

Mobile Equipment Monitoring

Improving Performance in Tight Times

October 8, 2009

Mining
Congress





Agenda

- Introductions & Objectives
- Condition Based Maintenance and Mobile Mining Equipment
- Extending Equipment Performance
- Enablers for Real Time Monitoring
- Why?? - Case Studies



Company Overview

Global Presence



- 17 offices
- 17 partner companies
- Leading clients around the world



Company Overview

Global Presence

- 20 Years Experience in Process Control and Real Time Monitoring – Refineries, Power Plants, Mining Process Plants
- Global Clients – Freeport McMoRan, Rio Tinto, BHP, Exxon, BP Oil across 5 continents
- The Pioneers in Mobile Equipment Monitoring – Partnered with Syncrude in 2002 to deploy MDSP – custom built real time monitoring on their heavy equipment



● 17 offices

● 17 partner companies

● Leading clients around the world



Real Time Monitoring.....Proven Value

- Has been used in process industry for 15+ years:
 - Refineries, Power Plants, Mining Processing
 - Central monitoring of control systems
 - Manages alarms, tracks temps, pressures etc., provides predictive monitoring of developing failures
 - Considered critical for operation of plant





Critical to Optimize Your Heavy Mobile Equipment.....

- Many mines are installing mine wide data networks
- Most equipment is heavily instrumented & data is easily available
- Data has been used for diagnostics for years – but often have to board equipment to collect
- Systems becoming practical to remotely collect, analyze all of the operating data in real time





What does Mobile Equipment Monitoring do...

- Remotely monitor the status and performance of heavy mobile equipment in real time
 - Enables:
 - Access equipment data from any location in near real time
 - Track equipment and operator performance in real time
 - Remote diagnostics
 - Management of alarms & events
 - Predictive Maintenance
 - Notification of Critical events
 - Track location, cycles, productivity

Do more with Less





Equipment Monitoring Value.....

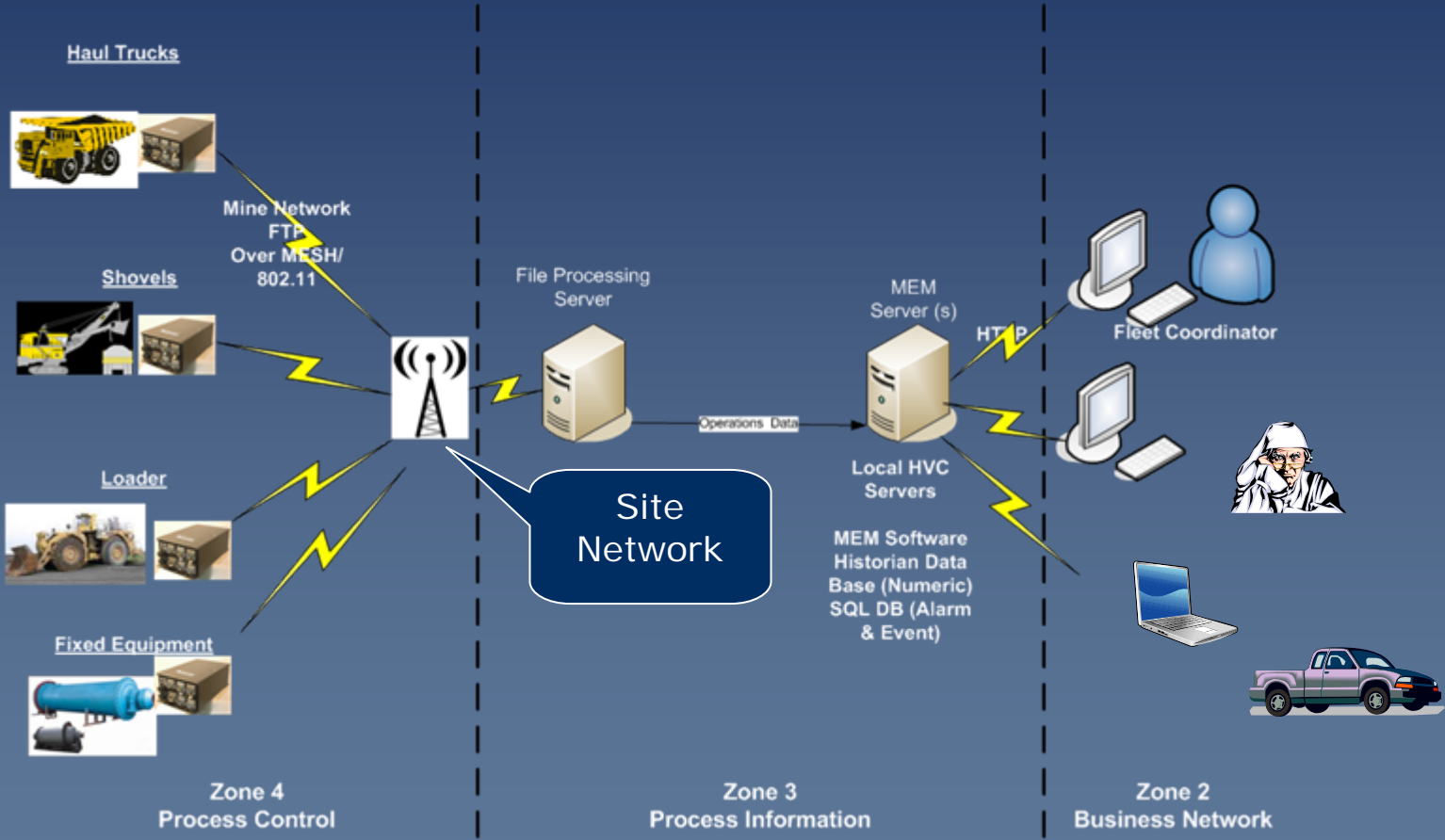
- Advanced Predictive Analysis:
 - Real time analysis provides user defined alarms and events – alarm what you need to measure
 - Detailed analysis to identify most costly problems
 - Predictive analysis can identify developing failures before they cause downtime and collateral damage
 - Enables reliability engineering to reduce breakdowns



