
Nexa Resources

Largest zinc smelter in Latin America

Warley Pereira – General Manager – Nexa Resources

Caue Fontana – Principal Architect - AVEVA

Goal – Increase Availability for critical assets at
Roasting 2 – Cajamarquilla through Predictive
Analytics

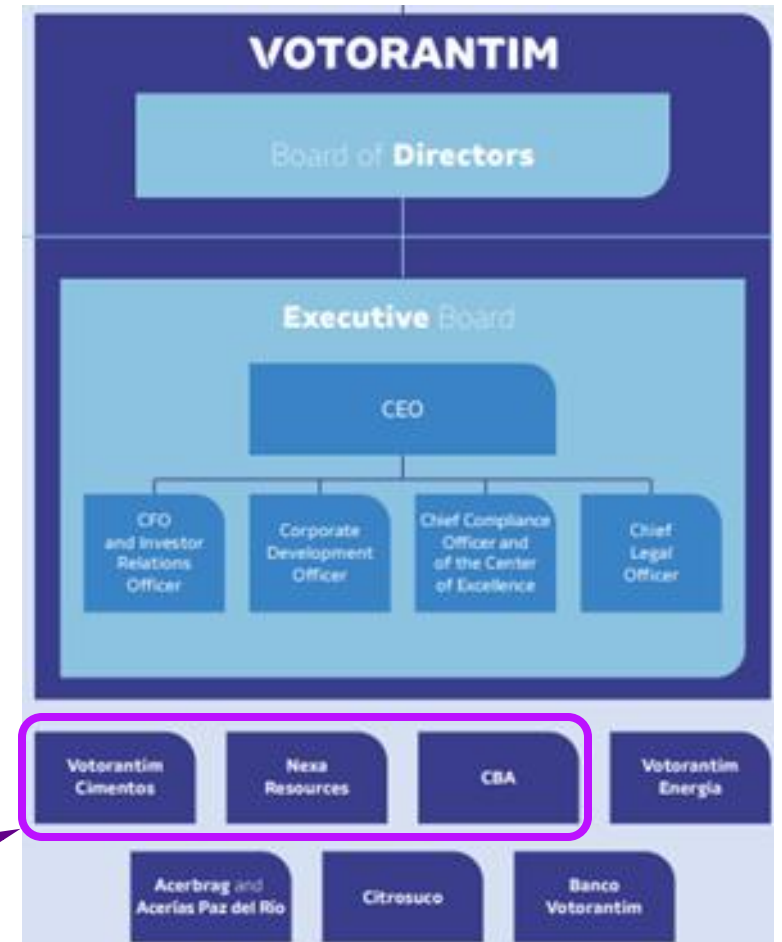


#digitaltransformation #maintenance #ITONexa

About Cajamarquilla Site – Nexa Resources

Nexa Resources is a global non-ferrous metals mining and metallurgy company

- Our Cajamarquilla smelter, which is wholly owned by Nexa CJM, is located in Peru and began operating in 1981.
- **\$1.8 Bi** Enterprise Value.
- **85.3 kt** Zinc Production Q3 2022.
- **162kt** Metal sales Q3 2022
- **It is currently the largest zinc smelter in Latin America and the sixth largest zinc smelter in the world in 2022**, according to Wood Mackenzie.
- Cajamarquilla uses **roast-leach-electrowin technology**.



PI System +
Predictive Analytics

Business goals and challenges

Goals

- Reduce downtime through predictive analytics
- Improve asset reliability
- Generates early warnings and diagnostics of equipment problems
- Reduces maintenance expenses
- Eliminates waste and production losses

Challenges

- **11** Predictive PoCs failed. **12nd** with AVEVA succeeded
- According to a study for Digitalization of Maintenance, Roasting stopped 772 hours for corrective maintenance in 2021. **649 hours** due to unscheduled downtime
- Lack of instrumentation and tags.



