Need for Industrial Base Rebalance in Pacific Pivot

Robert M. Read
Senior Industrial Analyst
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Pressures Facing DoD

★ Current Environment
  ★ Declining resources
  ★ Declining production
  ★ Competition for resources

★ Possible impacts on industrial base
  ★ Loss of innovative edge
  ★ Permanent loss of capability

★ Loss of capability to warfighter?
MIBP Mission

★ Ensure access to robust, secure and innovative industrial capabilities to fulfill short- and long-term National Security requirements
SECTOR BY SECTOR, TIER BY TIER (S2T2) AND FRAGILITY AND CRITICALITY (FAC)
What is Sector-by-Sector, Tier-by-Tier (S2T2)?

★ A standardized Industrial Base Analysis (IBA) approach and methodology for assessing the health of the Defense Industrial Base

★ Objectives:

☆ Understand the impacts of changes in the acquisition / DoD budgets on the Industrial Base

☆ Establish early warning indicators & identify Industrial Base (IB) risk, particularly at the lower tiers of the supply chain

- Single points of failure, unreliable suppliers, overreliance on foreign sourcing, areas of limited competition, etc.

- Identify production rate limitations & production constraints

☆ Ensure successful DoD weapons system program & portfolio outcomes

☆ Support long-term planning & investment decisions by & across the Services

☆ Develop an industrial base data repository & a standardized set of tools to use for IBA

Leverages a statistically-validated & standardized Fragility & Criticality (FaC) assessment process to analyze risk across the tiers of the Industrial Base
**S2T2 FaC Process**

<table>
<thead>
<tr>
<th>Process Activity</th>
<th>Action</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Select</strong> Sector/SubSector</td>
<td>Scope the problem (existing risk assessments; program shutdowns)</td>
<td>Sector Taxonomy</td>
</tr>
<tr>
<td><strong>Search</strong> Available Data</td>
<td>Identify IB-related risks &amp; related capabilities/products Identify suppliers and market</td>
<td>Potential IB Risks/Issues</td>
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<tr>
<td><strong>FaC Screening/Filtering</strong></td>
<td>Focused set of IB-related risks for further assessment</td>
<td>Screened IB/Issues Capability-Supplier Pairs</td>
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<tr>
<td><strong>Conduct</strong> FaC Matrix Assessment</td>
<td>Facilitated scoring, based on standardized criteria, by SMEs</td>
<td>FaC Risk Matrix</td>
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<tr>
<td><strong>Validate &amp; Mitigate</strong> High Risk Issues; Develop Mitigation Strategy(ies)</td>
<td>SME “deep dive” into IB risk areas; facility visits</td>
<td>High Risk IB Issues</td>
</tr>
</tbody>
</table>

**S2T2: iterative, repeatable, collaborative, fact-based**
Assessments Provide Guidance for Action
FY13 FaC Results Used by Leadership

- Quarterly industry meetings with USD
  - Potential issues in lower tiers
- Ongoing IPTs, IB forums
  - Space, energetic materials, fuze, vertical lift
- Congressional reports
  - FPA, Annual Report, specialty metals
- FY15 POM Issue Teams
  - MDAP, TACAIR, Munitions, Space, Missile Defense, Strategic Warfare
- Defense Management Advisory Group on IB (4-star)
  - December 2013
Missile FaC IPT

• Missile FaC was a pilot program
• Missile FaC IPT consisted of representatives from OSD, DCMA, Army, Navy, Air Force, and MDA
• Process began with the development of the refinement of the missile sector taxonomy
• Data Collection began in Spring 2013
• Results were completed by August 31, 2013 to affect Budget Review Process
Missiles Industrial Sector

- **Tactical Missiles** (AMRAAM, AIM-9X, AARGM, ATACMS, APKWS, GMLRS, Hellfire, JASSM, Javelin, JAGM)
  - **Smart Munitions** (Excalibur, JDAM, LGBs, SDB I & II, JSOW, SFW, WCMD)

- **Strategic Missiles** (Trident II (D5), Minuteman III)

- **Missile Defense** (Patriot (PAC-3), Patriot/MEADS, Standard Missile (SM-2/3/6), THAAD, GMD, KEI)
These are examples of hardware components associated with the major functional elements often found in Missiles. Not all elements are found in all missiles.

**Missile All-Up-Round Specification, Integration, Assembly and Test**

- **Propulsion**
  - Solid Rocket Motor
  - Ammonium Perchlorate
  - Jet Engine
  - Jet Propellant
  - Motor Case
  - Fuel Tanks

- **Armament**
  - Warhead Explosive Fill
  - Warhead (Inert Components)
  - Fuzes
  - Safe & Arm Device
  - Target Detector

- **Guidance**
  - IR Seeker
    - Integrated Detector Assembly (Focal Plane Array)
    - Cryostat/Engine (Cooler)
    - Lens/Mirror
    - Gimbals
    - Sensor Window/Dome
  - Radar Seeker
    - Transmit/Receive
    - Antenna
    - Signal Processor
    - Radome
  - Optical
    - CCD
    - Lens/Mirror
    - Window

- **Navigation**
  - AMU/IMU/RMU
  - GPS
  - GPS Antenna

- **Control**
  - Circuit Card Assemblies (ASICs)
  - Control Actuators
  - Battery
  - Data Link

