

## All-electric power systems

All-electric power systems are being considered as replacements for the traditional electrical-mechanical (segregated) power systems currently installed in most U.S. Navy ships and submarines. Proponents of all-electric power systems claim that the systems will reduce ship signatures, vulnerability, manning, and fuel consumption. In a recent study conducted for the ASN(RDA), CNA attempted to *quantify* these claims using existing data and results from previous analyses. We found that the existing data do not support the claims. Instead, the claims are based primarily on engineering judgement and logic.

Our attempts to quantify the operational benefits of all-electric power systems were hampered by either too little test data or modeling assumptions that did not equitably compare the two power systems. However, we found some measured data from laboratory and field tests and relevant modeling results with which we were able to discern performance trends. The trends showed the potential of the all-electric power system to lower acoustic signatures (other signatures were not studied) and slightly reduce vulnerability. For example, an extrapolation of data from recent laboratory tests on the motor alone indicated that the Integrated Power System (IPS) would likely meet the DD-21 15-knot acoustic noise threshold. This would reduce ship susceptibility to some mines.

We found no evidence from previous analyses that the switch to all-electric power would result in significant manning reductions. Indeed, shipboard automation and changes in maintenance philosophy are major manning reduction enablers and can be applied to any power system selected.

Data collected from DDG-51 ship logs revealed that actual speed profiles for surface combatants are much slower than profiles used previously for estimating fuel consumption. This discrepancy hinders a comparison of fuel efficiency of an all-electric system to that of a segregated power system. We suspect that, in terms of fuel efficiency, an all-electric system will have advantages over a segregated system. But additional modeling is needed to quantify the advantages.

New surface combatant, aircraft carrier, and submarine designs with all-electric power are currently being considered. We anticipate, for example, at least one design team will submit a concept for DD-21 that includes an all-electric power system. A decision to convert Navy ships to all-electric power systems represents a major transition in ship design. That decision should be based not only on engineering judgement and logic but also on quantitative analysis. Before any decision is made, an assessment of the operational benefits of all-electric power systems based on field and laboratory test data and validated modeling must be made. Given the information now available, this assessment cannot be made with confidence.

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## Cleanup program execution

The Navy's funds for environmental restoration (ERN) are transferred to an operations and maintenance (O&M) account for actual expenditure. Financial Management and Budget (FMB) analysts expect funds in the O&M accounts to be used rather quickly. FMB has noted that the outlay rate of cleanup funds is well below the standard for O&M accounts, and sees this as evidence of poor financial management practices in the cleanup program. Specifically, they argue

that the cleanup program has been committing Navy funds well in advance of the actual need.

When the issue of slow outlays was raised again this year with respect to BRAC cleanups, ASN (I&E) asked CNA to examine the reasons for low outlay rates in the cleanup program. Our analysis indicated that slow outlay rates do not necessarily reflect poor financial management in the program. Three factors combine to lengthen the outlay of funds: technical uncertainties associated with cleanups, the need for regulatory approval, and extended subcontracting and invoicing procedures used by cleanup contractors. The result is that even well-managed programs can have low initial outlay rates.

The Navy used these findings, in part, to protect cleanup funding levels in the budget, and to respond to questions during budget reviews. The analysis also affected OSD's recent review of the Navy's environment funds. OSD removed funds from BRAC environmental accounts based on poor execution rates—but only from those accounts more than five years old. OSD explicitly accepted the relatively low outlay rates typically observed in the first two years of execution.

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### **USCG staffing standards**

In his recent *State of the Coast Guard* message, the Commandant of the Coast Guard spoke of his concern that personnel are stretched too thin. He noted that 81 percent of Small Boat Stations frequently stand 24-hour duty days for three days straight. He also cited several incidents involving the loss of Coast Guard and civilian life. The Coast Guard is concerned that inadequate staffing will result in overworked and undertrained personnel and may contribute to operational errors. A resolution of the problem is hampered by staffing standards that may not reflect current operational, administrative, and boat and facility maintenance activities. To address the problem, the Coast Guard asked CNA to develop new staffing standards and a staffing model for Coast

Guard Groups, Boat Stations, and Aids-to-Navigation Teams.

The data we have examined to date reflect the Commandant's concerns. In addition to long duty-hours, we found that the level of staffing at Boat Stations does not match the workloads at those stations. We also found a disparity between the experience level of personnel assigned to a unit and what seems to be required. We are using industry standards and fundamental workload drivers as a basis for our staffing model. The workload factors we are using include time spent on search and rescue missions, number of recreational boats and fishing vessels in the area of responsibility, and number of and distance to navigational aids.

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### **Big competitions and small businesses**

DoD is implementing an aggressive program of public-private competitions for commercially available services now performed by government personnel. Based in part on previous analysis that showed that savings increase with the size of the competition, DoD policy is to try to conduct large competitions. The Small Business Administration has expressed concern that this policy will make it more difficult for small businesses to compete for the work.

