

MDA Assurance Provisions (MAP)/ Parts, Materials and Processes (PMAP)



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Agenda

- **Bottom Line Up Front (BLUF)**
- **QS Organization Update**
- **MDA Assurance Provisions (MAP) Rev B and Rev C**
- **Parts, Materials, and Processes (PMAP) Rev B and PM 86**
- **MDA Assurance Reps (MAR) Locations and Regional Plan**
- **FY 16 Assessment Summary and Pareto**
- **Supply Chain Issues, Best Practices and Improvement Initiatives**
- **“Made for MDA” Campaign**
- **Supplier Quality Days**
- **Conclusions**

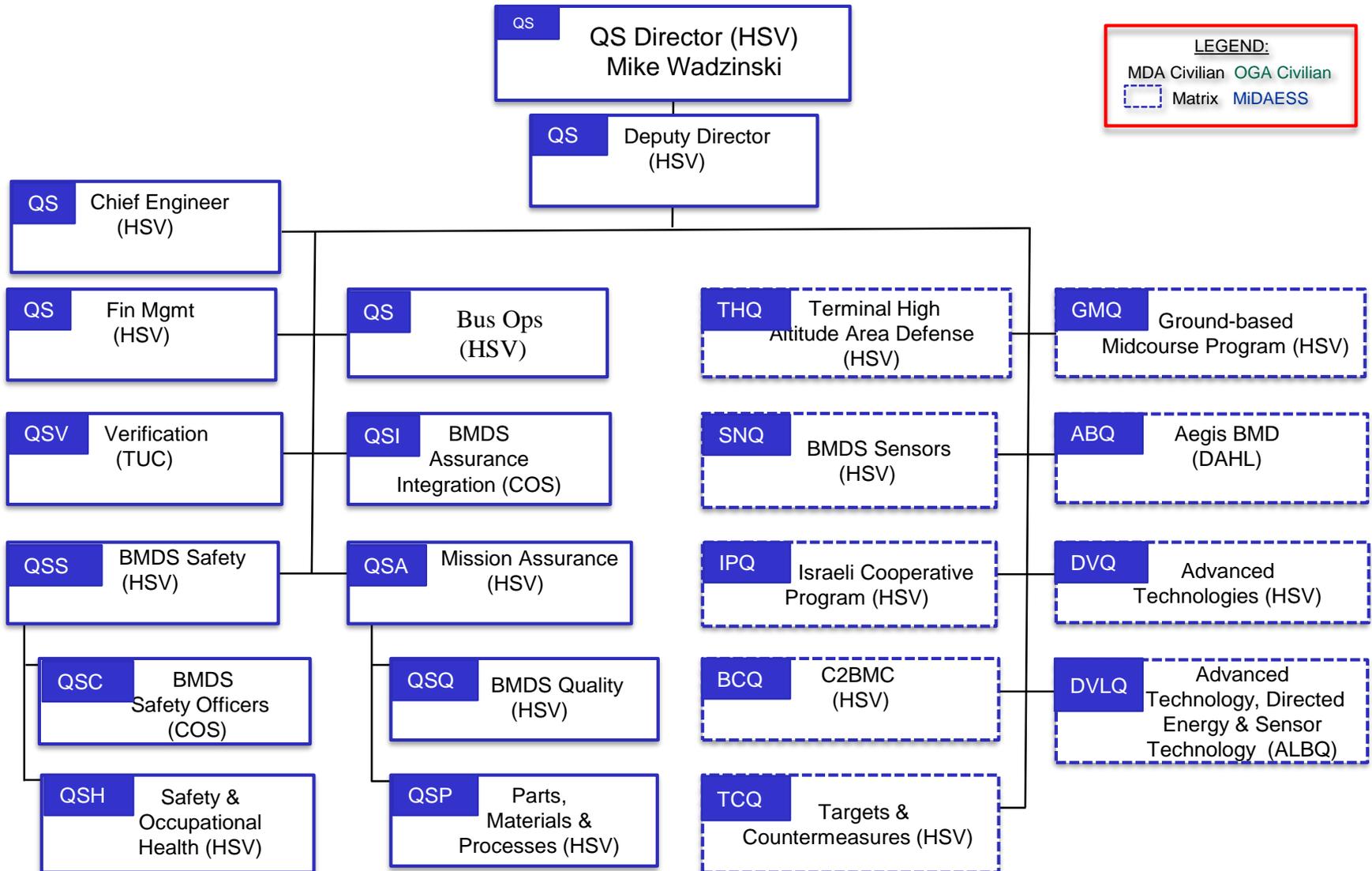


BLUF

- **Why Quality is Important**
 - Even the smallest parts matter, and for that reason everyone, up and down the supplier chain, has a critically important job – to ensure the Ballistic Missile Defense System (BMDS) is of the highest quality. This is an imperative for the nation.
 - The cost of a defect may be the cost of a city (when an interceptor or another part of the BMDS does not work, we cannot do our mission).



QS ORGANIZATION



LEGEND:
 MDA Civilian OGA Civilian
