



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.



Condition Based Maintenance

Mr. Tom Udvardi

15 April 2008

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE APR 2008		2. REPORT TYPE N/A		3. DATES COVERED -	
4. TITLE AND SUBTITLE Condition Based Maintenance				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Tank Automotive Research, Development & Engineering Center				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release, distribution unlimited					
13. SUPPLEMENTARY NOTES Advanced Planning Briefing for Academia (APBA) Presentation. The original document contains color images.					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT UU	18. NUMBER OF PAGES 5	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			



Current Failure Management Strategies Common Maintenance Practices



Reactive Maintenance

Run to Failure



Preventive Maintenance

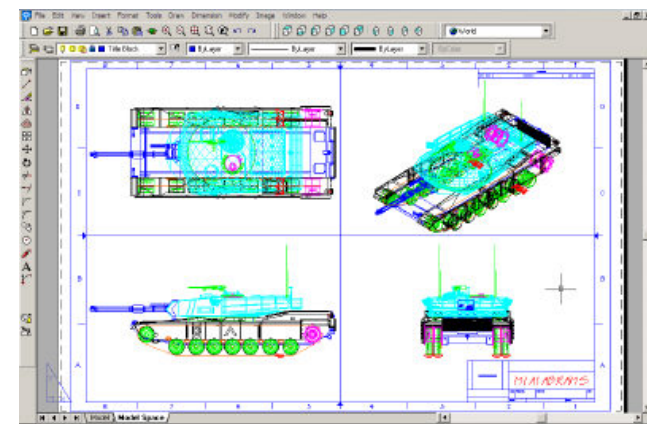
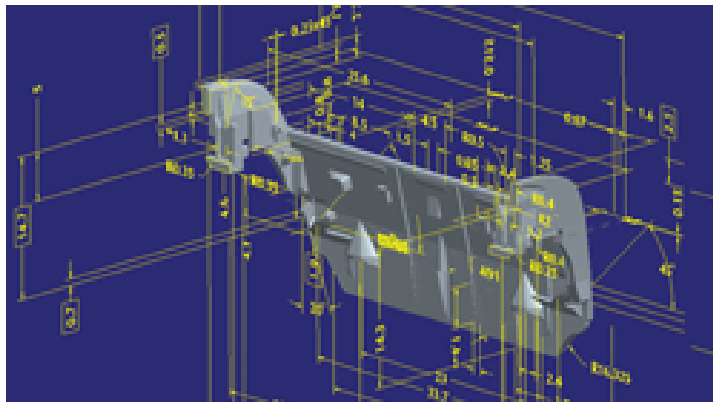
Service



