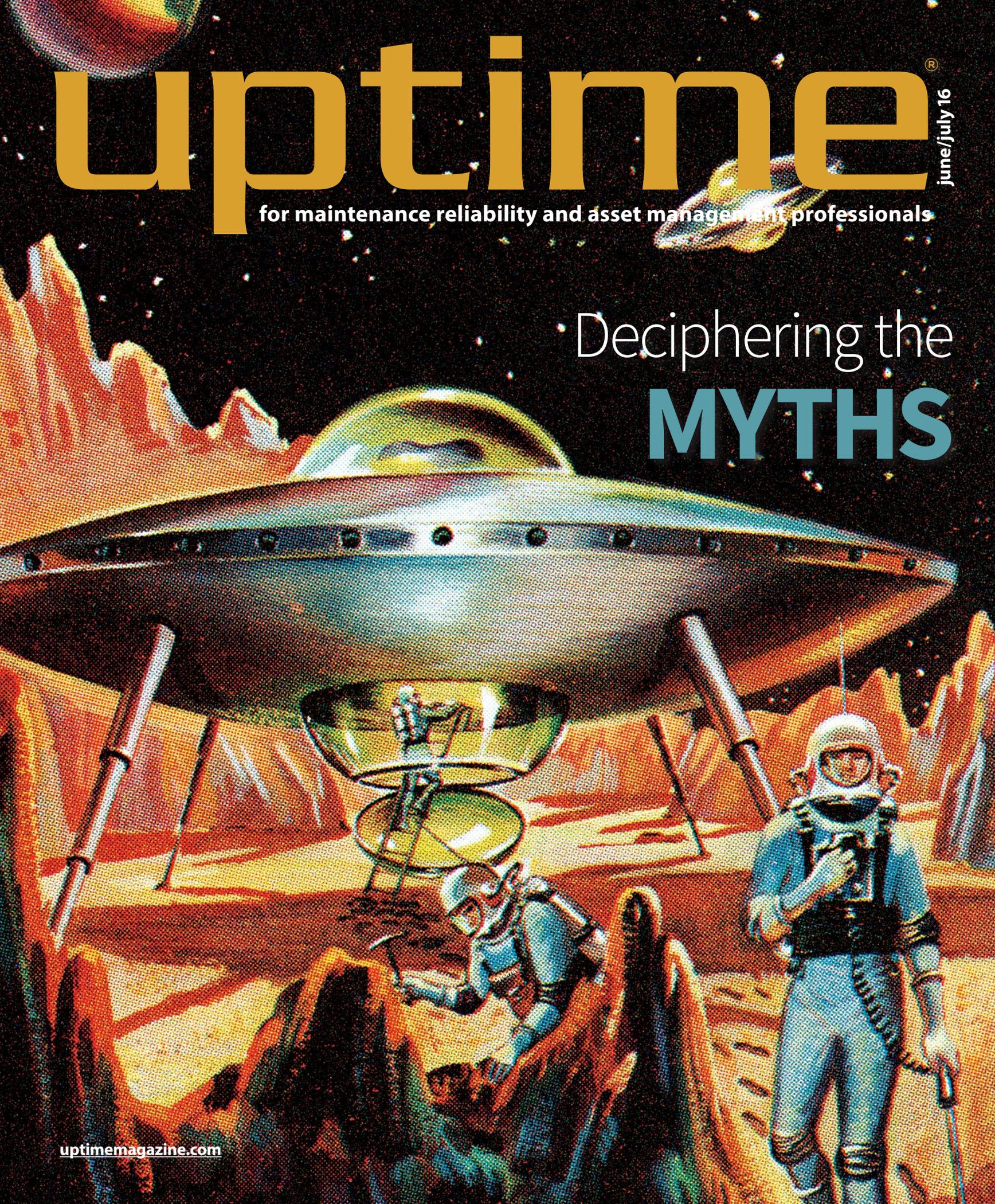


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# Remote Monitoring and Diagnostics:

Manufacturing's  
Version of  
the Armchair  
Quarterback



by Chad Stoecker

In any industrial environment, and particularly those with geographically distributed and remote assets and operations, reliable monitoring can be a challenge. Catastrophic equipment failure can occur without warning and, in some cases, go for long amounts of time without being noticed. The oil and gas industry, among other industries, was quick to recognize the benefits of remote monitoring and diagnostics (RM&D), as oil and gas companies have very expensive equipment deployed in disparate locations around the world. These difficult operating conditions make topflight monitoring and diagnostics systems crucial to ensuring that workflow operations can continue without interruption.

With remote asset monitoring, organizations are able to source valuable operations data, leading to valuable insights to drive informed decisions and better manage desired outcomes. The more workflow data a company can capture and analyze, the better it can understand its system and equipment performance and identify areas for improvement.