 Matrix MiDAESS



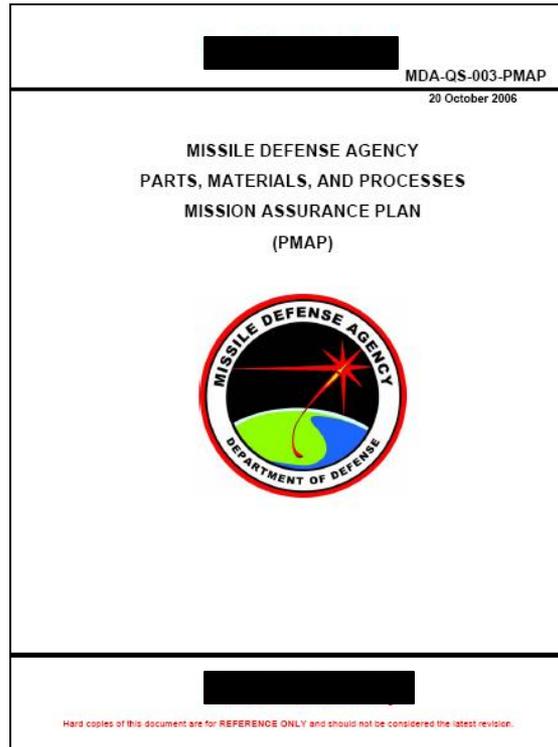
MAP Revision C

- **Goal April 2018 Publication**
- **Primary focus will be to include new/updated SAE AS9100 requirements and new DoD directives for software assurance**
- **Will solicit industry input via MDA programs**



Parts, Materials, and Processes (PMAP) Rev B

- **Applicable Documents (References)**
 - Government and Commercial**
- **PMP Management Structure, Roles, and Responsibilities**
 - PMP Board, PMP Control Board, PMAG**
- **PMP Requirement examples**
 - Electrical, Electronic, and Electromechanical (EEE) Parts**
 - Materials**
 - Corrosion Prevention**
 - Prohibited Parts and Materials**
 - PMP Quality Requirements**
 - Counterfeit Parts**
 - Radiation Hardness Assurance**
 - PMP Qualification**
 - Commercial Off the Shelf (COTS) Management**
 - Failure Analysis**
 - Environmental Controls Handling**
 - Preservation, Packaging and Storage**



Appendices

- Derating
- Plastic Encapsulated
- Microcircuit (PEM)
- COTS
- Radiation Hardness
- Assurance
- Prohibited PMP
- PMAP Data Items
- Corrosion
- Prevention

