SOLUTION SPOTLIGHT

AllScan Provides Operators Real Time Quality Control Increasing Good Aluminium by 60%

Introducing the AllScan system into the mine site resulted in:

60% Increase in good Aluminium yield

56% Reduction in reject product

COMMODITY

Bauxite

TYPE OF MINE

Surface

APPLICATION

Ore Management

Background

In the bauxite mining and refining industry, maintaining consistent ore quality is critical for efficient processing and cost management. The presence of out-of-specification product results in operational inefficiencies, increased processing costs, and potential penalties for non-compliance with customer specifications. Traditionally, laboratory testing has been the primary method for quality control, providing highly accurate results. However, with a turnaround time of two to three days, laboratory analysis was often too slow to allow for timely operational adjustments.

Recognizing the need for real-time, in-situ quality monitoring, our customer partnered with Real Time Instruments (RTI) to implement an online elemental analysis solution. The goal was to provide continuous quality control of ore grading, enabling immediate corrective action when deviations from the desired composition occurred.

The Challenge

Prior to the implementation of RTI's AllScan technology, the customer faced several key challenges. Traditional laboratory analysis was too slow to provide actionable data in real time, leading to the processing of non-compliant material. Non-conforming material resulted in penalties, increased waste, and inefficient resource utilization. Operators lacked visibility into elemental composition trends, limiting their ability to optimize ore blending and feed quality in real time.

Additionally, the primary objective was to maintain a specific alumina level while minimizing silicon dioxide content, ensuring the highest possible efficiency in downstream processing.

The Solution

RTI's AllScan elemental analyzer was identified as the ideal technology to address these challenges. By implementing an online, real-time elemental analysis system, the customer gained the ability to continuously monitor alumina and silicon dioxide levels, instantly adjust processing parameters in response to deviations, and eliminate the need to wait days for laboratory test results. This resulted in improved efficiency by reducing reject material and non-compliant shipments.

Implementation & Discovery

RTI's Research and Development team worked closely with the customer to integrate the AllScan system into their operations. The implementation process involved system calibration and integration, where the AllScan analyzer was installed on the material feed line, calibrated for site-specific conditions, and integrated into the plant's control systems. Initial data collection and baseline analysis revealed frequent deviations from desired alumina levels, with 56% of material falling into the reject category. Plant operators were then trained to interpret real-time data, enabling them to make informed adjustments to maintain target composition.

The Results

Since the implementation of solution, operators were able to respond to product deviations in real-time. The benefits have been substantial:

- **Increased Good Alumina Yield:** The proportion of compliant alumina product increased from 11% to 70% over six months.
- **Reduction in Penalty Alumina Levels:** Instances of material falling into penalty-grade alumina decreased from 32% to 30%.
- **Elimination of Reject Material:** Initially, 56% of the product was classified as reject due to non-conformance. After six months of using real-time monitoring, reject material was reduced to zero.
- **Enhanced Operational Efficiency:** Operators could respond to deviations immediately, ensuring process stability and minimizing reprocessing costs.
- **Cost Savings & Revenue Optimization:** By reducing penalties and eliminating waste, the financial impact of real-time monitoring was substantial, contributing to improved profitability.

Conclusion

The implementation of RTI's AllScan elemental analysis solution has revolutionized the way this bauxite processing operation manages ore quality. By providing operators with real-time visibility into composition data, the system has enabled improved process control, higher product yield, and significant cost savings.

This case study underscores the value of real-time data in modern mining operations and reinforces RTI's commitment to helping industries Measure, Analyse, and Optimise their processes for maximum efficiency and profitability.

Future Applications and Industry Impact

The success of the AllScan technology in bauxite processing demonstrates its potential for broader applications across multiple mining and industrial sectors. Real-time elemental analysis provides a significant advantage in optimizing raw material quality, reducing waste, and improving process efficiency. The ability to make immediate adjustments based on accurate data is a game-changer for operations where material composition directly impacts production outcomes and profitability.

- **Iron Ore Processing:** Real-time monitoring of Fe and SiO_2 levels to optimize blast furnace feed.
- **Coal Processing:** Controlling ash and sulfur content to improve combustion efficiency and compliance.
- **Cement Production:** Ensuring consistent raw material composition for clinker formation.
- **Base Metals & Industrial Minerals:** Real-time monitoring of key constituents in copper, nickel, and lithium mining operations.

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