U.S. Coast Guard

ENGINEERING, ELECTRONICS & LOGISTICS Quarterly

Winter 2008

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All issues are available to Coast Guard personnel on *CG Central* under "Magazine and Newsletter"

Winter 2008
Vol. 11, No. 42
ISSN: 1931-4051

U. S. Coast Guard Engineering, Electronics and Logistics Quarterly

COMDTPUB P5700.2

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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 by DHL in hard copy and/or in Microsoft Word on a 3.5 disk, 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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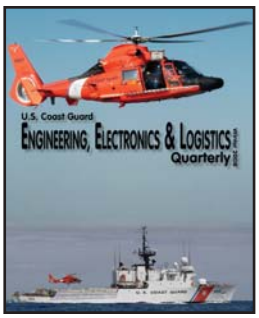
Submission deadlines are as follows:

Spring 2008 - 03 January 2008
Summer 2008 - 03 April 2008
Fall 2008 - 03 July 2008
Winter 2009 - 03 October 2008



On the Cover:* The Engineering Logistics Center's ELC-025 (Auxiliary Machinery Branch) was tasked to research potable water production and quality issues for the 210/270 WMEC (Medium Endurance Cutter) Diesel Engine (DE) Makeup Water and HH-65C Engine Wash (EW) capability aboard air capable cutters.** ***Read more about this research on page 36.

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CORRECTION: In the Spring / Summer 2007 issue, page 74, first paragraph; "LTIPO" should read "LTPIO." This is correct in the electronic copy found on *CG Central* but is spelled wrong in the paper issue.

***Backcover*: The EADS CASA CN235-300M was selected as the platform for the MPA for the Integrated Deepwater System (IDS) Program, which is aimed at modernizing and replacing its aging surface and air fleet. It is the perfect complement for the Coast Guard fleet of long-range, heavy-lift HC-130 aircraft. Its high-efficiency turbo prop design allows persistent surveillance and quick response speeds in the role of a maritime patrol aircraft. These, plus other additional features allow the Coast Guard to control the movement of high interest vessels and quickly locate mariners in distress. Photo by EADS CASA.**

From the Assistant Commandant

The Commandant's transformation initiative is moving forward steadily and the Mission Support Organization is beginning to take shape. The organizational structures, roles and responsibilities for Logistics Centers for surface forces, aviation forces, shore infrastructure, and C4IT are being generated by various work groups made up personnel from the field and staff levels. In the quest to define the best mission support structure, many of these work groups have had trouble defining the bi-level maintenance structure that the Commandant has mandated. I would like to take this opportunity to offer my thoughts on this matter.

A bi-level maintenance philosophy has an organizational element and depot element. Instead of trying to lock down strict definitions of "O" level and "D" level maintenance, I'm going to call the two elements "unit level" and "above unit level" maintenance. "Unit level" maintenance is conducted at the unit and "above unit level" maintenance is conducted somewhere other than the unit, or it is maintenance conducted at the unit by personnel from an "above unit level" organization.

As we transition to the Coast Guard's new logistics business model, asset Product Lines will ensure there are detailed Maintenance Procedure Cards (MPCs) for every maintenance action that occurs on an asset. MPCs will have step-by-step maintenance procedures and will define which specific support equipment, parts, tools and consumables are required to complete each specific maintenance action. The asset Product Line will also define the intervals at which these maintenance actions shall be completed for preventive maintenance. When the Product Lines add up all of the MPCs and their intervals, they can determine the amount of support equipment, parts, tools and consumables that are required for the entire asset. Examining these maintenance requirements, the Product Line can determine which maintenance is "unit level" and which is "above unit level." While the Product Line maintains authority over all the MPCs, units are responsible for completing "unit level" maintenance. Product Lines are responsible for ensuring "above unit level" maintenance is com-

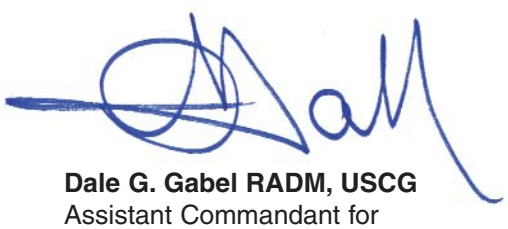
plete and also have the ability to monitor units to ensure "unit level" maintenance is performed and documented.

A question that frequently comes up is "how can unit level maintenance be defined if not all units have the same organic capability?" The answer is that the Product Line has authority over all maintenance procedures for a particular asset. Product Lines will standardize "unit level" maintenance across an asset type. If there is some "above unit level" maintenance that needs to be completed on an asset, it is the Product Line's responsibility to ensure that maintenance is complete. The Product Line can consider a commercial source or a tiger team of qualified Coast Guard personnel. If the unit is remotely located or underway, the Product Line could also defer the maintenance or consider the best way to effect temporary repairs. So if one unit has a more robust organic capability than another of the same type, the Product Line may authorized the more robust unit to complete "above unit level" maintenance as required. The Product Line can also provide technical assistance for "unit level" maintenance, if the unit has questions. Ultimately Product Lines are responsible for ensuring maintenance is completed to support operations in a timely and cost effective manner.

We can also use "unit level" maintenance, defined by a list of MPCs, to determine staffing requirements. Each MPC has a corresponding enlisted rate and number of labor hours attached to it. For example, as part of 200 hour maintenance for an RB-S, I could pull the corresponding MPC for changing spark plugs and find that it should take a Machinist Mate approximately 0.75 hours to complete this maintenance. When I add up all the MPCs that MKs are responsible for and use historical data to determine the corrective maintenance requirement, I can develop algorithms to determine how many MKs are required to maintain a particular asset. I can do this for any enlisted rate that is responsible for an MPC. Therefore, if we use MPC's and historical data we can better align the workers to the workload.

We are piloting our efforts at Sector Baltimore and will be standing up a second pilot program at Sector San Francisco in January. Our efforts are already starting to pay off. With their ability to centralize funding and inventory, the standard boat Asset Project Office (APO) is achieving cost savings on spare parts by negotiating with approved vendors and buying in bulk. After examining and measuring zinc anodes on the exhaust ports of the RB-S, the APO has extended the inspection cycle from 800 to 1200 hours, saving $4K annually for the boats assigned to Sector Baltimore. APO Item Managers found a suitable alternate in the Federal Stock system for worm gear clamps at a fraction of the cost of the ones units had been ordering from the Original Equipment Manufacturer. These are just a few examples of the progress we have been making.

Modernizing the Coast Guard means shifting fundamentally changing the ways our maintenance business is done. Units should not have to determine what is "O" level and what is "D" level maintenance. It is up to the Product Lines to define that through the use of MPCs. It is the MPCs that dictate the support equipment, spare parts, tools, consumables, and personnel that are required to maintain our Coast Guard assets.



Dale G. Gabel RADM, USCG
Assistant Commandant for
Engineering and Logistics

Yard Hosts Great Lakes Customer (Yard)

In August 2007, the Yard welcomed the Cutter HOLLYHOCK, the first Great Lakes cutter in recent history to undergo an emergency repair availability at Curtis Bay. The cutter, homeported in Port Huron, Michigan, transited 2161 nautical miles to arrive at the Yard for an anticipated wholesale replacement of a leaking Controllable Pitch Propeller (CPP) hub. The Yard's estimate to perform the work was approximately $180,000 less than a Great Lakes contractor's estimate for the same service. Upon dry docking, the CPP original equipment manufacturer's technical representative determined that only replacement of the propeller blade seals was required. The Yard also completed a small repair to the cutter's bow thruster that, if not corrected, could have resulted in considerable future damage. The Yard's work encompassed seven days, and the cutter departed Baltimore on the 8th day for its Great Lakes' homeport.

Out-of-Town Guests Come to Yard (Yard)

The Yard's waterfront hosted two west coast cutters and a Great Lakes buoy tender in late August, 2007. The Coast Guard Cutter (CGC) HOLLYHOCK, seen positioned on the shiplift's concrete working platform, traveled to the Yard for an emergency repair from Port Huron, Michigan. Lining the Yard's east wall were two west coast 110' cutters currently under the 110' Mission Effectiveness Project. The CGC NAUSHON, homeported in Ketchikan, Alaska, is pictured in left background. The CGC CUTTYHUNK from Port Angeles, Washington, is positioned in right background. Arriving after this photo was taken was the EDISTO, a 110' Cutter hailing from San Diego, California, that entered the Yard for MEP in early September.

Yard Road Team Answers Call for Emergency CASREP Repair (Yard)

On September 14, 2007, the Yard was directed to deploy a road team to North Charleston, South Carolina, to replace 12 helo tiedowns on CGC DALLAS' flight deck. Maintenance and Logistics Command Atlantic (MLCA) was unable to obtain a commercial contractor to perform the work in a timeframe that would allow the cutter to meet its scheduled deployment. Yard dispatched four tradesmen on September 17th to begin the emergency repair and return the cutter to operational status. Extensive interferences in the galley and mess deck were also identified, and

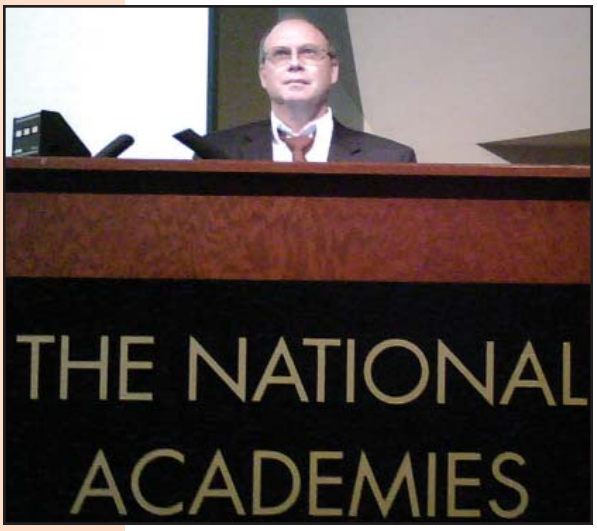
required additional resources for removal. Eventually, 16 Yard personnel were on-scene working to complete the job prior to the cutter's sail date on September 29th. Work crews finished their work on the 28th, and the cutter sailed the next day.

RADM Ronald Hewitt, Commander, MLCLANT, visited the Yard on October 3rd and presented Yard road team members with his Admiral's coin in appreciation for the group's quick response and expertise.

RADM Hewitt (center), Commander of the Maintenance and Logistics Command Atlantic, poses with Yard road team members after extending his congratulations for outstanding work on the DALLAS' CASREP repair.

YARD Presents to Federal Facilities Council (Yard)

On September 7, 2007, Mr. Richard Eschenbach, Coast Guard Yard Mechanical Engineer and Chief of the Maintenance and Operations Branch, made a presentation to the Federal Facilities Council (FFC) on the advantages of Energy Savings Performance Contracts (ESPC). The event was held at the National Academy of Sciences in Washington, DC as a joint conference with the International Facility Managers Association to demonstrate the power of public-private ventures. The more than 100 participants from numerous federal agencies learned of many creative mechanisms other agencies are using to address their facility challenges. To highlight the benefits of ESPCs, Mr. Eschenbach discussed the Yard's Landfill Gas project where the Coast Guard will purchase methane from the Quarantine Road Landfill owned by Baltimore City. The methane will be piped underground approximately one mile to a cogeneration facility where enough electricity and steam will be produced to cover the Yard's utility requirements. The construction of a methane collection system at the landfill, the pipeline, and co-generation facility will be privately financed through the ESPC. Ameresco Federal Solutions is the company arranging the financing, design, construction, and follow on operations and maintenance of the new cogeneration plant. They will recoup their costs over the next 15 years through payments from the Coast Guard funded by the annual energy savings gained by self generation of electricity and steam. When the system is placed on line, tentatively the fall of 2008, it will be able to generate up to 4 megawatts of electricity and 35,000 lbs of steam.



The FFC operates under the auspices of the Board on Infrastructure and the Constructed Environment of the National Research Council, the principal operating agency of the National Academies and the National Academy of Engineering. The FFC's mission is to identify and advance technologies, processes, and management practices that improve the performance of federal facilities over their entire life-cycle, from planning to disposal.

by CDR John Slaughter, Yard Chief Facilities Engineer

The first LRI is taken off the truck in Pascagoula and prepared for storage until it goes to sea trials with USCGC BERTHOLF.

The LRI pulls into the ship yard after arriving from Anaheim, Calif.

Long Range Interceptor Arrives at Shipyard

Pascagoula, Miss. -- The Long Range Interceptor (LRI) arrived at Northrop Grumman's Ship Systems facility in Pascagoula after completing factory acceptance testing in September [2007].

The LRI, built by Willard Marine in Anaheim, Calif., is one of two small boats that will be deployed with the National Security Cutter (NSC). It will allow a boarding party or search and rescue team from the NSC to operate independently over the horizon from the cutter for up to 10 hours. The cabin is fully climate-controlled and includes shock-mitigating seats to minimize crew fatigue on extended missions.

Traveling at speeds up to 45 knots, the LRI is capable of intercepting most targets of interest or reaching the scene of an emergency much more quickly than the cutter itself. The LRI was designed around an existing 11 meter Rigid Hull Inflatable Boat (RHIB) customized to meet the unique mission requirements of the Coast Guard.

Lockheed Martin is responsible for the Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) system aboard the LRI which integrates numerous navigation sensors, computer networks, and communications equipment with long range connectivity providing the crew with unprecedented situational awareness. The navigation system has passed the factory acceptance test with 100 percent stability and availability. Lockheed Martin completed internal tests of the boat's C4ISR suite for NSC sea trials.

The crew of the LRI have received Familiarization Training (FAM) for the operational capabilities of the boat. This first LRI will then be integrated with USCGC BERTHOLF (WMSL 750) as a major component of the cutter's mission equipment to be tested on sea trials and deployed with BERTHOLF after the ship is delivered in early 2008.

Deepwater News Flash, courtesy of the Deepwater Project.

Coast Guard Senior Chief William Bodley (right) pushes the button to start the first diesel engine on board BERTHOLF (below). Witnessing the milestone are Test Engineer David Peterson and Senior Test Engineer R.A. Smith, Jr.

BERTHOLF and WAESCHE Reach Production Milestones

The stern is landed on NSC 2. The lift marks the 34th unit erected on board WAESCHE.

Pascagoula, Miss. -- The National Security Cutter (NSC) program recently completed significant milestones on each of the cutters currently in production at the Northrop Grumman Ship Systems facility in Pascagoula.

Recently, the two MTU main propulsion diesel engines completed a successful light-off on board USCGC BERTHOLF (WMSL 750). This was the second phase in an operational test of the ship's combined diesel and gas turbine propulsion system. The gas turbine engine light-off was completed in early August.

"Lighting off the diesel engines is a critical milestone that represents thousands of hours of hard work, bringing BERTHOLF one step closer to self-sufficiency," said Kevin Amis, Northrop Grumman NSC program manager. "I am very proud of the men and women who make these events a success."

The NSC is powered by a combined diesel and gas turbine (CODAG) power propulsion plant. The Coast Guard will use the diesel engines to conduct the majority of NSC operations. The gas turbine engine will be used primarily for high speed and intercept operations.

Recently, the stern assembly was erected onto the second NSC, USCGC WAESCHE (WMSL 751). With this unit erection, WAESCHE is now 33 percent complete. The construction team erected three of the five remaining lifts necessary to complete WAESCHE's structure. These include the forward and aft superstructure grand blocks and the upper bow unit.

Deepwater News Flash, courtesy of the Deepwater Project.

NSC BERTHOLF

BERTHOLF is prepared to go back into the water after a scheduled dry dock in September.

NSC's C4ISR Systems Tested Following Scheduled Dry Dock

Sister ships stand side-by-side as BERTHOLF undergoes testing and preparation for sea trials this year.

WAESCHE

Pascagoula, Miss. -- Following a scheduled dry dock period, USCGC BERTHOLF (WMSL 750) is now back in the water. Several C4ISR systems are online and already able to track targets of interest using its all weather day/night sensors. The ship successfully performed two 360-degree rotations to assess the navigation sensor stability as a first step in preparation for sea trials.

Specifically, for the first-time while maneuvering, the command and control system tracked targets with its S- and X-band surface search radars, Automatic Identification System (AIS), and Electro-Optical Infrared (EO/IR) camera utilizing real-time navigation data.

Northrop Grumman Ship Systems is building the National Security Cutters in Pascagoula, Miss. Lockheed Martin is building and integrating the Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) capabilities on board the cutters.

The C4ISR systems aboard the NSC are critical to assuring the crew can see vessels in distress or targets of interest; collaborate with other Coast Guard assets at sea, in the air, and ashore; and take action on the most current and pertinent information available. The interoperability provided by the C4ISR systems also helps ensure the cutter can work with 117 individual agencies and organizations in support of homeland security.

"We have established a strong working relationship with the Coast Guard," said Leo Mackay, vice president and general manager of Lockheed Martin Coast Guard Systems. "As part of a normal quality control program, we are making sure that every potential C4ISR issue, including those that arise during basic installation and test procedures, receive close scrutiny to ensure that any and all issues are dispositioned prior to the delivery of the ship next year."

Development of the NSC command and control system is more than 90 percent complete. Shipboard integration and test on BERTHOLF is now past the halfway point leading up to third-party acceptance trials next year [2008]. Equipment for the second NSC, USCGC WAESCHE (WMSL 751), is being delivered to the shipyard for installation.

The crew of BERTHOLF has completed initial C4ISR operations training at the Coast Guard's training center in Petaluma, Calif., and is preparing for shipboard familiarization and training.

Deepwater News Flash courtesy of the Deepwater Project.

Coast Guard, Industry Team Put Finishing Touches on Cutter BERTHOLF

Apply Lessons Learned to Sister Ship WAESCHE

by Hunter C. Keeter, Deepwater

PASCAGOULA, Miss. -- Inside the new ship, rare jets of chilled air from cooling units bolted to the weather deck above are the only practical respite from the stifling Mississippi heat. The noise -- the roar of machinery and the ventilation system -- is powerful; it cancels out the cries of the gulls hovering over the Gulf around the ship. Not simply enduring but working through the heat and the noise, U.S. Coast Guard and shipyard personnel negotiate dim passageways crowded with cables and equipment, tools and pre-fabricated parts. The intermittent flash of cutting torches and the spray of sparks as craftsmen and women make final adjustments are the telltale signs that this vessel is nearing completion.