Start: September 2021

Covid Delay: January 2022 to April 2022

Fine Tuned: 22 June 2022

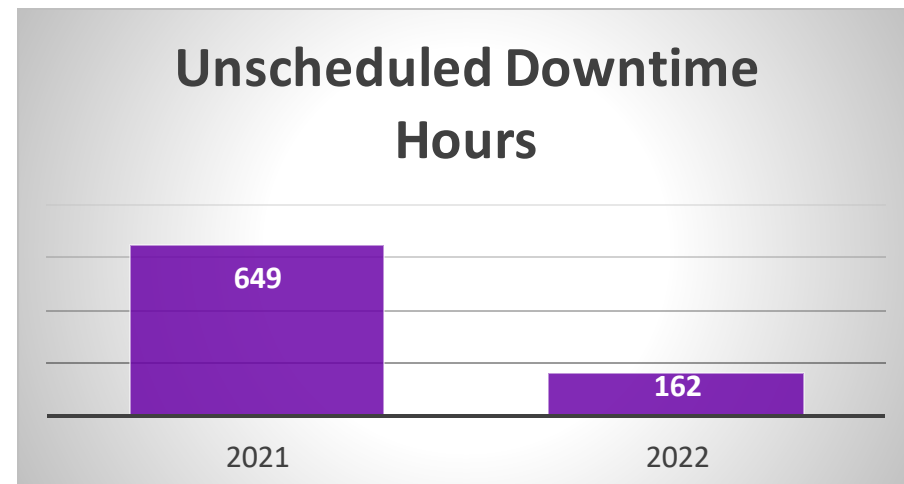
The road to asset excellence

Solution

- Single source of reliable data and information with AVEVA PI System and AVEVA Predictive Analytics
- 11 models fine tuned out of 50 available models
- Covering 30% of critical assets of Cajamarquilla Roasting Plant 2
- Cajamarquilla has 2 Roasting plants.

General outcomes

- Improve asset reliability
- Reduce the need for emergency maintenance purchases
- Unscheduled downtime reduction



Project Team



ITO Leadership

Marcelo Santos **GG TI**

Jonathan Fonseca **Manager BRM**

Business Leadership

Warley Pereira **GM Cajamarquilla**

Eugenio Ponce **Maintenance Manager**

Juliano Alves **Production Manager**

Project Leader

Guilherme Guedes **IT Consulting**

Business Technical Team

Jose Gongora Reliability Engineer

Renato Balta Automation Engineer

Javier Valderrama Tostacion Maintenance Manager

Andy Ticona PPCIM Engineer

Rogger Hernandez Production Engineer Tostacion

Percy Torres Maintenance Chief

Miguel Angel Reliability Chief

Pedro Alexander Maintenance Supervisor

Jim Reymundo Automation Supervisor

Project Management Team

Pedro Matheus **PMO Physical**

Pedro Henrique **PMO Finance**

Consulting (AVEVA)

