

NIOBEC INC. EXCAVATING POTENTIAL:

Reliability and responsiveness of data for better operational standards

The Saint-Honoré Niobec mine, located in the Saguenay-Lac-Saint-Jean region, is the only underground niobium operation in the world and currently leads the three top producers of niobium worldwide. This high-demand metal can be found in all fields of advanced technology, from jet engines to beams and girders. Accordingly, it is an essential resource to industries worldwide, and with high demand comes the demand for a high quality! As such, Niobec has always chosen to take an environmentally conscious approach, while providing the highest-grade niobium to its partners at the lowest possible extraction cost.

Niobec's challenges lie in the fact that the data management process from the various laboratories and the environmental traceability were all done manually. As a consequence, this was a large time-consuming drawback and was subject to a large margin of error.

Premier Tech Digital's specialists paired digital solutions tailored to Niobec's needs following a set of constructive assessment meetings with all of the department heads. These technical conversations are how our team amasses a deeper understanding of operations and these Niobec-specific issues.

To ensure the quality of its products, Niobec sample analyses are performed cross-sectionally by both internal and external laboratories.

Challenges:

To free its environmental laboratory Niobec sample analyses technicians from manual and repetitive tasks, Niobec sought to acquire a technologically inclined solution: One that would allow their personnel to centralize and systematize laboratory analyses and data they base critical decisions on.

Two main issues influenced Niobec's choice for a technological solution: The need for data reliability and system responsiveness.



Photo credit: Niobec

Reliability:

Prior to consulting with Premier Tech Digital's smart manufacturing solutions, once the laboratory data was obtained, all subsequent steps from pooling all this data into a database, to sharing the information confidentially and securely, were handled manually. Therefore, the solution had to facilitate the following:

- Automatic importation and access of the external laboratory data.
- Notifications triggered by manually reviewed instances in the database.
- Managing the various sampling parameters.
- Real-time synching between interconnected communication systems.
- Secure platform login management.

Responsiveness:

While the data handling was a significant factor, data processing and analysis were equally paramount. Since the intervention window is very short in the operation, the solution required saving time in identifying problematic data and its accuracy. The solution therefore had to enable:

- Automatic identification of out-of-range data accompanied by a notification.

- Easy access of cross-laboratory data and report sharing.
- Setting up a digital standardization process that would allow comparing the received data with the expected standards.

Niobec's ambition was that with the right Manufacturing Execution System (MES), or MES-module solution, their employees would see significant increases in time, where they could focus on quality improvement, as well as proactively optimizing tests and operational analyses.

Finding a solution:

To address these challenges, Niobec chose GE Digital's Proficy Plant Applications.

Premier Tech Digital's 25 years of experience in the smart manufacturing field were an asset in integrating and configuring the system.

To ensure a smooth digital transformation, PT Digital suggested a comprehensive approach. This facilitated collaboration with various key elements, such as:

- Establishing a team of project management and smart manufacturing specialists, as well as identifying Niobec's key players.
- Developing a progressive deployment plan for the required features sought after by Niobec in order to allow the Premier Tech team to better

understand the operational reality of the mine and to offer a personalized support. Additionally, to allow Niobec to test the system gradually to facilitate the integration of this new toolset into their array of quality control processes leading up to a fully integrated MES operation.

- Ongoing training and support by PT Digital's services team are put forward to ensure Niobec's autonomy in the eventual integration of all the system's functionalities.

Reliability

Steps were taken to improve Niobec's management efficacy:

- Integrating a program to automatically import environmental results from external laboratories into an on-site centralized database.

- Automating the result entry from the equipment within the internal laboratory into the database.
- Incorporating access management to the MES, through a user authentication program.

Responsiveness

Additionally, features were configured in terms of system responsiveness requirements:

- Configuring alarms to signal non-compliant results based on required data formats.
- Automating the interception of out-of-range results and triggering a real-time call-to-action notification to departments.
- Setting up an approval system to evaluate the results and ensure data certification has been put in place.

