AUTOMATION & DIGITALIZATION

PROCESS OPTIMIZATION AND DIGITALIZATION IN THE LITHIUM INDUSTRY – ANDRITZ, A TECHNOLOGICAL ALLY FOR SQM

ANDRITZ

ENGINEERED SUCCESS

Lithium: The Engine of the Electric Mobility Revolution

The migration towards a cleaner and sustainable economy has turned electromobility into a global catalyst for change. It is anticipated that by the end of 2040, approximately half of the world's vehicles will be electric. Given the current scenario and future projections, lithium has become one of the most coveted minerals worldwide due to its crucial role in battery manufacturing. In this context, global markets turn their attention to this part of the world. Chile stands out as the second country with the largest lithium reserves globally, surpassed only by Bolivia.

Lithium Mining: Innovation and Technology in a Growing Market

Given the exponential growth in global lithium demand, it becomes necessary for mining companies to undergo accelerated growth as well. This growth is associated with improvements in production efficiency and environmental responsibilities. In this regard, the incorporation of new technologies plays a fundamental role in addressing the various current and future challenges in an increasingly demanding market. Technological innovations have been one of the main drivers of change that mining companies have utilized in recent years, assuming controlled risks that allow for proper adaptability and evolution towards the standards demanded by a rapidly advancing lithium market.

ANDRITZ: A Technological Ally for SQM

Within the challenging scenario of lithium mining, ANDRITZ establishes itself as a technological ally for SQM, one of the leading lithium-producing companies in the country. With extensive experience in digital and technological transformation, and a prominent presence in major mining companies in Chile and around the world, ANDRITZ has supported and enhanced the adoption of new technologies for SQM. Through advanced tools, expertise, and technological solutions, we have contributed to strategically positioning SQM, preparing it to overcome current challenges in the industry and the market.

"The revolution in the lithium industry is here and is driven by autonomous technology. From automation to artificial intelligence, these innovations are not only improving efficiency and safety in lithium extraction and processing but also redefining what is possible in terms of reducing operational costs. At SQM, we stand at the threshold of this new era, adopting a progressive strategy that begins with meticulous planning and extends to implementation and continuous improvement. This path toward total autonomy is not just an investment in technology but in our future,"

Jorge Collado, Regional Product Manager DPS MM OPT at ANDRITZ.

Technological Transformation for Lithium Production in Chile: From Asset Management to Innovation with Digital Twins

ANDRITZ has closely collaborated with SQM, one of the leading lithium producers in northern Chile, to optimize and digitize its operations, resulting in more efficient and sustainable production. This article details how a phased technological transformation has been carried out, addressing key aspects of production such as asset management, automation, optimization, and the integration of digital twins, with the aim of delivering the additional value SQM was seeking. Here, we will explore the specific solutions implemented, challenges overcome, and the additional value gained through the incorporation of technology.

Digital Transformation and Asset Management: Advancing towards Intelligent Maintenance

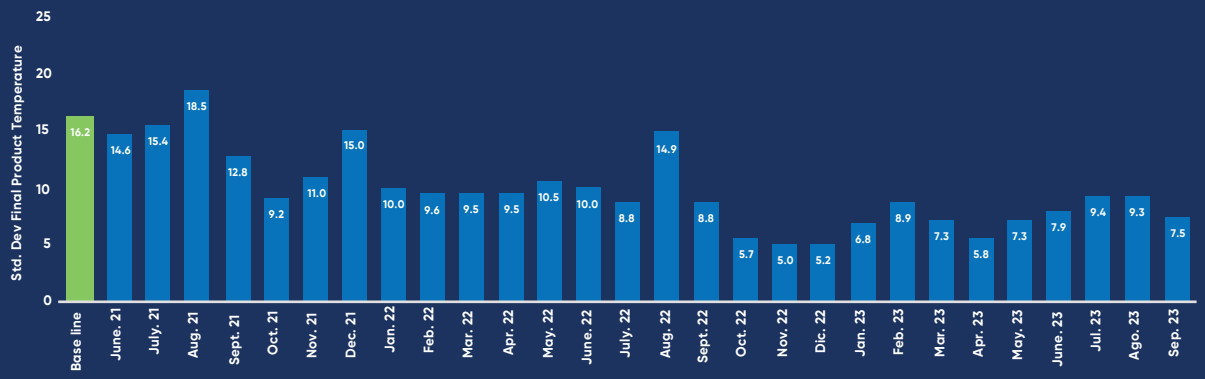
With the establishment of the Automation and Energy Management Department, special emphasis has been placed on the development of advanced technologies, supported by SQM's specialized competencies in Automation and Data Analysis.

