Delivering the Goods
News from the U.S. Coast Guard Acquisition Directorate
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DF-430 Direction-Finding System Saves Lives

By Rebekah Gordon

WASHINGTON – The Rockwell Collins advanced DF-430 direction-finding system is a significant improvement over the U.S. Coast Guard's previous direction-finding system and has helped the service save lives, including that of 55-year-old Dennis Clements. A solo mariner sailing the Atlantic Ocean 250 nautical miles east of Hatteras, N.C., he ran into bad weather on January 2 and his sailboat began taking on water. With the help of the DF-430 on a new HC-130J long-range surveillance aircraft from Air Station Elizabeth City, N.C., the Coast Guard was able to lock in on the signal emanating from his Emergency Position Indicating Radio Beacon (EPIRB) at 25,000 feet from 75 miles away and fly to his precise location in the water.

A new HC-130J long-range surveillance aircraft like the one shown here recently used the DF-430 direction-finding system to help save the life of Dennis Clements.
U.S. Coast Guard photo

The weather was rough, with winds in excess of 150 miles per hour, Lt. Cmdr. Mark Driver, who was piloting the HC-130J, told Fox News on Jan. 5. Running low on fuel, Driver deployed three life rafts to Clements. In the dark, the sailor managed to find and climb onto one until an H-60 helicopter diverted from the Navy aircraft carrier USS Dwight D. Eisenhower (CVN 69) arrived on scene with a rescue swimmer. Clements' preparations, and the advanced technology of the DF-430, were critical to the operation's success.

"He wisely had a 406 (megahertz [MHz]) EPIRB—an emergency locator beacon—that got us into the rough area of his position," Driver said in the interview. "However, we had to use electronic systems on our aircraft to further triangulate his position. It really took a combination of signals—electronic signals—and direction finding off his signals, and the flares that he had on his boat for us to find him."

The DF-430 is a small but important system that is being installed on all Coast Guard aircraft. An example of a successful acquisition program, its value is illustrated each time it takes the "search" out of search and rescue.

How DF-430 Works

The DF-430 is a commercial-off-the-shelf (COTS) direction-finding system that can pick up both the stronger 406 MHz and weaker 121.5 MHz signals that emanate from an ERIPB in an emergency at sea. The 406 MHz signal emanates once every 52 seconds for a half-second burst, while the 121.5 MHz signal is constant—a combination that preserves battery life. "The two

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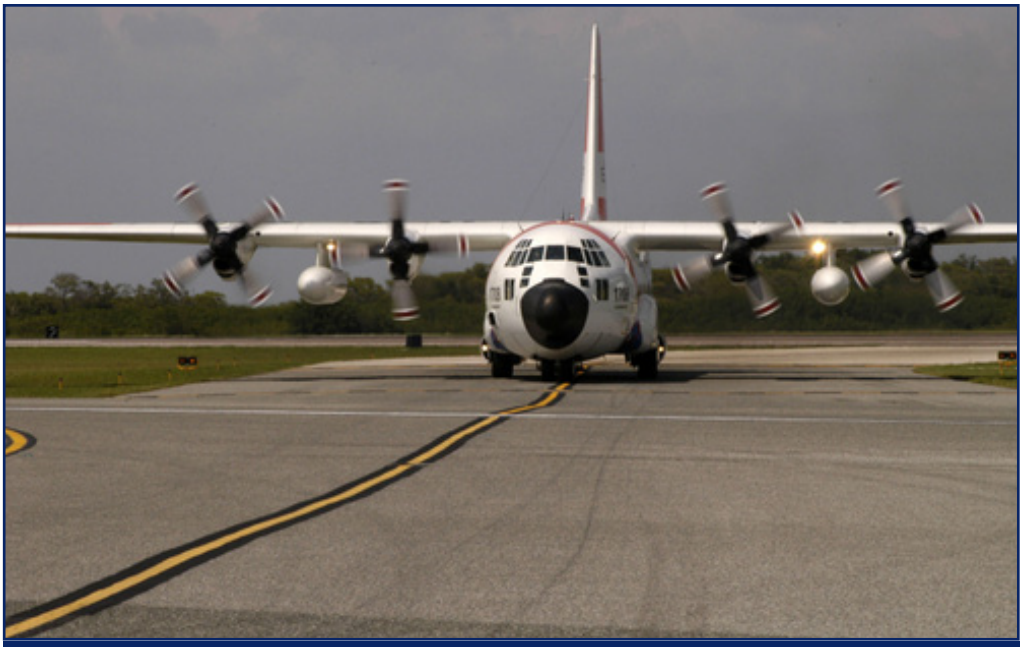
blend together to get us to scene," said Cmdr. Joe Deer, operations officer at Air Station Kodiak, Alaska, and one of the Coast Guard's DF-430 experts.

