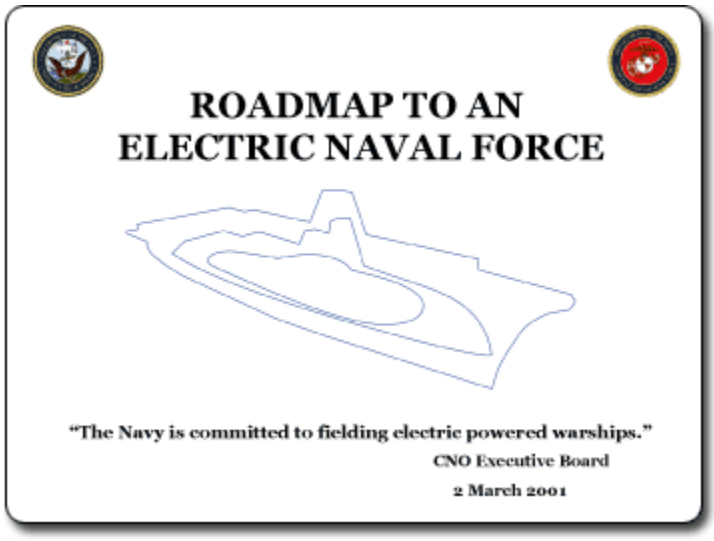
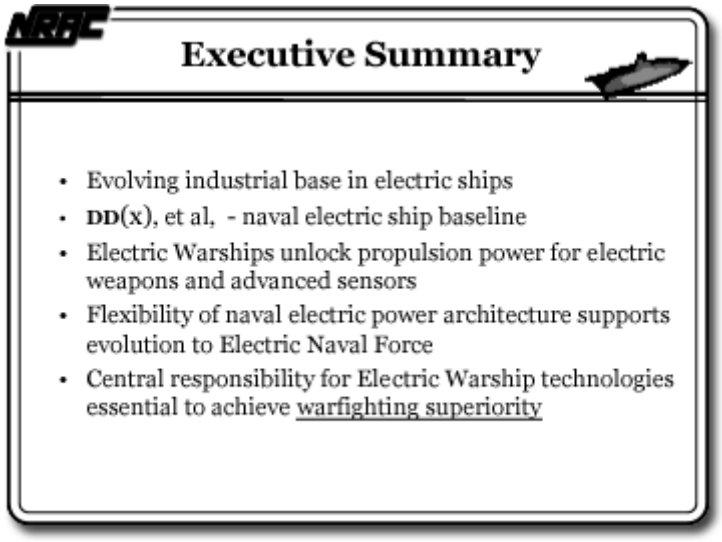
Excutive Summary
Roadmap to an Electric Naval Force



Introduction

In February 2001 Mr. Paul Schneider, Acting Assistant Secretary of the Navy (Research, Development and Acquisition) [ASN(RD&A)] charged the Naval Research Advisory Committee (NRAC) to perform a study entitled "Roadmap to an Electric Naval Force." The context of the study is the increasing electrification of traditionally mechanical marine and naval functions. The naval electrification process offers improved affordability through reduced maintenance, more efficient operation, enhanced commonality and compatibility with automatic sensing and control. It also portends a shift of the industrial base away from traditional mechanical disciplines upon which the Navy has relied throughout the 20th century.

Several events that occurred during the course of the study serve to underline its timeliness. In March, the Chief of Naval Operations (CNO) Executive Board issued the statement quoted on the cover of the report and shortly thereafter the CNO appointed a flag level Electric Warship Strategy Task Force to recommend the course that the Navy should pursue. During the summer, the Office of Naval Research (ONR) identified "Electric Warship" as a proposed Future Naval Capability. The overall effect of these parallel events upon this NRAC study was to shift the panel deliberations away from why the Navy should pursue an Electric Naval Force, toward how the newly emerging electric-based technologies might be most beneficially implemented.



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A rapidly evolving industrial base in marine electric technology provides a sound basis for evolution to all electric ships in which propulsion and auxiliaries are powered by common electric power sources. However this industrial base, focused upon principally commercial ships, has not addressed Navy specific concerns such as shock hardening and signatures. The new generation of Navy ships, LHD8, DD(X), CVNX, and VIRGINIA SSN, will address these issues and provide the naval electric ship baseline upon which this study is based.

Electric weapons and advanced, high-power, sensors offer the superior warfighting capabilities such as deeper magazines, longer range, higher rates of fire, precision strike, quicker time to target, and longer-range higher-resolution sensors necessary for the 21st century environment. However, the large amount of electric power these systems will require makes current shipboard electric systems impractical. Making all shipboard power available electrically enables the integration of such advanced weapons and sensors to create Electric Warships. The flexibility of the resulting naval electric power architecture allows Electric Warships to provide power to offboard weapons and sensors as well as forces ashore. This is the recommended route to create a technically superior Electric Naval Force.

In order for the Department of the Navy (DON) to realize the benefits of superior warfighting capabilities, affordability, reduced workload, commonality and reduced logistics burden, it is necessary to centralize the responsibility for developing the enabling technologies for the Navy's future Electric Warships.