



## CNA Research Highlights FY 2014

### Cyber Security and Information Dominance

#### Cyber Intrusions into DOD Networks

Fleet Cyber Command asked CNA to reconstruct and analyze the largest DOD cyber incident to date. We looked at specific vulnerabilities and how they were exploited; the resources from the Navy and broader DOD and Intelligence Community that were applied to detect and respond to the intrusion; the painstaking process to remove the threat; and the lessons learned.

#### Support to CNO's CYBERSAFE Program

CNA is directly supporting CYBERSAFE—a key element of the CNO's "Navigation Plan" designed to address cradle-to-grave cyber security for network, platforms, and systems Navy-wide.

#### Operating in a Contested Radiofrequency (RF) Environment

The U.S. military depends on the RF spectrum so that command and control can provide precise position and navigation information to warfighting units. But due to high-frequency and line-of-sight spectrum vulnerabilities the Navy needs to develop ways to operate in environments where RF communications are inaccessible or degraded by an adversary. CNA performed a study for Third Fleet that analyzed air and missile defense and anti-submarine warfare in contested RF environments.

#### Improving the Critical Nuclear C3 Network

Emergency Action Messages (EAMs) are used in the command and control of nuclear forces. CNA's field representative to Fleet Forces Command recently completed an analysis examining the resiliency of the Navy's NC3 network.

### Assessing the 4G LTE Commercial Cellular Technology

Military wireless communications have not kept pace with the military's ever-increasing need for bandwidth. The Naval Air Forces (NAVAIR) Counter-Networks and Illicit Trafficking (CNIT) Program Office began a novel wireless telecommunications initiative in which NAVAIR instrumented fourth-generation long-term evolution (4G LTE) wireless networks on two combatants of the *Kearsarge* Amphibious Ready Group (ARG): USS *Kearsarge* and USS *San Antonio*. Our comprehensive assessment addressed all facets of the trial, such as the initial design study, certification and accreditation process, and spectrum control. We conducted in-depth interviews with ship personnel and Marines who were familiar with 4G LTE operations onboard the ARG. With the foundation of the sea trial, the Navy will have the framework to improve and refine the 4G LTE wireless network architecture.

### Cyber and Electro Magnetic Maneuver Warfare as a Warfighting Domain

#### Emerging Issues for the Cyber Mission Force

The Department of Defense established Cyber Mission Force (CMF) in 2013. The Navy's Fleet Cyber Command asked CNA to identify operational and organizational issues associated with the new CMF. We reviewed plans, concepts, orders, and other documents, and then assessed selected operations and exercises. We identified issue areas, and recommended measures that Fleet Cyber Command and U.S. Cyber Command might take to mitigate limitations and weaknesses.

#### Cyber Wargames

Cyber wargames is a relatively new activity. This CNA-initiated project is examining the way in which wargames can be constructed to provide insights into cyber operations in such areas as command, control, and communications.

## Rise of China

### **RIMPAC 2014: Analysis of PLA Navy Participation**

CNA's China Studies analysts are supporting the inclusion of PLAN vessels in RIMPAC. One analyst was embarked aboard USS *Chosin* to accompany participating PLA Navy ships from Guam to Hawaii in June, immediately before the start of RIMPAC-14. He made multiple ship visits to PLA Navy warships while at sea. CNA analysts captured the key themes from the PLA Navy's participation in the exercise.

### **How Do China's Media Cover U.S. Pacific Operations?**

CNA analysts are in their third year of an ongoing effort to provide U.S. Pacific Command with timely analyses of China's media coverage of PACOM operations and activities.

### **Understanding Counterparts: China's New Navy Leadership**

CNA analysts completed a study of the individuals and organizations shaping the Chinese navy leadership that affect Chinese decision-making on navy operations. The study identifies the common career paths and typical professional experiences of different types and generations of PLA Navy leaders and provided detailed biographical profiles of individuals currently serving in the top levels of the PLA Navy.

### **PRC Foreign Policy Under Xi Jinping: An Initial Assessment**

In February 2014, CNA hosted a roundtable of subject-matter experts and an informed audience to examine key Chinese foreign policy developments under the leadership of Xi Jinping. A report that summarizes the key findings from the event was publicly released in August 2014.

