

Tomahawk employment

Recently, we compared the Tomahawk land attack missile's performance in Operation Enduring Freedom (OEF)—the offensive operation against Al Qaeda and the Taliban in Afghanistan—to that of previous strikes. The missile has performed consistently. A continued analysis of the data and comparison with other weapons would shed more light on the sources of observed random and correlated weapon delivery errors. Such analysis would also aid in the development of precision strike capabilities for the future. Operation Enduring Freedom demonstrated again that TLAM can fill a niche role in the overall strike picture. It can be particularly useful in striking multiple targets in different locations simultaneously or when there is a potential risk to TACAIR from enemy air defenses. (Contact: Dr. Barry L. Howell, (703) 824-2041)

UAVs' role in OEF

The use of unmanned aerial vehicles (UAVs) in OEF brought widespread acclaim in the press, in Congress, and from senior military officials. To better understand the reasons behind their success and the implications for the Navy's UAV programs, we examined UAV successes and operational limitations. The UAVs' success involved more than just the air vehicles. Numerous information-technology initiatives enabled the timely distribution of information to where it was needed and facilitated coordination among key players. Furthermore, our analysis highlighted numerous challenges that face the development of future Naval UAVs and suggested roles that leverage their proven strengths. (Dr. Kevin M. Kirk, (703) 824-2845)

Surface Combatant Spiral Development Review

The DD(X), CG(X), and LCS are members of a new surface combatant family of ships. The DD(X) and CG(X) will be multi-mission combatants with emphases on naval surface fires and air dominance and ballistic missile defense, respectively. The LCS will be a

smaller combatant that supports sea battle-space dominance missions in the littorals. Each of these ships will exploit network-centric operations, take maximum advantage of commonality across the platforms, and complement ships in the existing surface combatant force. To support this new program, the Navy chartered a Surface Combatant Spiral Development Review, a large, multi-organizational effort. We provided both a managing director and several analysts for the review. Together we developed potential concepts for DD(X) that varied the number and type of naval guns, the size of gun magazines, and the number of peripheral vertical-launch system cells. We analyzed the ability of each ship concept to support new Navy concepts of operations and developed associated costs for each option. Our analyses will provide Navy decision-makers the information they need to develop an Operational Requirements Document for the DD(X). (Contact: Dr. Mark Lewellyn, (703) 824-2190)

Dr. Stephen Guerra receives award

Dr. Stephen Guerra received the Commendation for Meritorious Civilian Service award from Commanding General, III Marine Expeditionary Force, for his work as a CNA field representative there. Dr. Guerra was cited, in part, for providing "analysis and assessments that greatly assisted [CG, III MEF] in making decisions that advanced the theater-level goals established by Commander, Marine Corps Forces, Pacific and Commander in Chief, U.S. Pacific Command."

New initiatives could improve facility management

The volatility of funding for DOD construction and maintenance makes it difficult for facilities managers and budget planners to prevent fluctuations in the level of facilities readiness. Two significant changes under consideration would address this difficulty. CNA evaluated these changes and their impact on facility investments and maintenance. The first proposal is to shift to capital budgeting for construction costs; the second

proposal is to expand a move already under way toward formula-based funding and away from project-based funding for maintenance and construction of facilities.

Our work supports adopting capital budgeting for DOD facilities in a way that preserves Congressional approval of budget authority for major construction projects. Our analysis also supports an expansion of formula-based funding of facilities. However, because such funding necessarily does away with top-level approval of detailed spending choices, it requires well-developed accounting and reporting systems to track and audit expenditures. Applying formulas to subsets of facilities or even individual facilities would require more attention to detailed formula design. The cost of added detail may be justified if it captures “best-practice” information well and yields useful, objective spending guidelines for facility and installation managers. (Contact: Dr. Omer Alper, (703) 824-2863)

Military housing forces trade-offs on school quality

Military families can choose between military-provided housing and allowances for civilian housing. For those with school-age children, the quality of schools is a significant factor in the decision. CNA examined the satisfaction of service members with their schools and how that affects their behavior. We found: (1) Service members who live in military family housing are less likely than those who live in civilian housing to rate their children’s schools highly. (2) Parents with school-age children are less likely to want military housing than parents with non-school-age children, except in locations where all the schools are perceived as very bad. (3) Navy children are more likely to attend private schools at bases with fewer public school alternatives and at bases with lower-quality public schools.

