IUID Item Unique Identification

Marine Corps Maintenance Center Albany

Moving Forward On The Item Unique Identification (IUID) Program

The 7.5 Ton Crane (pictured above) is the first piece of equipment to be marked using IUID at the Marine Corps Maintenance Center in Albany, GA

To improve the identification, tracking, and management of Department of Defense (DoD) assets, the Office of the Secretary of Defense has funded multiple projects, including the Marine Corps Maintenance Center Item Unique Identification (IUID) Integration Project. The initial phase of this project was completed at the Marine Corps Maintenance Center in Albany, GA, on March 15, 2006 through the successful marking of items on the 7.5-ton crane, an air mobile crane support system capable of lifting 7.5 tons and swinging 360 degrees while on stabilizing outriggers.

IUID and Marine Corps Maintenance Center

The IUID Integration Project enables better management of tangible items used in warfighter support through improved identification and tracking. By assigning each mission critical item a unique identifier, the U.S. Marine Corps and DoD have the capability to track identical items throughout their individual lifecycles and across the global supply chain. As part of this change management initiative, the DoD funded qualifying Depot activities to jumpstart the marking process, realize lessons learned, and share experience as the program is instituted throughout the supply chain.

Beyond improving its own operations, the Marine Corps Maintenance Center IUID Integration Project also focuses on improvements that can be applied throughout the DoD. In order to share best practices and lessons learned throughout the DoD, the project team is documenting all implementation procedures, while demonstrating the successful application of Unique Item Identifier (UII) marking technology on Depot commodities, gaining experience, and evaluating implementation costs and schedules. Knowledge will be shared with other DoD organizations and suppliers via an After Action Report, the IUID Toolkit, and at IUID Program Forums.

Implementation Process

This IUID Pilot followed the roadmap and process outlined in the IUID Toolkit.

Development of an Item/Parts List

To implement IUID on the crane, Depot employees first developed an item list of parts for marking. The project team applied the criteria of item selection contained in IUID policy to identify which parts of the crane required marking. The policy requires that an item be marked if it meets one of the following criteria:

- Acquisition cost of $5,000 or greater
- Serially managed, mission essential, or controlled inventory equipment or repairable item, or a consumable item or material for which permanent identification is required
- A component of a delivered item deemed by the program manager to require unique identification
- A DoD-recognized IUID equivalent is available for that item

IUID Marking Technology

Following compilation of the item list, the project team evaluated the use of Commercial-Off-The-Shelf (COTS) products for marking technologies (dot peening, laser etching, chemical etching, and inkjet marking). The Depot will contribute its lessons learned to the IUID Toolkit, providing key information relevant to cost of technology, ease of use, and applicability in the DoD environment.

Marking Parts

Each item identified for labeling is being marked with a laser-etched anodized aluminum data plate. Each plate includes human-readable and machine-readable information. Templates for etching metal data plates were developed, and sample data were used to proof the plates.

Legacy parts are also marked as part of the Marine Corps IUID Project to determine what issues emerge when constructing the IUID and marking the parts (e.g., dirty, worn, original manufacturer unknown, etc.).

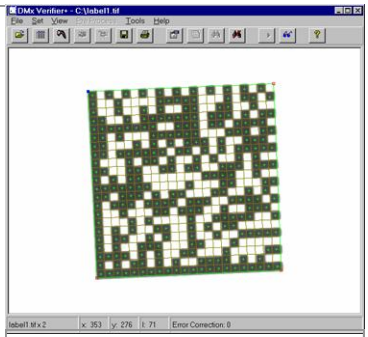
Reading IUID Marks

The project includes reading multiple parts — different sizes, materials, colors, finishes, shapes, etc. The four legacy parts being marked in this current phase are the crane main vehicle, the transmission, the engine, and the main boom cylinder. This phase also includes testing the ability to read parts under a wide variety of conditions — poor lighting, bright lighting, outdoors, in tight spaces, etc. This has helped the Depot to determine the time and cost of IUID reading, as well as gauge the reliability and ruggedness of the readers.