### **PLA Views of the U.S. Rebalance to Asia**

CNA analysts recently completed a project to help the U.S. Navy leadership better understand China's views on the rebalance. The study concluded with a set of actionable recommendations for the U.S. Navy to consider when it conducts operations and activities in support of the U.S. rebalance.

## Reassuring Allies, Developing Partnerships & Partner Capacity

### **Independent Assessment of the Afghan National Security Forces**

The 2013 National Defense Authorization Act (NDAA) required DOD to conduct an independent assessment of the size, structure, posture, and capabilities of the Afghan National Security Forces (ANSF). The Undersecretary of Defense (Policy) asked CNA to conduct this assessment. We conducted a qualitative threat assessment of the Taliban-led insurgency in Afghanistan through 2018 and then used this threat assessment to determine what size, structure, capabilities, and posture the ANSF must have in order to defend against the projected threat. Our final report was delivered to the Secretary of Defense, the Senate and House Armed Service Committees and other military and congressional officials.

### **A Regional Strategy for the Gulf of Guinea**

Since 2012, piracy, armed robbery at sea, and other illicit, maritime activities have surged along the West African littoral. U.S. Africa Command (AFRICOM) wanted to know how it could best align its existing activities in the theater to encourage the consolidation of two regional marine law enforcement agreements and help the member states meet their objectives under those agreements. CNA conducted contextual analysis of the "Zone E" Agreement and suggested focus areas for future AFRICOM maritime engagements. We also observed and supported Obangame Express—AFRICOM's premier, annual multilateral exercise in the Gulf of Guinea.

### **Strengthening the Navy's Arctic Capabilities Through Partnership**

The opening of the Arctic region brings new opportunities for competition and cooperation, and increases the demand for maritime security and safety operations. We assessed how the Navy can address DOD/interagency capability gaps in the short term by improving its data-sharing relationships with interagency and international partners in three areas: hydrography and nautical charting, weather and ice forecasting, and maritime domain awareness.

## Lessons from U.S. Security Assistance to Colombia

This study, led by our field representative at Joint Staff J7 Joint and Coalition Operational Analysis (JCOA), examined U.S. efforts over the past 15 years to build Colombia's capacity to deal with its twin threats: armed insurgent groups (such as the FARC) and illicit trafficking networks.

## Stability and Security

### Primer on Iraqi Tribes and Tribalism

Using data collected in the field during our support to U.S. Marine Corps operations in al Anbar in 2007, we produced a short primer on Iraq's Sunni tribes: how they view collective security, how they organize and act to maintain security and justice in tribal areas, and how U.S. forces should think about structuring their own engagements with Sunni tribal elements.

### Reviving the Caliphate: Fad, or the Future?

In 2007, CNA hosted a conference on the topic of the caliphate. At that time, certain Islamist groups were calling for the re-establishment of the caliphate—and, in the wake of multiple crises throughout the Muslim world; those calls appeared to be gaining relevance and support. After the June 2014 emergence of ISIL, we updated the 2007 conference report, providing our analysis to specific military audiences who are actively thinking about and working on countering the spread of ISIL in Iraq and Syria.

### Coordinating Counter-IED Efforts

Improvised explosive devices (IEDs) quickly became the enemy's weapon of choice in Operations Iraqi and Enduring Freedom. CNA looked at the current landscape of RDT&E efforts across the U.S. government and recommended areas where senior leaders need to maintain their focus in order to improve and sustain cross-government RTD&E.

## Strengthening Defense Biometrics/Forensics Efforts Across Government

CNA is supporting DOD's efforts to strengthen Defense Biometrics/Forensics efforts across much of the department. Our work is helping preserve and institutionalize the capabilities and lessons learned from ten years of counterinsurgency operations to connect terrorists with the forensic evidence left behind in their planning or attacks. JIEDDO, DOD's lead organization for counter-IED efforts, asked CNA to assess the value to DOD of TEDAC's IED exploitation efforts and to note any benefits of the Center's efforts to other U.S. government agencies involved in counter-IED operations.

## Operationalizing the Rebalance to the Pacific

### A "Roadmap" for the Asia-Pacific Rebalance

At the request of the Navy's Director of Strategy & Policy (N51), CNA initiated what would evolve into a multi-stage assessment of the Navy's contribution to the Asia-Pacific Rebalance. CNA assessed the complementary role(s) regional states can play in helping support the Navy's rebalance efforts.