Do more with Less

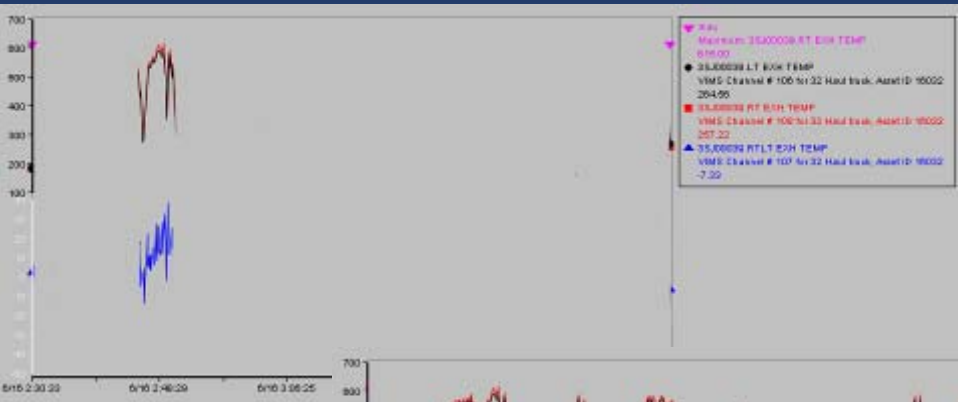


Typical Mobile Equipment Monitoring Configuration:

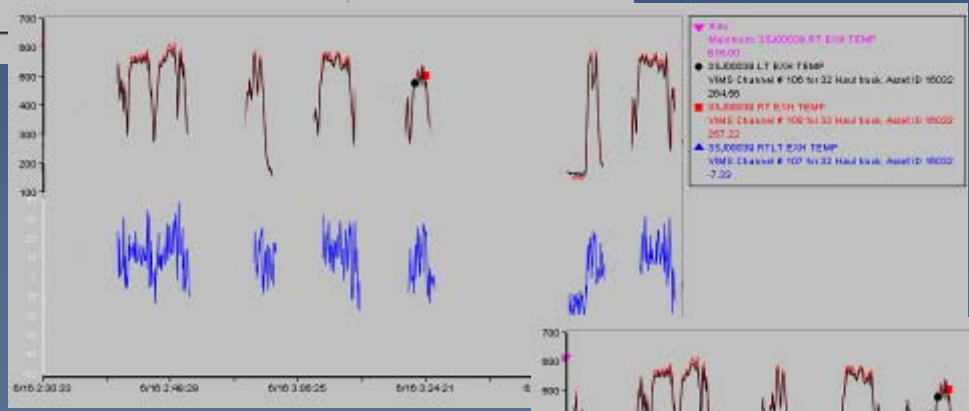




All the Data, All the Time!

