U.S. Coast Guard
Engineering, Electronics & Logistics Quarterly
Summer 2009

The Yard's New Renewable Energy Center

A Coast Guard First

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Articles should be about 500 words long; however, C4IT, engineering, logistics and environmental specific articles can be up to 2,000 words -- all acronyms must be spelled out when first used. To have your article considered for publication, photo(s) must accompany each article. Articles can be submitted in Microsoft Word on a CD or e-mailed electronically. Please submit original photographs and graphics. All slides, photos, graphics and illustrations should be in color where possible. Please include **by-line** when submitting article. Let us know if you want your photos and graphics returned to you. Submit inquiries, letters, articles, and photographs to:

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***On the Cover**: The exterior of the Coast Guard Yard's new Renewable Energy Center dedicated on April 22, 2009. Read more about it on page 24.*

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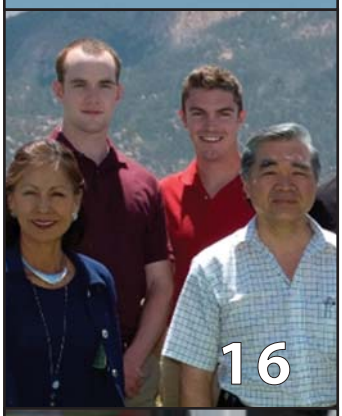

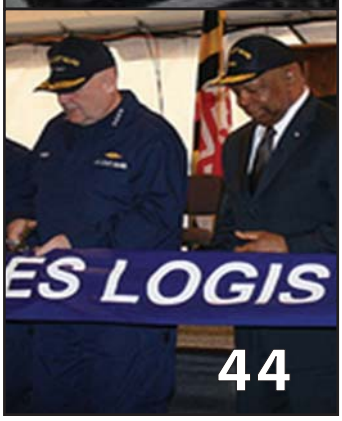

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***Back Cover*: 2009 U.S. Coast Guard Headquarters Earth Day poster.**

From the Assistant Commandant

These are truly exciting and historic times to be in the U.S. Coast Guard. We are rapidly and decisively changing our organizational structure and business processes to provide superior support for mission execution into the twenty first century. I am pleased to report that we have made significant strides toward implementing our modernization plans this year, notably, standing up the service centers and offices that will provide Coast Guard mission support under the new logistics business model. The Command, Control, Communications, Computers and Information Technology (C4IT) Service Center stood up on February 9, 2009 at the Telecommunication and Information Systems Command (TISCOM); the Shore Facilities Logistics Center (SFLC) stood up on January 26, 2009 at Coast Guard Yard in Baltimore, MD; the Shore Infrastructure Logistics Center (SILC) stood up on February 17, 2009 in Hampton Roads, VA; the Personnel Service Center (PSC) stood up on March 16, 2009 in Arlington, VA; and, the Asset Project Office (APO) stood up on January 26, 2009 at Coast Guard Yard in Baltimore, MD. We will be adding more capability in the coming months as we continue with our union bargaining.

Some of you may have already received letters of notification regarding the realignment of your position. In addition to identifying your placement, the notification is intended to ensure that no one is overlooked as a vital member of the modernized organization. As you review your notification, I ask that you take a moment to consider the significance of this modernization effort, to reflect on your personal role in the organization, and ask yourself the following questions:

- Why did I join/take a position with the Coast Guard?
- What is keeping me in/with the Coast Guard?
- What can I do to help the organization succeed?

Although your individual responses will likely be unique and varied, I suspect that many of the answers to the first two questions will share a common theme; that we take pride in the service that we perform for our country. No other organization has a greater impact on the daily lives of the people of this nation. However, as engineers and logisticians, no one knows better than you the significant challenges and degree of work associated with supporting the assets used to execute our diverse missions. Future organizational success will be achieved through your dedication to professionalism and duty, continued commitment to your fellow teammates, shipmates and crew and your willingness to embrace change for the opportunity to provide a better product or service.

I asked the staff here at headquarters these questions during a recent all hands, because I wanted to impress upon them that although their job description may not change due to modernization, the work to be performed on a daily basis will have a more direct impact on the field. I asked them, and I ask you, to reflect on your responsibilities and internalize how your efforts will support the execution of the operations that the U.S. Coast Guard performs on a daily basis. The modernized Coast Guard is designed, in part, to facilitate faster communication and improved decision making through more accurate and timely information exchange. Those of you transitioning to one of the five mission support organizations will be even closer to the operators and the impact of your work will have a direct affect.

The timing for logistics transformation is now. New assets, such as the CGC WAESCHE (page 10) and the HC-144A Ocean Sentry Maritime Patrol Aircraft (page 30) are currently rolling off the production lines, undergoing tests and being placed into operations. The engineering and logistics community has a unique opportunity to posture itself to better support these assets throughout their design life by utilizing modern management techniques and technology. Information technology will also play a vital role in our successful move to a modernized logistics system. The Port Engineer Electronic Performance Support System (EPSS) (page 3) and the Aviation Logistics Management Information System (ALMIS) are two examples of information management systems that reinforce the importance of collecting, maintaining accurate data and enable sharing of data across the enterprise.

As I continue to visit units, I invite you to ask questions and raise any issues or concerns that you may have with regards to modernization and logistics transformation. Also, I encourage you to visit the new CG-4 Blog, located on CG Portal at: https://cgportal.uscg.mil/lotus/myquickr/cg-4-blog/team-blog and share your thoughts, questions and ideas. I look forward to hearing from you.

Thomas Ostebo RDML, USCG
Assistant Commandant for
Engineering and Logistics

Visit CG-4's blog at https://cgportal.uscg.mil/lotus/myquickr/cg-4-blog/team-blog

Mission Effectiveness Project Celebrates 4th Anniversary Yard

Service To The Fleet

The Coast Guard's Mission Effectiveness Project (MEP) celebrated its 4th Anniversary in May 2009. To date, the skilled hands of the Yard have delivered MEP's modernization to six 270' cutters, eight 210' cutters, and eight 110' cutters.

When MEP began, former U.S. Senator Paul Sarbanes of Maryland commented during the commencement ceremony, "This is a terrific day in the life of the United States Coast Guard Yard!" With such rousing comments, the multi-year modernization project began with expectations to continue work at the Yard through 2013.

The MEP is designed to replace aging systems on board select ships to improve reliability, reduce future maintenance costs, and meet required mission hours. The project is intended to eliminate problems associated with obsolete and unsupportable equipment and systems.

Each MEP cutter's modernization maintains mission effectiveness until replacements of new assets are delivered and are operational. Without the benefit of MEP, the legacy fleet would continue to operate with excessive engineering casualties and reduced operational mission hours.

The Yard has expertly planned, managed, and executed the MEP on three cutter classes over the last four years. Timely delivery under MEP is the overriding goal with a commitment to maintain the desired scope of work and budget.

The Yard's shiplift provides a photo opportunity for BEFORE, DURING & AFTER MEP. Left to right are: Cutter DAUNTLESS, beginning MEP; Cutter VIGILANT, half-way through MEP; and Cutter VALIANT finished MEP and departed the Yard in March 2009.

Yard rigging crew lowers the 110' Cutter SANIBEL into the icy waters of Arundel Cove following MEP work that began on the vessel in July 2008. The Cutter completed MEP in April 2009, followed by return to its homeport in Woods Hole, Massachusetts.

Completed MEP Cutters, To Date		
270' MEP	**210' MEP**	**110' MEP**
TAMPA	DEPENDABLE	TYBEE
HARRIET LANE	CONFIDENCE	OCRACOKE
SPENCER	VENTUROUS	CUTTYHUNK
BEAR	VIGOROUS	NANTUCKET
SENECA	DECISIVE	NAUSHON
FORWARD	ACTIVE	EDISTO
	RESOLUTE	SITKINAK
	VALIANT	SANIBEL

Coast Guard Establishes Surface Forces Logistics Center Yard

Major Milestone For Logistics Efficiency

On January 26th [2009], the Coast Guard established the Surface Forces Logistics Center (SFLC) and the Asset Project Office (APO) on the Coast Guard Yard campus. Before a crowd of 1500 employees and guests, ranking dignitaries cut the ceremonial ribbon that represented the largest re-organization of logistics support in the history of the Baltimore area Coast Guard commands. The initiative offers Coast Guard customers increased efficiency through a single point of contact for 24-hour, 7-day-a-week product line technical support.

(Left to right): Captain Dennis Blackall, Captain Mark Butt, Vice Admiral Clifford Pearson, Admiral Thad Allen, Congressman Elijah Cummings, and Congressman Dutch Ruppersberger (not pictured) cut the ceremonial ribbon to establish the Surface Forces Logistics Center in Baltimore, Maryland on January 26, 2009. (U.S. Coast Guard photo by YN3 Brandon Webster)

"Today, I proudly participated in the ribbon cutting ceremony for the new Surface Forces Logistics Center and Asset Project Office held at the historic Coast Guard Yard in Baltimore, Maryland. Today's event represents critical milestones for both the United States Coast Guard's Modernization efforts and the Logistics Transformation Program. We are one step closer to providing centralized, bi-level support to power Coast Guard mission execution," commented Vice Admiral Clifford Pearson, Coast Guard Chief of Staff.

Joining Vice Admiral Pearson were Admiral Thad Allen, Commandant of the Coast Guard; Congressman Elijah Cummings, Chairman of the U.S. Congress Subcommittee on Coast Guard & Maritime Transportation and Representative of the 7th District of Maryland; and Congressman Dutch Ruppersberger, Representative of the 2nd District of Maryland. Also cutting the ceremonial ribbon were Captain Dennis Blackall, Commander, Surface Forces Logistics Center; and Captain Mark Butt, Commanding Officer of the Asset Project Office.

The Coast Guard's modernization initiative realigns the Service and establishes four major organizational elements at Coast Guard Headquarters and in the field. These elements are: Operations, Mission Support, Operations Command, and Force Readiness Command.

The Surface Forces Logistics Center is part of Mission Support. This element is established to unify logistics support, enable life-cycle management of assets from acquisition to decommissioning, and create a responsive human resources system.

The Surface Forces Logistics Center provides depot level maintenance, engineering, supply, logistics, and information services for all Coast Guard surface forces that includes over 200 cutters and over 1800 small boats. The SFLC is responsible for sustainment of the entire asset's operational life cycle -- from completion of the acquisition phase by the APO through decommissioning and disposal.

The SFLC's approximately 2000 employees will perform logistics functions in a geographically dispersed organization. The new center will be comprised of three main facilities. The Baltimore, Maryland facility will include staff elements from the former Baltimore-based Engineering Logistics Center. The SFLC command staff will be located in Baltimore. Two other facilities in Norfolk, Virginia and Oakland, California will be comprised of members from the former Maintenance and Logistics Command Atlantic and the Maintenance and Logistics Command Pacific. Subordinate commands to the SFLC include the Coast Guard Yard, the Naval Engineering Support Units, and Industrial Support Activities and detachments located throughout the United States.

The SFLC is one of five nationwide logistics centers under the Mission Support element. The SFLC joins the Aviation Logistics Center, the Shore Infrastructure Logistics Center, the Command/Control/Computer/Communications Information Technology (C4IT) Service Center, and the Personnel Services Center.

The Asset Project Office will support acquisition and life cycle management and provide logistical support for all legacy and newly acquired Coast Guard assets.

The creation of the Surface Forces Logistics Center and Asset Project Office are part of the Coast Guard's modernization effort that will position the United States Coast Guard to keep America safe and secure. This modernization will make the Coast Guard "ready today while preparing for tomorrow." (Read more on page 44.)

Yard Installs New Deckhouse on Cutter ALEX HALEY Yard

Service To the Fleet "On the Road" In Alaska

A team of Yard "road warriors" traveled to Alaska the first week of March 2009 to install a newly constructed deckhouse on the Coast Guard Cutter ALEX HALEY. Yard craftsmen from the Structural, Electrical, Mechanical, and Services Groups spent numerous hours fitting and welding a new deckhouse for the 38-year-old Mature Class medium endurance cutter.

Additional work on the ship included provision of 320 square feet of living space for the junior officers assigned to the vessel. The job list included new racks, furniture, fan coil units, new heads, bulkheads, and decks. To accommodate the work, Yard tradesmen renewed applicable piping, electrical, and ventilation systems. In addition, remediation activities were conducted on asbestos covered piping and lead paint on the structure.

The Yard converted the ALEX HALEY in 1999 from a Navy rescue and salvage ship. Yard trips to the west coast continued after the Cutter's special commissioning. Yard road teams installed a helicopter hanger in 2004 and a Yard-fabricated mast for an air surface radar system and electronics upgrades in 2005.

(left) Yard employees pose in front of the newly installed deckhouse on the Coast Guard Cutter ALEX HALEY.

(below) Commissioned in 1971 as the USS EDENTON, the U.S. Navy transferred the rescue and salvage ship to the Coast Guard in 1997 to begin conversion into a medium endurance cutter at the Yard. The ship is named after the first Coast Guard Chief Journalist, Alex Haley, the Pulitzer Prize winning author of the novel, "Roots." The Cutter ALEX HALEY accomplishes Coast Guard missions in the treacherous waters of the Bering Sea, Gulf of Alaska, and North Pacific Ocean from its homeport in Kodiak, Alaska.

The Yard deckhouse road team returned to Baltimore in early May with the satisfaction of maintaining the Yard's tradition of "Service To the Fleet" -- no matter where "on the road" that might be.

Yard Concludes 41' UTB Electrical Panel and Alarm Upgrade Project Yard

The 4l' UTB (utility boat) Electrical Panel and Alarm Upgrade Project was conceived to increase the reliability of both the 115 VAC and 24 VDC power panels and improve responsiveness and coverage of the alarm system aboard the 41' utility boats. Working nationwide on the 41' UTB fleet upgrade over a period of four years, Yard road teams replaced each boat's double power panels with marine-grade units and improved the alarm system by incorporating a separate alarm panel to replace the existing halon/loudhailer system. We added several new sensors and tied all existing sensors into the new system. Accomplishment of each boat's retrofit required the effort of two electricians for four days.

The project commenced in the summer of 2005 with the first boats in Honolulu, Hawaii and Yorktown, Virginia and was completed in the spring of 2009 in San Diego, California. During this time span, a total of 131 forty-one foot utility boats were completed incorporating the new system, utilizing teams made up of various electricians.

"Service To the Fleet" took on a whole new meaning as teams from the Yard Electrical Shop modified boats in all districts to accomplish this task, including visiting the frozen District 9 (Great Lakes) in winter 2005 and the sweltering District 7 (Florida) in summer 2006.

Our work was well-received from the various small boat stations commands and boat crews throughout the four-year project. For me, it was a great and informative ride!

by Tom Grabowski, Yard Electric Shop

Coast Guard Cutter BERTHOLF Completes Combat System Ship Qualification Trials

Courtesy of Deepwater News Flash

U.S. Coast Guard photo/PA3 Henry G. Dunphy.

ALAMEDA, Calif. -- The crew of Coast Guard Cutter BERTHOLF, the Coast Guard's first Legend-class cutter, returned to their homeport in Alameda after a successful eight-week underway period.

The crew conducted trials of the ship's weapons system, full power trials of the propulsion system, and performed the first fueling at sea and towing exercises ever done on board a Legend-class cutter.

The Combat System Ship Qualification Trials (CSSQT) tested the ship's weapon systems' ability to engage surface and aerial targets, as well as delivering warning shots and disabling fire on target vessels. This is an important step for BERTHOLF to be fully ready for the Coast Guard's many missions and long term deployments overseas. During the testing, BERTHOLF's crew worked with a Coast Guard testing team based in Port Hueneme and Navy testing contractors to put the ship's 57mm gun, Close-In Weapon System (CIWS), and associated electronic and communication systems to the test.

Video of the CSSQT trials can be viewed on the web:

http://cgvi.uscg.mil/media/main.php?g2_itemId=482896
http://cgvi.uscg.mil/media/main.php?g2_itemId=482703
http://cgvi.uscg.mil/media/main.php?g2_itemId=482893
http://cgvi.uscg.mil/media/main.php?g2_itemId=482749

U.S. Coast Guard photo/PA3 Henry G. Dunphy.

WAESCHE Successfully Completes Generator Light Off

Courtesy of Deepwater News Flash

U.S. Coast Guard photo/Petty Officer 3rd Class Casey Ranel.

WAESCHE on 11 March 2009.

PASCAGOULA, Miss. (March 28, 2009) -- National Security Cutter WAESCHE (WMSL 751) successfully completed the last of three Generator Light-Offs at the Northrop Grumman Shipbuilding facility in Mississippi. This marks the latest milestone for the second NSC.

