Missile Defense Agency

“Our Mission Assurance Tools”

To: CQSDI March 2013

By: Mr. Mike Wadzinski
MDA/QS Director (Acting)
Today’s Missile Defense Threat

Threat
- Real
- Growing
- Unpredictable
- Threatens regional stability
- Enables asymmetric threats

Missile Defense Attributes
- Provides extended deterrence
- Devalues missile proliferation
- Dissuades ballistic missile investment
- Enables international cooperation for regional defense

2010 Ballistic Missile Force Levels Not Including U.S., China, Russia or NATO

<table>
<thead>
<tr>
<th>Type</th>
<th>Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>SRBM</td>
<td>5,500</td>
</tr>
<tr>
<td>MRBM</td>
<td>350-450</td>
</tr>
<tr>
<td>IR/ICBM</td>
<td>&lt;50</td>
</tr>
<tr>
<td>Totals</td>
<td>5,900-6,000</td>
</tr>
</tbody>
</table>

Sources: NASIC, Ballistic and Cruise Missile Threat, 2009; DIA, Iran’s Military Power, Statement before the Senate Armed Services Committee, 14 APR 10; DIA, Annual Threat Assessment 2008; MSC, e-mail, RE: Unclassified Force Level Numbers, 8 APR 10 Case number: 0410-MS0391; DNI, Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, Covering 1 JAN to 31 DEC 29.
Layered Ballistic Missile Defense

ICBMs > 5,500 km
IRBMs / MRBMs 1,000-5,500 km
SRBMs < 1,000 km

Includes European Phased Adaptive Approach (EPAA)

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ICBM = Intercontinental Ballistic Missiles
MRBM = Medium Range Ballistic Missiles
IRBM = Intermediate Range Ballistic Missiles
SRBM = Short Range Ballistic Missiles
# U.S. Ballistic Missile Defense

## Developing and Deploying the Integrated System

### Homeland Defense Today With Upgrades And Enhancements Through 2020

**Phase I: Today’s Capability**
- **Aegis BMD** with Standard Missile
- **SM-3 IA**
- **Patriot**
- **THAAD**
- **AN/TPY-2 (FBM)**

**Phase II: Enhanced Medium-Range Missile Defense (By 2015)**
- **Aegis BMD**
- **SM-3 IB**
- **Patriot**
- **THAAD**
- **AN/TPY-2 (FBM)**

**Phase III: Enhanced Intermediate-Range Missile Defense (By 2018)**
- **Aegis BMD**
- **SM-3 IIA**
- **Patriot**
- **THAAD**
- **Initial PTSS**
- **AN/TPY-2 (FBM)**

**Phase IV: Early Intercept of IRBMs and ICBM (By 2020)**
- **Aegis BMD**
- **SM-3 IIB**
- **Patriot**
- **THAAD**
- **PTSS**
- **AN/TPY-2 (FBM)**

### Command, Control, Battle Management, and Communications (C2BMC) in 2011 With Coalition Infrastructure And Updates Through 2020

- **C2BMC Consoles**
- **C2BMC Displays**

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## European Phased Adaptive Approach

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<tr>
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<tbody>
<tr>
<td>Aegis BMD with SM-3 IA</td>
<td>Aegis BMD with SM-3 IA/IB</td>
<td>Aegis Ashore with SM-3 IB (Romania)</td>
<td>Aegis BMD with SM-3 IA/IB/IIA</td>
</tr>
<tr>
<td>SM-3 IA</td>
<td>SM-3 IB</td>
<td>SM-3 IIA</td>
<td>SM-3 IIB</td>
</tr>
<tr>
<td>AN/TPY-2 (FBM)</td>
<td>AN/TPY-2 (FBM)</td>
<td>AN/TPY-2 (FBM)</td>
<td>AN/TPY-2 (FBM)</td>
</tr>
<tr>
<td>C2BMC AOC Ramstein</td>
<td>C2BMC Updates</td>
<td>C2BMC Updates</td>
<td>Enhanced C2BMC</td>
</tr>
<tr>
<td>ALTBMD Interim Capability</td>
<td>ALTBMD Lower Tier</td>
<td>ALTBMD Upper Tier</td>
<td></td>
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<tr>
<td>Potential EPAA Surge</td>
<td>Potential EPAA Surge</td>
<td>Potential EPAA Surge</td>
<td>Potential EPAA Surge</td>
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<tr>
<td>THAAD</td>
<td>THAAD</td>
<td>THAAD Launch on Remote</td>
<td>THAAD Full Network</td>
</tr>
</tbody>
</table>

