Part Marking Master's Perspective

[Machine Readable Identification (MRI) With Automated Data Capture]

-SMART Implementation- Journey to Optimization

Facilitated By:

NDIA Industry Leadership Advisory Group (ILAG)

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Part Marking Master's Input

Honeywell – Torrance (Kelvin DeWinter)

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Leading The Way To MRI With Automated Data Capture!

Why MRI With Automated Data Capture?
-Success Stories-

- ✓ 100% Reduction – Quality Errors
- ✓ 100% Reduction - Quality Escapes
- ✓ 100% Reduction - Quality Notifications
- ✓ 90% Reduction – Labor (cycle time)
- ✓ 50% Reduction – Product Development Span Time

Master's Perspective – SMART Implementation

- ✓Simple Rules
- ✓Manage Implementation
- ✓Advanced Planning
- ✓Reduce Costs
- ✓Transform!

Master's Perspective – SMART Implementation

- ✓Simple Rules

SIMPLE RULES!

- ✓ LEAD transformation to MRI with automated data capture
- ✓ Identify "your pain" and quantify what transformation will mean to the organization in terms of internal and external benefits
  - ✧ Cost, schedule, standardization, confidence and quality improvements, compliancy
- ✓ Align transformation journey to customer(s) needs
  - ✧ IUID Compliance and Customer timelines used as a trigger (engagement) opportunity
- ✓ Estimate the cost of transformation
  - ✧ Infrastructure costs for Optimization vs. IUID compliancy
- ✓ Obtain and maintain High-level support
  - ✧ Commitment to transformation journey, resources and funding
  - ✧ Flow-down commitment and expectations to organization and suppliers

SIMPLE RULES!

- ✓ Begin transformation journey with pilots
  - ✧ Small "bounded" pilots – 1 Product
  - ✧ Fully test MRI and automated data capture procedures
  - ✧ Fix root problems prior to next roll-out activity
  - ✧ Notify and engage suppliers during planning stage
    - To begin to transform their processes in order to provide MRI product and data elements as required
- ✓ Remain informed
  - ✧ Work with technology providers
  - ✧ Engage in industry and government working groups
  - ✧ Modify transformation journey as technology evolves and as common standards and policy requirements are more universally adopted & applied

Master's Perspective – SMART Implementation

- ✓Simple Rules
- ✓Manage Implementation

MANAGE IMPLEMENTATION!

- ✓ Manage implementation like a "Program"
  - ✧ Set measurable objectives and goals
  - ✧ Form a diverse team – organization, customers, suppliers
  - ✧ Plan, estimate, schedule, execute, mitigate
  - ✧ Monitor performance and improvement metrics
- ✓ Formulate strategy and timelines based on
  - ✧ Compliance
  - ✧ Internal and external "Pain" (process improvements)
  - ✧ Evolutionary approach
    - Pilots
    - Trigger events to reduce cost impacts
    - Supplier input
  - ✧ Full optimization and institutionalization

MANAGE IMPLEMENTATION!

- ✓ Engage a diverse implementation team
  - ✧ Contracting, procurement/supplier management engineering, operations, information systems, sustainment organizations
  - ✧ Major Customers, DCMA, suppliers, sub-tiers
- ✓ Standardize and disseminate plan elements and expectations
  - ✧ Global policy regarding transformation (5-10 year plan)
  - ✧ Communication and training plans
  - ✧ Performance metrics
  - ✧ Harmonize configuration mgmt requirements with marking and data requirements
  - ✧ Manage supplier flow-down and costs
- ✓ Build energy and excitement regarding transformation
  - ✧ Engage
  - ✧ Communicate, communicate, communicate!

Master's Perspective – SMART Implementation

- ✓Simple Rules
- ✓Manage Implementation
- ✓Advanced Planning

ADVANCED PLANNING!

