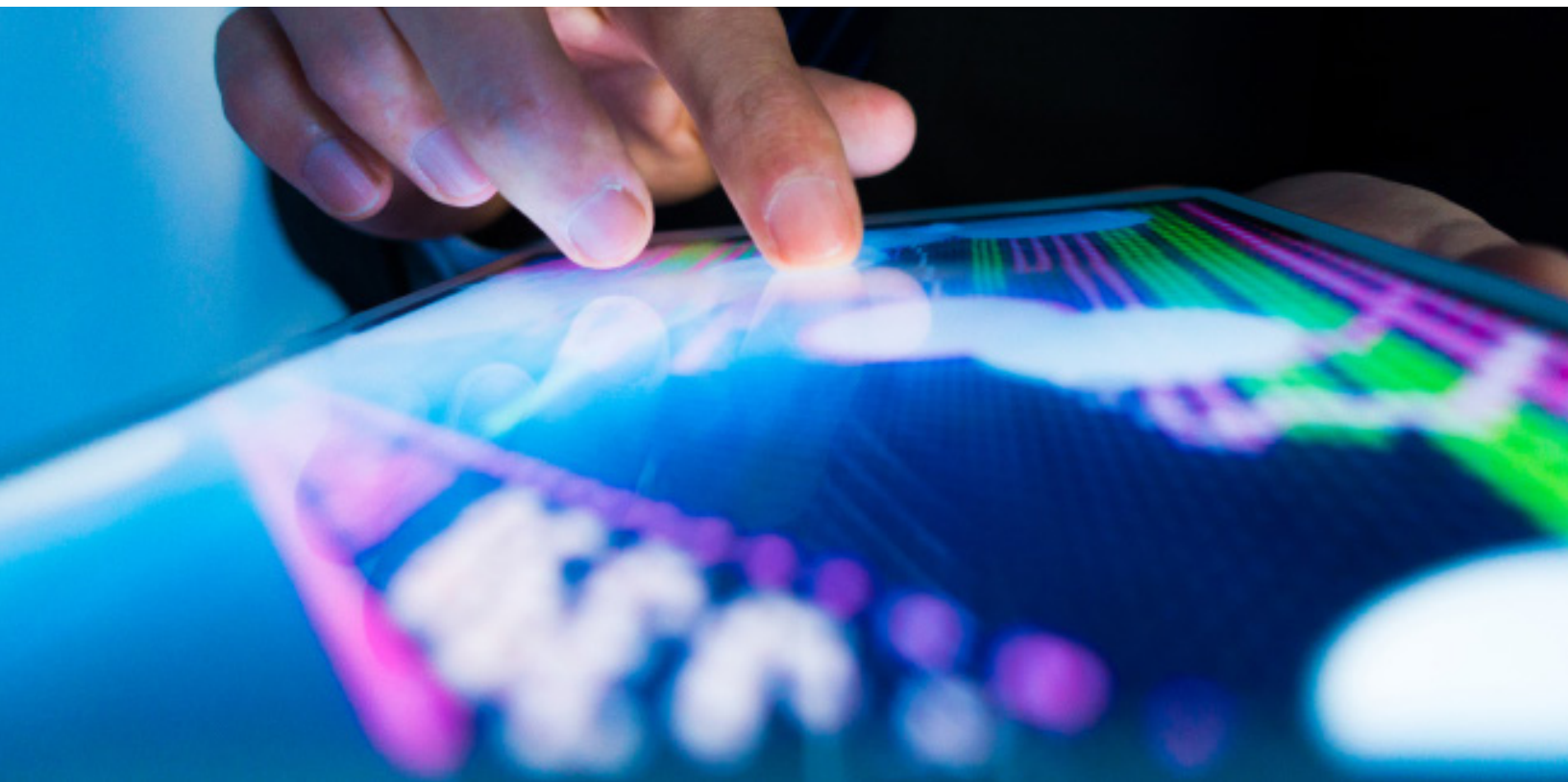





# **MONITORING & DIAGNOSTIC** SOFTWARE + SERVICES

Predictive analytics software combined with remote monitoring services for consultative issue detection, remediation, and planning support.



Operations leaders at power plants and other infrastructure-intensive sites face unprecedented change due to accelerating technological advancement, constant business process innovation, aging infrastructure, shifting workforce demographics, constrained budgets, and regulatory flux.

By adopting a **data-driven approach** to plant operations, leaders can better align their people, processes, and tools to clear, well-defined strategic objectives and performance outcomes.

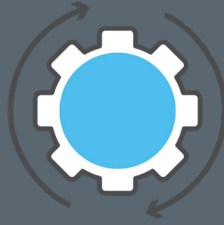
A person is seen from behind, sitting at a desk in a control room or office. They are looking at several computer monitors. The desk has a laptop, a mouse, and some papers. The scene is overlaid with a semi-transparent digital interface featuring glowing lines, nodes, and data charts. A purple text box is positioned in the upper right area of the image.

Atonix Digital Monitoring & Diagnostics software works with and facilitates the M&D process.



## People

- Technical experts assigned to your operations, including monitoring center staff & engineering subject matter experts.



