



CREATING  
**VALUE**

## Smart Services/PreVail® - Remote Health Management

phmsociety 2013

By:

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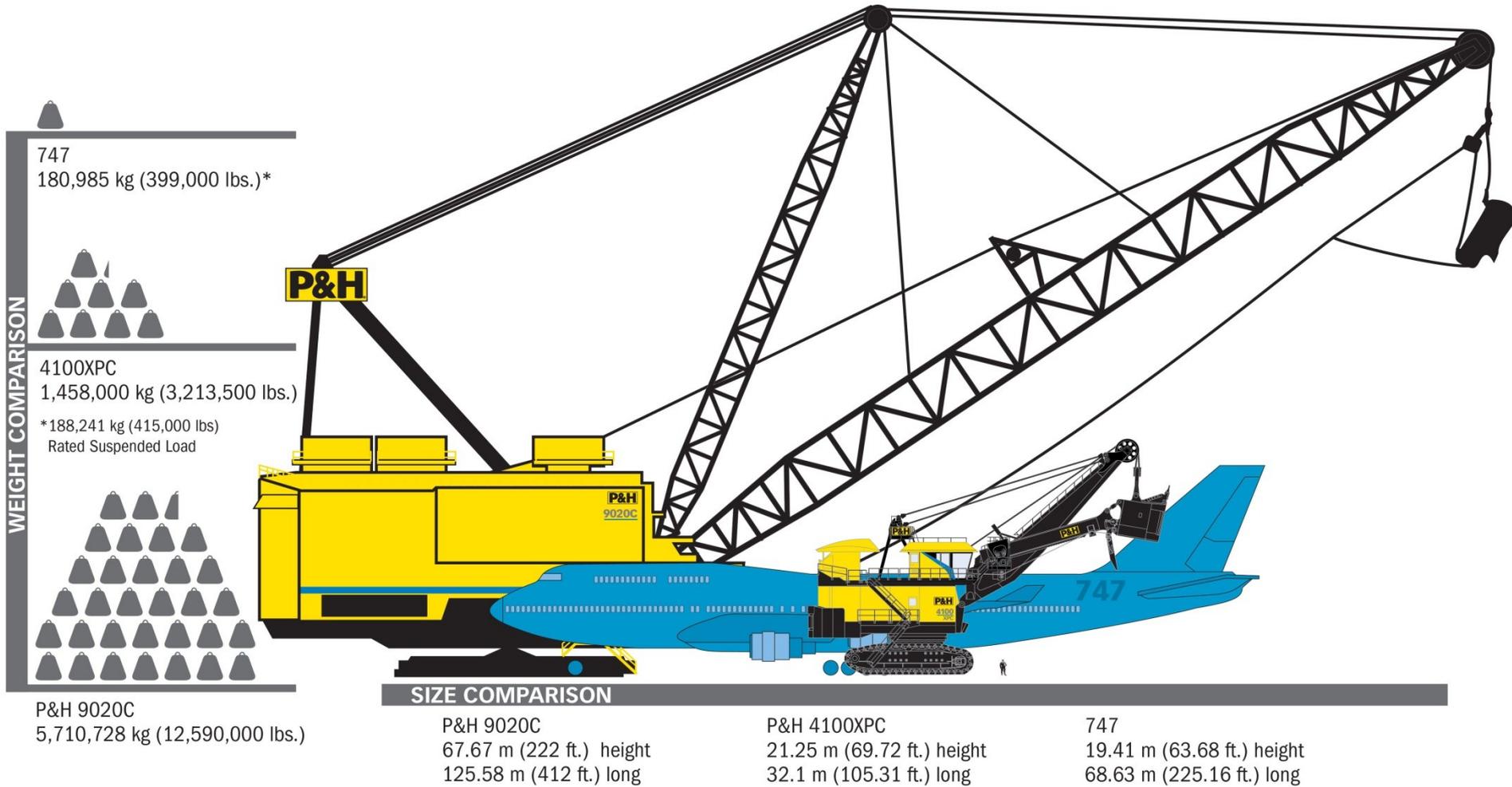
Program Manager - Remote Health Management

