PRESIDENT, NAVAL WAR COLLEGE
Newport, Rhode Island
02841-1207

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Dr. Richard Roca
The Johns Hopkins University
11100 Johns Hopkins Road
Applied Physics Laboratory
Laurel, MD 20723-6099

Dear Dr. Roca,

It is an honor for me to introduce the *Technical Digest* focused on the accomplishments and challenges of Battle Force Engineering.

Ever since the initial testing of the Naval Tactical Data System (NTDS) aboard USS *Oriskany* (CVA 34), USS *King* (DLG 10), and USS *Mahan* (DLG 11) in the early 1960s, the Navy has been hard at work engineering the means to enable our ships to better fight as a team at sea. These early attempts at multiship system engineering became Link 11 and then evolved to a much more capable Joint Tactical Information and Distribution System (Link 16-JTIDS) in the late 1980s. Recently, 35 years later, we completed the most complex and extensive technical and operational evaluation ever conducted to ensure that the next revolutionary system, Cooperative Engagement Capability, was ready for war. This force-wide development has been led and engineered by the Applied Physics Laboratory. Your contribution to engineering the Battle Force as a total combat system has been the primary reason we have continued to make such clear progress. Translating technical engineering into real combat power on a force-wide scale has been a challenge you have answered with aplomb.

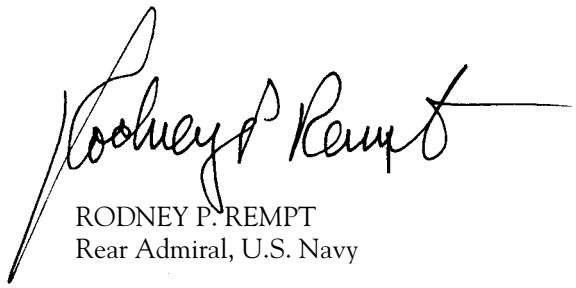
For nearly 60 years the Applied Physics Laboratory has led us through the myriad complexities of force-wide engineering. From the introduction of missilery in the 1950s, through Vietnam, the increased Anti-Ship Cruise Missile threat of the Cold War, to Desert Storm and now the Terror War, APL has led the charge. Our accomplishments of the past, however, are only a precursor for the increasingly complex and more demanding force engineering we will need in the future. In the face of rapidly advancing data links, new active and passive sensors, advanced open architecture combat systems, and new multimode weapon seekers, we must continue to rapidly and accurately close the fire control loop, and do so between multiple ships, submarines, aircraft, satellites, weapons, and forces ashore—a tall challenge indeed!

In today's complex world the need for force-wide systems is greater than ever—and continuing to grow. We need new innovative ideas, proven technical expertise, and system-of-systems engineering discipline to take us into the future. The engineering talent you provide must have warfighting savvy, hands-on-experience, and full understanding of proven engineering principles to enable us to achieve our goals. Further, force engineers must be comfortable working alongside sister services and international partners since the Navy will seldom, if ever, develop force combat systems by itself.

The future is not clear—our crystal ball is cloudy. But one thing *is* crystal clear: we need the Applied Physics Laboratory to help us engineer new technology and new concepts into the Fleet more than ever. This includes new ways of combining and deploying old and new technology while providing new systems with new capabilities for new missions.

The events of 11 September 2001 promise to challenge us even further. The demand for innovative, large-scale, complex, and advanced sensors, command and decision systems, and means of engagement is upon us. Whether searching out and destroying terrorists in the caves of Afghanistan or intercepting ballistic missiles high in the exo-atmosphere, the engineering task seems daunting. I am confident APL will provide the engineering leadership we need to see us through.

I salute the Battle Force engineers of APL and enjoin all hands to redouble their efforts to develop and deploy the best engineered systems in the world.



RODNEY P. REMPT
Rear Admiral, U.S. Navy