## Process

- Robust monitoring & evaluation process.
- Issue escalation process.
- Issue lifecycle management delivery.



## Tools

- Advanced pattern recognition alerts.
- Issues tracking and management.
- Advanced asset performance calculations.



“Getting the right information to the right people at the right time.”

## GROWING COMPLEXITY DEMANDS PROCESS INNOVATION.

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- **VOLATILE AND DYNAMIC MARKET:** Frequent changes in political, economic and regulatory climates create market uncertainty. This uncertainty has forced operators to shift from long-term to short-term asset ROI strategies.
- **GROWING RELIANCE ON GAS AND RENEWABLES:** Increasing use of natural gas, solar, and wind energy sources exposes baseload plants to unforeseen stresses. Designed to run constantly at high output levels, baseload plants are now being subjected to such suboptimal conditions as using lower-quality fuel and running at production levels well below rated minimums.
- **INEFFECTIVE AND OUTDATED PROCESSES:** Industry maintenance practices depend heavily on schedule-based approaches. This leaves plants vulnerable to failures unrelated to equipment age, such as manufacturing defects and human error.
- **PRODUCTIVITY LOSS:** Operators often discover problems only after a failure occurs, too late to head off productivity loss, downtime, crisis-mode reactions and unplanned outages.

“ Only **18 percent** of assets have a failure pattern that increases with use or age. This means that ‘preventive maintenance’ alone is not enough to avoid failure in the other **82 percent** of assets and a more advanced approach is required. ”

*ARC Advisory Group, Proactive Asset Management with IIOT and Analytics*





Plant operators must rigorously manage downtime and ensure availability from their aging assets. Growing reliance on natural gas and renewable energy sources can strain baseload equipment optimized for continuous, high-production operation. Preventable failures hurt overall plant efficiency.

Fortunately, data-driven insights can streamline daily operations – from early detection to root cause analysis and programmatic remediation – and measurably improve reliability and efficiency. Comprehensive asset management solutions help plant managers shift operations models from reactive to predictive, reduce the risk of forced outages, and ultimately extend the life of their infrastructure assets.

Through a combination of software-based analytics and consultative monitoring & diagnostics services, organizations can reduce costs, minimize risk, increase service reliability, and improve customer satisfaction.

### EXPERT-ASSISTED CONDITION-BASED MAINTENANCE.

Black & Veatch's Remote Monitoring & Diagnostics Services deliver engineering knowledge and domain expertise built up over 25+ years of experience supporting and improving operations for power plants and other utility, industrial, and commercial sites. Backed by our hands-on and collaborative services, our clients have realized over \$132M in risk-weighted savings across a variety of coal-fired, combined-cycle, and renewable-source power plants.

A central component of these services, **Atonix Digital™ Monitoring & Diagnostics (M&D)**, powered by ASSET360®, is a cloud-based data analytics software product designed by Black & Veatch engineers to help organizations in energy, utilities, and other industries streamline and improve operations. Purpose-built for complex infrastructures, M&D collects myriad sensor, device, and subsystem data; applies machine learning to benchmark healthy asset behavior patterns; alerts operations personnel of anomalies; and streamlines problem isolation and diagnosis.



## Better Together Software + Services

- ✓ **\$132M+**  
\*cost savings
- ✓ **15,000+**  
\*issues diagnosed
- ✓ **25,800+**  
\*assets monitored
- ✓ **25+**  
years of performance monitoring expertise
- ✓ **30+**  
technical M&D experts on staff
- ✓ **1000+**  
subject matter experts

\*As of June 2019.



"Between Atonix Digital's ASSET360 platform and Black & Veatch's Remote Monitoring Service, our benefits many times exceed the cost of the solution."

*Robert Hager | Senior Mechanical Engineer, Great River Energy*

## **A DATA-DRIVEN APPROACH TO MANAGING ASSETS.**

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Black & Veatch's Remote Monitoring & Diagnostics Services have benefited over 150 generating units, representing over 50,000 MW of power generation capacity. Adaptable and consultative, the Remote Monitoring service model produces repeatable, successful processes across a variety of plant sizes and environments. Key features include:

- **COMPREHENSIVE COVERAGE:** Our Remote Monitoring & Diagnostics services ensure that plant operations teams detect, assess, and resolve reliability, performance and efficiency issues early and quickly.
- **24-HOUR STAFFING:** With Remote Monitoring & Diagnostics centers in the United States and India, we monitor plants and operations 24 hrs a day, 5 days a week.
- **ALERT SCREENING AND DIAGNOSTICS PROCESS:** Our team of more than 30 engineers collaborate actively with plant operations teams to flag performance anomalies, recommend investigative actions, and formulate both immediate remediation measures and long-term strategies to mitigate risk and cost.
- **TAILORED COMMUNICATION PROCEDURES:** To maximize solution adoption and effectiveness, we assign a team of two experienced engineers to each Remote Monitoring & Diagnostics client. These engineers devise standard procedures for engaging key client engineering, operation, and maintenance personnel.
- **CORE TEAM MEETINGS:** We schedule regular meetings with client core teams to conduct detailed operations reviews, assist in resolving complex issues, and consult in strategic planning and investment decision making.