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Supporting the war against terrorism

In response to the attacks of 11 September, CNA is supporting Navy and Marine Corps participation in the current war against terrorism. We are focusing on the offensive operations of Operation Enduring Freedom and homeland defense and force protection.

Through our field program, CNA analysts at key Navy, Marine Corps, and joint commands were in position on 11 September to provide immediate on-scene analytic support and to collect data for future analyses of the Navy and Marine Corps roles in Operation Enduring Freedom. We also sent several senior analysts from our Washington office to key headquarters and operational commands around the world: the State Department, CENTCOM, NAVCENT, and aboard USS *Vinson*, USS *Theodore Roosevelt*, USS *Enterprise*, USS *Kitty Hawk*, and USS *Peleliu*. Currently we are tracking and analyzing four broad aspects of the offensive operations: strike operations; training and readiness implications; humanitarian operations; and political-military issues.

In the areas of homeland defense and force protection, we are analyzing:

- Force-protection initiatives in Bahrain and Norfolk to help the commands understand how they can best protect themselves. At NAVCENT's request, CNA deployed a chem/bio analyst to Bahrain to support force-protection efforts at the Naval Support Activity and help address concerns of the U.S. embassy and the Bahraini government.
- Issues involving military support to civilian authorities. We are reconstructing the Navy's support to NORAD and contributions of air surveillance in the homeland defense mission; examining the effort to counter the maritime shipping threat; observing both the Emergency Operations Center in New York City to gain its perspective on military contributions to the clean-up at the World Trade Center and the hospital ship to better understand its potential value to the homeland defense mission.
- Civilian support to the military. Arlington County was the lead for the response to the attack on the Pentagon. On 11 September we placed analysts at the Emergency Operations Center for the Pentagon to observe its coordination with Arlington County. We plan to take the lessons learned to other bases and stations that would rely on the help of their local communities in the event of an attack or incident.

(Contact: Ms. Christine Fox, (703) 824-2445)

Mine warfare initiatives

The Navy is mainstreaming mine warfare (MIW) and developing organic mine countermeasures (OMCM) systems to address the need for forward-deployed MCM capability. The goals of mainstreaming are twofold: to prepare today's deploying battle groups and amphibious ready groups for the likely mine threat; and to lay the groundwork for the transition to OMCM. CNA's support to the Navy's mainstreaming initiatives is broad—from developing a Navy-wide implementation plan to providing the MIW assessments for CVBG certification as part of the Senior Officer Observer Team.

We developed a consistent framework for mainstreaming, focusing on the currently embedded, though underutilized, countermining capabilities resident in deploying battle groups and amphibious ready groups. This framework provided the basis for our development of an approach for phased fleet accountability through the Interdeployment Training Cycle. This

methodology has provided the basis for Commander, Second Fleet (C2F) mainstreaming initiatives, and we used this consistent framework in the MIW assessments for the last four East Coast JTFEXs for C2F.

For OPNAV N75, we are helping with analyses of mainstreaming mine warfare and the transition to OMCM capabilities. Specific analyses recently completed include: (1) organic MCM system assessment and "test bed" development, (2) implications for coalition operations, and (3) mine warfare command, control, computers, communications, and intelligence. (Contact: Sabrina R. Edlow, (703) 824-2472)

Crew-rotation alternatives

The Navy often deploys ships far away from their home ports. To help overcome the "tyranny of distance," we recently assessed four crew-rotation alternatives for naval operations. Our objective was to use identical criteria to compare both the efficiencies of the various alternatives and the barriers to their implementation. The alternatives were: (1) *Blue-Gold crew*: two crews are assigned to each ship—one relieving the other after 6 months. (2) *Horizon*: has more crews than ships—one ship is continuously forward for up to several years and the others are undergoing maintenance or serving as training ships for the other crews. Like the Blue-Gold concept, a crew stays with the forward ship for 6 months until relieved by a new crew. (3) *Sea swap*: is similar to Blue-Gold and Horizon except the number of crews and ships is equal. A ship deploys with one crew; after 6 months, a second crew arrives, and the first crew takes over the ship the other crew was manning. (4) *Skeleton return*: is most like the traditional deployment except the ship remains forward until the 6-month mark, when most of the crew flies home. The remaining, "skeleton" crew sails the ship home. The skeleton crew could be augmented by civilian mariner government employees, but its combat readiness and force protection capabilities would be reduced.

Our evaluation of these options showed that the number of ships and crews decreased for each of the alternatives. The fraction of time ships and crews spent in a forward theater increased because of the decrease in ship transits. Thus, one concern across the alternatives is how longer ship deployments affect long-term maintenance.

Other barriers to implementation of these alternatives varied from difficulties in sending a ship forward for an extended time and coordinating the complicated swaps between four or five crews among three or four ships and a shore readiness facility to the lack of a ship for one crew at all times. Horizon and Sea swap share a concern about keeping the multiple ships "identical." For all alternatives, "ownership" issues may arise if crews are only temporarily assigned to a ship, and fewer high-quality port calls may result because of the reduced number of ship transits. Finally, each alternative is a new way of operating. Our conclusion was that Sea swap and Skeleton return are preferable to Blue-Gold and Horizon. (Contact: Dr. John J. Clifford, (703) 824-2048)

LHA replacement

The Navy needs to choose a replacement for its five aging LHAs (amphibious helicopter carriers). The Marines would like a ship that can simultaneously launch or recover Joint Strike Fighters plus multiple MV-22s. The Navy wants to keep costs down; thus, it has asked CNA to lead an analysis of alternatives (AOA). To date, we have developed LHA(R) alternatives and derived initial estimates of their costs. We grouped the alternatives into four categories: (1) a baseline "LHD-8 Mod Repeat," with slight modifications, (2) two modified LHDs, (3) three new designs, and (4) two small/distributed designs to explore what capability could be obtained at lower cost, what else might be done to make up the difference, and the operational impact of so doing.

