



**TACOM**  
Lethality, Survivability, Mobility and  
Sustainment for America's Army



Strategic Thinking  
Employee Support  
Leadership  
Empowerment  
Organizations  
Communications



***“SUPPORTING THE WARFIGHTER”***



***“SUPPORTING THE WARFIGHTER”***

***TACOM's Advanced  
Planning Briefing  
For Industry  
1 NOV 2002***

**Picatinny Arsenal:  
The Army's  
Lethality Center**

**Presented by: Mr. Geza Pap**

**Tank-automotive & Armaments COMmand**

# CONTENT



- Introduction to TACOM-ARDEC
- Future Projects & Enabling Technology Requirements/Needs
- Partnering Opportunities

# Vision

## *“Integrated Knowledge, Speed, and Agility”*



- **Customer Focus**

- Enhance our Baldrige-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

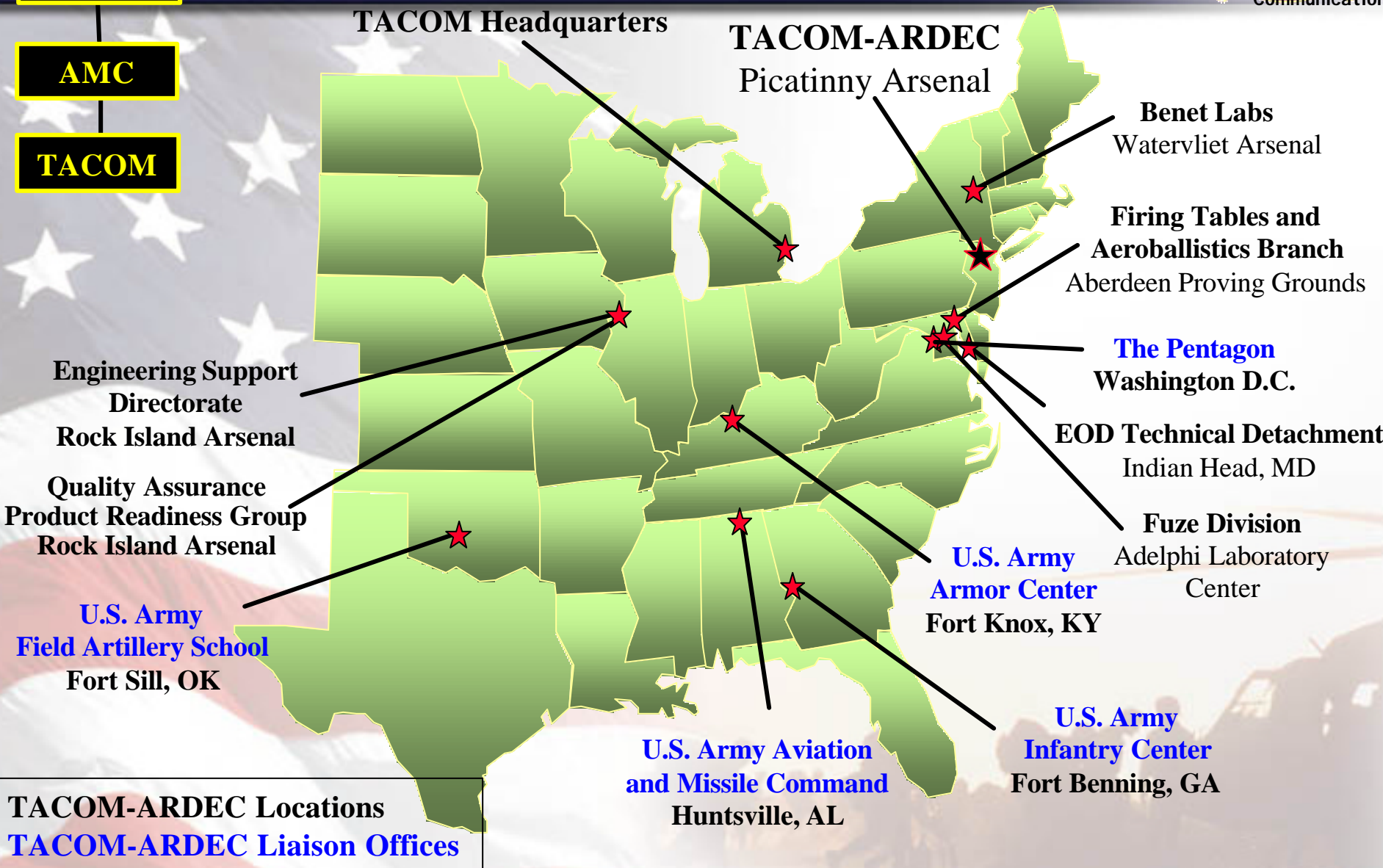
- **Mission**

- 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



# TACOM-ARDEC

Picatinny Arsenal



- **3,846 Military/Civilian/Contractors**
- **6,493 Acres**
- **804 Buildings**
- **64 Laboratories**

# TACOM-ARDEC US Army Armament Research Development & Engineering Center



## Quality Engineering Directorate (QED)

Non Destructive  
Testing  
Predictive  
Technology  
Software Quality  
Performance  
Specification Review  
System Safety  
International Stds  
Material Release  
Root Cause  
Malfunction  
Investigation  
Radiation Protection

## Fire Support Armament Center (FSAC)

Artillery  
Mortars  
Precision Munitions  
Mines & Demolitions  
Fire Controls &  
Software Engineering  
Explosives Ordnance  
Disposal Technology  
Advanced Warhead  
Development Facility

## Warheads, Energetics & Combat-Support Armaments Center (WECAC)

Energetics &  
Warheads  
Armament System  
Process  
Logistics Support  
Engineering  
Industrial Ecology  
Systems Readiness  
Packaging

## Close Combat Armaments Center (CCAC)

Light & Heavy  
Armament  
Small & Med CAL  
Ammo  
Weapons Systems  
Tank Ammo Team  
Anti-Armor Weapon  
Sys  
Fuze  
JSSAP  
Benet Lab  
Armament Technology  
Facility



