Industrial Base Management Scope

SMCA Industrial Base Integrated Product Team

• PEOs
  - Ammo
  - Missiles
  & Space
  • PMs
• AMC
• JMC
• ARDEC
• Industry
• EDCA
• Army
  G3/G4/G8
• OUSD(AT&L)
• GSA
• ASA(ALT)
• ACSIM/AEC
• USMC
• USAF
• USN
• ASA(I&E)
• DCMA
• CMA

Mission:

• Provide Integrated Supply Chain Management of the Ammunition Production & Logistics Base
• Optimize Preparedness of the National Technology & Industrial Base to Respond to Current and Future Warfighter Requirements

General Responsibilities:

• SMCA Directives & Army Regulation 700-90, Army Industrial Base Process
  • Develop & Maintain an Overarching Industrial Base Strategic Plan
  • Maintain GOCO Army Ammunition Plant Production Capabilities
  • Plan, Budget & Implement PAA-Activity 2 and RDT&E
• Implement Section 806, Public Law 105-261, Procurement of Conventional Ammunition—Permits SMCA to Restrict Procurements to Sources within NTIB

PEO Ammo – Industrial Base Support Agreements w/ AMC

• ARDEC (Aug 2003); JMC (June 2004); CMA-Pine Bluff (Dec 04); TACOM (Dec 04)

9 Feb 2006
Importance of Good Partnerships
Ongoing Industrial Base Initiatives

- Production Base Support Program
- AAP Modernization & Cost Reduction
  - Resources for Radford, Lake City, Holston
  - NC Upgrade at Radford
  - FY05 Congressional Activity: LC, RF, LS, Iowa, KS
  - FY06 Congressional Activity: Holston, Scranton, Kansas
  - WP LAP Upgrade @ Pine Bluff Arsenal
  - Congressional Report: Aug 06
- Industrial Base Preparedness Planning
  - 313 End Items
- Strategic Planning
  - Nov ’04 Plan Implementation & 2006 Update
- BRAC Implementation
- Section 806 Implementation
  - End Item/Component At-Risk List
  - Sustain Critical Capabilities
- Armament Retooling & Manufacturing Support (ARMS)

- Environmental Management
  - Power House Emissions: Sep 07
- SMCA Industrial Base Assessment Tool
- Single Point Failure Analysis
  - 300 Items; ~80 Critical
  - Congressional Report: 28 Feb 06
- Heavy Metals Charter Implementation
  - Conference Mar 2006
- Disaster Recovery Planning
  - Radford AAP Test Case, NC/Acid/Hydra
- ARDEC Center for Manufacturing Science
  - Partnering & Technology Transfer to Industry
- GOCO/GOGO Capacity Utilization Analysis
- GOCO AAP Facility Use Contracting
Key Industrial Base Challenges (Jan 2006)

Impact on Ability to Meet Requirements

1. Sustaining Supply Chain When Post-War Ammo Requirements & Resources Drop
2. Effective Acquisition Strategies & Section 806 Implementation to Sustain Critical NTIB Suppliers & Capabilities
3. Environmental Compliance (e.g., EPA's Powerplant standards)
4. Obtaining Adequate Resources for Modernizing AAPs, Depots & Commercial Sector
5. Effective Partnering with Commercial Sector
6. Reduce Supply Disruption (and Operating Costs) During BRAC Transition
7. Effective Single Point Failure Item & Process Risk Management

Impact on Ability to Operate Effectively & Efficiently

1. Predicting & Adapting to Future Warfighter Demands (Requirements)
2. Effective Partnering with the Commercial Sector
3. Maintaining Financial Viability of Suppliers
4. Mitigating Volatility in Requirements & Budget
5. Rightsizing & Reducing AAP Operating Costs & Increasing Efficiencies
6. Effective Employment of Required Technology for Future Ammo
Procurement of Ammunition, Army-Activity 2, Production Base Support Funding

