SSGN *Ohio* Class Conversion

Executive Summary
- DOT&E published the Combined Operational and Live Fire Test and Evaluation Report on the SSGN in May 2008.
- The SSGN is effective and suitable for strike and Special Operating Forces (SOF) operations and is survivable in the expected threat environment.
- The existing inventory of six Drydeck Shelters (DDS) may be inadequate to support all four SSGNs and DDS-capable nuclear attack submarines (SSNs) over the long term.

System
- The Navy converted four *Ohio* class ballistic missile submarines into strike and special operations platforms.
- In a full strike configuration, an SSGN can carry up to 154 Tomahawk cruise missiles for land attack strike, with 22 missile tubes carrying seven missiles per tube. In the standard configuration planned for normal operations, an SSGN carries one DDS or Advanced SEAL Delivery System (ASDS), embarked SEAL teams, and up to 105 Tomahawk cruise missiles in 15 tubes.
- The SSGN is designed to carry up to two ASDS and/or DDS, allowing submerged lockout and delivery of large numbers of SOF personnel. Additionally, the Navy converted two SSGN missile tubes into lockout chambers to allow submerged delivery of SOF without use of ASDS or DDS.
- The conversion includes extensive modernizations to electronics, radio, navigation, sonar, and fire control systems. It also includes an extensive payload capability for future off-board systems and weapons.

Mission

The Maritime Force Commander can employ the *Ohio* class SSGN for the following missions:
- Land attack strike mission, capable of launching Tomahawk cruise missiles
- Special operations missions, including all support and planning utilizing up to two SEAL submersible vehicles
- Traditional attack submarine missions

Prime Contractor
- General Dynamics

Activity
- DOT&E published the Combined Operational and Live Fire Test and Evaluation Report on the SSGN in May 2008.
- The Navy completed FOT&E in May 2008 to demonstrate SSGN Dual DDS capability.
- The Navy completed FOT&E in November 2008 to demonstrate special operations capability utilizing the SSGN lockout chambers.
- The first two SSGNs, USS *Ohio* and USS *Florida*, completed their initial overseas deployments in FY08.

Assessment
- In the Combined Operational and Live Fire Test and Evaluation report, DOT&E concluded that the SSGN is operationally effective for strike operations and for SOF operations when configured with either a single DDS or the ASDS. Additionally, DOT&E concluded that the SSGN is suitable for both strike and SOF operations and is survivable in the expected threat environment. Based on FOT&E results, the SSGN is also effective and suitable for SOF operations using two DDS or the SSGN lockout trunks.
- When configured with a single DDS or ASDS, the SSGN's capability to deliver SOF personnel to shore is commensurate with that of existing nuclear attack submarines (SSNs) in the same configuration. When configured with two DDS, the SSGN provides greater SOF delivery capability than an SSN. The SSGN lockout chambers also provide SOF delivery capability without use of a DDS or ASDS.
- In all configurations, the SSGN provides a significantly improved onboard environment for SOF operations, including better command, control, and communications as well as better equipment storage, berthing, and exercise facilities.
- The currently-deployed SSGNs are limited in their ability to utilize installed lockout chambers to deliver SOF because they lack oxygen recompression capability in case of a diver

accident. U.S. Special Operations Command (USSOCOM) will not certify the lockout chambers without this capability. The Navy intends to test this capability on USS *Michigan* in late 2008 or early 2009 and complete installation on remaining SSGNs during scheduled maintenance periods.

- The existing inventory of six DDS may be inadequate to support all four SSGNs and DDS-capable SSNs over the long term.
- Despite at least two attempts, the Navy has been unable to complete the testing required to certify the SSGN to launch Tomahawk missions that do not utilize GPS. This testing is intended to confirm that the SSGN systems can accurately transfer precise navigational data to the missile prior to launch.
- The Navy achieved their goal of maintaining the original ballistic missile submarine (SSBN) level of survivability by completing conversion to SSGN without introducing any new survivability deficiencies. However, SSGN missions require the submarine to operate closer to shore and assume a more detectable communications posture. As a result, the SSGN is more susceptible to detection than a typical SSBN.
- The Navy can enhance SSGN capability by modifying the SSGN High Data Rate (HDR) antenna in order to achieve the same antenna height as the HDR on *Ohio* class SSBNs. The shorter SSGN HDR antenna forces the SSGN to operate at a shallower depth while communicating. This makes control of the SSGN more difficult and results in greater periscope exposure, increasing the submarine's susceptibility to detection. The Navy expects to complete design of an appropriate modification by June 2009, but has not identified funding for procurement and installation.
- The Navy agreed to conduct Information Assurance (IA) network penetration testing of SSGN systems, but intends to evaluate the results from testing of similar systems installed on *Virginia* class attack SSNs prior to scheduling the testing on an SSGN. Previous IA test results indicate that the SSGN may be at high risk of network penetration.

Recommendations

- Status of Previous Recommendations. The Navy and USSOCOM have not yet taken effective action on two of the three FY07 recommendations. The recommendations concerning HDR antenna height and DDS inventory remain valid.
- FY08 Recommendations. The Navy should:
  1. Perform "Red Team" network penetration testing of SSGN systems as soon as practicable to fully evaluate the ship's vulnerability to network attack.
  2. Reassess SSGN tactical guidance for mine avoidance and use the Advanced Mine Simulation System to quantify the SSGN's specific susceptibility to bottom mines.
  3. Consider development of alternate strike tactics that will reduce the SSGN vulnerability during strikes conducted in adverse ASW environments.
  4. Complete certification of the SSGN for Tomahawk missions that do not utilize GPS.