Generator Light Off (GLO) is a critical milestone as it marks the first of many steps that bring the ship's electrical systems to life. The three Caterpillar generators provide 1,360 kilowatts of power each, with any two generators capable of providing the power requirements for the entire ship.

The successful completion of GLO brings WAESCHE another step closer in preparing for sea trials this summer.

(Front to back) U.S. Coast Guard Chief Electricians Mate, Sean League, pushes the button to fire up the number 3 generator as Grady Fountain, NSC 2 general ship superintendent, watches.

Legacy of Achievement:
Reflections on Coast Guard Acquisition

by Hunter Keeter

U.S. Coast Guard photo by PA2 Thomas Blue.

U.S. Coast Guard photo/PA3 Luke Clayton.

U.S. Coast Guard photo/ Petty Officer Patrick D. Kelley.

WASHINGTON -- As it closes its second year, the leadership of the Coast Guard's Acquisition Directorate (CG-9) reflects on the business improvements that have led to a number of high profile project successes, and on the challenge of continuing this momentum in the years to come.

In a speech in 2008, Commandant Adm. Thad W. Allen remarked about what a difference a year made in the status of Coast Guard acquisition, particularly in the projects initially begun with the Integrated Deepwater System program. In 2007, those projects and indeed all of Deepwater had been integrated with other major acquisition programs.

"Today, we are one Coast Guard team working together," said Assistant Commandant for Acquisition, Rear Adm. Gary T. Blore. "I don't make a decision without coordinating with our sponsor [the Capabilities Directorate (CG-7)] and our technical authorities [including the Human Resources Directorate (CG-1); the Engineering & Logistics Directorate (CG-4); and the Command, Control, Communications, Computers and Information Technology Directorate (CG-6)]. The MSAM (*Major Systems Acquisition Manual*) appropriately assigns everyone a role, and with early input on a project and CG personnel working together in concert on acquisition, our agency will be better-served for years to come."

For Deepwater, the results of the integration, and other improvements, speak for themselves. For example, Deepwater has delivered the first National Security Cutter, and soon will deliver the second for preliminary acceptance. Seven HC-144A Ocean Sentry maritime patrol aircraft are now in Coast Guard possession. The program has installed SELEX surface search radars on six HC-130Hs Hercules long range surveillance aircraft, and has completed the installation of other new mission systems aboard three HC-130Js, with two more in modification. Having upgraded their engines and transmissions, the program is delivering MH-65C Dolphin multi-mission cutter helicopters to air stations across the nation with airborne use of force capabilities. And the Coast Guard now has the critically needed Sentinel-class patrol boat under contract.

For other programs, those not originally affiliated with Deepwater, adherence to sound

acquisition processes likewise has had positive results. For example, the Response Boat-Medium (RB-M) project has delivered eight of an eventual 180 new boats during low-rate initial production. These boats, already making a difference in some high-profile real-world search and rescue cases, are helping sectors across the nation carry out an operational evaluation that will inform future production decisions.

The Rescue 21 project, what Blore described as "the Coast Guard's maritime 911 service," has delivered 20 of 39 sectors and now provides search and rescue radio and direction finding coverage along 28,000 miles of U.S. coastline. Also, the Coast Guard recently awarded a contract for the second increment of the Nationwide Automatic Identification System, which will allow the government to identify, track, and communicate with vessels navigating to and from U.S. ports. Another new initiative, called Interagency Operations Center/Command 21, will standardize and integrate the Coast Guard's command, control, and communications capabilities with those of other federal, state, and local partner agencies.

In keeping with the Acquisition Directorate's motto, "mission execution begins here," Blore noted that success at headquarters has had a real impact on Coast Guard men and women in the field, giving them the tools they need to serve the nation.

"That picture of the ditched US Airways flight in the Hudson River, with a RB-M in the foreground, really brings 'home' the notion that it isn't just about a contract," he said. "Although sometimes it may seem that we are moving the folders from one side of our desks to the other side, there is a very important reason for what we do here in acquisition. At the end of the day, when we get those assets deployed, we are saving lives, or interdicting drugs off our coast, or we are stopping illegal migrants. That is what we do here."

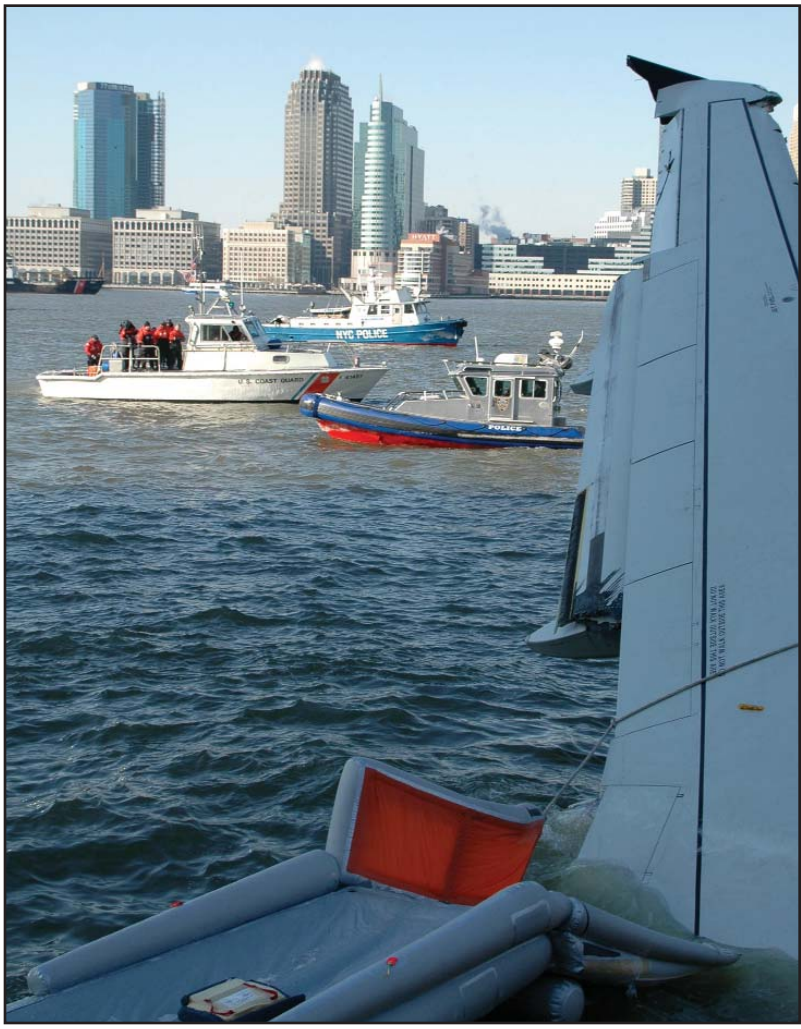
Improving Acquisition Policy & Process

Blore attributes the Acquisition Directorate's successes not only to the achievements of the projects themselves, but also to a comprehensive re-structuring of the entire acquisition enterprise.

"By having this transformation in acquisition and modernization writ large, it is affecting all the projects," Blore said.

Improvements in the lines of communication among headquarters offices have set the tone for cooperation. After consolidating the project offices from the former G-A (Acquisition) and G-D (Deepwater) organizations, the next step was to clarify the roles of the key players in acquisition, including program managers, technical authorities, and sponsor's representatives. Then, it was crucial to record the changes in policies and processes, so that these innovations could become part of the culture of acquisition, Blore said. Likewise, having contracting policy, research and development, and foreign military sales within the same directorate has increased both capacity and innovation.

U.S. Coast Guard photo/PA1 Susan Blake.



"All the projects are bettered by our having standard, repeatable, documented processes," he said. "We have written as much of this into the Blueprint for Acquisition Reform as possible and we will keep updating and using that strategic plan as a dynamic document to maintain our focus on acquisition excellence."

The Blueprint, now in its third edition, discusses business process improvements that have shaped the Coast Guard's acquisition and contracting capabilities. Another revised policy document that has shaped CG-9's world of work is the recently updated MSAM, which serves as a handbook for program and project managers. Whereas the Blueprint provides a strategic framework within which the directorate's acquisition reforms and improvements are taking place, the MSAM provides a documentation of current/new acquisition procedures, roles and responsibilities, and processes.

Blore noted that Deepwater and other programs have drawn on lessons learned from past acquisition disappointments, but has focused as well on the most successful projects in the Coast Guard's investment portfolio, including the Response Boat-Medium and the 87-foot Marine Protector-class patrol boat. Also, the Deepwater-funded Mission Effectiveness Project, which refurbishes 14 Reliance-class and 13 Famous-class medium endurance cutters and 20 of the service's 110-foot Island-class patrol boats, has served as a model for projects that are within budget, on schedule, and performing as planned.

"We have had a lot of good projects that have demonstrated that we really do know how to do acquisition," Blore said. "So the questions we have really focused on are, what is this process that we call acquisition? And how do we do it right? The reason our projects are well-run now is because we accept the fundamental cornerstones of acquisition and have practiced those."

Blore considers the basic cornerstones of successful acquisition to include many of the process changes that already have been instituted, such as independent review of designs, onsite government inspections at production facilities, and close partnerships with the U.S. Navy and with the Coast Guard's own technical authorities.

Human Capital Strategy

As acquisition policy and process improvements have encouraged project successes, one persistent set of challenges has been that of recruiting, developing, and retaining a highly qualified acquisition workforce.

Blore praised his directorate's personnel for their achievements in contracting, business and financial management, program management, systems engineering, and other key disciplines. But he noted that, like other federal agencies, the Coast Guard must work hard to attract and retain the best and brightest in a highly competitive market where government and private enterprise draw from the same labor pool.

Numbers matter. As the level of investment in Coast Guard acquisition has risen markedly since the 1990s (from approximately $200 million in annual investment to approximately $1.5 billion), the workforce needed to manage the investment workload has increased. The CG-9 Acquisition Directorate today has 855 military and government civilian personnel, and continues to grow, including 104 new hires in 2008 and 10 new hires so far in 2009.

Blore noted that in the years to come it will be important for CG-9 to remain in step with partners, such as the Department of Defense, to remain competitive in the labor market. CG-9 has taken steps to increase the attractiveness of its billets, offering, for example, internships to interest new workers, and workforce initiatives to enhance the retention of existing employees.

Increasing and maintaining the size of the workforce is one challenge. Another is ensuring that employees have the appropriate training and skills necessary to be successful in carrying out major acquisition programs.

According to Blore, it is the obligation of government to properly equip employees with the skills and tools they need to accomplish their missions.

"[In the early days of CG-9,] we had a lot of people who might have had the right experience, but hadn't completed all the required training for certification," he said. "This was especially true in the military ranks (CG-9 is approximately 50 percent military), and something we had to change."

Today, of the 14 Level I investments (valued at greater than $100 million) in CG-9, all are led by Level III (senior) certified program managers.

The Acquisition Directorate's new Human Capital Strategic Plan outlines several goals aimed at improving the workforce's skills. An overarching objective is to raise the profile of Coast Guard acquisition as a profession with well-defined career paths for both unformed and civilian employees.

The strategy sets goals for training and educational opportunities, using internal resources and by reaching out to third parties, such as the Defense Acquisition University and the Naval Postgraduate School, to provide additional support.

Additionally, helping to ensure that the most qualified personnel end up in the right positions, the directorate has advocated improving Coast Guard data management systems, to track the acquisition certification levels of personnel.

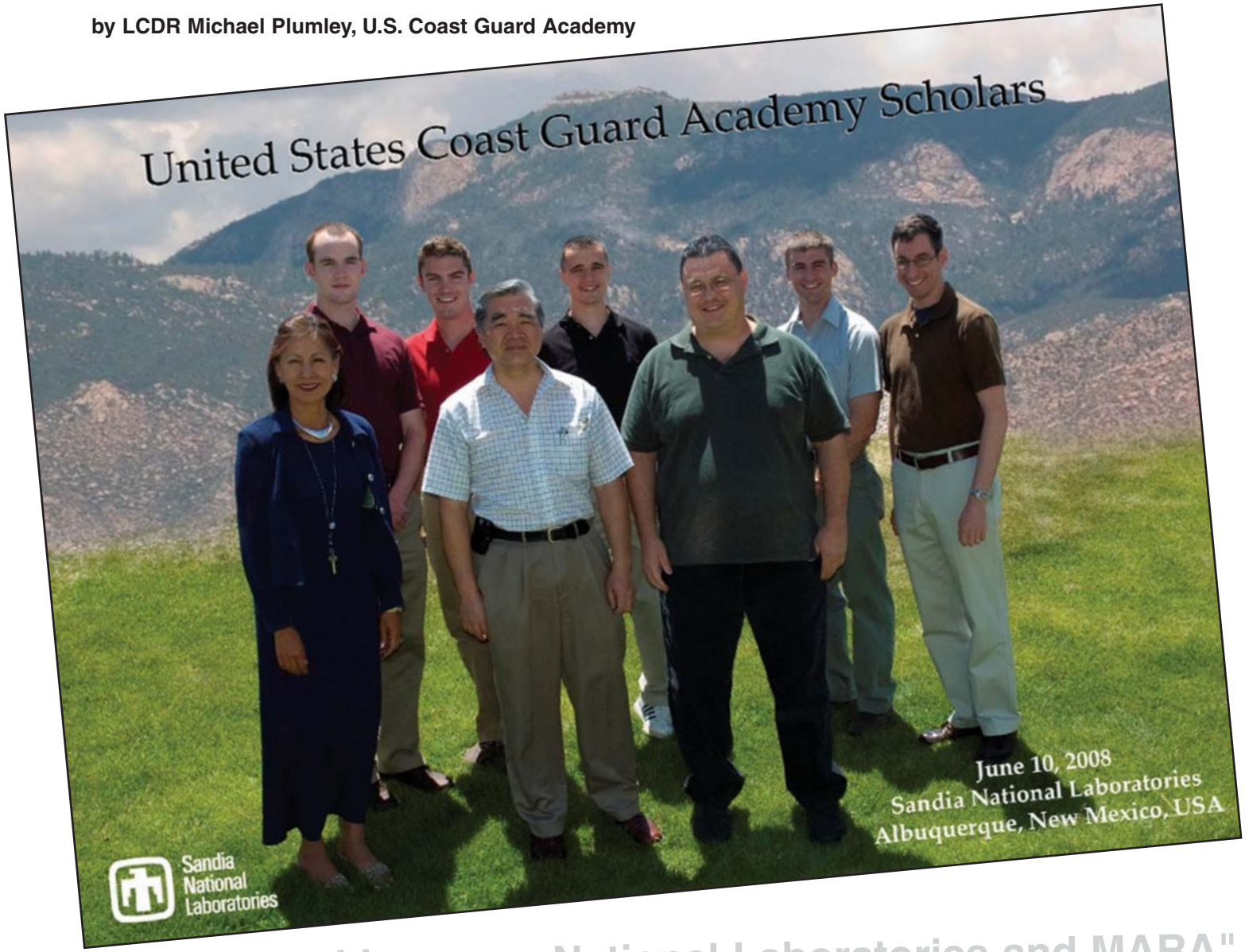
The goal is to improve the career path that can be followed by uniformed and civilian employees, ultimately narrowing the gap between the complexity of acquisition tasks and the availability of skilled workers to accomplish them.

"The Acquisition Directorate is transforming along with the operational Coast Guard so that we can provide the modern and sophisticated assets operators need to execute their missions," Blore said. "We are building the professional acquisition workforce we need to be successful in meeting the challenges of 21st Century."

Our Summer Vacation

"CGA Cadets on Cutting Edge of Innovation at National Laboratories"

by LCDR Michael Plumley, U.S. Coast Guard Academy



"Lawrence Livermore National Laboratories and MARA"

MIT Lincoln Labs

Sandia National Laboratories

For several years cadets have represented the Coast Guard by participating in homeland security related research projects at national labs throughout the country. These competitive programs give cadets invaluable hands-on experience with cutting edge technology and world class facilities. Those accepted spend five weeks at one of the national laboratories during the summer before their first class year. Cadets in these programs work closely with lab researchers and attend briefings and tours on Department of Homeland Security (DHS) and Department of Defense (DoD) funded research. Many continue their research when they return to the Academy.

