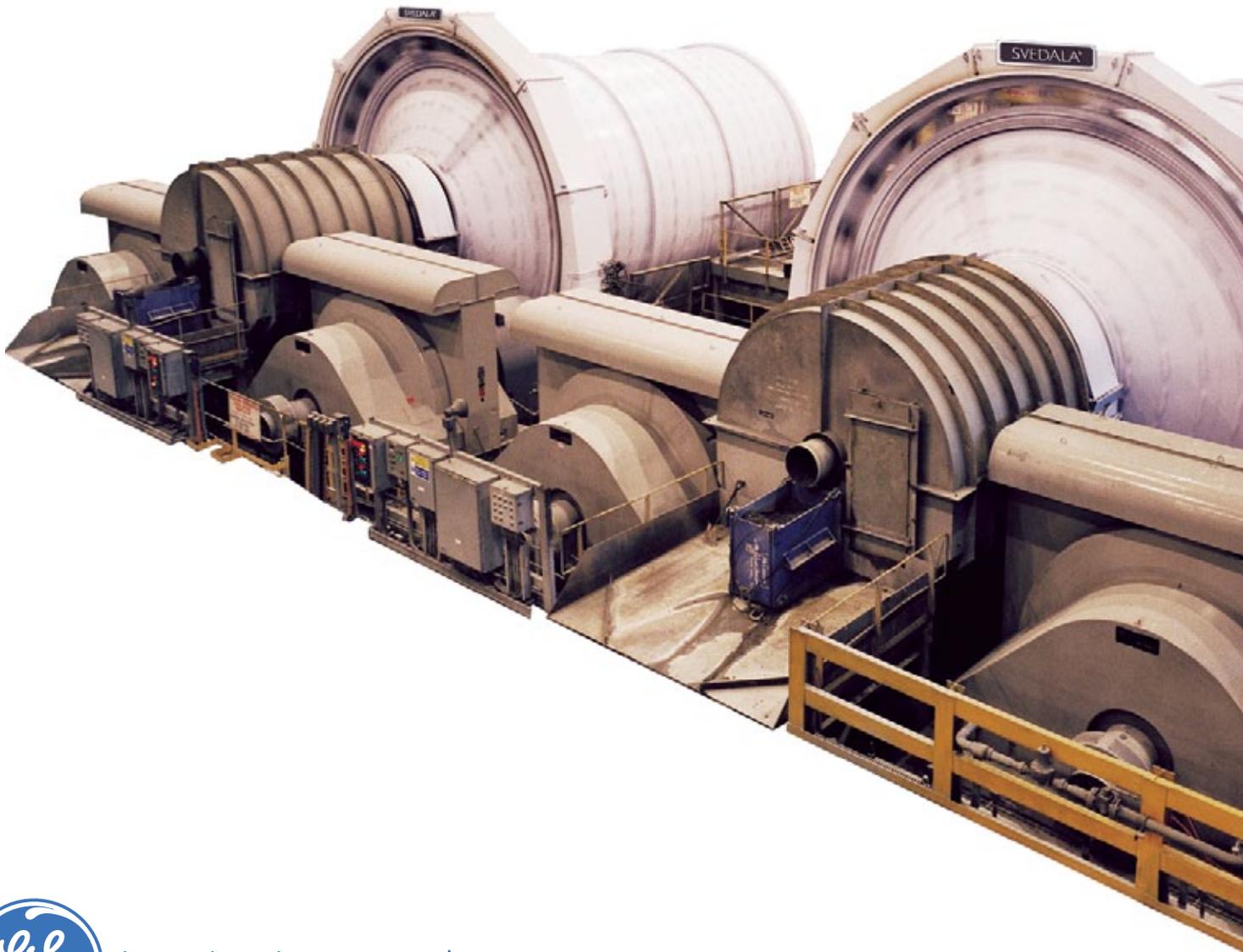


GE
Intelligent Platforms

Proficiency MaxxMine



imagination at work

Increase throughput and availability

If you're like most mining companies, you need to improve both your processes and your equipment availability to optimize throughput and recovery. You also need to minimize your energy costs, and do so in a sustainable, compliant manner. But how do you balance all these goals? How do you drive analysis and decisions to mitigate risks and achieve the operating improvements you need?