**JOYGLOBAL**

# Who Are We?

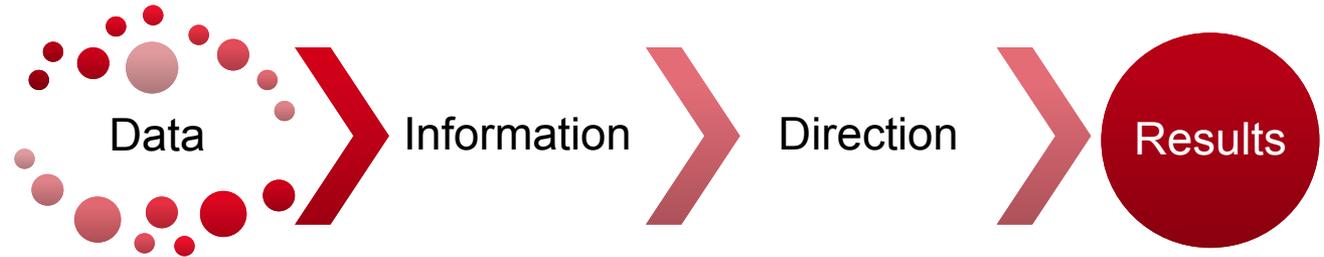


# How Big?



# Integrating Equipment, Information and Service

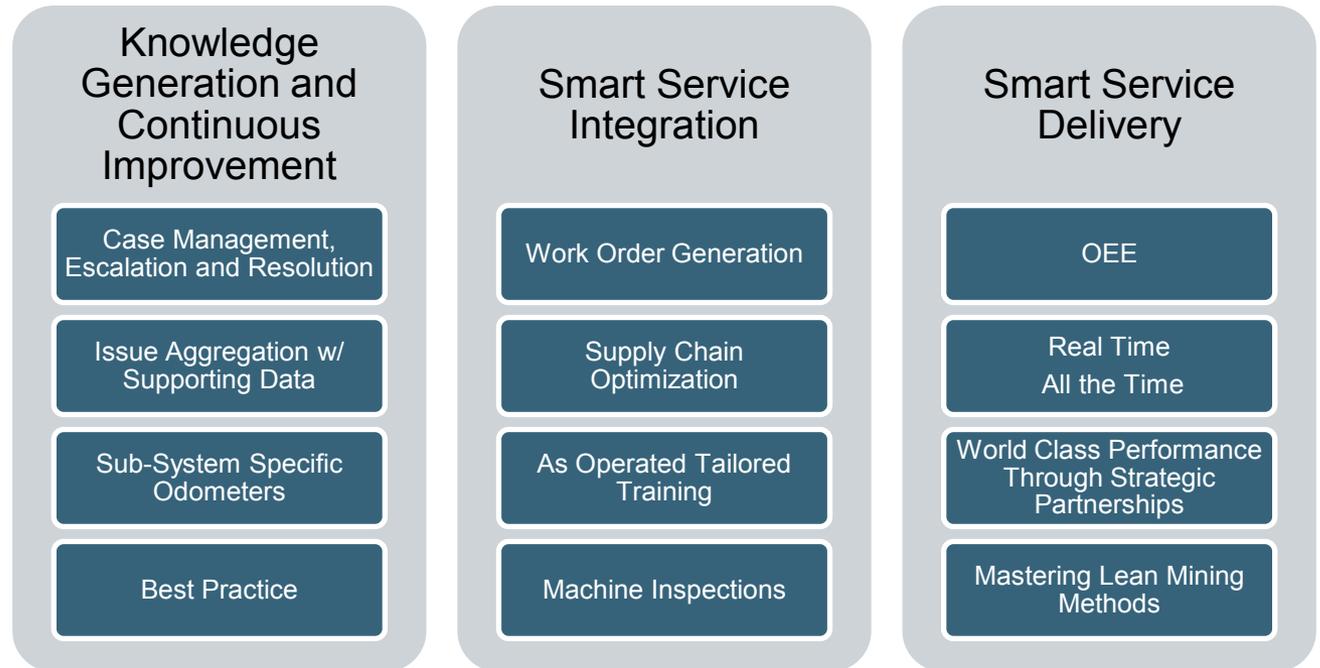
World Class Performance



Smart Services

Life Cycle Management

Operational Excellence



- Smart solutions
  - global network
- Integrated work orders
  - maintenance
  - parts orders
- Service Life Management



2013

"Smart Services"

- Global Benchmarking
- Performance Analysis (OEE)
- Integrated Monitoring Centers
- Productivity Analysis & Reporting
- Customer Portal - Visibility
  - Part Locations & Orders
  - Equipment and system performance
- Global network
  - Monitoring all equipment
- Dispatch people and product
- Integration with customer monitoring centers



2012

"Data to Knowledge"

- Condition Based Equipment Monitoring
- Operator Scorecards
- Monthly Reports/Comparisons
- Cost Avoidance Calculations
- Component Tracking System
- Workflow Engines-Issue Resolution

2010  
"PreVail"

- Enabled Machine Wi-Fi Communication
- Data Visualization
- Real- Time Monitoring
- Remote Diagnostics
- Integrated Schematics & Parts Books
- Historical Analysis



