



SOLVE & EVOLVE

How Asset Performance Management (APM) enables mining operators to solve the challenges they face today while evolving their organization for tomorrow.



GE VERNOVA

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THE MINING SECTOR STANDS AT A CROSSROADS.

On the one hand, the industry needs to find ways to improve how it operates today. This means finding better ways to avoid outages, meet demand, and increase availability — all while navigating financial uncertainty and maintaining safety.

On the other hand, mining organizations need to look to the future and consider how they'll ensure sustainable value and maintain profitability while supporting the energy transition with natural resources.

APM

With asset performance management (APM) software from GE Vernova, all of this becomes easier. Read on to learn how APM can help operators balance priorities and work toward a greener future.

The solution lies in effective asset management.

But in such an asset-intensive industry, finding a solution that works for all your assets is a minefield.

It's no wonder that many organizations have opted to build homegrown asset management solutions. While this may seem like a logical choice, many of these solutions aren't built to scale and evolve as your organization's needs change.

You need to find an asset performance management (APM) solution that helps you solve your challenges of today while enabling you to evolve your operations for tomorrow.

The Solution: **APM**

5 ways APM can help mining operators solve and evolve.

Asset Performance Management (APM) from GE Vernova is a suite of solutions designed to help optimize asset performance and operations and maintenance (O&M) efficiency across equipment, the plant, and the entire fleet.



APM is OEM-agnostic, working with any asset on any OEM. The suite contains five specialized solutions, which can be used alone or together in any combination:

APM Strategy:

uses a risk-based approach to analyze assets, helping you develop and manage strategies.

APM Health:

provides a clear view of the condition of your assets, including performance data and alerts.

APM Reliability:

delivers insight into asset performance, predictability, and trends to aid root cause analysis and ongoing improvements.

APM Integrity:

enables operators to reduce risk, lower inspection costs, and ensure compliance of assets.

APM Safety:

allows users to identify and mitigate process safety hazards, manage critical safety instrumentation, and manage equipment and process changes that can increase safety risk.



5 WAYS

TO SOLVE AND EVOLVE WITH APM

01

FROM REACTIVE TO PREDICTIVE MAINTENANCE:

Managing risk and reducing safety-related events is a key responsibility for operators. By using APM to shift from reactive to predictive maintenance, your operators will be able to conduct maintenance activities at the most effective time. This reduces the risk of equipment failure, avoids the cost of unscheduled maintenance, and improves the overall efficiency of assets.

02

UTILIZE AI/ML THROUGH DIGITAL TWINS:

By embracing new technology, mining operators can transform their O&M strategy. With digital twins, operators can use AI and ML to visualize their assets and their condition in a secure environment.

With this insight, O&M planning can be less about guesswork — and more about prediction. So far, APM customers have saved over \$1.5bn on O&M costs by using digital twins.

These results will only improve as APM is extended into monitoring haul trucks, conveyor belts, and other assets responsible for moving materials.

03

OPTIMIZING OUTPUT:

Downtime — especially unnecessary downtime — is a huge barrier to productivity. APM helps you reduce downtime and optimize output by only dispatching maintenance teams when they're needed. Taking a condition-based approach to maintenance reduces wasted resources and manpower.

APM also enables operators to improve yield by identifying performance gaps and anticipating failure. Condition-based maintenance even helps teams increase efficiency and reduce

04

HOW APM ENABLES EVOLUTION:

With APM, mining organizations can access the tools they need to future-proof themselves and build a more profitable and sustainable world:



Monitoring capabilities



Productivity optimization



Risk management



Predictive maintenance



Root cause analysis



Compliance management



Failure elimination

These tools also help operators retain and pass on industry knowledge which can be hard baked into new processes, powered by APM.

05

HOW APM PROVIDES VALUE:

By using APM, enterprises are realizing end-to-end value:

\$4 MILLION

Amount saved by an early warning of a deviation on a compressor at a mining site.

16 HOURS

Amount of downtime avoided by identifying a gearbox deviation on a bucket wheel reclaimer.

\$800,000

Production loss avoided by discovering a failing drive motor within a water recirculation pump.

\$1.3 MILLION

Cost saved by discovering damage on the shell of a cone crusher that could seize the main shaft.

OPERATIONAL EXCELLENCE:

A Glimpse into the Future of Mining



HOW PRIORITIZING PRODUCTIVITY SEPARATES SUCCESS FROM FAILURE.