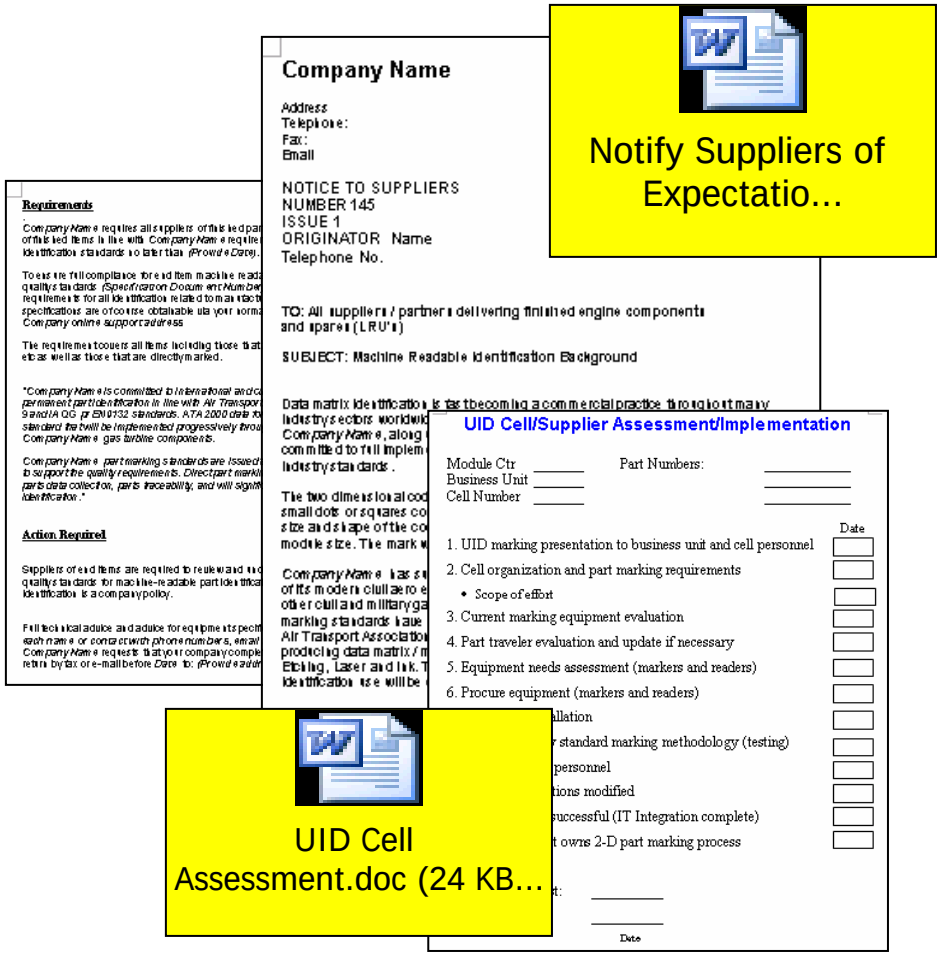
- ✓ Agree to MRI products/items listing
- ✓ Identify current state and capabilities
  - ✧ How items are marked…with what data elements (uses)
  - ✧ Technology utilized and types of equipment
  - ✧ Location of product/item "touch points"
  - ✧ Location of product/item "data capture touch points"
  - ✧ Information Systems potentially affected
    - Data elements, uses and current integration
  - ✧ WAWF and IUID Registry integration (process flows)
  - ✧ Supporting documentation
- ✓ Agree to data elements listing (integrated with use cases)
  - ✧ Internal value
  - ✧ Customer requirements
  - ✧ External value

ADVANCED PLANNING!

- ✓ Develop MRI with automated data capture future state processes and implementation activities
  - ✧ Standard procedures and work instructions for implementation
    - Accessible (electronic)
  - ✧ Common marking processes
    - Create marking requirements to integrate with current marking capabilities and change engineering specification upfront
    - Based on latest MIL-STD 130
    - Harmonize DoD and commercial requirements for single marking system
  - ✧ Common data elements and information system data flow processes
    - Eliminate non-value added "data capture touch points"
      - Future state includes only value added "data capture points"
    - Define information system integration
      - What systems need to be modified
      - Automated downloads of data

ADVANCED PLANNING!

- ✓ **Notify and engage suppliers to begin to transform their processes in order to provide MRI product and data elements as required**
  - ✧ **Disseminate an expectation notice to suppliers**
  - ✧ **Train and assist suppliers in their journey**
- ✓ **Develop supportive and continuing processes**
  - ✧ **Monitoring performance and metrics**
  - ✧ **Training**



Master's Perspective – SMART Implementation

- ✓Simple Rules
- ✓Manage Implementation
- ✓Advanced Planning
- ✓Reduce Costs

REDUCE COSTS!

- ✓ **Drive automated reading of marks and data transfer to eliminate manual key stroking, manual quality errors and processing time throughout the entire lifecycle!**

- ✓ **Minimize legacy system changes…utilization suggestions**
  - ✧ **Keyboard wedge technology to feed legacy and new systems**
  - ✧ **Automate pull of import text files into legacy and new systems**
  - ✧ **Distribute numerical control system to store saved marking system instructions (patterns)**
- ✓ **Standardize marking formats**
  - ✧ **Suppliers benefit as well**

REDUCE COSTS!