<table>
<thead>
<tr>
<th>APE</th>
<th>FY05</th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200 Industrial Facilities (06 Pres Bud)</td>
<td>$34.270</td>
<td>$32.560</td>
<td>$33.020</td>
<td>$36.340</td>
<td>$37.260</td>
<td>$34.110</td>
<td>$35.080</td>
</tr>
<tr>
<td>Congress Add</td>
<td>$59.670</td>
<td>$21.060</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supplemental/ PBR0711PF2.0</td>
<td>$57.800</td>
<td>$115.150</td>
<td>$79.590</td>
<td>$81.620</td>
<td>$35.390</td>
<td>$36.472</td>
<td></td>
</tr>
<tr>
<td>Subtotal</td>
<td>$151.740</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2500 Armament Retooling &amp; Manuf Supp</td>
<td>$4.743</td>
<td>$2.710</td>
<td>$2.770</td>
<td>$2.940</td>
<td>$3.010</td>
<td>$3.140</td>
<td>$3.180</td>
</tr>
<tr>
<td>Total IF, MIF, LIF and ARMS</td>
<td>$162.853</td>
<td>$62.450</td>
<td>$125.720</td>
<td>$90.390</td>
<td>$94.340</td>
<td>$52.770</td>
<td>$54.190</td>
</tr>
</tbody>
</table>

9 Feb 2006
## Critical Single Point Failures Snapshot

(Oct 2005)

### General
- Atomized Mag
- Black Powder
- VAAR
- Polysulfide
- TNT
- Lead Azide
- C4 Tag Agent
- RDX
- NC / Cotton Linters

### Direct Fire
- Small & Med Cal Propellants
- Small Cal Ammo
- Links

### Indirect Fire
- Laminac Adhesive
- Projectile Bodies
- Grenade Bodies
- TNC
- Fuzing Components
- Batteries
- WP
- TFE Lubricant
- Propellants M110 / M9
- Propellant M30
- Burster Tubes

### Close Combat
- CM Flares
- C70 Det
- Laminac Adhesive
- HHS Seals
- M18 Smoke Dyes
- Grenade Fuzing

### Mitigation Status

- In Planning
- Funded & In Mitigation
- Risk Mitigated

- 300+ Single Point Failures
- 80 + Critical SPFs
Manufacturing Science & Technology
Transfer Center Recent Investments
Picatinny Arsenal, NJ

- Universal Screw Extruder
- Pressure Caster for light weight materials (MMC)
- Cast Cure Explosive loading pilot plant capability
- Explosive Crystallization Science Equipment
- Smart Munitions MMW/IR/SAAL capability
- Advanced Materials Processing
  - Nano
  - Welding
  - Machining
- Advance Coating technologies for energetics

New Manufacturing Processes (e.g., Lead Azide)

Collaboration w/ Industry & Academia

Precision Armaments Laboratory

Explosive Cast Cure Loading
# Required GOCO AAP
## Modernization Resources-Summary (Mar 05)

<table>
<thead>
<tr>
<th>Priority</th>
<th>GOCO Facility</th>
<th>Core Processes</th>
<th>Critical Required Mod ($M)</th>
<th>Essential Mod ($M)</th>
<th>Total ROM ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Radford (VA)</td>
<td>Propellant Manufacturing (Rocket, Artillery, Tank, Med Cal; NC for all Propellants)</td>
<td>$136.5</td>
<td>$228.0</td>
<td>$364.5</td>
</tr>
<tr>
<td>2</td>
<td>Lake City (MO)</td>
<td>Small Caliber</td>
<td>$167.4</td>
<td>$70.0</td>
<td>$237.4</td>
</tr>
<tr>
<td>3</td>
<td>Holston (TN)</td>
<td>Explosives - HMX, RDX</td>
<td>$90.2</td>
<td>$104.6</td>
<td>$194.8</td>
</tr>
<tr>
<td>4</td>
<td>Iowa (IA)</td>
<td>Load, Assemble &amp; Pack (LAP) - Tank/Artillery, FASCAM</td>
<td>$62.3</td>
<td>$87.3</td>
<td>$149.6</td>
</tr>
<tr>
<td>4</td>
<td>Milan (TN)</td>
<td>LAP - Mortars, 40mm Cartridges; C-4 Extrusion</td>
<td>$20.7</td>
<td>$38.5</td>
<td>$59.2</td>
</tr>
<tr>
<td>4</td>
<td>Scranton (PA)</td>
<td>Large Caliber Metal Parts- Artillery/Mortars</td>
<td>$7.0</td>
<td>$13.5</td>
<td>$20.5</td>
</tr>
<tr>
<td>5</td>
<td>Riverbank (CA)</td>
<td>Large Caliber Metal Parts- 5&quot; Steel, 105mm Cartridge Cases; Mortar/Cargo Metal Parts</td>
<td>$9.6</td>
<td>$5.1</td>
<td>$14.7</td>
</tr>
<tr>
<td>6</td>
<td>Lone Star (TX)</td>
<td>LAP - Grenades, Initiators, Detonators, Mines, ICM</td>
<td>$0.2</td>
<td>$32.3</td>
<td>$32.5</td>
</tr>
<tr>
<td>6</td>
<td>Kansas (KS)</td>
<td>LAP-Sensor Fuzed Weapon; Mortar/Artillery; ICM</td>
<td>$0.0</td>
<td>$17.0</td>
<td>$17.0</td>
</tr>
<tr>
<td>X</td>
<td>Mississippi (MS)</td>
<td>Semi Active - Cargo Metal Parts</td>
<td>$0.0</td>
<td>$0.0</td>
<td>$0.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>FY05</th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>FY09</th>
<th>FY10</th>
<th>FY11</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Required</td>
<td>$21.80</td>
<td>$115.40</td>
<td>$134.94</td>
<td>$121.93</td>
<td>$85.39</td>
<td>$14.40</td>
<td>$0.00</td>
<td>$493.86</td>
</tr>
<tr>
<td>Additional Needed</td>
<td>$0.00</td>
<td>$97.30</td>
<td>$102.60</td>
<td>$105.40</td>
<td>$92.90</td>
<td>$133.90</td>
<td>$64.20</td>
<td>$596.30</td>
</tr>
<tr>
<td>Total Mod Required</td>
<td>$21.80</td>
<td>$212.70</td>
<td>$237.54</td>
<td>$227.33</td>
<td>$178.29</td>
<td>$148.30</td>
<td>$64.20</td>
<td>$1,090.16</td>
</tr>
</tbody>
</table>

