



# TACOM

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

## Tactical Wheeled Vehicles: Delivering the Vision 2003 Tactical Wheeled Vehicles Conference January 27, 2003

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Commanding General

Tank-automotive & Armaments **COM**mand

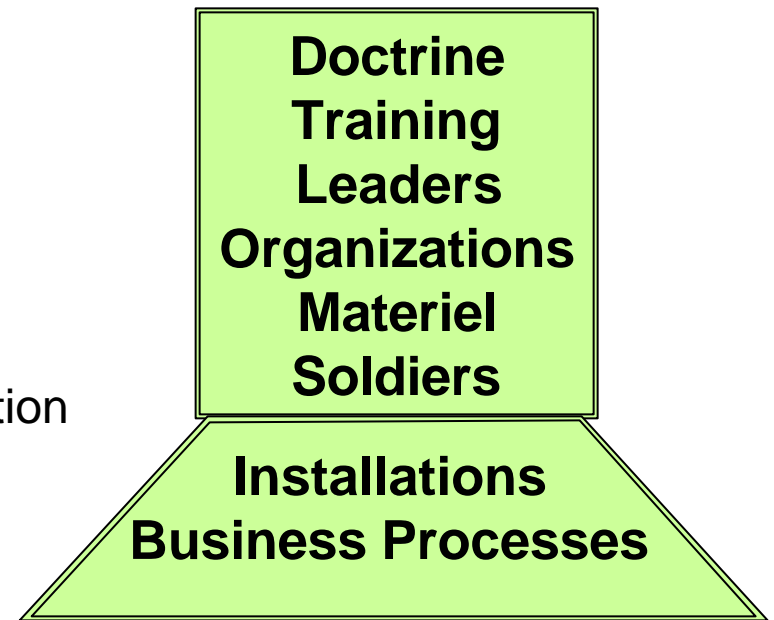




# Army Transformation

## It's About Changing the Way We Fight

- Financial Reforms are key to future success!
- Centralization and Restructuring Initiatives
- Integrated Industrial Center
- Cost Management/Activity Based Costing
- Army Working Capital Fund (AWCF)
- Acquisition Excellence
- ARDEC/TARDEC Reengineering and Collaboration
- TACOM Quality Federation
- TACOM Personnel Demo
- Advanced Collaborative Environment (ACE)



**Business Process Re-engineering is Essential for Army Transformation**





# Logistics Transformation Study Areas

- Life Cycle Management
- Tactical Logistics Operations
- Organization & Force Structure
- Enabling Technologies
- Logistics Automation
- Financial Reform
- End to End Distribution
- Power Projection Architecture
- National Sustainment Base





## Organization and Force Structure

# Contractor Reservists

### Recommendation

- **Follow Army regulations and policy** when making decisions to support a system or unit with Contracted Logistics Support
- **When exceptions** to the use of contractors **in the maneuver space** are **deemed in the Army's** and the Combatant Commander's **best interest** – institutionalize that support by having the **contractors** supporting a unit **be reservists** (as a condition of employment) assigned to a RC platoon/detachment of the maintenance unit.

### Contribution to Transformation

- **Reduces Requirement for Log Structure; Leverages the best aspects of CLS support while neutralizing the drawbacks:**
  - Unconstrained burdening of the tactical commander
  - Unknown quantity of contractors in maneuver footprint
  - Force protection
  - Essential workforce not contractually responsive to Commanders' orders, guidance, or requirements
  - OPTEMPO cost growth not identified at the time the CLS decisions were presented
  - Contracts that lack appropriate deployability clauses
  - Indemnification





## Enabling Technologies

# Power Generation / Fuel Demand Reduction

### Problem Being Addressed

- Current fuel distribution requirements constitute approximately 35% to 60% of the tonnage moved on today's battlefield. The major consumers of fuel are the combat and support vehicles.
- Ever-increasing demand for electrical power has forced the proliferation of generators and batteries, which contribute to the logistics footprint and infrastructure with their attendant fuel and maintenance requirements.

### Recommended Solution

- Continue to invest in developing hybrid electric vehicle technology and investigate the use of hybrid electric to provide battlefield power.
- Pursue an ACTD for hybrid electric powered vehicles.
- Investigate Air Force experience with electric vehicles for fixed base installation use as a cost savings initiative.
- Continue to invest in and leverage ongoing work in fuel cell technology to include a cost/benefits analysis assuming diesel fuel as a source.
- Continue to pursue technology efforts to reduce fuel consumption of the current fleet of equipment to include technology insertion efforts.