We have only rough cost estimates at this point, and they don't yet cover all the alternatives. The

next steps in the AOA are to develop the scenarios and concepts of operation for these alternatives and start comparing how their different performance characteristics affect operations. (Contact: Dr. David A. Perin, (703) 824-2309)

Aircraft aging increases maintenance costs

The cost to maintain aircraft has been increasing, and some of that increase has been associated with the aging of the fleet. We examined the relationship between aircraft age and failure rates. We looked at data for each type-model-series for each year and grouped these aircraft into three categories: carrier/extra complex aircraft, land-based fixed-wing aircraft, and helicopters.

Our analysis suggests a relation between age and the number of failures per flight hour. We statistically estimated the growth rate in repairs per year of age, as measured at the average age. For the carrier complex aircraft, we estimated that each year of age raises the number of repairs per flight hour by 7.3 percent. The corresponding figures for land-based fixed-wing aircraft and helicopters are much lower, 1.9 percent and 1.7 percent, respectively. To obtain an overall estimate for the aircraft fleet, we constructed a weighted average for the three groups and found that, from 1996 to 2000, 40 percent of the growth in costs is attributable to the aging of the fleet.

Trends like these are now being used to help budget for aircraft component repair at the depots. These findings can also be used to help assess the trade-off between buying new aircraft and extending the life of existing aircraft. (Contact: Dr. James M. Jondrow, (703) 824-2261)

Southwest border enforcement

The combination of a long and rugged U.S. border and a large pool of determined "border crossers" presents a difficult enforcement challenge for the U.S. Border Patrol (BP). To help assess BP effectiveness, the Immigration and Naturalization Service asked CNA to examine the historical relationship between the number of apprehensions made by the BP, the level of effort by the BP, and various economic and social factors that might affect the flow of illegal migrants.

Building on U.S. Census Bureau analysis of Mexican census data, we described the flow of migrants out of Mexico in terms of an at-risk population and an economic incentive based on inflation rates. Then we constructed an operational model, based on traditional techniques for search and screening operations, relating the BP effort to the probability of apprehension.

We applied the combination of these two models to apprehension data from the nine geographic sectors covered by the BP for the period 1992–2000 and identified sectors where increased BP activity resulted in a local reduction in the flow of migrants. By looking at neighboring sectors, we were able to see whether the local reduction was the result of migrants deciding to stay in Mexico or their choosing to cross the border elsewhere. We were also able to estimate the probability of the BP apprehending attempted border crossers for each year in our study and for each sector. The results provided an independent check on the BP's own effectiveness metrics and will serve as useful input in its self-assessment. The next step is to examine the effectiveness of the inspection process at official ports of entry. (Contact: Dr. Mark T. Lewellyn, (703) 824-2190)

Reducing workers' compensation cost

Federal civilian employees who suffer work-related injury or disease are eligible to receive workers' compensation through a program administered by the Department of Labor. Each year the Department of Navy pays about $240 million in compensation and related medical expenses under this program—more than any other federal agency. Despite a 40-percent decline in employment and a similar drop in injury rates over the past decade, these costs have not come down.

We assessed the reasons for the high cost of the program and identified ways to bring it down.

The problem quickly became apparent—too little attention is paid to individuals once they are on disability. Seventy-five percent of the annual bill goes to people who have been receiving compensation for at least seven years. The solution is also simple. We examined several Navy programs and found that some were containing cost. They get people back to work in a light-duty capacity as soon as possible after injury. They pay attention to claimants who are out, periodically checking on their ability to return to work. They provide alternative employment opportunities and training to individuals on extended disability who are unable to return to work in their previous capacity. Our analysis suggests that a $300 million savings over the next 10 years is possible if the best practices are implemented in all Navy regions. CNO is currently programming funds to act on this recommendation. (Mr. Michael D. Bowes, (703) 824-2353)

Tracking costs and performance after competitive sourcing

OSD asked CNA to evaluate whether the expected savings and performance from public-private competitions were realized years later. We collected actual costs and performance data at 16 sites, compared *observed* costs with *expected* costs, and identified *effective* costs—what the government spent for work equivalent to that in the original statement of work. Comparing effective and competition cost estimates allows policy-makers to assess the value of the competitive sourcing program and make appropriate adjustment to improve its implementation.

These are long-term savings. The follow-up studies of private winners showed that these savings persist after adjustment for regional increases in wages and changes in scope. A sample of 16 competitions indicated that an average savings of 34 percent was achieved and sustained over time without a degradation in performance.

We also surveyed customers, management, and contracting officers to gauge their satisfaction with performance and found that performance has not been degraded. Customers report satisfactory service years after a competition. The least satisfied are the contracting officers, particularly in the first year of a contract. We also found that data were poorly maintained when in-house teams win the competition. We proposed better collection of follow-up data for those competitions to verify the maintenance of savings. (Contact: Ms. Cheryl B. Rosenblum, (703) 824-2526)

Lee Gunn heads new center

Vice Admiral Lee Fredric Gunn, USN (Ret.), has joined the CNA staff as the Director for the new Center for Human Performance and Intellectual Capital. He is developing and implementing analytical study that will help federal, state, and local business and government leaders bridge the gap between the effective development of individual employees and the desired and most efficient business results. Admiral Gunn is marshaling some of the existing CNA talent and combining their efforts with those of an administrative and business team. He hopes to capitalize on the positions that CNA occupies today in DON and domestic work to leverage both in expanding domestic involvement and market share.

The CNA Quarterly provides summaries of research conducted by the Center for Naval Analyses.
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