TACOM’s Advanced Planning Briefing
For Industry
1 NOV 2002

Picatinny Arsenal: The Army’s Lethality Center

Presented by: Mr. Geza Pap

“SUPPORTING THE WARFIGHTER”
CONTENT

- Introduction to TACOM-ARDEC
- Future Projects & Enabling Technology Requirements/Needs
- Partnering Opportunities
Vision
“Integrated Knowledge, Speed, and Agility”

• **Customer Focus**
  – Enhance our Baldridge-based strong customer focus through an integrated environment of academia, industry, and government -sharing prototyping, models, simulations, and analysis
  – Continue our award-winning focus on cost effectiveness, timeliness, and world-class armaments design and soldier support

• **Mission**
  – Soldier effectiveness and survivability through highly intelligent, longer range, more lethal munitions
  – Enable industry to remain viable in a shrinking US industrial base

• **Investment Strategy**
  – An in-house workforce of super technologists
  – Picatinny as an economic and technological centerpiece for Northern NJ
  – Partnered with academia and industry
TACOM-ARDEC
Picatinny Arsenal

- 3,846 Military/Civilian/Contractors
- 6,493 Acres
- 804 Buildings
- 64 Laboratories
“We Integrate Complex Armament Technologies into Guns, Ammunition, and Fire Control Systems through Research, Development, Acquisition & Sustainment”

• Smart Munitions (Tank, Artillery, Mortars, Mines)
• Fuzes
• Fire Control
• Combat Vehicle Armament & Ammo
• Artillery Projectiles & Platforms
• Mortars
• Small Arms & Other Soldier Weapons
• Mines, Countermines & Demolitions
• Less-Than-Lethal Systems
• Ammunition Logistics
• Robotics Operations Training
MISSION - GENERATING & APPLYING OVERWHELMING
FIREPOWER FOR DECISIVE VICTORY

Mortar Systems
Artillery Systems
Smart Munitions
Combat Vehicle Armaments & Fire Control

Advanced Fuze Technologies
Special Operations Weapons & Demolitions
Advanced Explosives & Warhead Development

R&D
TOTAL LIFE CYCLE
PROD
FIELD SUPPORT
DEMIL

Providing over 90% of the Army’s lethality!
TOTAL LIFE CYCLE RESPONSIBILITIES

<table>
<thead>
<tr>
<th>Determine Mission Need</th>
<th>Concept Exploration</th>
<th>Program Definition &amp; Risk Reduction</th>
<th>Engineering &amp; Manufacturing Development</th>
<th>Production Fielding / Deployment &amp; Operational Support</th>
</tr>
</thead>
</table>

Responsive Accurate Mission Module
FCS Multi-Role Armament & Ammo System
Objective Crew Served Weapon
Adv. Sensors For Smart Munitions
Agile Target Effect (s) Systems
Advanced Acoustic/Seismic Systems
OICW System Enhancements
Advanced Light Armaments For Combat Vehicles
MEMS Inertial Measurement Unit For Common Guidance

Unique Commodities:
“Guns Ammunition, & Fire Control”
Fuzing & Lethal Mechanisms
Advanced Propulsion
Insensitive Munitions
Soldier Effectiveness
Smart Munitions
Indirect Fire & Anti-Armor

JLW155 Howitzer
M829E3 120mm KE Cartridge
M829E3 Excalibur
OICW
PGMM
Area Denial System
SMAW-D

M816 Ctg, 81mm IR Illum Mortar
XM232 MACS High Zone Artillery Propelling Chg.
Bunker Defeat Munition
Impr Volcano Mine
M2 SLAM
60, 81, 120mm Mortars
Wide Area Munition
M3A1 - M7A1 Armor Tile
RAAWS - 84mm, HEDP
M913 - 105mm HERA
M767 - 60mm IR Illum
M84 - Stun Grenade
Future Armor Tiles
40mm Non-Lethal Munition

M109A6 Paladin
M919 25mm Cartridge
Non-Lethal Munitions
M864 155mm Projectile
M139 Volcano Air System
M830A1 120mm Cartridge
M119 Howitzer
60, 81, 120mm Mortars
Mod. Demo. Initiator
M4 Carbine
Fighting Position Excavator
M16A4 Rifle
A1 Bradley Armor Tiles
M929 WP Smoke Ctg.
M152 Remote Activations Mun.
Bunker Defeat Munition

1386 Fielded Items Supported
Science and Technology Capabilities

New Advanced Warhead Development Facility
- Recently Completed: $86M

Propellant Surveillance Facility

Armament Technology Facility
- Over 250 New Hires

Intellectual Property
- FY97 FY98 FY99 FY00 3Q FY01
- Patents Issued, Patent Applications, Disclosures

