



Innovations in Machine Reliability
Bring Data and Information to People



Excellence in Condition Monitoring since 1966

New Generation of Analysis Tools

Web-based Infrastructure

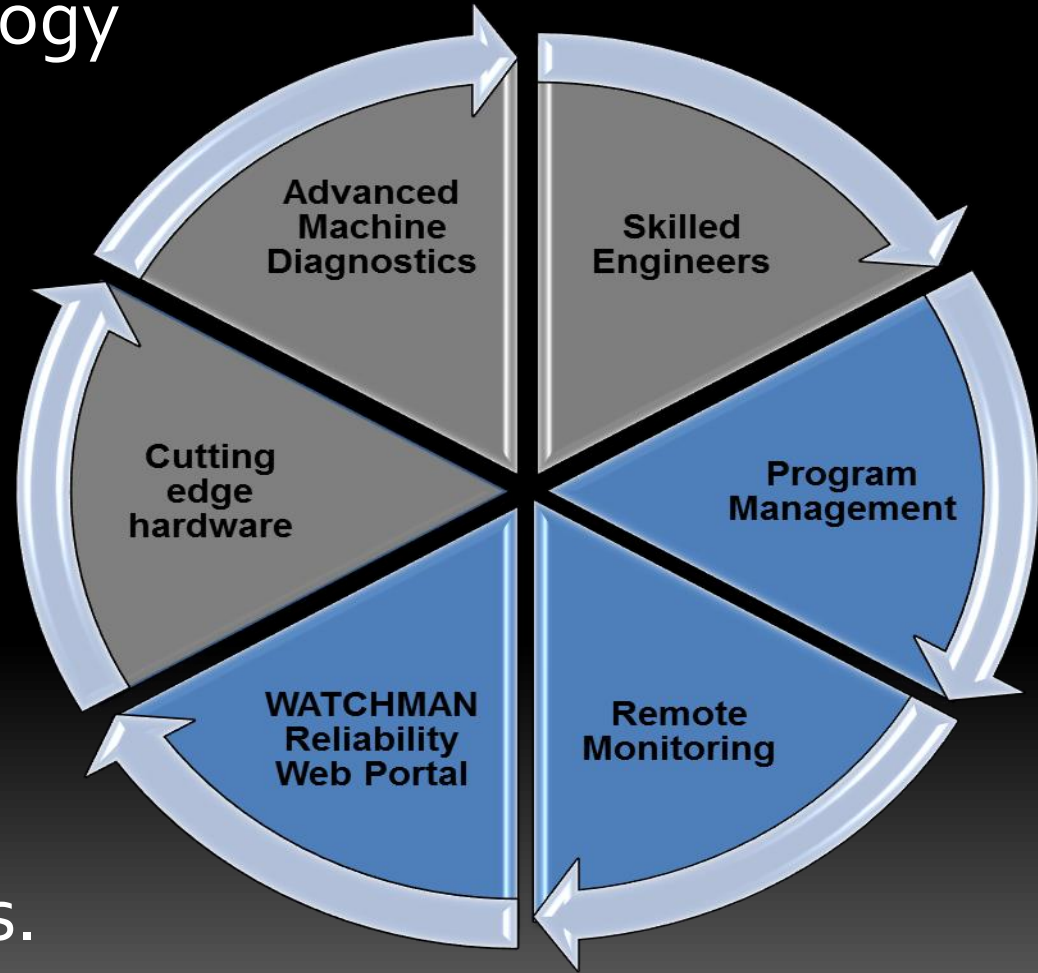
Large Pool of Expert Analysts

Azima DLI Success Model



Bringing Data and Information to People

The Azima DLI methodology has been successfully deployed around the world for over 40 years. It utilizes applied standards and best practices to enable globally diversified, successful CBM programs.

