Implementing Item Unique Identification in DoD

"Making a Difference for Asset Visibility, Management, and Accountability" (*Defense AT&L*, May-June 2007) explained the Department of Defense program for Item Unique Identification—IUID—a capability that marks items with a globally unique identifier using high-capacity machine-readable 2-D marking.

How are the Services and OSD progressing in implementation of the program?

Navy Leverages IUID for More Efficient and Effective Missile Tracking

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Under various laws and regulations such as the Arms Export Control Act (AECA) and Foreign Assistance Act (FAA), the U.S. government has a continual responsibility, from time of title transfer until eventual disposal, to ensure defense articles and services sold and/or transferred to foreign countries are being used for their intended purposes. The Defense Security Cooperation Agency (DSCA) established the "Golden Sentry" Program to ensure proper end-use monitoring of government-to-government transfers. Currently, enhanced end-use monitoring (which has more stringent requirements than regular end-use monitoring and applies to specific variants of missiles and other items) requires annual inventories at storage sites in the foreign countries—a totally manual and labor-intensive process.

Under sponsorship from the DoD UID Policy Office, the Navy International Programs Office (NIPO) executed an IUID— Item Unique Identification—project ("IUID Missile Tracking"—IMT) to leverage IUID asset information and generate shipping documentation, while allowing asset verification for missiles and other assets being sold, shipped and inventoried under the DSCA Golden Sentry Program.

The IMT project demonstrated the ability to capture missile IUID data, seal the missile in its container, create appropriate shipping documents, and observe the IUID-based transactions as the missile is shipped, received, and inventoried. The missile Unique Item Identifier (UII) would be related to its container UII and then related to a serialized container seal. This data would also cross-reference with the Transportation Control Number. Data would be integrated into existing DSCA programs, including the Security Cooperation Information Portal and Enhanced Freight Tracking System (EFTS).

Through the execution of three demonstrations and the application of Lean Six Sigma principles, the IMT team showed significant process improvements. Automated inventory processing allowed the removal of fork trucks, safety observers, and laborers to open containers for inspection. Data movement was streamlined and replaced manual database updates. Other operational benefits were documented, such as minimized USG time in foreign country magazines and improved visibility from origin to destination. In addition, we expect financial benefits (reduced USG in-country and service program office manpower) and benefits outside direct IUID impact (streamlined Customs processes and host nation inventory processes for example).

The results were impressive: New processes reduced inventory time by 95 percent, inventory cost by 97 percent, and labor expense by 67 percent; inventory visibility increased to 100 percent annually; data accuracy

improved to 100 percent. In addition, the use of seals greatly improves security during transportation; and provides visibility at title transfer, shipping, and freight forwarding. It also allows direct integration into EFTS and reduces risks of personnel injury and damage to missiles. A conservative business case analysis showed annual (unburdened) labor savings of $335,000. The additional savings in travel expense, safety, and significantly increased homeland defense security are compelling.

Recommendations going forward include adoption of the new IUID-based processes by the DSCA; production integration with EFTS; contract modifications to accomplish IUID/seals at original equipment manufacturer plants for new production; and field retrofits of bar-coded container seals to be accomplished during follow-on end use monitoring inventories.