The ship is the National Security Cutter, or NSC, named the BERTHOLF. When it is delivered early next year [2008], the Coast Guard will have procured the first of a class of eight of the most technologically advanced cutters in its 217 year history. The second NSC, the WAESCHE, and is being erected at an assembly area beside the BERTHOLF on the Northrop Grumman Ship Systems yard.

At the shipyard and at the NSC project's administrative office in Arlington, Va., the government and industry workforce is working toward the next major milestone: delivery, which is scheduled for early to mid-fiscal year 2008. Delivery will mark the date of the Coast Guard's formal acceptance of the ship from the builder, the point in time when custody of the vessel officially transfers from the shipbuilder to the government and from the Coast Guard's project office to the ship's captain and crew.

"This is really a team effort … with the government and industry working together," said CDR Douglas M. Schofield, deputy at the Project Manager's Resident Office (PMRO) Gulf Coast, which oversees the building of the NSC. "The complexity factor of this project is just like building a city on the water."

While the team is focused on a daunting list of tasks to complete before testing and delivery, there

BERTHOLF (WMSL 750); NSC 1

Builder: Northrop Grumman Ships Systems; Integrated Coast Guard Systems (ICGS)
Date Fabrication Started: Sept. 2004
Date Launched: Sept. 29, 2006
Length: 418ft.
Beam: 54ft.
Displacement: 4,306lt
Power plant: combined diesel and gas turbine with two MTU 10-cyl. 9,655hp diesel engines, and one GE LM2500 30,565bhp gas turbine
Max Sustained Speed: 28kts
Range: 12,000nm
Endurance: 60 days
Crew: 148
Armament: one Mk110 57mm gun; one 20mm Close in Weapon System (CIWS); one Mk53 NULKA active expendable decoy system; and port and starboard countermeasures launchers
Mission Systems: Furuno X&S band surface search radar; EADS 3D air search radar; SPQ-9B fire control radar; Mk46 electro-optical/infrared sensor; AN/SLQ-32 electronic surveillance receiver
Communications: HF, VHF and UHF; MILSATCOM; radio direction finder
Stern Launch: two water jet propelled cutter boats (Long Range Interceptor and/or Short Range Prosecutor)
Aviation Facilities: flight deck and hangar for one MH-65C Multi-mission Cutter Helicopter and two unmanned air vehicles, or other combinations

is a real sense of progress in nearing completion of the first ship. It is apparent that the NSC has come a long way from the start of its fabrication in September 2004.

"Three years to build a ship seems pretty good, especially when it is the first-of-class and a very complicated ship," said Martin F. Mardiros, a Coast Guard naval architect on assignment from the Engineering Logistics Center, Baltimore.

Typically, first-of-class shipbuilding projects may take between three and six years from contract award to delivery, depending upon the complexity of the vessel and other factors. Some examples: the Coast Guard's high endurance cutter CGC HAMILTON (WHEC 715) was awarded in fiscal year 1964 and delivered on Feb. 20, 1967. The U.S. Navy's *Oliver Hazard Perry* (FFG 7) guided missile frigate was awarded on Oct. 30, 1973 and delivered on Nov. 30, 1977. The *USS Arleigh Burke* (DDG 51), first of the Navy's Aegis destroyers, was awarded on Apr. 2, 1985 and delivered on April 29, 1991. Finally, the *Cyclone* (PC 1) coastal patrol craft was awarded on August 3, 1990 and delivered on Feb. 19, 1993.

The BERTHOLF is a complex ship, with capabilities that surpass those of the current fleet's high endurance cutters. The NSC features increased patrol endurance (60-90 day patrol cycles); more powerful weapons (including the Mk110 57mm main gun); a larger flight deck; chemical-biological and radiological environmental hazard detection and defense; and improved Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR) equipment. With a suite of modern air and surface search radars and target classification optics, the NSC's sensor range and capabilities also are extended and augmented by aircraft, such as the modernized MH-65C Dolphin helicopter.

Building modern vessels for the U.S. Navy, and now the Coast Guard, is a process for which the facility at Pascagoula was specifically designed in the 1970s.

Equipped with 100-ton, 300-ton and 660-ton cranes and gantries, the shipyard here is designed to erect ships in individual assemblies, which contain decks stacked within huge sections of the outer hull. The units are built upside down (because welding down is easier than welding up) at large assembly halls, away from the waterfront. There, the assemblies are outfitted with piping, ventilation ducts, and other subassemblies and equipment. In certain sections of the ship, these units are stacked together in what are called "grand blocks." The completed units and grand blocks are then brought down to the ship's keel, which is laid at a site on the waterfront. The units are assembled, or erected, and welded together.

A "translation system," a network of steel rails embedded in the ground at the waterfront, allows the grand blocks and erected sections to be moved by rail cars. When the ship is ready to be launched, it is shifted by rail onto a submersible barge and floated off into Pascagoula Bay. In 2006, the BERTHOLF was launched this way and has spent the past year in the water as work on her superstructure and below decks is completed. Now the ship has been raised out of the water for inspection and painting prior to the beginning of sea trials.

Lessons Learned

As the BERTHOLF has come through the construction process, the shipyard and the PMRO have been learning valuable lessons -- in the areas of design and engineering, and construction processes -- that already are being applied to the WAESCHE.

Jim French, NSC's deputy program manager with Northrop Grumman Ship Systems, said the infrastructure at the shipyard itself has evolved from the lessons learned through building many Navy ships over the years. For example, the shipyard's shops -- which manufacture miles of piping, ductwork, electrical assemblies installed aboard a modern ship -- are located away from the waterfront. Fabricated materiel is brought to the keel site, where craftsmen have access to it without leaving the vessel under construction, saving valuable man hours and dollars.

Making efficient use of the shipyard's infrastructure and fabrication and assembly process improvements has been a goal for the NSC project, according to Chief Warrant Officer Walter Probst, test officer at PMRO Gulf Coast. Probst noted that work done in the assembly halls or shops is money saved at the waterfront.

"If shop work has, for example, a dollar value of one, to do that same work when erecting that unit on the keel box increases the value to three dollars," he said. "Then any work that is not done on the keel box -- work that waits until after float off -- is going to cost five dollars. That is a very general rule of thumb. So any work that we can move back to the shop is money saved on the cost of the ship."

The rule of thumb about work costs and other lessons has helped the Coast Guard and industry develop their own process improvements that have built on the experience of designing and constructing the BERTHOLF. Already this learning process has yielded

improvements in the WAESCHE, which now is approximately 10-15 percent ahead of where the BERTHOLF was at the same point in its construction schedule.

Coast Guard CAPT William S. Krewsky, commanding officer at PMRO Gulf Coast, added that lessons learned from NSC 1 have enabled more work to be done in the shops, so that NSC 2's sections may be brought to the keel more than 95 percent complete for assembly.

A look aft at the underside of the WAESCHE provides two massive examples of the benefit of completing more work in the shops and assembly halls. The stern tubes, which are two house-sized steel cylinders that enclose the ship's propeller shafts, were easier and less risky to put in place aboard the WAESCHE than they had been aboard the BERTHOLF.

"On the BERTHOLF we had to land the stern tubes and erect the unit over top of them, and then chain-fall them [with many workers together, hoisting the heavy tubes] up into place," Jim French said. "The stern tubes weigh several thousand pounds each. On the NSC 2, we landed them while the hull assembly was inverted [up in the assembly hall] so that when we got them down here to the keel box, all we had to do was weld them into place."

Another example of a lesson learned that has saved money and time can be seen in the WAESCHE's engineering spaces. Adjustments that had been required to land the main propulsion equipment and engines aboard the BERTHOLF taught the PMRO and the shipyard a more efficient procedure that was used on the WAESCHE.

"Loading out the main diesel engines in a day vs. a week was a big accomplishment," CWO Probst said during a tour of the WAESCHE. "When they landed the equipment aboard the BERTHOLF, they had to cut a temporary access hole and then weld it back shut. So we eliminated that re-work here. They also had re-work to do in fitting up the reduction gear foundation to the lower level of the engine room foundation. All the piping was pre-fit on NSC 2, and they dropped all the machinery in there in one afternoon. That is typical of everything on [the WAESCHE]."

Other lessons learned may be more difficult to quantify in terms of man-hours or process efficiencies. Nevertheless, the shipyard and the PMRO have overcome major challenges since the BERTHOLF's keel was laid down.

Perhaps the most significant challenge the NSC team has confronted has been the recovery from Hurricane Katrina. The storm hit in 2005, when the BERTHOLF was about 25 percent complete. Katrina did enormous damage to the shipyard's workforce and infrastructure.

The hurricane crashed through Singing River Island -- which lies across the Mississippi Sound from the shipyard -- and piled the island's trees and other debris around the BERTHOLF, which at that time was on its keel blocks at the waterfront. While the ship itself was lightly damaged (its bow thruster was inundated with salt water and the motor corroded), after the storm the shipbuilders confronted the daunting task of cleaning away debris so work could resume.

"In spite of that, just 12 days after Hurricane Katrina, we struck an arc on this ship [the first ship at the yard on which NGSS resumed work after the hurricane]," French said. "This work crew is proud of this ship and they are dedicated to finishing it and getting it out to sea."

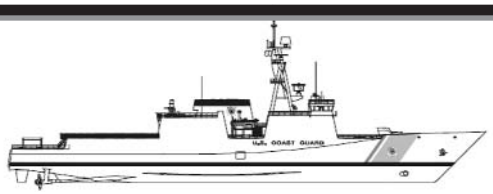
Royce Winbush, Northrop Grumman Ship Systems NSC ship director, added that his pride in the project is rooted in the way the workforce overcame the challenge of Katrina. He cited one example of the impact the storm had on a sub-assembly -- the gas turbine intake cone -- that created a significant challenge for the workforce to overcome.

"We had to rebuild the intake cone [which had been damaged by salt water]," he said. "We are talking about a 100 inch square trunk, about 30-40 feet long. We had to cut that thing in half in order to put it in the ship. All the finished structure that had been completed at that point of the ship had to be cut up in order to accommodate this big cone coming through. [Nevertheless] we were able to continue building the ship around that area, and then when the intake cone was finished fabrication, we accommodated it."

As the PMRO and the shipyard prepare BERTHOLF for sea trials and delivery, few are more enthusiastic about the prospect of completing the BERTHOLF and getting her to sea than the crew, led by Coast Guard CAPT Patrick H. Stadt. His crew, based at Alameda, Calif., where the BERTHOLF is to be homeported, is one of three being trained to man the NSCs as they are delivered.

Stadt's crew and the WAESCHE's pre-commissioning crew have helped support testing and equipment inspections aboard the BERTHOLF. Close working relationships of this kind are part of the lessons learned process, helping to educate the new generation of Coast Guard cutter crews that will operate NSCs.

All Threats, All Hazards:



The Cutter BERTHOLF Readies for Sea Trials

by Hunter C. Keeter, Deepwater

PASCAGOULA, Miss. -- It is a moment that every shipbuilding team looks forward to with anticipation, and a little trepidation: the date of delivery. For the Coast Guard and the Northrop Grumman Ship Systems/Lockheed Martin team building the new National Security Cutter (NSC), three years of hard work overcoming challenges (like Hurricane Katrina) are coming to an end, as the government prepares to evaluate the ship for acceptance.

Upon completion of sea trials early next calendar year [2008], the BERTHOLF will be recommended for delivery -- a formal milestone in the new ship's life-cycle, marking the date of the Coast Guard's acceptance of the ship. Delivery -- slated for mid-fiscal year 2008 -- is the date when custody of the NSC transfers from the shipbuilder to the government and from the Coast Guard's project office to the ship's captain and crew.

There is a great deal of work to accomplish between now and the project's final exam.

Builder's trials will be conducted by the contractor, with oversight and review by the Coast Guard's Project Manager's Resident Office (PMRO) Gulf Coast. The objective of builder's trials is to demonstrate the readiness of the ship for acceptance testing (which may be thought of as a final exam before the delivery of a new vessel).

Conducted in two phases, builder's trials begin with dock testing -- which demonstrate the readiness of the ship's machinery, equipment, and systems. At-sea testing follows, to demonstrate that the ship is seaworthy and that its equipment is fully operational across all functional areas: aviation, auxiliaries, combat system, damage control, deck, electrical, environmental protection, habitability, main propulsion, medical/dental, navigation, planned maintenance, repair, and supply.

The Coast Guard and industry will work together to address any deficiencies noted during the tests. Some items may require materiel improvements or changes, while others may simply require documentation to justify the condition and report on its impact to the ship's overall functionality.

When the PMRO and the builder are satisfied that the BERTHOLF is ready for delivery, the government conducts acceptance testing. This will mark an important "first" for the NSC: the participation of the U.S. Navy's Board of Inspection and Survey, or INSURV, which has partnered with the Coast Guard under a September 2003 memorandum of understanding.

INSURV will inspect the BERTHOLF and identify any major deficiencies that must be corrected prior to delivery. Based on INSURV's acceptance trials report, the president of the board, Rear Adm. Raymond M. Klein, USN, may recommend to Coast Guard Commandant ADM. Thad W. Allen whether the service should accept delivery of the NSC 1.

According to the Coast Guard and the shipbuilder, an important goal toward earning the recommendation for delivery and acceptance is to minimize the number of deficiencies that the INSURV team may find during its inspection.

"There will always be discrepancies when we are dealing with a complex system like a first-of-class ship, this is true for the Coast Guard and for the Navy as well," NSC Technical Manager, Richard Celotto, said during an interview at his Arlington, Va., office. "What we hope to get from the INSURV team and our own evaluators is a manageable list of items that, after we complete them, we can recommend that the NSC is ready for acceptance. So part of our goal is to minimize the number of items on that list."

The Coast Guard's relationship with INSURV and other third-party partners has helped build confidence in the project management team. INSURV's independent review is one of many elements of oversight that the NSC project has in place to ensure the new cutters meet the most stringent government standards.

"We are getting the same kind of critical oversight as all naval vessels receive," said CDR Douglas M. Schofield, the PMRO's deputy . "We look for continuity, trying to leverage the same processes that the Navy has had in place for a number of years, and that the shipbuilders are very familiar with."

The Navy has provided other support, including personnel from the Supervisor of Shipbuilding, Conversion, and Repair (SUPSHIP), the Department of Defense's administrator for all shipbuilding, conversion, repair, and modernization contracts. The organization also serves as the Navy's technical, contractual, and business agent for all projects and contracts assigned to private sector shipbuilding firms. In partnership with the Coast Guard, SUPSHIP has brought its experience to the NSC.

Paul E. McIntosh is the NSC deputy program manager's representative, leading a 12-member department of SUPSHIP personnel assigned to the PMRO. McIntosh noted that there has been extensive government oversight at the PMRO, including drawing reviews, process evaluations, quality assurance inspections, and documentation of all the work to be accomplished through the end of the production and test cycle.

Prior to acceptance, the NSC must pass 438 tests, including approximately 66 tests to be completed during the sea trials. The project office is a little more than halfway through the test schedule now. With the pace of construction and testing intensifying toward the scheduled delivery date, the NSC project office is preparing to meet any challenges identified by INSURV and others.

"While only a lucky few will be aboard the BERTHOLF for trials, hundreds of people will be getting ready to react to any discrepancies they find at sea," NSC technical manager Richard Celotto said during an interview from his office at Arlington, Va. "We will analyze any challenges that might turn up, and develop any fixes that are necessary prior to acceptance trials [early] next year."

A Sense of Accomplishment

Meanwhile, the PMRO and shipyard are putting the finishing touches on the BERTHOLF. One of the benchmarks of progress is the compartment completion process, which evaluates the BERTHOLF's

INSURV

Norfolk, Va.-based INSURV was established in 1868 under Adm. David Glasgow Farragut, USN. The INSURV board has statutory authority under an act of Congress passed Aug. 5, 1882. Since that time, INSURV has been the lead agency for ensuring the mission readiness of the U.S. Navy's fleet.

Recent inspections conducted by INSURV include the evaluation of new vessels, such as the *USS San Antonio* (LPD 17) and the *USS Sampson* (DDG 102); as well as materiel inspection of older ships, such as the *USS Enterprise* (CVN 65); and a combat systems assessment of the *USS Cole* (DDG 67).

According to Capt. Thomas Holman, USN, Board of Inspection and Survey Deputy Chief of Staff for Surface Trials, the Coast Guard PMRO will have the lead in evaluating the NSC-1.

"INSURV's role will be to support the U.S. Coast Guard in determining the materiel readiness of BERTHOLF for acceptance," Holman said. "Our mutually shared goal (that is Coast Guard and Navy) is to ensure new construction ships are inspected thoroughly and consistently, and that serious deficiencies are corrected prior to vessel delivery to the government."

To prepare for an INSURV inspection, a ship's project office and the shipbuilder certify that builder's trials are satisfactorily complete, and that any deficiencies have been corrected. All ship's systems are expected to be energized under ship's power and operational during acceptance trials. Any non-safety-related deficiencies are to be documented on items waived for correction after the trials period.

compartments by type -- such as fuel or water tanks, berthing spaces, machinery rooms, etc. As each compartment is completed, the shipbuilder and the Coast Guard evaluate whether the space is clean and its equipment is functional. Satisfactory compartments are then locked and considered "sold."

Of the 393 compartments on NSC 1, 146 have been reviewed and accepted by the Coast Guard.

Already, the BERTHOLF has passed through a number of discrete but important test events involving individual systems or components. For example, propulsion and generator equipment light-off (accomplished at the end of the summer [2007]) has been an important milestone on the way to builder's dock trials. Further tests will demonstrate the functionality of the ship's combined diesel and gas turbine propulsion system, reduction gear, and propeller shafts. Successful completion of propulsion dock trials will be a major accomplishment, according to Richard C. Vick, a Coast Guard shipbuilding specialist with PMRO Gulf Coast.