## Enabling Technologies

# Hybrid Propulsion Programs

**FMTV**  
Hydraulic Hybrid



**HE**  
HMMWV



**HEMTT**  
PROPULSE HE



**HE**  
HIMARS



**M113 EDD**



**HE COMBATT**



**HE Bradley**



**AHED 8 x 8**



**CHPS**



**RST-V**



**HE LAV**



## Current Activity

- FMTV Hydraulic Hybrid Propulsion Demonstrator
- Hybrid Electric HMMWV Demonstration
- Hybrid Electric Future Scout and Calvary System (FSCS)
- HEMTT PROPULSE Hybrid Electric Demonstrator
- HE HIMARS Demonstrator
- M113 Electric Drive Demonstrator
- Hybrid Electric COMBATT Demonstrator
- Hybrid Electric Bradley Demonstrator
- Advanced Hybrid Electric Drive (AHED) 8 X 8 Demonstrator
- Combat Hybrid Power System (CHPS) Systems Integration Laboratory (SIL)
- Reconnaissance, Scout and Targeting Vehicle (RST-V) Demonstrators
- Hybrid Electric Light Armored Vehicle (LAV) Demonstrator





## Enabling Technologies

# COMBATT

*Enhanced suspension w/load leveling/kneeling capability*

*Larger tires/Locking differentials*

*Enhanced chassis components*

*Data buses with diagnostics & prognostics*

*Efficient, powerful, reliable quiet diesel engines*

*Military bumpers/tie downs*



## Current Activity

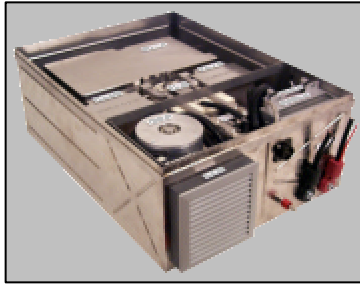
- Baseline diesels platforms will undergo testing and evaluation at YPG late 03
- GM and DCA to produce Hybrid Electric COMBATTs early 04
- Contractor testing to be performed on Hybrid Electric driveline vehicles in 04
- Up to 12 Hybrid vehicles from each manufacturer to be procured in 04 for operational evaluation
- Hybrid driveline modeling and simulation being developed as design and acquisition tool
- If Commercially produced, acquisition and support costs should be minimized





## Enabling Technologies

# Fuel Cell Projects



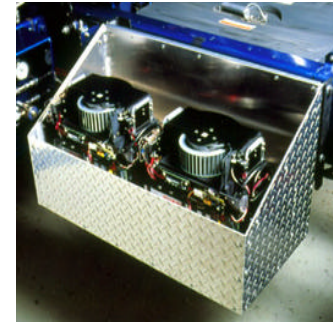
Solid Oxide Fuel Cell in a Heavy-Duty Vehicle



Phased Application of Fuel Cells in a Class 8 Trailer



Regenerative Fuel Cell



Liquid Fueled Fuel Cell APU

## Current Activity

- Beginning road test programs of fuel cell APUs on two Class 8 semi tractors
- The SunLine tractor integrates an APU with hybrid electric engine technologies
- The Ballard methanol-fueled APU enters road tests on a Freightliner tractor after showing at the SAE Congress in March 03. Bench scale work on a diesel reformer continues.
- Bench testing of the regenerative fuel cell begins February 03.
- TARDEC BAA has three fuel cell topics; fuel cell APUs, light vehicle propulsion, and passenger car demonstration. Selections to be made in March.

**Military Vehicles—Fuel Cell Power Follows Commercial Development**







## Enabling Technologies

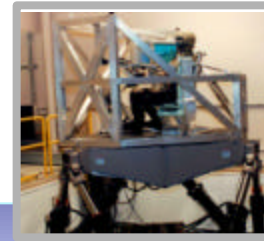
# Systems Integration

High Tech Collaboration Tools

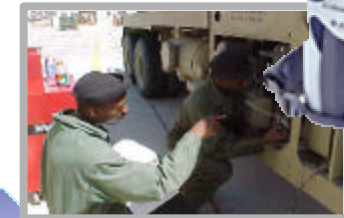
*Quickly Finding,  
Viewing,  
Understanding,  
and Using  
Information*



In the Office



In the Lab



In the Field



In the Virtual World



On the Shelf



On the Road

WWW

WWW

## Current Activity

- Expand collaboration by involving more of the Army Enterprise
  - Driven by “how-to-use” and show what is possible
- ACE enabled IPT Meetings & Reviews w/ Managed Feedback
  - Connecting War fighters, Engineers, Managers, Specialists
- Interactive, Information Driven Program Reviews & Decision Briefs
- Developing new collaborative methods to support processes in T&E

