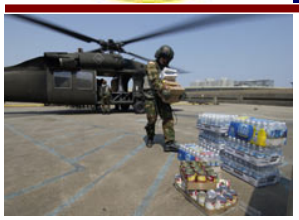
IUID Technology: Setting the Groundwork for a Fleet Management Program



A U.S. Army UH-60 Black Hawk helicopter flight engineer unloads food and water at the Louisiana Super Dome in New Orleans on Sept. 3, 2005. DoD photo.

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~ Jim Reisel
Chief ILS, Branch
Utility Helicopters
Project Office

As the prime contractor for the U.S. Army's Utility Helicopters Project Office (UHPO), Sikorsky is involved in item unique identification (IUID) implementation on a number of fronts. They are working with the UHPO to provide an electronic build of the UH-60M Black Hawk aircraft, which will be the Army's front-line utility helicopter used for air assault, air cavalry, and aeromedical evacuation units, as it comes off the production line in late 2007. They are also faced internally with meeting the Department of Defense's (DoD) IUID policy requirements, which mandate compliance on all solicitations issued on or after January 1, 2004. Having approached implementation from both corporate and client sides, Maureen Fino, who co-leads Sikorsky's UID team, recommends staying ahead of the requirements: "Taking the initiative allows you to plan better and more efficiently. It's definitely the better way to move out on this. The proactive approach the Army has taken has been a model for how implementation should be done."

Assessing the Technology

This proactive standpoint led the Army UHPO to begin investigating IUID technology well ahead of the DoD mandate. In 2002, the office tasked Sikorsky to conduct a series of studies on IUID technology as a facilitator to part marking and automated tracking of components. The initial study led to a pilot program which tested the Health and Usage Monitoring System (HUMS) and IUID technology simultaneously. After the success of this pilot program, the UHPO asked Sikorsky to conduct a second study to examine mission essential parts and recommend ways to mark each component. Jim Reisel is the Supervisory Logistics Management Specialist and Chief of the ILS Branch in the Utility Helicopters Project Office, Logistics Management Division. As he explains, the engineering analysis necessary to start the marking process is a significant undertaking: "In order to determine how to mark each part, they had to evaluate the surface condition, the material, the elements each part is being exposed to – all of these variables had to be taken into account before they could make engineering recommendations on how to best mark the part."

Enabling Fleet Management

Once the technology had been successfully tested and studied, the project office immediately found a place for it in their business processes. According to Reisel, "IUID is an enabler for a fleet management system. What we're ultimately striving for is to have an electronic build of the UH-60M aircraft as it comes off the production line. The electronic build will include IUIDs on approximately 1,000 aircraft parts, and from this build, we will essentially have an electronic data capture of all the parts we want to track on the aircraft when it flies away. We'll no longer have to manually track hours because all of the information for time-sensitive parts is being automatically captured. And IUID is what starts all of this off." By providing an automatic and accurate method to capture and track data, IUID technology is a basic building block in the program office's larger strategy to electronically manage aircraft fleets. As Reisel notes, "IUID is an integral part of the overall fleet management program because it enables the Platform Maintenance Environment (PME). The PME is software installed on a laptop which will significantly enhance the fleet management program. For example, when a maintenance officer performs a maintenance task today, he normally has to follow numerous procedures contained in paper Tech Manuals and manually record his actions. With PME, he will have an Integrated Electronic Technical Manual (IETM) on his laptop and will be able to check off maintenance tasks on the screen as they are worked. The tasks are captured in the PME and all necessary forms and records will be generated automatically, which improves both the accuracy of the data and saves the soldier significant maintenance man-hours. With this technology, we have an electronic record of every key part going on or coming off of the aircraft."