"Lawrence Livermore National Laboratories and MARA"

Cadets first participated in national laboratories internships through the Lawrence Livermore National Laboratories' (LLNL) Military Academic Research Associates (MARA) Program. LLNL, located in Livermore, California, is a premier national security and applied science laboratory with an annual $1.6 billion budget and over 8,000 employees, half of which have PhDs. CGA cadets compete with others from federal service academies and collegiate institutions for these highly regarded internships. Selections are based on academic achievement, practical experience, and technical interest. The CGA is historically well represented, regularly earning as many, if not more, appointments than larger academies. The program has traditionally been fully funded by LLNL, yet in some years CGA interns have received support from the DHS Directorate for Science and Technology (S&T).

LCDR Michael Plumley and other MARA participants receive a tour of one of LLNL's sensor labs.

In 2008 four cadets participated in the program. Cristina Nelson, a Marine Science major, worked with researchers to mutate yersinia pestis, the bacteria which causes bubonic plague, to determine how it becomes resistant to antibiotics. Dana Tomc and Gwen English, Operations Research majors, worked on a machine-learning and co-reference resolution so a computer analyzing an article can recognize, for example, that "George W. Bush" and "The President" are the same person. Zach Wolf, a Civil Engineering major, worked with researchers on the Homeland Operations Planning System (HOPS), a web-accessible system that provides risk management information and tools for critical infrastructure that may be affected by deliberate attack or natural disaster.

National Guard personnel use HOPS during a counter terrorism field exercise.

MARA attracts the best and brightest, giving cadets an excellent opportunity to rep-

Photo opposite page: The 2008 Coast Guard Academy Visiting Scholars. In the front are Ruth Bitsui, Mark Soo Hoo, and Anthony Salazar of Sandia National Laboratories. In the back, from left to right, are cadets Eric Tuner, Ryan Mowbray, and Zach Hennighausen along with LT Scott Ostrowski and LCDR Michael Plumley.

HOPS logo.

resent the Coast Guard and network with world class researchers and colleagues in other agencies. LLNL participants have already collected an impressive list of accomplishments. Kirsten Ambors won a Fulbright Scholarship in 2007, and DeCarol Davis won a Truman Scholarship the following year. Several LLNL participants have already been accepted to Coast Guard postgraduate programs. The Coast Guard has been represented by eleven cadets in the past four years. In addition to those mentioned previously, past participants include Meghan Hough, Sean Munnis, Michelle Casillo, James Ellsworth, and Samantha Gordon. This year cadet Jason Veara, an electrical engineering major, has been selected for the program.

Two faculty members have also participated, Dr Ian Frommer and LCDR Michael Plumley.. Dr Ian Frommer, an Operations Research professor, spent one month at the lab studying interdiction optimization. LCDR Michael Plumley, a Mechanical Engineering instructor, spent two months at LLNL conducting threat assessments on critical infrastructure in support of HOPS.

The program consistently receives high praise from those involved. When asked about its impact one intern responded: "This type of work is what I want to do for the rest of my life. I can only hope to be so privileged to do this for the Coast Guard. If not, then absolutely for DHS." Those interested in learning more may contact LCDR Michael Plumley or Dr Carla Egelhoff at the Coast Guard Academy. More information may also be found at https://internships.llnl.gov/mara/.

"4 Years at Sandia"

It comes as a surprise to many to hear that some of the Coast Guard Academy's best and brightest are conducting cutting edge research in central New Mexico. For five years the Mechanical Engineering section has arranged for cadets from all majors to participate in internships at Sandia National Laboratories in Albuquerque, NM. True to Sandia's slogan, "exceptional service in the national interest," these cadets are working on the latest technological innovations aimed at improving homeland security, many having direct application to Coast Guard missions.

Sandia National Laboratories is a government-owned, contractor-operated facility with labs in Albuquerque, NM and Livermore, CA. The work force of approximately 12,000 includes over 1,500 PhDs. Sandia conducts a wide variety of

Sandia National Laboratories

R&D programs that support five key areas including: Nuclear Weapons; Nonproliferation and Assessments; Military Technologies and Applications; Energy and Infrastructure Assurance; and Homeland Security. The lab's primary sponsors are the Department of Energy, the Department of Defense, and the Department of Homeland Security.

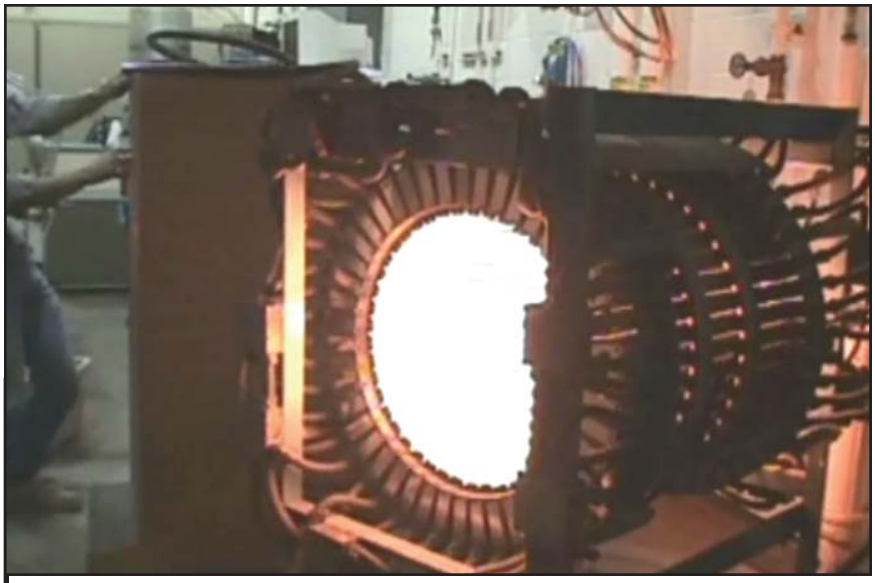
CGA's internship program began as a collaboration between long time colleagues Dr Carla Egelhoff, the Academy's Mechanical Engineering Section Chief, and Dr Susan Rhodes, Sandia's Manager for International Ports and Maritime Security. Qualified cadets compete for acceptance to Sandia's CMC Visiting Scholar's program during their junior year. In 2008 Zach Hennighausen, Ryan Mowbray, and Eric Turner developed a Maritime Passive Acoustic Detection Buoy to aid in the Coast Guard's counter-drug mission. Past visiting scholars include Matt Sexton, Jake London, Bryan Radik, Chris Toussaint, Casey Steuer, Nick Galati, Michael Daeffler, and Josh Gaidos.

CGA faculty are also involved. In 2008 LCDR Michael Plumley spent a month working with researchers at the lab's Thermal Test Complex. Working closely with CG-5223, a project sponsor, he developed a test plan for a new study investigating the potential for cascading damage in the event of a large scale liquefied natural gas (LNG) carrier fire. LT Scott Ostrowski, an Operations Research instructor, spent two months investigating cargo container transport dynamics with the National Infrastructure Simulation and Analysis Center (NISAC).

2009 will be another busy summer at Sandia. In December three senior managers from Sandia National Lab visited the Coast Guard Academy to interview cadet applicants and learn about the Academy's important contributions to the Coast Guard. Cadets Margaret

A 5 meter LNG pool fire test is conducted at Sandia National Laboratories. This year Sandia is planning larger pool fire tests for a study funded by Department of Energy (DOE) and the USCG. The fire tests will improve our understanding of the potential for a large scale pool fire on an LNG carrier at sea.

A 3 meter LNG pool fire test is conducted at Sandia National Laboratories Thermal Test Complex. This year Sandia is planning larger pool fire tests for a study funded by Department of Energy (DOE) and the USCG. The fire tests will improve our understanding of the potential for a large scale pool fire on an LNG carrier at sea.



A radiant heat flux experiment is conducted at Sandia's Thermal Test Complex (TTC). Panels in the TTC can be used to mimic the effect of a large scale fire by generating heating loads of up to 5 MW. CG 5223 and CGA faculty are working with Sandia to develop tests to study the effect of large scale pool fires on LNG carrier insulation systems.

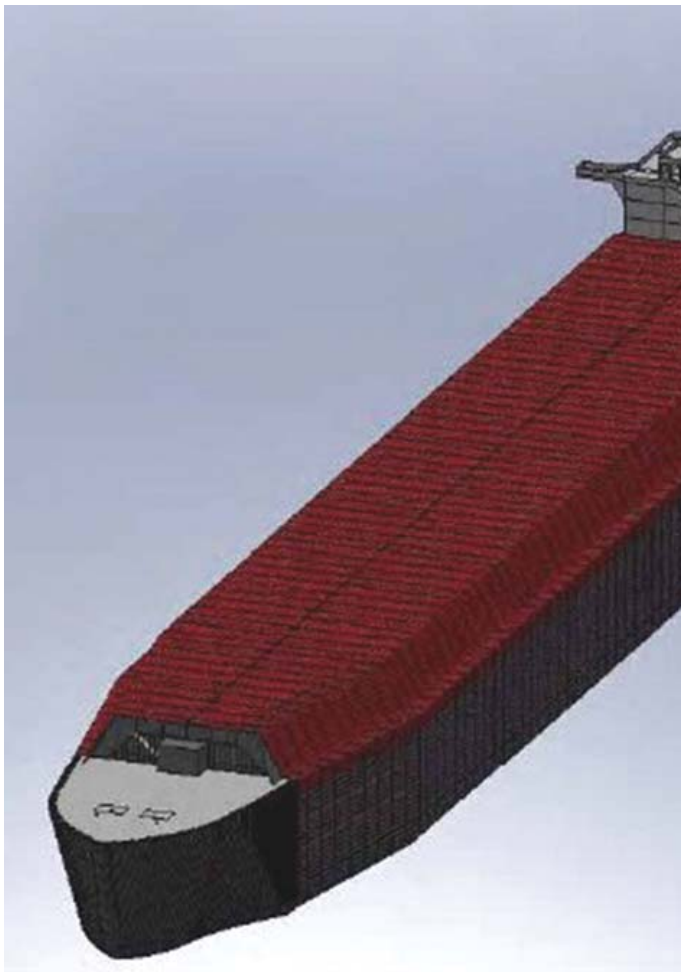
Woodbridge, Tom Olsen, Chris Grabe, Laura Gadziala, and Eric Johnston were selected for the program and will participate this summer. They represent the Mechanical Engineering, Naval Architecture and Marine Engineering, Electrical Engineering, and Marine and Environmental Sciences majors at the Academy.

Sandia researchers routinely express admiration for the professionalism and initiative demonstrated by Coast Guard personnel. Those interested in learning more may contact LCDR Plumley or Dr Egelhoff. For information on SNL visit www.snl.gov.

"A new collaboration with MIT Lincoln Labs"

The Coast Guard Academy's newest partnership is with Massachusetts Institute of Technology (MIT) Lincoln Laboratory (LL)

A small surveillance robot designed by ENS Michael Daeffler during a cadet internship in 2007.



This detailed LNG carrier CAD model was developed by ENS Michael Daeffler during a cadet internship in 2007. The model is being used in ongoing LNG carrier fire protection investigations.

in Lexington, MA. MIT LL is a federally funded research laboratory created in 1951 to support the nation's air defense system. Among other mission areas, MIT LL specializes in Communications and Information Technology, and Intelligence, Surveillance & Reconnaissance (ISR) System Technologies. This cadet internship program is a result of collaboration between Captain Vincent Wilczynski, CGA Engineering Department Head, and Mr. Joe Fischetti (USCGA Class of '83) of the MIT LL Information Services Department.

In 2008 MIT LL hosted two electrical engineering cadets. Kevin Sorrell worked with the Advanced Networks Research Group investigating the future of satellite communications for the Coast Guard, specifically communication protocols and transitions the CG will need to make to be compatible with the Navy's satellite communication systems. Ian Williams worked with the Intelligence and Decision Technologies Group, implementing a prototype early detection and warning system for the Boston area. The net-centric system receives input from numerous sensors, including some Coast Guard surveillance sensors, and integrates them into a robust threat identification system with numerous homeland security applications.

The program is already a tremendous success, pairing CGA cadets with the technical expertise of MIT LL engineers to complete Coast Guard related projects. Those interested in learning more may contact LCDR Dan Pickles or Captain Vince Wilczynski. More information regarding MIT LL can be found at http://www.ll.mit.edu.

MIT Lincoln Labs

1/c Ian Willaims (left) and 1/c Kevin Sorrell (right) with their respective MIT Lincoln Labs internship supervisors, Ms. Stephanie Sposato and Mr. Matt Kercher, and overall coordinator for MIT LL, Mr. Joe Fischetti (center).

About the Author

LCDR Michael Plumley is a rotating faculty member at the Coast Guard Academy. In addition to teaching courses such as Machine Design, Heat Transfer, and Controls, he is the lead coordinator for cadet internships at Sandia and Lawrence Livermore National Laboratories, the CG Aviation Logistics Center, and the DHS Directorate for Science and Technology. He holds Masters of Science degrees in Mechanical Engineering and Naval Architecture and Marine Engineering from MIT and is a registered Professional Engineer in the State of Connecticut. His previous duty stations include CGC ALERT and NESU Boston.

The author wishes to acknowledge the support of his fellow colleagues at the Coast Guard Academy, and in particular LCDR Dan Pickles, for their contributions to this article.

Save-the-Date!

Naval Logistics Symposium 2009-"Logistics in

Crystal Gateway Marriott, Arlington, VA
20-22 July 2009

In cooperation with the U.S. Navy, U.S. Marine Corps and U.S. Coast Guard, the American Society of Naval Engineers (ASNE) presents Naval Logistics Symposium 2009. Join us in Arlington, Virginia, in July 2009 as we explore "Naval Logistics in Support of the Joint Maritime Strategy."

Naval Logistics Symposium 2009 will address the requirements and challenges associated with ensuring that effective life cycle logistics support is developed and implemented during the design, development, test, production, fielding, sustainment, and improvement modifications of military systems.

The goal of addressing requirements and challenges is to ensure that life cycle logistics support will be cost effective and will achieve the intended material readiness and combat effectiveness as defined in operational requirements documents in support of the Maritime Strategy.

Through panel discussions, principal speakers and technical paper tracks, the symposium will explore the issues involved with achieving these objectives within the constraints of the systems acquisition process, including the Department of the Navy's new two pass/six-gate requirements and acquisition process.

Symposium Tracks

The symposium will be structured along three tracks:
1.) Acquisition Logistics-Trends, Tools and Practices;
2.) Total Ownership Cost Reduction-Successes, Challenges and Barriers; and
3.) Naval Logistics Integration-Bridging Across the Services.

Principal Speakers

- ADM Gary Roughead, USN, Chief of Naval Operations (Confirmed)
- GEN Duncan J. McNabb, USAF, Commander, United States Transportation Command (Invited)
- GEN James T. Conway, Commandant of the Marine Corps (Invited)
- ADM Thad W. Allen, Commandant, United States Coast Guard (Invited)

Additional agenda information will be released soon. To stay on top of the latest developments, visit www.navalengineers.org/Logistics2009.html.

Support of the Joint Maritime Strategy"

Registration

Registration information is also available on the symposium website. The symposium has been positively reviewed by government counsel for participation by federal employees subject to approval by individual component commands based on mission requirements and applicable regulations.

Location

Naval Logistics 2009 will be held at the Crystal Gateway Marriott Hotel <http://www.marriott.com/hotels/travel/wasgw-crystal-gateway-marriott/> in Arlington, VA. ASNE currently has a limited block of rooms being held at the government per diem rate plus applicable taxes. Rooms will be available until sold out or until the cut-off date of 3 July 2009.

In order to receive this rate, please call Marriott Reservations at 800-228-9290 or call the hotel directly at 703-920-3230 and tell them you are with the Naval Logistics Symposium 2009.

No Endorsement

Support of this event by the Navy, Marine Corps and Coast Guard does not imply endorsement of ASNE or its other events and activities.

Exhibits and sponsorship conducted by ASNE in conjunction with this event are separate and distinct from the symposium and are not connected in any way with Navy, Marine Corps and Coast Guard support of the symposium.

Any questions about exhibits or sponsorship should be referred to ASNE.

Contact Megan Sinesiou at (703) 836-6727 ext. 23 or msinesiou@navalengineers.org for more information.

