 torpedo is the only anti submarine and anti-surface ship weapon used by U.S. submarines.
- Fielded MK 48 torpedo variants include MK 48 Mod 6, Mod 6 ACOT, and Mod 7 Common Broadband Advanced Sonar System (CBASS).
- Torpedo improvements are made within CBASS variants as a shared development effort with the Royal Australian Navy. Torpedo improvements are primarily software based and the torpedo is commonly referred to by its software build (e.g. APB-5 torpedo).
- The torpedo software in development is APB-5. APB-5 is for Mod 7 CBASS only.



Mission
The Submarine Force employs the MK 48 torpedo to destroy surface ships and submarines in all ocean environments.

Major Contractor
Lockheed Martin Sippican Inc. – Marion, Massachusetts

Activity
- In November 2017, DOT&E approved the Joint Test and Evaluation Master Plan for the MK 48 Mod 7 Heavyweight Undersea Weapons Improvements Increment I program, referred to as the APB-5 torpedo.
- In March 2018, the Navy completed development of the Submarine Launched Modular 3-inch Device (SLAM-3D) with combined funding from the Resource Enhancement Project and the Navy. SLAM-3D was developed as a surrogate for threat representative torpedo countermeasure capability.
- In April 2018, the Navy conducted developmental testing that was coordinated with operational testers to support operational test objectives. Testing was conducted in accordance with a DOT&E-approved data collection plan and included the following events.
  - In April 2018, the Navy tested 10 APB-5 torpedoes against a U.S. naval warship.
  - In June 2018, the Navy tested five APB-5 torpedoes against a U.S. submarine.
  - In July 2018, the Navy tested nine APB-5 torpedoes against an Australian naval vessel and a Canadian naval vessel.
- In August 2018, the Navy concluded the APB-5 torpedo is ready to undergo operational testing against submarines. The Navy deferred operational testing against surface ships pending completion of additional developmental testing.
- In September 2018, the Navy conducted operational testing of the APB-5 torpedo in accordance with a DOT&E-approved test plan. The Navy tested 14 APB-5 torpedoes in anti-submarine warfare scenarios against a U.S. nuclear submarine and an Australian diesel submarine. The Navy employed SLAM-3D during several of the target evasions.

Assessment
- Operational testing of the APB-5 torpedo will continue through FY20. No preliminary assessment can be made on APB-5 torpedo capability against either threat submarines or threat surface ships.

- SLAM-3D supports a more complete evaluation of APB-5 torpedo capability by providing threat representative countermeasure performance to test against.

Recommendation

1. The Navy should develop an unmanned and mobile submarine surrogate for operational test of future MK 48 torpedo capability. The surrogate should support operationally representative response to an incoming torpedo and should allow minimal depth separation to be used between the tested torpedo and the target.