- ✓ Devise formal, documented training programs
  - ✧ Team members, marking and verification equipment operators, data capture operators, suppliers
  - ✧ Be creative….accomplish training via internet web meetings
- ✓ Provide continuing support to suppliers
  - ✧ Standardize information to suppliers
  - ✧ Brainstorm with suppliers how to
    - Reduce equipment and marking transformation costs
    - Eliminate errors prior to the "first mark"
      - Offer to review sample marks prior to production and/or require FAIR - First Article inspection Reports

Notify Suppliers of FAIR - SAM…

NOTIFICATION TO SUPPLIERS

NUMBER 123 **ISSUE** 001

DATE XXX

ORIGINATOR

SUBJECT **UID/Machine Readable FAIR Requirements for Suppliers**

The purpose of this letter is to inform you of FAIR (First Article Inspection Report) requirements in regards to direct part marking or machine-readable code requirements.

If you supply to **Company Name,** the following will apply:

- It will require a **Company Name** approval sheet
- A **Company Name** check sheet identifying level of required documentation
- AS9102 form 1 (Form 2 if required)
- Form 3, which shall include certification the equipment used, meets the requirements for marking this includes any special fixturing needed for holding the part
- The actual dimension of size for the machine readable data matrix and human readable
- Measurement of the depth of marking
- A sample part for verification to our reader
- Certification the part meets all requirements

Compliance to the above is mandatory to satisfy our Quality requirements, and time to achieve a successful FAIR should be factored into the milestones for the plans that need to be submitted to me by **DATE.**

You may feed back your questions to me directly by email or phone.

Thank you for your attention in this matter.

Master's Perspective – SMART Implementation

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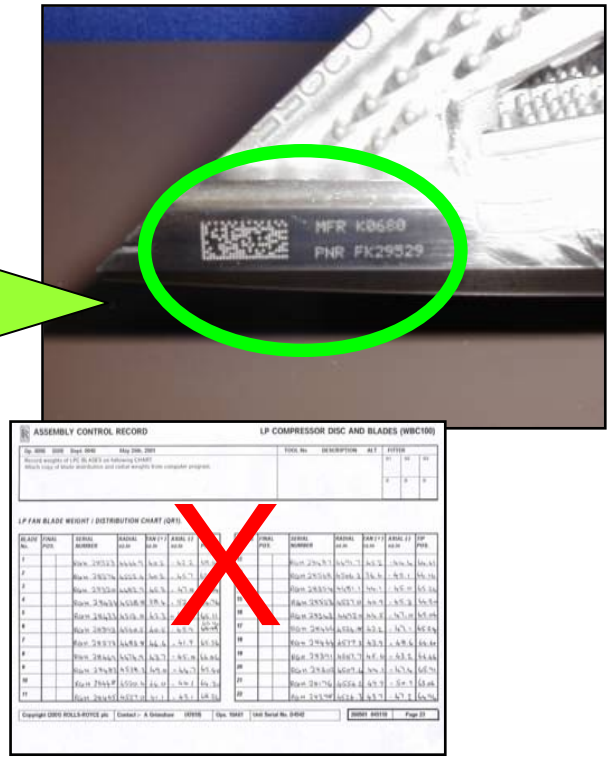
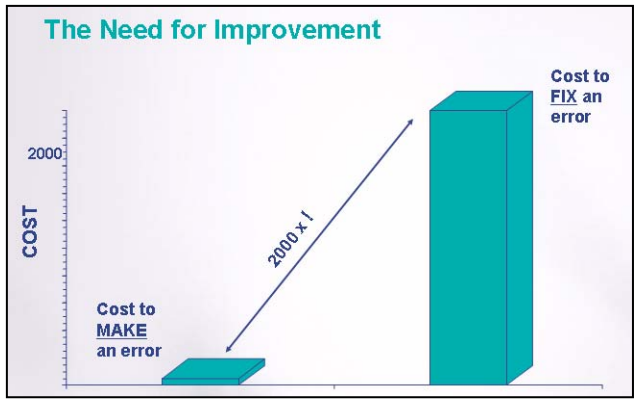
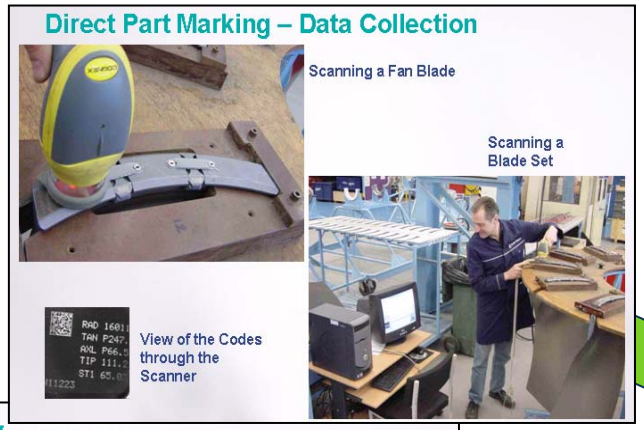
TRANSFORM!
Benefits of MRI and Automated Data Capture