U.S. Coast Guard Opens First Landfill Gas Renewable Energy Center

by U.S. Coast Guard Yard PAO

Under spring showers, representatives of the City of Baltimore and the Yard's contractor, Ameresco, Inc., joined U.S. Congressman John Sarbanes of the Third District of Maryland (second from right) and Vice Admiral Clifford Pearson (second from left), U.S. Coast Guard Chief of Staff, for the start of main engines that will burn methane gas from a nearby Baltimore City landfill. Additional festivities included the lighting of a historic, Fresnel lens. The fifth order drum lens that once warned mariners of treacherous waters is now operated by renewable energy. (Official USCG photo)

Baltimore, Maryland -- The U.S. Coast Guard opened its first Landfill Gas Renewable Energy Center during an all-hands ceremony at the Coast Guard Yard on Earth Day -- April 22, 2009. The Renewable Energy Center will burn methane from a nearby Baltimore City-owned landfill and convert the gas into two forms of energy -- electricity and steam -- for the shipyard's energy use over the next 15 years. The Coast Guard Yard becomes the first U.S. Coast Guard facility worldwide to be 100% self-powered by renewable energy.

The project is the first landfill gas co-generation center in the State of Maryland and meets the renewable energy requirements for the entire Department of Homeland Security for the next three years. Since the Coast Guard Yard will make its own electricity and steam, there will be less demand on the regional electric grid, a plus for national security during peak electric load days.

On Earth Day 2009, old technology met modern, green technology with the ceremonial lighting of a historic Fresnel lens with electricity converted from landfill methane gas. Dignitaries illuminated an 80 year-old minor lighthouse lens that once projected brilliant beams of light to guide mariners to safety. Originally lighted with whale oil, the Fresnel lens had an electrical power source since the early 20th century. History was made on April 22nd at the Coast Guard Yard with the lighting of the Fresnel lens with electricity produced from methane.

To demonstrate the Renewable Energy Center's co-generated steam energy form, the shipyard's steam-operated whistle loudly blew to signal the initial operation of the largest renewable energy project in Coast Guard history.

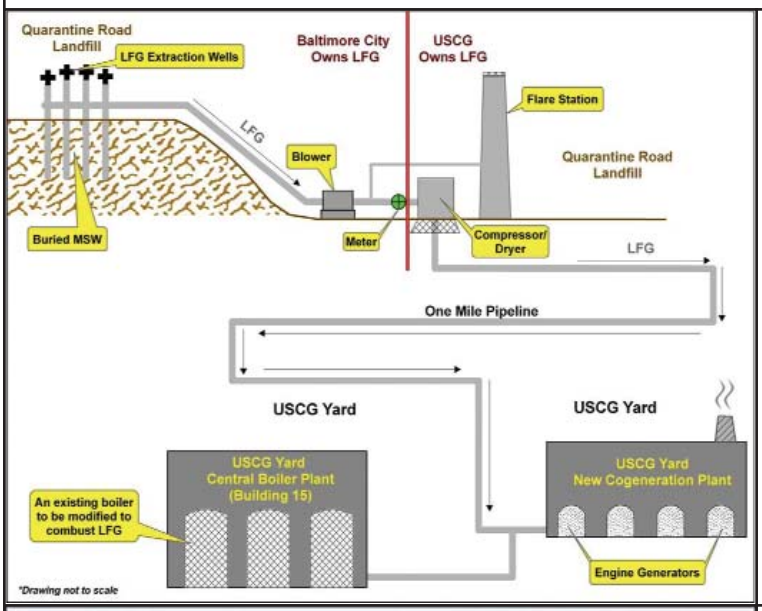
Read an overview of the Yard's Renewable Energy Center on the following pages.

An Overview

This project has been a collaboration of the Coast Guard Yard, City of Baltimore, and Ameresco Federal Services Group. The $41,000,000 15 year contract signed in October 2007 is the largest Energy Savings Performance Contract in Coast Guard History and is the Coast Guard's largest renewable energy project ever.

How it works

The Quarantine Road Landfill is owned by the City of Baltimore and is located on a 157-acre site less than one mile from Yard. It contains approximately 10,000,000 tons of waste. About 45% of the waste is Municipal Solid Waste (MSW) which produces Landfill Gas (LFG). About 35% of the waste is ash from the City's garbage incinerator, and about 20% of the waste is construction and demolition (C&D) waste.



Land fill Gas (LFG) is created as MSW decomposes in a landfill and consists of approximately 50% methane (CH4) and 50% carbon dioxide (CO2) and water vapor. LFG is the largest source of human-make methane emissions in the United States, and methane is a significant greenhouse gas that is 21 times more potent than Carbon Dioxide with regard to ozone depletion. Large landfills are required to collect and destroy the LFG in order to control its release into the environment, which is done through a LFG Collection System.

Landfill Gas (LFG) System Components

The city's LFG Collection System consists of wells, a header, a blower, and a flare located at the landfill. The first component is the LFG wells which are perforated plastic piping that are buried deep into the landfill to collect the LFG. For this project there are 34 wells scattered throughout the landfill.

Wells

The wells are connected together by a 1000' long header that is piping system connecting the wells to the blower system. The blower is a 40 horsepower motor that draws a vacuum on the header/wells in order to pull the LFG from the landfill through the wells and header. The blower is capable of pulling 2300 cubic feet per minute (cfm) of LFG.

Collection System/Conditioning System

USCG Yard Bioenergy Project Location

Legend

- USCG Yard Curtis Bay, Baltimore
- Baltimore City Quarantine Road Landfill
- Baltimore City LFG Collection System
- Offsite Pipeline (Ameresco Owned)
- Onsite Pipeline (USCG)
- Blower/Flare Station
- Compressor/Dehydration Station
- Renewable Energy Center (REC)

Flare Station

The final portion of the collection system is the flare which is the most visible component located at the landfill. The flare will burn any LFG that is not consumed by the renewable energy center. At 2300 cfm the flame is approximately 20 feet high.

Any LFG that is to be used by the Renewable Energy Center at the Yard is transferred to the Conditioning System which is immediately adjacent to the collection system at the landfill. The LFG Conditioning System is owned by Ameresco and consists of a refrigeration dryer and compressor. The refrigeration dryer cools the LFG down to 40° F to condense, or knock out, the moisture and contaminants. The condensate from the dryer is piped to the landfill's existing leachate pond. The compressor compresses the LFG to about 15 pound per square inch (psi) of pressure in order to push it through the pipeline to the Renewable Energy Center. To get the LFG from the landfill to the Yard the conditioning system pushes the gas through a 12" diameter High Density Polyethylene (HDPE) pipeline which runs under I-695 (Baltimore Beltway) a city road and railroad tracks. The pipe surfaces at the Yard adjacent to the Renewable Energy Center.

Rec Engine Generators

The Renewable Energy Center (REC) is a 5,000 square foot building that houses the equipment that uses the LFG to make electricity and steam for the USCG Yard. Four LFG Engine Generators (GE Jenbacher 320), each with an output of 1 MW, generate electricity at 4160 kV which is then stepped up to 33kV. A 33kV feeder in a concrete-encased duct bank has been installed between the REC and the Yard's electrical substation. The substation has been modified to allow the connection of the REC and to accommodate new pad-mounted switches with automatic normal-alternate switching. The modification to the substation also includes the installation of a new 3750kV step down transformer to serve the existing USCG 4.16kV switchgear and the necessary equipment to export power. The waste heat emitted in the engine exhaust stack is recovered in Heat Recovery Steam Generators (HRSG) and delivered to the yard's steam distribution system. Each of the HRSGs has the capacity to generate approximately 2000 lbs/hr of 95 psig steam. In addition, the methane is also directed to the Yard's central boiler plant where it is burned in a retrofitted boiler to produce the balance of the winter steam requirements.

Project Benefits

This project has many benefits with the environmental benefits of removing the methane from the atmosphere to the economic benefits of stabilized energy costs for at least the next 15 years.

From the environmental perspective for each year the renewable energy center operates it will be the equivalent of removing 33,000 cars from local roadways with the reduction in greenhouse gasses emitted.

The project cost the Coast Guard nothing up front. All of the initial construction costs were paid for by Ameresco. The Coast Guard will payback the $15,000,000 capital costs with the energy savings generated by the REC over the next 15 years.

By removing 4 MW (approximately equivalent to 2,500 homes) of electricity from the regional electric grid the project will help stabilize the electrical reliability on days when electrical demand is the greatest.

In the event of a widespread power outage due to natural disaster or man made event the REC has the capability to run in the "island mode" and provide 100% of the Yard's electricity requirement completely independent of the regional electric grid.

This project alone will allow the U.S. Coast Guard and Department of Homeland Security to meet our renewable energy requirements through 2012, as set forth in the Energy policy Act of 2005.

Renewable Energy Center (REC) Building

Aircraft Systems Into the Future

CAPT Joe Baker(CG-41) Chief
Office of Aeronautical Engineering

As my three year assignment as CG-41 comes to a close and I prepare to take command of the Helicopter Interdiction and Tactical Squadron (HITRON) in Jacksonville, FL, the leadership of the Aeronautical Engineering program passes into the capable hands of the current skipper of Air Station Barbers Point, Captain Brad Bean.

Aeronautical Engineering continues to support the comprehensive upgrade and recapitalization of our entire aviation fleet. We are making solid progress with fleet-wide enhancements extending the service life of our existing aircraft, while introducing new assets. Our maritime patrol capabilities are increasing with the introduction of the Coast Guard's new Medium Range Surveillance (MRS) and Long Range Surveillance (LRS) Maritime Patrol Aircraft (MPA), the HC-144A "Ocean Sentry," and the HC-130J Super Hercules. The mission systems of these two platforms provide new and enhanced capabilities, with integrated sensors that allow crews to identify targets of interest, assess vulnerabilities, compile data, and transmit information to other Department of Homeland Security / Department of Defense (DHS/DoD) assets through both classified and unclassified networks.

HC130J Mission System Suite.

There are currently six HC-130J and eight HC-144 aircraft in the Coast Guard inventory replacing the aging HU-25 fleet which is expected to retire by 2014. The HU-25 Guardian, with an average age of 25.6 years, has amassed over 255,000 hours in support of our Coast Guard missions. No recapitalization funding has been provided over the past six years, requiring projects to be financed "out of hide" or through fall-out funding. Last year we completed installation of new and greatly improved Direction Finding equipment (DF-430) on all our Falcons, and in the process of completing Flight Data Acquisition Unit (FDAU) installations, and upgrading our electrical system with a full AC electrical power replacement.

Coast Guard photo by Petty Officer 3rd Class Nick Ameen.

HU-25 Guardian and HC-144 Ocean Sentry.

Efforts to keep the HH-60J in the inventory through FY2027 have necessitated an upgrade to the cockpit and sensor systems. The avionics project is well underway with two aircraft already undergoing Operational Test and Evaluation. This upgrade completely transforms the flight deck instruments and displays with state of the art flat panels, and replaces 12 of the top 20 readiness degraders providing digital sensor capability and enhancing communications. This effort, in conjunction with installation of Aviation Use of Force (AUF) conversion kits, changes the aircraft mission design series from HH-60J to the MH-60T.

HC144A Mission System Pallet.

MH-60T Glass Cockpit.

HH-65

The H-65 continues to be the workhorse of the fleet and has gone through a number of variations to keep pace with the mission requirements of the Helicopter Interdiction and Tactical Squadron (HITRON), Aviation Use of Force (AUF), and the National Capital Region (NCR) Air Defense. The largest component of the Coast Guard aviation fleet, the H-65 average age is 21 years. The aircraft designation has evolved from the HH-65A, to "Bravo" models that incorporated the first major avionics upgrade, and all operational H-65s are now re-engined "Charlie" models. Numerous aircraft upgrades continue, with modifications planned through 2012 to transition the fleet in stages to the MH-65E, increasing mission capability, enhancing and upgrading communications, navigation, sensors, and flight management systems to include a future state of the art glass cockpit.

Our HC-130H Hercules, with an average age of 26 years, have been slower to modernize as we have concentrated on the structural health of the aircraft, such as the center wing box, to ensure continued safe operating life. However, a number of necessary projects have been completed, or are in progress, to modernize the fleet. The APS-137 radar is approaching the end of its service life and failing at an unacceptable rate. The Selex Seaspray 7500E, which takes advantage of advances in computer software and processing, was selected as a replacement and is now deployed at Air Station Clearwater.

Current HC-130H cockpit.

HC-130H

The aircraft is finally receiving a much needed cockpit overhaul as we proceed with an avionics upgrade project that will include a new digital cockpit with flat panel displays, military satellite communications (MILSATCOM) radios, global positioning system (GPS) approach capability, and a new flight management system (Rockwell Collins CDU 7000). The cockpit will be very similar to H-60T and future H-65 cockpits.

Our program managers here at Coast Guard Headquarters and at the Aviation Logistics Center have been working hard to make all these positive changes possible. As I transition back into the cockpit, I would like to extend my personal thanks to all of you for your support and diligence in our cooperative efforts to make the Coast Guard a more effective organization.

Best Regards,
CAPT Joe Baker

New HC-130H digital cockpit with flat panel displays.

Hidden Damage

Corroded Steel in Older Masonry Structures

by Marsha Levy, AIA
Architect, CEU Providence

The development of structural steel framing in the late 19th century created extraordinary possibilities in building and bridge construction. The strength of steel allowed the economical construction of multi-story buildings, and permitted larger spans and openings. As the use of steel increased, it was incorporated into traditional masonry exterior walls. One of the most common uses was as a lintel, the element that supports a wall above a door or window opening. Prior to the Industrial Revolution, openings for doors and windows in masonry walls were spanned by either masonry materials, in the form of arches or stone lintels, or by concealed wood members in simpler structures. It became common to use concealed steel angles and beams to span openings in masonry walls, replacing traditional lintel materials. These steel members could support substantial loads, but the construction technology of the time did not address the need to protect steel from corrosion. Unlike those in modern structures, steel members embedded in masonry walls were not protected by corrosion-resistant sheet metal or membrane flashing. Prior to the 1950s, engineers and architects did not often consider the implications of placing unprotected steel in exterior masonry or concrete walls. As a result, thousands of buildings built prior to 1950 exhibit problems from corroding steel framing and lintels embedded in masonry walls. The Coast Guard owns many buildings of this kind.

The problems that emerged from the use of unprotected steel in masonry stemmed from a lack of understanding of the permeability of masonry materials, such as brick, stone, and mortar. Traditional masonry walls of brick or stone absorb water. Older buildings often had solid walls that are more than foot thick. In this type of wall, rainwater saturates the outer portion of the wall, but does not usually travel through to the interior. The rainwater evaporates downward and outward toward the exterior. When a steel lintel is inserted into a wall of this type, rainwater repeatedly soaks the surface of the steel, starting a cycle of corrosion. In addition, the top of the steel acts as a collection point for water in the walls as it migrates downward. When there is no protection for the steel, such as flashing, severe corrosion begins. Although corrosion can be severe enough to reduce the load carrying capacity of the lintel, rust also damages the surrounding masonry. The phenomenon known as "oxide jacking" or "rust jacking" occurs when rust expands and displaces adjacent masonry materials. Brick and stone crack, mortar falls out, and as cracks and mortar loss progresses, a destructive cycle of water damage begins. A similar condition can also occur when steel columns and beams are partially embedded in masonry walls. The source of the damage is not always apparent. The clues include cracks and a band of rusted metal above windows and doors. At the interior, walls may have evidence of water damage around windows. Hairline cracks may also be visible in mortar joints.

Solid masonry walls are rarely used today, unless there is the need to grout the wall solid and use reinforcing. Solid walls reinforced masonry walls are used in zones with major seismic activity, and hurricane-prone areas such as southern Florida and Puerto Rico. Outside these areas, it is considered good practice to use masonry walls with cavities behind an exterior veneer. Cavity walls usually incorporate two methods of protecting steel members in walls -- flashing and drainage. Flashing is

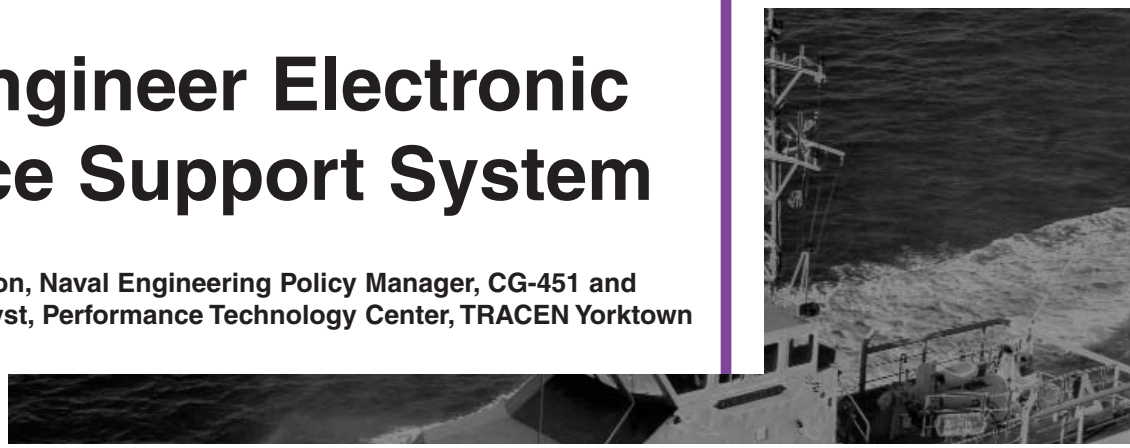
designed to cover surfaces of steel members that will be exposed to water-saturated masonry. In addition to flashing, cavity walls have a drainage cavity behind masonry veneer materials. Open joints or weep holes are placed above lintels to drain water out and prevent water collection at lintels. These measures can be defeated by poor quality control during construction, or by plugging open joints or weep holes. Some building owners and occupants think the holes or open joints are a defect, and plug them with sealant or mortar. Plugged drainage paths will create corrosion problems that require extensive repairs.

