



Data Management Excellence

**Eradicate UID Compliance Errors
With Data Management**

**A White Paper
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The Situation

As IUID (item unique identification) compliance gains traction it is more important than ever to understand the role that proper data management plays in the compliance process. MIL-STD-130 and serialized item tracking are the DoD's response to the CFO Act of 1990. The standard calls for the creation of permanent Data Matrix marks on assets to ensure they can be tracked throughout their lifecycle.

IUID compliance requires several best-practice steps to ensure cradle-to-grave traceability. These steps include the creation of IUID labels and marks utilizing Construct 1, Construct 2 or the commercial equivalent, verifying the mark for quality standards, validating standards for formatting and syntax, harvesting the data and submitting the data directly to the IUID Registry or via WAWF. While those steps may seem straightforward, they represent the proverbial tip of the data management iceberg.

Understanding the management of the data behind the compliance process is paramount to avoiding costly and time consuming errors that can result in non-compliance. In this White Paper we intend to point out the errors that result from improper data management, as reported by the IUID Program Office. In addition we will make the case for employing a software suite that has been developed specifically for proper IUID data management.

Those who are charged with implementing IUID on military bases and other legacy sites as well as contractors and manufacturers of end item deliverables will want to weigh carefully the evidence presented herein, in order to avoid a minefield of potential errors.

The Problems with Non-Conforming Systems

When well intentioned personnel decide to build IUID solutions internally, or to piece together partial solutions, they run numerous risks. For example, non-

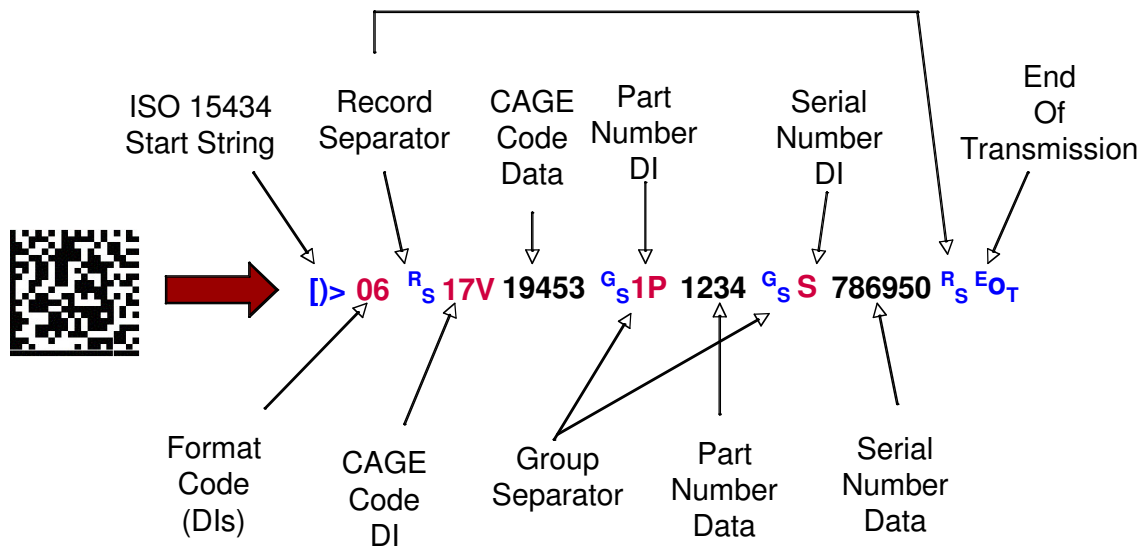
conforming or incomplete systems can and often do produce duplicate IUIDs, non-conforming data and miss-marked, laser etched or dot peened data that is impossible to remove.

A review of common Registry submission errors highlights problems with managing data ranging from erroneous inclusion of text element identifiers (TEIs) in UIIs, to incorrect use of part and serial numbers, to typos in pedigree fields, resulting in the inability to link the pedigree with the IUID.

Going it alone can prove costly indeed! Items that are incorrectly marked are akin to having an incorrect Social Security Number. As we all know, an incorrect or stolen Social Security Number results in loss of identity with resulting inability to collect Social Security and other benefits. It is essential that the data in the IUID are consistent and accurate per the call out of the ISO standard. An error in marking, which can occur for numerous reasons, means that the marked asset will never match the database. Moreover incorrectly marked assets cannot be associated with pedigree data. In other words, an incorrect UID equals an incorrect pedigree.