You've already invested in data for decision making

Yet, problems still persist. Your current systems don't provide the insight you need to leverage the data and obtain maximum performance. You're not getting the right information to the right people at the right time. This analysis gap consumes your people and your asset lives. Processes are being operated sub-optimally, and assets aren't getting fixed before they fail. Throughput, recovery, and availability are suffering, constraining your operational and financial performance.



"We now can provide a service to the mines where they can move away from the traditional way of doing maintenance and implement a more predictive maintenance approach. The Proficy MaxxMine software enables the mines to detect and warn on truck degrading and helps the maintenance teams to pinpoint problems for faster repair times."

Senior Mechanical Engineer

Proficy MaxxMine— maximize performance

The Proficy MaxxMine solution helps close this analysis gap. It's an all-in-one, real-time, 24/7 solution that helps you make timely and accurate decisions that balance process performance with equipment health. The solution increases:

Operational Visibility—to help you get the most out of your available resources and meet production targets safely and in compliance.

Availability & Reliability—to maximize the time that equipment is available to produce ROA. The solution allows for quick, planned repairs—but only when they're needed.

Performance Optimization—to improve operating results through better asset and process performance, utilization, and planning.

As an example, take a milling circuit. The Proficy MaxxMine solution calculates the optimal setpoints to stabilize and optimize the circuit. At the same time, the solution provides real-time predictive anomaly detection and diagnostics to increase asset availability and reduce maintenance costs. The solution monitors the sump pump, electric motor, and gearbox, and maximizes the lining lifetime. The solution can improve throughput from 1 to 10%, within grind quality constraints, while also minimizing specific energy consumption (kWh/t).

How does the solution improve process performance?

The Proficy MaxxMine solution is a proven technology that reduces process variability and inefficiency, improves product consistency, increases throughput by allowing operations to push constraints to the limits, and achieves higher ROA.

The solution includes a suite of production-management applications that work together to enhance performance. The applications consist of modules and tools for:

- Offline and real-time multivariate process control
- Offline and real-time process deviation cause analyses
- Advanced process control
- Control loop monitoring

These applications are used for identifying and visualizing abnormal process variations, visualizing causes for process variation in real time, and identifying and visualizing poorly performing control assets. The applications can be configured and customized for optimal use. Customized applications include real-time displays and the use of a unique combination of advanced analytical techniques to properly account for the complexity of any process.

Customer increases fleet availability from 70% to 85%

Challenges:

- High haul-truck maintenance and replacement costs.
- Even larger expenses due to lost production.
- Fragmented, incomplete, and user-unfriendly OEM coverage.
- Data overload.

Results:

- Increased availability from 70-85%.
- Reduced lost production due to decrease in breakdowns.

Now expanding the solution globally—across equipment, across operations.

How does the solution improve asset availability?

We use a data-driven empirical approach that leverages your existing instrumentation and IT infrastructures. Our software constantly samples data from your historian and analyzes the data to detect, diagnose, and prioritize impending problems.

In the Proficy MaxxMine solution, each piece of equipment is unique, as reflected in its own historical data. Our advanced modeling, protected by over 40 patents, puts into context the normal operating relationships

among all relevant parameters, such as load, temperatures, pressures, vibration readings, and ambient conditions. In real time, the software compares actual sensor readings to that particular machine's normal, predicted values.

