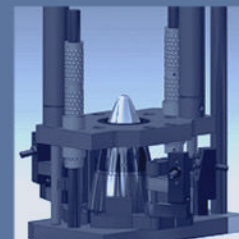
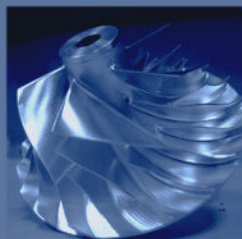




Inspiring Innovation Through People, Process and Technology

IMPACT



Available Resources to Business for State-of-the-Art Manufacturing

12th Annual Small Business Conference
November 12, 2008

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Mission Statement

Deliver optimized manufacturing solutions that enhance the quality, affordability, maintainability, and rapid deployment of existing and yet-to-be developed ***defense systems***.

Collaborate with government, industrial, and academic organizations to promote the implementation of best practices to key stakeholders through the development and delivery of disciplined training, advanced technologies, and methodologies.

Created as a non-profit organization to develop and deliver manufacturing solutions to the Department of Defense and its industrial base. The successes of the NCDMM help assure the readiness and sustainment of needed defense systems. These successes are widely recognized by Air Force, Army, Marine Corps, and Navy organizations as well as their contractors.





About the NCDMM

Primary Program Sponsor

- Manufacturing, Science and Technology (MST) Division of the Aviation and Missile Research, Development and Engineering Center (AMRDEC) – Huntsville, AL

Customer Base

- DoD Facilities – Depots, Arsenal, Shipyards, etc.
- Primes and tiered suppliers – Lockheed Martin, Boeing, BAE Systems, etc.
- Job Shops

Locations



NCDMM Headquarters on campus of Alliance Partner Kennametal Inc., Latrobe, PA



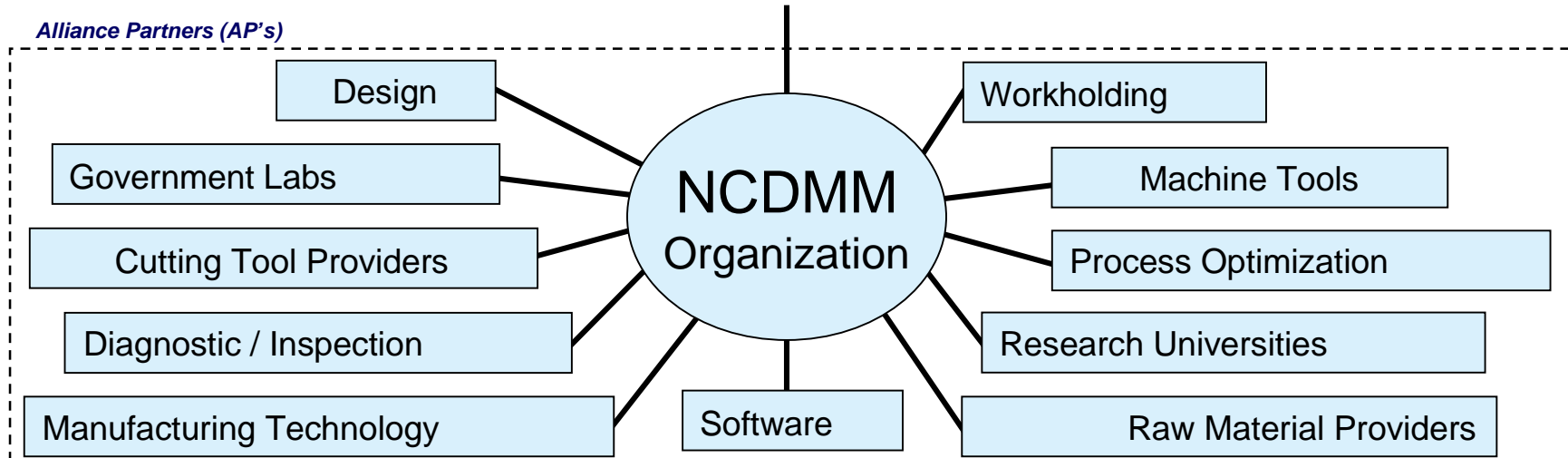
Advanced Manufacturing Laboratory located in Derry, PA