**Key**
- **Propellant**
- **Energents**
- **Metal Parts**
- **LAP**

9 Feb 2006
Radford AAP, Radford, VA (est. 1941)

**Mission:** Manufacture large volumes of propellant ingredients, propellants and TNT.
**Size:** 6,901 acres, 2,540 buildings, 214 igloos
**Employees:** 28 Government, 1,200 contractor, 19 tenants
**Contractor:** Alliant Techsystems
**Major Customers:** Army, Marine Corps, Navy, Air Force, NASA

**Problem/Need:**
- Only US/CA Source for Nitrocellulose; Critical DoD SPF
- ~$20M/Yr Operating Deficit; Inefficient Operating Footprint
- Equipment At or Past Useful Life
- Loss of Capability Impacts Delivery of All Ammo
- 71 Acid Plant Production Failures Past 12 Months

**Payoff (Critical Mod):**
- Risk of Acid/NC Supply Disruption Significantly Reduced
- Increased Quality & Yield
- ~$6M Annual Benefit

**Critical Modernization:** $136.5M

<table>
<thead>
<tr>
<th>FY05</th>
<th>FY06</th>
<th>FY07</th>
<th>FY08</th>
<th>FY09</th>
<th>Total ($M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Required (SM)</td>
<td>31</td>
<td>40</td>
<td>32</td>
<td>36.5</td>
<td>13</td>
</tr>
<tr>
<td>PEO Ammo IF</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional Required</td>
<td>15</td>
<td>40</td>
<td>32</td>
<td>36.5</td>
<td>13</td>
</tr>
</tbody>
</table>

- Nitric/Sulfuric Acid Plant
- NC Production Lines
- Quality Lab
- Power Plant Upgrade & Environmental Compliance

**Essential Modernization:** $228M

- Single & Multi-Base propellant facilities
- Continuous Multi-Base propellant facilities
- Environmental Controls
- Solventless Upgrade
$3.5M FY05 Project:
- Expand capacity for manufacture of crude RDX by 2M lbs/month
  - Effect of increasing capacity for manufacture of HMX
- Modernize control system and piping in Bldg D-10 and maintain second nitration reactor in ready status
- 22 month period of performance
- Benefits munitions used by all Services

$4.4M FY05 project
- Enhance operator safety by eliminating need to handle dry RDX in a batch process
- Increase through-put by transitioning to a continuous RDX drying and FEM grinding operation in one building (N-3)
- 24 month period of performance
- Benefits IM explosives used by all Services
Disaster Recovery Planning
Radford AAP:

Acid Plant Process Flow Diagram & Risk Points

- Ammonia Storage
- AOP
- AOP Cooling Towers
- AOP Compressors
- NAC/SAC
- Fume Incinerator
- NAC/SAC Cooling Tower
Pre Mitigation Composite Risk Summary

Impact – Loss of Production
Low: 0 – 14 Days
Med: 15 – 30 Days
High: 30+ Days

Probability – That Loss Occurs
Low: 10+ yrs
Med: 2 – 10 yrs
High: 0 – 2 yrs

Impact (I) / Probability (P) Matrix

High Risk
Moderate Risk
Low Risk

9 Feb 2006
C-6a-- Percent Resourced Industrial Facilities Requirements

<table>
<thead>
<tr>
<th>Performance Criteria:</th>
<th>Actual 37%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure</td>
<td>Weight</td>
</tr>
<tr>
<td>C-6a</td>
<td>20%</td>
</tr>
</tbody>
</table>

• Measures the amount of Government investment in the organic production base versus the amount identified as needed to sustain required capabilities over the POM.