As the BERTHOLF, nears completion and is readied for delivery, the shipyard's workforce and the PMRO are beginning to see the return on their investment of tens of thousands of hours of work. SUPSHIP's McIntosh perhaps put it best when he said:

"There isn't anybody that ever gets up in the morning and comes down here saying, I'm not going to do my best. We are all focused on that. … Our job is to put the right tools, training and materiel in the hands of the craftsmen that are building the ship. We are trying to make sure that programmatically these guys have a path to success. That is an easy thing to team with industry and the Navy about, and we find common ground doing that."

Engineering and C4IT Rating Force Master Chiefs

AET, AMT, AST, DC, EM, ET, IT, MK, SK active duty and reserve ratings

by SKCM Mark Ferguson, CG-481

Are you aware that CG-4 (Engineering and Logistics Directorate) is home to nine Rating Force Master Chief (RFMC) Petty Officers, representing nearly 50% of the Coast Guard's enlisted workforce? They provide workforce management for both CG-4 and CG-6 (Command, Control, Communications, Computers & IT Directorate), and are located in the Office of Engineering and C4IT Workforce Management (CG-481). Who are these RFMCs?

You may be wondering about their duties and responsibilities as you see them come and go within CG Headquarters and visiting your unit. The following is not intended to be all-inclusive, or compulsory, but generally this is their mission as leaders of their respective workforce.

The RFMCs are a component of the Master Chief Petty Officer of the Coast Guard's (MCPO-CG) Gold Badge Master Chief network and are, by assignment, the senior E-9 in their respective rating. They are the principle advocate for their rating's workforce and are advisors to Senior Coast Guard leadership on all matters that impact the workforce. Their role as an advisor normally stretches across multiple directorates, as well as the primary directorate in which their members serve.

The RFMC is responsible for the current and future workforce readiness and health, and play a crucial role in setting overall staffing standards, as well as addressing unit specific staffing issues.

The RFMCs play a significant role in the training programs affecting their rating including A- and C-Schools, correspondence courses, and Enlisted Performance Qualifications. Each RFMC is responsible for setting rating specific advancement requirements and reviewing lateral entry requests into their rating.

In order to accomplish these goals, the RFMC must maintain open communications with their workforce and the field in general. This is accomplished through *Force Notes*, field visits, and direct contact with individual members. Communication with the various Coast Guard leadership entities is also critical. CGHQ Directorates are responsible for informing RFMCs, at the earliest possible time, of issues which may affect the workforce's training, staffing, or career development needs. The RFMCs foster this relationship and work with the Directorates to form a plan best matching the needs of the service with the capabilities of the workforce. This is especially critical for new programs and platforms as the RFMCs can help to ensure that new acquisitions properly factor in the "people capability" component.

In general, but not all inclusive, the duties and responsibilities of the RFMCs are:

- ✔ Develop and maintain currency of Enlisted Performance Qualifications through Occupational Analysis and rating reviews. Through liaison with CG-13 (Reserve and Training Directorate), the results are approved and disseminated to the training

Sitting (LtoR) AMTCM Peterson, EMCM Abernethy, SKCM Ferguson
Standing (LtoR) DCCM Alicea, MKCM Winter, ASTCM Murray, ETCM Bletso, ITCM Gentry.
Not pictured AETCM Stroman.

commands for resident and non-resident course development.

- ✔ Review Rate Determination and Rating Change requests.
- ✔ Provide input for determination of: Enlistment, Selective Reenlistment, and Critical Skills Training Bonuses; and Special Pay initiatives.
- ✔ Review waiver requests for rating specific training and advancement requirements.
- ✔ Govern the rating's informal leadership team's (Assignment Officers, School Chiefs, Subject Matter Experts, Service Wide Writers, etc.) visions.
- ✔ Review Personnel Allowance List change requests and monitor/analyze general staffing standards.
- ✔ Endeavor to constantly keep the lines of communication open to all members of the rating, as well as their supervisor and commands. Understand the concerns of each of those groups and express those deck-plate level concerns to senior CG leadership.
- ✔ Publicize, through *Force Notes*, a way ahead and future vision of the rating based on expected changes to Coast Guard Policy, Procedures, Capabilities, and Systems.
- ✔ Partner within the RFMC mess to provide consensus opinions on matters affecting multiple ratings or the entire enlisted workforce.
- ✔ Partner with Program Managers to establish, define, designate, and review competencies within their rating.
- ✔ Last but not least, we are Career Development Advisors with a collective 244 years Time-in-Service.

Pass the word on about workforce management for your ratings. Through our CG Central Website, we provide links to our *Force Notes* which provide important information for your specific rating. You can also find the latest Enlisted Rating Scorecards which we use to determine the health of your respective ratings, which include Force Strength, average TIS, TIG for each paygrade, etc. To get to our website, click on the "Units" tab and search for CG-481 to find our website.

Another fantastic CG Central resource that aids in your Career Management and Development can be found through the "My Workspace" tab. On the left side menu, select "Career Management" and "Enlisted." Here you will find information on Accessions, links to the Force Manager webpages, and Advancement information. Additional information on the duties and responsibilities of the RFMCs can be found in the *CG Personnel Manual, COMDTINST M1000.6A, Chapt 4.E.21.*

CWOs From the Scullery to College Credit

by CWO4 Rusty Huyck, CG-481

The Coast Guard is preparing to complete the American Council on Education (ACE) review for all Engineering and C4IT Chief Warrant Officer (CWO) specialties in 2008. This review is conducted every ten years, or when a new specialty has been established, to credit members for college credit earned through occupational experience and advancement. The goal is not just to recognize members for their hard work through achievement, but also gives them incentive towards a degree or certification program whether they remain in the service or seek outside career opportunities. CG-481, Office of Engineering and C4IT Workforce Management, will be soliciting volunteers to assist with this review. Each of our CWOs should use this opportunity to shape the future of ACE accreditation.

Why volunteer to be a member of an ACE review for your Rate/Specialty in the service? This is your chance in updating the American Council on Education (ACE) on reviewing your Rate/Specialty for college accreditation. Your Rate/Specialty may have evolved in the past few years into new areas of responsibilities and technological skills of higher learning. Just as any training course or occupation was developed; it must also be reviewed to keep up with advancement of knowledge or changes in technology. These advancements require new learning skills that can be measured and accredited for the ACE review.

What happens now? As a selected team member you and your team will review the background matrix of your Specialty/Rate of job tasks or a new

familiar term, competencies. A team consisting of members in that Rate/Specialty with diverse experience within that occupation would review and add to the matrix (reference for matrix is on file with CG Institute) to ensure it was complete and up to date with current task requirements or competencies. Next, the team will meet with a team of ACE visitors, which is located in Washington, DC. ACE, through its Military Evaluations Program, evaluates military courses and occupations and recommends college-level credit for them. The Coast Guard Institute supports the coordination and resources the evaluation for credit recommendations every 10 years for each Rate/Specialty or newly developed one.

When evaluating occupations, teams of college faculty members meet with a group of individuals who are assigned to a particular specialty. The purpose of these interviews is to determine whether a given military occupation contains the type of knowledge and skills that would be comparable to learning acquired in college-level courses. The process involves an ACE team of three to five subject-matter specialists meeting with several individuals in each Rate/Specialty. These team members conduct a group interview at a conference room located at a designated location or military facility. The interviews last approximately 50 to 60 minutes. The discussion focuses on the responsibilities, functions, duties, and skills of the job. Please note, evaluations are of the job, rather than of you as an individual. The information and material that you present/provide helps the evaluators make informed decisions about the recommendations of college-level credits for that specialty.

The results of the interviews, combined with a thorough review of written job descriptions and other documentation, become the basis for possible recommendations of Lower Level (LL) or Upper Level (UL) college credit. The recommendations are based on the knowledge and skills required for each specialization. These recommendations are then published in the *Guide to the Evaluation of Educational Experiences in the Armed Services*, which is distributed to accredited educational institutions and all military education centers.

The advantage of this project is that many service members and veterans have been able to get equivalent credit at a college for their accomplishments in Military Service. Many service members at your unit who are taking college courses may have already benefited from this opportunity in credits toward a degree program. In closing, your helpfulness when selected for an ACE interview is a benefit to many service personnel and veterans. We appreciate your assistance in this worthwhile program and for more information go to CG Central, Search on ACE and look for *PDF Education Information … ACE National Registry Transcripts* … or contact CWO4 Rusty Huyck at 202-475-5752 or by email at: rusty.l.huyck@uscg.mil.

Lean Update - Pier One

by Keith Herchenroder, Yard

No, we're not talking about buying wicker furniture from the import company! As you may know, Pier One recently completed a structural inspection, repair, and repaving. This presented the Yard with a great opportunity to start with a "clean slate" to set the pier up correctly to get the best efficiency, order, and cleanliness. With the help of our Lean consultants, we put together an expert team with representatives from the rigging, pipe, and temp services shops to brain storm the best way to be doing business. It was clear that clutter was a major problem on the piers, as well as a lack of proper labeling as to what pallet of equipment belonged to what vessel, and if it was coming or going. Also, it was noted that although most of the Yard personnel knew where a vessel was located, many of the contractors we use often have no idea where a vessel is and spend time (and therefore money) looking for it. Then there is also the problem of unauthorized vehicles on the pier, and sometimes even authorized vehicles being parked on the crane rails; now comes the search for the keys, or to find the person to move the vehicle so the crane can get on with its' business at hand. All of this adds up to lost time and higher costs. With these problems acknowledged by the team members, they set out to make improvements.

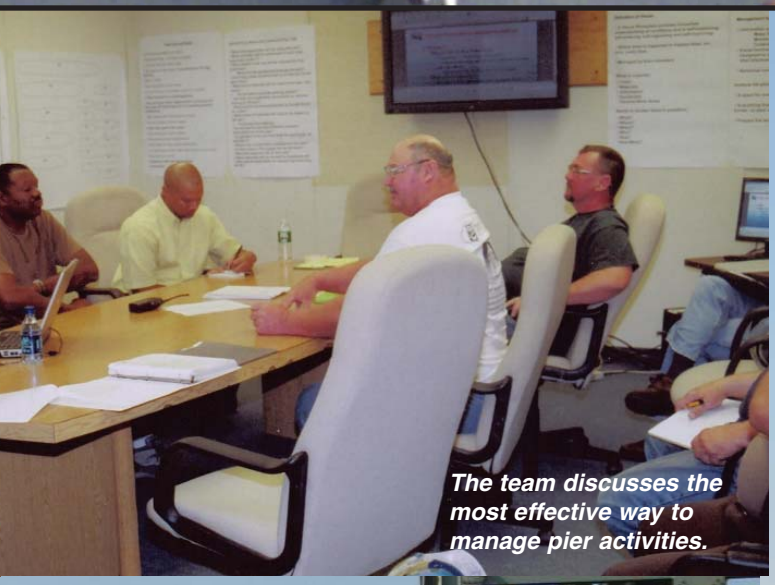
To start off the effort, a set of rules were established for what goes on the pier and when; where it will be staged; what areas are reserved for Yard production equipment; rules for vehicles on the pier; and pier markings. The team recognized the need for better identification of materials -- especially important if multiple vessels are at the pier. One of the new rules of the pier, no material is to be brought on the pier that is not labeled regarding what vessel it goes to and the point of contact for that material. Unlabeled material will be removed by the riggers to an off pier storage area. These rules are in the process of being made into formal Yard policy.

Although it would be a great idea to have standard locations marked on the piers for all routine requirements, it was recognized that the Yard repairs cutters of all shapes and sizes, and that we must maintain flexibility in our use of space. A plan was devised to make the pier organized, yet flexible.

The pier itself was divided into quadrants, with a labeling scheme that identifies each area. Each quadrant will belong to one project, although a larger cutter may need two quadrants, but those will be used for that vessel only. This will help keep material segregated by project and keep the pier better organized. Moveable sign posts were purchased and signs made by the X22 shop will allow the pier to be configured any way necessary to accommodate any vessel or work being done. Certain areas of the pier were striped in red as off limits for anything other than production equipment.

The final touches are still being put in place. The utility hook-ups are being painted by the X42 crew (Paint Shop) and the signs are being finished by the X22 shop (Inside Machine Shop) and X43 (Material Handling) personnel. The pier was officially "Reopened" on August 3, 2007, when the Cutter VENTUROUS was moved to Pier 1 Bravo South. Yard Rigger Foreman John Downes gathered the key players together and explained what we're trying to accomplish with this pier and the benefits that will be realized in improved work environment and efficiency by having a less cluttered and more organized workplace.

The real challenge still lies ahead -- sustaining the improvements!



The team discusses the most effective way to manage pier activities.

Pier One opens for business.

Pier One clutter free -- the goal is to keep it that way!

Inside the red lines is for production equipment.

USCG NDI Application Proficiency Seminar

by Rusty Waldrop, ARSC*

Reprinted with permission from The American Society for Nondestructive Testing (NDT) *Materials Evaluation / September 2007*, Volume 65/Number 9, edition.

United States Coast Guard Aviation implemented a nondestructive testing (NDT) standardized program in 2002. In keeping with both national and international standards, Coast Guard personnel performing NDT in the aviation community are required to be trained, qualified and (re)certified every three year cycle. Coast Guard Aviation recognized the need for a standardized certification program to increase confidence in both the NDT application and the interpretive results. Using *Recommended Practice No. SNT-TC-1A (2001)* as a guiding source, a two week course was developed. Completion of the course certifies Coast Guard inspectors as US Coast Guard Aviation Level II(R), which is now required for all documentation of Coast Guard fleet aircraft nondestructive testing. The development of this certification program is the result of months of engineering consultation between the NDI Program Office and Airworthiness Assurance NDI Validation Center (AANC) at Sandia National Laboratories in Albuquerque, New Mexico. (Note that nondestructive testing is commonly referred to as nondestructive inspection [NDI] in the US military.)

The inspectors were required to properly assemble their instrumentation and apply it to an actual aircraft on site.

Even though the Coast Guard deems the course to be comprehensive, these fleet inspectors are still novices in the technical NDT skills. With this in mind, it is imperative that the Coast Guard NDI Program Office be accessible to the inspectors for real-time consulting guidance. Also, some form of proficiency verification is needed to help guide the personnel through their NDT decisions and reset their foundational technical knowledge. To complement the recertification of inspectors, the Coast Guard NDI Program Office, in conjunction with the AANC, has developed a week-long US Coast Guard NDI Application Proficiency Seminar. The seminar has undergone revisions and refinement over the past three years and has

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been developed into a working program for Coast Guard Aviation. In 2006, the program was held at the AANC and included 22 uniformed participants from around the country. It consisted of individuals whose normal activities include maintenance on the H65, H60, C130 and HU25 aircraft. The US Coast Guard Level II(R) certification is a collateral duty for these individuals and the skills required need to match those of a full-time inspector. The seminar included chaired sessions in eddy current fastener hole testing, ultrasonic testing and aircraft holistic evaluation, as discussed below.

During the chaired sessions, inspectors were given technical directives similar to Coast Guard directives, and they were required to read, interpret and apply the technique on the given aircraft or component specimens. They were also required to interpret, evaluate and document all findings in a written format for review. The Coast Guard NDI Program Office gathered experts from the field of NDT to assist in guiding and consulting with the inspectors, honing their abilities and instructing them where necessary. Inspectors were broken into small groups of 6 to 8 members so that they received maximum attention and guidance. In addition to the Coast Guard NDI Program Office manager, the professional team of the seminar included the following:

AANC Specialist Mike Bode
AANC NDI Engineer David Moore
Dassault Falcon Jet NDI Level III Tim Kinsella
US Coast Guard ESD AAB ASIP Manager CDR (retired) Pat Dwyer
AANC Level II Ciji Nelson.

Having both the Coast Guard resident and the collected colleague experience available for independent consultation and guidance was extremely beneficial. The AANC in Albuquerque has an array of experience and education in the NDT arena, as well as several characterized retired aircraft, and is indeed a valuable resource for NDT practicality accreditation. The on-aircraft testing segment of the seminar hosted by AANC representatives greatly boosted the ability and confidence of the participating inspectors and was no doubt the meat of the Application Proficiency Seminar.

One chaired session was formal instruction in manual eddy current fastener hole testing techniques, with practical applications (Figure 1). The rational behind this instruction is that Coast Guard Aviation is beginning to require fastener hole testing in flight-critical structures, such as the lower forward beam cap on the C130. Bolt/fastener hole testing with eddy current is difficult to perform and interpret correctly. This is a complicated and critical test procedure requiring a strong focus and attention to detail. Refining this application and establishing the foundation for the novice inspector requires meticulous presentation with firm technical guidance to ensure success in the field. This seminar session stressed the issues of test criticality, patience and the consequences of misinterpretation, and ensured that the inspectors are confident in the procedure when the session is complete.

A second chaired session centered on ultrasonic testing (UT). Coast Guard Aviation is demonstrating a growing need to learn and apply this NDT method. This session was geared toward interpreting ultrasonic A-scan displays. An introduction to terminology and theory was given, along with a technical demonstration on determining loss of material. The personnel need to interpret an A-scan display to properly use an ultrasonic system. The technique introduced here starts the process of reviewing a longitudinal waveform and the digital radio frequency it displays in either the half, full or rectified wave format for the purpose of measuring thin-skin cross-section thicknesses of 1 to 6.35 mm ± 0.08 mm (0.040 to 0.250 in. ± 0.003 in.). The inspectors were required to properly

Figure 1. Manual eddy current fastener hole Inspection.

assemble their instrumentation and apply it to an actual aircraft on site. This application will help determine the loss of material due to corrosion, erosion or impact damage to aircraft. At the completion of this session, the inspector is able to confidently measure skin thickness and determine if limitations have been exceeded. This is extremely beneficial to engineering, when material is removed to repair corrosion damage.

Figure 2. The AANC Boeing 737.