**The MDA PMAP is widely recognized
as the best high-reliability PMP plan in DoD**



Key PMAP Revision B Requirements

PMAP Para.	Change	Rationale
3.1 Hardware Categories Definitions, Tables 1 & 2	Adds Target Category “T” similar to Cat “D” (Shipboard Environment) with additional requirements for Particle Impact Noise Detection (PIND) for cavity devices, non-destructive evaluation, parts traceability, special Destructive Physical Analysis requirements, supplier/vendor selection	Adds tailored Parts, Materials, Processes requirements for Targets (previously N/A)
3.2.9 Electrical Connectors	New paragraph invoking guidelines on connector selection, cleanliness, and maintenance	Provide guidance for connector selection
3.3.11 – Friction Welding	All friction welding processes shall be in accordance with American Welding Society (AWS) C6.2 or PMP Control Board approved alternative.	Covers Friction Welding for Titanium Spin Welding
3.3.16 Composites	New paragraphs 3.3.16 and three sub-paragraphs	Provides process requirements and design guidance due to complexity with composite in structural applications



Key PMAP Rev B Counterfeit Parts Requirements

Includes specific receiving inspection requirements (PMAP 3.6.6) to assist in identifying counterfeit parts

Includes specific tests (Table 5) for preventing/identifying, requirements for containing, and notifying user community about counterfeit parts (PMAP 3.6.7)

PMAP 3.6.8 Destructive Physical Analysis (DPA)

- **For Space and Interceptor hardware, DPA shall be performed on 1 device per lot date code for ICs, Semiconductors, Stacked Caps, and custom Magnetics**
- **Once a possible counterfeit is identified, developer shall**
 - **Impound the part/material and *all others in the lot*, including any product already used in another assembly**
 - **Verify procurement source and certifying paperwork**
 - **Contact the manufacturer (also the distributor if needed)**
 - **Initiate a Government and Industry Data Exchange Program (GIDEP) Alert**

PMP Team Must Work with Contractor Purchasing and Quality Organizations to Manage Counterfeit Parts



Key PMAP Revision B Requirements

PMAP Para.	Change	Rationale
3.10 Commercial Off-The-Shelf Product Management	Added a paragraph to address Information Assurance products evaluation and validation for compliance to NSA requirements	The acquisition of all Government OTS IA products to be used on systems entering, processing, storing, displaying, or transmitting national security information shall be limited to products which have been evaluated by the NSA, or in accordance with NSA-approved processes.



MDA Policy Memo 86

- **Parts, Material and Processes Requirements Verification**
- **Program Managers will implement a PMP requirements verification process for all MDA mission and safety critical hardware contracts.**
- **The PMP verification process will be based upon the program's approved PMP plan and include a schedule of planned contractor-led onsite PMP baseline and maintenance verification assessment at subcontractor facilities.**
- **Emphasis on the following:**
 - **Proper handling and storage of moisture sensitive EEE parts and wire**
 - **Appropriate derating of EEE parts**
 - **Receiving inspections to ensure XRF to detect pure tin, gold plated leads and PIND testing**
 - **Proper assessment of product change notices (PCNs)**
 - **Procurement from authorized sources**