When building owners and occupants initially observe damage from rust jacking, a common reaction is to apply sealant to the cracks and to the joint between the steel and the masonry above. (See picture previous page) This can solve some water entry problems on a temporary basis, but it can create new ones. Although water enters through cracks, water that enters the walls can also drain outward if the joint above the lintel is left open. The sealant can trap water at the lintels, and worsen rusting. Another problem usually found in conjunction with rust jacking is a lack of provision for expansion and contraction of steel. Prior to 1950, the need to incorporate expansion joints in masonry walls was not well understood. Cracks where movement of elements such as concrete slabs and steel beams are common in buildings built prior to 1950. A masonry wall may have cracks from a variety of causes. Painting or covering masonry will cover such problems, but concealing the problems will not solve them, especially if movement in the wall has occurred.

To effectively repair buildings with rusted steel lintels, the rusted steel must be removed from the wall. This involves shoring the opening, inserting a new steel lintel, along with new flashing, and replacing the masonry. New steel lintels should be galvanized and painted. Flashing should be a long-lasting material that will not deteriorate unseen inside the wall. Weep holes can be added to facilitate drainage. The picture at the left shows a lintel replacement project in progress at the Station Shinnecock boathouse that was completed in 2004. The boathouse was built in 1940. The outer course of brick around the opening has been removed. A column for temporary shoring is also visible. In some instances, brick can be removed in an "arched" pattern that temporarily supports the wall above during lintel replacement. A new steel lintel has been set in place, and new flashing (visible in the picture) set in place over it. This opening is ready to be re-bricked. The windows were left in place during the work. The picture below shows the part of the replacement process for a steel beam that spans a larger opening in the same building. Temporary shoring has been inserted to carry the load from the roof and floor above. The rusted beam is visible, and has not yet been removed. In this location and at several others like it in the building, the deteriorated steel beam supported more than just the wall above -- there was also loading from a reinforced concrete floor system and the roof framing. Rusting was severe.

Since the Coast Guard owns many buildings of this generation, there is a need to identify and repair structures that require these kinds of repairs. In some cases, it may be cost-effective to replace the building. The poor condition of the beam shown above was only hinted at by cracks and a relatively small amount of rust visible above the storefront.

The Port Engineer Electronic Performance Support System



by LCDR James P. Thompson, Naval Engineering Policy Manager, CG-451 and Brittany Noelle Davis, Analyst, Performance Technology Center, TRACEN Yorktown

As the most recently assigned Port Engineer (PE) at your Naval Engineering Support Unit (NESU), you have studied and feel well prepared for your first solo maintenance availability. The cutter placed under your guidance begins a dockside maintenance availability next week. You are familiar with most of the scheduled repairs as a result of your experience as a Student Engineer and COTR training, but one project, the flight deck coating renewal, ventures into a unique specialty area. You know that flight deck renewal is executed differently from other coating projects, but your only experience is with standard deck preservation. As the PE, your highest priority is ensuring that the contractor is performing quality work and that the job is completed in accordance with contract requirements. What's next and what resources are available? You know of several available resources, such as the Maintenance and Logistics Command Atlantic's (MLCLANT) tutorial on flight deck preservation, but would like more in-depth guidance. A senior PE suggests the Port Engineer EPSS, which you discover provides the special tools, inspection points, and environmental requirements information you were looking for.

EPSS stands for Electronic Performance Support System. EPSS may sound unfamiliar and complicated, but the truth is you use EPSSs almost daily; each time you withdraw money from an ATM; when you check in for a flight at the airline self-help kiosk; and when you use tax preparation software. Although these examples of EPSSs illustrate variations in terms of purpose and format, they, like all EPSSs, are doing the same thing -- providing the user with the information and guidance required to accomplish a specific task when the user needs it.

Armed with an EPSS, you do not need an accounting degree to prepare your taxes. Instead, you can "hit the ground running" because the help you need is built into the tool and packaged in a logical way. This is the beauty and value of a well-built EPSS.

With an understanding of what an EPSS is about, you can see how the Port Engineer EPSS can help you perform your job more effectively and efficiently. Using the PE EPSS, you can gauge the contractor's performance of the "near white blast" on the deck, based on procedures and criteria in the applicable standard (in this case Steel Structures Painting Council (SSPC-SP-10)). You will be able to determine the "dry film thickness" of the applied coatings and verify that the depth is within acceptable standards. You know the temperature range at which paint coatings may be applied and can ensure that the contractor is not painting at inappropriate times. You also know what engineering calculations are involved in dry-docking and why they are important. You can identify what special tools are required to complete various depot maintenance activities on board your cutter and can explain how to use them to the junior engineers.

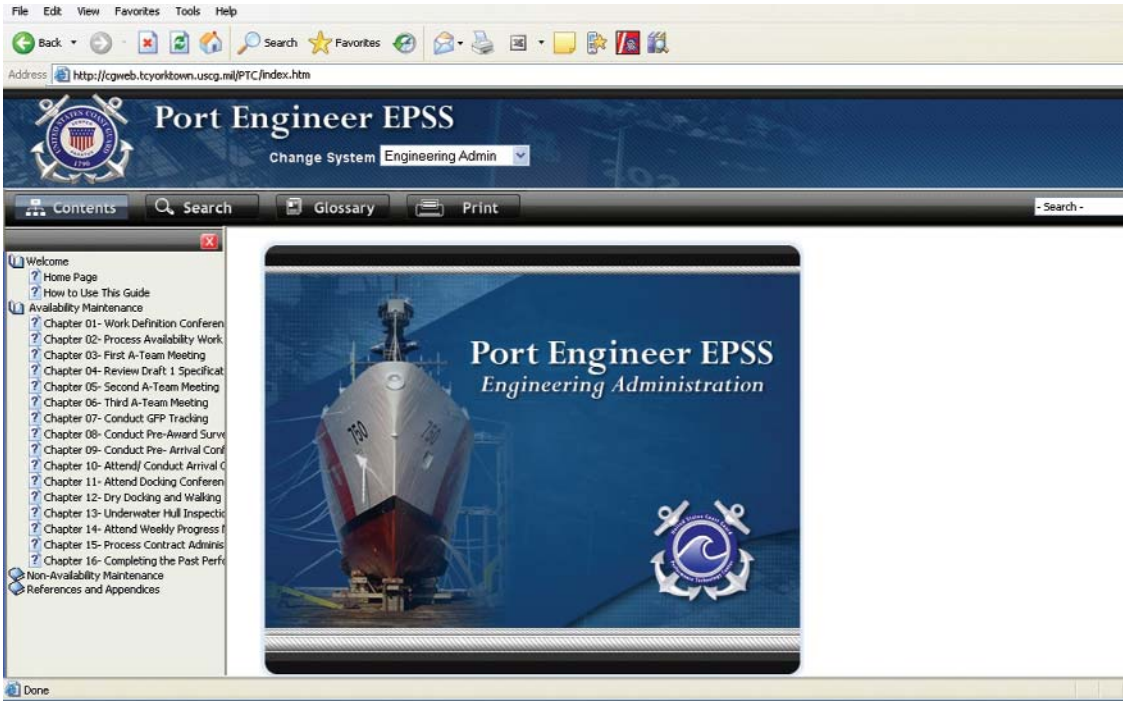
Recently, a majority of 87' CPB engineers reported in a survey that they would like to have an EPSS on their next platform and you can see why. It's only a week before the cutter's availability and since you have no time to attend training or go through a pile of manuals, the EPSS will be a lifesaver.

The effort to acquire the Port Engineer EPSS began in 2008. Naval Engineering leadership expressed concern that over the years, the job of the Port Engineer had changed significantly and, as a result, the legacy support mechanisms for Port Engineers were now outdated. To address this concern, MLCLANT, in cooperation with MLCPAC (Pacific), asked the Office of Naval Engineering (CG-45) to commission a study to validate the contemporary world of work for Port Engineers and compare this to their existing performance support infrastructure.

In February 2008, a group of seasoned Port Engineers and subject matter experts from several NESUs, and type desk managers from both MLCs met with analysts from the Performance Technology Center (PTC) to begin the process of

defining the Port Engineers' world of work. The Team's first challenge was to capture all the tasks that Coast Guard Port Engineers were currently accomplishing in the field, no matter whether the task was being performed on boats or on cutters. This master task list became the foundation for an online survey, which was distributed to every PE in the Coast Guard. Nearly 100% of them provided their input and as a result, this data provided an all encompassing picture containing specific information on tasks performed, task locations, and resources used by the Port Engineers. The data driven results revealed that the development of a Port Engineer EPSS, designed specifically to support validated Port Engineer tasks, would fulfill the performance support requirement.

Much like our PE responsibilities, the scope of the EPSS spans the entire Coast Guard Engineering Body of Knowledge. As such, Coast Guard resources from the Design and Development Team at the Performance Technology Center are dedicated to building the Port Engineer EPSS. Unlike a commercial off-the-shelf- application, the EPSS will address the specific needs of the Coast Guard Naval Engineering community. The EPSS is divided into seven modules tailored to the support categories from current Coast Guard Port Engineers: Contract Administration, Paint Inspection, Non-Destructive Testing process, Training Support, Dry-docking Procedures, Welding Processes, and Shaft Alignment Procedures. Because of the sizeable scope involved, the EPSS will deploy in two phases. The first phase is already under development and will be completed by the end of FY09. The Phase I performance areas are Administration, Paint Inspection, Non-Destructive Testing Processes, and Training Support. Phase II is scheduled for completion by the end of FY10 and will address the performance of Dry-docking Procedures, Welding Processes, and Shaft Alignment Procedures. Based on a separate EO/EPO gap analysis, an additional EPSS dedicated to EO/EPO specific issues is planned for FY10.



Each module of the EPSS will provide the user with access to systematic instructions, important warnings and cautions, a listing of special tools required for the job with information on how to use them, and links to relevant standards and specifications. A search feature included in the EPSS will enable Engineers to locate the information they need based on the task requirements. The EPSS is specifically designed to ensure access from the field. Through an interactive Intranet-based application and a stand-alone aspect, access from SWIII or personal computers will also be available.

Whether you are a new PE tasked with overseeing flight deck preservation or an EPO who desires to enhance your knowledge of Naval Engineering, you will want to watch for the release of this new tool. A Naval Engineering Advisory will notify the Naval Engineering community and a link to the EPSS will be posted on the CG-45 CG Central site once the EPSS is deployed.

The Port Engineer EPSS provides a centralized, accessible location for all information relating to cutters or boats in depot level availabilities. More than just a PE tool, anyone requiring this type of information can gain the vital insight required to get the job done. As witnessed through feedback from the field regarding the award winning 87' Coastal Patrol Boat EPSS featured in the Spring 2009 *EE&L Quarterly*, it is a low cost, high return method of optimizing mission readiness by providing performers in the field with the assistance they need to do their job in a flexible, just-in-time, on-demand format. This new tool will bring value not only to the Port Engineer but also to the Engineer Officer, a vessel availability inspector, or an EPO. As we strive to transform current engineering maintenance activities into a more efficient system through Modernization, key initiatives such as the EPSS play a fundamental role to support our most important assets, the hard-working members of the naval engineering community.

MSP Induction Demonstrates EAL's Extensibility

by Ryan Somma, USCG Aviation Logistics Center

ELIZABETH CITY, North Carolina, April, 2009 - In the year 2000, the Electronic Asset Logbook (EAL) started out as an information system that primarily managed air station aircraft and personnel logistics. With the addition of Coast Guard boats to EAL's responsibilities in August of 2007, the "Electronic Aircraft Logbook" became the "Electronic Asset Logbook." Expanding the system to accommodate both boat and aircraft configurations and their operational rules required a highly-normalized and more-generic database architecture and the implementation of metadata, data that defines data, to meet the differing business needs.

These enhancements to EAL's underlying framework laid the groundwork for additional asset types, and, in August of 2008, EAL inducted the Mission Systems Pallet (MSP), a roll-on, roll-off suite of electronic equipment for the HC-144A aircraft. Although the pallet uses the same maintenance interface as boats and aircraft, it is primarily an information system, and the maintenance of it primarily deals with software upgrades, installation, and networking. Additionally, inducting the MSP meant expanding EAL's functionality to allow for installing assets onto other assets, so they may be tracked together for operations. The induction of pallets demonstrates that EAL can be adapted to service a wide range of asset types.

Sample Aircraft Maintenance Records.

O	!	29 SEP 2008 / 1840 Z **TCTO T93140.0 (Install of MSP Software V2.6.7) needs to be completed before next flight.** - DOE J AET1 0000	01 OCT 2008 / 2049 Z **Completed TCTO T93140.0 and ops checked good IAW SOVT rev. A.** - DOE J AET1 0000 Toolbox: MTT	✓		!
C		26 SEP 2008 / 1622 Z **From Special Inspections: SIPRNET update due.** - DOE J AET1 0000	26 SEP 2008 / 1748 Z **Completed updates IAW Lockhead Martin and TISCOM procedures.** - DOE J AET1 0000 Toolbox: SENSOR	✓		✓

Current plans for EAL include inducting Coast Guard cutters into the system, which requires the capability to track helicopters, cutter boats, multiple subsystems, and other assets deployed with the ship. There is also a project underway to produce a new application framework for EAL, increasing the flexibility of the database architecture and implementing an object-oriented infrastructure to further expand the system's potential. In the future, vehicles, computer systems, and even buildings can be assimilated into the EAL application and the rest of the Asset Maintenance Logistics Management System (ALMIS) during Logistics Transformation.

For additional information on ALMIS or the Electronic Asset Logbook (EAL), please contact LCDR Rob Taylor, Information Systems Division Chief, USCG Aviation Logistics Center: Robert.f.taylor@uscg.mil or (252) 335-6789.

Sample Aircraft Maintenance Records.

Discrep Status	X if Grounded	Discrepancy	Corrective Action	Mech	GC	QA
C	○	27 MAR 2009 / 1756 Z **TCTO # T24000.0 RH MBDU DC GPU-IN Term Lug , needs to be compleated.** - DOE J AET1 0000	27 MAR 2009 / 1932 Z **Complied with TCTO # T24000.0 IAW TCTO.** - DOE J AET1 0000 Toolbox: ATAF	✓		✓
O	! ○	25 MAR 2009 / 1404 Z **Panel 128R [GPU Ground Point Panel] is open for Maint.** - DOE J AET1 0000		!		○

HBSS: End-Point Security

by Mike Gawlas, Defense Information System Agency

The Defense Department's networks are now safer and more secure thanks to a quiet upgrade that promises superb end-point (host) security.

In use now, DoD's host-based security system is a client-server system that attaches a management agent to each host (server, desktop, laptop) for end-point security across the DoD enterprise. The system is managed by local administrators and configured to block known-bad traffic using an intrusion prevention system and host-level firewall. HBSS provides a framework that allows DoD components to integrate existing security products and eliminate redundant systems management processes. A break-down of HBSS's functions and capabilities include:

- Centrally Managed Host-Based Enclave Level (Tier-3) IA/CND tool
- Intrusion Detection System (IDS)
- Host Intrusion Prevention System (HIPS)
- Host Firewall System
- Robust white list capability
- Allow use or execution of only authorized software/hardware (peer-to-peer software, applications, USB devices and thumb drives)
- Automated Support for INFOCON baselining
- Robust Buffer Overflow protection
- Rogue System Detection
- Ability to detect and report unauthorized computer systems on the network

HBSS History In 2003, DoD's Enterprise-wide Information Assurance and Computer Network Defense Solutions Steering Group (ESSG) was formed and chartered. The purpose and mission of the ESSG is to integrate, synchronize, and rapidly field enterprise-wide computer network defense solutions to support operational requirements. The ESSG is co-chaired by the United States Strategic Command and the Joint Task Force-Global Network Operations. Subordinate to USSTRATCOM, JTF-GNO has the responsibility and mission to conduct operations and defense of DoD's global information grid.

