Executive Summary
NRAC Report on Department of the Navy Science and Technology Program

PURPOSE OF STUDY : A special study of the Department of the Navy (DON) Science and Technology (S&T) Program was initiated in the summer of 1995 under the auspices of the Naval Research Advisory Committee (NRAC) at the request of the Assistant Secretary of the Navy for Research, Development, and Acquisition [ASN(RD&A)]. The Panel was asked to make recommendations to the DON relative to maintaining a strong and dynamic S&T base.

OBSERVATIONS : Science and technology played critical roles in the development of the most powerful Naval Force in the world. Over the last 50 years, the Office of Naval Research (ONR), the Naval Research Laboratory (NRL), and the Warfare Centers have been key players in the development of scientific and engineering advances that benefited both the DON and society.

The speed with which major technical advances are occurring has drastically increased, particularly in areas such as information technology, advanced materials, and biotechnology. While these advances often occur in academia, they are also substantially driven by the consumer and commercial industry, both at home and overseas. As a result, the defense community has become a net user rather than a net provider of advanced technology. The DON S&T program needs to be structured to give it access to technological advances occurring in industry. This will require that its S&T community continue to include some of the brightest scientists and engineers.

Federal policies regarding the governance of almost all Federal agencies impose excessive accountability and create employment and staffing obstacles to maintaining a strong S&T staff. The segmentation of R&D funding assignments within the Department of Defense into numerical categories (6.1, 6.2, ..., 6.7) leads to communication and administrative barriers that degrade effectiveness. These communication problems are especially serious between the DON S&T community (ONR, NRL) and the Fleet operations and requirements organizations (SYSCOMs and NO91).

RECOMMENDATIONS

Vision. An overall DON S&T vision is essential in order to guide the activities of its S&T community. This vision should clearly state the role of its S&T players and programs, including mechanisms for technology insertion and requirements feedback, within the context of the total Naval systems development, acquisition, and warfighting missions. The Panel recommends that ONR direct the long-term research programs (6.1-6.3), while the SYSCOMs and their Warfare Centers focus on applied research (6.4-6.7). To recognize the importance of the S&T program, the rank of the Chief of Naval Research should equal the rank of the System Commanders. Roadmapping, a technique

successfully applied by industry, should be a tool in long-term S&T planning and strategy development.

S&T Policies. Congressional policies should be reviewed and/or modified so that Naval personnel and their contractors can more effectively employ the limited resources available to the DON's missions. Accountability obligations should be relaxed. Personnel policies must be modified to allow the DON to maintain a technically superior work force in its S&T programs.

Communications. Increased communication and coordination is required among the operational forces, the acquisition community, and the S&T community. S&T management should remain close to working scientists and engineers. Cross-assignments between military officers and the S&T community should be encouraged. A new S&T Board, composed of innovative key S&T players and users, should provide a formal link to ONR.

Industrial Involvement. The present process of converting technology into products and services for use by the DON takes far too long. Efforts should be made to reduce these intervals to be consistent with those in civilian industry and with the pace of evolution of the underlying technologies. One way to increase the pace of technology insertion is to make greater use of industry in all aspects of the development/ procurement process, including exploratory development. Industry should be brought into programs early to allow timely insertion of proven and available technologies, such as those in manufacturing technology and rapid prototyping.

Academic Involvement. Universities collectively should be the largest recipient of the DON's basic research funding. This funding not only drives research in areas of importance to the DON, but it also helps provide the educational environment for preparing future generations of defense scientists, engineers, and program managers. The DON should reestablish SECNAV/CNO Chairs in areas of significant DON interest, and continue to strongly support the ONR Young Investigator Program.

Naval Components. The DON should retain its significant in-house laboratory capabilities in NRL and the Warfare Centers. ONR should increase its activities relative to monitoring technical advances worldwide. The Warfare Centers and the PEOs should increase their utilization of commercially available technologies. Since practical experience with S&T is so important, Naval officers should be assigned to S&T units (ONR, NRL, Warfare Centers) as part of routine training.

SUMMARY: The panel found that the DON's S&T program provided it with world-class access to S&T results over the last 50 years. However, as the DON approaches the 21st century, it must redefine its vision of S&T to provide stronger ties to industry and to forge stronger links between the S&T community and the Fleet. With a new vision and an Samp;T roadmap, the DON can position itself to take advantage of major technological advances.