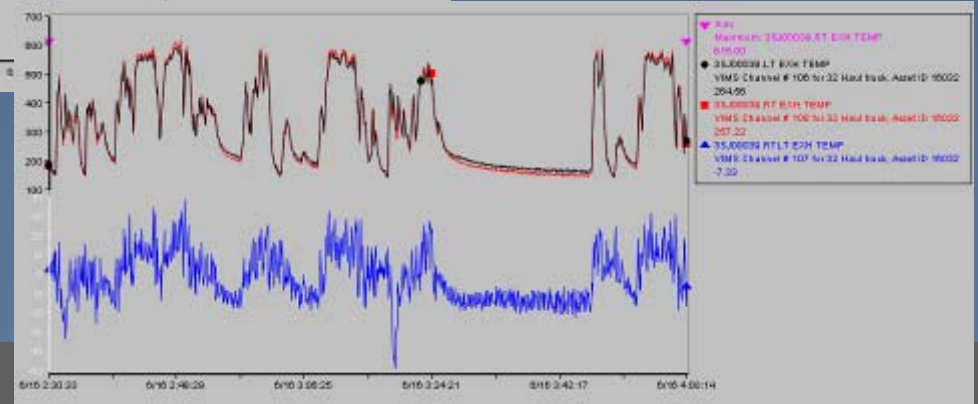


Onboard Data: 2006



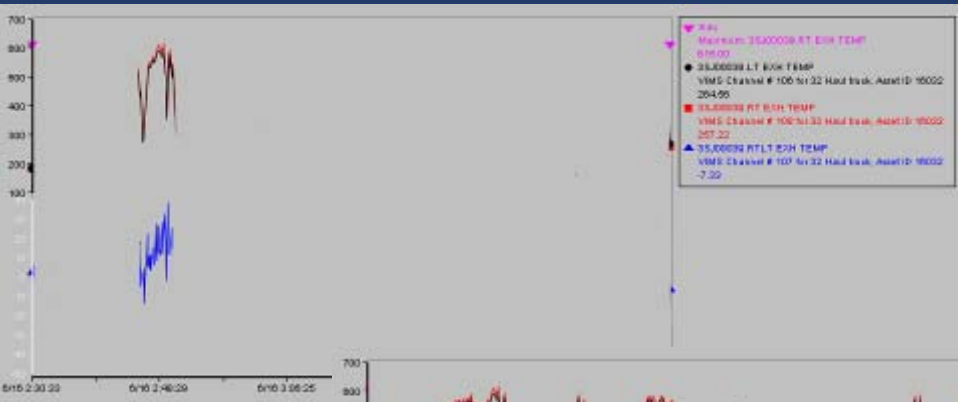
Phase 1: 2007

Phase 2 – All the data, All the time

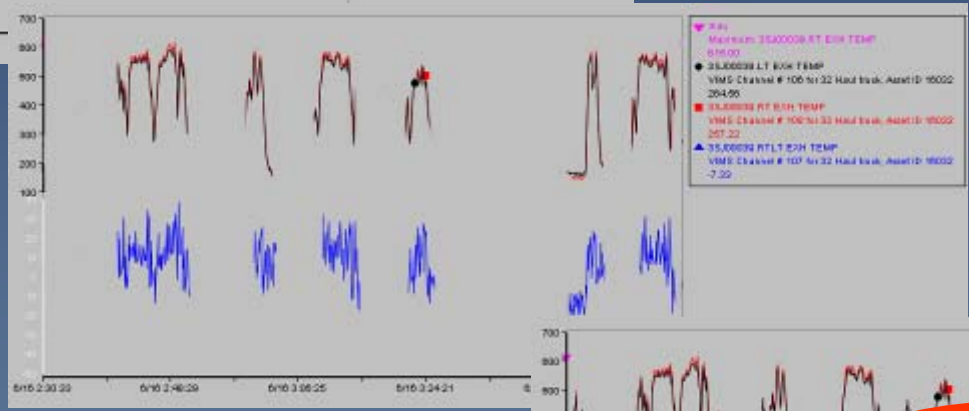




All the Data, All the Time!

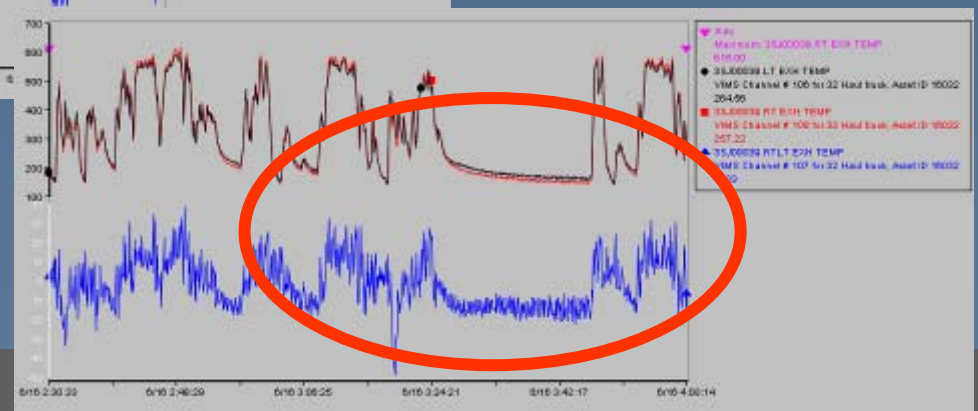


Onboard Data: 2006



Phase 1: 2007

Phase 2 – All the data, All the time





The Other Piece - Integration

- Important to provide gateway to integrate the wide variety of critical data sources and Enterprise systems
 - On Board
 - Tire monitoring – Kaltire/ Rimex
 - Lube system
 - Fuel systems
 - Mine Wide
 - Maintenance Management – Ellipse, JDE
 - Oil Analysis
 - Vibration Analysis
 - ERP system for cost data





Bottom Line?

- Reliability
 - Less unplanned downtime
 - Same production with fewer trucks, or more with same fleet
 - Less fuel, less greenhouse gas, fewer operators, less cost
 - Lower cost per ton
- Longer Component (& Equipment) Life
 - Lower costs
 - Less downtime





Bottom Line?

- Track KPI's
 - Life Cycle Cost
 - Availability
 - Utilization
 - Productivity
 -
- Operator Scorecards & Training
 - Reduce abuse
 - Proliferate best practices





OEM Systems - P&H Partnership

- Deliver best in class remote health monitoring for P&H equipment using Prevail – hosted MEM
- P&H/MinePro in-depth OEM expertise productized
- P&H's solution to enable customers to implement a CBM strategy