An antenna mounted on the belly of the aircraft picks up the signal, and a navigation needle on the aircraft's console then points toward the signal's source, helping to direct the pilot. The 406 MHz signal, 200 times stronger than the 121.5 MHz signal, is picked up when the aircraft is far from the scene. Once close to scene, a navigator can switch to picking up the 121.5 MHz signal for a constant beacon as the aircraft closes in on the spot.

The DF-430's predecessor could only pick up the 121.5 MHz signal, which left airborne rescuers having to be within approximately five miles of the scene to detect an EPIRB's emanations. The signal was also easily obstructed by bridges or other objects. Now, with 406 MHz emanations, the Coast Guard is forgoing laborious search and rescue patterns and "locking on like a laser," Deer said. "When it comes to EPIRBs and direction finders, it literally takes the 'search' out of search and rescue. We go right straight to the device every single time. We're batting, I think, close to 100 percent."

The greatest lock distance on the 406 MHz signal recorded to date has been 160 nautical miles from the scene of an emergency. On average, the DF-430 locks onto a 406 MHz signal at 116 nautical miles when an aircraft is flying at 15,001 to 25,000 feet, and at 92 nautical miles at 10,001 to 15,000 feet. Lower flight altitudes will lock in at less distance.

The first signals that emanate from an EPIRB are generally picked up by a constellation of stationary and moving satellites in the International Cospas-Sarsat Programme. Signals are transmitted to mission control stations, which then alert Coast Guard units to begin search and rescue operations. As of February 2009, Cospas-Sarsat only detects the 406 MHz signal, adding to the imperative for the DF-430. "They're the initial notification," Deer said. "If you go 200 miles offshore and sink, and your EPIRB goes off, the Cospas-Sarsat system is the initial detection system. And they tell us where to start looking."



The installation of DF-430 on board 26 HC-130Hs, like the one pictured here ready for take off, has been a model program.
U.S. Coast Guard photo

Program Management Success

The HC-130H installation effort has been a model program. The HC-130H installations began in September 2007, with the last one completed in January 2009 at Air Station Sacramento, on budget for $2.5 million. Every operational HC-130H (26) and HC-130J (5) is equipped with the DF-430 system.

Lt. Cmdr. Dirk Ames, an HC-130 production cell supervisor at the Aviation Logistics Center (ALC) in Elizabeth City, N.C., said that some of the HC-130H aircraft had DF-430 installed in conjunction with previously-scheduled depot maintenance. "However, as the demand for this unique system increased, we needed to come up with a better approach. And a better approach was to take skilled troubleshooters—artisans—that live this business and get them embedded into an air station, and to work round the clock to put the capability on the asset and return the asset to the command," Ames said. "And that was the one that knocked it out of the park for us and got the project done."

The requirement, developed by the Office of Aviation Forces (CG-711), was clearly understood by all entities with a stake in the project, according to Rick Seitz, the major systems acquisition project manager for the HC-130H/J project. "The fact of the matter is that there was a huge justifiable and urgent need for this equipment," Seitz explained. "And when that happens from the operator's perspective, engineering perspective and the acquisition

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Shown here is the installation of DF-430 on board an HC-130H during overhaul at the HC-130H heavy maintenance facility in Elizabeth City, N.C.
U.S. Coast Guard photo by Cmdr. Randy Hartnett

perspective, all the planets align to make it happen quickly. So we got the money, the statement of work lined up with the ALC very quickly, the requirement was there from CG-711, they put the word out and got it very rapidly. So those things that you need to have happen as far as acquisition process goes fell into place very quickly."

As a COTS system made by the same manufacturer of the aircraft's avionics suite, DF-430 turned out to be easy to add to the aircraft, and immediately began proving itself during testing on two prototypes, first begun in June 2005. Cmdr. Randy Hartnett, the HC-130 product line manager at ALC, said the Coast Guard "only needed about six months of observation to figure out that it worked great."

Cooperation was a key to success. "It is a really good example of partnering with the operational requirements generator and getting something in the aircraft quickly while still maintaining configuration control," Hartnett added.