### The Role of the U.S. Army in Asia

CNA analyzed U.S. national security objectives and the changes in the Asia-Pacific security environment, and their implications for the U.S. Army in the region. We developed actionable recommendations for the operational and institutional army.

### Picturing the Pacific Theater in 2025

What will the Asia-Pacific environment look like in 2025? How can we prepare for that environment, and avoid a crises? Our field representative to U.S. Pacific Command led an effort to address these questions. In particular, he designed two interagency table-top exercises, which included broad participation from the Pacific Command staff, service components, service futurists, the Office of the Secretary of Defense, the Joint Staff, and think tanks. The exercise attendees identified a set of actions to mitigate gaps in capabilities and approaches for signaling intent to adversaries.

## Ensuring Presence

### **SLIDER: A CNA-Developed Force Scheduling Tool**

CNA initially developed SLIDER as a ship-scheduling tool for use by the Navy. Due to the tool's power and ease of use, the SLIDER user community has expanded to Marine Corps and Coast Guard planners and schedulers.

### **Forward-Deploying More Naval Forces**

As the United States winds down from two wars and looks to the future, it faces the task of realigning its global force posture. The Director, Navy Strategy and Policy Division, asked us what interim steps must be taken over the next 15 to 20 years to prepare the way administratively, logistically, militarily, and geopolitically for such an expansion, including possibly basing a carrier strike group in Southeast Asia.

## Developing a Maritime Strategy

### **Helping Craft a New Maritime Strategy**

The latest U.S. maritime strategy, *A Cooperative Strategy for 21<sup>st</sup> Century Seapower* (CS 21), was introduced in 2007. CNA played an integral role in writing and staffing its successor. In addition, CNA's 17-volume *Navy Strategy Study*, published in 2011, has been used extensively by staff officers in the Navy's Strategy and Policy Division, as well as others, in this work.

### **Changing a Country's Threat Calculus**

How can the Navy use non-kinetic means, such as cyber warfare and deception, to impose large operational and economic costs on countries that present an escalating threat? The Navy's Strategy and Policy Division (OPNAV N51) asked CNA to address that question. We developed an analytic framework to help decision-makers focus on the objectives, strategies, and tools that would best do one—or both—of those things. We verified our model using case studies of countries that are of interest to our sponsors.

## Anti-Access/Area Denial Threats

### **Initiatives for Carrier Operations**

U.S. Carrier Strike Groups (CSGs) need to operate in areas where potential adversaries want to deny U.S. access. In a multi-year study for Commander, U.S. Pacific Fleet we explored the ability of CSGs to operate safely in anti-access, area-denial (A2/AD) environments, and ways in which concepts of operation or tactics, techniques, and procedures can be adapted to address multiple A2/AD threats.

### **Support of the Air-Sea Battle (ASB) Concept**

U.S. adversaries are developing increasingly complex sets of anti-access, area-denial strategies and capabilities to keep U.S. forces out of certain areas or obstruct their operations there. CNA supported the ASB implementation by observing a wide array of exercises and assessing how well they address the gaps in ASB capability that were previously identified in a FY14 ASB implementation plan.

## Integrating New Platforms

### **Impact of Increasing the Number of Airborne Electronic Attack Assets and Resources**

Warfare against high-end opponents means winning the battle to control the electromagnetic spectrum. One key to winning is the F/A-18G EW "Growler." We are helping the Navy maximize the availability of this critical, high-demand, joint force capability for both crisis response and surge operations. We are also assessing the potential impact of increasing the Growler force on existing bases within the United States.

### **Modeling and Analysis in Support of Managing the Strike Fighter Inventory**

As part of a multi-million-dollar effort for the program manager for the F/A-18 and EA-18G Strike Fighter aircraft, we developed a software tool—the *Navy Synchronization Toolset* (NST)—to help the process of maximizing the service life of the aircraft while reducing the projected future shortfall in the inventory of these aircraft. The tool allows Strike Fighter inventory managers to easily determine how to assign the more than 600 individual aircraft to both Navy and Marine Corps squadrons over a ten-year period in order to meet operational demands—a challenging calculation without the tool.



## **Delivering Integrated and Interoperable Warfighting Capabilities**

To work together seamlessly, weapons systems require I&I— interoperability and integration. Recognizing I&I gaps in some Navy weapons systems OPNAV N9I (Warfare Integration) and N2/N6F (Information Dominance) are developing processes to address those problems. We discussed I&I with over 30 subject-matter experts, and examined a number of existing processes intended to either to fix I&I gaps in fielded systems or to add procedures in the development and acquisition of programs to ensure that I&I gaps don't occur in the first place.