# CORE CAPABILITIES



**“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**



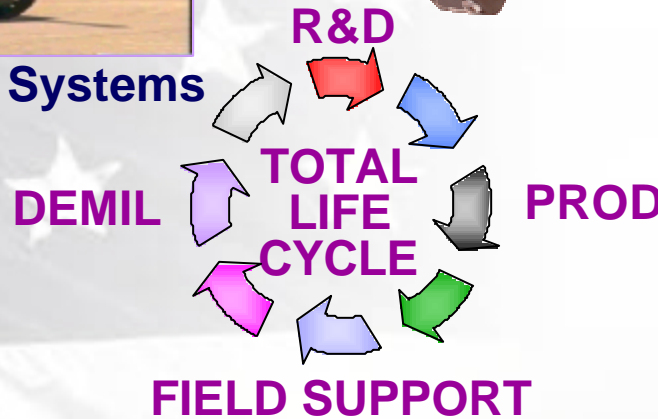
**Advanced Fuze Technologies**



**Special Operations Weapons & Demolitions**



**Smart Munitions**



**Advanced Explosives & Warhead Development**



**Combat Vehicle Armaments & Fire Control**



**Logistics R&D**



**Non-Lethal Technologies**

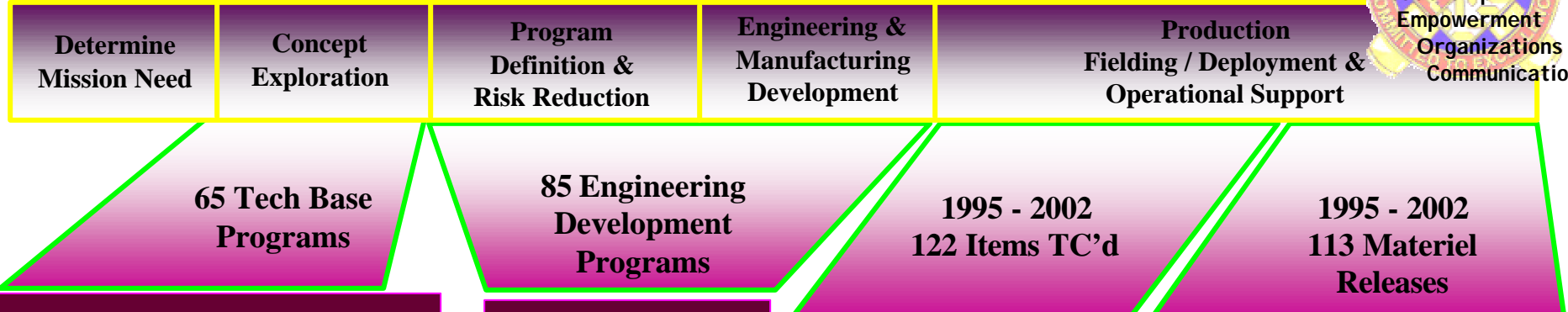


**Small Arms**

**Providing over 90% of the Army's lethality!**



# TOTAL LIFE CYCLE RESPONSIBILITIES



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

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.  
 M931 Full Rng. Prac. Ctg.  
 M152 Remote Activations Mun.  
 Bunker Defeat Munition