Caue Fontana – Principal Architect

Felipe Rojas – Services

Felipe Duarte – Services

Jorge Lizana - Services

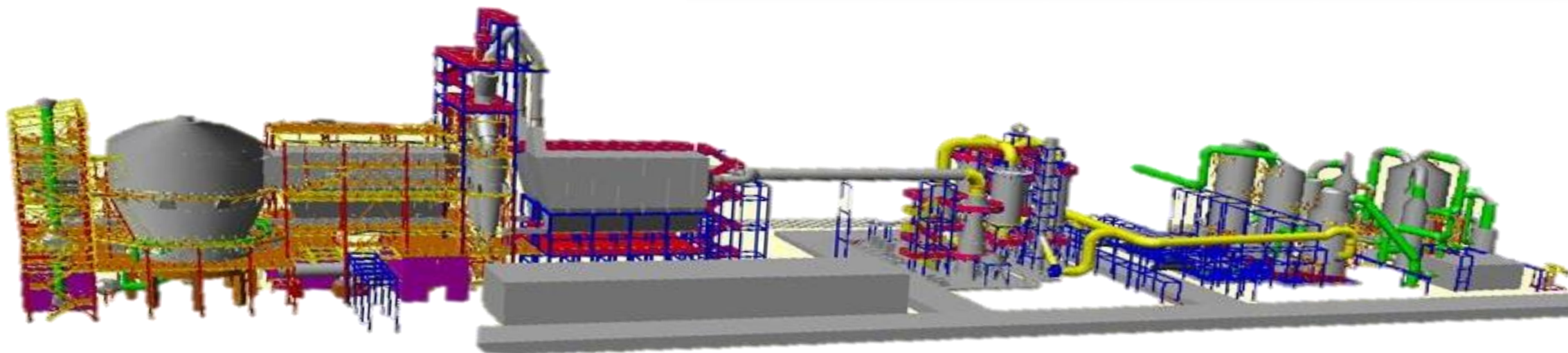
Tiago Mazetti – Project Manager

Project coverage at Cajamarquilla

PI System and Predictive Analytics

3 x Pumps
 1 x Sectional Cooler
 1 x Ball Mill
 4 x SO2 Blower (Process and Mechanical Models)
 3 x Drying Tower, Intermediate Absorption Tower,
 Final Absorption Tower

Name	↑	Alert State	Runtime Status	Case Status	Open Cases	Alert Persistence (%)	Alert Age (Days)	7 Day Event History	Assigned To
CJM B2016 BOMBA LUBRICACIÓN 1 SOP PRINCIPAL		✓	●						
CJM B2016 SOPLADOR PRINCIPAL		✓	■	⊖		92	153.2		Javier Valderrama
CJM B2019 SOPLADOR AUXILIAR		✓	■	⊖	1	53	86		Alexander Moran
CJM B2020 ENFRIADOR SECCIONAL		⚙	●	⊖	1	7	0.7		
CJM B2025 MOLINO DE BOLAS		✓	●	⊖					
CJM B2032 BOMBA CIRCULACIÓN		✓	■	⊖	2	82	117		Alexander Moran
CJM B2034 BOMBA ALIMENTACIÓN		⚙	●	⊖	1	47	1		
CJM C2109 SOPLADOR DE SO2 MECANICO		⚙	■	⊖	2	87	130		Alexander Moran
CJM C2109 SOPLADOR DE SO2 PROCESO		✓	▲	⊖		79	176.2		
CJM C2150 TORRE SECADO		⚙	▲	⊖		94	176.2		Rogger Hernandez
CJM C2153 TORRE ABSORCION INTERMEDIA		✓	▲	⊖	1	86	137.8		Rogger Hernandez
CJM C2158 TORRE ABSORCIÓN FINAL		⚙	■	⊖	3	93	278.1		Rogger Hernandez



Increased Diagnostics – Few Sensors

Increased diagnostics with Ball Mill with limited number of sensors (8 tags).

- Increased OMR and Temperature (Only 4 degrees from Actual vs Prediction).
- Sensor's 4 degree's increased due to higher increase at another position of asset.

This single catch:

- Avoided Losses: **\$2.1 M**



Next steps

Short term

- Reinforce the culture of Digital for Predictive Analytics within the CJM unit
- Implement and account for new success stories using the software
- Replicate the system for Roasting 1

Medium term

- Replicate the system for the Vazante, Três Marias and Juiz de Fora units
- Increase automation and instrument levels

Long term

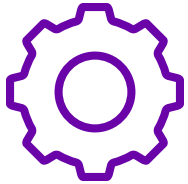
- Develop success cases using Digital in the other units
- Implement the Digital Maintenance Strategy at Nexa

What does the future hold?

- Standardize and deploy standardized, automated and online Maintenance KPIs for all Nexa units
- Have a Digital Predictive Maintenance Analysis system widely deployed and standardized at Nexa
- Have a Reliability Engineering team dedicated to the Digital tools in the units
- Having a Maintenance Control Center managing and supporting the maintenance of the assets



Summary



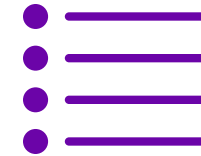
Challenge

- 11 Predictive PoCs failed
- Study for Maintenance digitalization, Roasting stopped 772 hours for corrective maintenance between January and June 2021.
- Lack of instrumentation and tags.




Solution

- AVEVA PI System and Predictive Analytics
- 12 models fine tuned



Benefits

- 75% reduction on unscheduled downtime hours
- Improve asset reliability
- Reduce the need for emergency maintenance purchases

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ABOUT AVEVA

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