• A Modernization Report to Congress is being developed and is scheduled for completion by 3QFY06.
Industrial Base Metrics

C-6b-- Percent of Critical Single Point of Failures (SPF) Mitigated and in Risk Mitigation

<table>
<thead>
<tr>
<th>Performance Criteria:</th>
<th>Actual 75%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measure</td>
<td>Weight</td>
</tr>
<tr>
<td>C-6b</td>
<td>20%</td>
</tr>
</tbody>
</table>

• Sum of Mitigated Critical Single Point Failures and SPFs w/ Resourced Mitigation Plans Divided by Total Critical SPFs

• Critical Single Point Failures are those sources in the supply chain that pose an unacceptable risk to meeting the warfighters’ requirements if lost.
Industrial Base Metrics

C-6c-- Percent Production Base Readiness

<table>
<thead>
<tr>
<th>Measure</th>
<th>Weight</th>
<th>Target</th>
<th>Max</th>
<th>Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-6c</td>
<td>20%</td>
<td>80%</td>
<td>100%</td>
<td>50%</td>
</tr>
</tbody>
</table>

- Measures the percent of items where the production base is able to meet the POM (06-11) demand.

- The production base’s ability to meet the POM demand is modeled using the SMCA Industrial Base Assessment Tool (IBAT). All items in each POM year are produced concurrently.
SMCA IBAT

• SMCA IBAT is a real time web based application focused on POM buys as well as contingency operations

• Contains near real time info on
  – Capacities
  – Single, sole, foreign sourced
  – Skills/technologies
  – Stockpile Levels
  – Deliveries versus schedules
  – Customer Satisfaction
  – Environmental
  – Safety
  – Financial Viability
  – Tiered Bill of Materials
  – Identification of Producing Facilities
  – POM Item Costs

• Contains useful analytical tools
  – Pacer reports (3 levels)
  – Goes into lists
  – Base responsiveness against any set of requirements
## Items (By Family)

- Managed Items (By Family)
- Managed Items (By PM Subgroup)

### AMMO FAMILIES

<table>
<thead>
<tr>
<th>Category</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARTILLERY CALIBER</td>
<td>31/70</td>
</tr>
<tr>
<td>BOMBS</td>
<td>55/20</td>
</tr>
<tr>
<td>CANNON CALIBER</td>
<td>57/50</td>
</tr>
<tr>
<td>DEMO, GRENADES, MINES</td>
<td>98/19</td>
</tr>
<tr>
<td>DISPENSER/FASCAM</td>
<td>6/5</td>
</tr>
<tr>
<td>EXPLOSIVES</td>
<td>00/66</td>
</tr>
<tr>
<td>FUZES</td>
<td>28/72</td>
</tr>
<tr>
<td>INACTIVE</td>
<td>342/156</td>
</tr>
<tr>
<td>LOADED COMPONENTS</td>
<td>1/60</td>
</tr>
<tr>
<td>MORTARS</td>
<td>24/56</td>
</tr>
<tr>
<td>NAVY GUN</td>
<td>20/35</td>
</tr>
<tr>
<td>OTHER</td>
<td>00/00</td>
</tr>
<tr>
<td>PROPELLANTS</td>
<td>6/75</td>
</tr>
<tr>
<td>PYROTECHNICS</td>
<td>66/28</td>
</tr>
<tr>
<td>ROCKETS, WARHEADS</td>
<td>23/39</td>
</tr>
<tr>
<td>SMALL CALIBER</td>
<td>104/123</td>
</tr>
<tr>
<td>TANK</td>
<td>17/25</td>
</tr>
</tbody>
</table>

End items/Components in Family

Total = 872/894

9 Feb 2006
Summary: Item Has 11 Main Components, 10 Producers Operating In 9 States And 1 Foreign Country.

Family: Cannon Caliber

Base Capability Constraints:
- No Current Issues.
Material / Supplier Network - Example

[Diagram showing material and supplier network]
The Ammo Enterprise Continues to Make Progress Prioritizing and Resolving Critical Industrial Base Challenges in Consonance With the Joint Ammunition LCMC