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



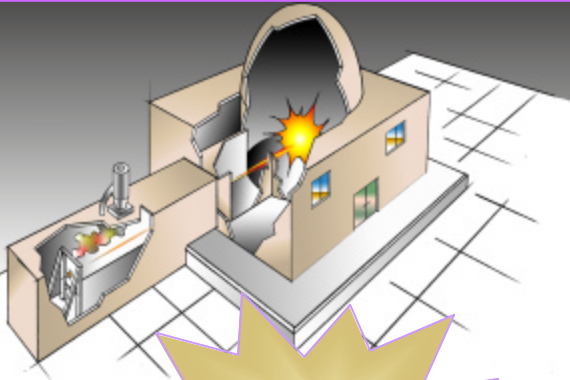
**1386 Fielded Items Supported**



# Science and Technology Capabilities



## New Advanced Warhead Development Facility

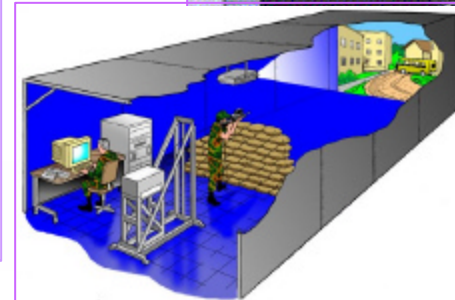


**\$86M  
Recently Completed**

**(70  
Labs &  
Facilities)**



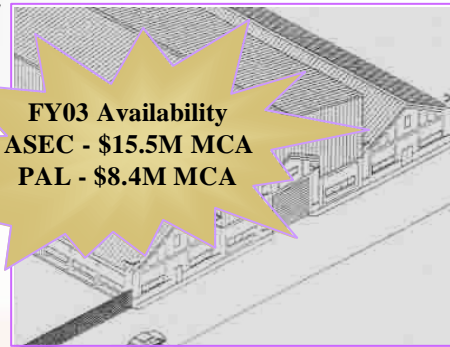
**Propellant Surveillance Facility**



**Armament Technology Facility**



**FY03 Availability  
ASEC - \$15.5M MCA  
PAL - \$8.4M MCA**

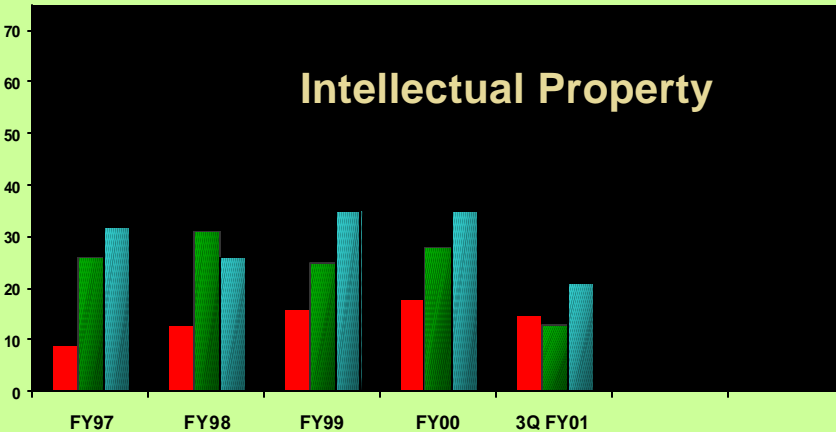


**Armament Software Engineering Center (ASEC) and Precision Armaments Lab (PAL)**

**Over 250  
New Hires**

<i>Demographics</i>	
Bachelors	944
Masters	635
Doctorates	60
S&Es	1,663

## Intellectual Property



■ Patents Issued ■ Patent Applications ■ Disclosures

**7 Patent License Agreements**

# TACOM-ARDEC Support to Transformation



2000

2008-2012(?)

## INTERIM

## OBJECTIVE

### Jt Lt Wt 155mm How, Towed

- 9000 lb Digitized Cannon Artillery

### Mortar Fire Control Sys

- Reduce Firing Time (8 min to 1 min)