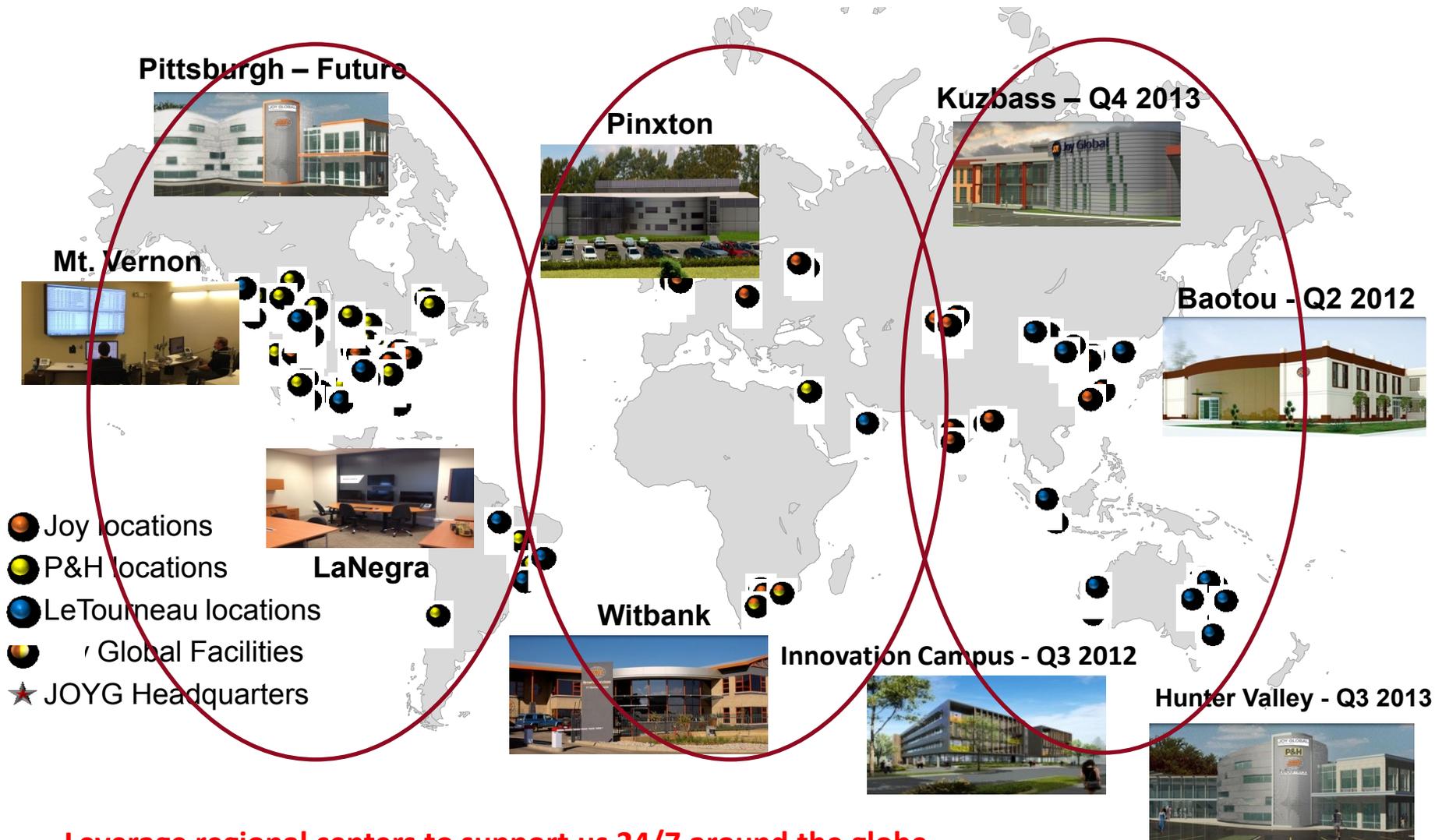
"Core" Joy Global Services

- Service Centres – back to OE
- Repairs
- Local Field Service
- Product training
- Parts Warehousing
- Technical Resources
- Asset Revitalizations



# Align to Global Services Network

*Smart Services Globally - Lead with Service*

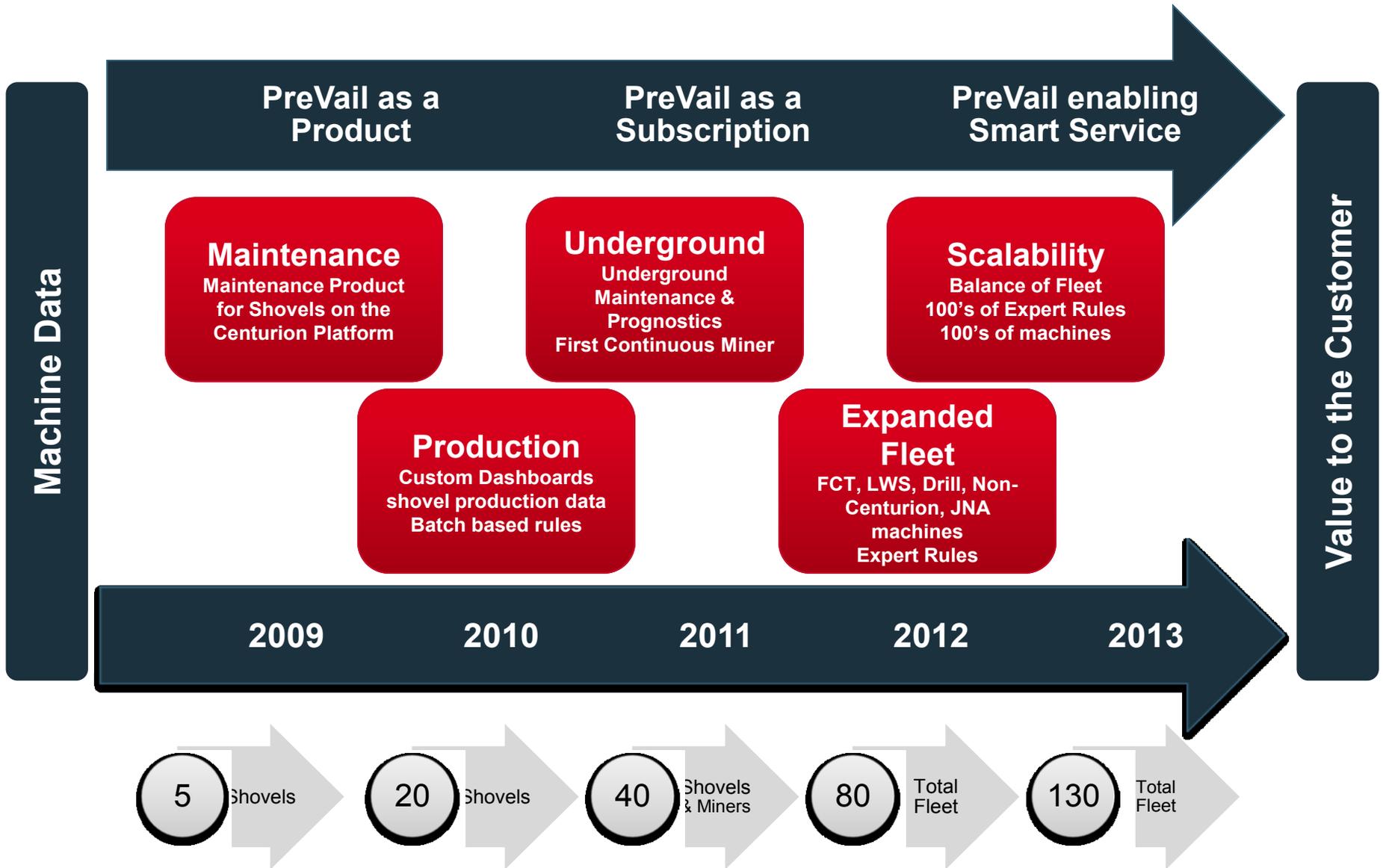


**Leverage regional centers to support us 24/7 around the globe**

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# PreVail Journey/Architecture/Value Offering

