

NAVY PROGRAMS

SSN 774 Virginia Class

SUMMARY

- The *Virginia* SSN completed the initial builder's and acoustic trials in August 2004, where both the crew and the ship performed well.
- Commissioning and ship delivery occurred in October 2004.
- DOT&E approved the updated *Virginia* SSN Test and Evaluation Plan in June 2004.
- The Program Executive Officer of Submarines requested a revision to the Live Fire Test and Evaluation (LFT&E) Plan and the Test and Evaluation Master Plan that would cancel the Full Ship Shock Trials.
- The Navy scheduled the operational evaluation for USS *Virginia* in FY08.



Virginia class submarines will replace the aging fleet of Los Angeles (SSN 688) class submarines.

SYSTEM DESCRIPTION AND MISSION

Virginia class submarines will replace the aging fleet of *Los Angeles* (SSN 688) class submarines. The Navy intends the *Virginia* class to be a submarine comparable in most respects to its immediate predecessor - the *Seawolf* - but in a more affordable configuration. The missions of *Virginia* include Covert Strike Warfare, Anti-Submarine Warfare, Covert Intelligence Collection/Surveillance, Covert Indication and Warning and Electronic Warfare, Anti-Surface Ship Warfare, Special Warfare, Covert Mine Warfare, and Battle Group Support.

Virginia will be capable of targeting, controlling, and launching Mark 48 Advanced Capability Torpedoes, mines, and Tomahawk missiles. Its sonar capability is expected to be similar to *Seawolf*'s, and its electronic support suite and combat control system is an improvement over legacy systems. The Navy is designing its external communications system to provide full, high data rate interoperability with U.S. and allied forces. These communications capabilities support *Virginia*'s intelligence collection and strike capabilities.

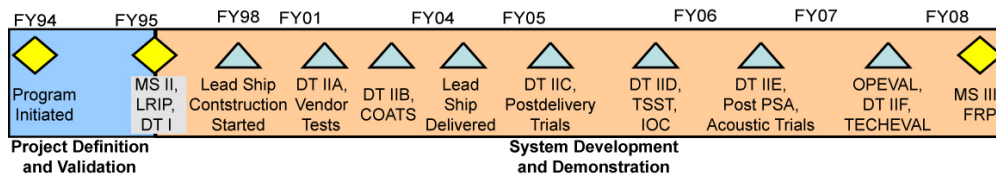
The Navy has integrated the SSN 774 submarine Non-Propulsion Electronics System outside of the ship's hull. Sonar displays and processors; Navigation and Combat Control Architecture; Data Distribution and Display and Electronic Support Measures, Onboard Team Trainer; Total Ship Monitoring; and Submarine Regional Warfare systems were all integrated electronically on a rafted system and inserted into the *Virginia* hull.

DOT&E recommended, and the Secretary of Defense approved, a waiver from full-up, system-level live fire testing of *Virginia* in accordance with Title 10, Section 2366. DOT&E approved the alternative LFT&E plan in June 1995. This plan includes shock qualification tests and analysis of components, surrogate underwater shock tests, a total Ship Survivability Trial, a Full-Ship Shock Trial, as well as a series of vulnerability assessments. In September 2004, the Program Executive Officer requested deleting the underwater shock trials.

The Navy commissioned the USS *Virginia* in Norfolk, Virginia, on October 23, 2004.

NAVY PROGRAMS

TEST AND EVALUATION ACTIVITY



The Navy and construction shipyards launched, christened, conducted dockside testing, and completed the builder's initial sea and acoustic trials on *Virginia* in 2004. To allow the ship to depart the shipyard and to test ship systems, the Navy postponed some construction items necessary for full ship's capability, but not affecting safe operations or self-defense capabilities. The Navy and shipyard completed the builder's trials successfully with minor system and ship deficiencies.

TEST AND EVALUATION ASSESSMENT

The Navy reported the *Virginia* performed well during the builder's sea trials. Reported problem areas appear to be minor in nature.

The *Virginia*'s Non-propulsion Electronic Systems adequately supported the at-sea trial and test operations. This is a credit to the extensive testing at the shipbuilder and the land based test site over the last two years. However, much of the systems capabilities have yet to be fully tested at sea. The Navy plans to upgrade the Non-propulsion Electronic Systems during the *Virginia*'s post-shipyard availability in 2006 and continue the upgrades during the modernization period in 2007. These upgrades will provide the configuration needed for operational evaluation in 2008. Currently, functionality for Acoustic Intelligence, Special Operations Support, and the Circuit D—active degaussing have not been tested, while problems are being resolved with the Light Weight Wide Aperture Array, the Photonics mast, the Submarine Regional Warfare System, and the Deployable Array Working Group. Other installs, such as the Common Submarine Radio Room and the operational evaluation version of Acoustic Rapid Commercial Off-the-shelf Insertion Sonar System, are part of the post shipyard availability modernization.

The Operation Test and Evaluation Force reported concerns regarding the linked issues of habitability, access, and damage control in the last two operational assessments. The most detrimental impact of poor habitability is on the damage control response to a major casualty, such as fire or flooding. Access to spaces outboard the berthing areas are extremely limited. These outboard spaces contain many high-pressure air and hydraulic lines, as well as electrical cables and water piping. Additionally, small passageways and lack of space in berthing areas limit the ability of the crew to evacuate from, and respond to, casualties from these crowded spaces. The program has improved access to these areas by installing removable panels for damage control access and widening or modifying the access doors. These changes will be evaluated during at-sea operations and during the operational evaluation.

The Navy chose the Voyage Management System as the new program to provide paperless navigation capability to *Virginia*. The initiative to integrate Voyage Manager System in *Virginia* does not support installation and testing of a paperless charting system until 2006. Consequently, *Virginia* conducted all operations using paper charts and temporary plotting tables.