Connecting Information and People

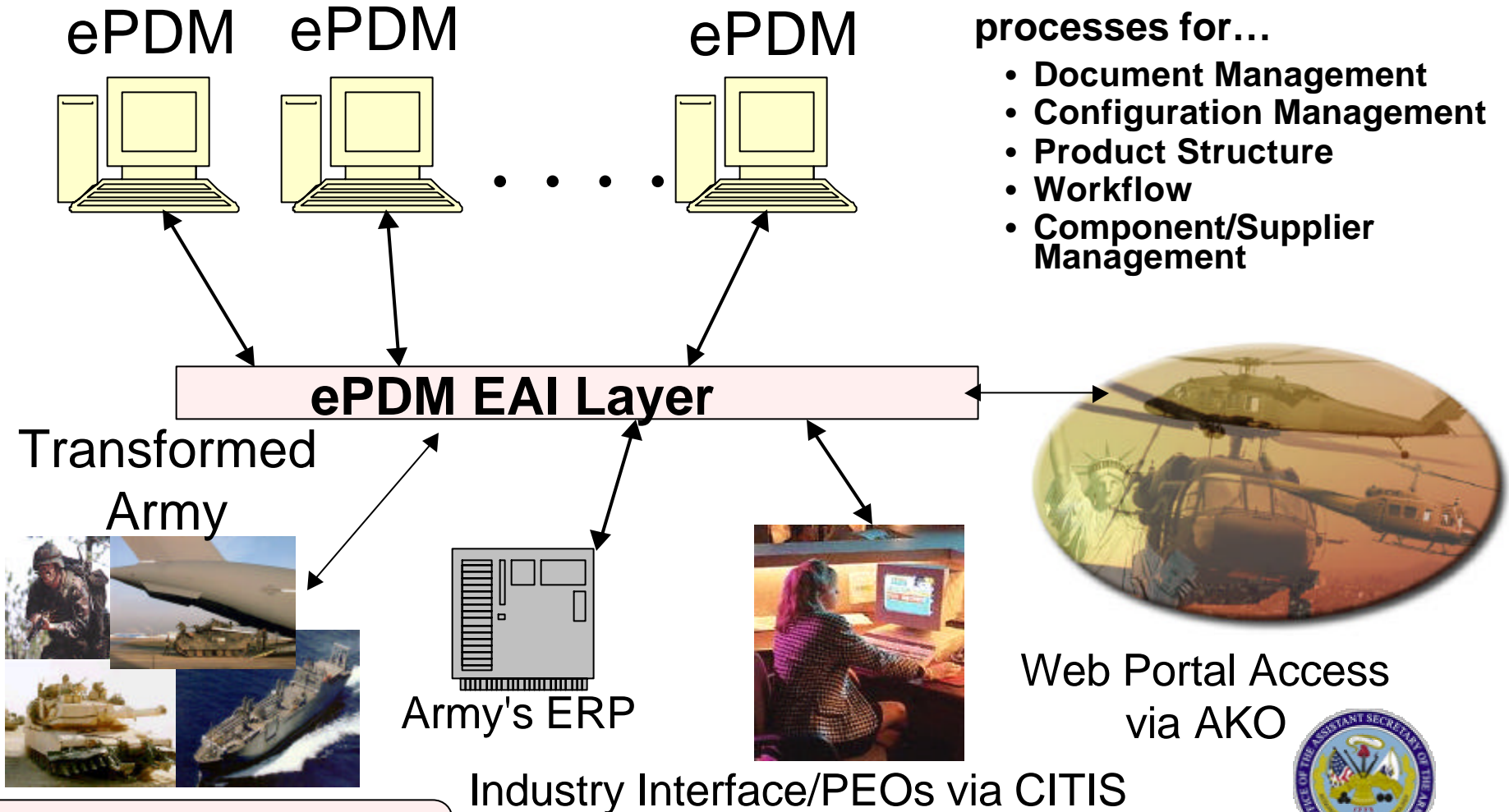




# ePDM Concept of Operations

• Distributed architecture allows for common data access/exchange and common business processes for...

- Document Management
- Configuration Management
- Product Structure
- Workflow
- Component/Supplier Management