# The Journey of PreVail

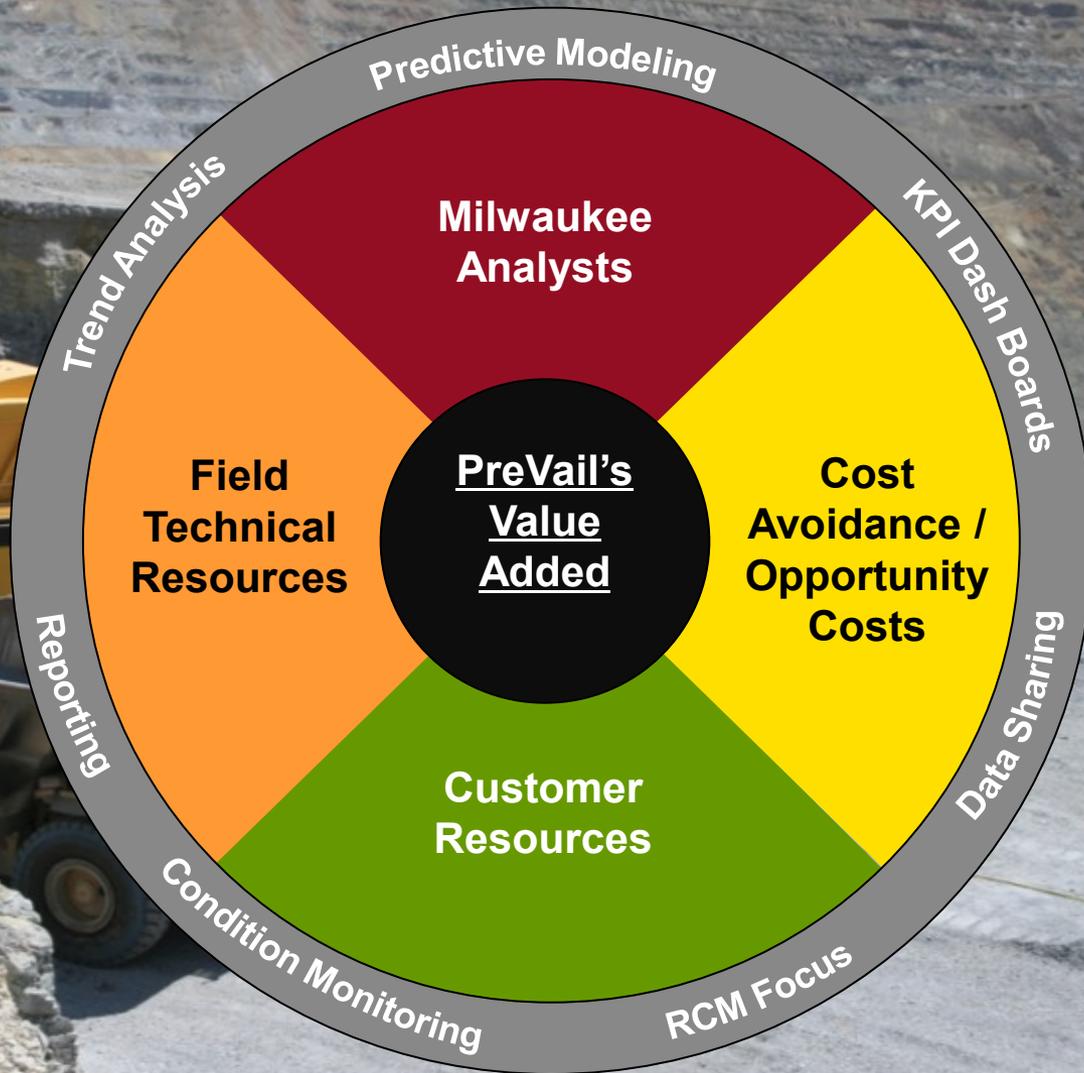


# PreVail Architecture



The cornerstone of the PreVail system is access to **24/7** expert diagnostic and consultative support.

# PreVail – Value Addition

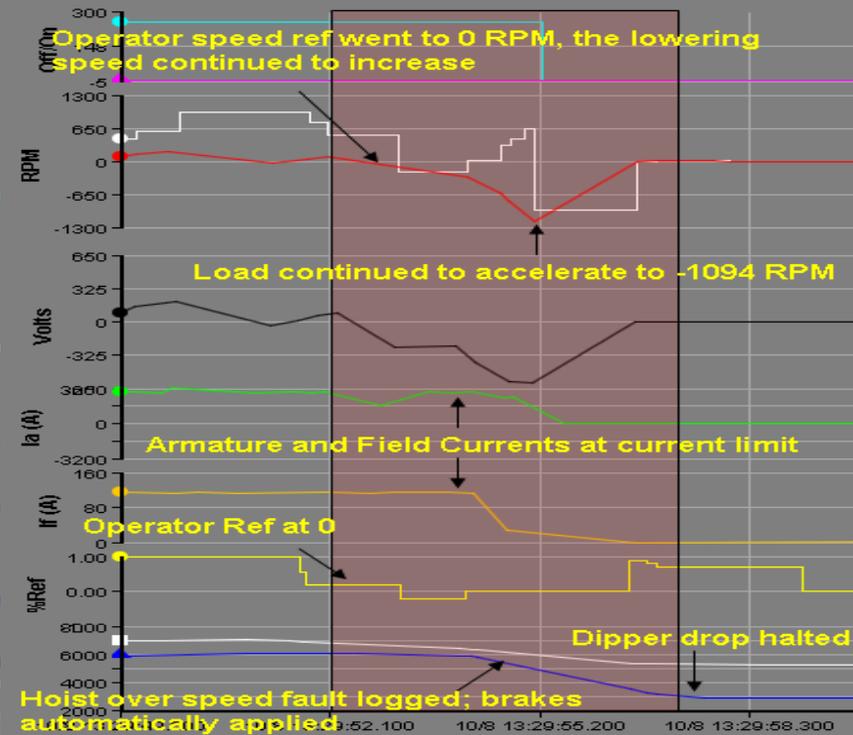
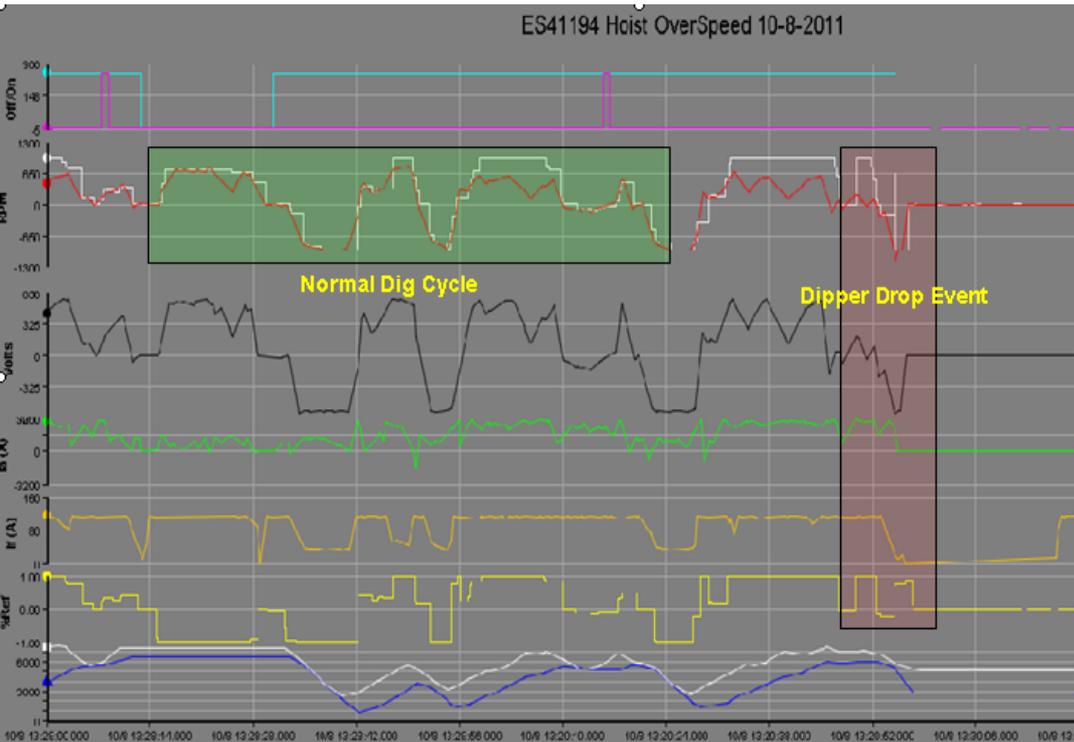