What Can Go Wrong

1. Items must receive a unique mark. Uniqueness requires encoding the correct data with as many as 50 alpha-numeric characters. The data coding must contain the ISO 15434 start string, the format code data identifier (DI), record separators, the CAGE code DI, the CAGE code data, group separators, part number DI, part number data, serial number DI, serial number data and finally the end of transmission or EOT. Characters such as commas, dashes and ASCII code are not allowable. Creating this code is difficult; changing data within the code presents a high risk of error.

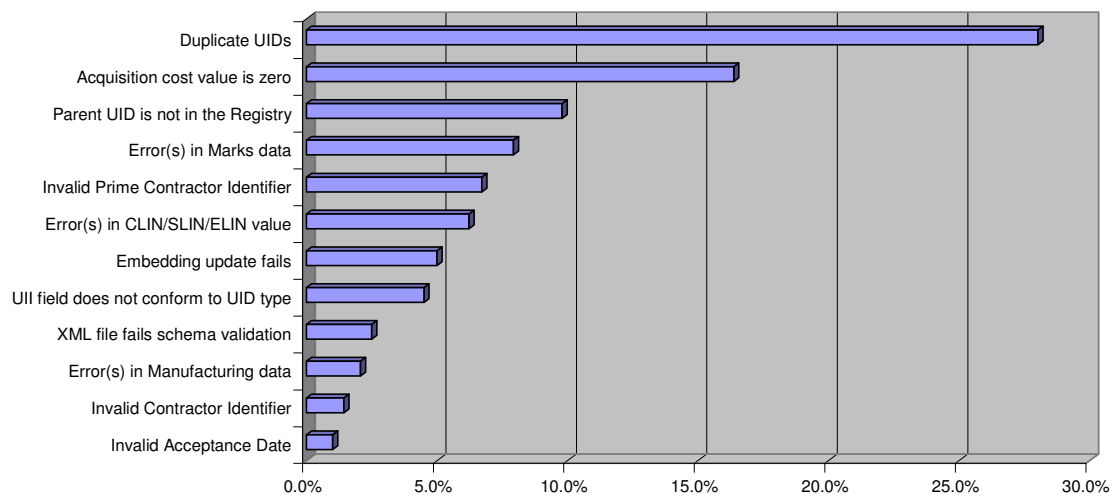


Source: DCMA WAWF/UID Presentation - 2004

2. These unique marks must contain data that is consistent with the syntax and format of MIL-STD-130. A grocery item with a UPC code containing anything other than 13 numeric characters or without the UPC standard for quality, formatting and syntax will not scan at check-out. The same is true of an IUID. Lacking standard data verification and validation provided by a data management system, many IUIDs cannot be submitted to the IUID Registry.

3. Problems also arise if data is being driven to the IUID Registry from an ERP system or a spreadsheet. As we have seen previously, data must be unique and correct, but files must also be submitted in the proper format, in the correct Registry schema and they must also generate an audit trail. Once incorrect data is submitted or when data is submitted incorrectly, the mistake is difficult and time consuming to unravel. Furthermore, it may be quite some time before one learns that items have not been accepted. This creates particular headaches when contract payment and reconciliation is delayed.

**Top IUID Registry Submission Errors
(as a % of total errors reported)**



4. The Registry calls for the ability to manage an IUID parent/child relationship correctly and accurately. That means IUIDs might be scanned in a configuration management-like environment, starting with an end item, progressing to its components, followed by the assemblies, the sub assemblies, and finally the lowest replaceable units (LRUs). If anything goes wrong in the IUID process, such as creation of an incorrect or duplicate mark or label resulting in incorrect IUID data, the data

management process required to manage parent/child relationship information becomes impossible.

5. For legacy equipment either in use by the government or PIPC (property in possession of contractor) a Virtual UII may be registered, without marking the item directly. The registration process requires submitting the UII with a medium code of “DEFINED.” Along with the UII, all the pedigree data for this item must be registered, including the serial number, part number, enterprise ID and all other elements that identify the item. In addition, the existing mark data must be registered within the mark loop in the registry XML. Virtually marked items MUST be physically marked by the custodian and the Registry must be updated when one of the following trigger events occurs: change of location from one entity to another; change in status (i.e. item taken out of service); change in program; change in organization (i.e. being returned from a contractor back to the government)

There are some serious pitfalls to avoid during a Virtual UII registration process. The first is failure to keep track of which items have been registered virtually and which are 2D mark compliant. Another is failure to track which item goes with which UII. This relationship must be maintained to ensure you are marking the appropriate item.

