

Navy Extremely High Frequency Satellite Communications Program (NESP)

The Navy Extremely High Frequency (EHF) Satellite Communications Program (NESP) terminal connects ship, shore, and submarine platforms to the Military Strategic, Tactical, and Relay (MILSTAR) satellite constellation. The NESP terminal supports survivable, enduring, and flexible worldwide command and control communications to strategic and tactical Naval forces through all levels of conflict. The NESP terminal provides minimum essential secure communications in stressed environments that require anti-jam and low probability-of-intercept capabilities.

There are three different configurations of the NESP terminal corresponding to surface ship, shore, and submarine platforms. Although each terminal has the same basic capabilities, their antennas and other peripheral equipment vary by platform. The NESP terminal has been upgraded to add a tactical medium data rate (MDR) capability to the existing strategic low data rate (LDR) capability. A limited number (64) of the existing NESP ship and shore terminals are being upgraded with an MDR appliqué to achieve the combined low/medium data rate MILSTAR capability. All existing NESP terminals will be replaced with the Follow-On Terminal (FOT), which provides the same functionality as the MDR appliqué, but offers technology upgrades in terminal hardware and software. The submarine LDR terminals are also undergoing MDR upgrades, including installation of a new mast with a 16" antenna, as well as addition of super high frequency and Global Broadcast Service capabilities.

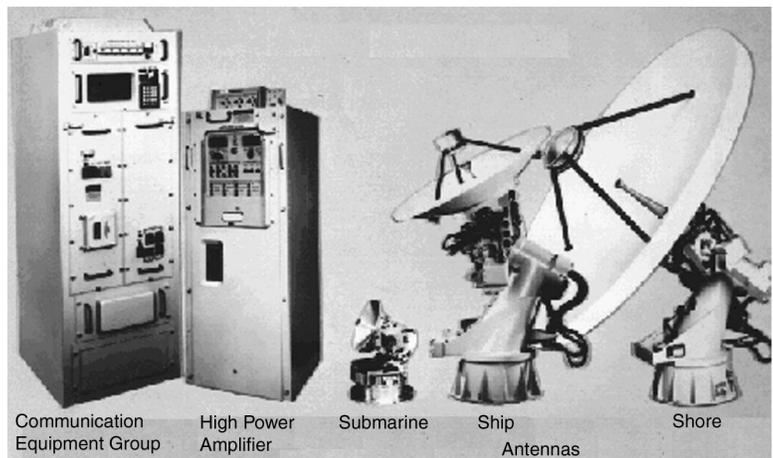
The Navy is developing two new communications controllers, the Navy EHF Communications Controller (NECC) and the Time Division Multiple Access (TDMA) Interface Processor (TIP). The NECC and TIP are baseband interface units that allow more efficient use of MILSTAR satellite resources. The NECC supports LDR data networks, while the TIP supports MDR data networks.

TEST & EVALUATION ACTIVITY

Testing of the NESP MDR terminal began with Developmental Test/Operational Test events associated with on-orbit testing of Milstar Flights 4 and 5, occurring from March-July 2001, and January-March 2002, respectively. These tests demonstrated compatibility and interoperability with the low and medium data rate payloads in orbit. Tests included satellite acquisition; simultaneous network operations; interoperable network and point-to-point calls with Army, Navy, and Air Force terminals; and antenna and network control functions.

Anti-jam and Low Probability Intercept (LPI) are two important characteristics of the NESP MDR terminal; MDR Operational Test and Evaluation (OT&E) is employing modeling and simulation, rather than testing, to evaluate the terminal's ability to meet requirements. Model validation testing of both the anti-jam and LPI models was conducted in 2001, and additional validation testing was conducted. Analysis of test data is on going, and the models will be accredited pending the results.

The NESP terminal with the NECC participated in a Navy developmental test in



The Navy Extremely High Frequency Satellite Communications Program is a general purpose terminal designed to accommodate secure voice, teletype, data systems, and extremely high frequency uplink for the fleet broadcast.

NAVY PROGRAMS

FY01. OT&E of the NESP terminal with the NECC was planned for September 2001, but it was not certified for OT&E due to reliability concerns. This test will use on-shore and at-sea terminals to determine NECC operational effectiveness and suitability, and due to resource scheduling issues, test will not occur until 2QFY03/3QFY03.

The MDR OT&E for the NESP terminal with the MDR appliqué was conducted from April 22 to May 10, 2002, in ships and shore stations in San Diego, California, and Pearl Harbor, Hawaii. This test was conducted to support a fielding decision on the MDR appliqué. Commander, Operational Test and Evaluation Force determined that the MDR appliqué is operationally effective and operationally suitable, and recommended fleet introduction.

Operational test of the FOT was scheduled to begin in October 2002, but was delayed due to poor reliability. It is now scheduled to occur in December 2003. A separate test will also be conducted to address the TIP (still under development) and any other issues not fully resolved. The submarine MDR terminal operational test schedule will be integrated into the overall MILSTAR and NESP terminal test schedules to the greatest extent possible, consistent with submarine terminal progress. Current plans are to conduct submarine terminal testing jointly during operational testing of the NESP ship and shore terminals.

TEST & EVALUATION ASSESSMENT

At the completion of the LDR IOT&E, DOT&E concluded that the ship and shore NESP terminals were operationally effective, suitable, and supported full fleet introduction. Although the MILSTAR LDR submarine terminal does meet the technical and operational requirements for LPI, operational tests showed that the submarine had a substantially higher probability of signal intercept than developmental tests had indicated. These LPI results reinforce the role of operational testing in providing the warfighter with the most accurate operational performance information possible.

The ship and shore terminals with the MDR appliqué are operationally effective and operationally suitable. However, no assessments can be made regarding joint interoperability, anti-jamming, and LPI until further testing is conducted later this year. DOT&E has recommended additional at-sea testing of MDR LPI performance of the submarine terminal to mitigate the risk associated with the model to be used for Operational Test.