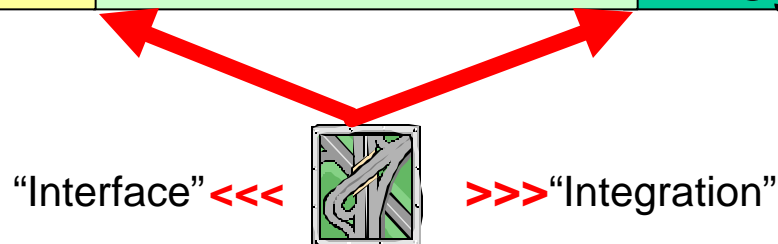
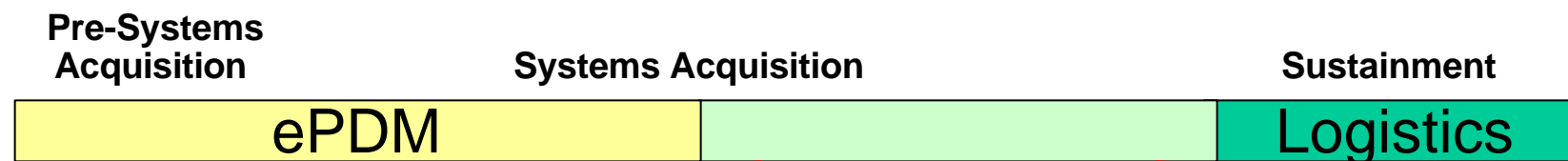
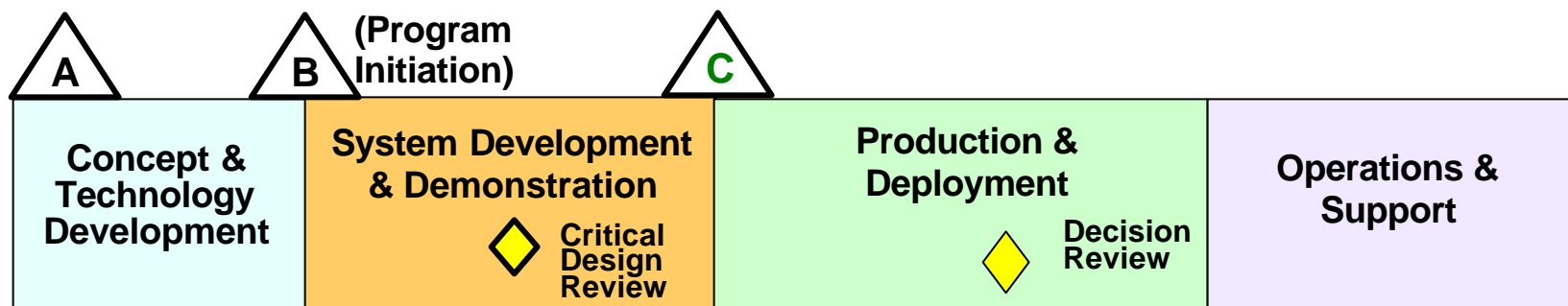
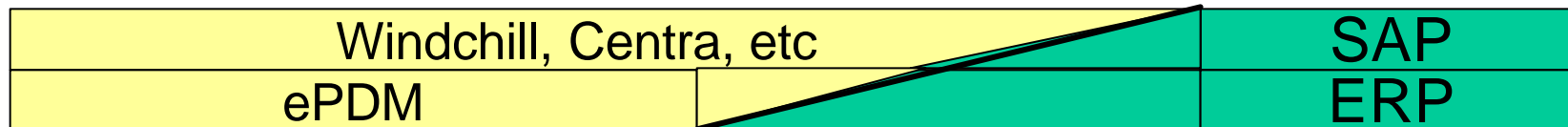


ePDM-enterprise Product Data Manager  
 EAI-Enterprise Application Integration  
 CITIS-Contractor Integrated Technical Information Service  
 ERP-Enterprise Resource Planning  
 AKO- Army Knowledge Online