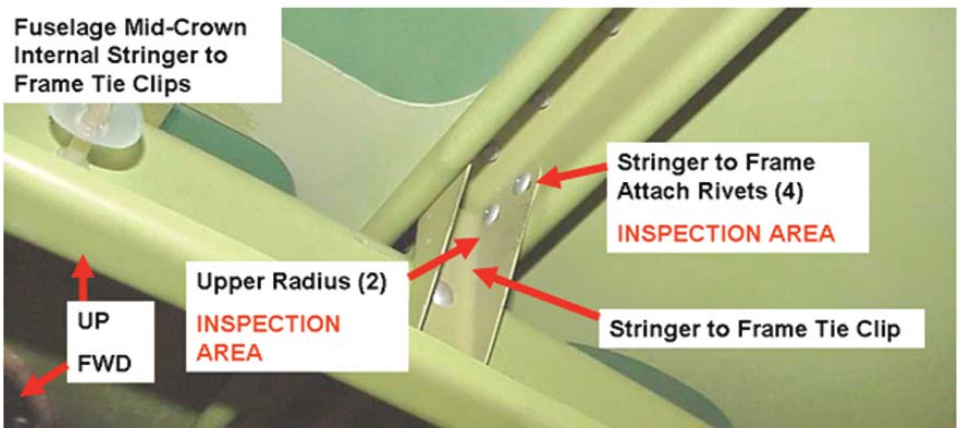

Figure 3. Fuselage mid-crown internal testing.

The third chaired session incorporated aircraft holistic evaluations. This session included eddy current surface testing on a retired aircraft. At AANC, the inspectors were able to perform the NDT applications on a Boeing 737 (Figure 2) that has recorded and measured crack characteristics. The inspectors were administered an NDT directive that gives detailed testing parameters and aircraft locations. The tests described below were chosen because of the similarities to the current Coast Guard Aviation maintenance procedure cards.

Fuselage mid-crown internal eddy current testing (Figure 3) requires the inspector to climb a ladder, reach up and test various tie clips along the mid-crown frame. Not only is the inspector subjected to a real-life scenario, but he or she is also challenged to set up two different probe configurations. Unfortunately, in the real world of NDT, most inspectors are found to hurry the job and not take the time to change and recalibrate a new probe or eddy current system, thereby foregoing thorough testing in favor of reduced production time — and thus increasing the odds of missing a crack.

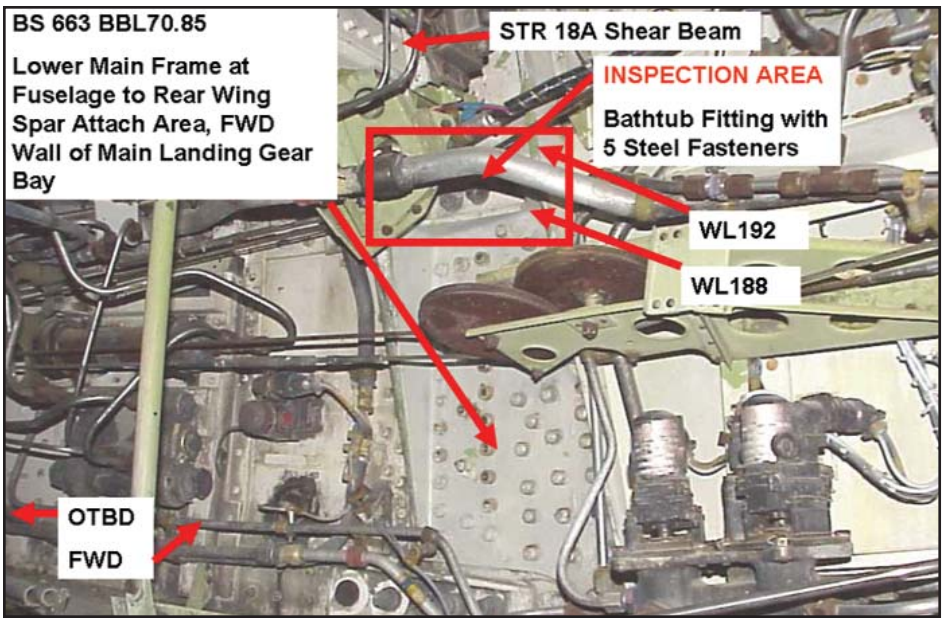

Figure 4. Main landing gear lower main frame testing.

Testing of the main landing gear lower main frame, in the wheel well (Figure 4), places the inspector into tight quarters on a stand using portable lighting to test a bathtub fitting that has five ferromagnetic bolts holding the main landing gear main frame in place. This is important, for the inspectors need to see the permeability effects of a ferromagnetic fastener installed in an aluminum alloy component on the produced eddy currents. This effect may mask a crack by distortion or through causing misinterpretation of the applied eddy current screen indications. The inspectors were required to determine the effective testing distance from a ferromagnetic bolt by a vector trace drift response check. If the distance between the eddy currents applied by the probe coil and the ferromagnetic fastener is large enough that a significant crack will be missed, the fasteners must be removed for testing.

The fuselage mid-section floor beam testing (Figure 5) requires lying down or stooping, then reaching up and

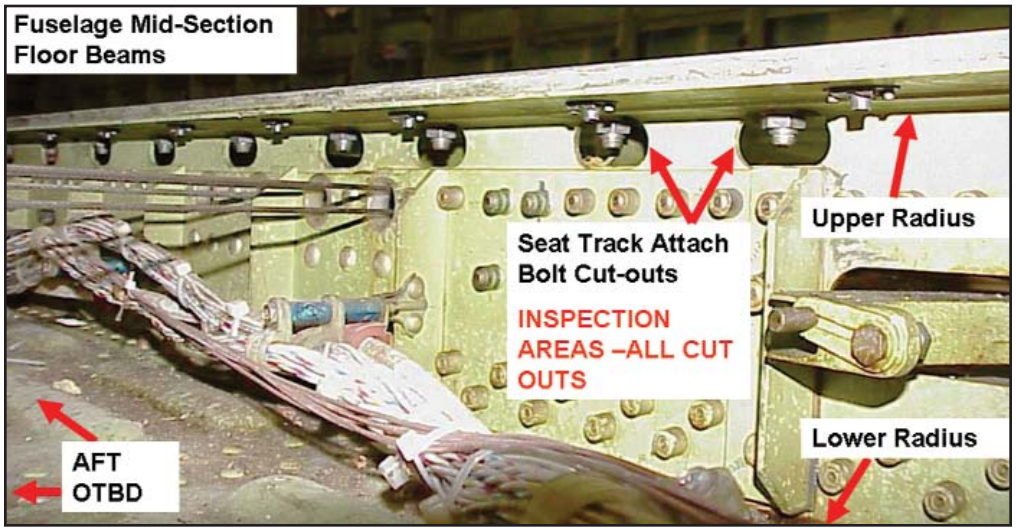

Figure 5. Fuselage mid-section floor beams.

under the floor beams, trusting the inspector's hand eye coordination and ability to work in an area not readily seen. A visual inspection of the surface using a flashlight and a mirror is required prior to testing, which allows the inspector the time needed to become familiar with the test area. This type of testing requires a patient, meticulous inspector. With the test area not being visible, the inspector must be attentive to the probe's location and movement. The inspector encounters numerous variables under the floorboard, including edge effects, eddy current distortion and probe wobble.

Internal testing of the fuselage left forward cargo compartment requires climbing into a somewhat tight, poorly lit compartment (Figure 6), which is uncomfortable due to the exposed structural members of the aircraft. This exercise reinforced the potential influence of human factors on the inspectors' work.

Included as part of the seminar were independent workstations (Figure 7) that featured specific US Coast Guard nondestructive testing applications that have been or will become routine for the fleet inspectors, and that are designed to build inspector confidence. Three independent testing stations were incorporated, highlighting the H60 rescue hoist support assembly, H60 drive shaft, and the new bead seat test procedure for the H60 and H65 wheels. These independent workstations played an important role in the seminar, as they gave the fleet technicians the opportunity to focus on routine (and possibly complacent) NDT application practices, and to correct any shoddy habits they may have developed. These

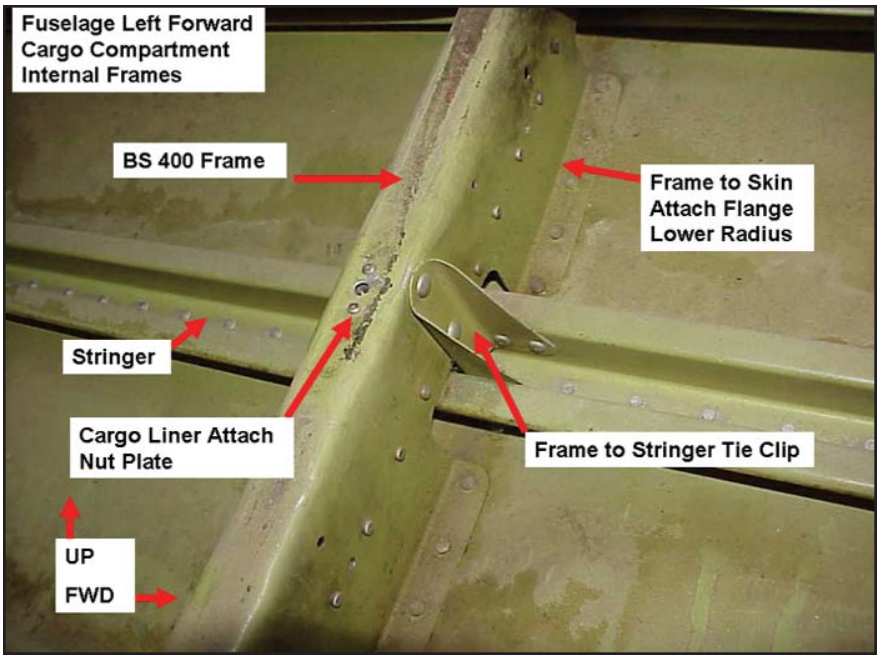

Figure 6. Fuselage left forward cargo compartment internal frame testing.

independent stations also offered the opportunity to address any concerns with the NDT directive through one-on-one interaction with Coast Guard NDT engineering personnel. During the course of the week, the inspectors were required to test the components and submit a written report containing the geometrical characteristics of any located discontinuities. This exercise confirmed that all the inspectors were in compliance with current directives, ensuring standardization amongst the air stations.

The 2007 US Coast Guard NDI Application Proficiency Seminar will be similar in nature. The number of test aircraft will be increased, along with the variety of NDT applications. Acontrolled probability of detection study will be conducted, which will enable Coast Guard Engineering to determine the confidence level of the fleet inspectors' abilities. This study will also allow the NDI Program Office to evaluate our training and make any necessary adjustments.

Figure 7. Independent workstations.

MH-60T Prototype is Airborne

The HH-60J supports an ever increasing spectrum of Coast Guard missions. In order to safely and effectively manage these diverse tasks, the H-60 cockpit and mission avionics must provide the capability to perform long-range navigation with high precision, and must be able to interoperate and intercommunicate with a wide range of cooperating assets on the ground and in the air. The current avionics suite is obsolete and not configurable to meet the new requirements. As a result, the HH-60J Avionics Upgrade Project was initiated with the Aircraft Repair and Supply Center (ARSC) as primary integrator in the fall of 2003. The ARSC H-60 Product Line worked feverishly under program oversight provided by CG-931, The Office of Aviation Acquisitions, to integrate the Rockwell Collins Common Aircraft Architecture System (CAAS) cockpit as well as an entirely new communications and navigation suite. Due to the extensive avionics modifications and addition of AUF base kits, the HH-60J will be re-designated as the MH-60T.

ARSC benefited immensely from a partnership developed with a multi-platform team referred to as the CAAS Users Group. The group membership includes nine Department of Defense (DoD) platforms to include CH-47F, MH-60M, VH-60N, and MH-53. This partnership ensured MH-60T compliance with the Chief of Naval Operations (CNO) requirements to be Required Navigation Performance Area Navigation (RNP RNAV) certified by the FAA (Federal Aviation Administration) mandate of 2010. Partnering with the CAAS Users Group yielded a $15M savings over individual procurement of the RNP RNAV software development.

In addition to the extensive Avionics Upgrade project, the H-60 is simultaneously undergoing Re-wire Project, which coupled with the Avionics Upgrade Project, will replace 100% of the original aircraft

by LCDR Randy F. Meador, ARSC

wiring. All modifications will be conducted almost seamlessly with the standard aircraft overhaul process (PDM). Performing the modifications during PDM allows the work to be completed with no visible impact to the fleet. Conducting the upgrade as a separate operation would require removing each airframe from an already minimal fleet for up to a year, as well as an exponential cost increase.

An historical milestone was reached on June 25, 2007, when the prototype aircraft 6027 took flight for the first time during its Post-PDM functional check flight. Developmental Testing & Evaluation (DT&E) is currently underway and is a team effort between ARSC and NAVAIR Patuxtent River. To date, Electrical Load Analysis, EMI testing, and preliminary CAAS flight testing have proceeded on schedule. Operational Testing & Evaluation (OT&E) is currently scheduled for late January 2008. In an effort to enhance the pilot's knowledge base, the Aviation Training Center (ATC) Mobile H-60 branch agreed to supplement the ARSC pilot pool during Rockwell Collins flight testing as well as DT&E. In addition, ATC Mobile's Aviation Engineering Department is preparing for transfer of the aircraft to ATC for OT&E by supplementing DT&E crews with maintenance personnel on two-week rotations. These efforts provide exponential benefits for both units.

Training tools for the MH-60T program are state of the art for both pilots and mechanics. Aviation Technical Training Center (ATTC) Elizabeth City has been provided with a technician trainer referred to as the Hot Mock Up and ATC Mobile is set up with a quarter-dome style Cockpit Procedures Trainer (CPT). The CPT developed by JF Taylor establishes an environment so realistic that is has been referred to as "a simulator without motion." ATC Mobile is currently testing an MH-60T desk top trainer which will allow pilot training at the unit level. These units will be tested by ATC as well as ATTC prior to unit level issue.

Overall, the MH-60T Project is proceeding better than planned. The current schedule identifies fleet implementation beginning early 2009 with all eight H-60 units being fully populated in 4 ½ years.

Volunteer

Facility Managers

by Richard Sasse, P.E., M.SAME

Engineers who specialize in facility management can benefit professionally and help their communities by volunteering to share their expertise to non-profit organizations.

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Most people understand the importance of volunteering, especially those with young families. There always are opportunities to volunteer with Little League, Scouting, PTA, swim clubs and the other organizations that families join as part of participating in everyday life. These non-profit organizations rely on volunteers, and being a coach, leader, or fundraiser is an ideal way to share your free, and even not-so-free, time with your family and other families. If you also happen to be an engineer, you are even in greater demand.

Recent natural disasters have highlighted opportunities to help those in greatest need. Yet it is easy to overlook the opportunities closer to home to volunteer facility management expertise to non-profit organizations. The non-profit organizations that spring to mind instinctively are those that cannot easily raise dues or admission fees, and often rely on gifts and pledges to balance the budget. The face of the organization itself is usually its premier (or only) facility and its mission's success depends on the quality of the facility. Poor facility management leads to a failing organization program. Keeping these missions going becomes a problem as their facilities age and become historic properties.

Identifying Areas of Need

Volunteer facility managers are needed in a variety of areas including property committees, plant and property committees, buildings and grounds committees, and prudential committees.

Sometimes you can identify an organization's needs simply by reading your local newspaper. In Providence, R.I., for example, the newspaper reports

on the efforts of volunteer property committees, their decisions and their problems.

Public libraries may be another good place to volunteer technical expertise, given traditional funding problems. For example, the chairman of Providence Public Library Property Committee grew up in the town and loved the library. As an engineer at a major engineering consulting firm in nearby Massachusetts, he feels so strongly about the library that he has served on the committee for years.

Scouting is always in need of volunteers. One of the committees I've volunteered my time for is the Narragansett Council of the Boy Scouts of America's Properties Committee. Scout Camp is where young boys want to be in the summer. But that is the result of a lot of behind-the-scenes work, including work on code compliance, discharge permits, property boundary disputes, fire safety upgrades, life cycle planning, facility condition assessments, water treatment plant upgrades and adaptation for the Americans with Disabilities Act. Scout Camp today is a lot more than just tents and latrines.

Your local place of worship also presents a good opportunity for volunteer work. I also volunteer on the Property Subcommittee of my church, the Central Congregational Church, a historic property on the East Side of Providence. This 115-year-old structure provides a hands-on laboratory for any engineer looking to share expertise and learn from others. The subcommittee's makeup consists of many retirees and typical for New England, mostly veterans. The senior members are former mill managers, and members include a realtor, two architects, a retired engineering professor, a local insurance magnate, a retired submarine sailor, an engineer at a precious metals recycler, a psychology professor, our minister and our sexton. From this membership list it is easy to see that there is great wisdom to be exchanged among group members, which provides a personal and professional reward for the volunteer.

The church's work list of issues is long. It also is a good example of the type of facility that needs engineering expertise because the subcommittee's decisions affect the long-term integrity, appearance and functionality of the building and they must be done right the first time. Many facilities, like my church, also need assistance in making major upgrades to fire safety systems. Rhode Island, for example, has stiffened its fire safety laws as the result of the Station Night Club fire in 2003 in which 100 people died and 200 people were injured.

More typical problems facing non-profits include electrical systems that often go through multiple life cycles before they can be replaced and safety issues, particularly for organizations that offer day-care. A common theme is that the best solution may not be what could be done with a more generous budget. Real money goes into fixing things, not into feasibility studies. That's where the volunteers contribute.

What's in it for You

Non-profit organizations of all types are in severe distress as a result of reduced funding and volunteer time, not to mention decreased community participation.

Sound engineering decisions will need to be made to keep these facilities from dipping so low that they cannot be restored for continued use to fulfill their original missions. Some of these facilities are doomed to become adaptive reuse projects after they are sold off to pay bills. Engineers can help prevent that by volunteering.

