

# CRS Report for Congress

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## Navy Network-Centric Warfare Concept: Key Programs and Issues for Congress

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### Summary

Programs for implementing network-centric warfare (NCW) in the Navy include the Cooperative Engagement Capability (CEC), the IT-21 program, and FORCEnet. A related program is the Navy-Marine Corps Intranet (NMCI). Congress has expressed concern for some of these programs, particularly NMCI. This report will be updated as events warrant.

### Network-Centric Warfare

Network-centric warfare (NCW), also known as network-centric operations (NCO), is a key element of defense transformation. NCW focuses on using computers, high-speed data links, and networking software to link military personnel, platforms, and formations into highly integrated local and wide-area networks. Within these networks, personnel share large amounts of information on a rapid and continuous basis. The Department of Defense (DOD) believes NCW will dramatically improve combat capability and efficiency.<sup>1</sup>

### Examples of Navy NCW Programs

**CEC.** The Cooperative Engagement Capability (CEC) system links Navy ships and aircraft operating in a particular area into a single, integrated air-defense network in which radar data collected by each platform is transmitted on a real-time (i.e., instantaneous) basis to the other units in the network. Units in the network share a common, composite, real-time air-defense picture. CEC will permit a ship to shoot air-defense missiles at incoming anti-ship missiles that the ship itself cannot see, using radar targeting data gathered by other units in the network. It will also permit air-defense missiles fired by

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<sup>1</sup> For more on NCW, see CRS Report RL32411, *Network Centric Warfare: Background and Oversight Issues for Congress*, by Clay Wilson. For more on defense transformation and naval transformation, see CRS Report RL32238, *Defense Transformation: Background and Oversight Issues for Congress*; and CRS Report RS20851, *Naval Transformation: Background and Issues for Congress*, both by Ronald O'Rourke.

one ship to be guided by other ships or aircraft. The Navy wants to install the system on aircraft carriers, Aegis-equipped cruisers and destroyers, selected amphibious ships, and E-2C Hawkeye carrier-based airborne early warning aircraft over the next several years. The system has potential for being extended to include Army and Air Force systems.

Tests of CEC aboard Navy ships in 1998 revealed significant interoperability (i.e., compatibility) problems between CEC's software and the software of the air-defense systems on some ships. In response, the Navy undertook a major effort to identify, understand, and fix the problems. The CEC system, with the new fixes, passed its technical evaluation (TECHEVAL) testing in February and March 2001 and final operational evaluation (OPEVAL) testing in April and May 2001.

Raytheon has been the primary CEC contractor but in 2002 faced potential competition from two firms — Lockheed and a small firm called Solipsys — for developing the next version of CEC, called CEC Block II. Solipsys had devised an alternative technical approach to CEC, called the Tactical Component Network (TCN). Solipsys entered into a teaming arrangement with Lockheed to offer TCN to the Navy as the technical approach for Block II. In late-December 2002, Raytheon announced that it had agreed to purchase Solipsys. In early-February 2003, Raytheon and Lockheed announced that they had formed a team to compete for the development of Block II. Some observers expressed concern that these developments would reduce the Navy's ability to use competition in its acquisition strategy for Block II. As an apparent means of preserving competition, the Navy in mid-2003 announced that it would incorporate open-architecture standards into Block II divide the Block II development effort into a series of smaller contracts for which various firms might be able to submit bids. In December 2003, however, the Navy canceled plans for developing Block II in favor of a new plan for developing a joint-service successor to Block I.

The conference report (H.Rept. 108-283, page 290) on the FY2004 defense appropriations act (H.R. 2658/P.L. 108-87) directed the Navy to keep the Appropriations committees informed on potential changes to the CEC Block II acquisition strategy and stated that, if the Navy adopts a new acquisition strategy, "the additional funds provided in this act for CEC Block 2 may be merged with and be available for purposes similar to the purposes for which appropriated."

The House and Senate Armed Services Committees, in their reports (H.Rept. 109-89, page 178, and S.Rept. 109-69, pages 108-109, respectively) on the FY2006 defense authorization bill (H.R. 1815/S. 1042), expressed satisfaction with the Navy's efforts to improve interoperability between the CEC system and other combat direction systems and ended a requirement established in the conference report (H.Rept. 105-736) on the FY1999 defense authorization act (P.L. 105-261) for the Navy to report to Congress on these efforts on a quarterly basis.