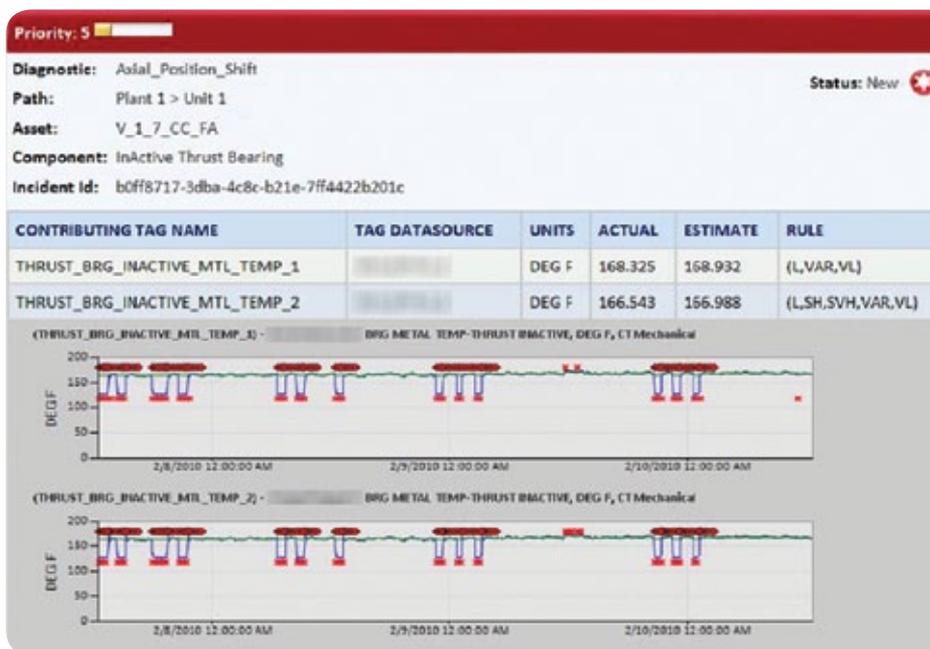
The Proficy MaxxMine software detects and identifies events and abnormal behavior by the differences between real-time, actual data and predicted, normal behavior—not by thresholds on actual values. The software then provides exception-based notifications of developing problems to users, along with diagnoses and prioritizations. This enables information management by exception.

The software does this automatically, continuously, and relentlessly, 24 hours/day. A typical early incident alert from the Proficy MaxxMine solution occurs 3-10 weeks before other systems.

“Some systems are just too complex and have too many variables for operators to run optimally. That’s when we need the help of dedicated advanced control intelligence that can deal with the complexities of our unique problems, rather than a one-size-fits-all solution.”

Tim Spandiel
Manager

Impala Base Metals Refinery
As quoted in MMS Magazine, June 2008



When it sees a problem, the Proficy MaxxMine solution sends a notification to the people who need to know—with a brief summary of the problem, key tags, and values. Multiple alerts are combined into one diagnostic notification, which narrows the range of potential problems and reports urgency. This drives productivity toward resolving pressing equipment issues in order to avoid more expensive surprises down the line.

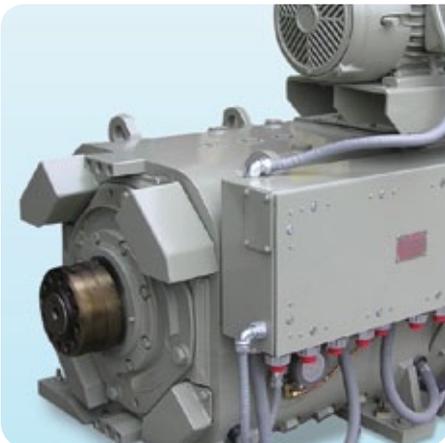


Easy to use → quick value

There are two ways to consume the Proficy MaxxMine solution. We can host the solution and provide monitoring services for you remotely in our Availability & Performance Center, or you can host the solution at your premises. In all cases, though, we deploy the solution and maintain the models to ease implementation, integration, and everyday use and help you obtain value quickly and optimally. Our customers report ROI in 6-12 months, some much sooner—and over 95% renew their subscriptions each year, attesting to the continuing value and service they receive.



Our Availability & Performance Center provides optional, full, and flexible support 7 days/week to large-equipment operators worldwide. The center currently is monitoring over 4,000 assets spanning the Mining, Power, and Oil & Gas industries.