Letterkenny office located in the Letterkenny Industrial Development Authority Building, Chambersburg, PA

The Team

Customer – DoD and Suppliers

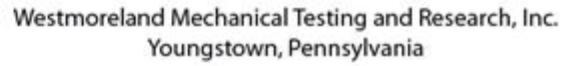
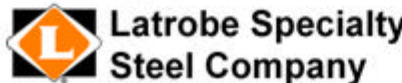


**2008 NCDMM
Alliance Partner
Summit**





NCDMM Alliance Partners





Army Materiel Command Involvement

Depots

Red River

- Site Assessment

Anniston

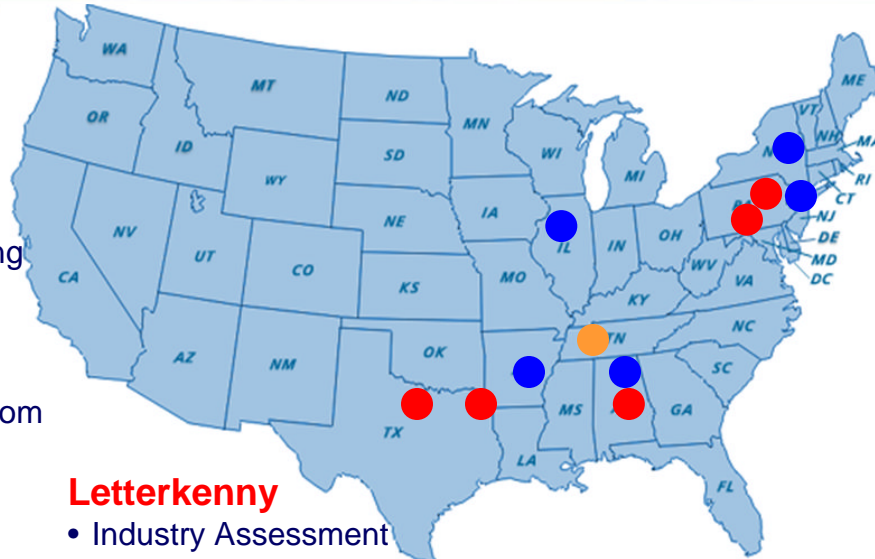
- HMMWV Armor Plate Drilling
- M1 Tank Seal Ring

Tobyhanna

- NVG Sheet Metal Clip Custom Metal Forming Machine
- Engineering Service

Corpus Christi

- Evaluation of Machining Issues
- UH-60 BIM Blanket Tap Test Evaluation
- UH-60 BIM Blanket Skin Removal Evaluation
- T-55 Compressor Rotor Turn Time Reduction



Letterkenny

- Industry Assessment
- Economic Analysis Support
- IMPACT
- Night Vision Goggle Plate Manufacturing
- Rhino Bar Machining Optimization
- GPK Drilling and Threading Optimization
- Wire Termination Process
- Modernization/Replacement of MLRS Winch Test Stand
- Transmission for Patriot Motor Test Stand
- Solid Edge Engineering Drawing Support
- Titanium Armor Plate Fabrication Process Development
- Tapping Working Cell Recommendations
- Training & Certified Metalcutting Professional Course
- Equipment Purchase Support

Arsenals

Picatinny

- Excalibur JUMPED Process

Redstone

- Contract Management
- PIF JUMPED Process

Rock Island

- Site Assessment
- HMMWV Drill Kits
- M119A1 Howitzer Trunnion Optimization
- Training

Watervliet

- FCS 120mm Gun Barrel Engineering Support
- Improved Boring of Large Caliber Cannon Tubes