**IT-21.** IT-21, which stands for Information Technology for the 21<sup>st</sup> Century, is the Navy's investment strategy for procuring the desktop computers, data links, and networking software needed to establish an intranet for transmitting tactical and administrative data within and between Navy ships. The IT-21 network uses commercial, off-the-shelf (COTS) desktop computers and networking software that provide a multimedia (text, data, graphics, images, voice, and video) organizational intranet similar to the Capitol Hill intranet or corporate intranets. The Navy believes IT-21 will

significantly improve U.S. naval warfighting capability and achieve substantial cost reductions by significantly reducing the time and number of people required to carry out various tactical and administrative functions. FY2007 funding requested for IT-21 is intended “to provide Integrated Shipboard Network Systems (Increment 1) procurement and installation to achieve a Full Operational Capability (FOC) for all platforms by FY2011.”<sup>2</sup>

**FORCEnet.** FORCEnet is the Navy’s overall approach for linking various networks that contribute to naval NCW into a single capstone information network for U.S. naval forces. The Navy has highlighted FORCEnet as being at the center of its Sea Power 21 transformation vision. Some observers have criticized FORCEnet for being insufficiently defined.<sup>3</sup> The Naval Network Warfare Command issued a functional concept document for FORCEnet in February 2005, but Navy officials acknowledged at the time that the concept was not yet adequately defined and stated that an improved version of the document would be published in 2006.<sup>4</sup>

The conference report (H.Rept. 107-732) on the FY2003 defense appropriations bill (H.R. 5010/P.L. 107-248) expressed concern about “the lack of specificity and documentation on the program,” and directed the Navy to submit a detailed report on it by May 1, 2003 (page 279). The Senate Appropriations Committee, in its report (S.Rept. 108-87, page 156) on the FY2004 defense appropriations bill (S. 1382), expressed support for the FORCEnet program but also said it “is concerned that no requirements have been approved or implemented and that there is duplication of effort, especially in the areas of experimentation and demonstrations. The Committee directs that the FORCEnet program establish these requirements, test them within the Navy Warfighting Experimentations and Demonstrations line (PE0603758N), and release the approved requirements changes as quickly as possible.”

**NMCI.**<sup>5</sup> Although not an NCW system itself, a significant program related to NCW is the Navy-Marine Corps Intranet (NMCI), which is a corporate-style intranet linking more than 300 Navy and Marine Corps shore installations. NMCI is to include a total 344,000 computer work stations, or “seats.” As of January 2006, the Navy had ordered 341,000 seats and fully implemented about 264,000. The Navy plans to achieve steady-state operation of all NMCI seats during FY2007. In October 2000, the Navy awarded an industry team led by Electronic Data Systems (EDS) Corporation an \$6.9-billion, five-year contract for installing, supporting, and periodically upgrading the NMCI. In October 2002, Congress, through P.L. 107-254, authorized a two-year extension to this contract, which is now worth \$8.9 billion. The Navy’s FY2007 budget requests \$1,681.5 million for the program.

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<sup>2</sup> U.S. Department of the Navy, *Highlights of the Department of the Navy FY 2007 Budget*, p. 5-10 (i.e., Section 5, page 10).

<sup>3</sup> See, for example, Malina Brown, “Van Riper: Navy’s ForceNet Too Broad, Mysterious To Be Meaningful,” *Inside the Navy*, Apr. 7, 2003. See also Malina Brown, “Mullen Acknowledges ForceNet Concept Not Clearly Understood,” *Inside the Navy*, July 5, 2004.

<sup>4</sup> Jason Ma, “Naval Network Warfare Command Issues FORCEnet Concept Document,” *Inside the Navy*, Feb. 14, 2005.

<sup>5</sup> The Navy’s site on the Internet for NMCI information is: [<http://www.nmci.navy.mil/>].