The initial phase of this digital transformation focused on plant asset management, particularly on essential physical assets such as centrifuges, belt filters, drum filters, filter presses, compactors, and motors, among others. To address this task, ANDRITZ implemented Metris, an innovative solution offering a wide range of functionalities and applications designed for the digitalization and optimization of processes.

One of the most notable features of Metris is its asset management capability, enabling real-time monitoring, the generation of intelligent indicators, and the provision of key information for both reactive and predictive responses. Through effective digitalization of information and monitoring, coupled with support for intelligent decision-making, Metris provides SQM experts with essential tools, enabling the selection of the best alternatives in terms of maintenance. This proactive and data-driven approach facilitates the transition towards intelligent, informed, and fully digitalized maintenance.

Optimization of Production Processes

Rotary Dryer N 3 - Final Product Temperature



In the first stage of the transformation, the focus was on plant asset management, concentrating on key physical assets such as centrifuges, belt filters, drum filters, filter presses, compactors, and motors, among others. This task was addressed using Metris, developed by ANDRITZ, a tool with various functionalities and applications centered around digitization and process optimization. Among these, its asset management application stands out, capable of real-time monitoring, generating intelligent indicators, and providing essential information for both reactive and predictive responses

Thus, through the digitization of information and its proper monitoring, and with support in informed decision-making, SQM is provided with key tools so that its experts can select the best alternatives in the field of maintenance, moving towards a more intelligent, informed, and digitized maintenance approach.

Innovation with Digital Twin (Digital Twins)

In recent times, ANDRITZ has achieved notable advancements with its Digital Twin technology, an achievement attributed to both its capabilities in simulating entire facilities and the specialized knowledge of its team in data analysis, process management, and optimization. Addressing a specific challenge at SQM's PQLC plant, one of the leading lithium-producing companies seeking greater stability and accuracy in density measurements, as well as increased availability in these measurements for controls, ANDRITZ recommended the adoption of Digital Twins. This initiative originated from the aim to eliminate redundancies and enhance accuracy in indirect measurements.

Using high-precision process simulations, these twins can infer real-time measurements. By integrating these simulated measurements with those obtained in the plant, the data accuracy is strengthened, thereby boosting the efficiency of existing automation and optimization systems. This advanced project is currently in its final implementation phase at SQM.

The mining industry is responding to the call for efficiency and sustainability, particularly in the production of the precious lithium. In this scenario, ANDRITZ stands out as a key partner, providing advanced digital solutions that make a difference. Our expertise spans from implementing automation and robotics in key processes to applying virtual reality for training and intelligent energy management.

What sets us apart is our comprehensive approach: the synergy between Big Data, IoT, and AI enables us not only to foresee and prevent problems but also to optimize every aspect of production. This is how ANDRITZ contributes to maintaining the competitiveness of market leaders like SQM, ensuring that the 'white gold' they produce is synonymous with high quality and environmental responsibility.

Our commitment to excellence and sustainability is the cornerstone supporting the future of lithium mining,"

comments Marcial Sepúlveda,
Technical Leader at ANDRITZ.

ANDRITZ: Your Partner in Digital Transformation

In times of accelerated technological evolution, SQM stands as one of the key players in the lithium sector. For SQM, digital transformation and process optimization are more than goals; they are imperatives to stay ahead in such a competitive industry. With ANDRITZ as its strategic ally, the company has access to tools, knowledge, and solutions that open doors to a future where SQM can not only become the most optimized and efficient lithium company globally but also a significant contributor to both national and global economies.

The outlook for SQM is promising. With the support of ANDRITZ's technology and solutions, SQM has the potential to lead the revolution in lithium mining, setting new standards in efficiency, sustainability, and profitability. The shared vision is clear: to transform SQM at the forefront of lithium mining, standing out not only for its production volume but also for the quality and efficiency of its operations.

Beyond the current transformation, ANDRITZ envisions a future for SQM where operations move towards autonomous plants, maximizing the capabilities of Artificial Intelligence, digital twins, and other technological advances. The goal is clear: to provide SQM with all the necessary tools and technologies for autonomous, efficient, and sustainable operations.

The future is now, and alongside ANDRITZ, SQM is perfectly positioned to lead this new chapter in the history of lithium mining. Together, they are shaping the future of the industry, driving the economy, and establishing new standards of excellence.

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