Armament Software Engineering Center (ASEC) and Precision Armaments Lab (PAL)
- FY03 Availability
  - ASEC: $15.5M MCA
  - PAL: $8.4M MCA

Demographics
- Bachelors: 944
- Masters: 635
- Doctorates: 60
- S&Es: 1,663

7 Patent License Agreements
<table>
<thead>
<tr>
<th>2000</th>
<th>2008-2012(?)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INTERIM</strong></td>
<td><strong>OBJECTIVE</strong></td>
</tr>
<tr>
<td>Jt Lt Wt 155mm How, Towed</td>
<td>Multi Role Armament f/FCS</td>
</tr>
<tr>
<td>- 9000 lb Digitized Cannon Artillery Mortar Fire Control Sys</td>
<td>- Lt Wt Low Impulse Gun</td>
</tr>
<tr>
<td>- Reduce Firing Time (8 min to 1 min)</td>
<td>- Multi-Role</td>
</tr>
<tr>
<td>Obj Indiv Cbt Wpn</td>
<td>- ETC Propulsion</td>
</tr>
<tr>
<td>- Land Warrior Wpn: Bursting Ammo Palletized Loading Sys “SHOE”</td>
<td>- Fire-Out-Of-Battery</td>
</tr>
<tr>
<td>- Faster Air Deployment of Supplies Com Remotely Op Wpn Sys</td>
<td>- Dist Interactive Fire Msn</td>
</tr>
<tr>
<td>- Fire Under Armor w/o Turret XM107 Cal .50 Sniper Rifle</td>
<td>- Isogrids/ER Fluid Tech</td>
</tr>
<tr>
<td>- Anti Materiel Sniper Wpn Obj C-S Wpn (25mm)</td>
<td>Ammo Suite f/ FCS</td>
</tr>
<tr>
<td>- Replace M2/MK19; Bursting Ammo Lg Cal HEP Rd</td>
<td>- MP-ERM</td>
</tr>
<tr>
<td>- Penetrate Concrete Walls w/ MGS</td>
<td>- Smart Cargo Rd</td>
</tr>
<tr>
<td></td>
<td>- Multi-Purpose Smart Warhead PGMM</td>
</tr>
<tr>
<td></td>
<td>- Precision Mortar Rd f/MOUT Adv Med Cal Ammo</td>
</tr>
<tr>
<td></td>
<td>- Bursting, Behind Armor Effects Responsive Accurate</td>
</tr>
<tr>
<td></td>
<td>Mission Module</td>
</tr>
<tr>
<td></td>
<td>- Shoot w/o on-site Crew</td>
</tr>
<tr>
<td></td>
<td>Strategic Thinking</td>
</tr>
<tr>
<td></td>
<td>Empowerment</td>
</tr>
<tr>
<td></td>
<td>Organizations</td>
</tr>
<tr>
<td></td>
<td>Communications</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
</tr>
<tr>
<td></td>
<td>Employee Support</td>
</tr>
<tr>
<td></td>
<td>Strategic Thinking</td>
</tr>
<tr>
<td></td>
<td>Empowerment</td>
</tr>
<tr>
<td></td>
<td>Organizations</td>
</tr>
<tr>
<td></td>
<td>Communications</td>
</tr>
<tr>
<td></td>
<td>Leadership</td>
</tr>
<tr>
<td></td>
<td>Employee Support</td>
</tr>
</tbody>
</table>
Every Army/Marine Corp’s Unit Relies on TACOM-ARDEC’s Armament Systems

(Headquarters Locations Shown)

* Army National Guard
Recognition of Focus on Close Customer Relations

New Jersey Quality Achievement Top Award 1998!

Twice Triple Crown Winner!

Based On Baldridge Quality Criteria

Program Peer Review

AMC ACOE WINNER 2002

Presidential Award for Quality 2000

Munitions Technology and Transformation

Responsive Deployable Agile Versatile Lethal Survivable Sustainable

Legacy Force
- Sustain & Recapitalize

Objective Force Capabilities
- Transform

Interim Force
- Initial BCT

Objective Force Requirements
- Log R&D - Smart Distribution
- Predictive Engineering

Logistics Enabler
- MANTECH

Full Spectrum Dominance

Strategy Thinking
- Employee Support
- Leadership
- Empowerment
- Organizations
- Communications
TECHNOLOGIES FOR THE FUTURE

- Antipersonnel landmine alternatives
- Nano materials
- Non lethal effects
- Electro-magnetic propulsion
- Smart autonomous sensors
- Explosively formed penetrators
- Advanced composite structures
- Micro electronic miniaturization
- Open architecture manufacturing controllers
- Distributed “holodeck-like” collaborative engineering
- Combined directed energy effects
- Cylindrical magnetron sputtering
- Plasma ignition systems
- Multi-layered propellants
- Smart Distribution/Logistics
- Agile Target Effects