The NMCI implementation effort has experienced a number of challenges and delays. A 2005 report from DOD's weapons-testing office identifies problems found with the program in 2003.<sup>6</sup> On September 30, 2004, the Navy and EDS restructured the terms of the NMCI contract to consolidate the number of performance measures and focus on measuring results rather than implementation steps.<sup>7</sup> User reaction to the system reportedly has been mixed but is gradually improving.<sup>8</sup>

The 106<sup>th</sup> Congress expressed concern over the difficulty of identifying the total cost of the NMCI effort in Navy budget documents, the Navy's ability to finance NMCI effort without disrupting other important Navy programs, the pace at which the Navy planned to implement NMCI, the Navy's ability to properly structure and manage the huge NMCI contract (the largest networking-services IT contract undertaken by a federal agency), the potential impact of NMCI implementation on employees of existing naval networking and telecommunications systems, and whether the network should be extended to cover installations in the Marine Corps, which already had its own service-wide network.

In response, the Navy took actions to improve the visibility of NMCI costs in its budget, stated that the NMCI would be financed to a large degree using funds programmed for older IT procurement programs that the NMCI will supercede, stated that implementing NMCI would have only a small net employment impact, and argued that implementing NMCI in the Marine Corps as well as the Navy would result in greater efficiencies and lower overall costs for the two services. At Congress's direction, the plan for implementing NMCI was restructured to begin with a smaller number of initial installations, so that the success of the NMCI effort could be more carefully assessed before the program was expanded to cover larger parts of the Navy and the Marine Corps.

The 107<sup>th</sup> Congress expressed substantial concerns regarding the implementation and testing of the NMCI system. Section 362 of the conference report (H.Rept. 107-333 of December 12, 2001) on the FY2002 defense authorization act (S. 1438/P.L. 107-107) permitted the Navy to proceed with the NMCI project only after meeting certain testing requirements. The provision also required the Navy to submit a report on the status of NMCI testing and the implementation of the NMCI network, and to identify a single individual whose sole responsibility will be to direct and oversee the NMCI program. (The Navy in February 2002 announced that it had created a single program office to manage the NMCI program, headed by an admiral. An NMCI senior executive council headed by the Navy's acquisition executive will provide senior-level review of the program office.) The provision required GAO to study the impact of NMCI implementation on the rate structure of naval shipyards and other repair depots. (GAO

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<sup>6</sup> Jason Ma, "DOT&E Report Identifies NMCI Problem Areas Found During 2003 Test," *Inside the Navy*, Feb. 7, 2005.

<sup>7</sup> David McGlinchey, "Navy Says New Technology Contract Yields Rewards," *GovExec.com*, Nov. 3, 2004; John T. Bennett, "Godwin: NMCI Contract Changes Should Remedy Schedule Delays," *Inside the Navy*, Oct. 4, 2004; David McGlinchey, "Navy Streamlines Its Intranet Contract," *GovExec.com*, Oct. 6, 2004; Crayton Harrison, "EDS, Navy Agree," *Dallas Morning News*, Oct. 2, 2004.

<sup>8</sup> Jason Ma, "NMCI Customer Satisfaction Inches Up 2 More Percentage Points," *Inside the Navy*, August 8, 2005; Jason Ma, "NMCI Satisfaction Stays Flat, But Navy Touts Increase Of 2 Percent," *Inside the Navy*, May 9, 2005.

submitted its report [GAO-03-33] on October 31, 2002.) The conference report also expressed concern about delays in implementing the program and the resulting shortage of data about the viability and performance of NMCI. (See pages 55-57 and 641-642.)

The House Appropriations Committee, in its report (H.Rept. 107-532) on the FY2003 defense appropriation bill (H.R. 5010/P.L. 107-248), commented extensively on the NMCI program, expressing concerns over the incorporation of “legacy” computer programs into the network and the adequacy of the testing program. (pages 198-199) The conference report on the bill (H.Rept. 107-732) expressed continuing concerns for the NMCI program and included a provision (Section 8118) prohibiting the Navy from ordering additional seats beyond the 160,000 already authorized until certain conditions are met. (Pages 48, 106-107, and 329.)