If you feel strongly about the importance of such organizations, either because it is meaningful to you regardless of your current home, you are where you want to be forever, or you read about a non-profit trying to regroup, then there is great need for you to share your professional expertise.

The skills that we engineers have acquired through education and practice are in demand. We have the ability to read building codes; we understand the presence of fire hazards, asbestos, lead and historicity; and we know how to perform an economic analysis. For the other members of these organizations whose skill lie elsewhere, they depend on the engineers to present the facts, opinions, alternatives and recommendations that will support continued operation of the facility and its mission.

Military people are, by definition, in the service to others. Extending off-duty time by providing engineering expertise is in line with this calling. Sharing your knowledge and experience will be rewarded in many ways such as by learning from others and from encountering and resolving new situations when no one else has the expertise. When the pipe organ is due for major capital work, it may well be the engineer, not the organist, whose recommendation is selected.

editor's note: Richard Sasse is a retired USCG CDR

Deionization System Analysis for Diesel Engine Makeup, Auxiliary Boiler Feed and HH-65C Engine Wash Aboard Air Capable Cutters

by Erin Altemos, ELC

Tasking

ELC-025 (Auxiliary Machinery Branch) was tasked to research potable water production and quality issues for the 210/270 WMEC (Medium Endurance Cutter) Diesel Engine (DE) Makeup Water and HH-65C Engine Wash (EW) capability aboard air capable cutters. This task was expanded to cover Auxiliary Boiler Makeup Feed Water (MUF). ELC-025 developed this report focusing on the following items in support of this task due to system communality and overlap of issues:

1. Determine baseline potable water quality for the following classes of cutters: WAGB 420, WAGB 399, WHEC 378, WMEC 282, WMEC 270, and WMEC 210.
2. Determine whether potable water production on the cutters listed under (1) above meet the DE makeup requirements in COMDTINST M9000.6 (series), *Naval Engineering Manual (NEM)*.
3. Determine whether potable water production on cutters with Auxiliary Boilers meets the MUF water quality requirements of the NEM.
4. Determine the feasibility of using deionization (DI) to produce DE makeup, Auxiliary Boiler MUF, and HH-65C EW water from available sources of potable water on aviation capable cutters.
5. Develop cost estimates for procurement, implementation, and logistics for the list of cutters mentioned under item (1) above.

Executive Summary

Deionization provides a cost effective method of producing high quality water in limited quantities in a relatively compact package. DI systems have low capital, operating, and maintenance costs, and if properly configured, will provide water that meets the application specific water quality requirements.

Background

Unit Conventions and Conversions -- Conductivity, Resistivity, and Total Dissolved Solids (TDS)

Electrical conductivity (C) can be defined as the measure of the ability of a material to conduct an electric charge. Conversely, resistivity (R) can be defined as the opposition of a material to conduct an electric charge (expressed in ohms, Ω), and is the reciprocal of conductivity (R = 1/C). Resistance is expressed in ohms (Ω), and conductance is often expressed as Ω^{-1} but more commonly as mhos or S (Siemens in SI units).

It is important to understand that pure water is not a good conductor; it naturally has a resistance of 18,300,000 Ohm-cm. Because electrical current is actually transported by ions in solution, the resistivity of a solution decreases as the concentration of ions in solution increases. Therefore, by measuring the conductivity or resistivity of a given solution sample, one can determine the amount of impurities held in a solution. Conductivity is typically measured in µmhos/cm or µS/cm while resistivity is typically measured in Ohm-cm.

Another means of expressing the amount of impurities held in solution is referred to as Total Dissolved Solids (TDS). TDS can be defined as the total weight of all solids that are dissolved in a given volume of water, expressed in units per unit volume of water (mg/L) or parts per million (ppm).

In general, as the TDS of a solution increases, its conductance increases proportionally. In relatively dilute solutions (TDS < 1000 ppm), TDS and C are comparable and can be approximated using the following relation:

> PPM TDS = Conductivity (C) x 0.50; where conductivity is expressed in µmhos/cm or µS/cm

As a solution becomes more concentrated (TDS > 1000 ppm), the proximity of the ions to each other limits their ability to transmit current. The net effect is still an increase in current transmission, but it occurs at a much lower rate, so the relation is no longer valid.

Potable Water Sources

USCG Cutters can produce potable water using two methods: thermal distillation and reverse osmosis.

The traditional method of producing desalinated water is through thermal distillation. Thermal distillation is accomplished by converting sea water to vapor through heating of the raw seawater feed. This vapor is drawn from the evaporation chamber to a condensing chamber where it is turned back into liquid, thereby leaving the

dissolved solids in the concentrated feed water. Evaporators require a significant heat source to heat the feed water in order to produce distillate. Heating of feed water can be accomplished through the use of steam, hot water, or waste heat. The major advantage of thermal distillation is that it produces high quality water.

The other method of producing potable water aboard Coast Guard Cutters is through Reverse Osmosis (RO). Osmosis is the tendency for a less concentrated solution to diffuse through a semi-permeable membrane into a more concentrated solution. Forcing the reversal of the natural osmotic process is achieved by applying a significant amount of pressure on the salt water side of the membrane. This pressure causes the fresh water, called permeate, to pass through the membrane while the concentrated dissolved salts are blocked and discharged. The quality of the RO output depends upon the water temperature, salt concentration, available membrane surface area, type of membrane, the number of passes in the unit, and the pressure applied by the high pressure pump. ROs are simple to operate and do not require an external heat source, but water quality varies greatly with conditions (i.e., temperature, salinity, and system pressure) and therefore, in general, RO systems produce lower quality water than evaporators.

A potential third source of potable water is from shore side facilities; cutters frequently take on potable water while in port.

Baseline Water Quality

Riley-Beaird MAXIM Flash Evaporators M/N, 2-TCEFE-10-SC, 2-TCFE-6-SC, TU-106HR, and TCF-7.5-H-1 are installed on WAGB 420, WAGB 399, WHEC 378, and WMEC 282 class cutters. Beaird Industries was contacted to discuss evaporator operation and baseline water quality output. Detailed water quality data for evaporator systems was not available at the time this report was developed, however, Beaird Industries reported that the flash evaporators mentioned above produce a high quality distillate. The quality of the water being produced by the evaporators is continuously monitored by salinity cell. The evaporators incorporate an automatic dump valve interlocked with the salinity cells. The evaporators automatically stop delivery of water to storage when the contaminant level is greater that 0.25 grains per gallon (4.28 ppm). Provided the units are operated in accordance with published procedures, evaporator distillate should be about 4 ppm TDS but can be as low as 2 ppm TDS.

Village Marine Tec (VMT) RO Units M/N RC 7000+, RC 7000, and RC 5000 are installed on WMEC 270 and WMEC 210 class cutters. All VMT RO units are single pass units. VMT reported that the RO output as installed meets the World Heath Organization TDS requirements for drinking water and provided a detailed water quality breakdown. Table 1 represents worst case first pass permeate quality.

Typically Recognized Water Quality Breakdown				
Water Type	**Seawater**	**Seawater**	**Seawater**	**1st Pass RO Permeate**
	25,000 ppm TDS	**36,000 ppm TDS**	**42,000 ppm TDS**	**500 ppm TDS**
ASH-Residue from Heating/Evaporation	N/A	N/A	N/A	N/A
Sodium- Na^+ (mg/l as ion)	7,680.08	11,064.00	12,902.00	153.961
Total Hardness = Mg+Ca+Sr+Ba	1,213.03	1,749.05	2,038.06	24.20
Mg^{++} (mg/l as ion)	917	1,322.00	1,541.00	18
Ca^{++} (mg/l as ion)	287	414	482	6
Sr^{++} (mg/l as ion)	9	13	15	0.2
Ba^{++} (mg/l as ion)	0.03	0.05	0.06	0.001
Chlorides - Cl^- (mg/l as ion)	13,800.00	19,885.00	23,186.94	276
F^- (mg/l as ion)	1	1.4	1.6	0.02
Sulfate -SO_4^{--} (mg/l as ion)	1,920.00	2,766.00	3,223.00	38
pH	8.1	8.1	8.1	7

Table 1. VMT RO Output.

Shore side potable water quality varies greatly and is specific to location. The World Health Organization limits for potable water quality are set at 500 ppm TDS. Average tap water in the United States ranges from 150 to 400 ppm TDS.

Brominators/Chlorinators

The WAGB 420, WHEC 378, and WMEC 282 class cutters use Everpure Bromine Feeder Systems to disinfect the potable water. These systems inject bromine into the potable water system using two methods; by dosing the distillate from the evaporator as it is transferred from the evaporator to the potable water tank and by dosing the existing potable water tanks using a recirculation system. Potable water is typically dosed to 0.7 ppm bromine, but concentrations may be higher or lower according to residence time in the system.

The WMEC 270 and WMEC 210 cutters use a VMT bromine feeder system to disinfect the potable water as it is produced in the RO. This system is integral to the RO unit itself. Bromine concentrations may vary between 0.7 and 2.7 ppm, with the target being 1.0 ppm. These cutters also use an Everpure tank recirculating system similar to the WAGB 420, WHEC 378, and WMEC 282 class cutters for maintenance of bromine levels.

The WAGB 399 class cutters use a chlorinator system to dose distilled and shore side potable water prior to being sent to storage. This system ensures a minimum free chlorine residual of 0.2 ppm is maintained.

Diesel Engine Makeup Requirements

NEM Chapter 233 requires that diesel engine makeup water conductivity shall not exceed 150 µmhos/cm and that chloride shall not exceed 60 ppm.

> PPM TDS = Conductivity x 0.50; where conductivity is expressed in µmhos/cm or µS/cm
>
> Per NEM Requirements, makeup water shall have a maximum TDS of approximately:
>
> 150 µmhos-cm x 0.50 = 75.0 ppm TDS

Provided that the water source can produce water with a TDS below 75.0 ppm and a Chloride concentration below 60 ppm, the water may be used without additional treatment. Water produced by evaporators will meet the NEM requirements for DE makeup water. Water produced by RO and shore side water does not meet the requirements and requires additional treatment.

Auxiliary Boiler Feed Water Requirements

NEM Chapter 517, Auxiliary Boilers and Forced Circulation Steam Generators states that feed water quality requirements shall be in accordance with NSTM Chapter 220 V(2). Section 220-29.24, Water Requirements for Auxiliary Boiler Systems, Reserve and Makeup Feed Water addresses makeup feed water quality. The NSTM limits boiler MUF to 0.10 epm (equivalents per million) by salinity indicator or 15µmohs/cm by conductivity indicator.

> PPM TDS = Conductivity x 0.50; where conductivity is expressed in µmhos/cm or µS/cm
>
> Per NSTM Requirements, makeup water shall have a maximum TDS of approximately:
>
> 15 µmhos-cm x 0.50 = 7.5 ppm TDS

The requirements for MUF coming from storage tank are limited to 7.5 ppm TDS.

Furthermore NSTM Chapter 220 V(2), Section 220-29.22, Distillate addresses distillate discharge direct to feed. The NSTM limits distillate output quality to 0.065 epm by salinity indicator or 10 µmohs/cm by conductivity indicator.

> PPM TDS = Conductivity x 0.50; where conductivity is expressed in µmhos/cm or µS/cm
>
> Per NSTM Requirements, makeup water shall have a maximum TDS of approximately:
>
> 10 µmhos-cm x 0.50 = 5.0 ppm TDS

The evaporators produce distillate below the MUF threshold. Distillate produced by the evaporator may be stored via feed tank or discharged directly (if so configured) to the Auxiliary Boiler as MUF. Water produced by RO and shore side water does not meet the requirements of the NEM/NSTM for use as MUF in Auxiliary Boilers without additional treatment.

HH-65C Engine Wash Requirements

Turbomeca provided the following standards for engine wash water in "Technical Specification, Standard Conditions for Rinsing, Washing, Cleaning, and Protecting Turbomeca Engines, No. 00800, Rev. A." Table 2 (see next page) summarizes the water quality requirements for helicopter engines.

The Arriel 2C2CG Maintenance Manual explicitly states "the use of minimum quality water is in exceptional cases only and should not be used as a long

Parameters	Maximum content			Water quality test	
	Distilled water	Deionized water	Minimum imposed quality water	Rapid test (in the field)	Precise test (Lab Test)
Appearance	Clear, pure, colorless, without deposits and suspended solids			Visual inspection	Visual inspection
PH	5 - 7.5		6 - 8.5	Strip (pH paper)	pH meter
Conductivity or resistivity (µS/cm)	5	5-10	400	Conductivity meter	Conductivity meter
SOAP (residues following evaporation and heating)	2 ppm	10 ppm	175 ppm	None	Rotary evaporator, Boiling water bath, Platinum, silica or borosilicate glass capsule, Stove
Chloride content	None		15 ppm	Strip Colorimetric test	Ion chromatography Titrimetric test
Sulphate content	None		10 ppm	Strip Colorimetric test	Column chromatography Titrimetric test
Hardness	None		18° f	Strip	Colorimetric test
Sodium content	None		10 ppm	Multi-parameter device	Ion chromatography ICP

Table 2. Turbomeca Water Quality Requirements.

term substitute … Use only Distilled or Demineralized water."

Therefore;

PPM (approx) = Conductivity x 0.5; where conductivity is expressed in µmhos/cm or µS/cm

5 µmhos-cm x 0.50 = 2.5 ppm TDS for distilled water

10 µmhos-cm x 0.50 = 5.0 ppm TDS for deionized water

The evaporators produce distillate below the 4.28 ppm TDS threshold and can produce distillate to as low as 2 ppm TDS. Evaporator distillate may or may not be acceptable for use in the HH-65C EW. Water produced by RO and shore side water does not meet the requirements of the HH-65C EW without additional treatment.

Deionization Systems

Several manufacturers produce commercial deionization (DI) systems. The data provided here is based on research from Culligan, GE Ionics, and Aquapure.

DI is a process in which impurities (ions) are removed from water. DI is most often accomplished by first passing the water through a column of cation exchange resin. As water moves through the resin, it leaves its cations (Ca^{+2}, Na^{+}, Mg^{+2}, Fe^{+2}/Fe^{+3}, Mn^{+2}, K^{+}) on the resin while it picks up hydrogen (H^{+}) ions. Next, the water passes through a column of anion exchange resin. Here, the water leaves its anions (sulfates, chlorides, carbonates, bicarbonates, nitrates, and silica) on the resin and picks up hydroxide ions (OH^{-}). The hydroxide ions then combine with the hydrogen ions to form pure water.

Because the deionization process is so effective, the water quality is usually measured by the water's resis-

tance to electric current (in Ohms-cm). Deionized water quality depends on a variety of factors, including raw water composition, ion exchange resin types and quantities, and the number of resin tanks in the system.

Multi-bed deionizers utilize individual cation and anion exchangers linked in series. Multi-bed deionizers typically processes water to 1 M (mega or 1 x 10^6) Ω-cm resistance, which is equivalent to 0.500 ppm TDS. Depending on the influent, the systems, age, and type of resin, multi-bed DI resins saturate at approximately 12,000 to 15,000 grains per ft^3. Multi-bed DI systems provide high capacity water treatment with a 1 M Ω-cm limit to water quality.

Mixed-bed deionizers utilize cation and anion resins thoroughly mixed in a single tank. The mixed resins act like a series of alternating cation and anion exchange tanks to produce very high quality water. A mixed-bed deionizer typically process water in excess of 18 M Ω-cm resistance, which is equivalent to less than 0.028 ppm TDS. Depending on the influent, the systems, age, and type of resin, mixed-bed DI resins saturate at approximately 7,000 to 9,000 grains per ft^3. Mixed bed DI systems provide high quality water at a limited capacity.

A ***multi-tank*** DI system can be configured using multi-bed and mixed-bed deionizers to combine the benefits of both types of systems to achieve a specific water quality and throughput.

Bromine, Chlorine, and organics will damage the bed resins used in DI systems. A carbon/charcoal filter must be installed to strip these contaminants from the potable water prior to processing in a DI system. Additionally, a pre-bed filter assembly can be installed to trap sediment before the water enters the exchangers, as particulate will plug the bed and reduce the effectiveness of the DI resins. A post bed filter is also recommended to trap any resin particulate which may have been drawn from the bed to prevent damage of equipment downstream.

Water quality monitoring is performed by using resistivity monitors. Resistivity monitors continuously test the resistivity of the permeate exiting the DI system. If the resistivity of the permeate deceases below a preset value, an indicator light illuminates alerting the operator of excessive ion concentration levels within the permeate. The resistivity monitors are provided by the equipment manufacturers in standard increments and are available as multiple setting and single setting units. The standard unit settings for variable resistivity monitors used in this application are 50k, 200k, 500k, 1 M, and 2 M Ω-cm settings. Fixed resistivity monitors are also available in other increments. A standard 20k Ω-cm fixed resistivity monitor is also used in this application.

Analysis and Discussion

As noted above, NEM Chapter 233 requires that diesel engine makeup water conductivity shall not exceed 150 µmhos/cm or 75 ppm TDS and that chloride shall not exceed 60 ppm. Water produced by evaporator will meet this requirement without additional treatment. Water produced by RO and shore side potable water will not meet this requirement without additional treatment.

Water Requirements for Auxiliary Boiler Systems, Reserve, and Makeup Feed Water addresses makeup feed water quality, limiting boiler feed water to 10 µmhos/cm or 5 ppm TDS per NSTM Chapter 220 V(2), Section 220-29. Water produced by Evaporator will meet these requirements without additional treatment. Water produced by RO and shore side potable water will not meet these requirements without additional treatment.

Cutters utilizing evaporators for producing potable water can use potable water for DE makeup and Aux. Boiler MUF without additional treatment as it meets the minimum water quality requirements. However, only water produced by evaporator should be used for these applications. This requires the cutter to consume or segregate all of the low quality potable water taken on in port before using evaporator produced potable water for these services.

As noted previously, Turbomeca's standards for engine wash water in "Technical Specification, Standard Conditions for Rinsing, Washing, Cleaning, and Protecting Turbomeca Engines, No. 00800, Rev. A," HH-65 EW water quality shall be maintained below 5 ppm TDS.