Pine Bluff

- Facility Review

Ammunition Plants

Milan

- AMC Rapid Review Team Assessment

Selected project examples



Aero-Based Weapon Systems

- Advanced Anti-Radiation Guided Missile (AARGM)
- Advanced Medium Range Air-to-Air Missile (AMRAM)
- Advanced Precision Kill Weapon System (APKWS)
- AIM-9 (Sidewinder) Missile
- AH-64 Apache Helicopter
- Attack Reconnaissance Helicopter (ARH)
- C17 Globemaster Transport
- CH-47 Chinook Helicopter
- CH-53 Sea Stallion Helicopter
- F-16 Falcon
- F-18 Hornet
- F-22 Raptor
- F-35 /JSF Joint Strike Fighter
- Future Scout and Cavalry System (FSCS)
- Global Hawk Unmanned Aerial Vehicle
- HH-47 CSAR-X
- Loitering Attack Missile (LAM)
- Non-Line of Sight (N-LOS) Weapons
- PATRIOT Missile System
- Precision Attack Missile (PAM)
- Targeting Systems
- UH-60 Blackhawk Helicopter



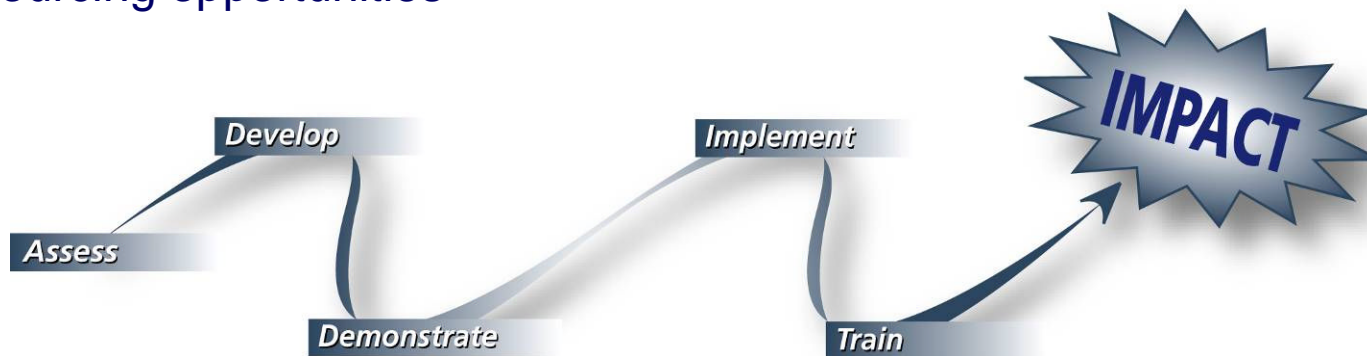
Land-Based Weapon Systems

- 105mm, 120mm, 155mm and M119A1 Howitzers
- XM 982 Excalibur Guided Artillery
- Expeditionary Fighting Vehicle (EFV)
- FCS UGV MULE
- HMMWV Up Armor
- M1 Abrams Tank
- M2A3 Bradley Fighting Vehicle
- M88A2 HERCULES Improved Recovery Vehicle
- Night Vision Goggles



Core Initiatives

1. **ENGINEERING**: Engage with the DoD and DoD supply base to implement new methodologies and “affordable” solutions that reduce/avoid cost and reduce lead times
2. **TRAINING**: Transfer these advanced solutions and knowledge to DoD, DoD suppliers and U.S. based manufactures through training programs, seminars and technical publications
3. **JOB SHOPS**: Enable job shops to better support DoD and DoD Prime outsourcing opportunities



Impact Examples



Chinook - Bulkhead Optimization

Objective:
Reduce weight and improve reliability of floor frame bulkhead

IMPACT
15% Weight Reduction

795 Armor Drill Kits – OIF/OEF/CONUS

Objective:
Provide Armor Drill Kit to Drill Up Armor in the Field

IMPACT
Reduced installation time by 30%



Navy Propulsion Shaft Machining

Objective:
Reduce shaft taper inspection time from 74 man hours to 24

IMPACT/COST AVOIDANCE
\$8M



Black Hawk Ti Rotor Component

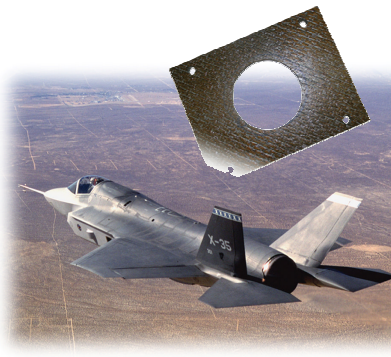
Objective:
Improve manufacturability from 60 to 95 pieces/week