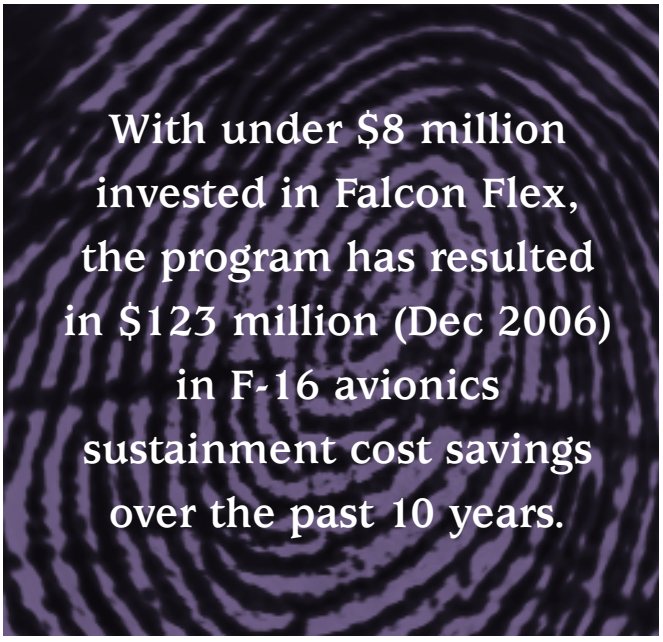
Hayes *is director of logistics policy at Navy International Programs Office.* **Mueller** *is founder and CEO of BNet Corporation, which provides wireless solutions for real-time asset visibility.* **Steffen** *is a retired Navy Supply Corps captain and president of Paladin Logistics Inc.* **Sunday**, *engineering director at Raytheon Missile Systems, is responsible for special projects for Mission Support.*

Falcon Flex: Turning Maintenance Information into Air Power

Kevin J. Berk

"Can we improve the reliability and availability of F-16 avionics while reducing costs?" This is the question that drove the creation of the Falcon Flex program. In combination with the Defense Repair Information Logistics System (DRILS) maintenance data collection tool, Falcon Flex was established to develop business practices, using IUID/serial number tracking-based techniques, to enable disciplined tracking and analysis of serialized parts. This improved serialized maintenance data collection, at the point of maintenance, enables meaningful analysis to generate "actionable intelligence," which is used to identify failure trends and perform root cause analysis to increase the effectiveness of F-16 avionics sustainment. DRILS and Falcon Flex have made great strides in capturing and utilizing maintenance data respectively to lower costs and increase aircraft availability to the warfighter—effectively turning maintenance information into air power. DRILS facilitates the documentation and analysis of maintenance data with an easy-to-use interface and serial number tracking capability. The tool, which began humbly as a Microsoft Excel® spreadsheet in the depot shops, has evolved into a sophisticated Web-based application available worldwide that allows technicians in the field and at depots and contractor repair facilities to easily record and retrieve maintenance data by serial number. The focus of this powerful application is at the most vital point—the point of maintenance. This serialized maintenance data collection enables the integrated product team engineers to determine root causes of failures for both the part-number family and specific units, isolating the low performers.

Falcon Flex is a business practice that was developed in response to the Air Force's continual Leaning of its supply chain. The performance-based logistics (PBL) practice seeks to reduce weapon system sustainment costs and increase availability. Falcon Flex uses performance-based acquisition to effectively manage and reduce the impact of obsolescence by concentrating on the acquisition of improved parts rather than repeatedly buying parts that continue to fail or are obsolete.



The Falcon Flex program was created to meet several key goals: reduce sustainment costs, increase system reliability, increase aircraft availability, reduce obsolescence concerns, and enhance system performance. Seven business practices comprise the Falcon Flex program:

- Obsolescence Research Support. The program supports obsolescence research by providing F-16 Diminishing Manufacturing Sources and Material Shortages (DSMS) research and resolution focusing on high-failure DMSMS items.
- F-16 Avionics Root Cause Analysis. The program employs analysis of failures at the line-replaceable unit (LRU), shop-replaceable unit (SRU), and discrete part level.
- Bad Actor F-16 aircraft identification. Falcon Flex provides a quarterly analysis of aircraft producing the greatest number of LRU failures. The analysis of data behind this report helps maintainers identify underlying problems either with the aircraft or LRU.
- F-16 Avionics Can Not Duplicate (CND) / No Faults Found (NFF) identification and resolution. When symptoms