**Notes:**
- Aegis BMD
- Aegis Ashore
- SM-3 IA
- SM-3 IA/IB
- SM-3 IB
- SM-3 IIA
- SM-3 IIB
- AN/TPY-2 (FBM)
- C2BMC AOC
- ALTBMD
- THAAD

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Successful engagement of threat missiles depend on quality, highly reliable systems and sub-systems
- First time, every time level of reliability
- Producible/maintainable designs - adequate MPE margins
- Tested and verified capabilities - strenuous flight test & Warfighter evaluations, constrained response time
- Dependable, High Mean Time Between Failure (MTBF)
- Extended storage/fielded, on-alert hardware

In the time you spend commuting to work, system must detect, track, engage and destroy the threat
MDA/QS strives to be more proactive and less reactive. Some QS tools that have proven effective at early phase of contract are:

- **Prerequisite:**
  - Select a proven company with proven technology and a strong mission assurance program

- **Strong Requirements:**
  - MDA/QS approves requirements for all new, major contracts
  - MDA/QS requires our MAP and PMAP on all new design contracts
  - MAP and PMAP contains strict requirements for piece part selection; PMPCB Board dispositions non-standard parts (QS Parts experts participate)
  - MDA requires strict control of design, critical processes, tech training
  - MAP and PMAP contains robust margins for Qual and ATP test (H/W & S/W)
  - MDA/QS teams with DCMA to implement supplier surveillance and MGI’s
  - Mandate robust, precise First Article Inspections
Additional QS tools that have proven effective at early phase of contract are:

- **Tech Reviews:**
  - Require PDR’s, CDR’s, DCR’s, PRR’s, Pedigrees, TIMs. QS participate in each.

- **Audits:**
  - MDA/QS has an aggressive audit schedule; over 1,000 findings/yr.
  - MDA/QS and DCMA are implementing a pilot program to “initially” assess many suppliers and prioritize subsequent assessments.
  - MDA/QS and DCMA team together to identify and proof critical processes (QALI’s and LOD’s).

- **MARs (In-Plant Reps):**
  - Direct, unfiltered insight at suppliers. Drive continuous improvement at company and supply chain.
  - Ensures thorough RC/CA to prevent escapes.
MAP & PMAP

- **MDA Assurance Provisions (MAP)**
  - A standardized set of Quality, Safety and Mission Assurance requirements that apply to new or modified safety and mission critical items (Approx 375 pgs)
    - Vetted with industry leaders
    - Incorporates Best Practices, Lessons Learned and Audit Findings
    - Tailorable by Programs (MAIP and RAM)
    - Rev B soon to be released. New req’s: MGI’s, Responsible Engineer, Integrated Digital Environment, Supplier Management Planning, Software and Firmware, Reliability Surveillance of Deployed or Fielded Systems, Critical Lifts

- **MDA Parts, Materials and Processes (PMAP) Mission Assurance Plan**
  - A standardized set of requirements for parts, material and processes that apply to new or modified safety and mission critical items
    - Recognized as a benchmark across the DOD
    - Requirements specified by Category depending on environment and period of use (ex: Missile, Target, Sea-Based System, Ground-Based System)
MEMORANDUM FOR EXECUTIVE LEADERS, SENIOR LEADERS, SPECIAL STAFF, AND CONTRACTING OFFICERS

SUBJECT: Missile Defense Agency Policy on Purchasing Electronic Parts

References: (a) MDA Parts, Materials, and Processes Mission Assurance Plan (MDA-QS-003-PMAP-REV B)
(b) FAR Clauses 52.243-1 “Changes – Fixed-Price,” 52.243-2, “Changes – Cost-Reimbursement,” and 52.243-1 “Time-and-Materials or Labor-Hours”
(c) National Defense Authorization Act for FY 2012, Section 818

The Missile Defense Agency (MDA) has experienced the presence of counterfeit parts in critical hardware and has implemented steps to reduce the risk of procuring counterfeit parts in all programs via Policy Memorandum 50, released June 29, 2009 (hereby superseded). Since the release of that memorandum, we have taken additional actions to further reduce the risks posed by counterfeit parts. The Quality, Safety and Mission Assurance (QS) Parts and Materials Advisory Group has updated and revised the MDA Parts, Materials, and Processes Mission Assurance Plan (PMAP) (Reference (a)) paragraphs 3.6.7 and 3.7.1 to meet current laws and implement best practices of the defense and commercial product industry to address the counterfeit part threat to Ballistic Missile Defense System quality and reliability.

