Tactical Wheeled Vehicles: Delivering the Vision

2003 Tactical Wheeled Vehicles Conference

January 27, 2003

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Commanding General

Tank-automotive & Armaments COMmand
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
## Contractor Reservists

<table>
<thead>
<tr>
<th>Recommendation</th>
<th>Contribution to Transformation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• <strong>Follow Army regulations and policy</strong> when making decisions to support a</td>
<td>• Reduces Requirement for Log Structure; Leverages the best aspects</td>
</tr>
<tr>
<td>system or unit with Contracted Logistics Support</td>
<td>of CLS support while neutralizing the drawbacks:</td>
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<tr>
<td>• <strong>When exceptions</strong> to the use of contractors in the maneuver space are</td>
<td>• Unconstrained burdening of the tactical commander</td>
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<tr>
<td>deemed in the Army’s and the Combatant Commander’s best interest** –</td>
<td>• Unknown quantity of contractors in maneuver footprint</td>
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<tr>
<td>institutionalize that support by having the contractors supporting a unit</td>
<td>• Force protection</td>
</tr>
<tr>
<td>be reservists (as a condition of employment) assigned to a RC platoon/</td>
<td>• Essential workforce not contractually responsive to Commanders’</td>
</tr>
<tr>
<td>detachment of the maintenance unit.</td>
<td>orders, guidance, or requirements</td>
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<td></td>
<td>• OPTEMPO cost growth not identified at the time the CLS decisions</td>
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<td></td>
<td>were presented</td>
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<td></td>
<td>• Contracts that lack appropriate deployability clauses</td>
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<td>• Indemnification</td>
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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
Enabling Technologies

Hybrid Propulsion Programs

- FMTV Hydraulic Hybrid
- HE HMMWV
- FSCS
- 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
COMBAT
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
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.
Enabling Technologies

**Systems Integration**
High Tech Collaboration Tools

Quickly Finding, Viewing, Understanding, and Using Information

In the Virtual World
In the Office

In the Lab
On the Shelf

In the Field

On the Road

**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
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 EAI Layer

- Web Portal Access via AKO
- Industry Interface/PEOs via CITIS

Transformed Army

Army's ERP

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

<table>
<thead>
<tr>
<th>Windchill, Centra, etc</th>
<th>SAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>ePDM</td>
<td>ERP</td>
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</table>

## Concept & Technology Development
- Pre-Systems Acquisition
- Systems Acquisition: Critical Design Review

## System Development & Demonstration
- Systems Acquisition: Decision Review

## Production & Deployment
- Operations & Support

## Sustainment
- Logistics

“Interface” <<< “Integration”
**Benefits:**
- Decreased life cycle costs
- Reduced Acquisition Lead Time/ Production Lead Time
- Faster warfighter problem resolution
- Reduced manufacturing costs and scrap
- Improved communication

STEP = Standard Exchange of Product
ISO 10303
Ground Systems Industrial Enterprise

A Ground Systems Industrial Enterprise 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) 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)
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.

*Source:* “Depot Considerations in Army Acquisition” Memorandum
Claude Bolton, Jr. – Assistant Secretary of the Army (Acq, Log, and Tech)
# Financial Reform