- ✓ Significantly reduces risk of quality failure associated with identification escapes
- ✓ Eliminates legibility issues
- ✓ An enabler to a paperless system
- ✓ Improves speed and accuracy of data transfer
- ✓ No data transcript errors
- ✓ Internationally recognized
- ✓ Has the ABILITY to……..
  - ✧ Improve parts traceability
  - ✧ Reduce internal processing procedures
  - ✧ Capture accurate 'As Built' data
  - ✧ Check 'Should Build' data
  - ✧ Reduce Replenishment costs
  - ✧ Generate electronic log books

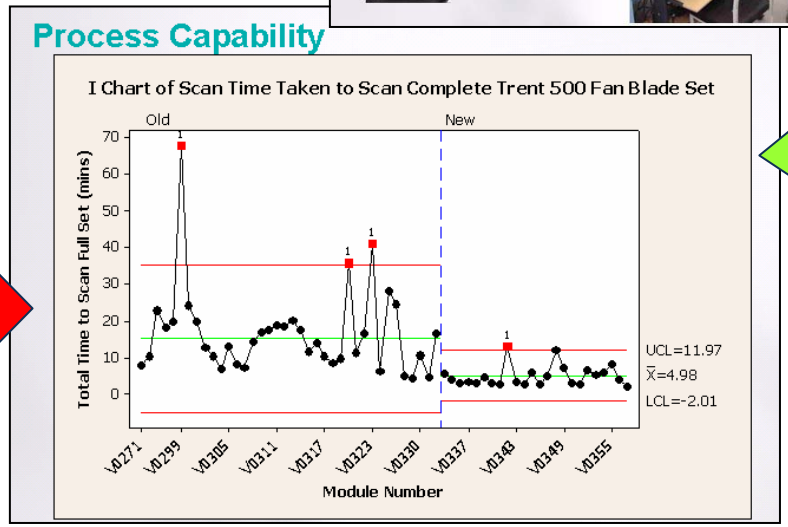


An MRI Journey - Sample





BEFORE



AFTER

Provided Courtesy of Rolls Royce Engines : Nat Russhard Oct 2005

Technical Information
-Lessons Learned-

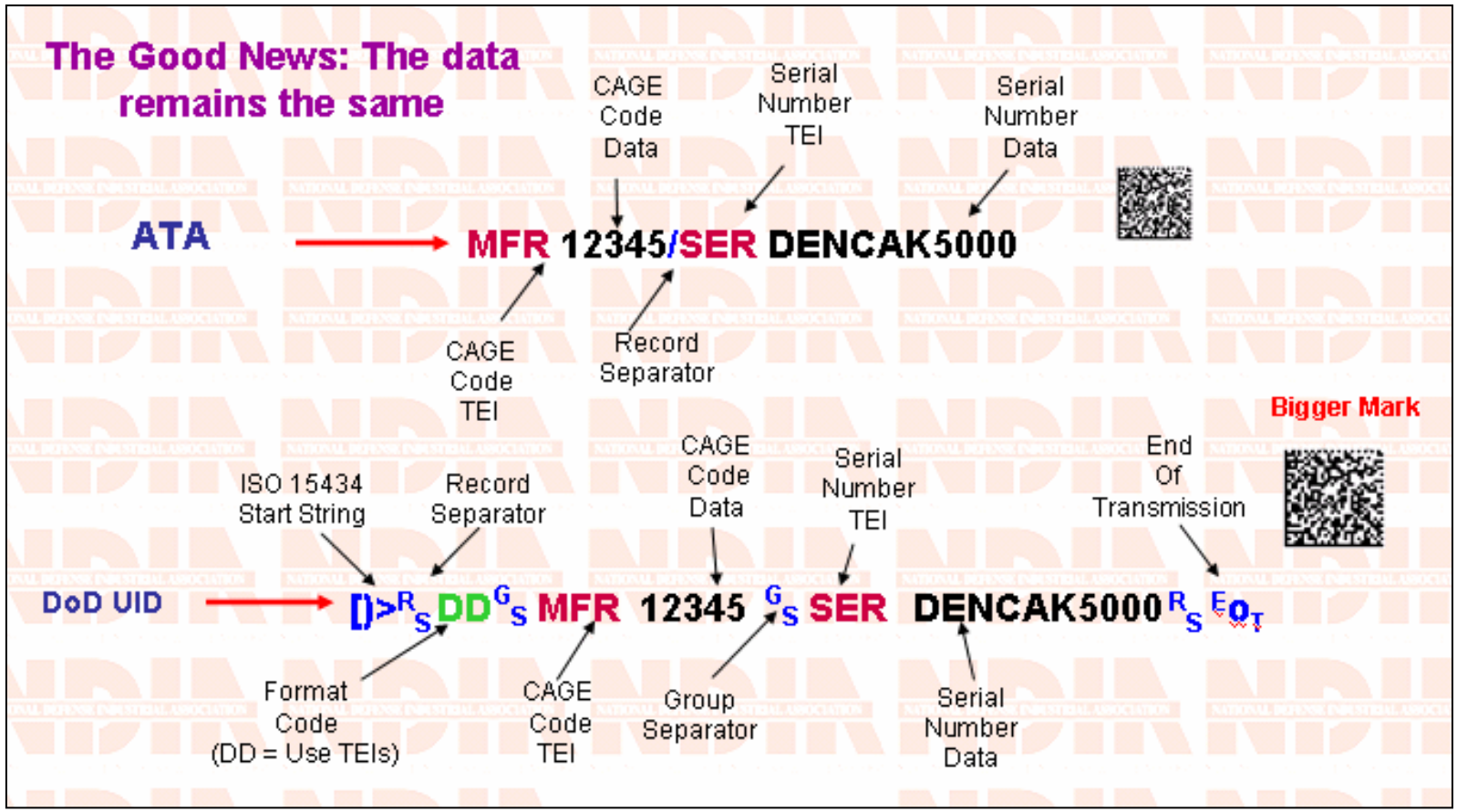
Technical Information

- ✓ Eliminate UII construction errors which could cause costly labor hours to fix and schedule delays
  - ✧ Don't encode the UII data element string without a format code
  - ✧ Don't 'hard code' RS, GS, EOT
    - Must use their ASCII character representation in the syntax
  - ✧ Use the message header, group separators, record separator, and end of transmission in the syntax per ISO 15434
  - ✧ Don't use the same enterprise identifier more than once in the message string
  - ✧ Use the appropriate data qualifier when encoding a concatenated UII or a DoD recognized IUID equivalent