# Integration of Technical Data with Logistics Data

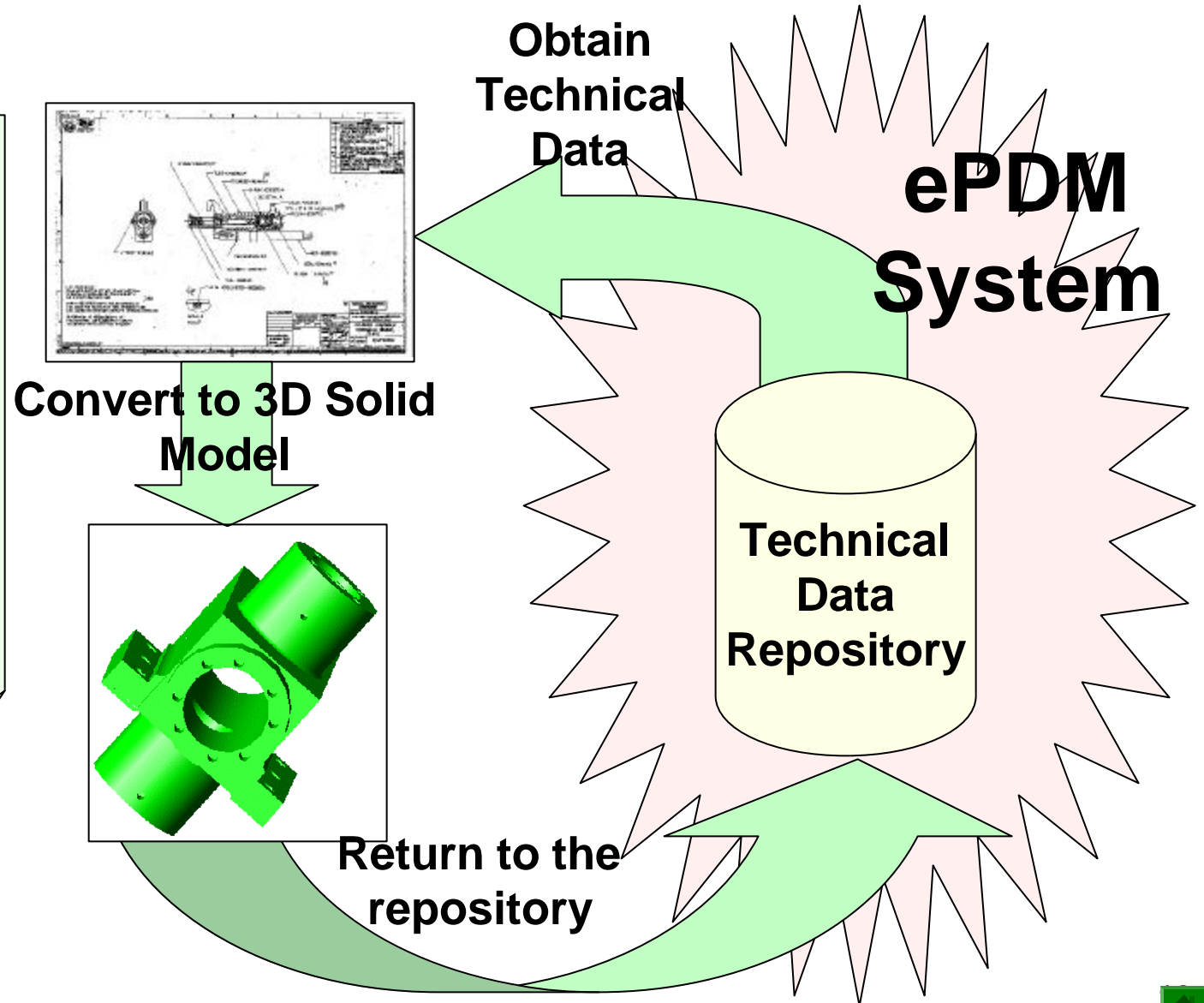




# 3D / STEP Conversion Initiative

## Benefits:

- Decreased life cycle costs
- Reduced Acquisition Lead Time/ Production Lead Time
- Faster warfighter problem resolution
- Reduced manufacturing costs and scrap
- Improved communication





**National Sustainment Base**

# Ground Systems Industrial Enterprise

A **G**round **S**ystems **I**ndustrial **E**nterprise that operates as a single business unit, efficiently utilizing core capabilities of each installation, while simultaneously transforming those core capabilities to meet the needs of Army Transformation.



Phase I – Integrate all U.S. Army Materiel Command ground systems industrial capability into a new business area.

- Transfer Rock Island & Watervliet Arsenals & Sierra Army Depot to TACOM, aligning them with their primary work loading organization.

Phase II – Integrate Director of Logistics (DOLs) from TRADOC and FORSCOM sites that are predominately ground systems installations.

**Leverage all TACOM / (PEO)<sup>4</sup> Community Assets**  
(PEOs/RDECS/Acquisition/Corporate Mgmt/Commodity Business, Legal)





# TACOM Lean Projects

- **Manufacturing Lean (Ongoing)**

- Cummins 903 (500 & 600 HP) Engine Rebuild Program
- HMMWV
- HEMTT Vehicle
- SEE
- Supply System Enhancement
- Reciprocating Engine Process
- Turbine Engine Process
- Class VIII (Medical) Supplies
- 81MM Barrel Process
- Forward Repair System

- **Manufacturing Lean (Proposed)**

- Bradley
- MLRS
- HEMTT Engine
- Track and Roadwheel Program
- Transmission Process
- Generator & Rail Mission
- Production Support Shops
- Vehicle Assembly
- Common Support Process
- Long Term Storage (Medical Hospitals)
- 60MM Barrel Process
- Central Supplies: Stock Issues & Receipts

- **Non-Manufacturing Lean (Proposed)**

- Material Release Process (Ongoing)
- Budget Planning and Execution Process
- Defense Logistics Agency 339 Process
- Information Technology Life Cycle Mgt
- Information Assurance
- Field Incidence Response
- In-processing Newly Hired Employees
- Manpower Requirements Validation
- Sustainment (SWCF) Buying Process
- Total Package Fielding
- Spare and Repair Parts Procurement
- Housing Operations
- Operations Security Review Process
- Awards & Officer Evaluation Reports
- Hiring (Internal Process)





## National Sustainment Base

# Product Support Strategies

Maintain core logistics capability that is Government-Owned and Government-Operated.

Core Logistics capabilities ensure a ready and controlled source of technical competence and resources necessary for effective and timely response to mobilization.

- Source of Support: Use most effective source of support to optimize performance and life-cycle cost. Optimize customer support and achieve maximum weapon system availability at the lowest Total Ownership Cost (TOC).
- Depot Maintenance Source of Support: Best value over the life cycle of the system, using existing contractor capabilities, while system is in production.
- Product Support Partnership Policy: Ensure partnering is included in the acquisition management plan and fully assessed in all future acquisition strategy plans.