<u>DE Makeup Water Analysis and 25 TDS DI System Configuration</u>

A 25 TDS DI system to process DE makeup water is required on all cutters using RO to produce water while underway. This system should be a multi-bed deionization system since high quality water is not required for the primary application and capacity optimization is preferred. See Figure 1, next page, for the 25 TDS DI System flow diagram and operating limits.

<u>25 TDS DI System Arrangement</u>

A balance must be struck between water quality, equipment size, and system capacity. The system should be

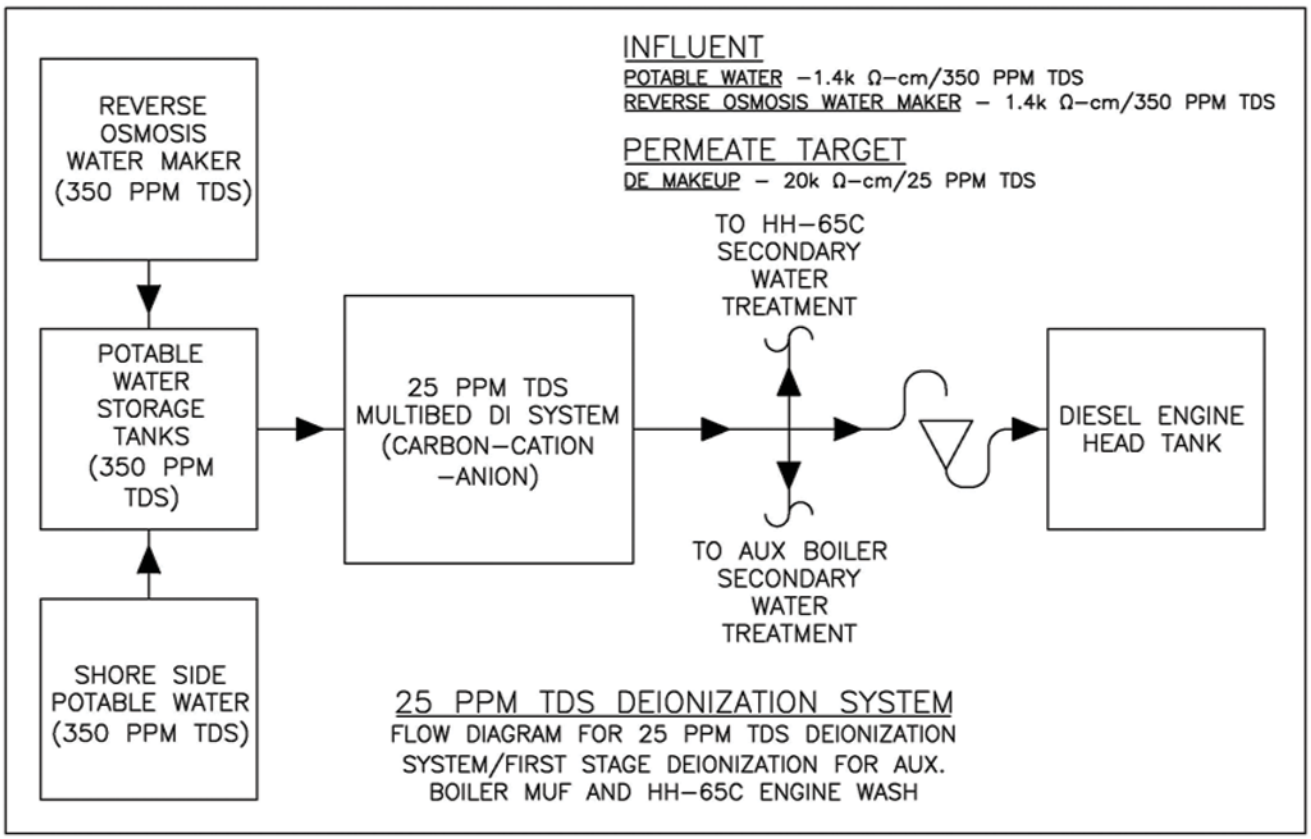


Figure 1. Primary DI System Flow Diagram.

comprised of individual carbon, cation, and anion tanks; particulate filters; a resistivity monitor; and associated valves and piping. Preliminary calculations suggest that 2.0 ft³ tanks will provide sufficient processing capacity in a compact package for the intended service. In the proposed three bed arrangement, 2.0 ft³ tanks will process approximately 700 gallons of potable water from 350 ppm TDS to less than 25 ppm TDS quality before requiring renewal. The three tank 25 TDS DI sys-

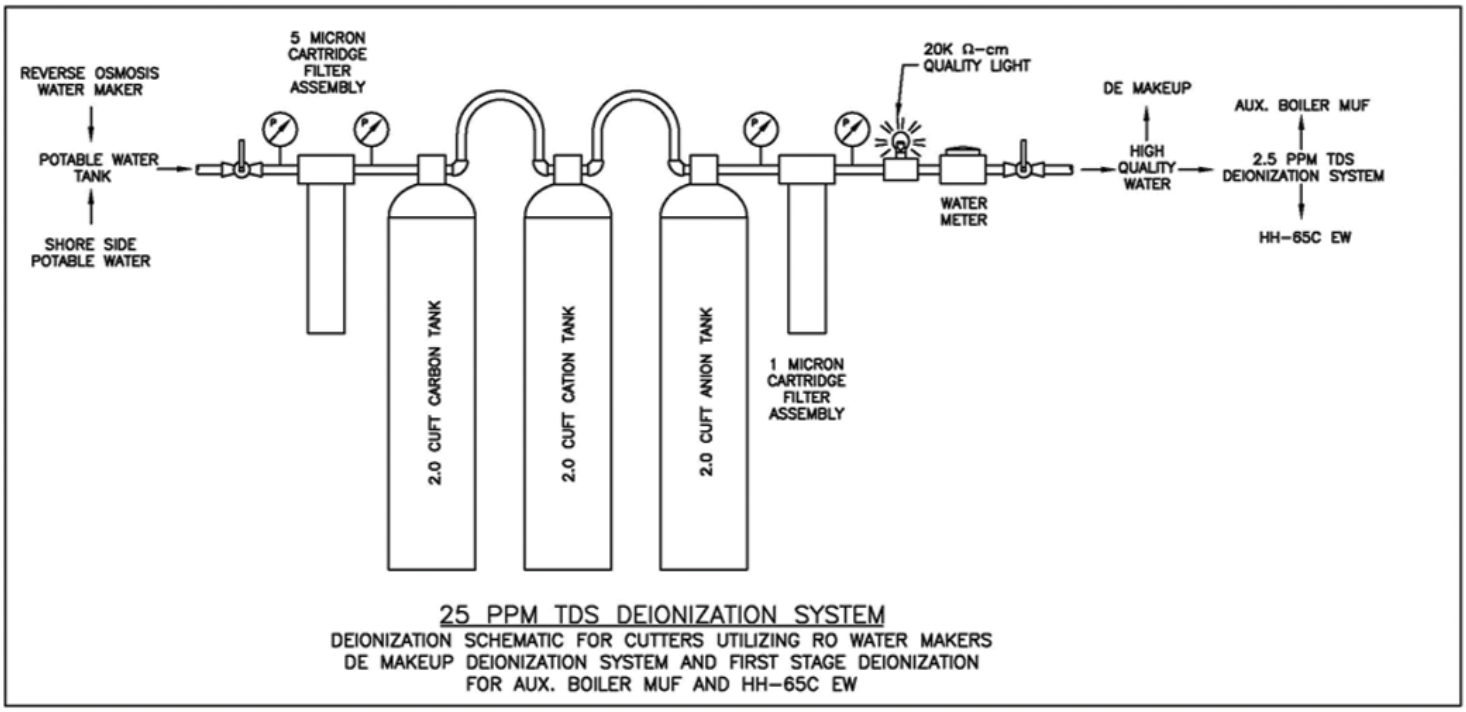


Figure 2. 25 ppm TDS DI System Schematic.

tem is rated for up to 5 GPM flow to expedite filling of the DE expansion tanks. See Figure 2 for the 25 TDS DI system schematic for configuration and operating parameters.

Output of the 25 ppm TDS DI should be monitored to 20k Ω resistance (25 ppm TDS) for DE makeup by fixed resistivity monitor. Monitoring to this value ensures that the quality requirement for the application is being met. It is important to note that when the tanks are initially put online, the system will produce 1 M Ω quality water even though it exceeds quality requirements for the application. As the resins saturate, the output quality of the water decreases non-linearly until the alarm threshold is met, at which point the quality light illuminates. It should also be noted that the time to saturate (tank longevity) increases with a decrease in TDS loading.

The 25 ppm TDS DI system will require an envelope of approximately 15" x 52" x 52" for the three tank installation, with each tank weighing approximately 150 lbs. Filter assemblies and valves require an envelope of approximately 6" x 12" x 26" and weigh 5 lbs.

Aux. Boiler MUF and HH-65C EW Water Requirements and 2.5 ppm TDS DI System Configuration

Separate treatment systems will be required for the HH-65C EW and Auxiliary Boiler MUF. As noted previously, cutters producing water by RO should utilize a 25 TDS DI

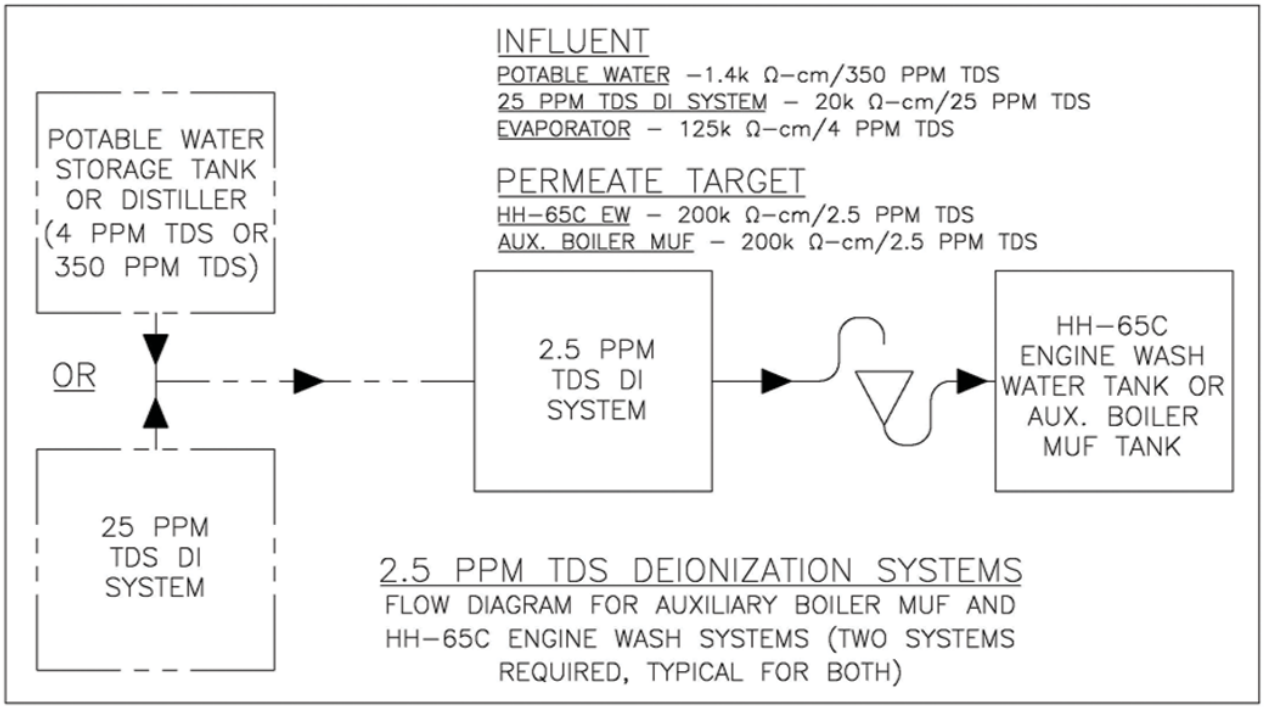


Figure 3. 2.5 ppm TDS DI System Flow Diagram.

system to process water for DE makeup, as shown in Figures 1 and 2. Permeate from the 25 ppm TDS DI system should be further processed by two 2.5 ppm TDS secondary DI systems. See Figure 3 for 2.5 ppm TDS DI system flow diagram and operating limits.

Cutters utilizing an evaporator to produce water do not require the 25 ppm TDS DI system for Aux. Boiler MUF; however, it is recommended that only distilled water be processed through the DI bed. Although the 2.5 ppm TDS DI system can process water with high TDS (i.e., shore side potable water or RO permeate), system longevity is severely impacted. ☛

Auxiliary Boiler MUF and HH65C EW DI System Arrangements

Two separate 2.5 ppm TDS DI systems are required to achieve the desired water qualities.

A separate 2.5 ppm TDS DI system is required for the Auxiliary Boiler MUF and requires the following components: a mixed bed tank, particulate filter(s), resistivity monitor, and associated valves and piping. See Figure 4 for the Auxiliary Boiler MUF 2.5 ppm TDS DI System schematic for configuration and operating parameters.

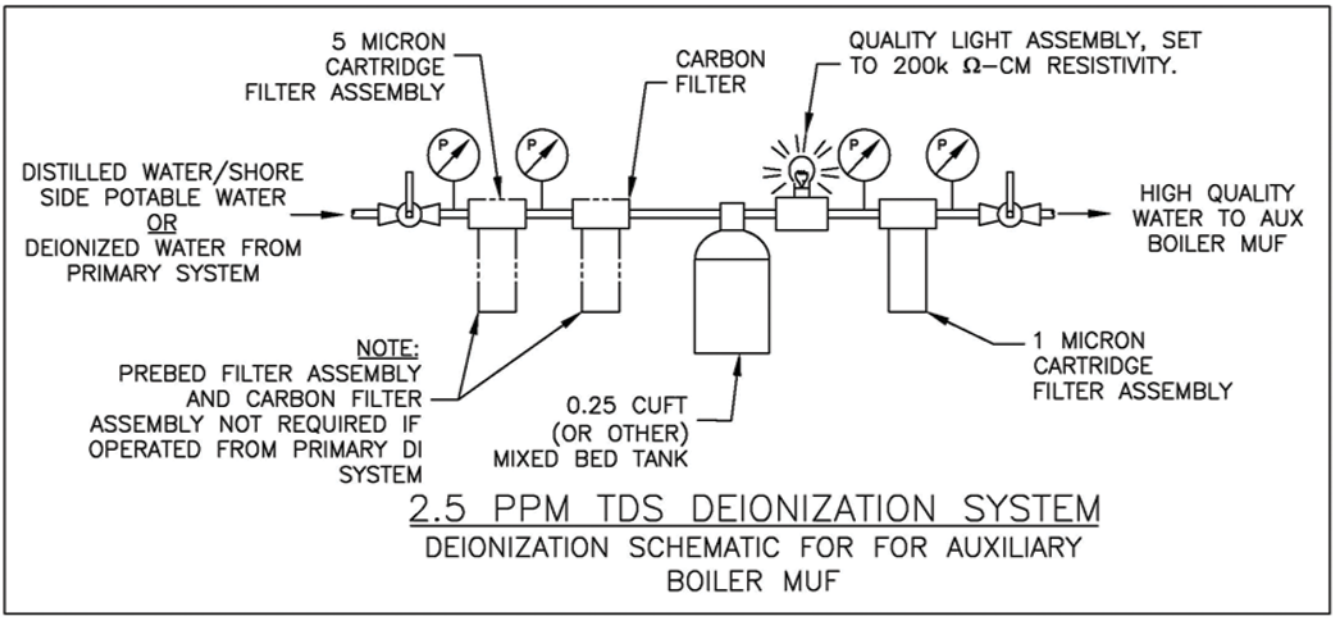


Figure 4. Auxiliary MUF 2.5 TDS ppm DI System Schematic.

The HH-65C 2.5 ppm TDS DI system will require the following components: a mixed bed tank, resistivity monitor, particulate filter(s), a water delivery unit, and associated valves and piping. The water delivery unit will be comprised of a small tank, an electric pump, and hose with fittings to facilitate the engine wash process. See Figure 5 for the HH-65C 2.5 ppm TDS DI system schematic for configuration and operating parameters.

Output of both 2.5 ppm TDS DI systems should be monitored to 200k Ω resistance or 2.5 ppm TDS. Assuming a 25 TDS influent, a 0.25 ft^3 tank is capable of processing 700 gallons of water at or higher than 200k Ω or 2.5 ppm TDS at flow rate of 1.0 GPM. This meets the NEM/NSTM requirements for MUF in Auxiliary Boilers and Turbomeca's requirements for water quality for EW.

If additionally capacity is required, larger mixed bed tanks could be utilized.

It is also important to note that when the tank is initially put online, the system will produce 18 M Ω quality water even though it exceeds quality requirements for the application. As the resins saturate, the quality of the water decreases non-linearly until the alarm threshold is met, at which point the quality light illuminates. It should also be noted that this time to saturated (tank longevity) increases with a decrease in TDS loading.