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# Power of Data

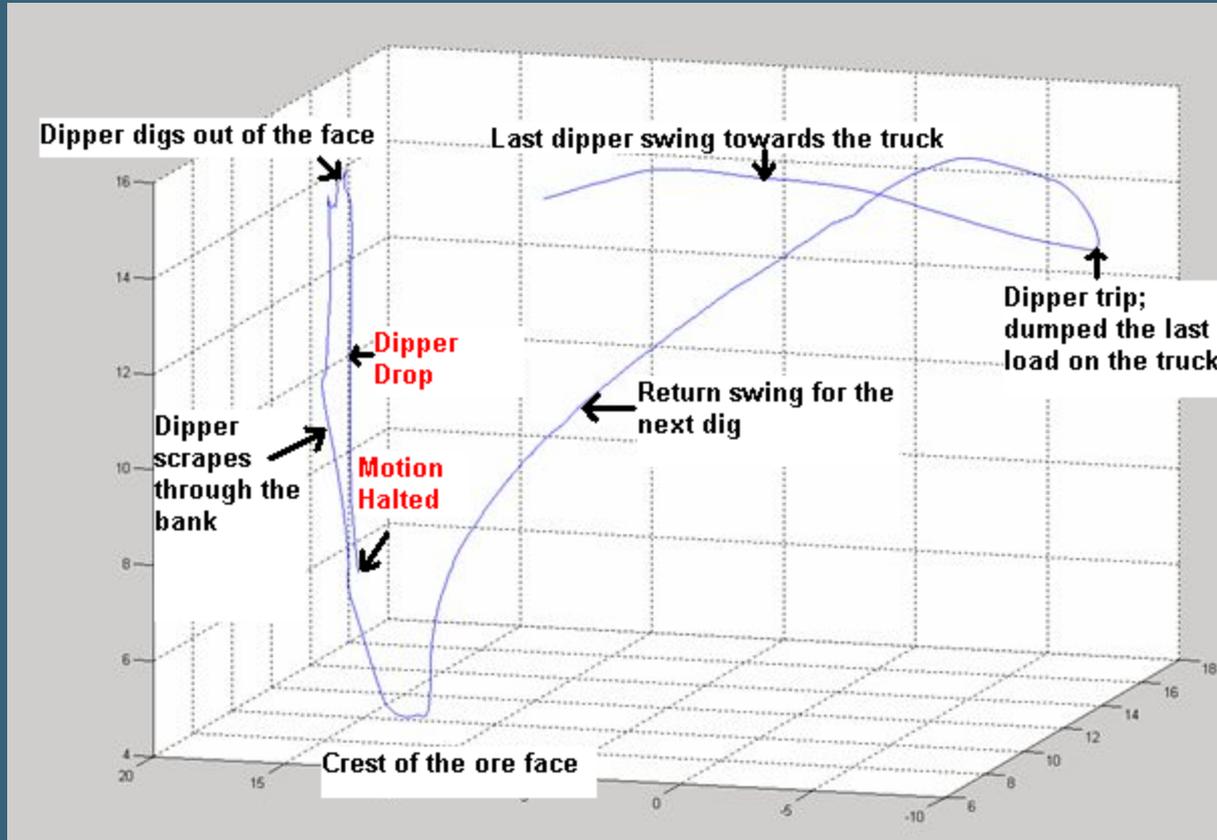
# Machine's Behavior – Hoist Over speed Event

Time Stamp	Events
13:29:52.646:	Operator ref went down to 0 RPM, the lowering speed continued to increase
13:29:54.033:	Armature and Field Currents at current limit
13:29:54.156:	Load continued to accelerate to -1094 RPM, maximum motion torque failed to hold the dipper & contents
13:29:55.265	Hoist over speed fault logged, brakes automatically applied
13:29:57.632:	Dipper fell another 5.7 meters before its motion was halted