## Financial Reform

# SUMMARY OF SALES / UTILIZATION STATUTES

STATUTE	SALE OF	SALE TO	FOR	RESTRICTIONS	FINANCIAL	APPROVAL LEVEL
10 USC 4532 (The Arsenal Act)	“supplies” (articles or services)	other Army activities	Army use (but can be partial and items supplied as GFE to contractor)	must establish “economical basis”; make-or-buy decision on out- of- pocket, but pay full cost	reimburse-ment, by project order	CDR of facility (by reg)
10 USC 2208 (h)	AWCF inventory	contractors	use in performing DOD contracts		reimburse fund	PCO (?)
10 USC 2208(j)	manufactured or re-mfd goods or services as subcontractor	contractors	fulfilling DOD contract or subcontract	solicitation for contract / subcontract must be open to public/private competition	omit costs of DOD- designated “mission- critical activities”, ancillary activities	HCA  (delegation)
10 USC 4543 (mfr of large cal cannon, gun mounts, recoil mech., munitions or components)	manufactured items / related services	U.S. company	DOD, USG, friendly foreign government, or commercial	items/services not commercially available; buyer indemnifies US	Incremental payments; <i>may</i> be FFP / variable costs if commercial item; develop working capital	CDR of MSC responsible for facility (by statute)
10 USC 2563 (NOT mfr of cannon, mounts, recoil mech., munitions/component s; DOD may designate)	articles and services	person outside DOD	not specified, but subject to Arms Export Control Act	items/services not commercially available; buyer indemnifies US, but gross negligence/ willful misconduct / Govt noncompliance excluded	Incremental payments; FFP; variable costs + deprec. +capital improvement ; develop working capital	DA level (delegation)
22 USC 2770	defense articles and services	U.S. company	incorporation into end items for friendly foreign country	items/services not commercially available; buyer indemnifies US export license/ possible end-user certificate	adv. payment of estimated costs; full cost	HCA (delegation)







## Financial Reform

# SUMMARY OF SALES / UTILIZATION STATUTES

STATUTE	SALE OF	SALE TO	FOR	RESTRICTIONS	FINANCIAL	APPROVAL LEVEL
10 USC 2539b	samples, drwgs, <u>equmnt</u> / <u>mtls</u> lab / test facilities	person or entity	independent research & development or use in demonstrations to friendly foreign govts	equipment /materials must be used exclusively for research and development	recoup direct and indirect costs	PARC ----- instn cdr
10 USC 2358  (cooperative agreements or grants)	services, use of employees or facilities	private sector or other federal agencies	participation in R & D projects relating to weapon systems or other military needs	can't duplicate research under other DoD programs; Army funds can't exceed outside funding	funds to Army	COC-Wrn or Pictny; >\$5 m /yr or \$25m total DA level (del)
10 USC 2371  "other transactions"	services, use of employees or facilities		participation in R & D projects	can't duplicate research under other DoD programs; Army funds can't exceed outside funding; use when standard contract or cooperative agreement not appropriate	reimburse-ment goes to special Treasury account	COC-Wrn or Pictny; >\$5 m /yr or \$25m total DA level (delegation)
10 USC 2474  (Centers of Industrial Technical Excellence)	services related to depot-level activity core competencies, or use of facilities or equipment	private industry	public- private partnership to increase use/decrease costs, or encourage creation and preservation of jobs to maintain skills	must have no adverse effect on readiness; private industry must indemnify US	reimburse direct & indirect costs to fund that incurred; can use revenues for facility operation, maintenance & env.restoration	MSC CG ( ? )
15 USC 3710a  (Cooperative Research and Development Agreements)	R & D work by federal "lab" , or use of lab's equipment and facilities	non-federal entity	enhancing technological knowledge of lab and private sector for mutual benefit; transferring technology	R & D must be consistent with lab's purpose, not unduly compete with services in private sector	reimburse direct & indirect costs to fund that incurred	Director of federal laboratory (by statute)





## Financial Reform

### **SALES / UTILIZATION STATUTES Recommended Solution**

**Change is needed:** The DoD Financial Management Regulation (FMR), must accurately reflect current law and current business practices.