Lives Saved in the Field

Real search and rescue cases aided by the prototypes helped to cement the DF-430's future in the Coast Guard. In April 2007, the first HC-130H to carry the prototype locked onto an EPIRB signal at 10,000 feet, 15 nautical miles from an overturned catamaran off the coast of Florida, saving the lives of a husband-and-wife crew. Previously, an HU-25 aircraft not equipped with DF-430 had been unable to locate the vessel.

Deer recalls a local story from October 2008, when four fishermen were rescued from a life raft after their boat sank in the Bering Sea off the Aleutian Islands. An HC-130 flying at 22,000 feet locked onto the 406 MHz EPIRB signal 94 nautical miles out, and subsequently guided an MH-60 Jayhawk helicopter in for rescue.

"The EPIRB was not with the raft, but soon thereafter, the helicopter found the raft and the four people inside of it," Deer recalled. "The C-130 with this 406 MHz direction-finding capability on board was able to get them to the exact location that the EPIRB was floating at inside the debris field."

DF-430 has found its way onto Coast Guard aircraft largely due to early evangelizers who saw its benefits and caught the ear of decision-makers. They include Deer, along with Greg Johnson—the state commercial fishing vessel examiner at Sector Charleston, S.C., who was one of the first to suggest the need for a 406 MHz direction-finder to service leadership—and former ALC Elizabeth City aviation technician John Turmelle, now a civilian.

Turmelle made the first request to try the DF-430 prototype on an HC-130H in October 2002, developed cost estimates, built installation kits, integrated the system and oversaw installation. These DF-430 advocates have also helped the Coast Guard to educate recreational mariners on the importance of carrying a 406 MHz EPIRB (it has been required of commercial vessels for almost two decades), and registering it with Cospas-Sarsat. The latest EPIRB models also have GPS, allowing rescuers to pinpoint your exact location even faster.

According to Deer's calculations, by June 2009 at least 55 lives had been saved with the help of DF-430. He estimates the number now to be closer to 90 or 100. "It's so simple now as to be unremarkable," he said. ■

Opportunities and Challenges in Hiring the Best Acquisition Professionals

By Linda M. Johnson

While the U.S. Coast Guard Acquisition Directorate has made great strides in its efforts to grow, hire and retain the best acquisition workforce possible, some challenges still remain, Deputy Assistant Commandant for Acquisition Michael Tangora recently told *Delivering the Goods*.

Because the Coast Guard faces tough competition for the most qualified individuals, the service has requested parity with the U.S. Department of Defense (DoD) in acquisition hiring. DoD has direct hire authority for all acquisition positions while the Coast Guard only has direct hire authority for contracting officer positions. Direct hire authority allows an agency to avoid some of the usual processes and hire quickly for shortage positions. "We've asked our oversight authorities for parity with DoD in hiring because we're all pulling from the same labor pool," Tangora explained.

Tangora appreciates the 100 additional Coast Guard acquisition positions that Congress approved in its fiscal year 2010 appropriation, recognizing that the service needs more personnel to do a better job. But he also noted that acquisition workforce quality is just as important, if not more important, than quantity.

"Your operation is only as good as your intellectual capital. The amount of people you have that are trained, have the experience and know what they're doing is your intellectual capital," Tangora said. "Our competency in acquisition—whether it be in acquisition contracting, acquisition law, procurement, financial management, testing and evaluation, systems engineering or planning—

Michael Tangora, Deputy Assistant Commandant for Acquisition

all the different things we do here to bring quality products to the Coast Guard operator, that's our value."

Acquisition Skills and Benefits

Tangora highlighted some of the crucial skills needed to be a good acquisition professional. "When we're looking at new hires, we're looking for experience, education, competency and the ability to work under deadlines. We're looking for critical thinkers who question assumptions and can look farther out than six months, and we're looking for people who are team players," he said.

Diversity is also imperative. "In my experience, our best programs are transparent and inclusive—they bring in everybody. A lot of people know exactly how to do engineering or financial management, but if you're working in a cell by yourself, you're not as effective as you are on a team," Tangora noted. "A diverse team provides the ability to get a problem solved better than a group of people who are working independently. Diversity of thought, education and experience all add value to problem solving."

So why should an acquisition professional consider working for the Coast Guard? "What motivates people to come work for the Coast Guard is its mission. Every time you get out to the field and talk to the operators at their duty stations using the equipment we have acquired to save lives, save the environment, provide important waterway security, all of the different mission sets—that is job satisfaction," Tangora explained. "People that end up working for longer periods of time identify with the Coast Guard mission."