In the 108<sup>th</sup> Congress, the conference report (H.Rept. 108-767, page 642) on the FY2005 defense authorization act (H.R. 4200/P.L. 108-375) asked the Navy to accelerate the transition of legacy applications and networks into the NMCI environment, and directed the Navy to report on its efforts in this area.

## Issues for Congress

Potential issues for Congress include the following:

- Is the Navy making sufficient progress in implementing and testing the NMCI system?
- Does the Navy have a clear and adequate acquisition strategy for developing a successor to CEC Block I?
- Is the FORCEnet concept adequately defined?
- Is the Navy taking sufficient actions for preventing, detecting, and responding to attacks on NCW computer networks?
- Is the Navy taking sufficient steps to provide adequate satellite bandwidth capacity to support NCW?
- Are Navy efforts to develop new tactics, doctrine, and organizations to take full advantage of NCW sufficient?
- Has the Navy taken the concept of NCW adequately into account in planning its future fleet architecture?<sup>9</sup>
- Are NATO and other allied navies investing sufficiently in NCW-enabling technologies? If not, will the Navy’s implementation of NCW hinder U.S.-allied naval interoperability?

## Legislative Activity For FY2007

**FY2007 Defense Authorization Bill (H.R. 5122/S. 2766).** The House Armed Services Committee, in its report (H.Rept. 109-452 of May 5, 2006) on H.R. 5122, states:

The committee supports the Navy Marine Corps Intranet (NMCI) and commends the Secretary of the Navy for resolving the long standing contract dispute on the NMCI

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<sup>9</sup> For additional discussion of Navy force-structure planning, see CRS Report RL32665, *Navy Force Structure and Shipbuilding Plans: Background and Issues for Congress*, by Ronald O’Rourke.

contract. The committee remains concerned, however, about the cost of the contract and the enduring nature of legacy programs that a now mature NMCI was designed to replace. For that reason, the committee cannot support the increased funding contained in the budget request. Accordingly, the committee recommends \$240.5 million in servicewide communications for NMCI, a decrease of \$70.0 million. (Page 291)

The Senate Armed Services Committee, in its report (S.Rept. 109-254 of May 9, 2006) on S. 2766, states:

The budget request included \$1,681.5 million for the Navy Marine Corps Intranet (NMCI) program. Of these funds, the Navy requested \$94.0 million for the program management of the contract with Electronic Data Systems (EDS). The requested amount for fiscal year 2007 is over three times the amount requested in fiscal year 2004, and three times the amount budgeted for the future years of the contract from 2008 through 2010. The Navy should better define its program management roles, mission, and budget in future budget justification materials to the Congress. The committee recommends a decrease of \$30.0 million in Operation and Maintenance, Navy, for the NMCI program office — to more closely align the 2007 funding level with future years plans.

The committee notes that the Navy recently had to reprogram \$74.6 million to settle numerous legal claims between EDS and the Federal Government. The committee is concerned that the flawed development of the NMCI contract led to this additional, unplanned cost. The committee notes that many organizations within the Navy and the Office of the Secretary of Defense, including the Chief Information Officers of both organizations and the Office of Program Analysis and Evaluation, did not perform adequate oversight and analysis of the details of the contract and its terms. The committee believes that the Department of Defense should examine the development of this contract to derive lessons learned on structuring, managing, and performing adequate oversight for similar information technology programs in the future. Additionally, the NMCI program should remain on the “watch list” of major automated information systems which the Department uses to monitor the progress of such programs.

Despite past difficulties, the committee is encouraged by the recent negotiations between the Navy and EDS. By exercising the 3 year option on the NMCI contract, the Navy expects to realize lower costs per sailor and marine for information technology services. Long-standing disputes surrounding the initial contract, including fees and legacy systems migration, are being remedied.

However, the committee notes that entering the recent renewal negotiation, the Navy was not in the best position to explore all possible options to acquire needed information technology services. The committee has been assured that the modified contract will enable the Navy to acquire the information technology services it requires and be in a more flexible position to adjust how it acquires those services in the future — should it be deemed necessary. With nearly \$6.0 billion already spent, and another \$3.0 billion expected to be expended over the next 3 years, the Congress will continue its close oversight of this program to ensure that sailors and marines receive world-class information technology services. (Page 289-290)