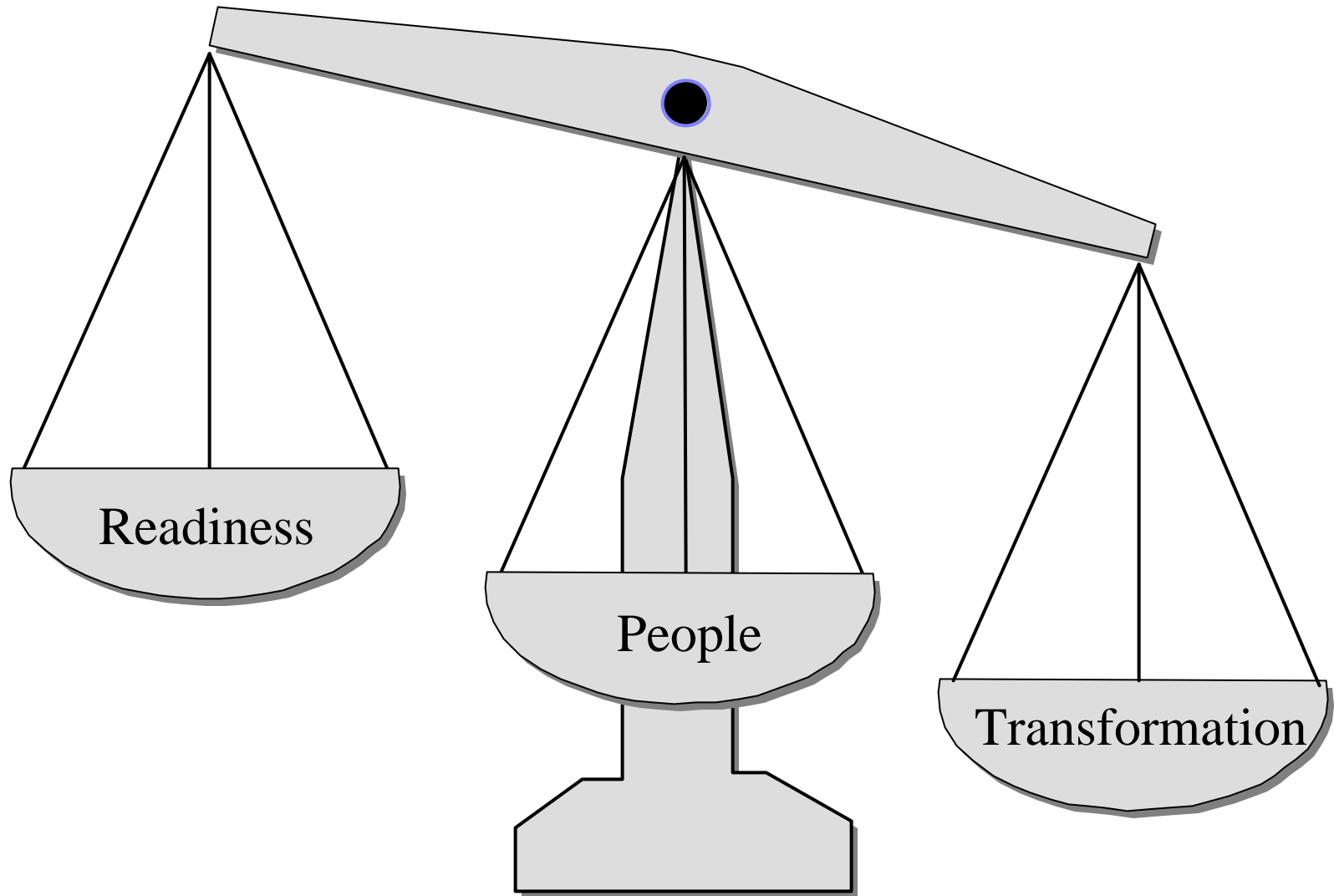
**The FMR needs to be changed to uniformly allow Working Capital Fund (WCF) Installations to:**

- Enter into fixed price contracts and orders with Governmental and non-Governmental customers alike; to permit the WCF installations to charge only the variable costs for work that is in addition to the designated work for a facility;
- Enter into long term relationships;
- Permit more flexibility in the acquisition of capital assets so that the business of the WCF facility can be accomplished more efficiently and in a more cost effective manner.





# Are We Out of Balance?





# Backup





# TACOM Attendance at Industry Conferences

- In a typical year, TACOM sends attendees to 400+ conferences, symposia, and workshops.
  - NDIA sponsors 100+ of these events each year.
  - AUSA sponsors 30+ of these events each year.
- A representative two-day conference in DC costs TACOM approximately \$1,909 for each attendee.
  - The \$1,909 figure includes the registration fee, per diem, hotel, travel, and GS-14 salary cost.
- Contractor participation in these local / regional / national events is comparable - but the government ultimately pays.
- If we need funds for technology transformation, this could be a potential source.
- Can we consolidate events or cut back on participation?
  - Many events address the same topic.





# Six Sigma/Lean in the AMC Quality Federation Roadmap

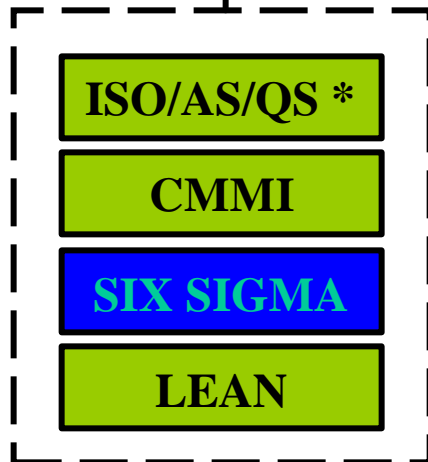
## Solution Set #1:

### Internal Quality Management

#### (Better Ourselves)

- Core Competencies
- Quality Single Process Initiatives (SPIs)
- Integrated Data Environments

### STRONG TOOLKITS

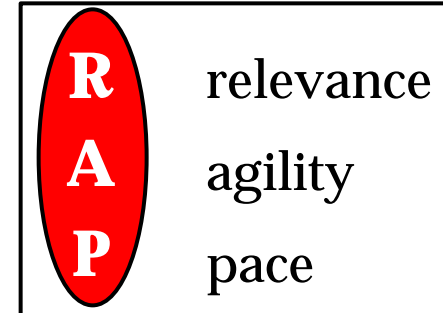


\* ISO – Int'l Stds Org 9000-2000;  
AS - AS 9100 Aerospace Quality System Standard  
QS - QS 9000 Automotive Quality Standard