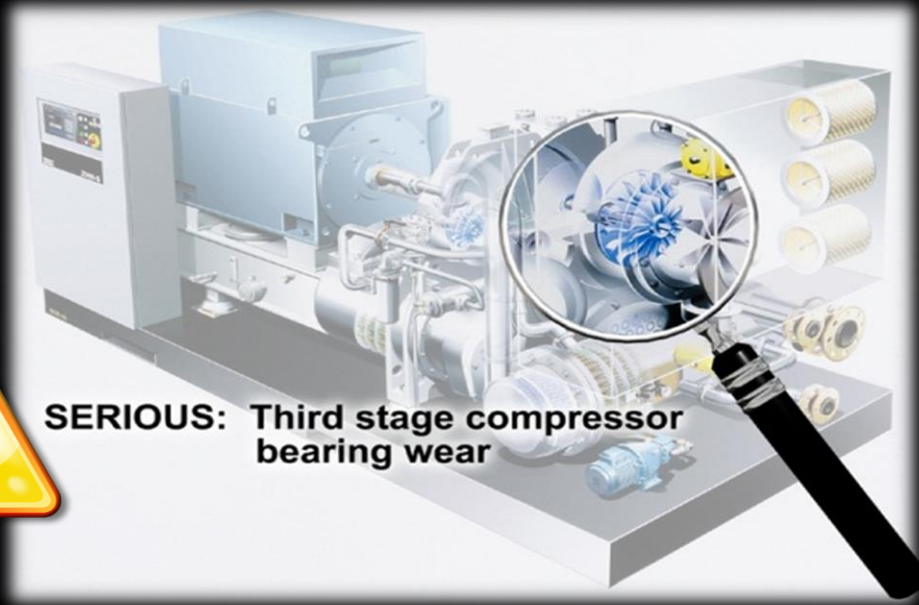




Azima DLI combines state-of-the-art hardware and software technologies along with best practice techniques that ensure the collection of quality, repeatable vibration measurements – manually or online.