### Obj Individ Cbt Wpn

- Land Warrior Wpn; Bursting Ammo

### Palletized Loading Sys "SHOE"

- Faster Air Deployment of Supplies

### Com Remotely Op Wpn Sys

- Fire Under Armor w/o Turret

### XM107 Cal .50 Sniper Rifle

- Anti-Materiel Sniper Wpn

### Obj C-S Wpn (25mm)

- Replace M2/MK19; Bursting Ammo

### Lg Cal HEP Rd

- Penetrate Concrete Walls w/ MGS

### Multi Role Armament f/FCS

- Lt Wt Low Impulse Gun
- Multi-Role
- ETC Propulsion

- Fire-Out-Of-Battery

- Dist Interactive Fire Msn

- Isogrids/ER Fluid Tech

### Ammo Suite f/ FCS

- MP-ERM

- Smart Cargo Rd

- Multi-Purpose Smart Warhea

### PGMM

- Precision Mortar Rd f/MOUT

### Adv Med Cal Ammo

- Bursting, Behind Armor Effects

### Responsive Accurate

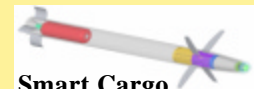
### Mission Module

- Shoot w/o on-site Crew



Adv KE

MP-ERM

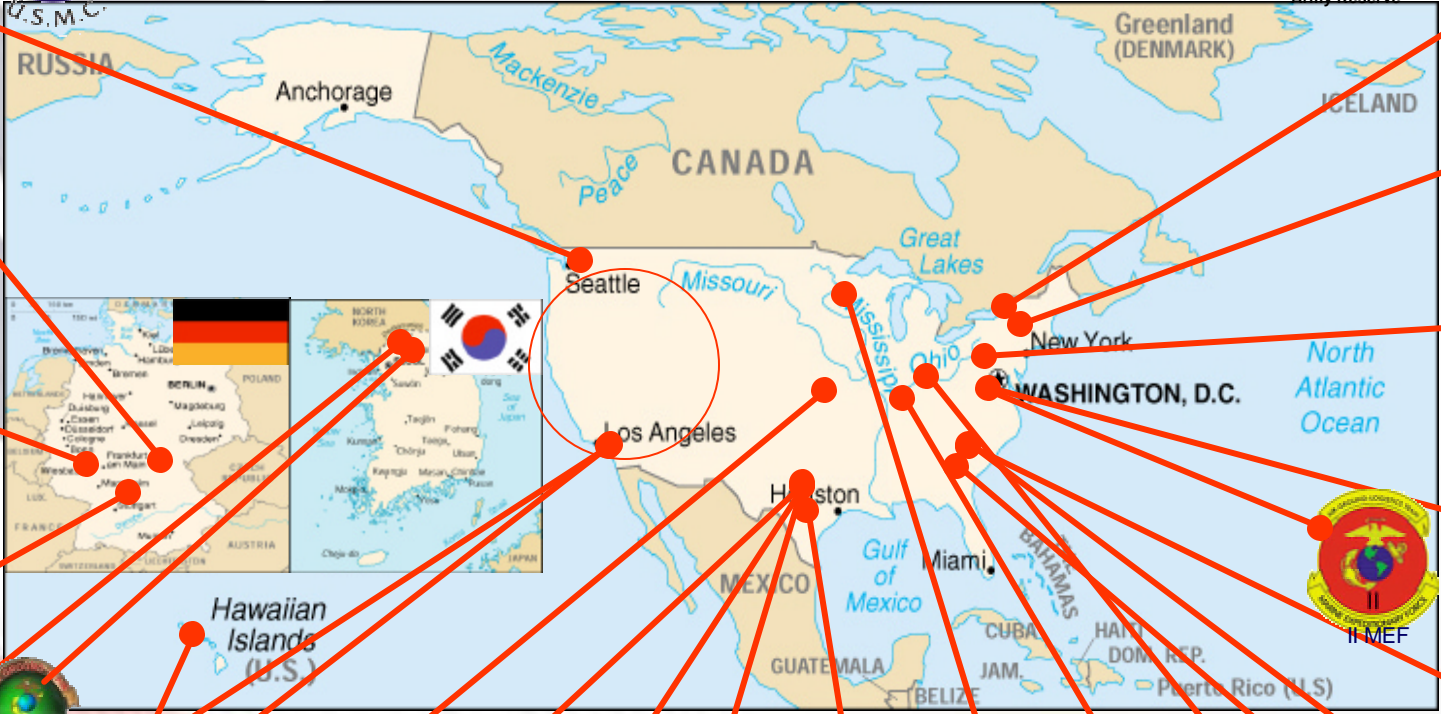


Smart Cargo



# Every Army/Marine Corp's Unit Relies on TACOM-ARDEC's Armament Systems

Strategic Thinking  
Employee Support  
Leadership  
Empowerment  
Organizations  
Communications



- I Corps
- 1st Infantry Div
- 1st Armored Div
- V Corps
- 2nd Infantry Div
- 40th Infantry Div\*

- III MEF
- I MEF
- 35th Infantry Div\*
- 25th Infantry Div

- 4th Infantry Div
- 1st Cavalry Div
- III Corps
- 49th Armored Div\*
- 34th Infantry Div\*
- 101st Airborne Div

- 10th Mountain Div
- 42nd Infantry Div\*
- 28th Infantry Division\*
- 29th Infantry Div\*
- 82nd Airborne Div
- 38th Infantry Div\*
- 3rd Infantry Div
- XVIII Airborne Corps

(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  
Baldrige Quality  
Criteria**