## Constraint:

### Transformation



## Solution Set #2:

### Quality Supplier Management (Better our Suppliers)

- (CP)<sup>2</sup> Integration
- Gov't & Commercial Partnerships
- Use of Past Performance Info

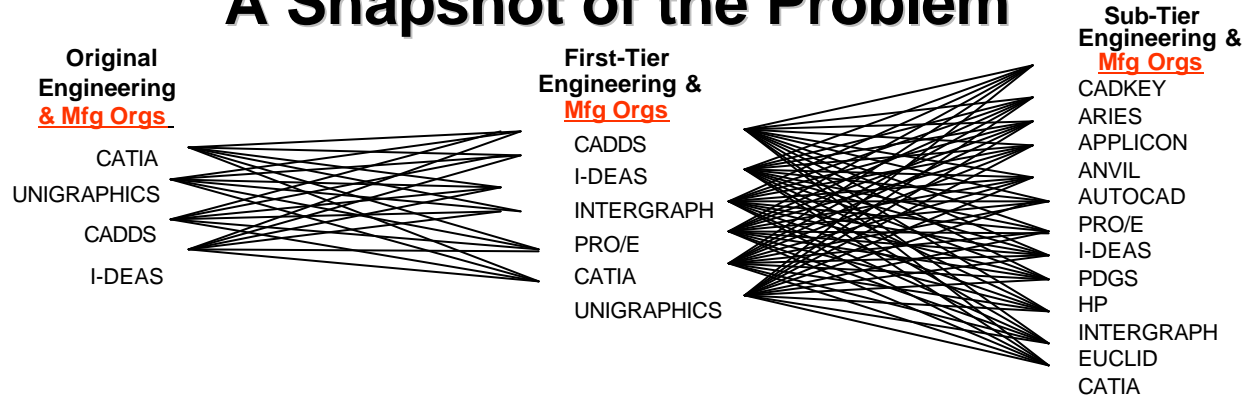
Total Focus on Quality



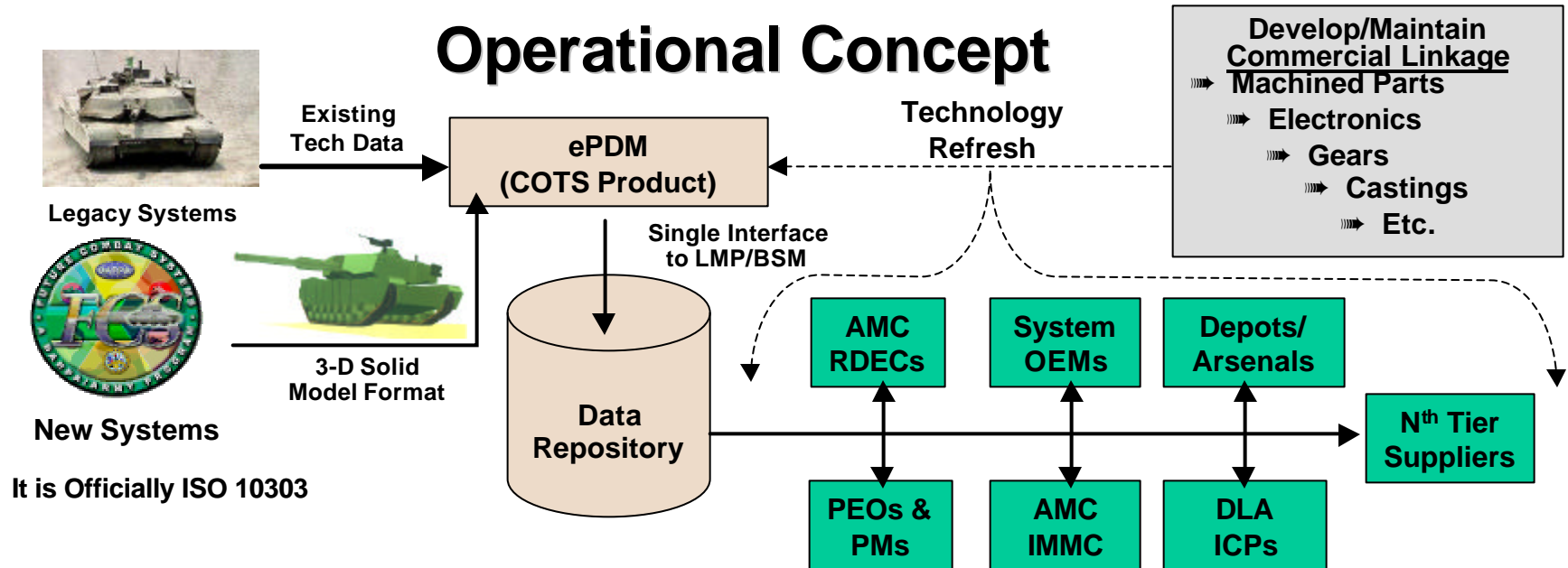


# Standard Exchange of Product (STEP) Data Overview

## A Snapshot of the Problem



## Operational Concept



STEP Improves Quality – the Right Part the First Time