As the ESSG highlighted comprehensive host-based security as a prioritized requirement for the DoD, it began gathering detailed requirements in the Summer of 2005. In March 2006, a contract was awarded to BAE Systems and McAfee for an automated host-based security system solution. This would provide network administrators and security personnel with mechanisms to prevent, detect, track, report, and remediate malicious computer-related activities and incidents across all DoD networks and information systems. Piloting began at 22 sites a few months later, followed by testing, certification, accreditation, and source code reviews. Separate contracts acquired additional capability modules.

The Order! The deployment and installation of HBSS became mandatory across the Non-Secure Internet Protocol Router Network (NIPRNet) in October 2007 through a JTF-GNO Communications Tasking Order. This CTO required all Tier 3 (enclave-level) NIPRNet networks to have HBSS installed by June 2008. In February 2009, JTF-GNO issued an additional order requiring immediate acceleration of HBSS deployment and installation on the Secret Internet Protocol

Router Network (SIPRNet). The Defense Information Systems Agency, working in concert with the military services, DoD agencies, and COCOMs, identified the required resources to meet implementation goals for the aggressive timeline. DISA planning also factored in additional teams to perform worldwide installations, in-person training classes, and to create virtual training for system administrators.

Implementation Success The pilot phase of the HBSS life cycle captured valuable lessons, to include that successful HBSS installations and deployments occurred in organizations with strong network defense workflow processes, a full understanding of the local network infrastructure, and strong and enduring leadership support. It helped that leaders and operators at all levels, responsible for defending their portion of the network, are becoming more aware that admitting one malicious information packet into the network can cause mission-impacting damage. Educating network users and deploying HBSS endpoint security capabilities can mitigate the probability of a user's activities endangering the network environment or putting other DoD networks at risk.

Managing Expectations HBSS is just a single tool in the DoD IA/CND portfolio and should not be considered a network security "silver bullet." Multiple practices and toolsets achieve the required layers of defense. Leaders and resource managers should understand that HBSS is not an autonomous system and requires dedicated, trained, and conscientious administrators. However, once the HBSS hardware and software are properly installed in a network enclave, configuration management becomes relatively straightforward. As new modules become available, they can be seamlessly added to complement existing network and information system defense capabilities.

Acknowledgement: The author would like to thank DISA's IA/NetOps Program Executive Office (PEO-IAN), the HBSS PMO team, and the information and resources located at the IASE website and DKO portal. Each of these resources provided valuable and updated information relevant to this article.

About the Author: Mike Gawlas provides program support and IA/CND subject matter expertise to the ESSG and JTF-GNO, part of a team from DELTA Resources, Inc. and SCITOR Corporation. After graduating from the U.S. Naval Academy, he spent 10 years on active duty in the Navy, flying the S-3B Viking and as an information assurance and information operations professional at JTF-GNO. He is a Certified Information Systems Security Professional (CISSP), Certified Information Security Manager (CISM), and certified Project Management Professional (PMP). He earned a MS degree in Computer Science from George Mason University in 2007. He now serves as an officer in the Naval Reserve.

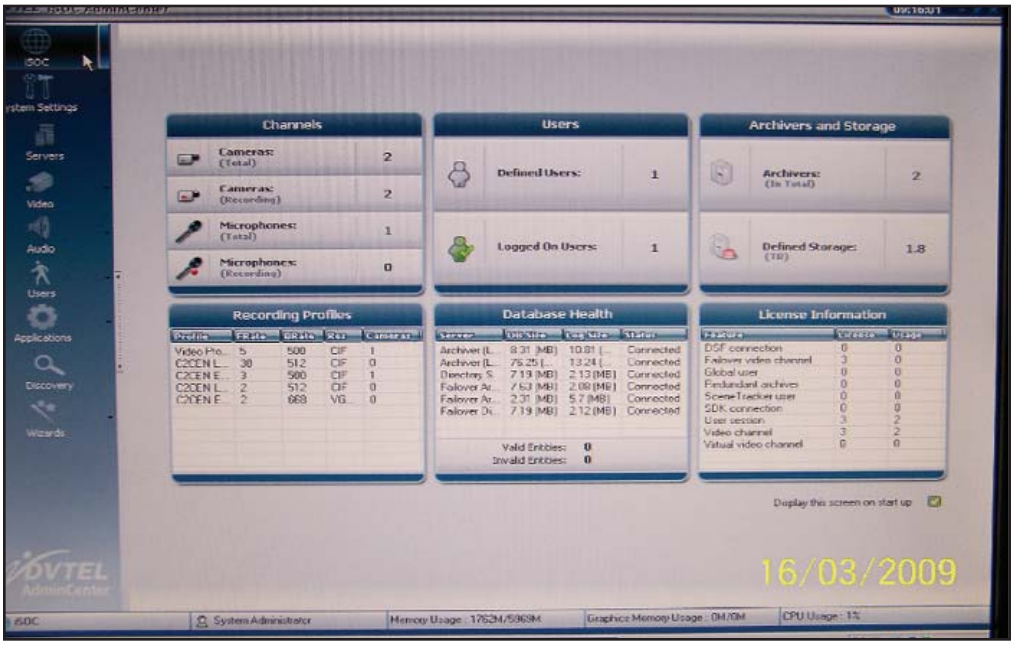
Additional Information:
DISA Information Assurance Support Environment
http://iase.disa.mil/
DISA IA/NetOps Program Executive Office
http://www.disa.mil/peo-ian/
HBSS Fact Sheet
http://www.disa.mil/news/pressresources/factsheets/hbss.html

Integrated Network Video System (INVS) for the USCG Vessel Tracking Service (VTS)

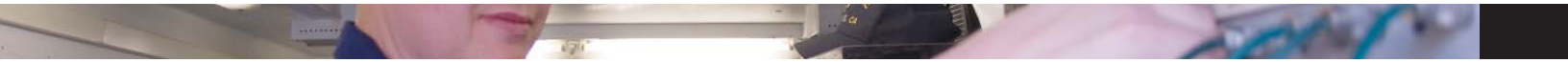
By Thomas James, C2CEN

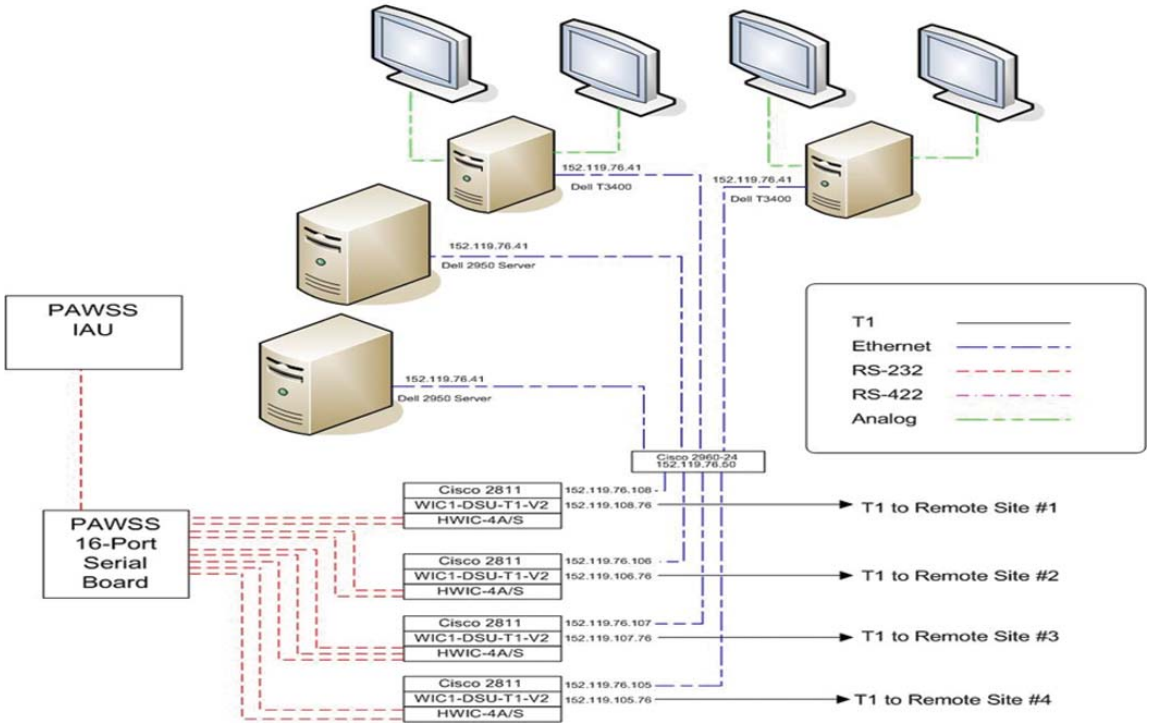
Video from client workstation 1 on C2CEN's INVS baseline.

The Integrated Network Video System (INVS) is an Internet Protocol (IP) based video system used for the purpose of enhancing surveillance in support of Maritime Domain Awareness. This system is to replace the existing legacy analog video control systems at all Vessel Traffic Service (VTS) sites. INVS is easily configurable, scalable, supportive of open architecture, widely supported, and interoperable with other agencies. With INVS, operators will easily be able to view live and recorded video simultaneously, control PTZ cameras with the click of a mouse, view instant replay, export archived video clips to an .avi file or a DVTel proprietary.dvt video file that is water marked and will hold up in court, and view many display configurations. These are just some of the features of the system. INVS was prototyped at VTS Saint Mary's River (SSM) in Sault Ste Marie, Michigan, October 2008. After a 45 day evaluation of the INVS prototype at VTS SSM, the Operation Director deemed that INVS is an enhancement to their operations mission. The heart of the system is DVTel's Latitude Version 5 software. With this software there is no need for a Digital Video Recorder, a matrix switcher, and a video multiplexer.



Dashboard of server1 on C2CEN's INVS baseline. The Dashboard is a snapshot of the system's performance.





Typical Vessel Traffic Center.

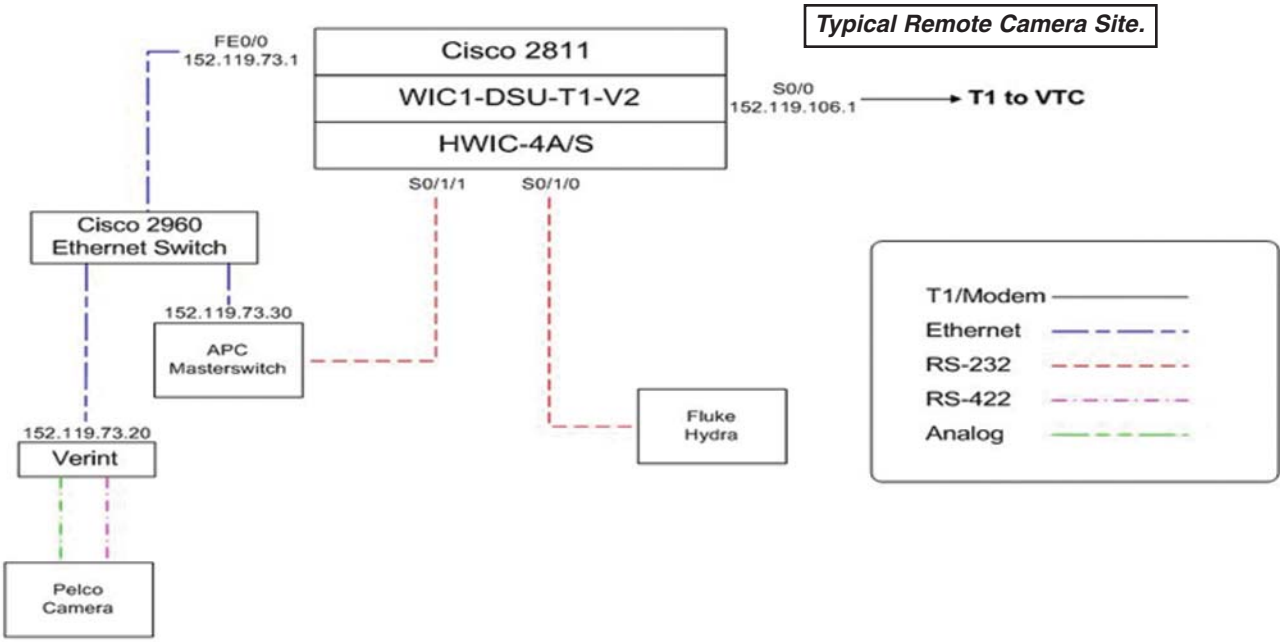
INVS hardware platform consists of:

- ✔ Dell PowerEdge 2950 III Server (2 servers for redundancy)
- ✔ Dell Precision T3400 Workstation (Number of workstations dependent on VTS requirements)
- ✔ Cisco 2960 Ethernet switch
- ✔ Verint Nextiva encoder, S1970e
- ✔ Camera

INVS is independent of the CG Data Network and has the capability of forwarding video to Port Partners.

C2CEN POC is Mr. Thomas James or Mr. Steve Farthing.

Typical Remote Camera Site.



Asset Project Office (APO)

by CAPT Mark E. Butt, Commanding Officer, APO Baltimore

APO and SFLC Ribbing Cutting: (From left to right) Captain Blackall, Captain Butt, Vice Admiral Pearson, Admiral Allen, Congressman Elijah E. Cummings, and Congressman Dutch Ruppersberger cut a ribbon at the Coast Guard Yard in Baltimore Monday, Jan. 26, 2009 to commemorate the formation of the SFLC and APO Baltimore. U.S. Coast Guard photo/Petty Officer Brandon Webster.

On January 26th, 2009, on the grounds of the Coast Guard Yard in Curtis Bay, Maryland, I participated in a ribbon cutting ceremony with Admiral Allen; Congressman Ruppersberger of Maryland's Second Congressional District; Congressman Cummings of Maryland's Eleventh Congressional District and the Chairman of the Subcommittee on the Coast Guard and Marine Transportation; and Vice Admiral Pearson. This ribbon cutting ceremony formally commissioned two new commands; the Surface Forces Logistics Center (SFLC) and the Asset Project Office (APO) Baltimore, marking an important milestone for both Coast Guard Modernization and Logistics Transformation. The APO plays a unique role in Coast Guard Mission Support, and this article will discuss it's origins as well as its role in transforming Coast Guard Mission Support under our new Coast Guard Logistics Business Model.

What is the APO?

The Asset Project Office (APO) is an independent and largely self-contained Coast Guard acquisition command that is responsible for all aspects of asset logistical and operational support up to the point that the acquisition is complete and the asset moves into sustainment. The APO plans, manages, and executes the transition between a newly acquired asset and a legacy asset. The focus of the APO is to make this transition safely and effectively with minimal impact on the operators and maintainors in the field. The APO views the receiving field unit, Acquisition Program Manager, PRO, and the Logistics Center responsible for sustainment as its primary customers. A key component of the APO is the asset Product Line which transitions from the APO at the end of the acquisition phase to the designated Logistics Center for sustainment, providing critical continuity for the life cycle support of the asset.

The primary mission of an APO is to deliver an asset to the field that meets the Operational Requirements Document (ORD) and is optimized for all Integrated Logistics Support (ILS) elements at a desirable cost, schedule, and performance level. Properly planned and executed, these result in Coast Guard systems deployed to operating units that are properly equipped, trained, and provisioned; with an established infrastructure prepared to provide field level support. The APO pays particular attention to operational suitability. That is the degree to which a system can be satisfactorily placed in field use, with consideration given to reliability, availability, compatibility, transportability, interoperability, national incident response usage rates, maintainability, safety, human factors, manpower supportability, logistics supportability, documentation, training requirements, and natural environmental effects and impacts. The APO provides for the early planning of suitability through evaluations ensuring operating hours, environmental testing, maintenance demonstrations, testing profiles, and test requirements are addressed and are evaluated in a mission context in order to provide meaningful results.

The History of the Coast Guard APO

In June 2005 (then) Vice Admiral Allen directed the use of our aviation business practices for all asset types in the Coast Guard, standardizing Coast Guard mission support for the first time in our history. The APO is a key component of that mission support model by ensuring that asset acquisition and introduction to the field is done properly, and an APO has been used to successfully acquire and field the HH65 (Dauphin) Short Range Recovery and most recently the C130J Long Range Surveillance aircraft. For each of these aircraft new APOs were created solely to acquire and deliver these specific assets. The role of the APO extended beyond just asset acceptance and contractor oversight, but included insuring units were fully trained in all aspects of operation and support, and that the unit had the proper infrastructure improvements to enable them to conduct their operations and support responsibilities. Upon delivery of the final airframe, the APO stood down and they transferred their established product lines to the Aircraft Repair and Supply Center (ARSC) to manage these assets into sustainment.

