Cooperative Engagement Capability (CEC)

SUMMARY

- The shipboard Cooperative Engagement Capability (CEC) system is in full-rate production. Interoperability issues with shipboard combat systems and tactical data links continue to prevent operators from realizing the full benefit of CEC's capability.
- The airborne CEC system is in low-rate initial production. Results from FY04 operational testing and evaluation are under review.
- Work is underway to upgrade combat systems to realize full benefits of CEC composite tracking.

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SYSTEM DESCRIPTION AND MISSION

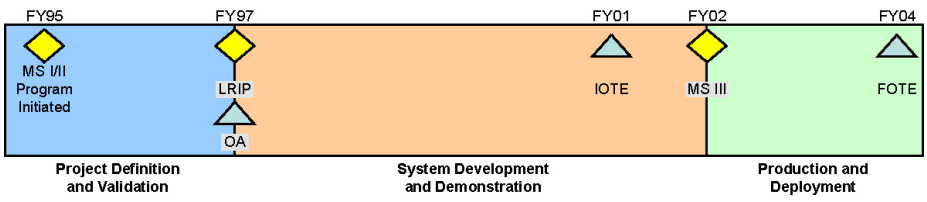
The CEC is a system of hardware and software that allows ships and E-2C aircraft to share radar data on air targets. CEC-equipped ships and aircraft transmit radar data to other CEC units via a line-of-sight radio system. Each ship or airplane uses identical data processing techniques so each will display the same track picture of aircraft and missiles. An Aegis ship can fire a missile at a hostile aircraft or anti-ship cruise missile based on radar data it receives from another CEC unit. Ships with the Ship Self Defense System or Advanced Combat Direction System can receive radar cueing information from CEC ships or aircraft to alert them to hostile air contacts. E-2C aircraft with CEC provide airborne radar coverage and extended relay capability, and receive increased track accuracy for targets held by shipboard radars.

In 1990, the Navy demonstrated a CEC prototype at sea. Navy testers conducted early operational assessments in FY94, FY95, and FY97. CEC entered engineering and manufacturing development at Milestone II in 1995. In accordance with congressional guidance, the Navy certified initial operational capability for CEC in late 1996. It was designated an Acquisition Category ID program in 1999.

Navy testers conducted Initial Operational Test and Evaluation of the shipboard system (Baseline 2.0 software) in 3QFY01. DOT&E published a beyond low-rate initial production report in February 2002. The acquisition decision memorandum of April 3, 2002, approved the shipboard system for full-rate production and the aircraft system for low-rate initial production. The Navy anticipates a full-rate production decision for the airborne system in FY05.

Eventually the Navy plans to upgrade CEC software and hardware to operate in an open architecture environment. If successful, this should correct the integration deficiencies observed in operational testing and reduce the cost of future software upgrades.

TEST AND EVALUATION ACTIVITY



The Navy conducted follow-on operational test and evaluation (OT-IIIB) in two phases from January to March 2004. This was the Initial Operational Test and Evaluation-equivalent test for the aircraft version of CEC. The test included a four-week period during a USS *John F. Kennedy* carrier strike group pre-deployment exercise and involved live missile firings at unmanned targets. Participants included *John F. Kennedy* (CV 67) and its embarked air wing (including four CEC-equipped E-2C Hawkeye aircraft) and two CEC-equipped Aegis ships.

The Navy is installing CEC in aircraft carriers and amphibious ships (LPD 17 class) that are equipped with the Ship Self-Defense System Mark 2. The program office plans operational testing for these installations in FY05 and FY06.

TEST AND EVALUATION ASSESSMENT

CEC Shipboard System with Baseline 2 Software. DOT&E's 2002 beyond low-rate initial production report for CEC determined the shipboard system operationally effective and operationally suitable. However, there were problems related to CEC's integration and interoperability with the ship's combat system and the Link 11 and Link 16 tactical data links. Although CEC produced generally excellent tracking data, the integration of the tactical data links degraded the picture operators saw on their display screens. The system also had some maintainability problems. Operational testing in FY04 (OT-IIIB) showed progress in correcting some of these problems, but the data link interoperability issue continued to prevent operators from realizing the full benefit of CEC. Correction of problems due to legacy system design is prohibitively expensive so the Navy has started a substantial effort to improve the engineering of the overall combat system. Developing an open architecture computing environment for the system may solve many of these problems. A further effort to achieve combat system interoperability may come from the model driven architecture efforts at the Joint Single Integrated Air Picture System Engineering Office. This effort will probably not be fielded before 2010.

CEC Airborne System and Baseline 2 Software. We have received the Navy testers' data and evaluation of AN/USG-3 airborne CEC system performance in the E-2C. Our evaluation is ongoing, but preliminary indications are that the operational effectiveness of the system is comparable to that in surface ships. Some deficiencies exist in operational suitability. Scheduling difficulties associated with the need to run this test in an active fleet Carrier Strike Group without affecting the Navy's deployment schedule contributed to these deficiencies. Logistic and training issues associated with an initial introduction of the new system are under review for their significance to the readiness of USG-3 full-rate production.

OT&E of Network Centric Warfare Systems. The Navy has applied substantial effort to develop the Distributed Engineering Plant, an interconnection of land-based combat system components simulating shipboard and airborne systems. It has been a useful tool for new system development and for software certification. Future improvements in the Distributed Engineering Plant will provide significant, useful data for the overall test process. However, the Distributed Engineering Plant cannot take the place of realistic operational testing. Actual testing at sea with ships and airplanes is still required to adequately evaluate the effectiveness and suitability of these systems.