of a problem cannot be reproduced during testing, valuable maintenance resources are tied up; many times, these problems are dismissed only to recur later. Falcon Flex analysis significantly contributes to identifying and resolving CND/NFF problems using DRILS serialized repair history from the field and depot (Air Force and contractor).
- Test Station anomaly investigation. Falcon Flex develops techniques to collect and analyze serialized test station LRU and SRU results to resolve anomalies between testers at each level of testing.
- Business Case Analysis generation, support, and tracking. Falcon Flex generates LRU repair cost analysis on a semi-annual basis providing important information on savings as well as a baseline for future repair cost projections. Falcon Flex initiatives account for approximately 80 percent of the total F-16 reduction in total ownership cost savings being reported to Air Force Materiel Command.
- Performance-based Acquisition Support. PBA leads to procurement of improved parts rather than parts that continually fail. Falcon Flex support is provided to define and prepare the specifications needed for product performance based procurement.

With under $8 million invested in Falcon Flex, the program has resulted in $123 million (Dec 2006) in F-16 avionics sustainment cost savings over the past 10 years. Savings are projected to grow to more than $1 billion through 2024, resulting primarily from the avoidance of costs that field units are charged for exchanging unserviceable units for serviceable units.

Although savings is a primary motivator for the program, Falcon Flex also directly supports weapon system availability goals of the Air Force Smart Operations for the 21st Century (AFSO21). From the start, the Falcon Flex program realized the value of uniquely identifying parts by serial number to solve supply chain problems. The Falcon Flex program and its utilization of the DRILS maintenance data collection tool is a solid model for the Air Force as it pushes ahead with the implementation of serialized item management. The goal is to stop buying high-failure parts and to reduce the time to procure improved parts which in turn increases the reliability and availability of weapon systems while reducing sustainment costs.

Berk *is DRILS program manager and has over 20 years of program/project management in both public and private sectors.*

Army Successes in IUID

Dianna Woody

2006 was a very busy year for the Army in the implementation of IUID. Candidate lists of items to be marked with IUID were refined, and the marking process began on major programs. The DFARS rule has been included in new solicitations for which there are candidate items/equipment. Marking has been integrated into resetting the force (RESET) and has begun for initial programs; a plan for expansion is in place for others. Government-furnished materiel marking is in progress at contractor facilities.

The Abrams tank is a successful pilot program. Over 1,300 parts were identified for meeting the criteria for IUID marking. This marking is currently being accomplished through a phased implementation. General Dynamics Lima plant is marking the end item, and the Tallahassee plant is working with line-replaceable units using the dot peen as the direct part mark using Construct 2.

In August 2006, 14 M9ACE vehicles were inducted into the Army's recapitalization program and 13 vehicles in RESET. There were 19 components identified for marking plus the end item. In October 2006, 119 M113 family of vehicles began going through depot maintenance at Anniston Army Depot, Ala. New data plates with direct part marking are being applied during this process.

Initiatives at Red River Army Depot, Texas, include the purchase of A2B Tracking Solutions software, mobile laser etch cart, verifier, and computer with screen; and the marking of 1,829 Humvees during its Recapitalization (RECAP) Program.

The Tank Automotive Research Development and Engineering Center (TARDEC), Mich., is developing the prod-

uct data infrastructure to support the IUID marking, tracking, and exchange between depots, suppliers, and original equipment manufacturers (OEMs). TARDEC is implementing a standards-based solution for the exchange of as-built and as-maintained configurations of tactical and combat vehicles using the ISO 10303-239 Product Life Cycle Support standard. Using an international standard like PLCS will allow the Army to integrate the UID information exchange not just between the Army's Life Cycle
Management Commands (LCMCs) and the OEMs, but also to and from the DoD IUID registry. TARDEC is also implementing a methodology called Federated Army Lifecycle Collaborative Enterprise (FALCON) to integrate engineering data from as-designed configurations with logistics maintenance and support data using IUID. A pilot implementation on the humvee is currently in process.
Leveraging the successes of the T700 engine pilot, where equipment was purchased to mark the T700 engines at Corpus Christi Army Depot, Texas, CCAD has demonstrated their ability to create and apply data plates and labels. All criteria for initial operating capability (IOC) have been met with the exception of manual intervention with the IUID registry. Software has been developed with formal release scheduled for second quarter fiscal year 2007 after which IOC will be declared.

