

# **Executive Summary (U)**

## **Open Systems Architecture For Command, Control and Communications**

### **Purpose of Study**

The need for precise and timely information in strategic and tactical operations, as well as optimum use of Navy sensors and weapons systems is inhibited by the limits of current Command, Control and Communications (C<sup>3</sup>) systems architecture and its associated components.

### **Observations**

The shortcomings of Navy combat and C<sup>3</sup> computer systems reveal vulnerability in warfighting capability and survivability. These shortcomings are due to narrow range and lack of flexibility in support of numerous tactical afloat and ashore users. The limiting factor in these shortcomings is the continued development of uniquely Navy systems. C<sup>3</sup> systems designed to Military Specifications (MILSPEC) force the Navy into unrealistic development and life cycle support time and cost. This approach diverges from the current industry utilization of Open Systems Architecture (OSA) and common standards that facilitate increased growth in processing while decreasing costs. In contrast, the Navy's approach requires a longer lead time and produces less capable and costlier C<sup>3</sup> systems.

### **Conclusions**

Implementation of OSA is the best method of reducing development time and system cost while using leading technology and improving compatibility between Navy units, other service branches and industry. The Panel found several examples of effective use of OSA. Most notable of these was the Naval Tactical Command System - Afloat (NTCSA). In addition, the endorsement of OSA by the Copernicus Architecture effort of the Director, Space and Electronic Warfare (OP-094) represents significant progress. However, examples of Commercial-Off-the-Shelf (COTS) items being randomly employed throughout a system in order to claim use of OSA results in a loss of most of the inherent benefits.

From an engineering perspective, the Panel found no technological barriers to adopting OSA and industry standards in combat and C<sup>3</sup> systems. Policy and cultural barriers to implementation exist, and are due to institutional inertia and minimal understanding of OSA applications by decision makers.

### **Recommendations**

As was evident in Desert Storm operations, Navy C<sup>3</sup> must obtain dramatic increases in the communications bandwidth. Expansion into commercial satellites, antenna design, and ashore and afloat processing and display systems is critical. To expedite this conversion to COTS technology, particularly with computers and software, the Panel recommends that the current MILSPEC waiver policy be inverted to require a waiver for procurement of MILSPEC equipment. In addition, education of program managers and

decision makers regarding advantages, capabilities and availability of commercial products should be provided.

Ruggedized commercial equipment and standards should be the norm for Navy C<sup>3</sup> while systems designed to a MILSPEC should require a waiver for use. This will ensure optimum fleet readiness in the future.