The Coast Guard recently developed an employee orientation program that takes newly hired acquisition professionals to see how the work they're doing supports local operators out in the field.

Tangora also noted that the Coast Guard values work-life balance. "When I look at the way senior Coast Guard management cares for its workforce, both military and civilian, it's far superior to anything I've seen in government," he said. "Mission is number one, but there are ways to get your mission accomplished and at the same time take care of your workforce. I think that permeates through this organization."

Workforce Achievements

The Coast Guard has made tremendous strides in growing its acquisition workforce and equipping them with the professional skills, compe-

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tencies and credentials necessary to position the program for success. In fiscal year 2009, the Coast Guard hired about 90 new acquisition professionals. A year ago, the civilian vacancy rate for Coast Guard acquisition positions was almost 23 percent; today that rate is less than 10 percent.

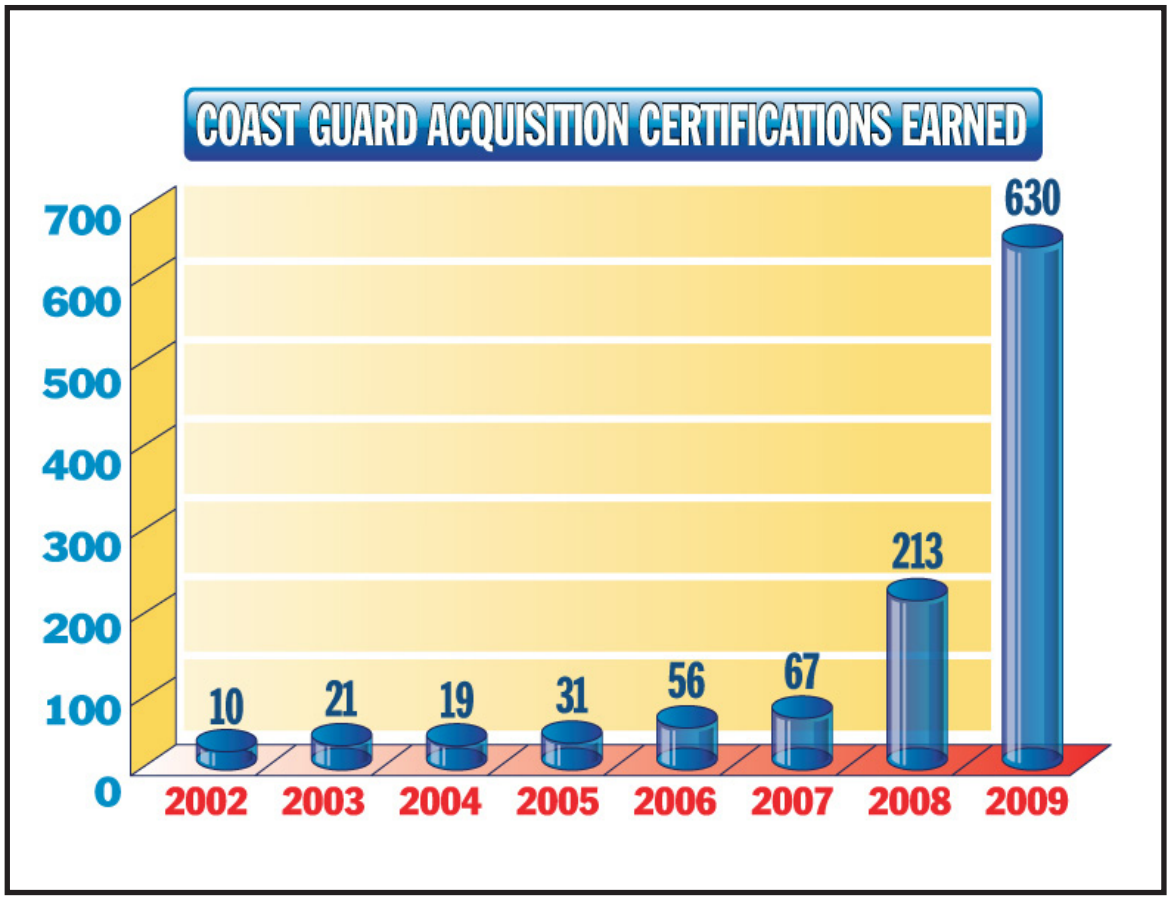
Asked about what else the Coast Guard is doing to build and improve its acquisition workforce, Tangora explained that education and professional certifications are very important. "Three years ago, very few people at the Coast Guard had any acquisition certification," he said. "Now you see a very rigorous certification program that results in a more professional workforce. I've witnessed the experience base of our workforce increase as more contracts and programs are executed. I've also witnessed the disciplined process of acquisition management begin to take hold and be repeated throughout the organization."