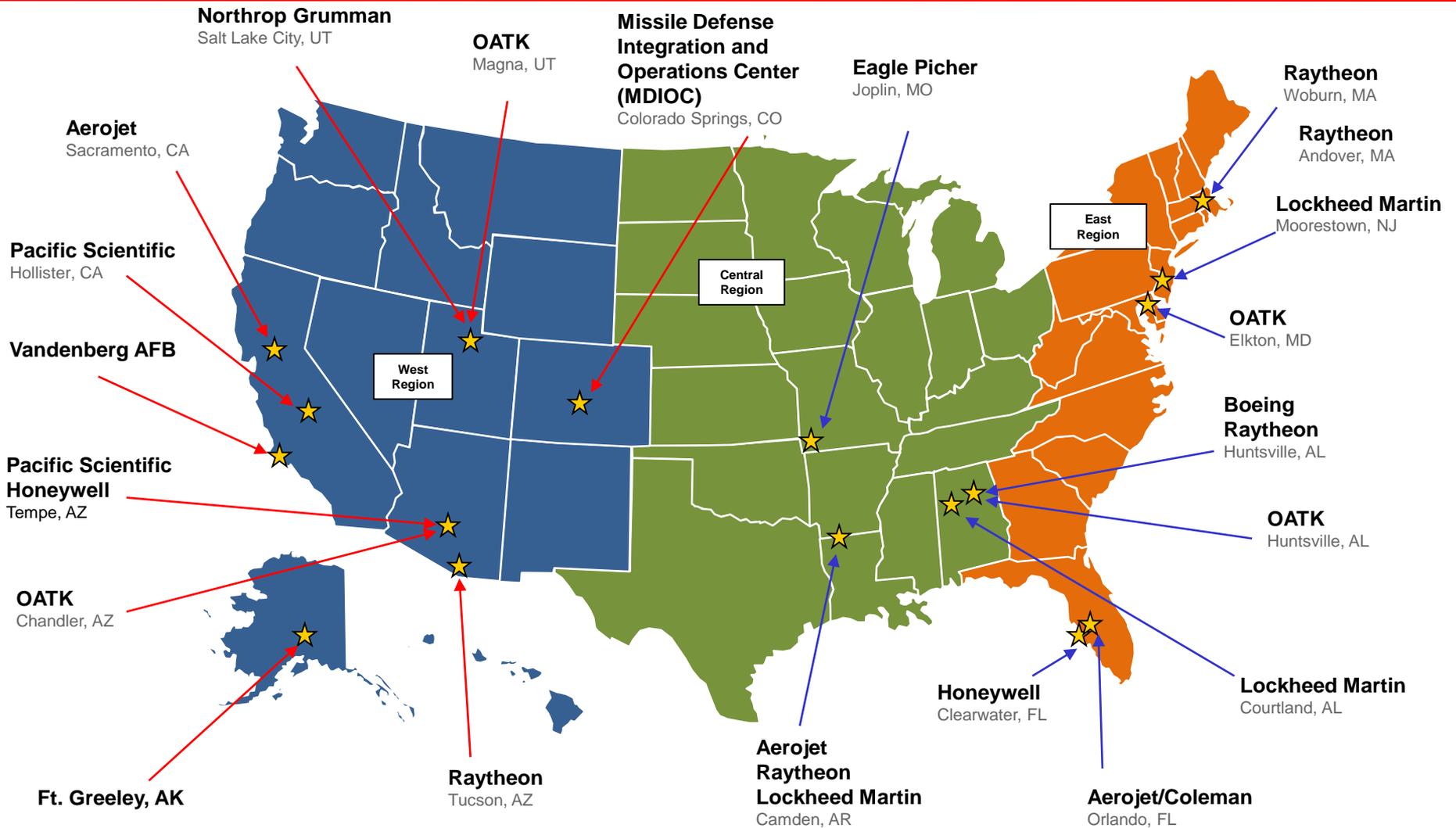


MDA Assurance Representatives (MARs)

- **MARs are located in critical manufacturing plants and integration facilities across the USA.**
- **MARs provide independent, unfiltered technical and quality assessments to the MDA Director through the MDA/QS Director.**
- **MARs put quality ahead of cost and schedule.**
- **MARs ensure industry best-practices are present at sites.**
- **MARs ensure Lessons Learned on one MDA program are implemented across all MDA programs.**
- **MARs assist the many MDA Program Offices with requests to witness tests and attend meetings.**
- **MARs assess not only the facility that they are located within, but spend a significant amount of time assessing lower-tier suppliers.**



MDA/QS MAR Locations





MAR Regional Plan

Purpose: Expand the footprint of the current MARs to cover additional companies utilizing a regional approach to supplier management.

Background: Based on previous QS supplier assessments, many quality issues exist at lower tier suppliers. This plan was developed in Jan 2013 to provide visibility into the sub-tier supply chain, to identify similar issues and mitigate the risks.

- The MRP consists of small scale visits to suppliers (1 or 2 MARs) that are conducted on a non-interference basis. Specified criteria are evaluated.
- MRP Phase I in 2014 covered 35 companies.
- Phase II in Feb 2015 added 42 companies.
- Phase III in Feb 2016 added 48 companies.
- Phase IV in work will add 20 companies.
- Companies are selected based on complexity of hardware, critical function of hardware within the system, history of quality issues and production status.

Results: MARs work significant findings with MDA Program Offices. Companies have been very receptive to date.