Here are a few real-life examples of how implementing a RM&D solution makes industrial organizations more efficient with better resource allocation and avoided downtime.

### Wise Resource Allocation

In today's economic environment, with industries like oil and gas facing particular pressures, facility performance and reliability have never been more critical. No business can afford the interruptions in productivity when a piece of equipment or system goes down. Constant on-site monitoring of a facility's oil and gas workflows naturally drains valuable manpower resources, leaving fewer workers available to focus on the core business.

Off-site or remote asset monitoring increases overall efficiency by saving time and reducing expenditures so organizations can put their valuable resources elsewhere. In many circumstances, on-site staff may be limited, but RM&D allows organizations to automatically receive information on all assets, such as patches, updates and equipment upgrades, with less legwork. Workflow databases are consistently updated and important business applications are continually tracked without the need for 24/7 manual processing.

### Catching Problems Before They Occur

Outside of scheduled maintenance, which at best is an estimate of when maintenance should actually occur, operators generally are only able to diagnose and resolve problems after there has been a failure. Now, RM&D platforms with predictive analytics, driven by the connected machines of the Industrial Internet of Things (IIoT), allow operators to see when their assets will fail before they actually do. Asset diagnostic technology is

able to rapidly convert vast amounts of raw data into actionable intelligence for operators by automatically identifying anomalies. This simplifies the often overwhelming amount of data sets being streamed from equipment and alerts staff to potential failure.

For example, a team was running RM&D for a gas customer when an increase in the primary seal gas inlet flow to the drive end on a reinjection compressor was detected. Over the course of 60 days, consistent monitoring of the seal supply flow to the drive end showed a steady increase. After alerting the customer to the increase, the team inspected the valves that control the inlet

flow to the high pressure stage drive end seals. It was determined that a valve was abnormal due to a faulty response signal from the valve positioner. But as a result of early notification, along with daily monitoring and regular updates, the customer was able to review the seal gas control system and identify the inlet flow control valve requiring calibration and testing. After making an adjustment to the valve, the inlet flow returned to a normal operational range, saving the customer approximately \$360,000 in avoided downtime.

Predictive maintenance also can be custom designed for a company's specific system, built from regular observation and recordkeeping that can reveal trends and uncover anomalies. For instance, when equipment is commissioned, a facility may create a pump health log to use as a baseline for alarms and required maintenance triggers during the lifetime of the system. This dashboard allows an organization to spot trends and identify unusual operations that could create problems in the future, so it can adjust its overall maintenance schedule accordingly and maximize its workflow uptime.

### A Holistic View

Asset managers use a variety of software tools and systems to do their jobs, often working with the same or related data, but at off-site locations. Asset diagnostics systems automatically filter workflow data and allow industry operators to monitor all systems in one view, regardless of location. This integration also extends to workflows that include multiple users in their execution and allows workers to perform this process on their own. Employees are now armed with a holistic snapshot of operations at all times, empowering them to make better, more informed decisions, 24/7.

For example, a customer needed to monitor a remote engine using a 360 degree, holistic view of all the engine data. A decrease in firing temperature was noticed and the customer was alerted to this discrepancy. Due to the early notification, the customer scheduled a planned maintenance trip to the remote platform to inspect the engine. After inspection, the maintenance technician replaced the spark plugs and was able to return the engine to a normal combustion pattern before serious damage was done.

RM&D platforms' holistic view of data from various databases is crucial to ensuring that process and manufacturing plants, often some of the

## No business can afford the interruptions in productivity when a piece of equipment or system goes down

most dangerous work environments, are safe for workers. With direct access to data, ranging from material safety data to real-time equipment and environmental monitoring, workers are armed with the information they need to ensure safety for themselves and their colleagues.

### Conclusion

These examples show how RM&D technology platforms have turned from a "nice to have" to a "must-have" for industrial companies to remain competitive and safe. Complete automation of data collection and data analysis ensures the seamless execution of machine maintenance, regardless of location, increasing the uptime of operations.

RM&D platforms continue to prevent millions of dollars in lost productivity by identifying issues before they occur, keeping systems online and helping organizations more efficiently allocate internal resources in an increasingly competitive digital and global economy.



**Chad Stoecker** is a Manager at the Industrial Performance & Reliability Center of GE Digital, where he oversees a global team of customer reliability engineers to deliver a high value monitoring solution to power, oil and gas, mining and aviation clients. Mr. Stoecker, an accomplished engineering professional with over 10 years in the automation and asset monitoring industries, holds a Master's Degree in Mechanical Engineering from Oklahoma State University. [www.geautomation.com/products/industrial-performance-reliability-center](http://www.geautomation.com/products/industrial-performance-reliability-center)

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