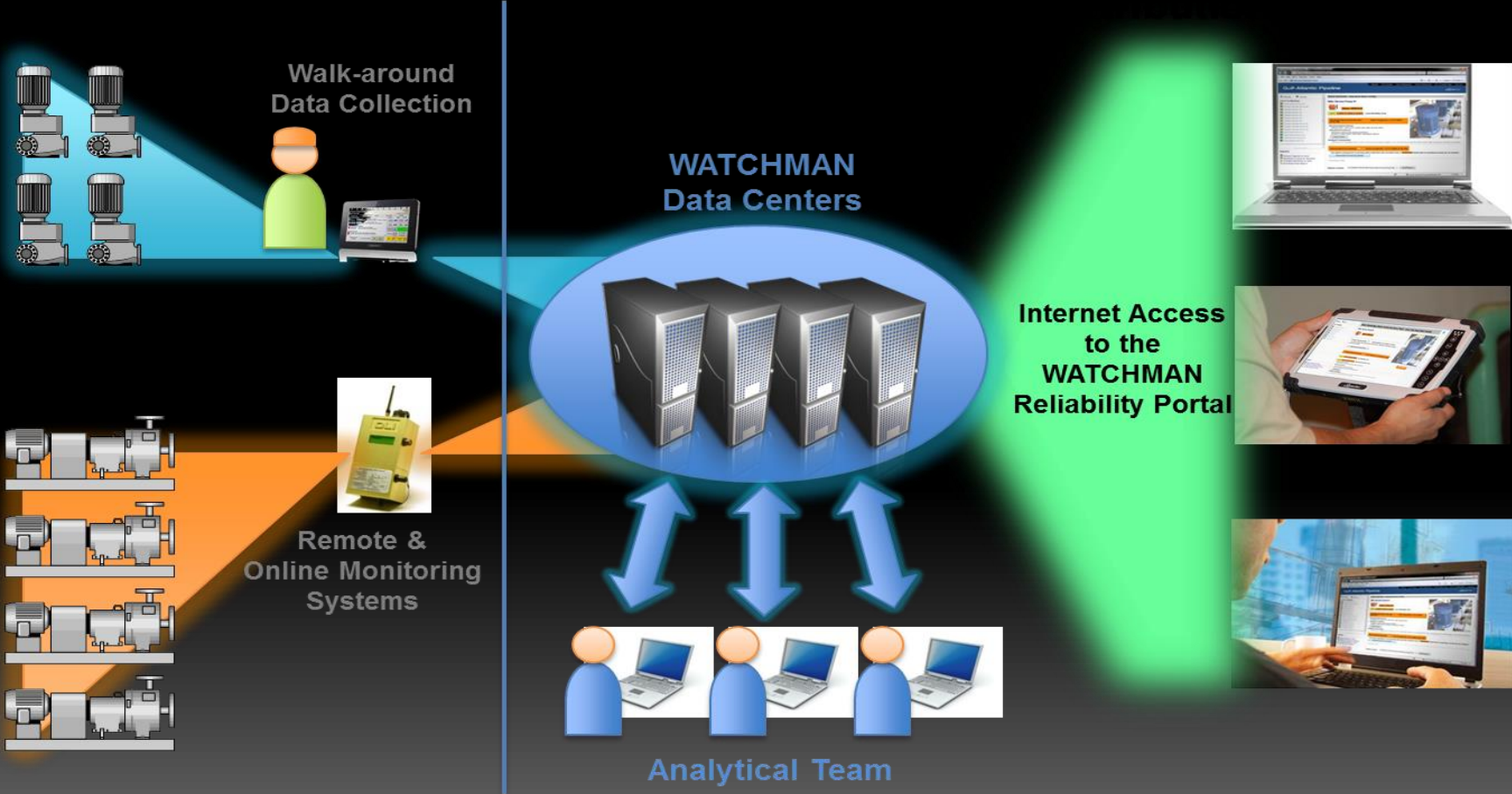


SERIOUS: Third stage compressor bearing wear



ExpertALERT, Azima DLI's automated, diagnostic software accurately detects machine faults so an analyst only needs to focus their time and resources on those machines experiencing problems.

A web-based analysis infrastructure that brings the information to people who need it, when they need it, wherever they are located.



Azima DLI enables a Better Model!



Plant: Power Station - A

Condensate Pump 1
(10LCB11AP001)

 **Status: SERIOUS**

Analysts Reviewed Results
PM
(by Brandon Schaner)

Nov11 Jan12 Feb12 Apr12 Aug12

Nov11 Jan12 Feb12 Apr12 Aug12

Recommended Actions
IMPORTANT: INSPECT SYSTEM FOR DAMAGE

Identified Problems
SERIOUS PUMP CAVITATION OR AIR
[Cited Peaks](#)

Analyst Comments
DIAGNOSIS:
Elevated levels of cavitation are noted in range spectral data. When viewed in Acceleration, waveform data reveals random pump cavitation noise as opposed to bearing noise.
RECOMMENDATION:
Unit should first receive inspection for improperly operating valves / controllers, if issues are present, then physical impeller inspection leading to the cavitation issues currently noted.



Bringing data and information to the people who need it when they need it!

Traditional Model

In-House Program

- Purchased equipment
- Internal training requirements
- Small teams
- Verbal information distribution

Outsourced Program

- Supplier-provided equipment
- Contracted personnel
- Verbal and written report distribution
- Other customer commitments

Depends on bringing people to where the machines are located!

Traditional Model: Challenges

In-House Program

- Costs – Fixed staff & expenses
- Sustainability - Loss of expertise
- Variability in available expertise
- Visibility of information

Outsourced Program

- Travel expense
- Intermittent coverage
- Variability in available expertise
- Limited access to data

The Distributed Model

Brings data and information to the people who need it when they need it!



Data Collection



Execute Corrective Actions



Data Analysis



Program and Plant Management



Plan and Schedule Maintenance

Why a Distributed Model?

- Sustainable expertise
- Increased effectiveness
- Controlled costs



Sustainable Expertise

- Declining population
- Loss of trained personnel
- Steep learning curve for new hires
- Specialization of expertise
- Workload and distribution of experts



Increased Effectiveness

- Focuses on results rather than technology
- Maintains involvement and ownership
- Requires routine inspections
- Employs best practices
- Provides responsive analysis



Controlled Costs

- Scalable expenses
- Predictable coverage
- Reduced vulnerability
- Reduced software and IT support costs



“We have had a successful program for a number of years and I see no reason to change something that is working....”

But What If...

- Your analyst leaves or retires?
- You need to expand your program?
- Your program funding is cut?
- You need new measurement/analysis tools?
- Your corporation wants consistency at all sites?

Reliability Products





Azima DLI introduced the industry's first modular data collection devices.

TRIO's separated tablet controller gives users the ability to routinely upgrade the aging tablet technology and lower the overall cost of ownership.



The heart of the TRIO™ brand of data collection instruments is the **TRIO DP-1 Processor**.

Communicating remotely to the TRIO Controller using Bluetooth® technology, TRIO delivers the **safest** data collectors on the market today.