Our results suggest that bases can face drastically different situations in terms of school quality. There are schools of uniformly low quality around some bases, schools of uniformly high quality at others, and substantial variation across schools at still others. The lack of good data on the quality of schools attended by service members’ children severely limits the extent to which the Navy can directly improve families’ quality

of life in this dimension. A requirement for continued analysis in this area is the collection of key data on school resources and perceptions of school quality as well as the reasons service members choose the neighborhoods and schools they did. (Contact: Mr. Andrew Seamans, (703) 824-2346)

Regional Coordination Cell

Exercise Eagle Resolve supports USCENTCOM’s Cooperative Defense Initiative, which is designed to enable the GCC states, plus Egypt and Jordan, to deter, defend against, and respond to the use of weapons of mass destruction. CENTCOM J-5 asked CNA to design, run, and analyze Eagle Resolve 02 (ER02). The Regional Coordination Cell (RCC) concept—a major focus of ER02—comprises GCC officers who work together to respond to threats that overwhelm the response capability of any one country. The key issue raised by the exercise was what the RCC should do during a chemical or biological attack and how it should be organized to accomplish that mission. Specific issues included: communication and organization within the RCC, the role of the RCC for intelligence and other specialized missions such as air operations, the role of the RCC during transition from peacetime to a terrorism threat, and then to full-scale hostilities, and the relationship between the RCC and the national operations centers (NOCs) for each country involved in the exercise.

These issues represented key decision points for planners developing RCC procedures and doctrine. Game play illustrated that, in most cases, there was no one clear answer for RCC design, but it was evident from game play that a design that allowed for both country and functional organization, for a relationship with a host nation NOC as well as all other country NOCs, and for specialized coordination centers when needed would provide the greatest flexibility and most options for those standing up an RCC. (Contact: Dr. E. D. McGrady, (703) 824-2484)

EA-6B weapon system tracking and readiness reporting tool

Naval aviation tracks all equipment and spare parts installed on naval aircraft. An exception to this practice involves the ALQ-99 Tactical Jamming System (TJS)—the principal weapon system for the EA-6B

Prowler. A squadron and its air wing may know the material readiness of their TJS during a deployment, but the community cannot track these data over longer time spans so that long-term performance trends and procurement requirements can be identified. One EA-6B squadron and the CNA analyst at the Navy's Electronic Attack Wing at Whidbey Island produced the General Asset Reporting System (GAPS), which records the location and status of all components of the ALQ-99 TJS system not otherwise tracked.

The squadron tested GAPS during its deployment to Operation Enduring Freedom (OEF), which required extensive use of an otherwise little-used transmitter. Thus, the Navy had little experience and no knowledge of its maintenance issues. Using GAPS, two CNA analysts were able to illustrate the maintenance and availability experience for this transmitter from this deployment. This analysis and other illustrations of the utility of this database persuaded the Naval Air Systems Command (NAVAIR) to adopt GAPS as a Navy-wide tool. After additional development and refinement of GAPS, all squadrons will be able to export their data to the system via the Internet, and NAVAIR will track all components of the EA-6B and its weapon systems. (Contact: Dr. Gregory M. Swider, (703) 824-2574)

Modular Command Center

The Modular Command Center (MCC), designed to improve situational awareness and command and control within an expeditionary littoral force, comprises three technologies. The first enables tactical communication of multi-sensor data originating from air, surface, and ground forces in a low-bandwidth environment. The second provides warfighters with a SIPRNET-based collaboration that supports C². The third provides a three-dimensional rendering of the battle space designed to help warfighters acquire a better appreciation of an amphibious ready group's battle space.

Our assessment of MCC showed that it can enhance SA and C² and has capabilities that offset current limitations in the amphibious forces. That said, we concluded that MCC is not yet ready for fleet introduction, and that further enhancements and demonstrations need to be conducted prior to fielding. We also found that the technical performance of MCC was negatively

affected by communication networks; development of a more stable, effective communication system should be a priority in order to enhance advanced sensor netting capability. We examined the cost of installing MCC in the amphibious and mine countermeasure ships, landing craft, and P-3 aircraft and found it to be cost-effective and can be installed throughout the amphibious force for about \$100M. (Contact: Mr. Mark B. Geis, (703) 824-2745)

Electromagnetic launch systems

A major attribute of electromagnetic guns of either the rail or coil variety is their potential for launching projectiles at high muzzle velocities, well beyond those of conventional guns. The potential operational benefits include longer ranges, shorter flight times, and increased impact speeds. Most of our past work on this technology dealt with railguns, for which we formulated a design that has been adopted by the research and development community as a notional baseline for the Navy in its pursuit of electromagnetic launch technology. The projectile we used in our analysis was based on the Navy Barrage Round.