Supply Chain Issues

- **Flow down of MAP/PMAP Requirements to lower tier suppliers**
- **Verification of implementation of flowed MAP/PMAP requirements at lower tier suppliers**
- **Inadequate oversight/involvement with lower tier suppliers**



Supply Chain Management Best Practices

- Incentivize Supply Chain Management performance
- Use data to drive Supply Chain Management improvements
- Increase control of design, parts, materials and processes as required.
- Engage regularly with suppliers

Lesson Learned -- Verify requirements flow down and implementation



MDA Supply Chain Management Improvement Initiatives

Key Ongoing Initiatives

- **Supplier conferences by program** (4 complete, 2 planned, annual event)
- **Monthly quality metric reviews** (Defects Per Unit and Escapes for past year)
- **MDA/Industry Quality Forum** (conducted 2 – 3 times a year for past two years)
- **Made for MDA**
 - Awareness campaign
 - e.g. video, posters, stickers
- **Joint MDA and DCMA Technical Assessments** (Full participation started in FY16)
 - Moving deeper into the supply chain
 - MDA Assurance Provisions (MAP) Revision B and Parts, Materials and Processes Mission Assurance Plan (PMAP)
- **MDA Assurance Representatives (MAR) Regional Plan**
- **First Article Inspection process per new AS9102**

Initiatives in Development

- **Expand Supply Chain Management requirements in contracts**
- **Add first time yield and test problem reports to defects per unit and escapes**
- **Increase attention to requirements verification and supplier selection**