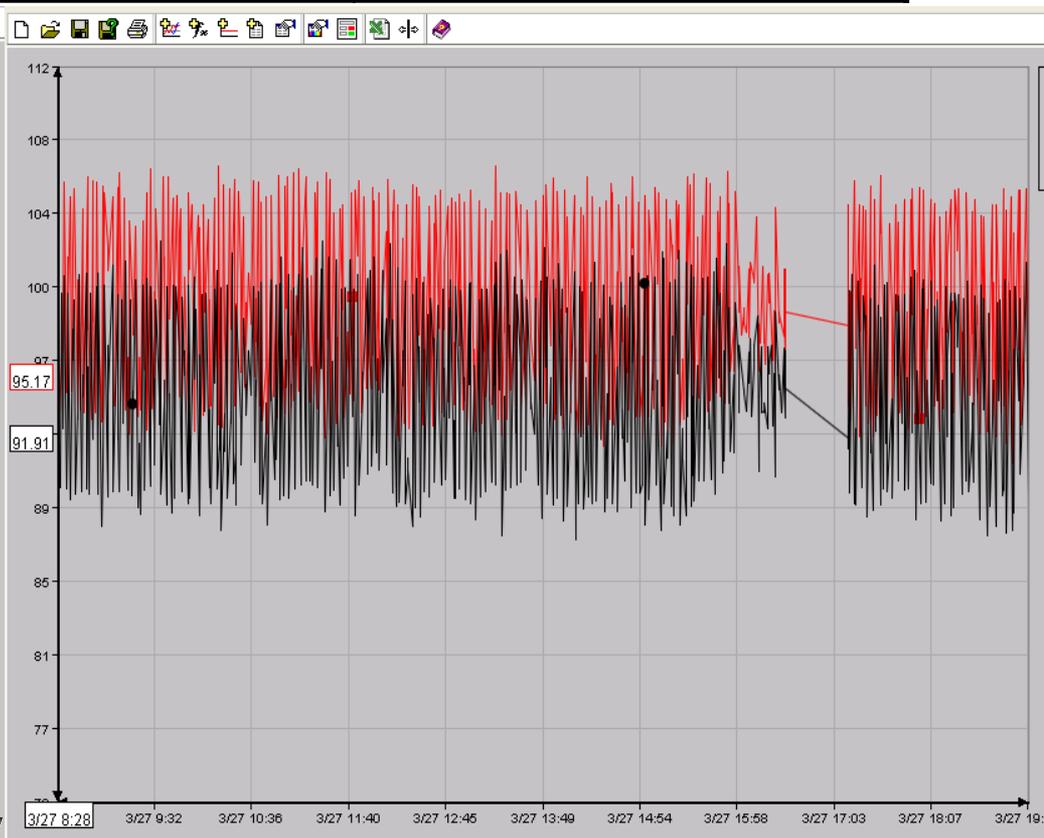
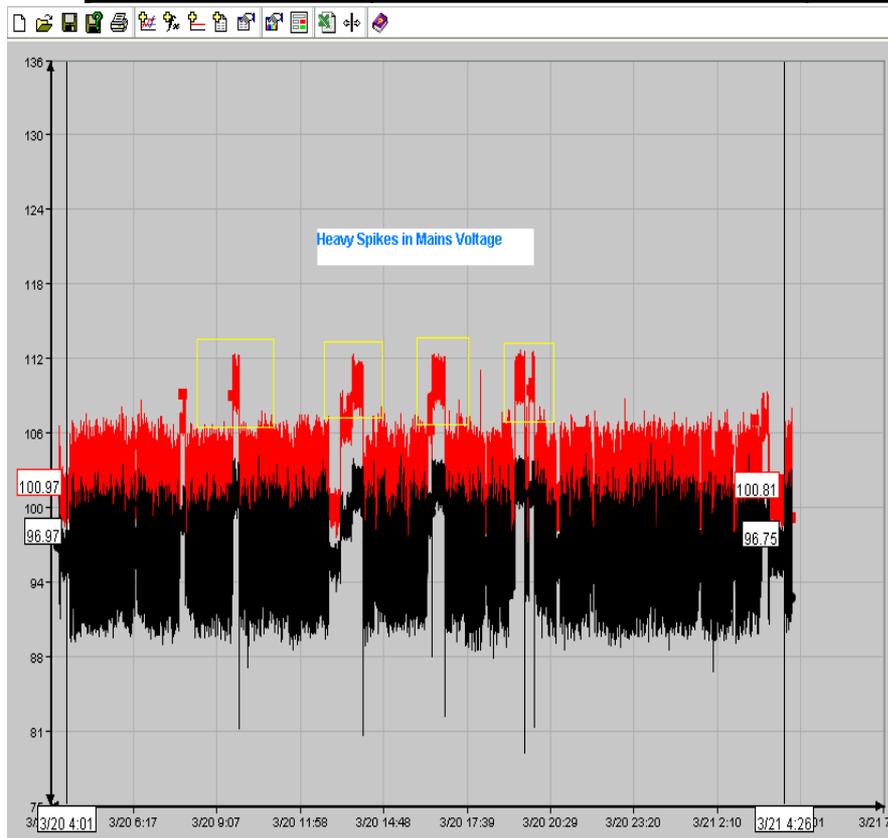
# Machine's Behavior Contd..

Power of Data Trending, Computing, to aid in the explanation of Machine's behavior down to milliseconds interval....