AZIMADLI



What We Accomplished with the Trio

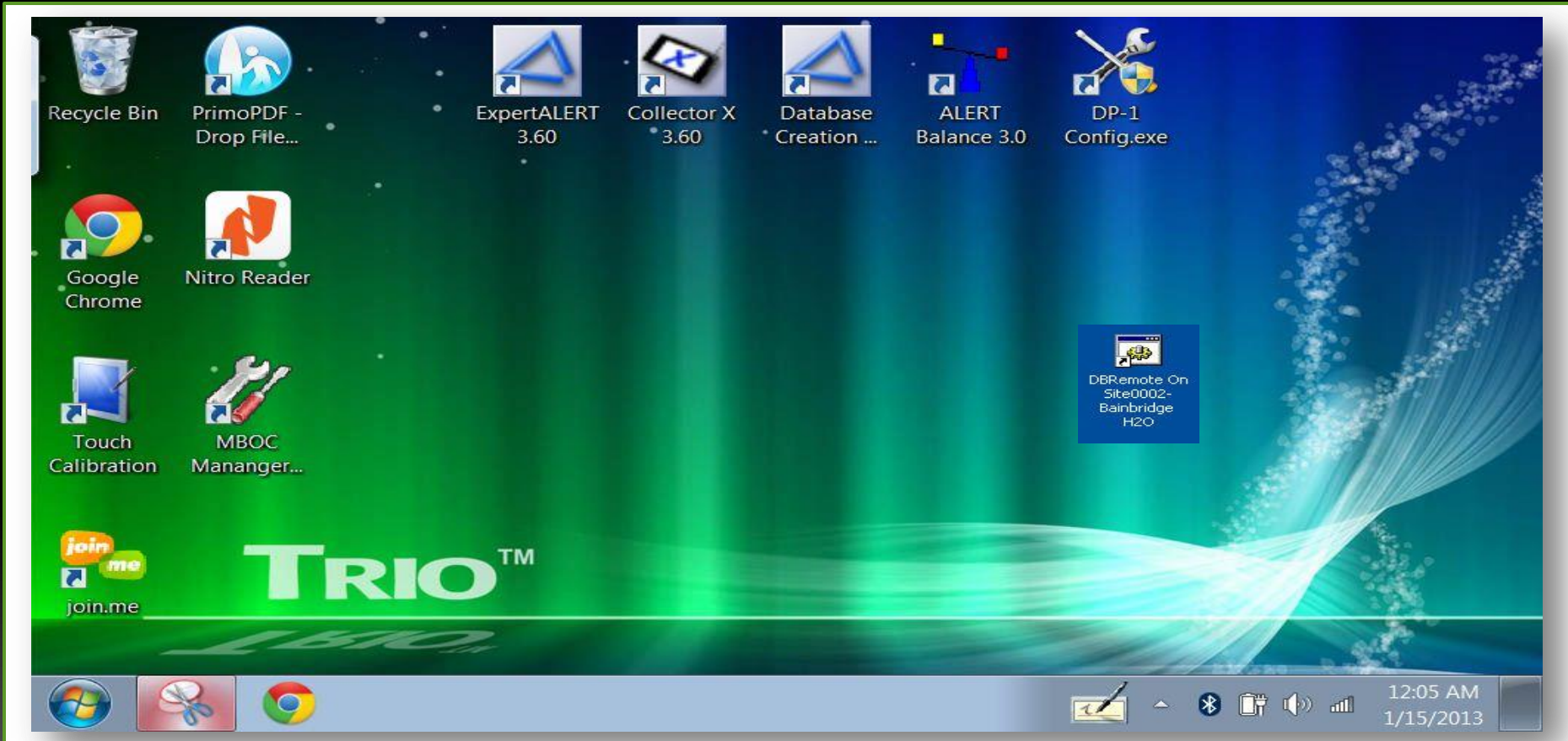
- **Very flexible and expandable product design**
- **Replaces and improves DAQ functionality**
 - Higher frequency range (40kHz)
 - Four signal processing channels
 - Dedicated tachometer with integral control
 - Improved dynamic range (24-bit A/D)
 - Enhanced measurement modes (impact demod, order tracked sampling, new trigger modes, and more to come)
- **Lightweight**
- **Eight hour battery life with extended batteries**
- **Custom tachometer for measuring speed on route**





One size does not fit all. TRIO™ data collectors come in different types and sizes giving users flexibility in choosing the right device that fits their business needs.