An important next step is to establish the viability of the projectile technology at hypersonic speeds and validate the lethality estimates against a spectrum of targets. Both avenues could likely be pursued at funding levels below those required to build, demonstrate, and test a full-scale gun. The Barrage Round program provides a good path for projectile technology development. Our recommendations are to: pursue a full-scale railgun demonstration as soon as possible, as an electromagnetic launch proof-of-concept. Then, if successful, pursue both rail and coil technologies to mitigate risk prior to an ultimate decision on an operational system. If funding is available, develop both technologies simultaneously with a goal of full-scale demonstration. (Contact: Dr. Frederick Bomse (703) 824-2296)

National reconnaissance programs

CNA—in 1997 on behalf of the Director, National Reconnaissance Office (NRO) and ASN (RDA) and again in 2001 for the Under Secretary of the Navy—organized a senior panel of space and naval warfare experts to review naval participation in the national reconnaissance programs and to assess the broader

issue of DON's role in space given the designation of Air Force as Executive Agent for National Security Space Programs. We played a seminal role in both of these naval space reviews because responsibility for space in DON spans many organizations and does not have "community" sponsorship as do platform and warfare communities. CNA's long experience in supporting space-related directorates in OPNAV, the Navy TENCAP Office, and the Naval Element of the NRO was of significant value to this effort. Our continued support is now formalized through a Memorandum of Understanding and assignment of a flag officer to the NRO Board of Directors.

In July 2002, CNA planned and organized the third annual Naval-NRO Conference—*Space and Naval Transformation*. The Under Secretary of the Navy and Under Secretary of the Air Force co-sponsored the conference, which was attended by more than 350 people, including 75 flag/general officers, senior civilian executives, and executives from private industry. The conference highlighted issues related to FORCENet implementation, the role of space, and the relative utility of space compared to other sources of tactical information. (Contact: Dr. Gary A. Federici, (703) 824-2506)

Using earned value to manage acquisitions

In the mid 1960s, Secretary of Defense Robert MacNamara established the Planning, Programming and Budgeting System as the central component of a suite of integrated management processes and tools. One of those tools was the Cost/Schedule Control Systems Criteria (C/SCSC). Over the years, C/SCSC degenerated from its initial concept to a financial reporting system that few people used. A rash of major program "surprises" in the early 1990s—including the Navy's A-12, the Air Force's C-17, and the Army's Javelin programs, combined with an emerging acquisition reform movement—resulted in the rebirth of C/SCSC

under the name of earned value management (EVM). EVM is now an industry-sponsored project management discipline with a government-wide mandate.

CNA is helping ASN (RDA) review program EVM data and assess contractors' EVM systems and processes. We are also helping ASN (RDA) develop a strategic management system, including enhanced implementation of EVM, that will help ensure that the entire Navy acquisition community is working in harmony to execute (1) the RDA vision of being the "world's best acquisition and life-cycle support organization," and (2) its mission of "developing, acquiring and supporting technologically superior and affordable systems for Navy, Marine Corps, Joint and Allied Forces." (Contact: Dr. Matthew S. Goldberg, (703) 824-2455)

Defense transformation—a status report

CNA's most recent conference on defense transformation examined the Bush administration's progress to date in this area and looked at the road ahead. Panel discussions addressed: transformational progress made in the post-Cold War era; the need for transformation of the programming and procurement processes within DOD; the attitudes of allies and friends who worry about being left behind as DOD goes full-speed ahead on transformation; the transformational reality of DOD's need to address homeland security by conducting "home" games as well as traditional "away" games. Featured speakers at the conference were: Vice Admiral Arthur Cebrowski, USN (Ret.), the OSD transformation "czar"; Congressman Mac Thornberry of Texas, a leading transformational advocate on Capitol Hill; and Major General Dave Cash, USA, special assistant to Admiral Ed Giambastiani at Joint Forces Command. A conference report will be available next quarter. (Contact: Mr. James Wylie, (703) 824-2487)