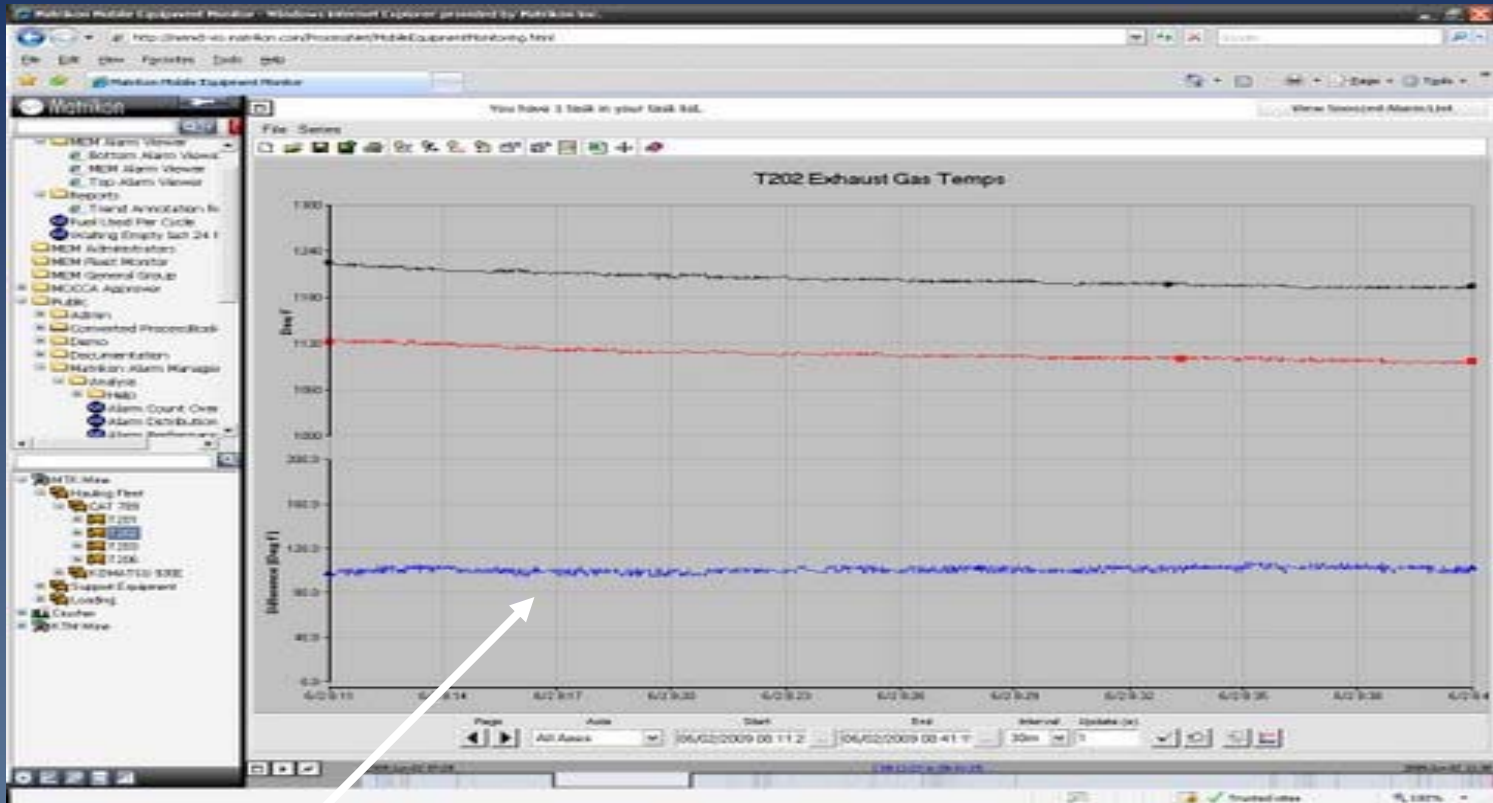
Why Monitor?

- A Fleet Monitor identified a 100.8 °F exhaust gas temperature spread between cylinders on a Caterpillar 793, indicating a fault with the cylinder and injectors. The #11 cylinder injector head and bridge were replaced, saving a low time engine from failure. Net savings - \$500,000+ + .





