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**THE U.S. COAST
GUARD'S INNOVATIVE
SAFETY PROJECT WILL
REVOLUTIONIZE PARTS
MARKING AND SAVE
\$600,000 ANNUALLY**

SAFEST AIRCRAFT IN THE S



BY SCOTT WILSON

AFT KEY

Beyond the banks of the Albemarle Sound, over the deep waters of the Atlantic, somewhere west of Bermuda, an HH-60 Jayhawk surges through the midnight sky. By day, the black beak and crimson stripe and tail of the medium-range recovery helicopter contrast boldly with its white body, and as it darts above the ocean at 180 knots, a spectator sees only a blur of red, white and blue—the colors of the U.S. Coast Guard (USCG) and the country it serves. But here in the night, the sea mist obscures all 65 feet of the mighty Jayhawk, save the long-range spotlight it aims into the tumultuous waves.

The two pilots spot their objective after moments of searching: a capsized yacht that drifted too far into the storm. Signaling the crew, the pilots slow to a hover above the sinking vessel. From behind the cockpit, the rescue swimmer dives into the cold depths as the hoist operator prepares the lift. The survivors are hauled to safety one by one. Once all are aboard and secure, the Jayhawk distances itself from the ocean and ascends once more into the clouded night sky. The war of the waves has ended and tonight the Coast Guard has won.

For the USCG, successes such as these rely on years of disciplined training, a dedication and drive toward superior teamwork, and a deep respect for the weather and the water. However, beyond the aptitude of the crew, a successful mission depends upon safe, reliable aircraft parts.

Launching innovation

For decades, black market and counterfeit parts have been circulated into the aircraft industry supply chain. Without the rigorous standards applied to genuine assets, these parts present severe safety risks. In response to this problem, the Department of Defense (DoD) issued the Unique Identification (UID) program, which stipulates that 2D data matrix bar codes must be placed on all DoD mission-critical items by 2010.

During the last five years, 40 different parts-marking methods have arrived on the market to meet the needs of the DoD UID initiative, but these have been created for manufacturer use in a supply chain. The marking methods have not been safe, mobile or feasible for marking the estimated 98 million legacy assets already in existence.

In 1996, the USCG Aircraft Repair & Supply Center (ARSC) in Elizabeth City, N.C. volunteered to be a testing ground for a system that would address the needs of legacy marking. While the USCG is not required to conform to the DoD's UID program, it had the same concerns with counterfeit parts, and needed a solution for its Flight Safety Critical Aircraft Parts (FSCAPs) program. As a division of the Department of Homeland Security, the USCG also wanted to serve a role in bringing safety to the skies.

"We wanted to help because it was the right thing to do," said Terry Boyce, chief criminal investigator for unapproved parts at the USCG ARSC. Boyce leads a team that identifies and convicts criminals involved in distributing counterfeit parts into the aircraft industry's chain of supply.

Since 1985, the USCG ARSC had been tracking its parts by serial number. However, they had received many parts with duplicate serial numbers—and many that did not have serial numbers at all. To resolve these issues, the safe marking of legacy parts in the field was the single most pressing challenge related to the implementation of the ARSC's parts-tracking program. A new mobile system would help change everything. So to consolidate a marking tool

Credit: PAC Tom Spurduto



set in one package, the USCG ARSC turned to Intermec.

“We chose Intermec because of the knowledge and capability that the company offered,” Boyce said. “Intermec provided the most opportunity and value for the future; they were willing to work with us until it was right.”

Marker on wheels

Over the course of several months, during three test phases, Intermec provided possible solutions and the USCG ARSC suggested improvements. Together, the agencies tested more than 1,000 parts and 1,000 labels, using a variety of marking methods. For each, they evaluated safety, viability and accessibility.

“The resulting solution was the Intermec Mobile Marking System,” said Intermec UID Program Manager Don Roxby. “It’s a complete parts marking system, equipped with tools that can safely mark, verify and report 98 percent of all warehouse and depot parts.”

The Intermec Mobile Marking System provided the USCG ARSC with the maneuverability to reach parts in the field. The self-contained system was built on a welded steel frame with fitted side handles and eight pneumatic wheels. Equipped with a CO₂ laser to apply non-intrusive direct part marks as well as materials for printing labels and creating data plates, the system could mark almost every part. Boyce’s team was able to adapt to the system quickly because the rugged Intermec industrial on-board computer featured a user-friendly, menu-driven marking selection process. An Intermec handheld optical character recognition (OCR) reader and a handheld bar code reader provided additional versatility for scanning items. The system even allowed for a streamlined workflow with software that could automatically synchronize data with a UID Registry and WAWF system over a wireless connection.

The Intermec Mobile Marking System provides the ability to create 2D bar codes and RFID smart chips. For its 2D bar



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coding, the USCG ARSC used a data matrix developed by the National Aeronautical and Space Administration (NASA). Information derived from the project is shared with the DoD and NASA as part of a cooperative agreement to support direct parts-marking initiatives as they relate to Homeland Security and National Defense. NASA uses the information to adapt its specifications in its parts-marking handbook.

“This is a way we can get one step ahead of the bad guys,” Boyce said.

\$6 million ROI

Now one year into the project, the USCG ARSC identifies multiple benefits from the system, not least of which is heightened parts safety. After all, the system will save lives.

“Right now, the U.S. Coast Guard is leading all of aviation with this technology,” Boyce said. “This is one of the most up-and-coming technologies out there. It’s the safest technology that’s being developed for aircraft today.”

Beyond the benefits of having the safest aircraft in the sky, Boyce identifies increased efficiency in inventory control, maintenance and logistics operations. Using the new marker, USCG ARSC personnel will be able to decrease marking times and eliminate input errors. Prior to implementation, inputting data would result in an average of one error for every 300 entries. Once in practice, the Intermec Mobile Marking System will allow the air stations and ARSC to perform real-time product control and tracking with higher accuracy and quicker efficiency. At the completion of the project, the USCG will be able to boast that they have the most accurate parts-tracking system in military service.

“The production marking program initiated at ARSC will drastically improve operational efficiency,” Boyce said. “The system has also been an aid by providing solid evidence used in the prosecution and conviction of suppliers providing sub-standard and counterfeit parts.”

In dollars and cents, the implications of the new system are monumental. Before the new system, every data inaccuracy would cost the USCG at least 40 labor hours as personnel determined what had caused the inaccuracy, where the associated part was supposed to be and where it actually was. The system houses more in-depth tracking records, so personnel can quickly verify inaccurate data. Converted to costs, studies done by the USCG indicate that the marking program will yield an estimated annual savings of \$598,000, or almost \$6 million over 10 years.

Eyes to the sky

For now, the USCG ARSC is using the Intermec Mobile Marking System to mark, verify and report parts specific to the HH-60 Jayhawk, but in the future will begin using the equipment to address all of its legacy parts. ARSC anticipates adding additional carts to its lineup as the project moves further.

Boyce believes that the implications of this project extend beyond the mission-critical needs of the USCG, and even beyond the needs of the DoD. He advocates for the use of complete marking solutions for every aircraft in the sky.

“The future of this is not just for us,” Boyce said. “This is going to make all of aviation safer—not just the Coast Guard, not just the Department of Defense, but the commercial industry too. It’s not just about accountability; it’s about prevention. This should be an enhancement that goes across all of aviation.” ■

Scott Wilson can be reached at scott.wilson@intermec.com.

Resources:

United States Coast Guard: www.uscg.mil

National Aeronautical and Space Administration: www.nasa.gov

Intermec (Intermec Mobile Marking System): www.intermec.com