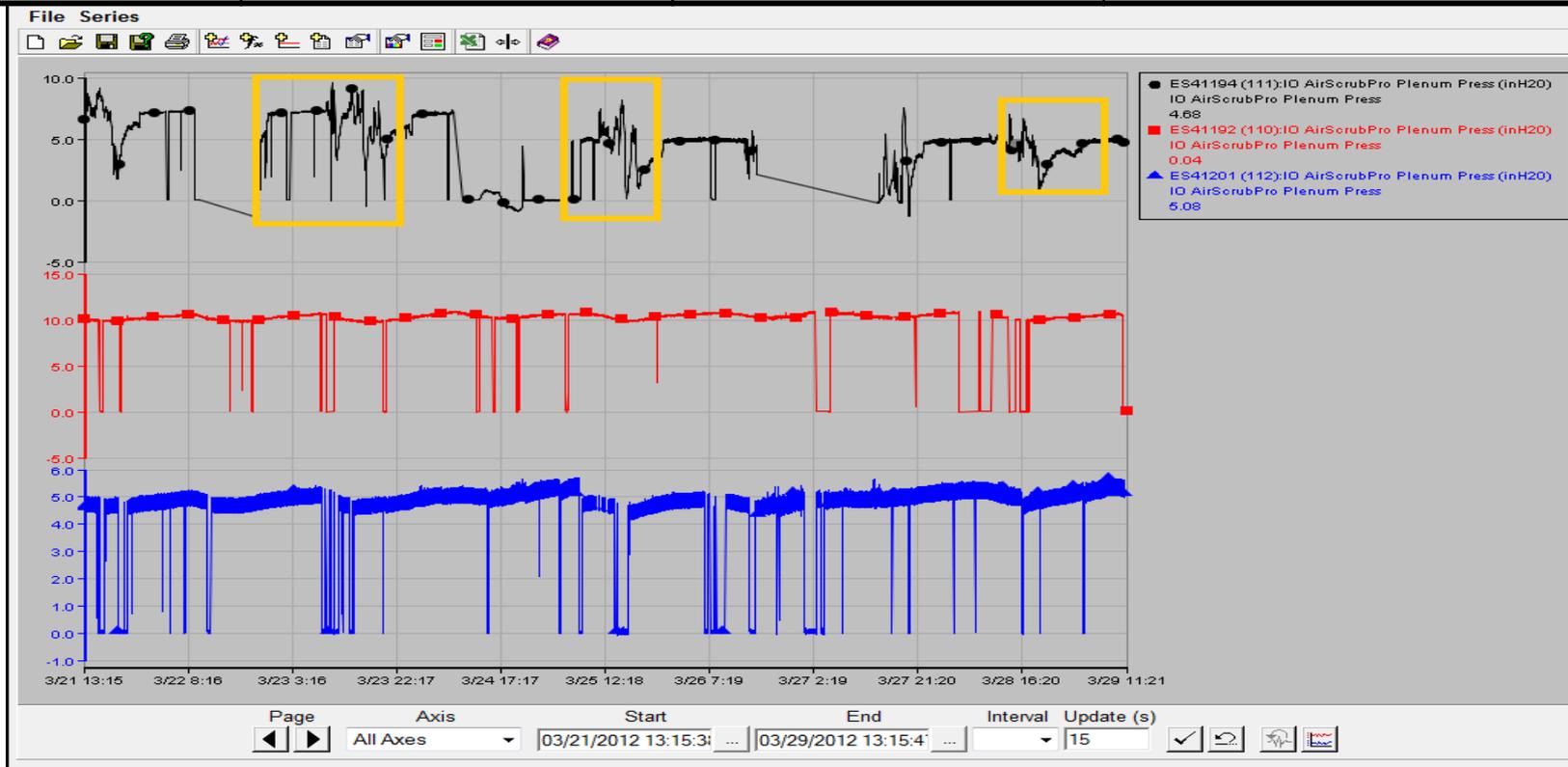
# Machine Health Analysis - Voltage Feed

Scenario 1	PreVail Analysis	CBEM Augmentation	Competitive Benefit
Mains Voltage Signature-Weak power distribution	Trending of mains voltage trips alarms correlation used to detect the possible issue causing downtime	A model built on the historical data and has triggered numerous true positive alerts, leading one of them into a case study	<ul style="list-style-type: none"><li>•Faster RCA and corrective action leading to shorten the trail cable length and stabilize the power feed</li><li>•Use of Expert domain knowledge and predictive modeling</li></ul>

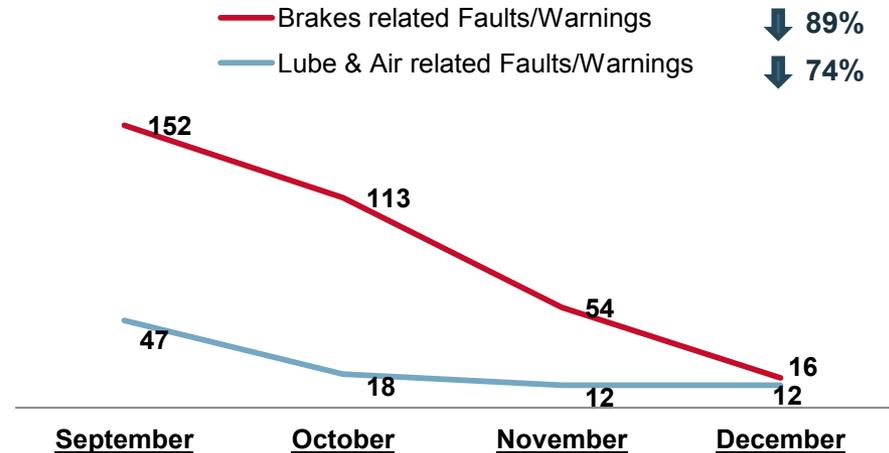
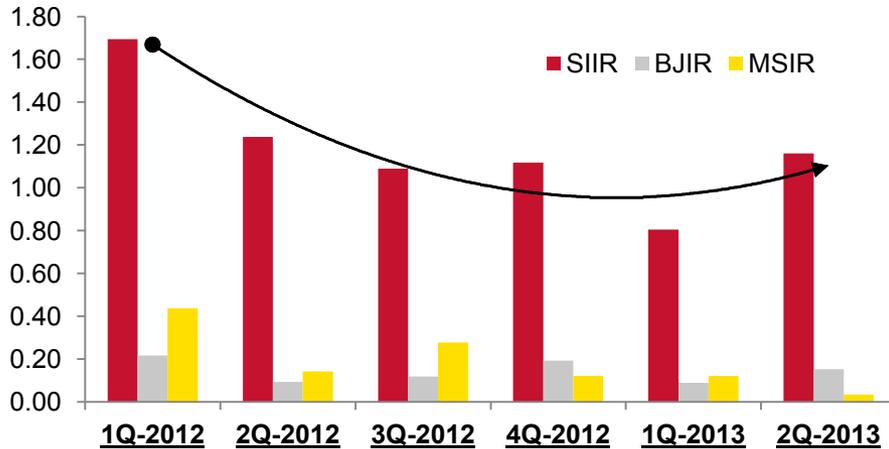