The Coast Guard is now fully compliant with U.S. Department of Homeland Security policy for credentialed and certified project managers for its highest dollar-value acquisition programs. In 2009, the service dramatically increased the number of certificates issued for project managers and other qualification levels, not just in Acquisition Directorate, but for other stakeholders such as engineers and financial managers.

The Coast Guard also studies hiring and retention metrics, performs exit surveys for departing employees and encourages employees to look for job promotion opportunities.

One of the accomplishments Tangora is most proud of is the new grade structure. "When I came here, the Coast Guard couldn't compete because of its grade structure. We now have more GS-14s and GS-15s (high civilian pay grades) and O-5s and O-6s (high military officer pay grades) than we've ever had before," he explained. "We never would have been able to accomplish what we have to date without the right grade structure. You can't ask people to work for less, no matter what your mission is."

Looking at upcoming challenges for the workforce, Tangora pointed to the Offshore Patrol Cutter (OPC) project. "Our oversight has given us these new billets and they expect performance. We have very big projects coming up, including the OPC, which will be the biggest program the Coast Guard has ever undertaken," he said. "The OPC will be far larger than anything we've ever attempted before in terms of size of budget, complexity, contracting strategy, acquisition strategy and numbers. We've got to get it right on the first hull."■



Acquisition News Brief

Sentinel-class Patrol Boat Fast Response Cutter Contract Option Awarded


Artist Rendering, Bollinger Shipyards

The Coast Guard awarded a contract option for approximately $141 million to Bollinger Shipyards of Lockport, La., on Dec. 15, 2009, to begin production on three Sentinel-class Fast Response Cutters (FRC).

Having successfully cleared its Critical Design Review in November 2009 and the Department of Homeland Security's Acquisition Review Board in December 2009, the Sentinel project is now approved to begin low-rate initial production (LRIP) of three of the 154-foot patrol boats.

In September 2008, the Coast Guard awarded Bollinger an $88 million contract for the lead Sentinel. The initial patrol boat, which will be home ported in Miami, is expected to be delivered to the Coast Guard in the third quarter of fiscal year 2011. The Sentinel project leverages the expertise from the Coast Guard's highly successful 87-foot Coastal patrol boat acquisition project as well as recent improvements in the Coast Guard's acquisition processes.

MASTER CHIEF AYER,

Q. I was reading about the new Sentinel-class patrol boat and heard that it will be ABS classed. What is ABS and what does it mean to be classed? Does this mean we are buying a civilian ship?

A. ABS is the American Bureau of Shipping. It is a non-government classification society that develops rules for the design and construction of vessels and marine facilities. These rules are pretty comprehensive and cover almost every aspect of ship design and construction. For example, there are rules for where the living quarters can be located, how much ventilation should be provided and what the maximum sound levels can be. It also provides requirements for individual pieces of machinery on a ship.

When a vessel is classed, it means that the vessel's design and construction meet the rules established for that particular type of ship. In the case of the Sentinel, it also requires that an ABS inspector is present for various inspections and tests.

This does not mean we are buying a civilian ship. ABS has classes for all types of vessels including military vessels. For example, the Sentinel is being designed and built to meet the ABS High Speed Naval Craft rules (HSNC). The Navy also uses ABS for many of its new vessels and was involved in the development of the HSNC Guide and the Naval Vessel Rules, as was the Coast Guard.

What this means for the Coast Guard is that we don't have to reinvent the wheel and draw up detailed ship specifications from scratch. These standards also assist the Coast Guard in overseeing the design and construction of the vessel, which in turn lowers risk, provides a better value for the American people and helps to provide our operators with a highly capable, safe and operationally effective ship.

— MCPO Brett F. Ayer, Command Master Chief, Coast Guard Acquisition Directorate

[To submit a question for an upcoming Acquisition Directorate newsletter, please e-mail Master Chief Brett F. Ayer directly at: Brett.F.Ayer@uscg.mil or acquisitionwebsite@uscg.mil.]