  - ✧ Don't mix the use of Data Identifiers, Application Identifiers or Text Element Identifiers in the message
- ✓ Finding a UII construction or syntax error AFTER marking the part is too late!

Tips!

http://www.acq.osd.mil/dpap/UID/attachments/Tips%20on%20Constructing%20the%20UII.pdf

Technical Information

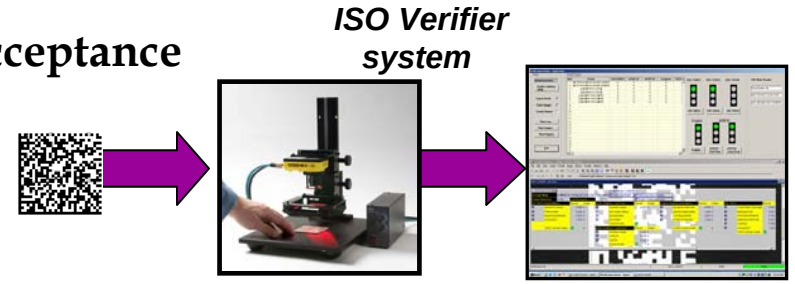


The DoD UID Construct is an accepted equivalent to the ATA Construct.

Technical Information

Verification – Evaluation of the marking quality of the 2D Data Matrix symbol for:

- Marking quality and part payment acceptance
- Marking process setup and control
- Prediction of marking durability
- Standards are still evolving
- Sampling plan
  - Defined by internal Mfg process procedures for the verifier
  - 5% of markings checked but could be larger based on batch size



Validation – 2D Data Matrix symbol has the appropriate syntax and semantics according to the last version of MIL-STD-130

- Syntax shall comply with ISO 15434 → Unprintable ASCII characters complicate that
- Semantics for AIs or DIs shall comply with ISO 15418
- Semantics for TEIs shall comply with ATA Common Support Data Dictionary (CSDD)

IN SUMMARY…

- ✓Simple Rules
- ✓Manage Implementation
- ✓Advanced Planning
- ✓Reduce Costs
- ✓Transform!

and…continue to share Lessons Learned!