## **Force Modernization**

### **Future Fleet Architecture Wargame**

N9, the Navy's Office of Naval Warfare Systems, asked CNA to design and facilitate a series of wargames to consider alternate concepts of operation to help shape requirements. The game considered possible changes in concepts of operation and their impact and potential trade-offs between capabilities across the surface, sub-surface, aviation, and amphibious warfare areas. Follow-on games are planned.

### **Restructuring the Marine Corps' Amphibious Doctrine**

CNA is helping the Marine Corps leadership restructure its amphibious doctrine to counter anti-access/area denial threats to amphibious operations. For example, the Marines recently asked us to examine the support and sustainment requirements in 2025 for a Marine Expeditionary Brigade (MEB). Our analysis focused on what might be different in the 2025 timeframe relative to past amphibious operations. We developed several scenarios to help us understand the differences and the ability of the MEB to sustain forces ashore.

### **How Standardization Could Help Overcome Inconsistencies in Ship Modernization**

The configuration of command, control, communications, computers, combat systems, and intelligence (C5I) varies greatly from ship to ship, even within the same class of ship. This lack of

consistency can strain the support infrastructure necessary for operationally effective C5I. A recent CNA study assessed the impact that greater standard-ization of these systems could have on training, personnel support, and operations. In this study, we examined all Navy guided-missile destroyer (DDG) variants, 34 combat systems, and 21 C5I systems.

## **Special Operations Forces**

### **Building a Foreign Language Program for the Special Operations Command**

Marines who are trained in a country's language and culture are invaluable in gathering information and building relationships. MARSOC is building a longer-term program, in which each trainee will select a language to learn not just for one deployment but as a valuable life-skill to use throughout his or her career. Our MARSOC field representative has supported this initiative through a number of analytic efforts which analyzed the duration of language program courses versus desired proficiency levels. She also explored the concept of providing condensed courses on the history, political trends, and religious and social traditions of a country to support its language instruction. MARSOC is using these findings in its critical-skills training plan.

### **Giving Special Operations Forces Better Access to Information While Saving Money**

Naval Special Warfare Command (WARCOM) asked us to look at issues that limit the effectiveness of embarked Special Operations Forces (SOF) units. The success of their deployments depends, in part, on the SOF units having ready access to information about fleet capabilities and the fleets' knowledge of SOF requirements. Our analysis focused on key support areas where plans and policies might be needed and practical ways that embarked SOF units can leverage command, control, communications, computer, and intelligence (C4I) systems already installed on Navy ships.

## Health and Well-being of Military Personnel

### Caring For Navy Beneficiaries Who Are Prescribed Opioids

Opioids have been associated with overdose and death when not appropriately prescribed and managed. The Navy's Bureau of Medicine and Surgery (BUMED) asked CNA to see what percentage of Navy beneficiaries have received prescriptions for opioids. More generally, BUMED asked us to identify some of the conditions related to pain treatment, how pain is being treated and by whom in Navy medicine, and whether these treatments are appropriate or comply with best practices.

### Non-Demographic Factors Associated With Suicides

Since 2010, suicides among service members has outpaced all other forms of death in the military, not including combat-related deaths. In our study, we document the suicide count and rate for active-duty Department of the Navy (DON) service members by military career characteristics and other factors, such as deployments.

### Does Medical Home Port Enrollment Provide Higher-Quality Care?

We are continuing our support to the Navy's Bureau of Medicine and Surgery (BUMED) in assessing its implementation of the Medical Home Port (MHP) program—the Navy's team-based, comprehensive model of health care delivery. Our study compared quality-of-care metrics for two groups of patients (diabetes, hypertension and/or hyperlipidemia) and examined the outcomes for those enrolled in an MHP vs. those enrolled in a managed care support contractor (MCSC) program of treatment.

## The Military Manpower Pipeline

### Impact of the Economy on Navy Retention

To address Navy worries that retention will be hurt as the economy improves we conducted a study that examines the impact of unemployment and the economy on Navy enlisted retention. CNA is also doing a follow-on study analyzing the impact of Navy force-shaping policies on retention. Such policies determine how many sailors are allowed to reenlist in their current occupation vs. only being allowed to reenlist in a different occupational field.