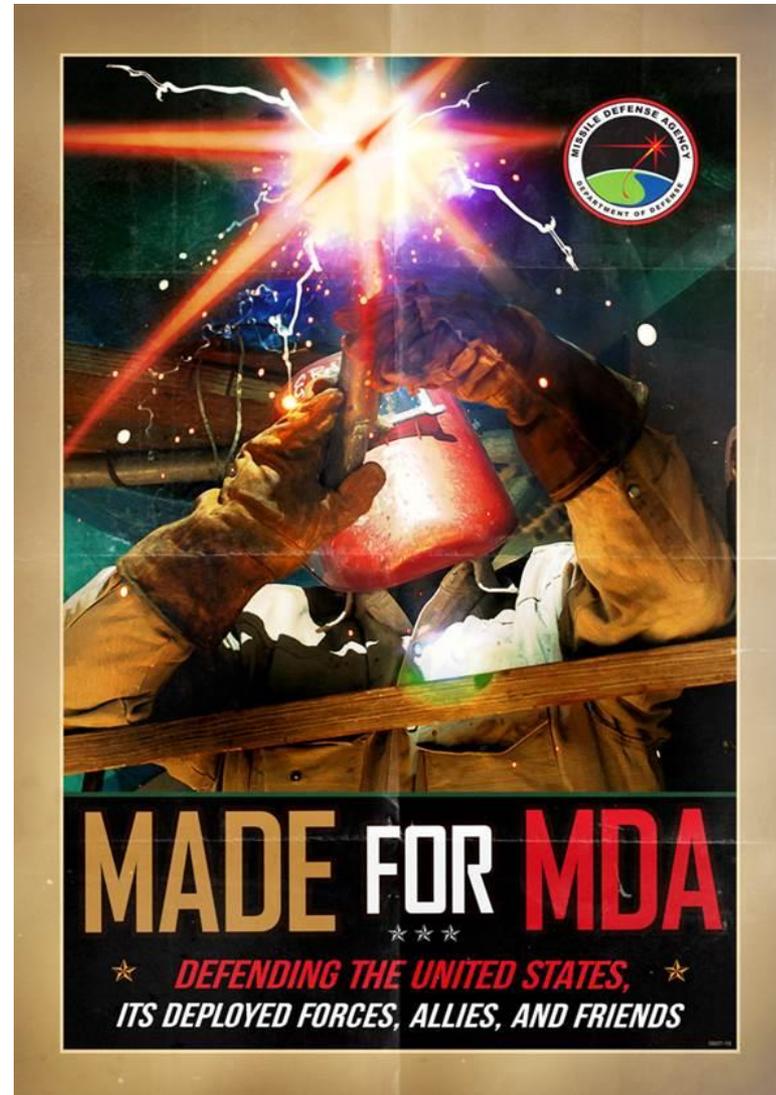
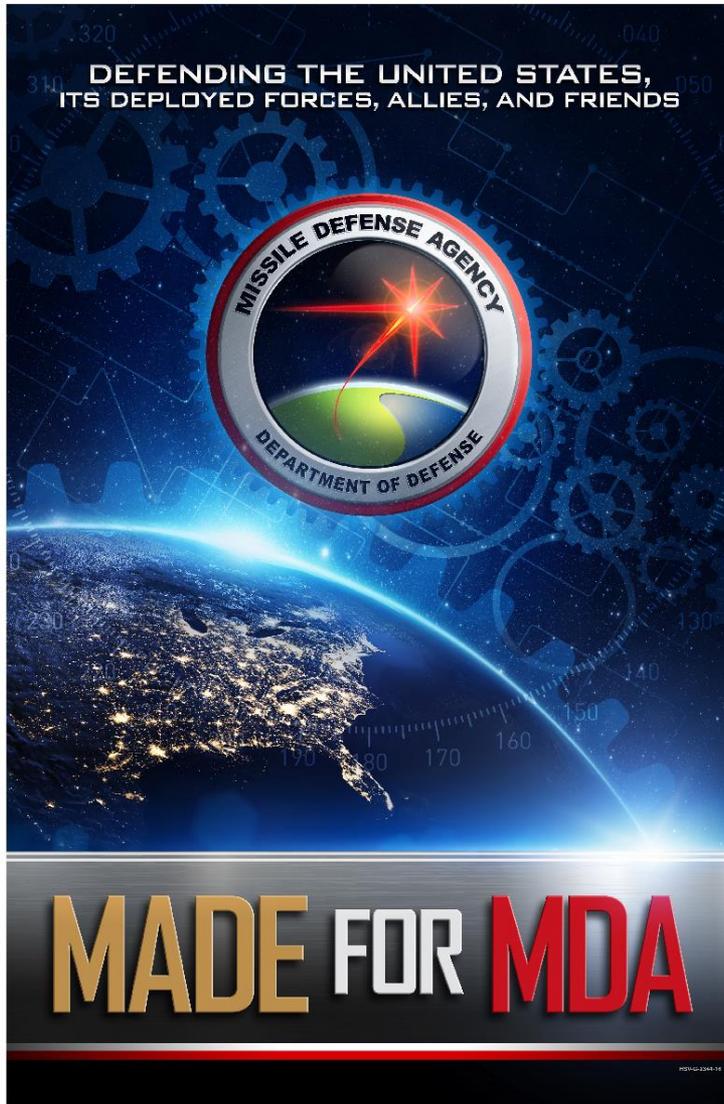


“Made for MDA” Campaign

- **Purpose**
 - **Ensure all MDA suppliers of safety and mission critical components are aware that they are building products for MDA**
 - **Ensure all MDA suppliers of safety and mission critical components are aware of the criticality of their components to safe and reliable MDA systems**
- **Products**
 - **MDA Video**
 - **Posters, Calendars, Badge Cards, Stickers**
- **Distribution**
 - **MDA Website**
 - **MDA Program Quality/Supplier Days**
 - **Direct Distribution via mail**
 - **MAP/PMAP Training Events**



“Made for MDA” Campaign Video





Conclusions

- **Quality is a requirement, not an option**
- **MAP/PMAP provide guidance to suppliers on MDA Quality, Safety and Mission Assurance requirements**
- **MDA continues to update standards and enforce lower in supply chain**
- **MARs increasing lower tier supplier assessments**
- **MDA Assessments finding more issues than they should**
- **Supply chain needs greater attention**
- **MDA using “Made for MDA” Campaign and Supplier Quality Days to reach lower into supply chain to emphasize quality**



Questions?

QS POC's for MAP/PMAP

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