CNA examined the issues and found some surprising results. Historically, almost two-thirds of the competitions have been restricted to small businesses. We found that the savings from these restricted competitions were just as large as savings from unrestricted competitions. We also found that the average number of competitors was higher when the competition was restricted to small businesses. For those large competitions where small businesses are not competitive, current subcontracting rules normally guarantee a substantial amount of work for the small businesses. These results indicate that DoD can continue to achieve savings while retaining some portion of its competition as small business set-asides.

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## TRICARE evaluation

TRICARE is DoD's managed-care program for delivering health care to Servicemembers—active and retired—and their families and survivors. CNA and the Institute for Defense Analysis (IDA) are the evaluators of the program; CNA evaluates access and quality of care, IDA the cost. This year's evaluation covered the seven regions that had operated at least one full year under TRICARE in FY 1997. On 1 November OSD's Health Affairs sent the report on this year's evaluation to Congress.

The evaluation was generally favorable for TRICARE. Controlling for the changes in the composition of the beneficiary populations, we compared *quality*, *access*, and *satisfaction* under TRICARE to that under the traditional health care system. As measured by national standards and survey responses, we found the *quality* of health care is being maintained under TRICARE. On surveys, beneficiaries reported greater *access* and *satisfaction* with TRICARE. Those using private health care services reported greater satisfaction than those using military services. Those enrolled in the HMO option at military facilities showed a greater increase in overall satisfaction since TRICARE was introduced. In addition, IDA reported that DoD costs are lower for TRICARE than for the traditional care, but retirees pay a few hundred dollars more a year.

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## Early attrition and contract length

As part of our support for the Navy's Training and Education IWARS, CNA examined the attrition of recruits during their initial training programs (i.e., bootcamp and initial skills training). We found that the attrition rate in the first 24 months of service for recruits who sign six-year contracts increased from 17 percent for 1990 accessions to 27 percent for 1996 accessions. Most of the attrition was from skill training after bootcamp. In other words, over a quarter of the recruits who signed six-year contracts in 1996 never reached the fleet.

Although the attrition is lower than that for recruits with shorter obligations, the Navy invests less in the training of the other recruits. The longer contracts are usually for those entering ratings with long training programs, and those recruits tend to be among the best and the brightest. The effects of the attrition are twofold: the Navy loses young, potentially high-quality Servicemembers and does not realize a return on its investment. These findings prompted the IWARS team to propose that the Navy reconsider its strategy of offering so much up-front training to some recruits.

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## USMC interagency operations study

Headquarters, Marine Corps (PP&O) asked CNA to analyze the military's—particularly the Marine Corps'—participation in complex contingency operations and recommend ways to conduct these operations more effectively. We focused on identifying interagency coordination problems at the tactical and operational levels—defined as those of JTF and geographic combatant commanders—and tracing the problems to their root causes at the operational and strategic levels.

We examined four complex contingency operations that span a wide range of size, scope, agency and Service participation, and mission focus: an evacuation of U.S. citizens from Albania conducted by the USMC; housing of Haitian refugees at the U.S. naval base at Guantanamo Bay, Cuba; the multinational intervention in Haiti, focusing on the justice sector; and the on-going nation-building operation in Bosnia, focusing on the first 90 days. We identified common root causes and developed recommendations to address interagency coordination issues in four areas: planning, the interagency environment, providing security on the ground, and institutionalizing lessons learned and training. In the area of planning, for example, we found that the Marine Corps' mission preparation would benefit from extending the planning process to other participating agencies. We recommended build-

ing unity of effort and consensus, establishing expectations for the military endstate and transition, and extending planning to the operational and tactical levels.

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## Replacing the command ships

The Navy's four dedicated command ships have been in service for 28 to 35 years. By the time replacement ships could enter the fleet, the oldest of them, USS *Lasalle*, will have been in service nearly 45 years. Because the ships have limited capabilities and are becoming more expensive to maintain, the Navy, with OSD approval, has begun developing a replacement capability, known as JCC(X).

JCC(X) will operate in a much different world than the one that existed when the current command ships were built. The information revolution is changing the way civilian and military organizations operate. The international scene

looks much different from that of the late 1960s and early 1970s. And, military operations are not only more joint than they were at that time but also increasingly involve interaction with other governmental and nongovernmental agencies. Because of these changes, JCS, OSD, and, ultimately, the Navy agreed on one issue that must be explicitly addressed: Need JCC(X) be a ship?

In the acquisition process, DoD addresses these types of issues in a formal assessment known as an Analysis of Alternatives (AOA). OPNAV N86 and ASN(RDA) asked CNA to lead the Navy's AOA for JCC(X). To guide the AOA, the Navy formed a JCC(X) AOA Oversight Group, cochaired by N86 and DASN(Ships). The overall plan for the AOA has two parts: Part 1, to be completed by March 2000, will address whether there is a need for dedicated command ships in the future; more detailed systems characteristics will be explored in Part 2.

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