The secondary DI system requires the installation of a single tank weighting approximately 23 lbs and an envelope of approximately 8" x 8" x 22". Filter assemblies including valves require an envelope of approximate 6" x

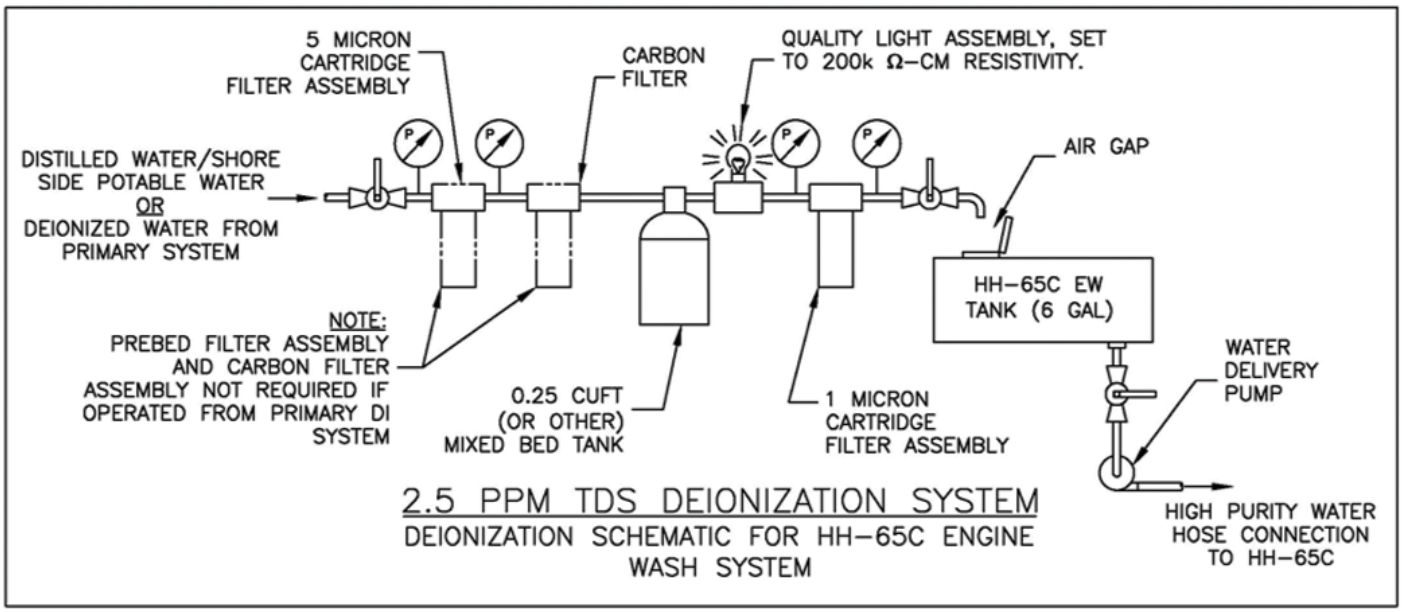


Figure 5. HH-65C EW 2.5 ppm TDS Secondary DI System Schematic.

12" x 15" and weigh 3 lbs. The water storage tank requires an envelope of 15" x 10" x 10" and weighs 5 lbs. The delivery pump is 8" x 8" x 7" and weights 12 lbs.

Since both 2.5 ppm TDS DI systems are relatively compact, they could be connected to the water supply at its point of use. In this configuration, the DI systems operate on demand at potable water pressure (from either the potable water system or the primary DI system) and therefore do not need a dedicated pump. Both 2.5 ppm TDS DI systems should deliver processed water through an air gap/funnel to the appropriate tank to prevent possible contamination of the potable water system.

The HH-65C EW system could be installed in the hangar (for cutters so equipped) or some other suitable location near the flight deck. The HH-65C EW system should use a small tank to store deionized water. Once the tank is filled to the appropriate level, a small delivery pump could supply the EW water to the engine flow limiter and wash water port. Additionally, the water delivery unit could be mounted to a small cart so that it may be transported to the aircraft for service. The aviation community already uses small carts for this purpose at land based facilities. Turbomeca's Technical Specification, No. 00800 indicated that certain maintenance procedures require the addition of chemicals for the wash process. These

chemicals could be added to the tank and delivered by this system if so desired.

MUF addition to the Auxiliary Boilers is continuous via solenoid controlled automatic fill valve, or manually by the watch. There is no data available on consumption of MUF.

HH-65C EW is reported to be once daily per engine per aircraft. The EW process requires up to two gallons of water per engine. Using a two aircraft per day wash requirement as a worst case scenario, bottle life can be projected as:

2 gallons/wash x 2 engine washes/aircraft x 2 aircraft/day = 8 gallons/day

DI bottle life is projected to be 700 gallons before exchange is required

700 gallons / 8 gallons/day = 87.5 days service life

DI System Configuration Summary

Table 3 is a summary breakdown of the proposed DI configuration for cutters producing water by RO and evaporator. As noted, cutters producing water by evaporator do not require the 25 TDS DI system.

Installation, Operation, and Maintenance Costs

Although this cost analysis is based on data provided by Culligan and GE Ionics, several manufacturers sell the equipment that is referenced here.

Installation Cost

The system installation cost will depend on the individual platform configuration. Cutters requiring the installation of a 25 ppm TDS DI system will most likely require equipment to be installed in an engineering space proximal to the equipment being supplied with high quality water. Total estimated cost for the 25 ppm TDS DI system installed is $5,440.

The 2.5 ppm TDS DI system cost estimate is based on system installation in an engineering space proximal to the 25 ppm TDS DI system and boiler feed tank. The total estimated cost for the Auxiliary Boiler MUF system is $4,255.

The HH-65C EW 2.5 ppm TDS DI system cost estimate is based on system installation in an enclosed space

Water Process	I/O	RO System	Evaporator System
Potable Water Production	Input (TDS)	36,000	36,000
	Output (TDS)	350	4.2
25 TDS DI System	Input (TDS)	350	N/A
	Output (TDS)	25	N/A
DE Makeup Water	Input (TDS)	25	4.2
2.5 TDS DI System	Input (TDS)	25	4.2
	Output (TDS)	2.5	2.5
Aux. Boiler MUF	Input (TDS)	2.5	4.2
HH-65C EW	Input (TDS)	2.5	2.5

Blue indicates RO or Evaporator input output.
Red indicates 25 ppm TDS DI system is required to support equipment requirements.
Green indicates 2.5 ppm TDS DI system is required to support equipment requirements.

Table 3. Summary of DI System Configuration for Cutters with RO Water Makers and Evaporators.

(i.e., hangar) proximal to both the primary DI system and the flight deck. The total estimated cost for the HH-65C EW system is $5,985.

Operating Cost

DI systems have a negligible operating cost. These systems operate on demand using the cutters existing potable water system. The only operating cost is power to operate the Resistivity monitors and a fractional horsepower motor (delivery pump for HH-65C EW Only).

Maintenance Cost

Support costs for the DI system are tank exchange cost and filter replacement. Most DI system vendors offer recharge programs for the tanks. The tanks are effectively leased and are returned to the vendor once they are exhausted. Tank exchange is approximately $100 per tank for the 2.0 ft^3 tanks and $25 per tank for the 0.25 ft^3 tank. Filter assemblies can be purchased for $15-$20 per filter depending on the element type, size, and rating.

Summary

Commercial-Off-The-Shelf (COTS) DI provides a cost effective method of producing high quality water in limited quantities in a relatively compact package. DI systems have low capital, operating and maintenance costs, and if properly configured will provide water that meets application specific quality requirements.

COTS DI systems provide high quality water at relatively low capital cost. The estimated cost to install primary and secondary DI systems meeting all the high quality water requirements (DE makeup, Boiler Aux. Boiler MUF, and HH-65C EW) for legacy cutters which utilize reverse osmosis water makers is approximately $15.6k per cutter. Cutters that use evaporators to produce water require the installation of a single DI system to delivery high quality water for HH-65C EW at an estimated cost of $5.9k per cutter.

COTS DI systems are maintenance free. The systems operate without intervention from the operator and provide a simple pass-fail indication via monitoring of the purity light. Upon indication of high conductivity by the purity light, the tank is simply exchanged, eliminating the requirements for specialized water tests and treatment with hazardous chemicals.

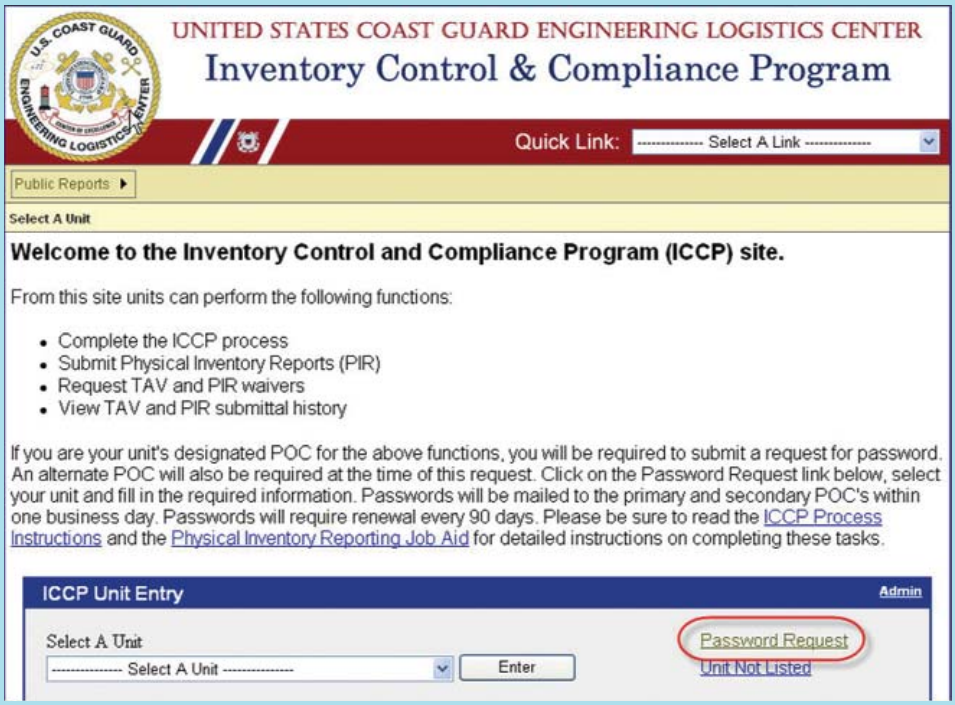
ICCP, CG PART, and AOCR Overview

ELC Mission Statement

Our mission is to deliver the right parts, information and service support at the right time, place and cost to maximize our customer's operational capability and effectiveness.

ICCP

The Inventory Control and Compliance Program (ICCP) is a means to reposition items not used by Coast Guard (CG) units to a centralized warehouse where dedicated resources are assigned logistics and financial accountability. A quarterly message is sent to units identified to start the ICCP process. The units will assign two Point of Contacts (POCs) for the entire process. A unit must complete the following four ICCP milestones:



1. Unit transmits CMplus or TAIT data via the ICCP web.

Progress to Date

Step	Status	Task	Date to Start	Date Complete	Date Due	Date Validated
1	✓	Transmit CMPLUS / TAIT Data	7/23/2007	9/7/2007	7/7/2007	9/7/2007
2		Download Unit Data				
	✗	Download and Save Inventory File	7/22/2007	Complete	7/27/2007	N/A
	✗	Download 1348's for Printing	7/22/2007	Complete	7/27/2007	N/A
3		Send PP&S Tracking Information	7/28/2007	Complete	9/25/2007	
4		Reconcile Inventory Data				
		Upload Inventory Spreadsheet	9/26/2007	Complete	9/30/2007	
		Request Utility Run	9/26/2007	Complete	9/30/2007	
		Overall ICCP Process	7/1/2007	Complete	9/30/2007	N/A

Once a step is complete ICCP shows a green checkmark, tasks not complete show a red "X" if overdue.

Data is analyzed by the Engineering Logistics Center (ELC) and a list of items to be repositioned is generated based on 3 years for consumables and 7 years for repairables non use criteria then loaded to the ICCP database.

2a. Once unit data is analyzed, the unit downloads the inventory list of items to be repositioned in HTML application format. The unit reviews the list and is allowed to keep up to 2% of the items, anything over requires Maintenance and Logistics Command (MLC) approval.

2b. The unit downloads and prints two copies of the DD-1348 form, one copy is attached to the item being repositioned the other is kept for unit records. In this step the unit physically removes the item(s) from their inventory.

3. The unit ships repositioned items to the warehouse and uploads the tracking information to the ICCP website.

Progress to Date

Step	Status	Task	Date to Start	Date Complete	Date Due	Date Validated
1	✓	Transmit CMPLUS / TAIT Data	4/1/2007	9/18/2007	4/7/2007	9/18/2007
2		Download Unit Data				
	✓	Download and Save Inventory File	4/22/2007	7/3/2007	4/27/2007	N/A
	✓	Download 1348's for Printing	4/22/2007	7/3/2007	4/27/2007	N/A
3	✓	Send PP&S Tracking Information	4/28/2007	7/3/2007	6/25/2007	7/5/2007
4		Reconcile Inventory Data				
	✓	Upload Inventory Spreadsheet	6/26/2007	7/3/2007	6/30/2007	7/6/2007
	✓	Request Utility Run	6/26/2007	7/9/2007	6/30/2007	7/10/2007
	✓	Overall ICCP Process	4/1/2007	7/10/2007	6/30/2007	N/A

ICCP

Reconcile Inventory data:

4a. Unit uploads the list of items being repositioned to the ICCP website where it's loaded to the ICCP database.

4b. Unit requests a utility run via ICCP website. When a unit requests a utility run ELC schedules the unit on the ICCP calendar. On the scheduled day, the ELC creates a list of items to be removed from the unit's database based on unit input. An ELC representative calls the unit ICCP representative and runs the utility that removes the items from the CMplus or TAIT database. This eliminates the unit going into the database and removing each item one at a time.

If the packing information has been received the utility run marks the completion of the ICCP process.

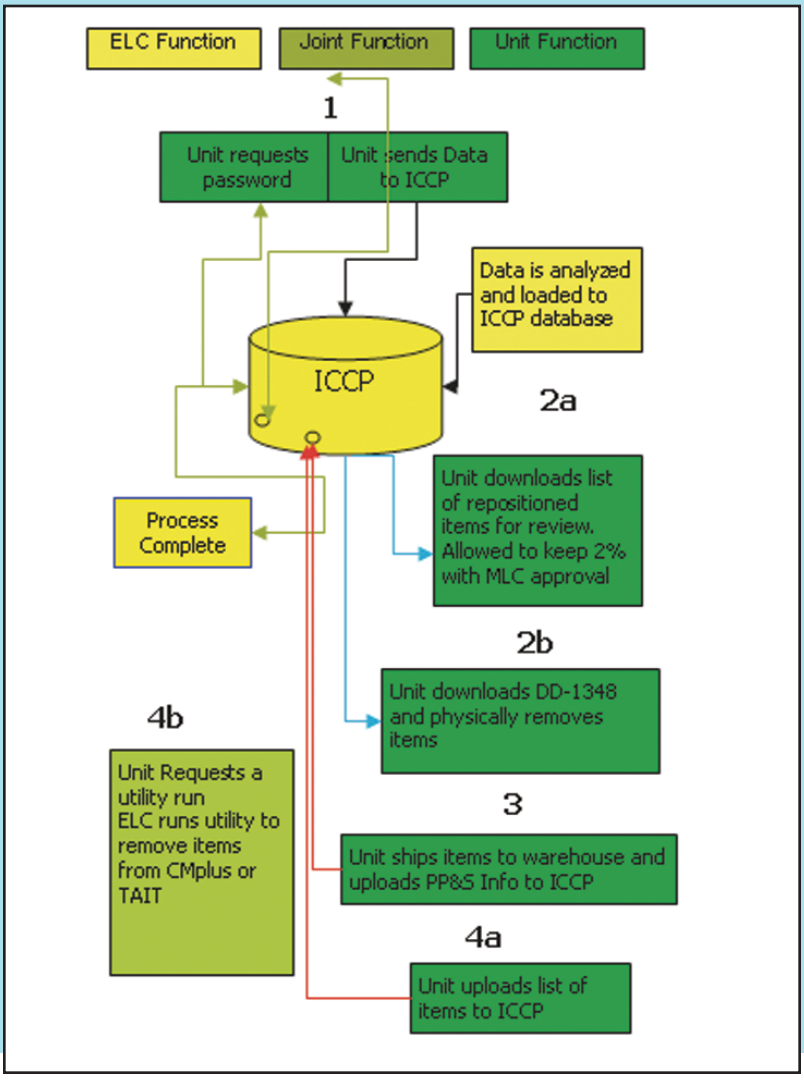
Progress to Date

Step	Status	Task	Date to Start	Date Complete	Date Due	Date Validated
1	✓	Transmit CMPLUS / TAIT Data	4/1/2007	9/18/2007	4/7/2007	9/18/2007
2		Download Unit Data				
	✓	Download and Save Inventory File	4/22/2007	7/3/2007	4/27/2007	N/A
	✓	Download 1348's for Printing	4/22/2007	7/3/2007	4/27/2007	N/A
3	✓	Send PP&S Tracking Information	4/28/2007	7/3/2007	6/25/2007	7/5/2007
4		Reconcile Inventory Data				
	✓	Upload Inventory Spreadsheet	6/26/2007	7/3/2007	6/30/2007	7/6/2007
	✓	Request Utility Run	6/26/2007	7/9/2007	6/30/2007	7/10/2007
	✓	Overall ICCP Process	4/1/2007	7/10/2007	6/30/2007	N/A

Color Legend: Item Complete and Verified | Over 1 Day Past Due | Over 14 Days Past Due | Pending Admin Action | Item Not Complete

ICCP Process Chart:

Message is sent to all units starting the ICCP process

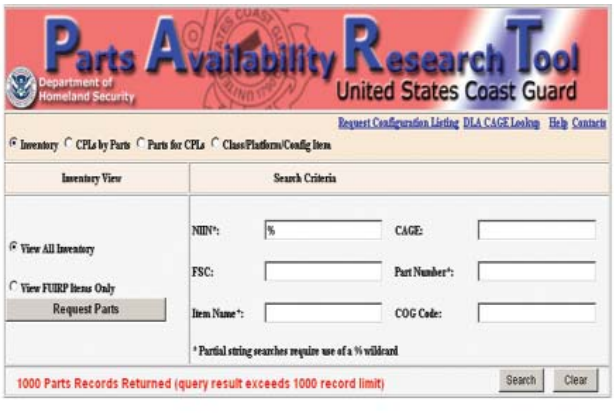


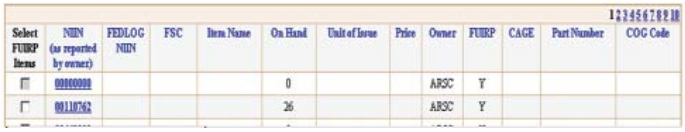
ICCP

ICCP Performance Metrics	
Volume of Inventory Repositioned NIIN's	19,866
Volume of Inventory Repositioned (piece parts)	308,519
Value of Inventory Repositioned	$16,250,717
Number of parts reutilized (Issued out)	11,408
Number of parts reutilized by original Units (Issued out)	6,718
Number of parts utilized by Units that were not the original	4690
Total value of parts reutilized	$4,893,671
Value of parts reutilized by original Units (Issued out)	$828,212
Value of parts utilized by Units that were not the original owner	$4,065,459
# of 1348s produced	42,400

CG Part

CG Parts Availability Research Tool (CG Part) is the website where Coast Guard (CG) units may request parts that have been repositioned. The site allows views of various data including items that have been repositioned by the Field Unit Repositioning Project. The interface is easy to navigate and use. Why would a unit need to have a part returned? If a consumable part is used only once in a 5 year period then it would have been repositioned by ICCP because the criteria of 3 years of non activity for consumables would have applied. The unit is able to have the item returned at no cost.