**Army Communities of Excellence (ACOE) Award 2000**



**Presidential  
Award for  
Quality  
2000**



**Program  
Peer Review**

**AMC ACOE  
WINNER 2002**

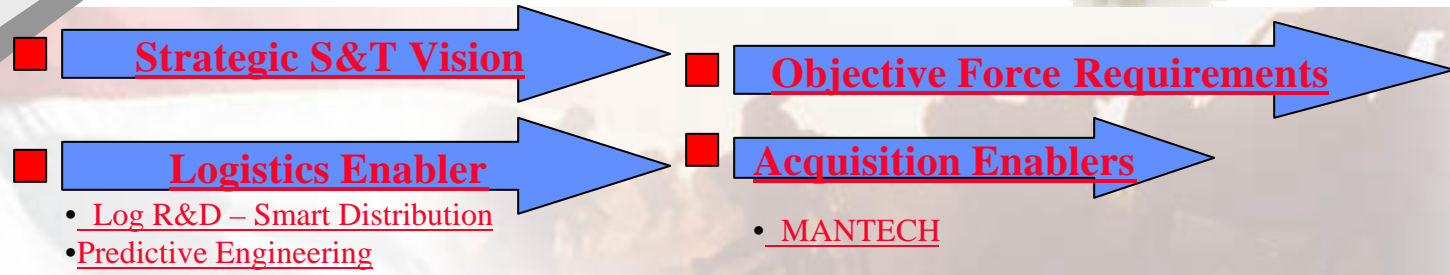
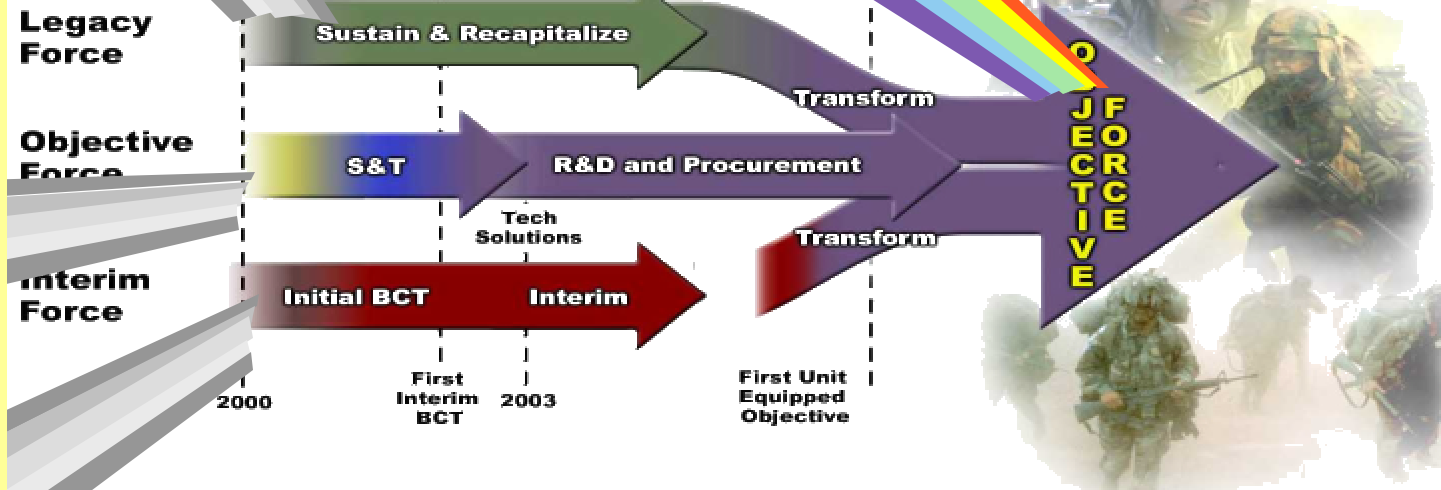
**R&D Organization of  
the Year 2000  
&  
R&D Center of  
Excellence Awards  
1996, 1997, 1998**

# Munitions Technology and Transformation

Full Spectrum Dominance

RESPONSIVE  
DEPLOYABLE  
AGILE  
VERSATILE  
LETHAL  
SURVIVABLE  
SUSTAINABLE

Objective Force Capabilities



- LEGACY**
- RADM
- APLA
- RECAP
- NON-LETHAL
- LCCM
- Single Point Failure
- OBJECTIVE**
- Logistic R&D - Smart Distribution
- MRAAS
- CKEM
- Quick Look
- Common Missile
- OCSW ATD
- LCPK
- RAMM
- Agile Target Effects
- MEMS IMU
- EFP/SC Technology
- FC-NET
- Adv Sensors for Smart Munitions
- OICW Enhanced MEMS
- CAPS
- Metal Matrix Composites
- Novel Energetic Materials
- ALACV
- MANTECH
- Mortar PGMM-ER-DPICM
- INTERIM**
- LCCM
- LCPK Missile
- PGMM
- ER-DPICM Mortar
- MFCS
- OICW