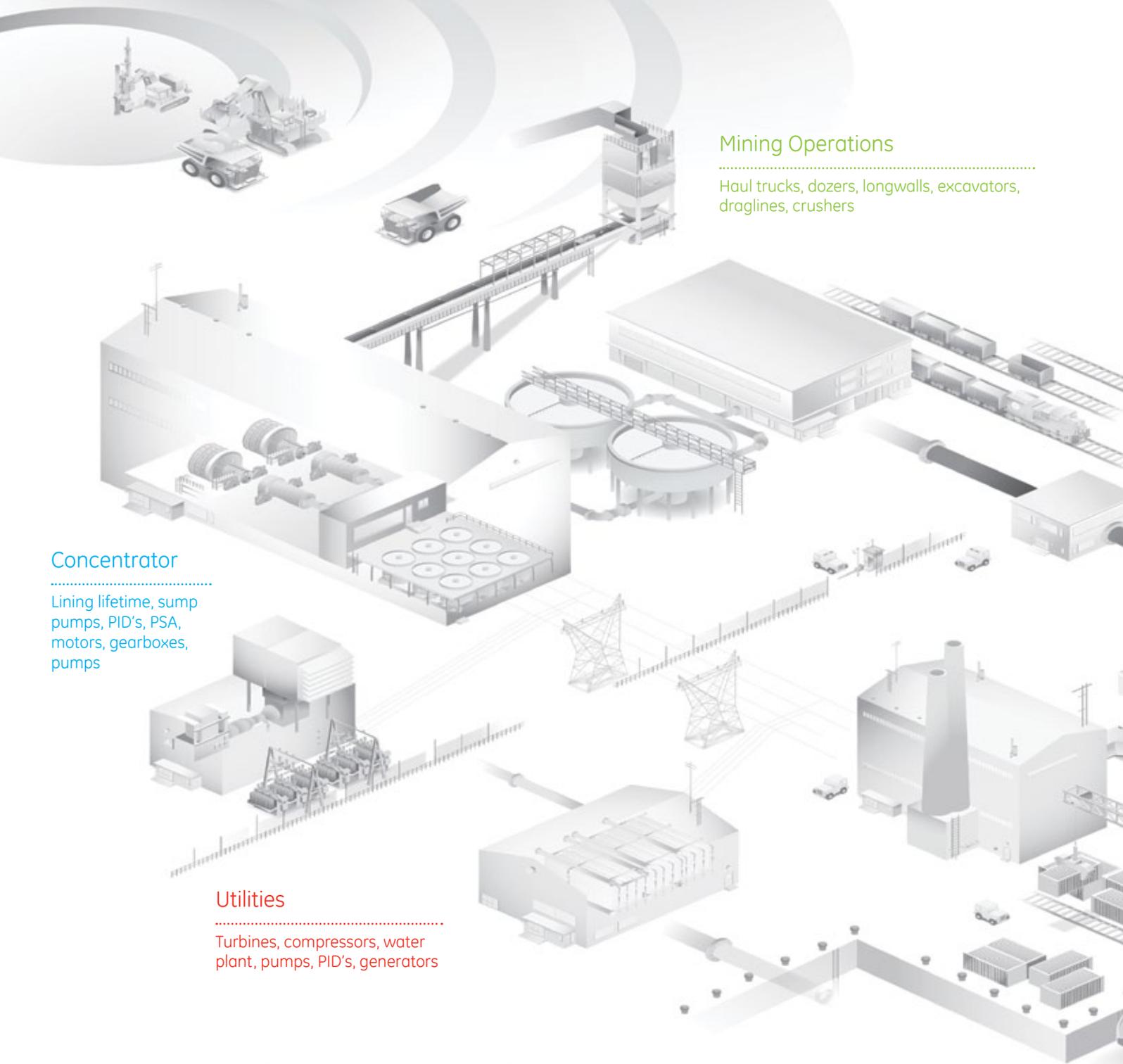
Customer decreases flow variability through flotation circuit by 50%

Challenges:

- Inconsistent flow.
- Need for manual intervention.
- Need to stabilize flow for downstream flotation levels.

Results:

- Decreased flow variability by 50%.
- Increased throughput by 5%.
- Increased recovery.