6. Further review of common errors, particularly with UID Construct 1 or UID Construct 2, when submitting data to the IUID Registry includes the following:
 - Omission of issuing agency code from the UII.
 - A common UII is reported for all items in a single submission or across multiple submissions, though the pedigree data is different for each item.

- The original part number or the serial number is used as the UII instead of the full UII.
- UIIs that contain a value that is not related to any of the pedigree fields.
- UIIs or other pedigree fields contain typos such as omitting preceding zeros from the serial number pedigree value or from the UII, but not from both.
- UIIs submitted when parts are not marked and there is no UII marking requirement on the procurement contract.
- Unintentional change of the UID type of a given item to a value other than the one originally intended.

The Solution: Fail-safe UID Data Management

What those charged with UID compliance should demand is fail-safe data management. With the military's lean business practices, it is rare to find technology personnel with time on their hands and rarer still to encounter individuals who do not seek excellence

UID is simple in concept: The item is marked, the data is harvested and that data is uploaded to a master database. That simple UID concept is a powerful tool for a lean military that operates alongside and in tandem with lean commercial enterprises. The ability to supply, replace, repair and replenish parts, just-in-time, without duplication and with total transparency is fundamental to the operation of the world's most powerful military. The efficiency afforded by UID is not a choice but an imperative, and those who support the military recognize the urgency of the UID movement.

While UID is simple in concept the back-end, if you will, of UID requires precise data management for success. There are several reasons why this is so. Start with the far flung arena where DoD assets are built and deployed – the whole world! Add to that the universe of DoD asset handlers, namely the manufactures,

custodians and users who must participate in the UID process. Another consideration is the multiple industry and international quality standards and organizations that impact those who supply the military and ultimately feed into the overall UID MIL-STD-130. And perhaps most important of all is a set of automatic identification technology (AIT) best practices, the foundation of conforming UID data management success.

One of those AIT best practices is ensuring that good data is collected and that the data remains associated with its pedigree throughout an asset's lifecycle. Given the deployment and complexity of many of the DoDs assets, the ability to employ sound data management, with filters at every step, is difficult in the extreme without a conforming data management system.

Some view the IUID Registry as a “bit bucket” where data is dumped with no practical use. Given the granular visibility available within the Registry, that would be lamentable. Movement is underfoot to evolve the Registry so that the data therein would become available for practical use, those handling logistics, configuration management and engineering, for example. This movement makes data integrity all the more important, right from the start, because inaccurate data will always “poison the well.” Inaccurate data will never be trustworthy. Good data, on the other hand, ensures that this huge repository of information enables a more efficient military.

Leave UID Data Management to the experts

A2B Tracking Solutions has been a staunch supporter of UID from the beginning. As AIT veterans, A2B developed a bar code asset tracking system (BCATS) for the FAA in the 1990s. It was at that time that the A2B staff became convinced of the need for granular visibility within the government and across the military. During the development of the BCATS program A2B had opportunity to study the complexities of government installations. Much of the AIT best practice methodology developed for BCATS was incorporated into UID.

With the introduction of UID in 2003, A2B was therefore in a unique position. As UID requirements were rolled out, A2B developers began work on UID Comply!® with the express purpose of producing COTS software that performs all the UID compliance and data management functions in one conforming package.

Because it follows AIT best practice, UID Comply! ensures that the errors inherent to non-conforming systems cannot occur. It is, quite simply, a fail-safe data management system with built-in checks for all UID requirements, from the creation, validation and verification of labels and marks to final upload to the IUID Registry or via WAWF. The UID Comply mobile computer not only enables data harvesting in remote locations, but it also acts as a filter to ensure that UID conforming data is imported and associated with the appropriate pedigree.

As a total UID data management system, UID Comply! stores all transactional history for each UID. It imports data from existing legacy databases and systems, including ERP. It also enables printing of the IUID mark to virtually any printing device or method available such as CO2 lasers, YaG lasers, metal-photo, dot-peen, ink-jet, tesa® tape or polyester labels.

As mentioned earlier, a conforming data management system needs to address the parent-child relationship of embedded items, a feature that is supported by UID Comply! And the creation of virtual UIIs for legacy assets that may be deployed to the field and unavailable for marking is also supported.

When one considers the complexity of UID compliance, the potential for costly and time consuming errors, and the importance to the military of gaining visibility across its vast asset base, we feel the case for utilizing a conforming data management system, written by recognized AIT experts is compelling.



In short A2B believes that UID Comply!, which is installed at numerous military installations and scores of DoD suppliers throughout the nation is the gold standard for UID data management.

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