### Are Higher-Quality Recruits Worth the Extra Cost?

Maintaining a high-quality force is one of the United States Marine Corps' five pillars of readiness. But higher-quality recruits—those who have a high school diploma and score above a certain percentage on the Armed Forces Qualification Test—are more expensive to acquire than lower-quality recruits: they have more outside options, require more creative recruiting strategies, and may demand more of a recruiter's time. The Commanding General Marine Corps Recruiting Command (MCRC), asked CNA to analyze the cost-benefit tradeoffs of accessing high-quality recruits. We compared a number of performance metrics across quality groups. Overall, we found that higher-quality recruits outperform their lower-quality counterparts across a range of different measures.

### Should Military Technicians be a Distinct Personnel Management Category?

Military technicians (MilTechs)—federal civilian employees who primarily work with Selected Reserve units—generally have a dual status, meaning they must also be naval reservists in the same Selected Reserve unit they support as civilians. Whether the MilTech program should be terminated is a continuing question which we considered, evaluating alternatives to the MilTech program in terms of compensation costs and unit readiness.

### A Model to Help Man the Carrier Strike Force

As part of a study on carrier strike group (CSG) manning, we developed a simulation of manning for CSGs. This simulation differentiates between CSG and non-CSG sea units, allows the user to set different manning priorities for CSG, non-CSG sea units, and shore activities, and enables the user to vary manning priorities depending on where the unit is in the Fleet Response Plan cycle.

### Enlisted Career Paths for Top "Snipes" and Combat Systems Maintenance Managers

The Surface Navy has decided to implement a new optimal career path, which will ensure that select sailors will be assigned to sea tours that enable them to hone their skills on a particular platform and to shore tours that will enrich their knowledge in their specialty, or "rating." In a study for the Navy Personnel Command, we examined whether the sailors currently serving as CSMMs/Top Snipes have career paths that realize these goals. We

found that most current CSMMs/ Top Snipes already follow the optimal career path, although very few have all of their sea tours on the same platform. We also found that there are enough rating-enriching shore billets.

### **Military Health Care and External Resource Sharing Agreements**

The military's health care costs are growing, troops are being drawn down, and inpatient numbers at many military treatment facilities (MTFs) are declining. One option that could mitigate both these problems is the use of external resource sharing agreements (ERSAs). ERSAs are written agreements between an MTF, a managed care support contractor, and a civilian hospital that allow personnel from the MTF to provide patient services to TRICARE beneficiaries at the network facility when the MTF lacks the space, resources, staffing, or equipment to provide those services. The Navy Bureau of Medicine and Surgery (BUMED) asked us to conduct a study to determine if ERSAs are a cost-effective mechanism to maintain currency of military providers.

## **Women in the Military**

### **Analysis of Female Marines' New Physical Fitness Test**

In November 2012, an All-Marine Message (ALMAR) stated that, as of January 1, 2014, pull-ups would replace the flexed-arm hang in the female physical fitness test. We prepared several analytic memoranda for the USMC on female pull-up data. Based in part on our findings, female Marines will have the option of doing either the flexed-arm hang or pull-ups on their physical fitness tests through calendar year 2015.

## **Veterans' Issues**

### **Examining Employment Services for Veterans**

The transition from military to civilian life can be tough, especially for new veterans who must enter the job market. This year, we completed a study for the Transition to Veterans Program Office, in order to assess employment services for nondisabled, 18- to 30-year-old veterans in eight localities, ranging from metropolitan to rural areas across the United States. We identified 34 services that subject matter experts consider important for

facilitating veteran transitions and compared local services against this baseline.

## **Teacher Proficiency**

### **Does National Board Certification Improve Teaching**

The National Board for Professional Teaching Standards (NBPTS) is a professional organization that provides national certification to teachers who apply for and meet the board's standards of performance for "accomplished" educators. We recently did a study using data from Kentucky and the city of Chicago to find out whether national certification changes teachers' classroom practices and improves student outcomes.

### **Using Data to Inform Practice and Improve Student Performance**

Since the 1960s, Technical Education Research Centers (TERC) have been involved in improving science and mathematics education. TERC recently created "Using Data"—a professional-development program designed to help teachers improve instruction through collaboration with external resources. The U.S. Department of Education asked to evaluate Using Data based on the experience in Duval County, Florida. Among other measures, we looked at student performance on the state-administered end-of-grade mathematics assessment.