## SUMMARY OF SALES / UTILIZATION STATUTES

<table>
<thead>
<tr>
<th>STATUTE</th>
<th>SALE OF</th>
<th>SALE TO</th>
<th>FOR</th>
<th>RESTRICTIONS</th>
<th>FINANCIAL</th>
<th>APPROVAL LEVEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 USC 4532 (The Arsenal Act)</td>
<td>“supplies” (articles or services)</td>
<td>other Army activities</td>
<td>Army use (but can be partial and items supplied as GFE to contractor)</td>
<td>must establish “economical basis”; make-or-buy decision on out-of-pocket, but pay full cost</td>
<td>reimburse-ment, by project order</td>
<td>CDR of facility (by reg)</td>
</tr>
<tr>
<td>10 USC 2208 (h)</td>
<td>AWCF inventory</td>
<td>contractors</td>
<td>use in performing DOD contracts</td>
<td></td>
<td>reimburse fund</td>
<td>PCO (?)</td>
</tr>
<tr>
<td>10 USC 2208(j)</td>
<td>manufactured or re-mfd goods or services as subcontractor</td>
<td>contractors</td>
<td>fulfilling DOD contract or subcontract</td>
<td>solicitation for contract / subcontract must be open to public/private competition</td>
<td>omit costs of DOD-designated “mission-critical activities”, ancillary activities</td>
<td>HCA (delegation)</td>
</tr>
<tr>
<td>10 USC 4543 (mfr of large cal cannon, gun mounts, recoil mech., munitions or components)</td>
<td>manufactured items / related services</td>
<td>U.S. company</td>
<td>DOD, USG, friendly foreign government, or commercial</td>
<td>items/services not commercially available; buyer indemnifies US</td>
<td>Incremental payments; may be FFP / variable costs if commercial item; develop working capital</td>
<td>CDR of MSC responsible for facility (by statute)</td>
</tr>
<tr>
<td>10 USC 2563 (NOT mfr of cannon, mounts, recoil mech., munitions/component s; DOD may designate)</td>
<td>articles and services</td>
<td>person outside DOD</td>
<td>not specified, but subject to Arms Export Control Act</td>
<td>items/services not commercially available; buyer indemnifies US, but gross negligence/ willful misconduct / Govt noncompliance excluded</td>
<td>Incremental payments; FFP; variable costs + deprec. +capital improvement ; develop working capital</td>
<td>DA level (delegation)</td>
</tr>
<tr>
<td>22 USC 2770</td>
<td>defense articles and services</td>
<td>U.S. company</td>
<td>incorporation into end items for friendly foreign country</td>
<td>items/services not commercially available; buyer indemnifies US export license/ possible end-user certificate</td>
<td>adv. payment of estimated costs; full cost</td>
<td>HCA (delegation)</td>
</tr>
<tr>
<td>STATUTE</td>
<td>SALE OF</td>
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<td>FOR</td>
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<tr>
<td>10 USC 2539b</td>
<td>samples, drwgs, equipment / mls / lab / test facilities</td>
<td>person or entity</td>
<td>independent research &amp; development or use in demonstrations to friendly foreign govt</td>
<td>equipment / materials must be used exclusively for research and development</td>
<td>recoup direct and indirect costs</td>
<td>PARC</td>
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<td></td>
<td></td>
<td>instn cdr</td>
</tr>
<tr>
<td>10 USC 2358 (cooperative agreements or grants)</td>
<td>services, use of employees or facilities</td>
<td>private sector or other federal agencies</td>
<td>participation in R &amp; D projects relating to weapon systems or other military needs</td>
<td>can’t duplicate research under other DoD programs; Army funds can’t exceed outside funding</td>
<td>funds to Army</td>
<td>COC-Wrn or Picny; &gt;$5 m /yr or $25m total DA level (delegation)</td>
</tr>
<tr>
<td>10 USC 2371 “other transactions”</td>
<td>services, use of employees or facilities</td>
<td></td>
<td>participation in R &amp; D projects</td>
<td>can’t duplicate research under other DoD programs; Army funds can’t exceed outside funding</td>
<td>reimburse-ment goes to special Treasury account</td>
<td>COC-Wrn or Picny; &gt;$5 m /yr or $25m total DA level (delegation)</td>
</tr>
<tr>
<td>10 USC 2474 (Centers of Industrial Technical Excellence)</td>
<td>services related to depot-level activity core competencies, or use of facilities or equipment</td>
<td>private industry</td>
<td>public- private partnership to increase use/decrease costs, or encourage creation and preservation of jobs to maintain skills</td>
<td>must have no adverse effect on readiness; private industry must indemnify US</td>
<td>reimburse direct &amp; indirect costs to fund that incurred; can use revenues for facility operation, maintenance &amp; env. restoration</td>
<td>MSC CG ( ? )</td>
</tr>
<tr>
<td>15 USC 3710a (Cooperative Research and Development Agreements)</td>
<td>R &amp; D work by federal “lab”, or use of lab’s equipment and facilities</td>
<td>non-federal entity</td>
<td>enhancing technological knowledge of lab and private sector for mutual benefit; transferring technology</td>
<td>R &amp; D must be consistent with lab’s purpose, not unduly compete with services in private sector</td>
<td>reimburse direct &amp; indirect costs to fund that incurred</td>
<td>Director of federal laboratory (by statute)</td>
</tr>
</tbody>
</table>
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.

Source: GSIE Point Paper
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

Solution Set #2:
Quality Supplier Management
(Better our Suppliers)
- (CP)^2 Integration
- Gov’t & Commercial Partnerships
- Use of Past Performance Info

Constraint:
Transformation
relevance
agility
pace

STRONG TOOLKITS

ISO/AS/QS *
CMMI
SIX SIGMA
LEAN

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

Total Focus on Quality
Standard Exchange of Product (STEP) Data Overview

A Snapshot of the Problem

Operational Concept

- Legacy Systems
- New Systems
  - It is Officially ISO 10303

Data Repository

- ePDM (COTS Product)
- 3-D Solid Model Format
- Existing Tech Data

Technology Refresh

- Single Interface to LMP/BSM
- AMC RDECs
- System OEMs
- Depots/Arsenals
- PEOs & PMs
- AMC IMMC
- DLA ICPs
- Nth Tier Suppliers

Develop/Maintain Commercial Linkage

- Machined Parts
- Electronics
- Gears
- Castings
- Etc.

STEP Improves Quality – the Right Part the First Time