# ***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)

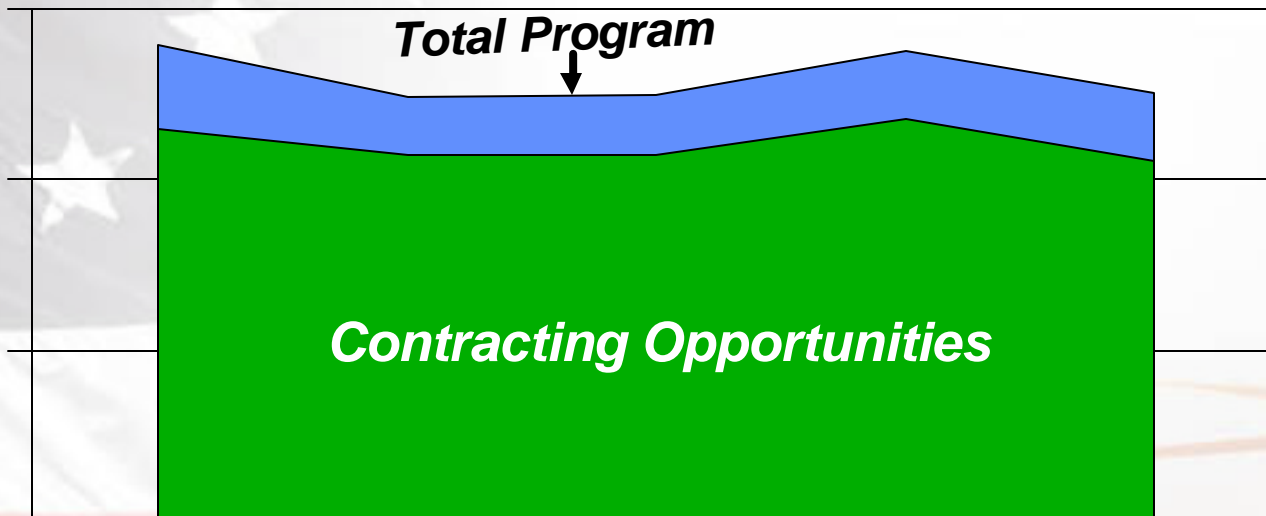
Dollars in Millions

1500

1000

500

0



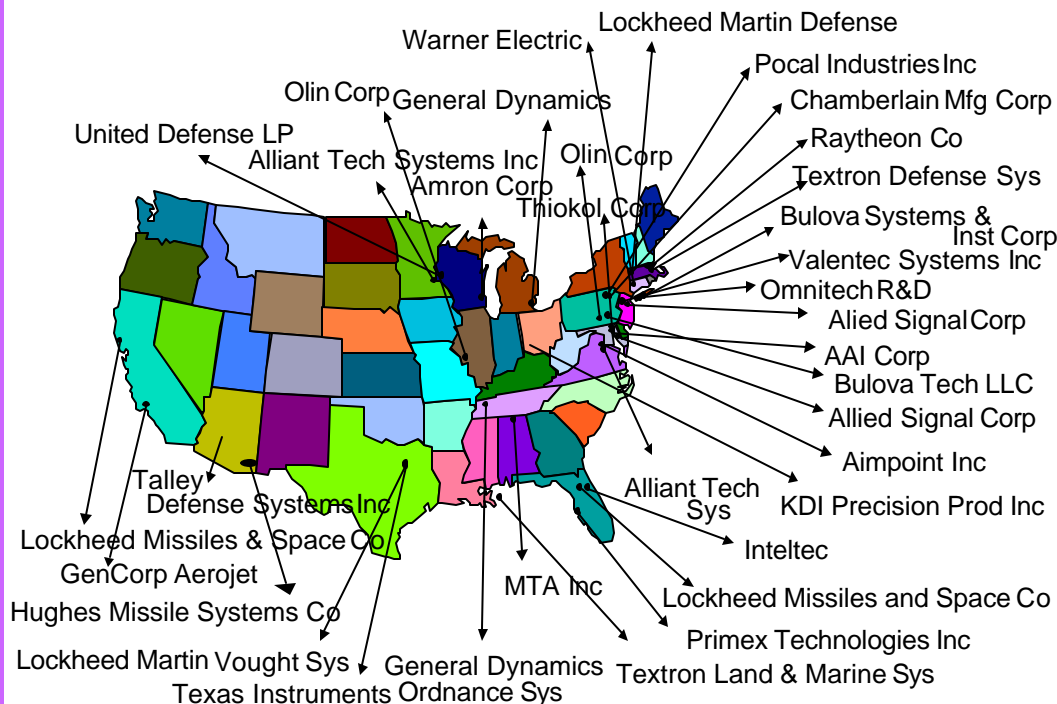
	<b>FY03</b>	<b>FY04</b>	<b>FY05</b>	<b>FY06</b>	<b>FY07</b>
<span style="color: blue;">■</span> <b>Total</b>	<b>1396</b>	<b>1242</b>	<b>1248</b>	<b>1379</b>	<b>1251</b>
<span style="color: green;">■</span> <b>Opportunities</b>	<b>1151</b>	<b>1073</b>	<b>1071</b>	<b>1176</b>	<b>1057</b>