## **College and Career Readiness**

### **Helping Kentucky Students Transition to College**

CNA Education operates the Regional Educational Laboratory (REL) Appalachia—one of ten RELs funded by the U.S. Department of Education—which provides technical assistance and research support to educators and policy-makers in Kentucky, Tennessee, Virginia, and West Virginia. REL Appalachia recently examined Kentucky high school students' participation and pass rates in college preparatory transition courses. Our findings will help schools and districts understand how college preparatory transition courses are used and how they may be adapted to meet the needs of students targeted for intervention.

### **Evaluating the Niswonger i3 Consortium**

In 2010, Tennessee lagged behind the national averages in unemployment rate, median income, and percentage of population with a high school diploma. Northeast Tennessee lagged even further behind. The Niswonger Foundation received funding from the U.S. Department of Education to support a network of 29 high schools and five colleges across 15 counties in the northeast corner of Tennessee. In FY 14 we analyzed the network's progress in increasing dual enrollment and distance learning for participating schools.

## **Environment and Energy**

### **Quantifying the Value of Energy Security**

Decision-makers are growing increasingly concerned about the security of electricity at military installations and the associated dangers to military readiness and operations. Because of this, the Deputy Assistant Secretary of the Navy wanted to investigate alternate energy sources and incorporate security considerations into decision-making on renewable-energy investments. We included a derivation of estimates for the value of energy security in a "levelized cost per kilowatt-hour" form. We also discussed how to quantify the overall value of energy security currently being purchased by DON.

### **Hybrid Electric Drive for DDG-51 Class Ships**

As a way to reduce fuel consumption, the Navy has been looking at backfitting its Arleigh Burke-class destroyers with hybrid-electric drives (HEDs). CNA examined fuel savings per ship attributable to HEDs; the costs of research, development, testing, and evaluation (RDT&E); and procurement costs.

### **Costs and Benefits of Mobile Electric Hybrid Power Sources**

The Marine Corps Expeditionary Energy Office is managing a portfolio of programs designed to increase the operational effectiveness of the force by improving energy performance. One program involves the development of "Mobile Expeditionary Hybrid Power Sources" or MEHPS—systems of solar panels and rechargeable batteries for use in conjunction with existing generators. We provided a business case analysis of MEHPS to assess its operational and financial benefits and costs, including life-cycle costs, compared with current and planned systems.

### **Exploration of Water Security Issues**

The Skoll Global Threats Fund commissioned CNA to develop and execute a game to explore how Bangladesh, China, India, and Pakistan share water from the Brahmaputra, Indus, and Ganges river basins. We executed two games in Washington D.C. and Kuala Lumpur, Malaysia to provide insights into water and its connection to politics, conflict, and cooperation in the region.

### **Exploring the Energy-Water Nexus**

Electricity generation from thermoelectric power plants is inextricably linked to water in nearly all stages of power production, yet this critical constraint has been largely overlooked. As competition for water resources increases among agriculture, industry, and municipalities the impacts on electric power sectors is inescapable. To better understand potential conflicts over water use, CNA developed a model of the power sector and used it to develop a series of scenarios for each of four case studies: China, India, France, and Texas.

## **Law Enforcement**

### **Enhancing Law Enforcement and Research Partnerships through the Smart Policing Initiative**

Police departments nationwide know that the old manpower-intensive methods of policing no longer work: citizen demographics are changing, lower budgets are forcing personnel layoffs, and new threats to public safety are emerging. We have helped them address this issue through the DOJ's Smart Policing Initiative (SPI) which builds evidence-based, data-driven policing strategies that are effective, efficient, and economical.

### **Should Campus Police Officers Be Armed?**

In response to recent incidents of shootings on school campuses, universities have increasingly focused on how to prevent, mitigate, and respond to such attacks. CNA provided a report to George Washington University (GWU) with best practices and recommendations on arming officers. A template use-of-force policy was also provided.



## Emergency Preparedness

### **How Well Can the Nation Respond to a Disaster? Evaluating Capstone Exercise 2014**

To commemorate the 50<sup>th</sup> anniversary of the 1964 south-central Alaska earthquake the State of Alaska sponsored “Alaska Shield 2014” an exercise to assess the state’s preparations for, and its ability to respond to and recover from, such a catastrophic earthquake and its after-effects today. Before the exercise, CNA prepared the master scenario events list and developed exercise evaluation materials. During the exercise, CNA analysts deployed to the HHS Simulation Cell to manage HHS’s exercise play and provide on-site data collection support to the HHS lead controller. After the exercise, CNA developed HHS’s after-action report and improvement plan, which documented exercise observations and identified areas for improvement.