Trio Analyzer - Desktop



Trio Navigation Layout

The interface features a top toolbar with the following icons and labels: Start, ID Tag, New Note, New Speed, More Data, Voice, Options, Analysis, Unload, Help, and Exit.

The main header area displays:
Aeration Blower #1
Motor Drive End
1780 RPM (Nominal)
Last tested 9/20/2012 2:52 PM

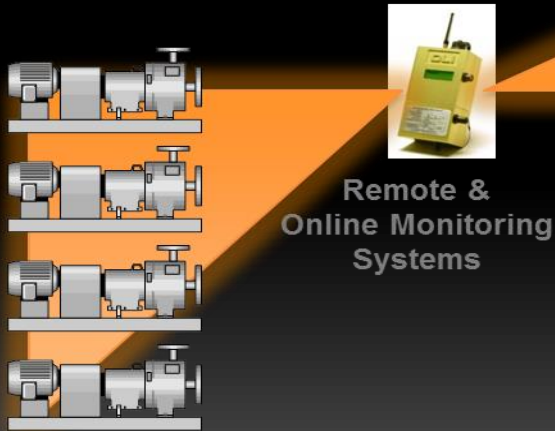
The navigation tabs include: Machine List, **Status**, Picture, Test Setup, and Details.

The **Machine List** shows a tree structure:

- Bainbridge Water Authority Demo Plant
 - Day Road Main Facility
 - Aeration Blower #1**
 - Motor Drive End** (highlighted)
 - Blower Drive End
 - Blower Free End
 - Downtown Service Pump #1
 - Main Service Pump #1
 - Main Service Pump #3
 - Service Pump #1
 - Service Pump #2
 - Example Setup Plant
 - Ken Piety Plant
 - Test Area #123
 - Machine A1
 - MASTER LISTS

The **Details** panel on the right shows:
POS: 2 RAT ID: 23
Buttons: Previous Machine, Next Machine, Stop Test, View Data, Stored Notes, Previous Location, Next Location, and a large green Start Test button.

The bottom right corner shows the date and time: 11/29/2012 1:15 AM.