The requirements of MDA PMAP Rev B paragraph 3.6.7 (including subparagraphs) and 3.7.1 (items d, f, g, and h) shall be implemented immediately on all MDA mission and safety critical hardware contracts and flowed down to all MDA subcontractors. Primary requirements include:

- Preventing counterfeit electronic parts by maintaining procedures for supplier assessment and selection, traceability, training, and flowdown to subcontractors
- Informing MDA by reporting unauthorized supplier purchase requests before buying the electronic parts, including justification and test results
- Detecting counterfeit electronic parts by ensuring appropriate authentication inspection and testing is performed for all purchases from unauthorized suppliers
- Containing counterfeit electronic parts in a manner that assists future prosecution
- Reporting counterfeit electronic parts to MDA, the Government-Industry Data Exchange Program, and any other required parties

All Program Managers shall have their contracting officers immediately implement via bilateral agreement the above requirements on all MDA mission- and safety-critical hardware contracts. These supplemental agreements shall cite the applicable Changes clause (Reference (b)) as the authority. The above requirements also are to be included in current and new solicitations for MDA mission- and safety-critical hardware.

Additionally, Section 818 of the FY 2012 National Defense Authorization Act (NDAA) (Reference (c)) requires that Defense Federal Acquisition Regulation Supplement (DFARS) be revised by September 26, 2012 to include statutorily-specified requirements regarding counterfeit electronic part avoidance, detection, and reporting requirements. DFARS changes normally apply only to contracts resulting from solicitations issued on or after the effective date; when these DFARS changes are issued, additional guidance will be provided regarding the amendment of existing solicitations and modification of existing contracts. Meanwhile, contracting officers shall ensure that prime contractors are aware of the FY 2012 NDAA requirements reflected in the forthcoming DFARS change.

My point of contact for this matter is Mr. Barry Birdsong, QSA at (256) 450-4265, or email at barry.birdsong@mda.mil.

PATRICK O’REILLY
Lieutenant General, USA
Director

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MDA Supplier Road Map

- Created for each MDA Program.
- Identifies supply chain from primes to low-tier suppliers of components/critical piece parts.
- Used by programs to track and manage suppliers and used by QS and DCMA in targeting audits and assessments.
MDA Formal Audits

Qty of Findings (since mid 2011)

Category (Ex: CM, FOD, Design, etc.)
• Common issues found throughout the supply chain included:
  • Quality requirements not flowed to sub-tier suppliers for mission critical components
  • Evaluations of sub-tier suppliers not performed on periodic basis and in some cases, not performed at all
  • Insufficient assembly instructions
  • Lack of detail on drawings
  • Critical processes or tolerances not identified
  • Insufficient lot/vendor traceability
  • Lack of FRACAS
  • Lack of details regarding material procurement and inspection