Point Of Contact:
Mr. Pete O’Neill

COMM; 973-724-7945
DSN 880-7945
BUSINESS OPPORTUNITIES

Armaments Development & Sustainment Community
Projected Business Requirements (FY 03-07)

Total Program

Contracting Opportunities

Dollars in Millions

FY03  FY04  FY05  FY06  FY07

Total

1396  1242  1248  1379  1251

Opportunities

1151  1073  1071  1176  1057
80 Developmental Project Teams

- Every Project !!!
- Team Members:
  - ARDEC / Industry / User / PMs / OGAs
- Empowered to Do the Job!
TECHNOLOGY PARTNERING METHODS

SBIR/STTR
- ARDEC awarded total $13M in FY02
- $730K to NJ Small Business

Cooperative Research & Development Agreements
- Over 70 active
- 9 with NJ Companies/Academia
- $800K collected from Partners in FY01

Memorandum of Agreements
- Stevens
- NJIT
- NJ DEP
- NJ Commission of S&T

Picatinny Innovation Center
- 17 Tenants

Service Agreements
- Unique collection of:
  - Specialty Technologies
  - Test Facilities and Expertise
  - Strong Manufacturing/Quality Assurance Base
  - $350K from over 67 customers in FY01

Patent Licensing Agreements
- Extensive patent portfolio available for commercial licensing
- Preference for small business
- 191 active patents/84 applications in process
- Licensing income over $1M

Point of Contact:
Mr. Tim Ryan
COMM: 973-724-7953
DSN 880-7953
Public Private Partnerships (PPP) Initiatives

• On Site
  - Enhanced Leasing Initiative
  - Develop 1500 Acres-HiTech Park
  - Highlands Park Conservation Zone
  - Innovation Center

• Memorandum Of Understandings (MOUs)
  - Ft. Dix - Penn State - pending
  - Stevens Institute - West Point - pending
  - Rutgers - CECOM - pending
  - NJIT - ERDC - pending
  - Princeton - Pending - GSA - pending
  - 3M – Pending - EPA – pending

• Homeland Defense/Security
  - CECOM - Less than Lethal
  - FT Dix - Center
  - SIT - IA Communication
  - County Prosecutor

• Memorandum Of Understandings (MOUs)
  - Ft. Dix - Penn State - pending
  - Stevens Institute - West Point - pending
  - Rutgers - CECOM - pending
  - NJIT - ERDC - pending
  - Princeton - Pending - GSA - pending
  - 3M – Pending - EPA – pending

• Prototype Manufacture
  - Composites - Explosives
  - Nano Technologies - Propellant
  - Metal Parts - Pyrotechnics
  - Fuzing - Material Characterization

• Environment
  - Range-Safe
    » NJETI
  - Green Armament
  - CEI – Mining Industry

Point of contact:
Mr. Tom McWilliams
COMM: 973-724-2660
DSN 880-2660
PICATINNY INNOVATION CENTER (PIC)  
PPP (con’t)

What is it?
- A cooperative effort with TACOM-ARDEC and County College of Morris (funding from State and County)
- Provides facility space for Cooperative Research and Development Agreement (CRADA) partners
- Provides training and support for small business growth

How the PIC Helps Us:
- Identifies and solicits new partners in industry, academia, state and local government
  - Technology spin-on
  - Income to maintain technology infrastructure
  - Equipment & materials
- PIC helps TACOM-ARDEC develop innovative partnerships

17 Current Tenants: Examples
- Beacon Dynamics: industrial sensors
- Cadence: displays & exhibits
- HPTI: modeling & simulation
- LSI: proximity sensors
- GD-OTS: advanced propellants & mfg processes
- Allmet: Radar wave guides
- FOCNJ (pending): Document storage & retrieval
- GDAS: advance armaments
- AIM: precision micro-glass
- Epitaxial Labs: advanced optical materials
- Forensic Eng: polymers & composites

Point of Contact:
Ms. Pat Milley  
Tel: 973-442-6400  
Fax: 973-442-6402  
or  
http://www.picinnovation.com
TACOM-ARDEC - TAKE AWAY

- Translates USER Requirements/needs into solution/s
- Technology Incubation/maturity/Integration
- Systems Engineering Integrator
- Develop Industry Partnership
  - Cooperative RADAs
  - Technology Transfer

PROVIDE OVERWHELMING FIREFORCE FOR DECISIVE VICTORY

$5.5 Billion in projected business opportunities
- Pursuit of Key Partnership Endeavors
- Pursuit of Key Armaments Transformation

TACOM-ARDEC

~ THE BRIDGE ~

DEVELOP ARMAMENTS/MUNITIONS TECHNOLOGY IN SUPPORT OF THE CURRENT, INTERIM AND FUTURE “WARFIGHTER”

INDUSTRY