Data Management Solution Mapping

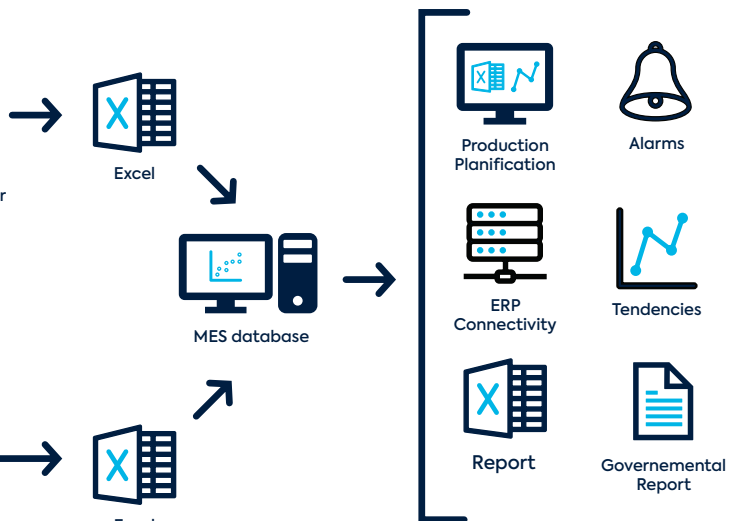
Control Laboratories' Data

Analysis equipment



Environmental Collection Data

External Laboratory





Results and Benefits:

With the modular implementation approach of GE Digital's Proficy Plant Applications software by Premier Tech Digital's specialists, Niobec is progressing in its digital transformation of operations and is on their way to maximize efficiency by automating key processes.

System installations account for downtime tracking and historization through an efficiency module. The laboratory was proposed a quality module and genealogy module to introduce comprehensive traceability. Consequently, the demanding water treatment operations and tracking were almost entirely automatized, with the exception of one older machine.

This project resulted in revitalizing the mine with approximately 95% autonomous data management.

Reliability

The new system eradicated errors that were historically problematic and costly due to manual data entry. By freeing up their environmental laboratory sample technicians from manual and repetitive tasks, Niobec stated they saw an increase in workplace efficiency due to the return of valorizing work. Put simply, with the help of PT Digital's knowledge transfer, Niobec chose a champion, or power user, to lead the role of autonomous Plant App operator while encouraging process optimization. In light of the labour shortages spanning across the country, being able to rely on consistent and flexible team members is an asset.

The consolidation of data sources into a central database has reduced the need to manipulate files that could lead to data loss and and costly reporting mistakes.

Moreover, the centralization of both internal and external data on their own in-house base of operations has also facilitated a safe access to information by all of their departments in real-time. This centralization came with the authentication of users, which makes it possible to identify those who have accessed and made changes to data. As a result, Niobec has made improvements in historization and traceability, which effectively contributes to a better distribution of accountability among the various parties involved; including the scrutiny of governmental audits and inquiries.

Responsiveness

In parallel to laboratory-associated technicians, the QR&D team has also witnessed an exponential growth in efficiency. The responsiveness of the system resulted in their ambitions focussing on additional cross-sectional tasks with greater added value.

On a day-to-day basis, workers now work and react pre-emptively to adjust product properties based on real-time data to significantly improve quality and reduce waste. As any business knows, preventing losses is a significant benefit to profitability. By being able to automatically intercept out-of-bound results, Niobec has been able to adjust processes in a more diligent manner and has seen substantial savings in terms of cost, time, and waste.



Photo credit: Mathieu Dupuis, Niobec

What's Next...

Niobec's case shows the value of referring to the right service provider to set up a centralized data collection, storage, and processing system in mining production process management.

In being able to consult and create partnerships with various domains, we are specializing towards facilitating prospective requests to acclimatize operations to Artificial Intelligence (AI) data analysis and improving on environmental footprints based on comprehensive data models.

Niobec's ambitious next steps with us are developing and integrating specific schedules and metrics to simplify the traceability of processes in terms of perpetual and reliable data accountability. Our integrated smart manufacturing solutions powered by Plant Apps cater to complete tracking for government-monitored sampling.

The automation of tasks can reinvigorate your team, improve profitability and workplace efficiency. It results in keeping an edge over competition and setting up tangible tools to bring organizations up to speed with the 4.0 smart manufacturing revolution.

Are you curious to see how a manufacturing execution system combined with PT Digital's smart manufacturing excellence and support services can help you optimize your production lines?

Get in touch and we can determine the possibilities that apply to your context together!



PT Digital

Smart Manufacturing

1, avenue Premier
Campus Premier Tech
Rivière-du-Loup (Québec)
G5R 6C1 CANADA
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Industry: **Mining**

Client: **Niobec Inc.**

Location: **Québec, Canada**

Integrated Solutions: **GE Proficy Plant App**