• Growing level of risk related to “suspect” electronic parts
  • Use of unauthorized distributors/brokered parts
  • Inadequate acceptance test/inspection processes
<table>
<thead>
<tr>
<th>Supplier Approval</th>
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<tbody>
<tr>
<td>A1. Does the process for adding suppliers include appropriate supplier forms with</td>
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<tr>
<td>specific reference to counterfeit avoidance and detection?</td>
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<tr>
<td>A2. Does the process for adding suppliers include verification of the supplier's</td>
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<tr>
<td>selection and rating system to ensure the risk of low-quality or counterfeit</td>
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<tr>
<td>parts is addressed?</td>
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<tr>
<td>A3. Does the process for adding suppliers include checking contractor history with</td>
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<td>the supplier, as well as checking government or commercial databases such as</td>
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<tr>
<td>GIDEA and ERAI?</td>
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<tr>
<td>A4. Does the process for adding suppliers include checking of business information</td>
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<tr>
<td>(BINCS) such as financial status (DUNS) and government exclusions (EPLS)?</td>
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<tr>
<td>A5. Does the process for adding suppliers include verification of ISO9001 and/or</td>
</tr>
<tr>
<td>AS9120 certification?</td>
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<tr>
<td>A6. Does the process for adding suppliers include verification of membership in</td>
</tr>
<tr>
<td>ERAI and/or IDEA?</td>
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<tr>
<td>A7. Does the process for adding suppliers include verification or requirements that</td>
</tr>
<tr>
<td>the supplier's parts procurement strategy is to procure from an OCM or authorized</td>
</tr>
<tr>
<td>supplier instead of an unauthorized supplier?</td>
</tr>
<tr>
<td>A8. Does the process for adding suppliers include verification of compliance or</td>
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<tr>
<td>certification to ANSI ESD S20.20 and IPC-J-STD-033?</td>
</tr>
<tr>
<td>A9. Does the process for adding suppliers include verification of minimum inspection</td>
</tr>
<tr>
<td>and test requirements for all parts bought from unauthorized suppliers? What are</td>
</tr>
</tbody>
</table>
| the minimum
MDA Facility Assessment Checklist

• Assess suppliers to a common set of objective, industry-standard criteria

• Weighted system for each criterion

• 14 Sections
  ✓ Electrical, Electronic, Electromechanical (EEE) Parts
  ✓ Software
  ✓ Design & Workmanship
  ✓ Work Instructions
  ✓ Manufacturing & Tooling
  ✓ Clean Rooms
  ✓ ESD, FOD, Safety, Training & Operator certification
  ✓ Critical lifts & moves
  ✓ MRB and Configuration Management Processes
  ✓ Metrology
  ✓ Safety (Work hazards & Ordnance)

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<table>
<thead>
<tr>
<th>Supplier Management</th>
<th>1. Does the company visit their suppliers and sub-tier suppliers to validate their intended requirements flowdown?</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2. Answer if the company procures any EEE parts - Does the company have a formal written policy that restricts the purchase of EEE parts from independent part distributors? Independent part distributors are non-OEM suppliers or a supplier not specifically authorized by the OEM to sell their parts.</td>
</tr>
<tr>
<td></td>
<td>3. Answer if the company procures any EEE parts - Does the company perform lot sample decapsulation and die verification when parts are procured from Independent Parts Distributors?</td>
</tr>
<tr>
<td>Configuration Management</td>
<td>4. Does the company have a policy/procedure that defines the method to manage and track all design and process changes via a release process with peer review?</td>
</tr>
<tr>
<td></td>
<td>5. Do drawing changes go thru a formal Configuration Control Board for approval?</td>
</tr>
<tr>
<td></td>
<td>6. Does the company provide written notification to its customer when it changes a design or process?</td>
</tr>
<tr>
<td></td>
<td>7. Does the company require its suppliers to provide it with written notification when they change designs or processes?</td>
</tr>
<tr>
<td>Special Processes</td>
<td>8. Answer if the company performs any of these special processes: anodizing, bonding, brazing, encapsulating, heat treating, plating, soldering, welding, nondestructive testing, EEE part handling. Are there written technician training requirements specified for each of these special processes?</td>
</tr>
<tr>
<td></td>
<td>9. Are the tech's performing these special processes &quot;current&quot; in qualifications or certifications?</td>
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<tr>
<td></td>
<td>10. For each of these special processes, are there time intervals formally specified by the company that require the tech's performing these processes to be formally retrained/recertified?</td>
</tr>
<tr>
<td></td>
<td>11. Are any of these special processes NADCAP certified? If yes, state which one(s) in comment column.</td>
</tr>
</tbody>
</table>
MDA Assurance Representatives (MARs) Philosophy

MARs shall always maintain their QS Independence and recognize the QS Director as our ultimate customer
- MARs will put Quality ahead of Cost/Schedule
- MARs will strive for Best Industry Practices (MAP & PMAP)
- MARs will be primarily proactive and less reactive
- MARs will coordinate their reports with the programs/companies before release
- MAR deliverables will drive continuous improvement
- MARs are “Accountable” for their facilities

MARs will recognize the PM and QS Function Leads as customers
- MARs will be “Value Added” to PM’s
- MARs will generate deliverables that illustrate their Value
In-Plant MAR Locations

Total: 28 MDA Reps at 19 Sites