- **Airframe**
  - Fuselage
  - Substructure
  - Wings, Fins, Tail
  - Coatings
Prime Contractors
# Prime Contractors

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<th>Boeing</th>
<th>Raytheon</th>
<th>ATK</th>
<th>Lockheed Martin</th>
<th>Northrop Grumman</th>
<th>BAE</th>
<th>General Dynamics</th>
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* Northrop Grumman is prime on KEI, but Raytheon has the interceptor.
Missile Procurement Funding Distribution by Prime Contractor (FYDP 12-18)

Source: DoD FY 2014 President’s Budget Procurement Program
### Missile New Start Development & Production Timeline
#### In 5 Year Increments

<table>
<thead>
<tr>
<th>Year</th>
<th>Name of Systems in Development</th>
<th>Name of Systems Beginning Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>1950</td>
<td>5 AGM-12 Bullpup, AIM-9, AIM-4 Falcon, AIM-7 Sparrow, AGM-28 Hound Dog,</td>
<td>5 AGM-12 Bullpup, AIM-9, AIM-4 Falcon, AIM-7 Sparrow, AGM-28 Hound Dog</td>
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<tr>
<td>1960</td>
<td>5 TOW, Standard Missile, AIM-54 Phoenix, FIM-43 Redeye, AGM-45 Shrike,</td>
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<tr>
<td>1965</td>
<td>8 Maverick, Patriot, Stinger, Harpoon, MIM-72 Chaparral, Dragon, AGM-78, AGM-69 SRAM,</td>
<td>6 Standard Missile, AIM-54 Phoenix, MIM-72 Chaparral, RIM-43 Redeye, AGM-45 Shrike, AGM-78,</td>
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<tr>
<td>1970</td>
<td>2 Maverick, Hellfire</td>
<td>3 TOW, Dragon, AGM-69 SRAM,</td>
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<tr>
<td>1975</td>
<td>4 HARM, RAM, AMRAAM, MLRS,</td>
<td>3 Patriot, Stinger, Harpoon,</td>
</tr>
<tr>
<td>1980</td>
<td>1 ATACMS</td>
<td>3 HARM, Hellfire, MLRS,</td>
</tr>
<tr>
<td>1985</td>
<td>2 Javelin, THAAD</td>
<td>2 RAM, AMRAAM,</td>
</tr>
<tr>
<td>1990</td>
<td>5 ESSM, SM-3, PAC-3 MSE, GBI</td>
<td>0 ATACMS,</td>
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<tr>
<td>1995</td>
<td>1 GMLRS,</td>
<td>2 ESSM, Javelin,</td>
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<tr>
<td>2000</td>
<td>4 Griffin, SM-6, AARGM, Joint Common Missile*,</td>
<td>5 SM-3, PAC-3 MSE, GMLRS, THAAD, GBI</td>
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<tr>
<td>2005</td>
<td>1 JAGM*</td>
<td>2 Griffin, SM-6</td>
</tr>
<tr>
<td>2010</td>
<td>0 AARGM,</td>
<td>1</td>
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</table>

**NOTES:**
* JAGM has been restructured as a tech development program.  
* Joint Common Missile was canceled in 2007.  
- New Starts do not include most of the current missile development program modifications/upgrades to existing missile systems (AMRAAM, AIM-9X, etc.)  
- Does not include missiles with turbo fan engines (Tomahawk, JASSM, ALCM, ACM)  
- Does not include glide munitions (LGBs, JDAM, JSOW, SDB I, SDB II)

Few new start missile programs to hone industry’s design Engineering skills and sustain workforce
These are examples of hardware components associated with the major functional elements often found in Missiles. Not all elements are found in all missiles.
INDUSTRIAL BASE
DEFENSE MANAGEMENT
ADVISORY GROUP (DMAG)
AT&L Support

- In the past, there has been talk of support for the industrial base. (Office was created in 1994 due to IB concerns peace dividend)
- Mr. Kendall has demonstrated more than just concern, he has implemented actions
  - Request for IB review to determine where we were breaking the IB
  - Supported funding IB concerns – including missiles
Industrial Base DMAG

- AT&L directed MIBP to lead an Industrial Base DMAG during this Fall’s Budget Review Process
- For the first time the Department committed to funding projects solely associated with industrial base concerns. These include:
  - Air Force and Navy high-performance jet engine technology development
  - Army next generation ground combat vehicle design team investment
  - Investments in the missile industrial base for production process improvements/automation and material/technology upgrades
Missile Industrial Base Concerns

- Using the data from the missile FaC, MIBP supported CAPE Budget Issue Teams. Missile issue teams included: Munitions, Missile Defense, and Strategic Offense. Also IB issue team

- Proposed budget reductions resulted in the following industrial base concerns (design & production):
  - Fuzes
  - Thermal Batteries
  - Solid Rocket Motors

- DoD supported funding for fuze & thermal battery areas
Conclusion

- The Department and the Defense Industrial Base will continue to face fiscal realities.
- MIBP will continue to evolve the sophistication of our industrial analysis to identify those design and production risk areas that need mitigation.
- DoD’s Leadership recognizes the tough choices we face and continues to conduct reviews of our needs and systems to ensure an innovative fighting force and robust industrial base.