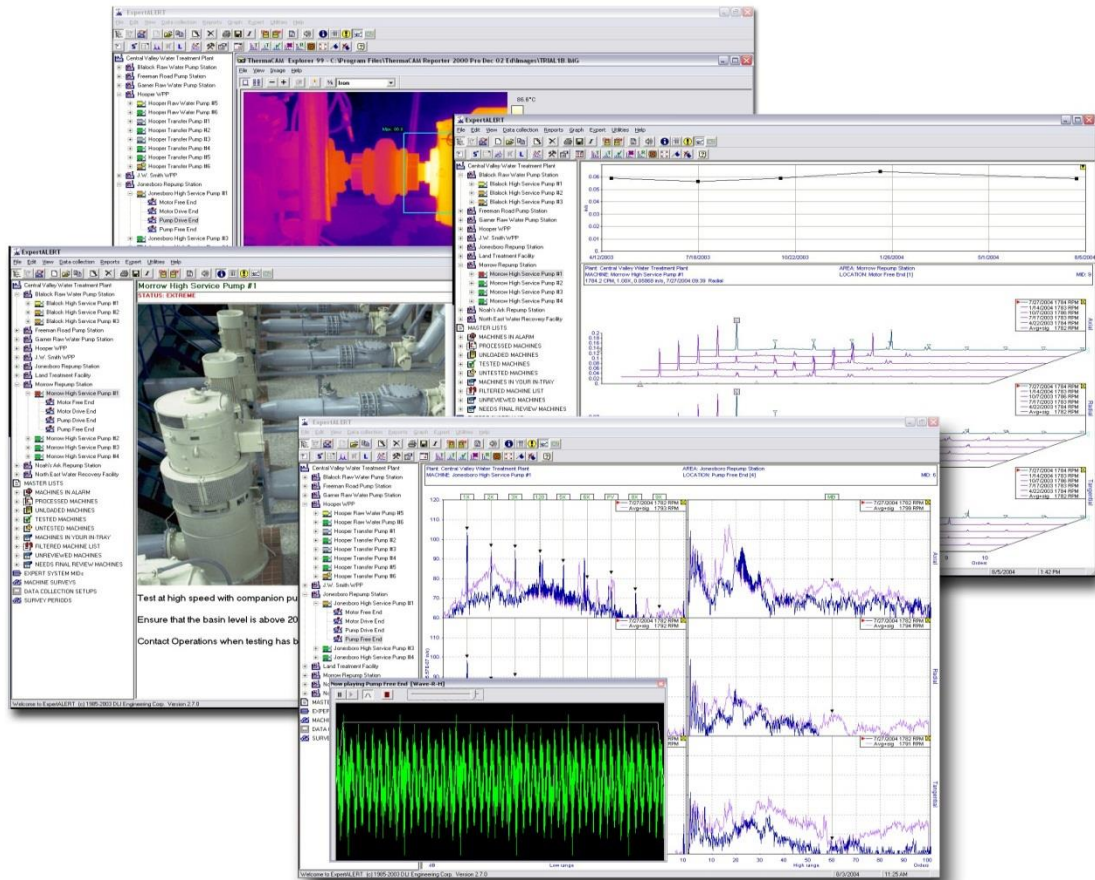


Azima DLI offers a variety of solutions to meet program needs and budgets. From walk-around data collector to fully integrated online systems like the SpriteMAX.

Azima DLI's database infrastructure allows all systems to work together, including process data and multiple technologies.

This gives analysts and reliability engineers a clear picture of equipment health so they can make informed decision.

Azima DLI's
flagship software,
ExpertALERT™, is
the world's only
fully automated
diagnostic software
that delivers plain
language, severity-
scaled solutions to
CBM problems.



With over 4,500 unique rules, ExpertALERT can identify over 650 individual machinery condition faults.

Using a true representation of healthy machine criteria, diagnostic faults are accurate and actionable.



Inter-Dependent Stakeholders

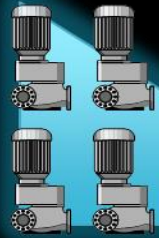
Corporate Management

Plant Management

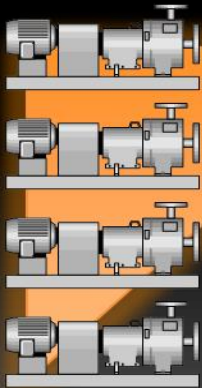
Maintenance Planning and Performance

Data Analysis and Machine
Health Reporting

Data
Collection



Walk-around
Data Collection



Remote &
Online Monitoring
Systems



WATCHMAN
Data Centers



Internet Access
to the
WATCHMAN
Reliability Portal



Analytical Team



All Plants

testintpower




mdemaria

Program View

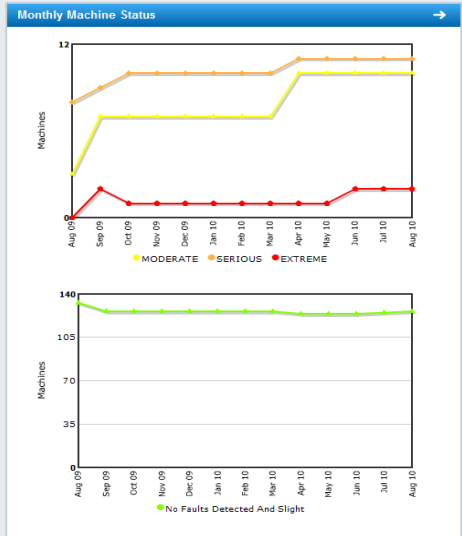
Machines by Severity

Recent Analysis Results

Manual Collection




Extreme	2
Serious	11
Moderate	10
Slight	4
OK	121
Never Tested	62
Total Machines	210



My Watch List

- PM-3400A - Mn Circ Pump A


Milford
Main Plant



Status: **EXTREME**

Date: 9/24/2009 6:02 PM
- 60-P-101


Cambridge
Building 6



Status: **SERIOUS**

Date: 9/9/2009 5:28 PM
- 60-P-102


Cambridge
Building 6



Status: **OK**

Date: 9/9/2009 5:25 PM

Online Collection



Extreme	0
Serious	0
Moderate	0
Slight	0
OK	1
Never Tested	0
Total Machines	1

Data Collection

2	0	1	146
On Schedule	Overdue	>15 Days OD	>30 Days OD

This efficient approach allows results to be quickly distributed to *all* decision makers.