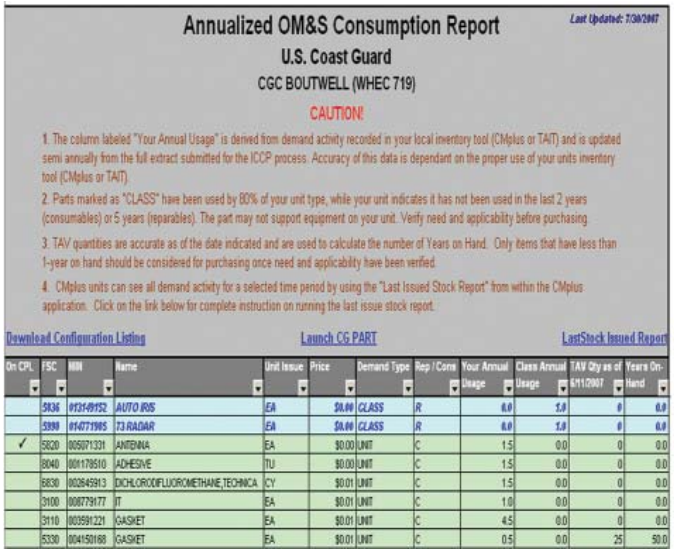


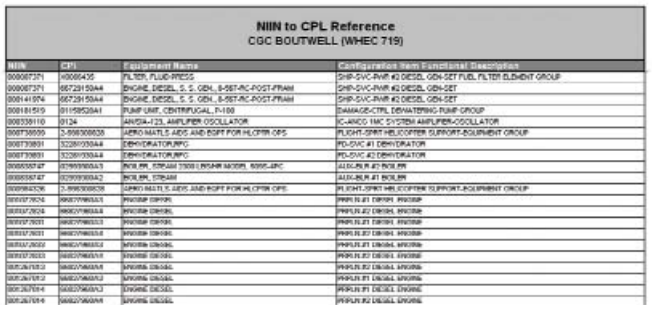


AOCR

The Annualized OM&S Consumption Report (AOCR) is an interim tool to assist units with making more informed local decisions as to what supplies are needed to maintain their operational readiness. The data in AOCR is based on the demand data in the authorized inventory tool (CMplus or TAIT).

Supplies that can be consumed within 1 year that verifiably support preventive, corrective, or alternative maintenance activities shall be purchased by the units. This is the maximum level of supplies authorized to be on the shelf. If current on-hand quantities exceed this limit, they shall be exhausted below the 1 year on-hand level before replenishing.





OZONE MESSAGE

Just a Reminder

In case you missed the original message, here is a reprint for those who are responsible for or work with Class 1 Ozone Depleting Substances (ODS) used throughout the U.S. Coast Guard.

R 171612Z SEP 07 ZUI ASN-A00260000025 ZYB FM COMDT COGARD WASHINGTON DC//CG-4// TO ALCOAST BT UNCLAS ALCOAST 439/07 COMDTNOTE 5090
SUBJ: OZONE DEPLETING SUBSTANCES (ODS) IN THE COAST GUARD A. MANAGEMENT GUIDE FOR REFRIGERANTS, COOLANTS, AND FIRE SUPPRESSANTS COMDTPUB P6280.3 B. DHS MANAGEMENT DIRECTIVE, 5120.1 ENVIRONMENTAL MANAGEMENT PROGRAM, SEPTEMBER 17, 2004 C. SUPPLY POLICY AND PROCEDURES MANUAL, COMDTINST M4400.19 (SERIES) D. SAFETY AND ENVIRONMENTAL HEALTH MANUAL, COMDTINST M5100.47
(SERIES)
1. IN ACCORDANCE WITH REFS A AND B ALL PROCUREMENT OF CLASS I ODS FOR NON-MISSION CRITICAL USES SHALL CEASE BY DECEMBER 31, 2010.
2. EFFECTIVE THAT DATE COAST GUARD ASSETS, ASHORE OR AFLOAT, SHALL NOT PROCURE OR OTHERWISE OBTAIN FROM DLA OR THE OPEN MARKET ANY CLASS I ODS (R-11, R-12, HALON 1211 AND 1301) EXCEPT FOR MISSION CRITICAL USES DESCRIBED IN REFS A AND C.
3. MISSION CRITICAL USES OF CLASS I ODS ARE: REFRIGERATED SHIPS STORES, SHIPBOARD AIR CONDITIONING SYSTEMS SERVING SPACES WITH MISSION CRITICAL TEMPERATURE SENSITIVE EQUIPMENT, SHIPBOARD FIRE SUPPRESSION SYSTEMS FOR ENGINE ROOMS, MACHINERY SPACES, TURBINE ENCLOSURES, FLAMMABLE LIQUID AND PAINT LOCKERS, FIRE SUPPRESSION ABOARD AIRCRAFT, FIRE SUPPRESSION IN FLIGHT SIMULATORS AT ATC MOBILE, FIRE SUPPRESSION FOR THE SHIP CONTROL AND NAVIGATION TRAINING SYSTEM AT THE U.S. COAST GUARD ACADEMY.
4. PROCUREMENT OF ODS FOR MISSION CRITICAL SYSTEMS SHALL BE MADE THROUGH THE DLA ODS RESERVES IN RICHMOND VA UNLESS OPEN MARKET PURCHASE IS AUTHORIZED BY COMDT (CG-441). REQUISITIONS MUST BE SUBMITTED THROUGH ARSC (FOR AIRCRAFT APPLICATIONS), MLC FOR AREA UNITS AND DISTRICT OFFICES FOR DISTRICT UNITS. AMPLIFYING INFORMATION ON THE VESSEL REQUISITIONING PROCESS IS AVAILABLE ON CG CENTRAL (CLICK THE UNITS TAB, SEARCH FOR UNIT/DEPARTMENT TAB, ENTER
CG-45 AND CLICK FIND DEPARTMENT, CLICK COMMANDANT (CG-45)). CLICK ON OZONE DEPLETING SUBSTANCE RESERVE, WHICH IS LOCATED IN THE INITIATIVES AND PROJECT INFORMATION SECTION. IN ADDITION, A REQUEST FOR REQUISITION FROM THE CG ODS RESERVES MUST BE SUBMITTED TO COMDT (CG-441) VIA EMAIL TO HENRY.J.HERZBERG(AT)USCG.MIL.
FAILURE TO SUBMIT AN EMAIL REQUEST MAY RESULT IN DELAYS IN THE REQUISITION PROCESS.
5. ACCIDENTAL RELEASES TO THE ATMOSPHERE OF INSTALLED STOCKS OF ANY CLASS I ODS, WHETHER OR NOT IN A MISSION CRITICAL APPLICATION, MUST BE IMMEDIATELY REPORTED TO THE NATIONAL RESPONSE CENTER.
REPORT RELEASES CAUSING INJURY, PROPERTY DAMAGE OR A NEAR MISS/HIGH POTENTIAL EVENT (HIPO) IN ACCORDANCE WITH CHAPTER 3 OF REF D, USING THE COAST GUARD E-MISHAP SYSTEM, HTTP://WEBAPPS.MLCA.USCG.MIL/KDIV/KSEMISREP/MHGO.ASP. SOME STATES ALSO REQUIRE REPORTS OF ACCIDENTAL RELEASES OF CLASS I ODS.

6. REPLACE NON MISSION CRITICAL HALON 1211/1301 HAND HELD FIRE EXTINGUISHERS, 150 LB. WHEELED HALON FLIGHT LINE EXTINGUISHERS, AND FIXED/TOTAL FLOODING HALON SYSTEM CYLINDERS WITH AN APPROVED ALTERNATE FIRE EXTINGUISHING AGENT WHEN EXTINGUISHERS HAVE BEEN LEGITIMATELY EXPENDED OR WHEN DUE FOR HYDROSTATIC TEST NLT DECEMBER 31, 2010. A COAST GUARD-APPROVED ALTERNATE TO HALON IS HALOTRON I.
UNIT COS AND OICS SHALL BUDGET TO MEET ODS CHANGE OUT REQUIREMENTS. INTENTIONAL RELEASE OF ANY CLASS I ODS MATERIAL IS STRICTLY PROHIBITED. OTHER APPROVED FIRE EXTINGUISHING AGENTS LISTED IN CHAPTER 9 OF REF D ARE CO2, PKP, ABC, AND AFFF.
7. PROCEDURES FOR TURN IN OF ODS ARE CONTAINED IN REF C. ENSURE THAT USCG IS CLEARLY PAINTED IN LARGE LETTERS ON EACH CONTAINER RETURNED. ADDRESS OF DLA IS:

DEFENSE ODS CYLINDER OPNS ACTIVITY
GATE 13 OPENSHED 1 RD M
CHIPPENHAM PARKWAY RTE 150 ENTRANCE
RICHMOND, VA 23297-0004

8. MY POC FOR ODS POLICY IS DR. KEN MALMBERG AT (202) 475-5691, FOR SUPPLY REQUISITION/RETURN QUESTIONS HENRY HERZBERG AT (202) 475- 5666, FOR VESSEL SPECIFIC QUESTIONS LTJG JAY KIME AT (202) 475- 5733, FOR HEALTH AND SAFETY QUESTIONS MIKE SMITH AT (202) 475-5205.
9. INTERNET RELEASE NOT AUTHORIZED.
10. RADM D. G. GABEL, ASSISTANT COMMANDANT FOR ENGINEERING AND LOGISTICS, SENDS.

EARTH DAY 2007

Coast Guard Acts to Keep the Earth Green

by Dr. Ken Malmberg, CG-443

ALCOAST 170/07 called for Earth Day, April 22, 2007, celebrations in the Coast Guard, and asked units to reinforce the spirit of the Commandant's Environmental Stewardship Commitment by focusing on environmental best practices. Here are a some examples in which Coast Guard Units participated:

INTEGRATED SUPPORT COMMAND (ISC) ALAMEDA

ISC Alameda conducted its 18th annual Earth Day Observance on Coast Guard Island, performing an island-wide cleanup that resulted in restoring the natural beauty of the beach and surrounding areas.

AIR STATION BARBERS POINT

Crewmembers from USCG AIRSTA Barbers Point cleaned up a stretch of Coral Sea Road that leads to the AIRSTA from Ewa Beach. Their effort was also part of the Adopt-a-Highway program.

INTERNATIONAL ICE PATROL

The ice patrol has adopted a local road, and executed a litter cleanup campaign for Earth Day 2007.

COAST GUARD CUTTER ORCAS, D13

In recognition of Earth Day, the cutter is seeking a change to CG policy to permit purchase of water in 5-gallon containers, instead of the requirement to buy only individually packaged, single serving water bottles. This would save energy, and reduce expenses and waste.

In addition, CG-133 recognized Earth Day in their Spotlight on Leadership campaign, citing the following from the Commandant's Environmental Stewardship Commitment: "I challenge all Coast Guard units to improve the environment, and to reduce our environmental footprint. Do your part, wherever you are within the organization, to make environmental stewardship a Coast Guard core competency." See stewardship as a leadership competency at www.uscg.mil/leadership/spotlight.

Below are additional events CG units have participated in the past:

- begin/enlarge recycling program
- poster contest for kids
- 5K walk
- plant a tree(s)
- combine efforts w/other Department of Homeland Security (DHS) elements in area, and with the community.

Here are some suggestions to consider for Earth Day 2008:

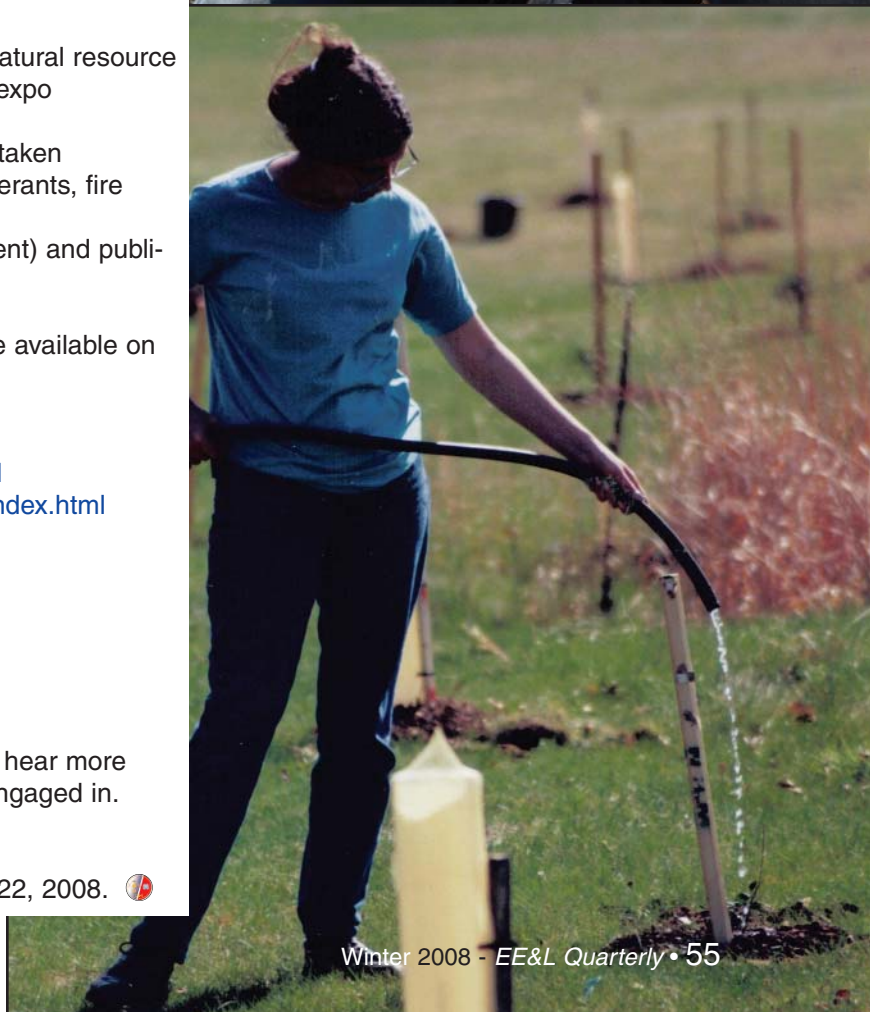
- car free day (carpool if necessary)
- trash sculpture contest in unit-give a recycled award
- find an alternative reuse of something that is being discarded
- alternative energy discussion/displays
- search for hazardous substances, remove from unit/grounds if possible, handle safely/dispose of by acceptable methods
- attack local invasive plant species
- volunteer to clean up dwelling in a nearby community
- propose plan thru COC to recycle computers/monitors when replaced
- cleanup a walking trail nearby
- make efforts to erect signs/further protect historic/natural resource
- check w/local community for Earth Day fair/festival/expo
- clean/clear historic area
- invite some kids to unit, show them activities undertaken
- propose plan through COC to replace ODSs (refrigerants, fire suppressants, solvents) w/substitutes
- pick a theme (i.e., Protect the Homeland Environment) and publicize it.

Other Earth Day ideas that can be done at any time are available on the following websites:

http://aec.army.mil/usaec/publicaffairs/earthday00.html
http://www.eere.energy.gov/femp/services/earthday.html
http://www.whitehouse.gov/ceq/photoessays/earthday/index.html
www.healthyforests.gov/
www.eere.energy.gov/hydrogenandfuelcells
http://earthday.net
www.energystar.gov/homeimprovement
http://epa.gov/watersense/
www.epa.gov/earthday/

The Office of Environmental Management would like to hear more reports from units about ecological activities they are engaged in. Point of Contact is ken.b.malmberg@uscg.mil.

Be prepared and participate in Earth Day 2008 -- April 22, 2008.



YARD Clears First Superfund Site

by CDR John Slaughter, Yard

On September 28, 2007, the Environmental Protection Agency (EPA) Region III and the Coast Guard (CG) Yard signed a Record of Decision, with concurrence from the Maryland Department of the Environment (MDE), officially de-listing Site 1 at the Yard from the National Priority List. Site 1 consisted of sediments under the shipways and old dry dock locations. Through completion of a Remedial Investigation and human health and ecological risk assessment, it was determined that no action was required. Site 1 was initially established as the site with the greatest liability to the environment and financially to the Coast Guard. Its removal from the list is a major milestone.

Although no action was required, the Yard has done several dredge projects over the past few years which removed contaminated sediment and transported them to a contaminated disposal facility. The no action ultimately gained EPA, MDE and the public's support through a series of informational meetings and the success of the Community Action Group formed to raise visibility and awareness of the environmental clean-up efforts at the Yard.

The Coast Guard Yard was added to the National Priority List (Superfund) by the EPA in 2002. After many years of studies to delineate the exact nature of the contamination, several remediation projects are planed to begin as early as this fall. The next location to be addressed is the Salvage Lot (Site #4) which will begin clean-up before the onset of winter.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