EGT Differential

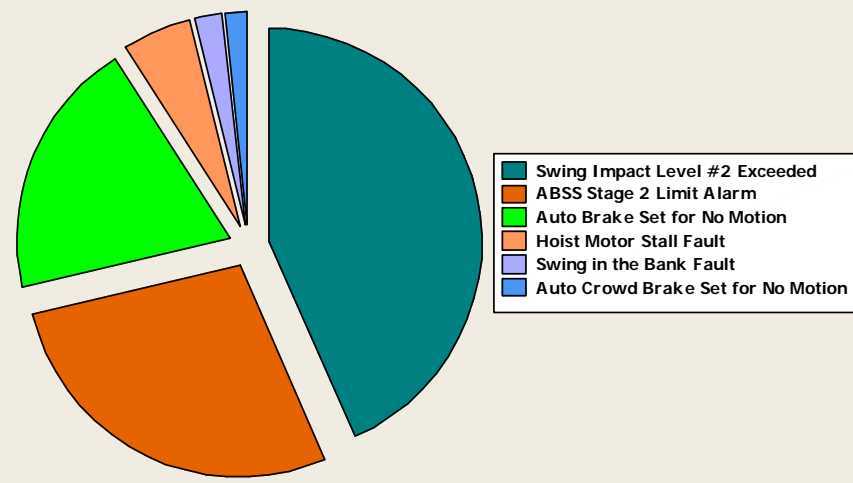


- 100° differential in EGT between cylinder banks

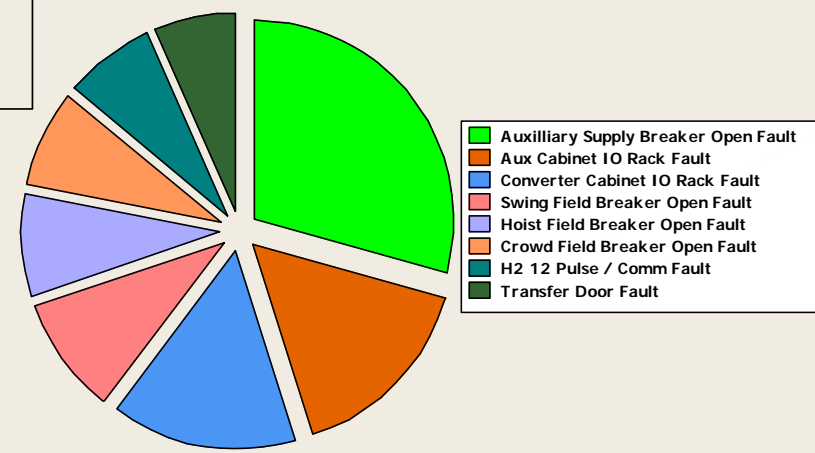


Shovel Event Data

Shovel Fault Data: Operator Induced Events



Shovel Fault Data: Equipment Induced Events



- Monitor Operator Induced Events for operator coaching
- Evaluate Equipment Induced Events



Impact on Life Cycle Costs

Life Cycle Costing Example

Service Hours	10,000	15,000	20,000	25,000	30,000	35,000	40,000	45,000	50,000	55,000	60,000		End Result	Cost
OEM Recommendation														
Engine	Service		Replace		Service		Replace		Service		Disposal		2 replacements	\$ 800,000
Transmission		Service			Replace			Service			Disposal		1 replacement	\$ 300,000
Differential	Service		Rebuild		Service		Rebuild		Service		Disposal		2 rebuilds	\$ 200,000
													Total Cost	\$ 1,300,000

CBM with MEM Support														
Engine		Service			Replace			Service			Continue Running		1 replacements	\$ 400,000
Transmission			Service			Replace			Service		Continue Running		1 replacement	\$ 300,000
Differential			Service			Replace			Service		Continue Running		1 rebuild	\$ 100,000
													Total Cost	\$ 800,000

Net Savings \$ 500,000





Thank You!

David Fisk

Director Mining Solutions

416-620-4564 ext 228

Email. David.Fisk@matrikon.com

<http://www.matrikon.com/mem>



Matrikon

Matrikon™ Mobile Equipment Monitor

- Monitor the real-time performance of mining equipment, regardless of vendor
- Record and analyze data to fix all suboptimal O&M systems
- Predict and prevent incidents and failures
- Expediently recover equipment, fix and reduce downtime

Join us for a demonstration at booth #1629