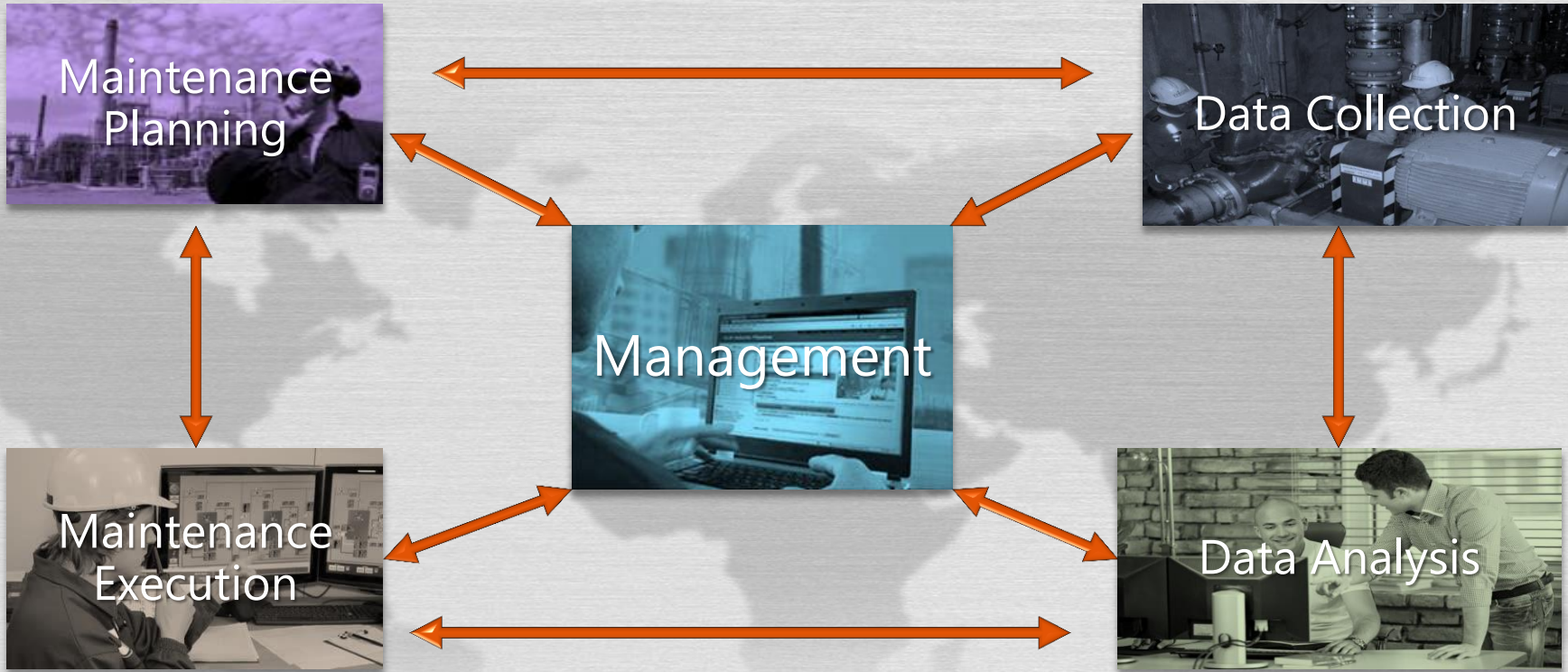
WATCHMAN™ Reliability Services

Azima DLI's WATCHMAN Reliability Portal is a cloud-based solution that hosts and distributes machine health information to geographically disbursed analysts and plant staff.

WATCHMAN™ Reliability Services

It delivers a dashboard of business level metric, risk assessments, and historical information to plant managers and all decision makers. Most importantly, it is powered by the full diagnostic services offered by Azima DLI.

Bi-Directional Communication



Virtualization of Communication

Cloud Computing



Virtualization Benefits

- Centralization
- Collaboration
- Integration
- Transparency
- Communication
- Participation
- Optimization



Azima DLI has a staff of more than 40 seasoned, CBM specialists in a variety of fields of expertise. These analysts are distributed in key areas to offer the level of services expected in today's fortune 500 companies. Azima DLI's deep bench of analysts are highly skilled and experienced



Why Companies Work With Us

- Cost-effective, no Capital expenses
- Sustainable, scalable programs
- Access to world-class expertise
- Proven technology
- Web-based reporting
- High ROI
- Active Program Management



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