# Industry Partnering

Strategic Thinking  
Employee Support  
Leadership  
Empowerment  
Organizations  
Communications

## TACOM-ARDEC IPT Contractors



## 80 Developmental Project Teams

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

*Making Integrated Product Teams A Reality*

# 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  
\$\$ Collected from Partners in FY01- \$800K

## 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

Point of Contact:

Mr. Tim Ryan  
COMM: 973-724-7953  
DSN 880-7953

## 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

# 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        |

## •Cooperative R&D Agreements (CRADA) – 60

## •Prototype Manufacture

- |                    |                            |
|--------------------|----------------------------|
| -Composites        | -Explosives                |
| -Nano Technologies | -Propellant                |
| -Metal Parts       | -Pyrotechnics              |
| -Fuzing            | -Material Characterization |

## •Environment

- Range-Safe
  - »NJETI
- Green Armaments
- CEI – Mining Industry

## •Homeland Defense/Security

- |                    |                   |
|--------------------|-------------------|
| -CECOM             | -Less than Lethal |
| -FT Dix            | -Center           |
| -SIT               | -IA Communication |
| -County Prosecutor |                   |

Point of contact:

Mr. Tom McWilliams

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# 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
  - o Technology spin-on
  - o Income to maintain technology infrastructure
  - o 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:

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Fax: 973-442-6402

or

<http://www.picinnovation.com>



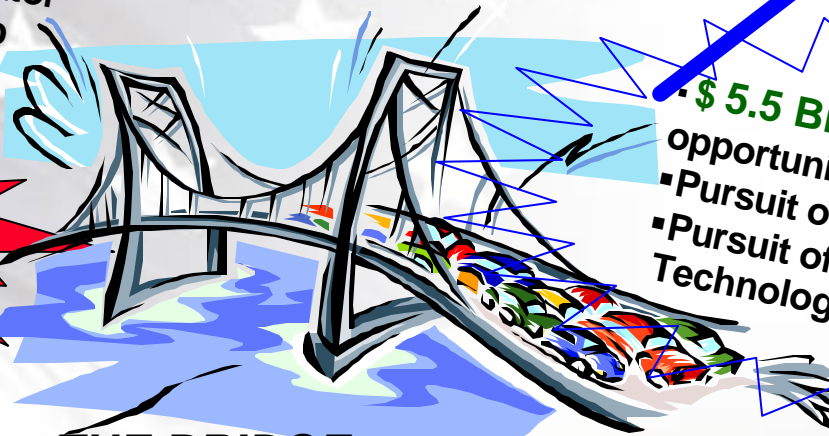


# TACOM-ARDEC - TAKE AWAY

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

**PROVIDE OVERWHELMING FIREPOWER  
FOR DECISIVE VICTORY**

**TACOM-ARDEC**



~ THE BRIDGE ~

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

**INDUSTRY**

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