APO Baltimore - The Next Generation APO

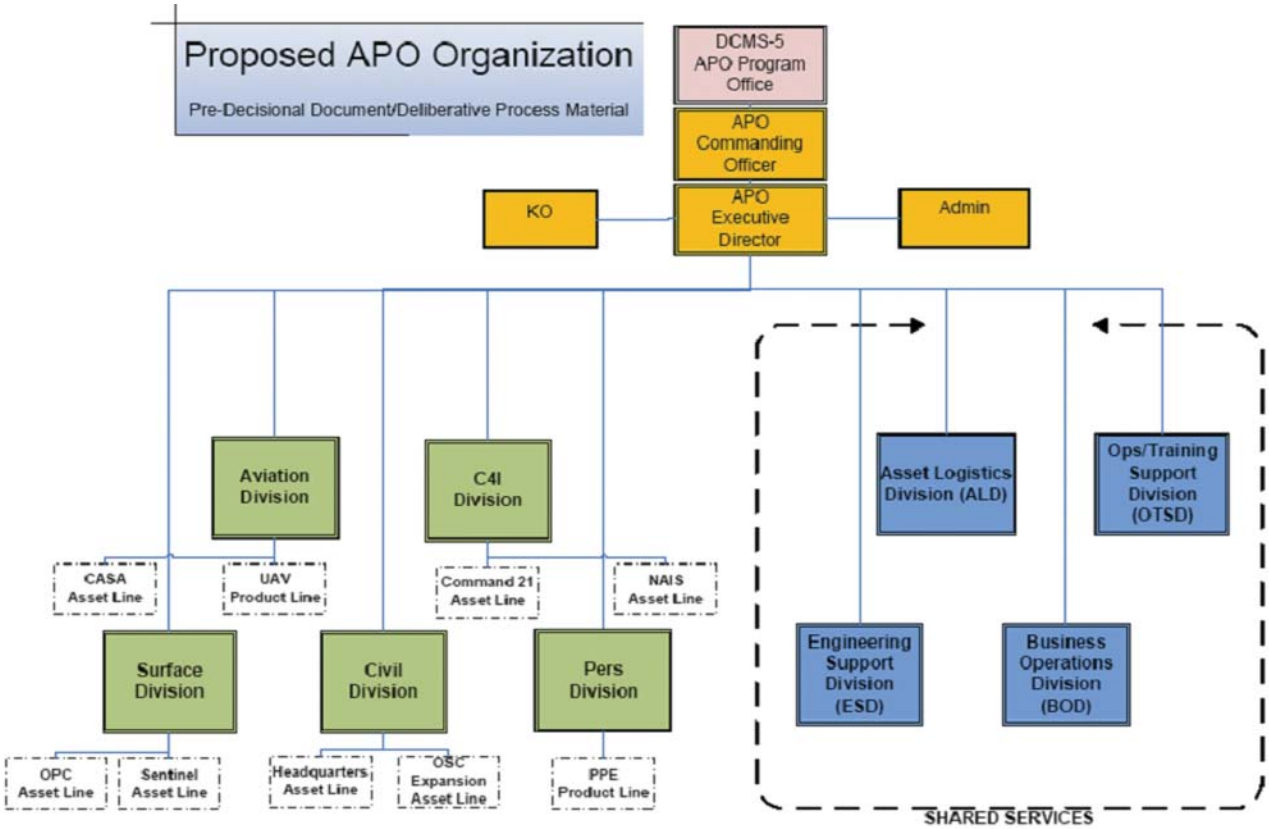
Unlike previous APO commands formed to deliver select airframes for Coast Guard aviation, APO Baltimore is a permanent mission support entity which will receive, indoctrinate, and ultimately deploy new product lines for both legacy and new acquisition assets across all of our asset disciplines. The APO will be comprised of divisions for surface, aviation, civil, C4IT, and personnel which will focus on building and training new product lines for legacy and new acquisition assets, and in assisting these new product lines in the successful deployment of their assets across the Coast Guard prior to releasing them to their destination Logistics or Service Center. In addition to asset-focused divisions, the APO will have four shared-service divisions which will provide support to established product lines. These are the Asset Logistics Division (ALD), the Engineering Services Division (ESD), the Operations and Training Support Division (OTSD), and the Business Operations Division (BOD).

SBPL - The First non-Aviation Product Line

To accomplish the Commandant's direction the Logistics Transformation Program Integration Office (LTPIO) and the APO Baltimore formed a Small Boat Product Line (SBPL) to re-baseline and standardize information for the legacy boat fleet and establish and maintain contract standards that ensure future acquisition projects deliver "suitable capability" to our operational and support units. At the time of this writing the new SBPL is preparing to migrate to its permanent home within the SFLC Product Line Management Division. Presently the SBPL is transforming our legacy assets' technical data into configuration-based, maintenance-driven supply products that are loaded into our selected interim logistics IT tool, ALMIS, so that these assets can be managed in accordance with our Logistics Business Model. Deployment of these new processes and the supporting IT have already been accomplished in Districts 11 and 13, and at the time of this writing is getting underway within District 5. Already, the SBPL can point to a host of early successes, detailed in a separate article within this issue of the *EELQ*, see page 48.

The **ALD** is principally responsible for supporting the fiscal and supply management responsibilities of the APO and its formed product lines, including budget preparation and funds execution, source of supply identification and inventory optimization, and provide a full range of supply chain management capabilities. The **ESD** assists product lines in the coordination and implementation of new asset equipment, systems and procedures, the management of technical data, system and subsystem maintainability and reliability, and provides a full range of other technical services needed for life cycle management. The **OTSD** is responsible to the APO Commanding Officer and product line divisions for supporting Operational Test and Evaluation (OT&E), development of operational training packages for all crew positions, conducting unit site surveys, preparing operational units to receive new assets, and ultimately coordinate the transfer of ownership of all asset training materials to the appropriate training center. Finally, the **BOD** is responsible for administering the business operating environment of the APO, to include directives, operating procedures, job aides, desk guides, quality assurance, process improvement, and APO and product line performance measurement and monitoring.

This is a high level overview of each division's responsibilities and complete descriptions can be found in the APO Functional Statement. The APO's proposed organization structure is depicted in the following org chart graphic.



APO Organization: The APO has divisions focused on Product Line formation, shown on the left, and shared services contained within the dotted line box. Like all of our new Logistics and Service Centers, the APO is a "work in progress." This depiction of the APO Organization shows positions in green which have already been resourced. The APO will achieve Interim Operating Capability during late FY09 and hopes to achieve Full Operating Capability in late FY10 or FY11.

How Acquisition differs under an APO

Today the Coast Guard's acquisition managers deliver capability with inconsistent outcomes due in part to our use of Integrated Logistics Support Management Teams (ILSMT) consisting of matrixed (i.e., part time) personnel and the attendant inability to get certified and/or dedicated subject matter experts. The acquisition project office is focused on the overall acquisition project and having the asset meet the requirements set forth in the ORD, while the Project Resident Office (PRO) is concerned primarily with contract oversight and quality control, typically on site with the manufacturer. It is the ILSMT which is responsible for ensuring that the asset can be operated and sustained by our people and within our existing infrastructure, often without the expertise or resources to address key aspects of the suitability equation. The resulting disparities are left for the sustainment community, and our field personnel, to wrestle with.

An example of this inconsistency is evident in the approach to logistics information support by various acquisition programs. Inconsistent approaches to configuration information, technical data, maintenance procedure card format, and supply data have resulted in a plethora of "one off" logistics IT systems. The RB-S, TANB, and SPC-LE require the field to use of the Fleet Management Information System (FMIS) for technical information, parts data, and warranty support. The RB-M project will require the field to use the Integrated System Model (ISM) with includes an Interactive Electronic Technical Manual (IETM). Rescue 21 has its own asset support system, and Deepwater was on a path to require the field to use DW-LIMS. CG-761's Satellite Datum Marker Buoy Project and Command 21 Program also each use their own logistics IT system solutions. While these examples focus on IT, because of the inconsistent outcomes each major and minor acquisition project's ILSMT produces, the field is forced to learn and navigate through a myriad of functionally equivalent business processes and IT systems. Interestingly, it was the proliferation of various logistics information management systems that produced the most visible evidence of our stove piped and disjointed approach to asset support across our enterprise, leading Vice Admiral Allen to establish the Logistics Transformation Program Integration Office. Inexplicably, the stove piping and IT proliferation continues despite the Commandant's consolidation mandate.

In contrast to the model described above, the C-130J APO was a single, self-contained, full-time, permanently assigned ILSMT with a minimum of matrix support required. This command had Subject Matter Experts (SMEs) who delivered the asset using the same system as all other CG Aviation assets: ALMIS. In addition to the information management system, the format and quality of the configuration, maintenance, supply, and other technical data is the same. When delivered the field needs only to learn the operating and maintenance procedures of the asset, and not relearn an entire support system behind it.

As Admiral Allen stated in his opening letter to the Summer 2006 edition of the *Engineering, Electronics and Logistics Quarterly* Magazine, "Acquisition projects, of any size, must not exist in a vacuum. The solutions they bring must be extensible to the entire organization, and not just selected parts of it. Acquisition logistics must roll seamlessly into sustainment logistics, and provide solutions that benefit the entire enterprise." Acquisition programs must deliver solutions that operate within our Logistics Business Model, and if changes to that model are desired, they must first be brokered with and approved by the sustainment community so those changes can be incorporated throughout the enterprise. Through accepted configuration management practices we must manage our chosen Logistics Business Model and its key components with the same discipline that we manage the configuration of our mission critical assets.

This is not to say that acquisition projects should not bring new capability to the Coast Guard beyond that which they were explicitly chartered to provide. For example, the RB-M project's Interactive Electronic Technical Manual (IETM) initiative clearly demonstrates a way ahead for Coast Guard technical information management. However, the sustainment community does not presently have the skill, training, and infrastructure to support it and the project did not budget to upgrade the CG's technical data management capability.

In Conclusion

Identifying and eliminating these gaps is key reason the Coast Guard is investing in a permanent APO as a key component of Modernization and Logistics Transformation. The APO task is not a small one: establishing product lines with new business process for all of our current assets while simultaneously preparing to establish product lines for new acquisitions as well. The workload is immense, but the outcome is worthy of our efforts.

About the author:
Captain Butt is the first Commanding Officer of APO Baltimore and a 1982 graduate of the Coast Guard Academy. He is Coast Guard Aviator No. 2397 and holds a Master of Science degree in Aeronautical Structures from Purdue University. Prior to assuming command of the APO he was previously assigned as Commanding Officer of Air Station Detroit and Air Station/Group Humboldt Bay. He has also served as the Chief of Aeronautical Engineering for the Coast Guard and was the HH65 Product Line Manager at the ARSC, (now ALC) in Elizabeth City, NC.

Logistics Transformation: Cost Savings and Success Stories

Logistics Transformation Program Integration Office (LTPIO)

Transforming the Coast Guard to a single Logistics Business Model had many goals in mind; the primary objective to implement a common way of doing business across the Coast Guard support communities based on centralized management and control with distributed execution. The model was established for the delivery of dependable, effective, and efficient support to operators for mission execution. As we continue this transformation effort, many "Success Stories" have been shared by those in the field, and our more efficient Logistics Business Model has created many cost savings to the Coast Guard. Here are some of the stories that have been shared with us:

- The Small Boat Product Line (SBPL) changed the maintenance schedule for 41' UTB, 47' MLB, and 55' ANB engine overhauls from a strictly hours-based overhaul schedule to entirely condition-based, using trending data, mission profile, and hours. This effort has averted more than $210K this year (cost avoidance) with negligible impact to operational readiness. This has also allowed the Coast Guard to capitalize on engineering improvements to the 47' MLB and 41' UTB that have increased engine life.

- The SBPL developed a technical package and Performance Work Statement (PWS) to accomplish boat-trailer Programmed Depot Maintenance (PDM) at FRSEFAC Solomons Island. The average PDM cost of the RB-S trailers was $3,857 compared to $8,634 for a new trailer. Thus far, this program has netted approximately $35K in cost avoidance. When implemented fleet-wide, it will save $350K/year.

- The SBPL took a holistic review of all Honda engine maintenance, and based on information from ALMIS, a set of "run to failure" tests in a lab, and MPC extensions performed in the field, we increased the frequency of most engine MPCs. We currently have over 900 engines operating in the field. The previously implemented MPCs (taken directly from Honda maintenance requirements) were crafted for recreational use. The cost savings of this change (observed predominantly at the unit level for modernized units) is $2M a year in labor and parts and increases reliability.

USCG photo by PA2 Jacquelyn Zettles.

Laura W. Kelly, 2009 Coast Guard Engineer of the Year

Laura W. Kelly

Laura W. Kelly, USCG Integrated Support Command, Kodiak, Alaska, is the 2009 Coast Guard Engineer of the year. She was selected from a group of nominees throughout the Coast Guard, both civilian and military for her engineering work in Alaska.

In an ALCOAST message Ms. Kelly is recognized for being "responsible for engineering design, engineering review, and system management of over seventy-five commercial facilities and over twenty-one miles of water and wastewater treatment plants that support the Coast Guard's largest facility, its 2000 residents, the Kodiak State Airport, and the Buskin River State Park. Individual initiatives started by Ms. Kelly have lead to many improvements to the engineering infrastructure of ISC Kodiak, including the 3-D Geospatial Computerization of base utility maps, re-establishing a base-wide survey control and monumentation program for the 21,000 acre facility, and completing a seismic vulnerability study for critical shore facilities structures using FEMA guidelines. Ms. Kelly was appointed by the Governor of Alaska to serve on the Alaska Seismic Hazards Safety Commission and currently serves as the Vice Chair for the organization."

Ms. Kelly was recognized for her contribution to the Coast Guard during an award ceremony hosted by the National Society of Professional Engineers (NSPE) on 19 February 2009 at the National Press Club, Washington, DC. Vice Admiral Clifford Pearson, US Coast Guard Chief of Staff, congratulated Ms. Kelly for a job well done during an early morning visit to Headquarters on the 19th of February. VADM Pearson later accompanied Kelly to the FEYA luncheon where he presented her with the Coast Guard Engineering of the Year Award.

Other nominees for this year were CWO4 Richard Biagiotti, CWO3 Ray Bryant, LT Thomas Lowry, LCDR Gregory Rothrock, LT Gregory Sabra, LCDR Edward Sheppard Jr., LT Brian Thomas, and Mr. Wade Williams.

The annual luncheon honors and recognizes federal government engineers and agency winners for their achievements in engineering and their contributions to the American public. We congratulate Laura W. Kelly and all who were nominated for the "2009 Coast Guard Engineer of the Year."

FEYA

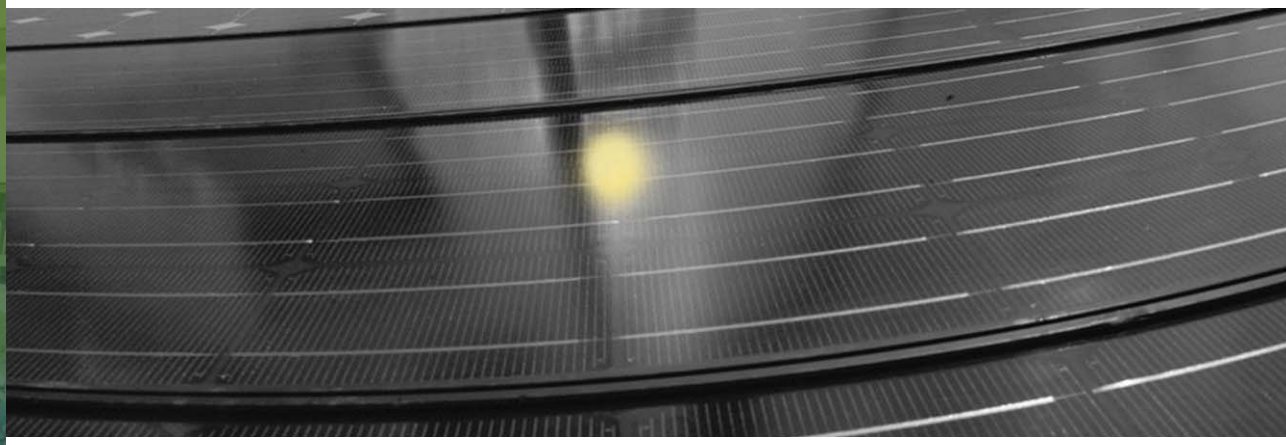
TRACEN Petaluma Honors Coast Guard Blue by Going Green

PETALUMA, Calif. -- Nestled among the rolling green hills of the Petaluma countryside, in northern California, Coast Guard Training Center Petaluma serves as the training hub for many of the Coast Guard's jobs and specialty schools. According to Captain Chris Hall, Commanding Officer of Training Center Petaluma, the Coast Guard base is more than a training center, it is a community of individuals who share a commitment to mission, respect, and innovation. That shared commitment will soon extend to include a greener, environmentally compatible Coast Guard base.