IMPACT/COST AVOIDANCE
\$2.2M

Picatinny Arsenal XM982 Excalibur

Objective:
Eliminate a production bottleneck from 40 hours/part to 1.5 hours/part

IMPACT/COST AVOIDANCE
\$75M



Edge-of-Part Composite

Objective:
Reduce cost of trimming composite wing skins

IMPACT/COST AVOIDANCE
\$225M

Cost Savings/Avoidance To-Date: > \$478 million



Core Initiative #2 Training Programs

- ***Are You At Your Speed Limit?***
- ***Machine Tool Performance Analysis & Improvements***
- ***Holding Onto Your Future...Quick Change Workholding and Fixturing for Today's Competitive Shop***
- ***Metalcutting Application Engineering***
- ***Hard Turning Made Easy***
- ***Threadmilling***
- ***Productivity Under Pressure***
- ***Programming and Verifying the Future***
- ***When to Five Axis Machine***
- ***Tool Holding, Measuring and Inspection***
- ***Is Hard Machining Really That Hard?***
- ***The Art of Reverse Engineering***
- ***Portable CMM***
- ***Metal Cutting Applications***
- ***Lathe & Milling Applications***
- ***Milling Applications***
- ***Cutting Tool Materials***
- ***Lathe Applications***
- ***Haas Emulator Training***
- ***GD & T***
- ***Blue Print Reading & Quality Inspection Techniques***
- ***Operator Performed Maintenance***
- ***Certified Metal Cutting Professional Program***

***Participating To-Date: >450 people, >141 organizations,
in 25 states***



Core Initiative: #3 – Job Shops

Objective

Enable job shops to better support defense outsourcing opportunities

Job Shop Consortium

- Established in western PA
- A national program
- Over 87 various-sized manufacturing firms
- Many firms classified as small disadvantaged businesses
HZ, WO, VO, 8A, DV and others



National Efforts

Expand NCDMM Efforts

- Transition NCDMM's western PA Small Business model - Nationally



NCDMM has contributed to more than \$150 million in western PA defense work



NCDMM Manufacturing Solutions

NCDMM Small Shop Efforts

- Assess area manufactures capabilities and capacities
- Provide technology awareness and training programs
- Assist in implementing advanced technologies
- Look for potential opportunities and provide guidance for shops

What steps you can take to engage and obtain DoD work

1. CCR Registration, CAGE Code
2. Work with your local PTAC
3. DLA training in Columbus, Oh. "TKO"



VOICe

Virtual Opportunity Information Center

Your **ONE** Source for Defense Manufacturing Opportunities

Features & Benefits

- Build your proposal inside of VOICe –
- RFPs and RFQs sorted by shop capabilities –
- Advertise your shop services –
- Locate partners to complete your bid –



Our Mission: Develop a Virtual Bid Board that matches manufacturing out-sourcing needs of large defense contractors with the capabilities of job shops.



Highlighted Benefits

- 132 projects completed to date
- \$480M savings/cost avoidance
- Manufacturing Consortium consists of 87 shops of all sizes and capabilities – provide national exposure to prime, tier, DoD outsourcing opportunities
- Delivered technology training and awareness programs involving over 450 personnel from over 141 organizations across 25 states
- Supported advanced DoD training with Industrial College of the Armed Forces (ICAF) and Depot and Arsenal Executive Leadership Program (DAELP)



Acknowledgement



This presentation made possible by the

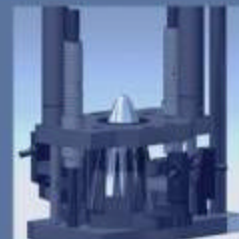
**United States Army
Army Material Command (AMC)
Research, Development and Engineering Command (RDECOM)
Aviation and Missile Research, Development and Engineering Center (AMRDEC)
Engineering Directorate (ED)
Manufacturing Science and Technology Division (MST)
Redstone Arsenal, Alabama
Russell Dillard, AMSRD-AMR-SE-MT (russell.dillard@us.army.mil)
*and the***

**National Center for Defense Manufacturing and Machining (NCDMM)
Latrobe, Pennsylvania
John VanKirk – Executive Director (john.vankirk@ncdmm.org)**



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