UID technology is fundamental to the PME because it provides basic part data that is essential for tracking with the assurance that it is error-free. As Reisel explains, "It gives us a record of the aircraft component configuration and other essential information. Scanning machine readable data matrix code when a part is being installed or removed from an aircraft will eliminate the common errors we see today. We currently have over 70 items on the UH-60 that are serially managed and require intensive tracking in what is commonly called the 2410 data base. We have countless examples of serial numbers being input incorrectly. For example, there could be a single serial number that begins with 3 0's, but, over time, the

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Electronic Data Interchange technology enables paperless data collection

item may have been entered into the 2410 system manually with three zeros at times, two zeros at other times, and one zero yet at other times. As the serial numbers are entered differently, it appears that there are 3 different serially numbered parts installed in the aircraft, when in fact only one part exists. IUID will eliminate erroneous duplications of this nature. Accurate data capture and eliminating data capture errors are the most significant gains we will realize from full IUID implementation."

Maximizing Benefits

In addition to error reduction in data capture, IUID technology has a number of ancillary benefits including reduction in time, fewer man hours, and improved accuracy. According to Reisel, "The DoD IUID mandate just supplements what we're doing. We saw the benefit of the technology from a maintenance standpoint. There's less paperwork, it saves time and man hours, enables an error-free environment, and it gives visibility to what's installed on the aircraft."

These benefits, however, are only part and parcel of the much larger goal of improving safety and ultimately saving lives. As Reisel explains, "What it all leads up to is Safety of Flight and the ASAM process. Take the recent Katrina relief efforts for example. If we had gotten a recall on a batch of 35 serial numbers of a particular part that had critical safety implications, we may have had to ground the entire helicopter fleet until a complete inspection could be made of every aircraft to find the defective parts and remove or replace them. If the fleet were grounded because of serious safety issues, a determination would've had to be made to keep the aircraft grounded until the inspections could be accomplished, or to continue to evacuate the hurricane victims. Given the criticality and time sensitive nature of the evacuation missions, most likely the aircraft would have continued to have been flown. However, if it turned out one of the parts in question had been installed on an aircraft and a catastrophic failure occurred, there would be tremendous repercussions. With electronic data capture, we would know by aircraft tail number which aircraft had the defective parts installed without grounding the entire fleet. Instead of grounding all of our nearly 1,600 aircraft world-wide, we would only have to ground a maximum of 35 aircraft. So there are a lot of benefits that aren't that apparent on the outside, but could ultimately save lives and will positively result in a marked increase in mission capable rates."

Overcoming Barriers to Implementation

Despite all of the eventual benefits of implementation, both Sikorsky and the UHPO initially struggled to build momentum. Both Fino and Reisel agree that gaining stakeholder acceptance is of utmost importance. As Fino observes, "The biggest challenge was getting people on board. Change is not always perceived as good, so it was important to communicate that we were doing this not only because it is a policy requirement but for the benefit of the company." Reisel concurs: "One of the greatest challenges to overcome was just the reluctance to get into this because it's something new. There's always reluctance because it affects other processes, and when it affects processes, it affects people. So once the new process is introduced, you have to educate everyone involved since it fundamentally changes the ways people do business today."

One of the keys to gaining stakeholder acceptance is including them throughout the implementation process and planning. As Fino explains, "The first major lesson learned for us was to get all the parties involved early in the process and develop a method. We ended up having to play catch up for awhile, so it's important to get the PM's and government community involved upfront so everyone is tasked accordingly. Be proactive."

Education also plays a key role in successful implementation. As Reisel stresses, "Education is absolutely vital – get all of the policies and related information. Go to forums and seminars that have detailed briefings that explain what UID is all about. Many companies that have already implemented are also happy to talk about their experience and can offer valuable lessons learned, obstacles to overcome, etc."

Both Sikorsky and the Utility Helicopters Project Office agree that the technology benefits outweigh any initial challenges caused by implementation. Fino notes that "from a logistics standpoint, the most obvious benefit is that is gives better visibility into components on the field. We saw this as a great way for the future to know where things are and what's happening to them, especially as they come off the aircraft or fail." In addition to giving Sikorsky greater insight into faulty parts, UID technology will revolutionize warehousing and component tracking. As Reisel concludes, "In terms of actual implementation we still have a long way to go. We're making great strides though and we're working hand-in-hand with Sikorsky and look forward to all the benefits that will be realized by the warfighter. It's a world of improvement from a readiness and data capture standpoint."

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~Maureen Fino, Co-leader of the Sikorsky UID team

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