Mining Operations

Haul trucks, dozers, longwalls, excavators, draglines, crushers

Concentrator

Lining lifetime, sump pumps, PID's, PSA, motors, gearboxes, pumps

Utilities

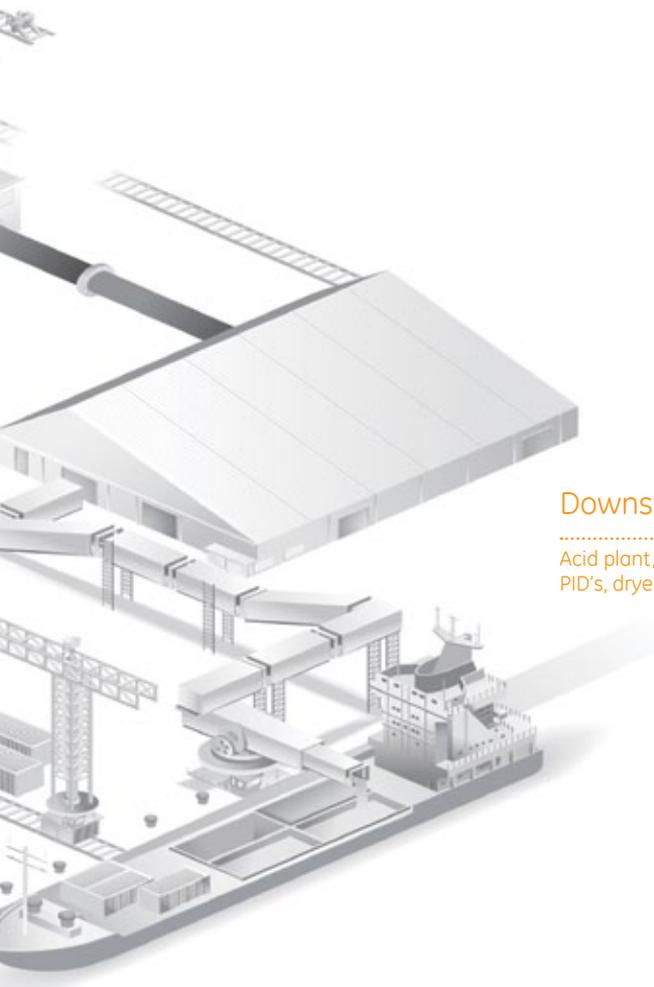
Turbines, compressors, water plant, pumps, PID's, generators

What makes the Proficy MaxxMine solution different? We uniquely:

- 1. Combine both process optimization and predictive analytics.** One solution handles it all.
- 2. Make it easy, no matter where you are.** We provide comprehensive global support. Our experts implement and maintain the software and can provide full and flexible monitoring services, as desired.
- 3. Are proven.** Proficy software has been deployed hundreds of times. We're currently monitoring over 12,000 critical rotary, reciprocal, and fixed assets around the world, across industries, and we can provide references for process optimization in the mining industry. Our depth of experience in large industrial-equipment monitoring and predictive analytics encompasses hundreds of millions of machine hours. We continue to automate and innovate while driving value to our customers.

Proficy MaxxMine solution portfolio

Offering availability and process optimization in all of these areas.



Downstream

Acid plant, furnace, leaching, pumps, PID's, dryers, kilns, roasters

4. **Work across all critical equipment, all OEM's.** The software detects the broadest range of equipment problems across the widest variety of assets, load ranges, and failure modes.

5. **Are global in reach and deep in experience.** GE has been serving the mining industry for over 80 years. The Proficy MaxxMine solution is supported globally by GE Mining, which offers a broad range of products and services for every step of the mining process.

Customer increases throughput in milling circuit by 9.75%

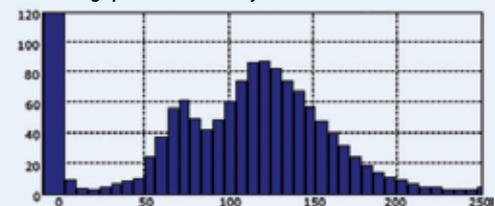
Challenges:

- Sub-optimal throughput.
- Circuit instability and poor grind quality.
- Sub-optimal energy consumption.

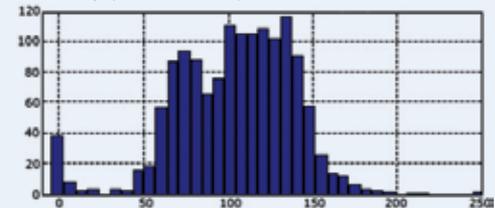
Results:

- 9.75% increase in throughput.
- Stable circuit and consistent grind quality.
- Decreased specific energy.

Throughput before Proficy MaxxMine Solution



Throughput after Proficy MaxxMine Solution



For more information about how the Proficy MaxxMine solution can deliver results for your mining business, visit www.ge-ip.com



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