Inspections

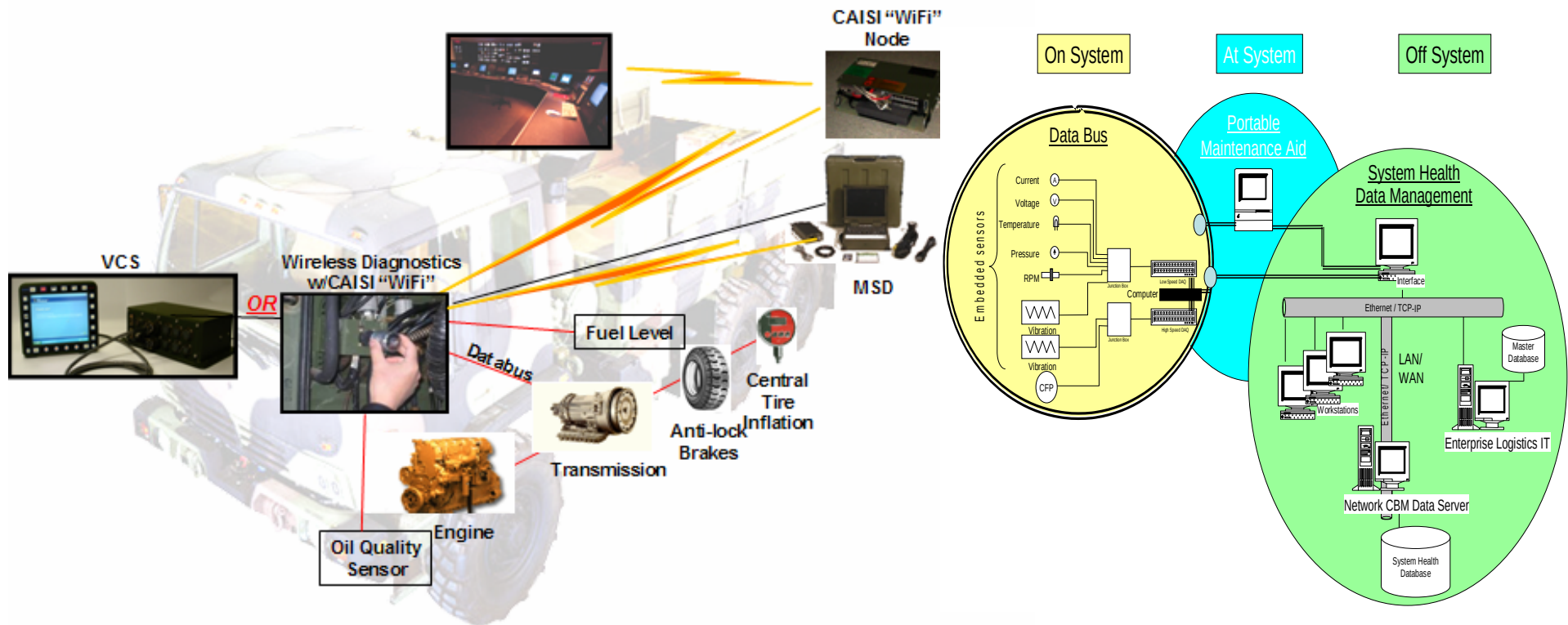


Alternative Maintenance Redesign



TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.

Condition Based Maintenance Concept



Utilize **onboard sensors, data collection**, networks, and computer resources to better enable the soldier and the Army to **Maintain Vehicle Readiness and reduce cost** by **proactively pre-empting failures** through predictive maintenance capabilities.

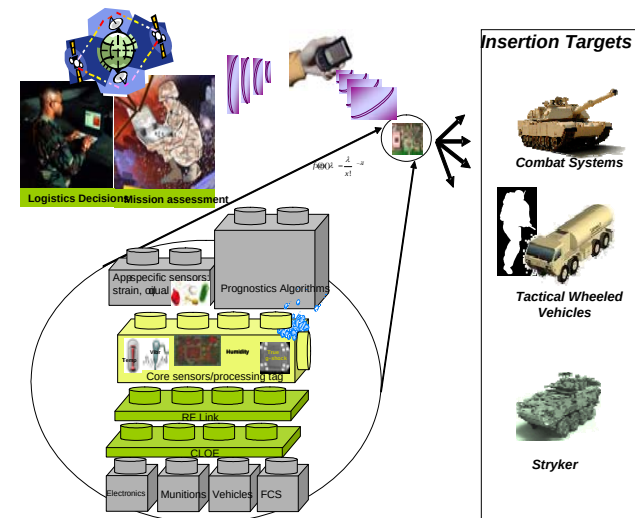
Understand Current Equipment Condition and Respond Proactively

Vehicle

- Improved Sensors and Sensor Networks
 - Robust/Ruggedized
 - Temperature/Impact/Vibration
 - Low Cost
 - Self-Diagnosing
 - Power-Scavenging/Self-powered/Kinetic
 - Signal Processing
- Batteries, Brakes, Bearings, Belts, Tracks
 - Routine Maintenance
 - Low Hanging Fruit
- New and Innovative Sensing Techniques
 - Fusion/Reduction
 - Global Sensing
- Low Cost Computational Platforms
 - Headless Computers
 - Diagnostic/Prognostic Framework
 - Open Architecture
- Low Cost Data Acquisition Components
 - Multi Channel
 - Versatile
 - Multi Bus J1939/1553/J1708

Communication link to transfer information off platform

- Short range wireless - CAISI “WiFi”, ZigBee
- Long range wireless - SINCGARS, EPLRS, MTS
- Walk up, plug in port - Ethernet, USB, RS232
 - Bandwidth
 - **Security**





CBM – Technology Gaps



Back End

- Algorithms to Analyze and Act on Information Rapidly
 - Predictive Models
 - Self Learning
 - Predict the Unknowns
- Maintenance Centers, Data Warehouses, Enterprise Resource Planners
 - Fleet Level Usage Pattern Detection/Trend Analysis Across the Fleet
 - Logistic Footprint Prediction/Preposition Parts
 - Tactical Operation Optimization/Situational Awareness
 - Fuel and Ammo
- Statistical Analysis and Prognostics
 - Data reduction
 - Anomaly Detection
 - Data Mining

Currently Working with the University of Detroit

- Analyzing and Developing Wireless transceivers for sensors.
 - Wireless Methods Analysis IEEE 802.11, IEEE 802.15.4
- Program Expanded into Robotic Sensor Focus

CBM Reps at TARDEC Booth

- Tuesday, April 15
 - Tom Udvare**
 - Chris Beck**

TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.