Tobyhanna Army Depot, Pa. (the Army Center of Industrial and Technical Excellence for Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance (C4ISR) and Electronics, Avionics, and Missile Guidance and Control; and the Air Force Technology Repair Center for Command, Control, Communications and Intelligence) employs a metal photo process for creating data plates and labels with the UII for the Combat-Service-Support Automated Information System Interface System (CAISI System), and 20 data plates for the AN/PPS-14 Mine Detector Set. In 2007, Tobyhanna is expecting to create an additional 300-plus data plates for the CAISI System and at least 38,000 data plates for additional communications systems in the near term.

Letterkenny Army Depot, Pa., has developed and applied human-readable and two-dimensional data matrix data plates to 715 Mats over a six-month period. Efforts are ongoing with the marking of "Water Buffalo" environmental control units and humvees. Timely, high-quality, economical marking support is being provided to project management offices. Initial operational capability has been attained with full expectation that a full operational capability will be achieved in fiscal year 2007.

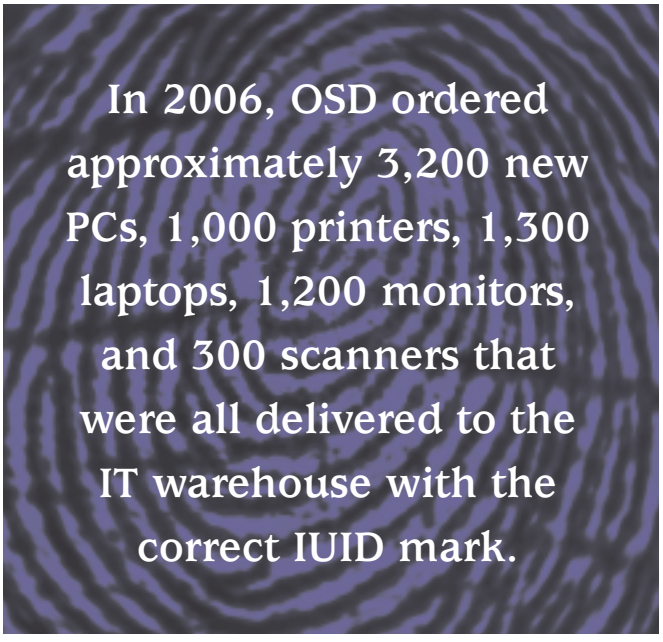
The Product Manager, Joint-Automatic Identification Technology (PM J-AIT) is supporting the OSD IUID Policy Office with a project involving the structured demonstration of imagers attempting to read a spectrum of data matrix mark use cases submitted by commercial industry and the Services. The result will be an objective document identifying the commercially available imagers that are capable/incapable of reading data matrix marks with specific characteristics. Concurrently, PM J-AIT has worked with the depot community, providing Anniston Army Depot with its initial RESET marking capability and Red River Army Depot, Texas, with marking apparatus to support multiple depot lines.

Woody *served as an Army logistician in the Office of the Deputy Assistant Secretary of the Army for Integrated Logistics Support, until her death in July 2007.*

IUID and Dell: Supporting the Office of the Secretary of Defense

Leah Aspell

When Bob Smolinski accepted his position as the Office of the Secretary of Defense (OSD) IT Asset Management Branch Chief in December of 2005, he took on a difficult challenge: how to consolidate 14 different inventory tracking systems into one system that met all the department's needs. Until recently, each of the 14 different components maintained its own IT inventory, and each had a different method for tracking assets. Some components used barcode systems, some had developed a unique numbering system, and a few of the smaller teams effectively "remembered" the distribution of equipment. Despite semi-annual audits by Washington Headquarters Services (WHS), the process lacked a uniform system to track the 38,000 reportable IT assets within and across components.