As part of the marking process, a Quality Assurance (QA)/Quality Control (QC) step has been included after parts are marked to measure the quality of the marks made in the Depot environment. The ability to read the data plate information is confirmed using a verifier and then firmly attached to the part using epoxy resin.

The IUID data plate for the 7.5 Ton Crane (pictured above) contains both human and machine-readable data

Data Entry
All data-entry tasks are tested using databases that mimic the IUID Automated Information System (AIS) that is being developed as part of the IUID Program.



The AIS will load data into marking equipment to generate IUID data labels

Development of an AIS
The Marine Corps Maintenance Center is evaluating AIS software for loading data into the marking equipment that generates the data labels. The AIS (turnkey) is being developed so that it will accept the data elements as delineated in the Department of Defense Unique Identification (UID) Implementation Plan for DoD Maintenance Depots. The system in development will accept input data from keyboard and scanner devices. The system design includes generation of two-dimensional barcodes (2D) and the ability to transmit the barcodes to a variety of output devices that engrave, print, etch, and peen the 2D barcode onto the item. The system will send the IUID data elements to the UID Registry. The operation of the system will be transparent to the operator and approved by Navy Marine Corps Intranet (NMCI) for installation on NMCI computers and use on the NMCI network. This system will interface with existing DoD systems and future DoD Enterprise Resource Planning (ERP) systems when developed.

The IUID Integration Project is ongoing and consists of marking items used during the Service Life Extension Process (SLEP) being performed on the 7.5-Ton Crane. Additionally the integration of IUID procedures into existing Depot processes is being realized.

Shop floor personnel have been trained to perform IUID tasks. Above, a Maintenance Center worker affixes an IUID data plate using epoxy resin

Depot Personnel Enablers
During the IUID Integration Project, special attention was paid to the shop floor personnel in order to determine the effect of this new process on day-to-day tasks. New tasks for these shop floor personnel included removing, marking, reading, and recording IUID data on the 7.5-Ton Crane. Overall, these new tasks were successfully incorporated into Depot procedures.

Training of Personnel
Four graphic artists and one engineering employee have been trained on the operation of the laser etching equipment, the printers, and the IUID AIS software.

Procedures Established
The Marine Corps is in the process of creating IUID procedures that specify for Depot personnel what items to mark and how to mark the items. A set of procedures to document workflow for marking of items was defined at the Maintenance Center and will be added to the IUID Toolkit.

Lessons Learned

This pilot includes testing and documenting procedures using various IUID part marking equipment within the Depot process in order to define procedures for future part marking and data-entry requirements. Some early lessons learned from testing the part marking methods on multiple materials include conclusions that ball peening is not viable for a painted surface, while laser etching can successfully be applied to anodized aluminum. Additionally, the use of epoxy adhesive for attaching plates has been successfully demonstrated.

Both phases of this pilot contain real-time, in-process procedures at the Depot for instituting IUID requirements, including marking equipment within the Depot process, validating the mark, using an AIS to transport the data to the IUID registry, and managing the IUID markings. These procedures will be shared with other Depot organizations through an After Action Report, the IUID Toolkit, and at UID Program Forums.

Hurdles that Have Been Overcome

The greatest hurdle to overcome was convincing people to advance from manual stamped data plates to machine-generated data plates. Software permissions have been established to extract data from multiple programs used in maintenance functions.

Benefits

The IUID program enables the DoD to reach established goals and objectives for enhanced total asset visibility, improved lifecycle item management and accountability, and improved financial audit requirements. The IUID program will eliminate the photo process for making labels, which requires multiple graphic art steps along with photo storage, and handling and disposal of hazardous materials.

Legacy data plates of the 7.5-ton crane are being replaced with new data plates that contain human readable and 2D Data Matrix instituted by the IUID program to identify items.

The IUID pilot project has transformed a World War II era Depot into a 21st Century Depot. The adoption of advanced technology at the Depot, including lasers, is a necessary evolution to support the modern warfighter. The pilot project is also demonstrating capabilities of how lasers may be used for marking serial numbers on other warfighter technology.

IUID

Item Unique Identification

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