A 2022 productivity index by McKinsey shows that mining trails manufacturing and business services for their rates of productivity (and has done for decades).

The ten largest manufacturing and business services companies have seen their productivity index grow between 15% and 25% in the last 25 years, but mining has only seen 1% growth in that time.

The Case for 'Operational Excellence'

For businesses to overcome these challenges, they need to integrate a culture of operational excellence.

According to McKinsey, operational excellence is considered a 'gold standard' framework with a host of long-lasting benefits, including cost optimization, and safety and sustainability improvements — fundamental to the mining industry.

Forbes considers operational excellence an overarching strategy to drive productivity, 'improving reliability and reducing risks and variations'. For a successful operational excellence program, your approach needs to align with your business strategy and values, considering where you are versus where you hope to be.

Support with Software

APM can act as a catalyst for attaining operational excellence. With APM and its intelligent asset strategies, you can analyze how well your assets are performing, avoid the costs of downtime, meet demand, lower risks, and increase productivity. Condition-based health data analysis of your infrastructure can identify what is performing at a sub-par level, and what you can optimize in your mining operations.

With the APM suite, you can connect the four pillars listed above- the people integral to your mining operations, the resources you have access to, how much use you get out of them, and how to boost your profit. You can prioritize your overall investment allocation into your asset strategies and mitigate costly issues and outages with a contingent plan.

By prioritizing operational excellence through APM, you can empower your team and reap the benefits of increased productivity.

ACHIEVING EXCELLENCE

To achieve operational excellence, focus on:

Who you have:

Providing training and coaching for your workers, encouraging constant improvement, and enhancing capabilities.

What you use:

Maximizing the value you can gain from the physical and digital assets you use on a day-to-day basis, ensuring you're getting the most from your equipment and infrastructure from both an operational and financial standpoint.

How you use it:

Implementing innovative methods based on mining principles and those from other industries that will allow for increased efficiency, minimized waste, and streamlined workflows.

What you want to gain:

Optimizing your finances in all ways possible. This includes reviewing your marketing and sales strategies, generating sustainable revenue streams, and finding methods to enhance profitability.



Case Study:



HOW A METALS COMPANY ACHIEVED 93% AVAILABILITY.

A major producer of large-diameter pipes and railroad wheels needed to decrease unplanned outages while overcoming low-level maturity in reliability management.

To do this, it would need to define and analyze 123 different systems — no small feat.

THE SOLUTION

To tackle these challenges, the producer chose GE Vernova's APM suite. They implemented APM with a strategy that unified people, sensors, assets, strategies, and processes.

RESULTS

91.25%

Meeting the target of 91.25% mechanical asset availability for a large-diameter pipe pilot plant.

93%

Raising availability to 93% through dashboards that simplified the process of identifying bad actors.

12

 hours
per
month

System reliability was improved by over 12 hours per month — saving millions.



HOW APM RELIABILITY SAVED ONE ORGANIZATION \$4 MILLION.

THE CATCH

GE Vernova's Industrial Managed Services (IMS) was able to identify a deviation on a compressor at a mining site using Digital Twins within APM. Specifically, the compressor showed the cooling water supply pressure had dropped from 200kPa (29psi) to 120kPa (17.4psi). This was a problem that needed investigating.

THE RESPONSE

The IMS team sent out a high-priority notification and added this item to the weekly report for discussion with the customer.

After the alert, the customer discovered that the non-return valve (NRV) on the cooling water pump was not sealed properly. When the customer replaced the NRV on Pump 3, the cooling water supply pressure returned to the model predicted value — avoiding failure and restoring efficiency.

RESULTS

\$4M

The customer is estimated to have avoided approximately \$4 million in costs as a result of this preventative action.

Due to the early notification from the Industrial Managed Services team, the customer was able to replace the NRV before the problem could worsen. Had the problem gone unnoticed and unaddressed, prolonged operation with the current NRV could have caused reverse flow and the possible failure of the cooling water Pump 3.





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EXPERIENCE APM FIRSTHAND

Today's mining enterprises need to find ways to solve and evolve. This is only possible with the right tools.

APM empowers operators to optimize asset performance and O&M efficiency across the entire organization.

To experience the power of APM firsthand, visit GE Vernova's demo hub.

Explore demos