### **Support to FEMA in the State Preparedness Report Summary**

Congress requires states and territories that receive Department of Homeland Security preparedness grants to report annually to the Federal Emergency Management Agency (FEMA) on their preparedness levels. CNA helps FEMA’s National Preparedness Assessment Division (NPAD) collect and analyze these State Preparedness Reports (SPRs) and helped NPAD develop the *State Preparedness Report Summary* which presents analytical findings from the 2013 SPRs and discusses their implications for FEMA preparedness programs.

### **Tracing the Evolution of the Emergency Management Assistance Compact (EMAC)**

EMAC, the legal mechanism that allows states to share resources during governor-declared disasters, is a cornerstone of emergency response and recovery. The National Emergency Management Association asked CNA to detail the 20-year history of EMAC, analyzing changes in its policies and operations over the years, and to explore how EMAC has affected mutual aid policies and response and recovery operations.

### **The District of Columbia Government’s Response to the Navy Yard Shooting**

The response to the 2013 shooting at the Navy Yard required considerable coordination among district, federal, regional, and private sector partners. The DC Homeland Security and Emergency Management Agency asked CNA to

coordinate an after-action review of the District’s response to this event. CNA is helping DC develop an improvement plan to address the issues outlined in the report.

### **Updating the Los Angeles Regional Transit Security Strategy**

In December 2013, the Greater Los Angeles Regional Transit Security Working Group contracted with Filler Security Strategy, with CNA as a sub-contractor, to update its Transit Security Strategy. To prepare this strategy, Filler and CNA completed a regional terrorism risk update which included an assessment of the terrorism risk to mass transit systems within LA, LA’s overall capabilities respond to and recover from an incident of terrorism, and how to fill priority gaps/sustain progress.

## Acquisition and Cost Issues

### **Assessing the Spectrum of Army Capabilities**

The U.S. Army organizes its research, development, and acquisition program around “capability portfolios.” The director of Army Capabilities Integration, Prioritization and Analysis asked CNA to help develop a capabilities-based analytic method to assess the “health and balance” of those equipment portfolios. We developed a method to assess Army capabilities across a range of DOD’s standard planning scenarios. We also analyzed whether the capability would enable Army future warfighting concepts.

### **Enhancing the Navy Base Operating Support Model**

Like other large organizations, the Navy must forecast its costs over a future period. The highest costs associated with the Navy’s shore infrastructure are base operating support (BOS) costs. The Navy’s Campaign Assessment and Modeling Branch asked us to develop a more robust model would better project funding needs and be more supportable. To build this model we expanded on prior work that determines an installation’s BOS requirement and balances it against that installation’s expenditures for a baseline year.

## Infrastructure, Logistics, and Readiness

### Resilience of Naval Logistics

OPNAV N42, which oversees strategic mobility and combat logistics for the Navy, asked CNA to address the question of the resilience of Naval logistics in a Western Pacific scenario. To do so, we developed a model, based on scenario plans and conversations with logistics experts. We investigated the flow of ship and aviation fuel, stores, and ordnance from outside the theater to various in-theater ports, to naval combat ships in the area of operations, using strategic sealift and Combat Logistics Force ships. We then determined whether those combat ships could still be adequately supplied if logistics ships or in-theater ports were lost. Finally, we explored how different concepts and capabilities, such as a seabase, could mitigate any gaps in logistics support that resulted from wartime attrition.

### Logistics-Centered Wargames

The Navy's Office of Fleet Readiness and Logistics needs a better understanding of, and means of articulating, how logistics shape operational capabilities in a contested and constrained environment with A2/AD elements. To this end, the office asked CNA to develop a logistics-centered game to explore the interplay between operations and the logistics chain. We held the game in FY 14.

### Figuring the Costs of Casualties

The Navy uses a system of Casualty Reports (CASREPs) to report personnel injuries and damaged or faulty equipment. Our deployed representatives are helping strike groups understand the "cost" of CASREPs and the drivers of surface readiness. CNA's field representative to Carrier Strike Group TEN (CSG-10), aboard USS *Harry S Truman*, recently analyzed the cost of CASREPs to the strike group while operating forward. Costs in this case were measured in three ways: dollar cost, decrease in mission readiness, and increase in time to complete a task or mission.