The training center is scheduled to have a five-acre array of solar panels installed on its property after recently awarding the first Power Purchase Agreement (PPA) in Coast Guard history to SilRay Inc., of Palo Alto, California.

The PPA is an agreement between the Coast Guard and the contractor, SilRay, in which the contractor will pay for the expense of building, operating, and maintaining a solar photovoltaic system on Coast Guard property. In exchange, the contractor is awarded tax credits and discounts, making the construction more affordable. The Coast Guard benefits from the installation of a renewable energy resource facility with no up-front cost, and is able to purchase the energy produced by the system at a contracted rate for the next 25 years.

"This project could cost the Coast Guard up to $9 million to complete," said Tony vanWinden, Energy Manager at TRACEN Petaluma, "but by awarding the PPA the Coast Guard pays none of the up-front cost and the contractor receives



tax credits and incentives which make the construction more affordable. It's a win-win situation," he said.

The agreement will help the Coast Guard save money, have less of an impact on the environment, and decrease the demand for energy on the local community power grid, said vanWinden.

He went on to explain that this will be especially noticeable in the summer months during peak demand when energy consumption is at its highest and the energy production of the on-base solar array will also be at its peak.

The PPA will also help the Coast Guard meet the standards set forth by the Energy Policy Act of 2005 by increasing its use of renewable energy. The agreement is in line with several provisions built into the Act, including establishing a photovoltaic energy commercialization program in federal buildings and, producing renewable energy on site or on federally owned land, said vanWinden.

"The agreement benefits the Coast Guard, it benefits our neighbors, it benefits California and, with rising energy costs, it's a step in the right direction," said Commander Jeff Good, TRACEN Petaluma's Facilities Engineering Officer.

The PPA also falls in line with the Petaluma green initiative, a multiple branch program designed to make the Coast Guard base more environmentally compatible through a combined effort to decrease energy consumption and improve water conservation.

The PPA comes on the heels of TRACEN Petaluma's other successful solar panel installations upon the roofs of two of the training center's buildings.

When combined with TRACEN's existing 125 kilowatt solar panel array, the scheduled five-acre array is expected to provide TRACEN with up to one megawatt of renewable power, which will meet a majority of TRACEN's daily electrical demand and up to 60% of its peak demand needs, said vanWinden.

"Our goal is to become one of the greenest bases in the world. We're located in the country, surrounded by farmland, and we want to be a good neighbor," said Hall.

EVERY DAY IS EARTH DAY!

Stormwater Management is Smart

by Dr. Ken Malmberg, CG-443

Introduction

Stormwater is precipitation (rain, sleet, snow, hail) that falls to the earth's surface. In areas with natural, unaltered ground cover, about 10% of the precipitation runs over the land surface and about 50% infiltrates into the soil to replenish groundwater flow and base flow to streams (1).

Impervious surfaces in a watershed are a factor in determining the amount of pollutants that end up in our water bodies. When the impervious coverage is 10% or less of a watershed, the water quality is generally very good. When impervious cover is between 10-25% of the watershed the water quality is impacted and deteriorating. Over 25% coverage results in badly deteriorated surface water quality in the watershed streams and lakes. Some estimates say over 60% of existing water quality problems are the result of non-point source pollution linked to storm water runoff. The reason for this is that as the land is covered more with impervious surfaces, more of the precipitation runs over the land and carries pollutants from the pavement into the waterway. In developed areas, less that 15% of runoff makes it into the soil, and over 55% of the precipitation runs off. This is known as non-point source pollution, and is one of the largest contributors to pollution levels in bodies of water like the Chesapeake Bay and the Great Lakes.
Pollutants include oil and grease, chemicals, nutrients, metals, and bacteria. These pollutants can cause serious damage to the water ecosystem.

What We Can Do

The U.S. Coast Guard occupies about 700 sites on approximately 65,000 acres of land. Most of these sites are occupied by different combinations of people, equipment, including vehicles of various types, and buildings. Sound environmental doctrine for the Coast Guard includes the following practices:

1. Vehicle maintenance, such as washing, should not be done in driveways, tarmacs, or parking lots with impervious surfaces. This allows wash water to find its way to the nearest storm drain, ultimately draining into the watershed and affecting water quality. A Coast Guard unit with responsibility for such runoff may be required to follow "best management practices" (sometimes imposed by local government authorities) to minimize harm pollutants in the runoff cause to our surface water bodies and to our groundwater. Even where there are no applicable procedural or substantive requirements to follow, we can still practice good stewardship of the environment.

2. Organic lawn care practices also reduce runoff, and can also be a wise environmental choice. Less use of chemical pesticides and fertilizers has a positive effect on runoff when the storms come.

3. Tree plantings are ecologically sound practices that help preserve watersheds. Trees provide visual additions, and reduce heat by shading small buildings, and reducing cooling costs. They naturally clean the air, and improve storm water management by reducing polluted storm water that normally would go directly into the drain. Their roots allow rainwater to filter back into the soil, recharging the water table.

4. Riparian buffers protect streams from pollution. These are vegetated areas along the edge of a stream that absorb pollutants and nutrients that would otherwise end up running directly into these streams. They filter out pollutants and sediments, reduce algae growth and improve fish habitat. They also attract birds, butterflies, and other creatures that will also play a role in the stream's health.

5. Winter deicing protocols to melt snow and ice can adversely affect streams and rivers, and can destroy a soil's natural structure and damage vegetation. Salt can seep into storm water runoff. Many alternatives exist, but remember, all deicers can harm the environment when applied in excess.

6. Rain barrels make excellent storm water capturing devices, and can be installed on small buildings for capturing and holding rainwater for release after the storm event. This reduces the overall flushing action of a large storm, and prevents the water table from being overwhelmed by the runoff. In effect, barrels add capacity to a sewer system and reduce sewer overflows to the creeks and rivers which are often sources of drinking water. Also, collected rain water can be reused for irrigation or, for example, washing off equipment at a small boat station. Remember, rain barrels are only effective storm water management tools when they are emptied in between storms (2).

Conclusion

These practices impact storm water in several different ways, reducing its overall contribution to poor water quality, while showing water quality benefits from small efforts with minimal or no added cost. Also, remember that land-based debris is a pervasive pollutant tied to stormwater runoff. Stormwater events that increase urban runoff and sewer overflow carry large quantities of marine debris into the waterways, a persistent problem for the USCG (3). Practicing sound storm water management can be one of the Coast Guard's most beneficial stewardship competencies.

Sources:

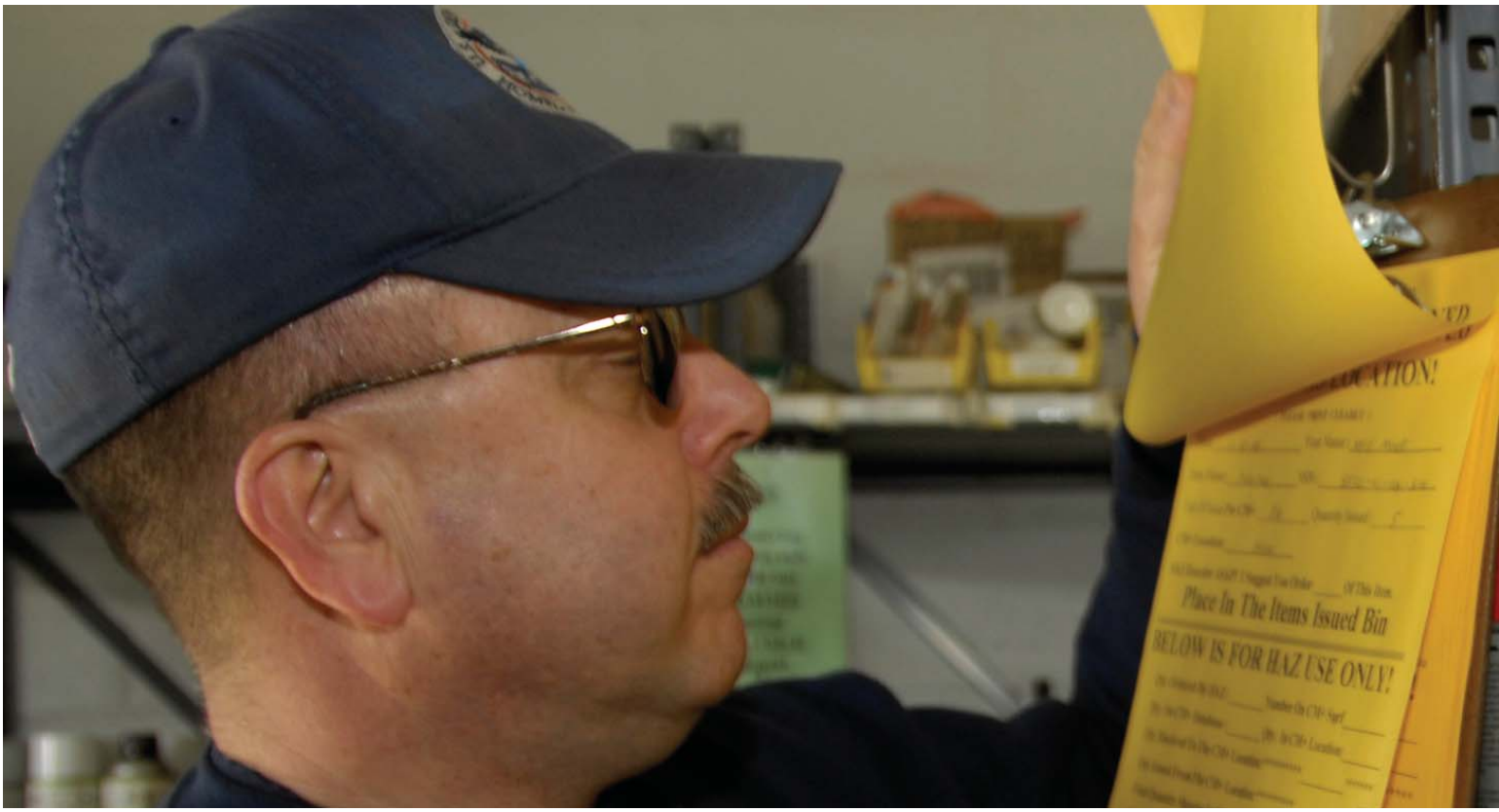
(1) Jacques Cousteau-National Estuarine Research Reserve website.
(2) A Homeowner's Guide to Stormwater Management -- Office of Watersheds, Philadelphia Water Department, Volume 1, January, 2006.
(3) Coast Guard Proceedings of the Marine Safety and Security Council, Winter, 2008-09. Forging Global Solutions to Environmental Challenges, p. 53.

Environmental Awards Handed Out

The Coast Guard's 2008 Environmental Awards have been announced for superior environmental performance. The Awards Panel considers the following ten environmental areas when selecting winners: source reduction, recycling, affirmative procurement, natural resources protection and management, pollution prevention, compliance, National Environmental Policy Act (NEPA), historic and cultural resources management, prevention/remediation of environmental damage, and overall environmental excellence. This years winners are:

A.	INDIVIDUAL	CATEGORY
	MR. JEFF SCHMIDT (AIRSTA ATLANTIC CITY)	OVERALL ENVIRONMENTAL EXCELLENCE
B.	TEAM	
	COAST GUARD ACADEMY	RECYCLING
	ISC KODIAK	SOURCE REDUCTION
C.	UNIT(LARGE)	
	ISC KODIAK	RECYCLING
	ISC HONOLULU	OVERALL ENVIRONMENTAL EXCELLENCE
	COAST GUARD ACADEMY	SPECIAL RECOGNITION
		OVERALL ENVIRONMENTAL EXCELLENCE
D.	UNIT(SMALL)	
	AIRSTA SITKA	OVERALL ENVIRONMENTAL EXCELLENCE
	CEU CLEVELAND	SUSTAINABLE DESIGN
	ESD SOUTHWEST HARBOR	SPECIAL RECOGNITION
		OVERALL ENVIRONMENTAL EXCELLENCE

Congratulations to all of this years winners!



2009 Coast Guard Environmental Award Winners

Best Practices for Applications to Other CG Units

by Dr. Ken Malmberg

Note: Some of these practices are also performed by other units in the Coast Guard as well as the winning units cited. It is expected that these practices can be made universal at all units in the Coast Guard, where applicable.

1. **Coast Guard Academy** cadets created a "Green Network" for advancing sustainability initiatives, which this year included leadership in reducing, reusing, and recycling over a wide span of outreach and training actions. The Academy's overall environmental excellence was capped by winning the Federal Electronics Reuse and Recycling Award from the White House Office of the Federal Environmental Executive.

2. **ISC Kodiak** won the Team award for source reduction, and the large unit award for recycling. The Team used a new Energy Savings Performance Contract to eliminate their economizer rinse water hazwaste stream from the heating plant. By partnering with a local community recycling center, the unit made great strides toward saving space in the local landfill in an ecologically sensitive area.

3. **Air Station Sitka** significantly improved its environmental stewardship in recycling, source reduction, pollution prevention, compliance, and other areas. By completing a Facility Energy Efficiency Fund project, the unit targeted several savings programs in lighting, energy, and reduced fuel use, in addition to purchasing an LPG forklift and electric utility vehicle.

4. **CEU Cleveland** incorporated sustainability, recyclability, and energy and water efficiency into their application for LEED (Leadership in Energy and Environmental Design) certification in the Station Emerald Isle rehabilitation project. A geothermal HVAC system, renewable energy, rainwater collection, recycled materials, and no ozone-depleters were incorporated throughout reconstruction of the two main buildings.

5. **ESSD Southwest Harbor** installed a centralized Renewable Energy (solar and wind) UPS system to replace 18 smaller UPS units, greatly reducing dependency on the local grid, and battery disposal costs. These favorable environmental conditions ensure continuation of operation of critical systems and also lessen the demand on fossil fuel backup generators.

6. **ISC Honolulu** opened the first Reduced Hazard Ammunition firing range, eliminating a hazardous waste stream. In partnership with the National Renewable Energy Lab and others, they have reduced energy and water use, as well as their electrical grid profile. By focused participation with the community they have coordinated training in LEED, energy/water auditing, and stewardship of resources. This large unit also maintained its small quantity generator status by judicious application of their ISO 14001 Environmental Management System.

U.S. Coast Guard photo/Petty Officer 3rd Class Jonathan Lindberg

Earth Day 2009

Petty Officer 1st Class Kay Johnson and Petty Officer 1st Class Michael Carlson, both from Coast Guard Station Washington, D.C., clean up a cemetery in support of Earth Day at Saint Elizabeth's Hospital in Washington, D.C., Friday, April 17, 2009. Following the clean up from the crew, the 4,000 grave cemetery is slated to be cleared out and restored. Coast Guard photo/LTJG Michael Bell.

LIHUE, Hi (Apr. 18, 2009) Coast Guard Petty Officer Second Class Zachary Rafoth, a Damage Controlman, sweeps garbage up as Seaman Adrian Lopez-Smith picks up trash from between rocks at Nawiliwili Harbor, Hi, on April 18, 2009. The two were part of a group from Station Kauai that volunteered along with members of the Coast Guard auxiliary, the Hawaiian Department of Land and Natural Resources, the Sierra Club, the Surf Rider Foundation, and the Nawiliwili Yacht Club to do their part for Earth Day. USCG photo by BM3 Darcey Crop.

Civilians from the Coast Guard Yard in Baltimore helped plant trees near the front gate at the base in support of Earth Day. Coast Guard members and civilians came together to plant trees, clean up trash throughout the base and label drain systems to help the environment. Coast Guard photo/Petty Officer 2nd Class Tim Jacobs.

EARTH DAY
APRIL 22nd

UNITED STATES COAST GUARD
INTRODUCING A GREENER GENERATION

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