As soon as Smolinski understood the system requirements and challenges ahead, he immediately thought of IUID, a system for distinguishing a single item from its

identical counterparts through the use of an identifying mark or label, and contacted the UID Policy Office.

Once IUID was determined to be the appropriate solution, the team immediately began to develop an IUID implementation plan. Because they were designing a new system, the OSD team had unusual flexibility to choose the methods and technology that would best suit the application without having to consider multiple restraints. "We had to establish everything, from getting a warehouse, trucks, and equipment, to the procedures for getting IT assets into and out of the Pentagon," says Smolinski.

Next, the Defense Information Technology Contracting Organization (DITCO) began inserting the existing IUID clause into contracts, and Smolinski contacted several manufacturers to alert them to the new requirement, including Dell.

Dell already had experience with the 2D Data Matrix (a high-density 2-dimensional matrix style mark) from previous customer requirements to apply company-unique asset tags. However, unlike previous requirements that provide little to no direct value to a commercial entity such as Dell, the DoD strategy embraces manufacturer serialization approaches to create the unique item identifier and complies with international standards. This distinction has potential to provide tangible benefits to Dell with greater linkage and value from post-sale customer data.

As Dell began processing the IUID requirement and shipping finished orders to the DoD maintenance facilities, John Medici, a member of Smolinski's team, determined very quickly that the 2D Data Matrix was not IUID-compliant. To correct the situation, Solms immediately assigned a Dell six-person team to solve the problem and re-label the erroneous markings. Within 72 hours of realizing the 2D Data Matrix was incorrect, Dell changed the process to better meet the OSD 2D Data Matrix requirements.

Because of the dedication of Dell and other suppliers, OSD received many properly marked items in 2006. OSD ordered approximately 3,200 new PCs, 1,000 printers, 1,300 laptops, 1,200 monitors, and 300 scanners that were all delivered to the IT warehouse with the correct IUID mark.

OSD expects to keep receiving IUID-compliant IT items in 2007 and beyond. Smolinski does not plan to mark most legacy items because IT inventory rotates relatively quickly. He estimates the majority of legacy inventory will circulate out of the current system in 3-4 years. As this happens, new orders filled by suppliers such as Dell will include the IUID 2D Data Matrix.

Smolinski, with the assistance of Medici, is also beginning to alter OSD processes to incorporate 2D imaging devices to capture the Data Matrix, decode the data symbol, and pass the data to Remedy, where the data are then managed. Remedy is a software package that includes capabilities in change management, asset management, life-cycle inventory, and workflow management. The software will assist the OSD in its efforts to track and properly manage all IT assets. Using this system will not only make these efforts easier to achieve, but will also reduce paperwork for technicians and expedite the repair process.

In 2007, OSD also plans to provide imaging devices to the OSD IT support staff so they can use them to manage the assets in the offices they support. The imaging devices, which are in effect PCs, will also be able to download subsets of data or the entire database, which will be particularly useful for the auditor, a new position Smolinski established. With the increased data management enabled by IUID, the new auditor position will allow for continued and more rigorous auditing of DoD assets.

The team is also currently working with the Defense Logistics Information Services (DLIS) UID office in Battle Creek, Mich., to develop the capability to produce IUID-compliant marks in house and register those marks within the DLIS-hosted IUID Registry. Currently, reportable IT assets purchased with a credit card to fill urgent orders will not have an IUID mark. When the in-house system is complete, the team will be able to mark these assets and track them appropriately. In-house marking/labeling will also be used to mark those few legacy assets that remain after the phasing out of obsolete equipment. It is this effort that will eventually allow for all assets to be marked and managed.

Once fully implemented, this IUID-enabled Remedy system will enhance asset visibility management of IT assets within and across the DoD. IUID will provide the capability to maintain critical data about each item. Remedy will allow OSD IT asset management staff to provide the infrastructure to manage both the information and the assets. The approach increases the level of item visibility to a level that the DoD has never before attained.

Aspell, *a consultant with XIO Strategies, provides outreach and communication support to the UID Policy Office, OSD AT&L.*

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