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### Critical Issues

Public and private organizations that rely heavily upon pumps and rotating equipment for their operations face similar critical issues which demand solutions. One issue—the need for improved plant reliability and availability—is key to both public utilities providing water, wastewater, gas or electric services to local constituencies, and publicly traded corporations with processing and distribution operations around the world.

By increasing plant reliability and availability, organizations can meet many of their business objectives and address a number of challenges facing their industries. In particular, utilities are increasingly expected to meet commitments to customers while maintaining system integrity and operating within changing regulations. Global processing and distribution industries must cope with increasing raw materials costs and aging equipment while quickly responding to marketplace demands.

In both sectors, unless pumps, compressors, turbines and other crucial plant assets are properly managed, organizations can't fully exploit their expensive capital investments by maximizing performance and reducing plant vulnerability to unscheduled shutdowns and maintenance. A shrinking skilled workforce makes this increasingly difficult. Existing plant personnel must work smarter and more efficiently.

### Current Trends

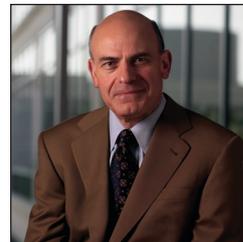
Predictive technology, supported by proper business practices, makes improved plant reliability and availability possible. Intelligent devices installed throughout the plant can collect real-time data about the health of turbomachinery and plant-wide mechanical equipment and details on temperature, pressure, flow and other process operations.

This field intelligence helps predict bearings faults, oil instabilities, cracked shafts, rubs, metal fatigue cracks or other issues before they occur. Actionable information is delivered to both maintenance and operations personnel, allowing them to anticipate and resolve process and equipment issues that may lead to component failure, process upsets and unscheduled plant shutdowns.

Plant events become more predictable and controllable with the use of these digital field devices. In turn, managers are better able to prioritize maintenance activities and plan purchases of pumps and other critical rotating equipment. When operations need to be halted, predictive intelligence enables operators to complete the orderly shutdown of complete units while protecting assets, avoiding environmental releases, and ensuring human safety.

When managers and staff have a better handle on the capabilities and potential problems, they can alter operations and maximize production as needed to supply customer demands and respond to marketplace opportunities.

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### Technologies Offering the Most Competitive Impact

Wireless technology expands a facility's predictive monitoring capabilities. Organizations have used vendor-specific wireless vibration monitoring for more than a decade, and field workers have had remote access to computerized maintenance and management systems. But today an open standards-based field wireless infrastructure—what could be considered a disruptive technology due to its high potential for positive business change—makes improved plant reliability and availability attainable by reducing monitoring costs and increasing data collection.

Plant assets previously unmonitored can now be fitted with wireless transmitters. These devices send data around concrete walls and other obstructions to communicate seamlessly with facility control systems through a Time Synchronized Mesh Protocol communications technology. In most cases, the devices are providing rich, reliable data within a few hours of installation. As transmitters are added or removed at the plant, the self-organizing network automatically adapts.

This innovative technology has been extensively tested in real-world environments. At a West Virginia steel mill, wireless water flowmeters installed on spraying equipment deliver information to operators about water volume, replacing employee guesswork with a decision-making process based on hard data. As a result, staff can precisely control water flow during steel cooling, making the process more reliable and improving product quality.

This example illustrates one way, among many, in which wireless technology allows management to empower their workforce to be more effective and efficient daily. This has never been more important as organizations face a shrinking pool of experienced, knowledgeable people. Wireless expands the “eyes and ears” within the plant, eliminating the need to monitor hard-to-reach assets manually and sometimes under dangerous conditions. A wireless network provides predictive intelligence to employees, allowing them to ramp up operations quickly at new plants and expanded facilities by making better decisions that protect facility assets and maximize their use.

Organizations that rely heavily upon pumps and other rotating equipment should look to predictive technology—fully expanded through wireless networks—as the means to attain improved plant reliability and availability. With the implementation of this smart technology, both public and private sector organizations can meet today's challenges to achieve their business goals.