## Training and Development of Warfighting Proficiency

### Developing a Model To Standardize Marine Training

The Marine Corps has three Marine Expeditionary Forces: I MEF on the West Coast; II MEF on the East Coast; and III MEF on Okinawa. With up to 90,000 Marines in each, it isn't feasible for an entire MEF to respond to a crisis or sudden contingency. Therefore, a MEF needs an internal command element that can rapidly pull together the right number and mix of air, ground, and logistics elements when a quick response is needed. This role is now filled by the newly reactivated Marine Expeditionary Brigade (MEB) command elements (CEs). These MEBs have significant differences in manning levels and available resources, which are leading to separate, non-standardized training plans. We were asked to develop a model for MEB CE training standardization that would work within the limits of available training resources.

### How Much Training Can Simulation Provide for the Coastal Riverine Force?

The Coastal Riverine Force (CRF) conducts maritime security operations on rivers and along the coast. Force personnel receive extensive at-sea training, however, like the rest of the Navy, it is faced with budget cuts that may limit live training opportunities. The CRF and its parent command, the Naval Expeditionary Combat Command (NECC), are considering the use of simulators to better prepare for live training and to maintain proficiency. We developed recommendations for NECC on a simulator investment plan that will produce the greatest return on investment in terms of both training value and cost savings/avoidance. We also provided recommendations on other policies and initiatives that will allow for the most effective use of simulators.

## **How Does Training Affect the Readiness, Proficiency, and Safety of an Aircrew?**

Naval Aviation conducts extensive tactical training to ensure that aircrews are ready to deploy and effectively conduct their missions. In FY 14, we analyzed flight and simulator data to see how sequestration and recent aircraft shortfalls have, in some cases, greatly reduced fleet squadron flying. We characterized the effects of that reduction upon mishaps and a general loss of aircrew experience. We also used flight and training data to learn how carrier air wings (CVWs) build readiness and tactical proficiency during their pre-deployment work-up period. We showed how flight training influences performance in subsequent training events and how simulation could be used to provide additional preparation.

## **Complying with the Marine Mammal Protection Act**

Under the Marine Mammal Protection Act (MMPA), every five years the Navy is required to renew its authorizations to conduct training and testing in major operating areas. As part of this process, the Navy must estimate and report the numbers (by species) of marine mammals that may be harmed to various levels, or harassed, by Navy active sonars. Early Navy compliance attempts (in the 1990s) used models from various Navy labs or contractors, which generally took different mathematical approaches. Since then, the Navy has funded the development of a single model to be used for compliance purposes—the Navy Acoustic Effects Model (NAEMO). The Navy's Energy and Environmental Readiness Division asked us to support NAEMO development by reviewing a its key mathematical components.

## **Operational Test & Evaluation**

### **Preparing to Test the Joint Strike Fighter**

The F-35 Lightning II joint strike fighter is the Navy's next-generation strike aircraft. Its formal operational tests are still over a year away, but work on test measures is already shaping the detailed approaches to these complex joint and combined testing processes. CNA is providing analytical guidance for test metrics, and for the development of the formal data management and analysis and overall test plans.

## **FAA Support**

### **Modernizing the FAA's Aeronautical Information**

On August 20, 2014, the FAA's Joint Resources Council Final Investment Decision unanimously approved moving forward with the Aeronautical Information Management Modernization Segment 2 (AIMM S2). AIMM S2 will provide a single trusted access point for aeronautical information, which will be accessible to internal and external National Airspace System (NAS) consumers. This decision represents a major step forward for the FAA's NextGen modernization initiative, which will use integrated strategies and new technologies to make air travel safer, more dependable, more direct, and more environmentally friendly. This decision was largely supported by the analysis and recommendations of the CNA team.

### **Support to the FAA Security Office**

Agencies such as the FBI and U.S. Customs and Border Patrol (CBP) need daily flight data in order to complete their sensitive missions. The FAA's Office of System Operations (SysOps) Security supports them—as well as other Federal, state and local law enforcement agencies—by providing analysis of historical flight data. Although CNA has been working with the SysOps Security office for over a decade, the past year has been especially active, with many requests for time-critical analyses related to FAA/law enforcement collaboration.