# Part Malfunction Detection

Scenario 3	PreVail Analysis	CBEM Augmentation	Competitive Benefit
AirScrub PlePressure	Trending of the relevant tag and comparative analysis with its behavior on other machines helped identified the issue	A model built on the field investigation, triggered a true positive alert and helped identified a leaky air regulator feeding the manifold	<ul style="list-style-type: none"> <li>Leveraged the globally deployed shovel fleet performance to distinguish between normal vs. abnormal behavior</li> <li>Expert domain knowledge used to quickly direct the field reps to take corrective action.</li> </ul>



# Results - Operational Excellence



Capitalized on Operating Practices Refinement Opportunities

## CUSTOMER ENGAGEMENT MODEL

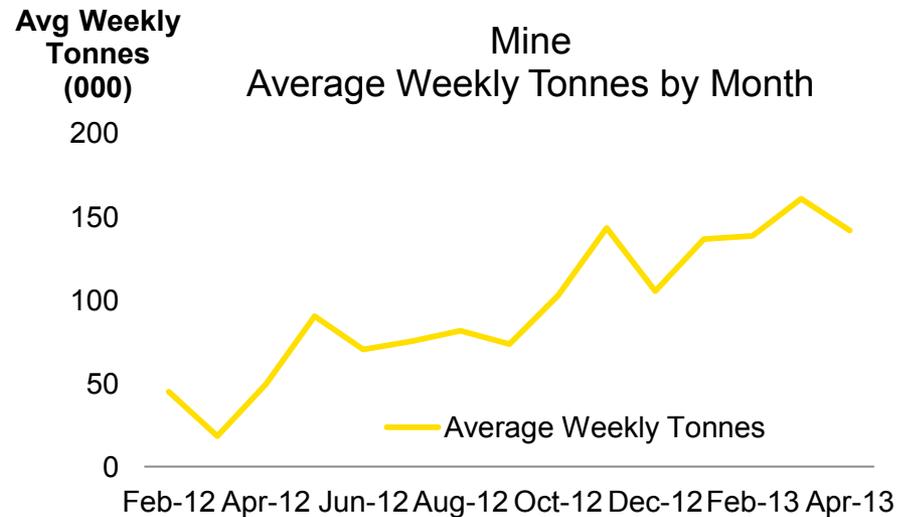
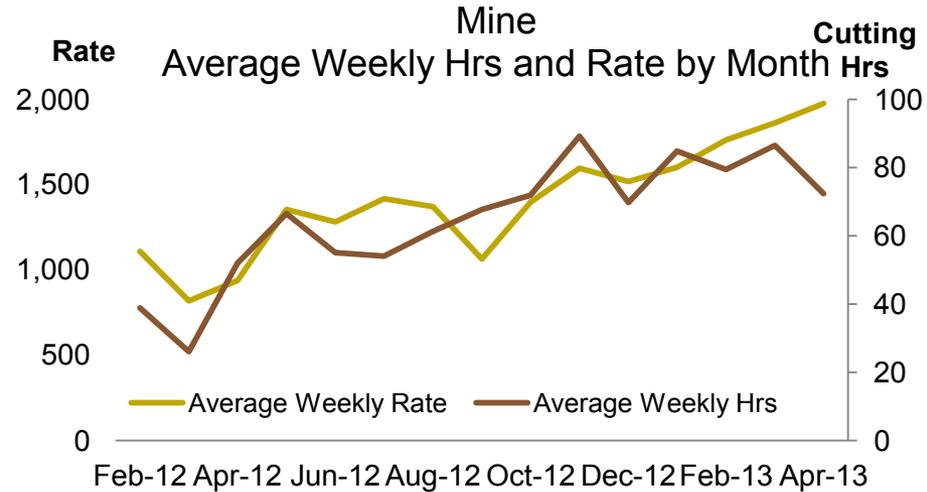
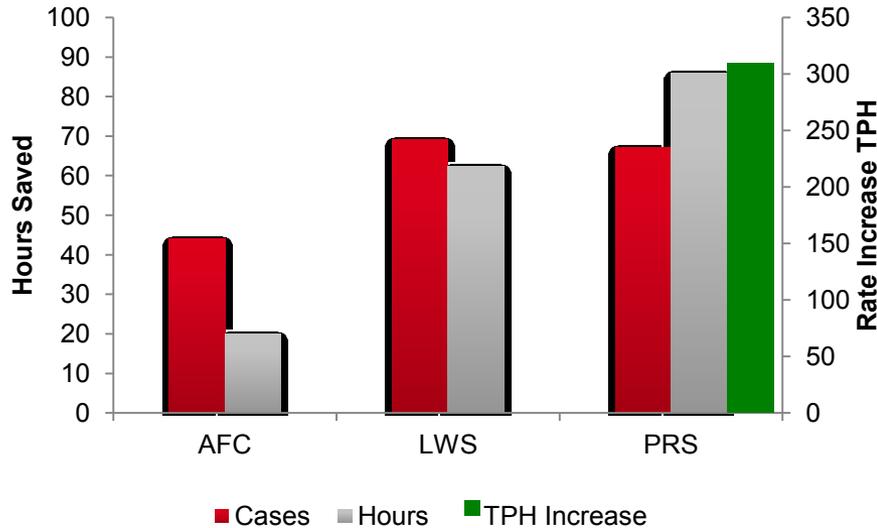


Maintenance Optimization - Faults Reduction Over Last Two Quarters of 2012

Prescriptive & Predictive Data Analysis – *Proactive Data Analysts + CBEM Rules*  
 Machine Knowledge – *Access to SMEs & Engineers*  
 Notification/Reporting – *35 FSNs, 48 Weekly Trackers, 12 Monthly Reports*  
 Recommendations/Corrective Action – *Closing the Loop with the Mine Site and Field Champions*

SIIR = Swing Impacts Index Ratio, BJIR = Boom Jacks Index Ratio, MSIR = Motor Stalls Index Ration, Index Ratio = Counts per Operating Hour, CBEM = Condition Based Equipment Monitoring

# Results - Productivity Improvements



Completed **180 cases**

Saved **168 Hours**

Rate increase **309 Tonnes per Hour**

Value in Tonnes/Year = 1,85 M Tonnes

1,85 MTons \* \$150/Ton = **\$277 M**

Note: Value calculated on 100Hr's per week at 1500Tons per Hour

# Thank You!

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