



zero breakdowns! program

This guide of our services and use cases has been published to provide support for anyone wishing to understand and implement an innovative and proactive approach to the maintenance of industrial assets.

2023

monixo
predictive maintenance & CBM

A specialist in predictive and condition based maintenance, Monixo has provided, since 2015, a complete solution based on IIOT and AI for the diagnosis and anticipation of breakdowns.

Email : contact@monixo.com

Website : www.monixo.com

Tel : +33 972570046



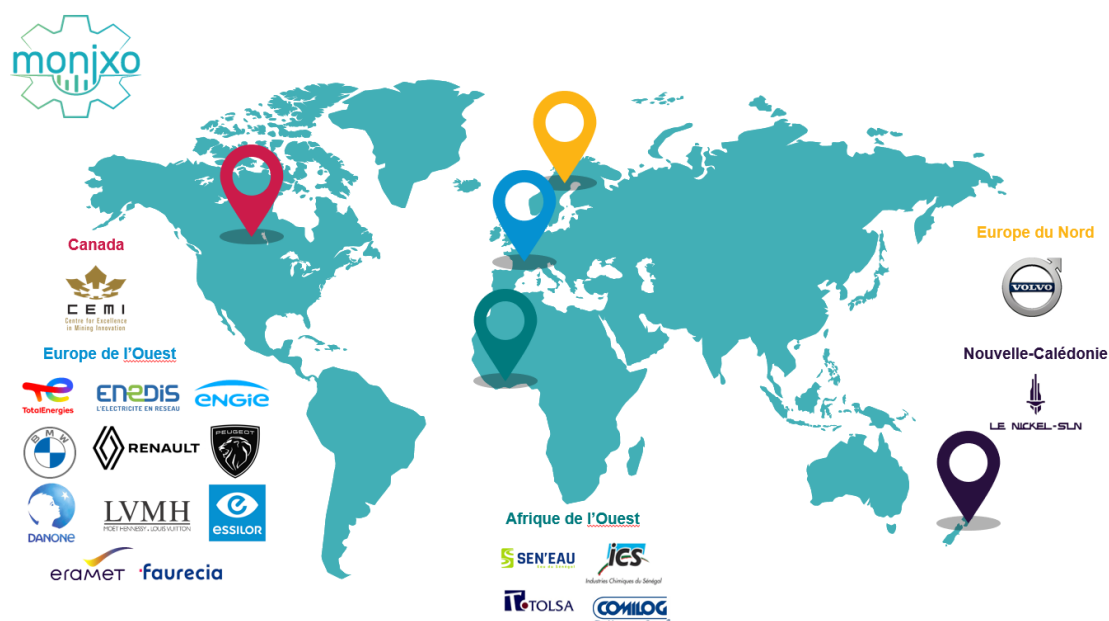
Dear (future) users, Our goal is to allow you to act early enough to avoid major and costly breakdowns, but never too early to avoid unnecessary expenses and downtime.

We therefore offer you this guide so that you discover all the expertise of our teams and what we can bring you.

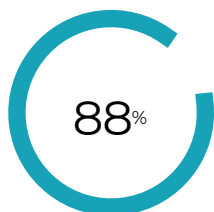
We also hope that the few use cases that we share with you will inspire you and, like all of our clients, you will be able to achieve the following **4 key objectives**:

1 Reduction of costs of maintenance Predictive maintenance helps identify potential problems before they become serious. This means you can plan and carry out minor repairs or maintenance instead of having to make costly major repairs or completely replace equipment.	2 Reduced unplanned downtime By detecting failures at an early stage, predictive maintenance can significantly reduce unplanned downtime. This improves productivity and equipment availability
3 Extension of equipment life By making repairs at the right time and avoiding overloads, predictive maintenance can extend the useful life of equipment.	4 Better maintenance planning By anticipating maintenance needs, it is easier to plan maintenance activities in a way that minimizes production disruptions.

These objectives have been our commitments to our customers for almost 10 years now. Innovation is at the heart of maintenance which, beyond being predictive, aims for efficiency and perfect agreement with each of the operational and technical specificities of our customers.



Ousmane SECK, Co-founder et President de Monixo



Proactivity & efficiency are the keywords

88% of breakdowns are repetitive, therefore avoidable. It is almost no longer necessary to demonstrate the benefit of implementing predictive maintenance. But more than its implementation, its integration into daily maintenance practice is important for its effectiveness. This is one of the keys to the success of our projects.



Experience & innovation

With almost 10 years of innovation and consolidation of our solutions for the industry, we provide a proven, turnkey approach to predictive maintenance

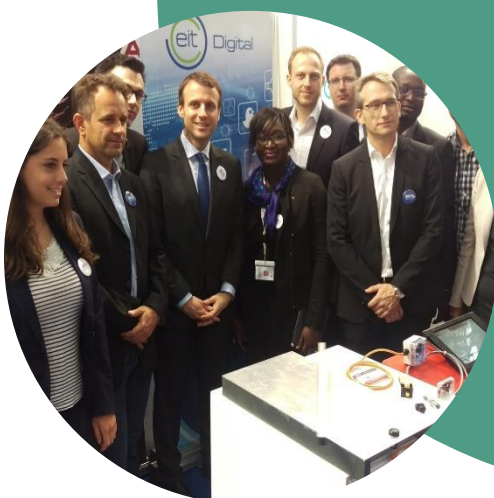
0 (zero)

Secure & non- intrusive

Zero ! Such as the number of interfaces required with our clients' information systems. Indeed, our system is completely independent of the industrial infrastructure of our customers and use their own channels to collect and report data. No connection = no security risk.

Your machines talk (a lot), all
you have to do is listen to
them.

Specialist in predictive and conditional maintenance, based in the Paris region, Monixo designs and implements a complete solution including 2 technological bricks, hardware materialized by industrial IIoT connected sensors and AI, through data analysis software. data collected.





Our customers testify on the use and interest of our approach to predictive maintenance

In an industrial environment focused on optimization and performance in the age of Industry 4.0, in addition to adding a crucial security component to a sustainable transformation strategy, our solutions offer the flexibility and ability to adapt necessary to successful integration with the maintenance teams of large groups or manufacturing SMEs keen to be a step ahead thanks to proactive and better targeted maintenance.



Jean-Phillipe CHARLES,
Maintenance Manager
Actemium

"On old machines, the Monixo solution provides us with cutting-edge monitoring tools to measure the impact of maintenance operations or prevent unforeseen breakdowns on critical machines"



ENGIE

Nans SEDAT,

Maintenance manager

"Our client wanted to innovate their maintenance system using conditional and predictive maintenance. The experience was enriching. The whole project went well. If I had to recommend MONIXO, I would say that they are a very professional and trustworthy team. »



faurecia
inspiring mobility

David Gaillard,

Faurecia Factory Manager

"...Several attempts have been made on other sites without results, even with "prestigious" service providers like CAPG**** and IB*. We at CALIGNY are convinced that our data can help us to better control our process. And for now, you "MONIXO", you are starting to demonstrate it to us"

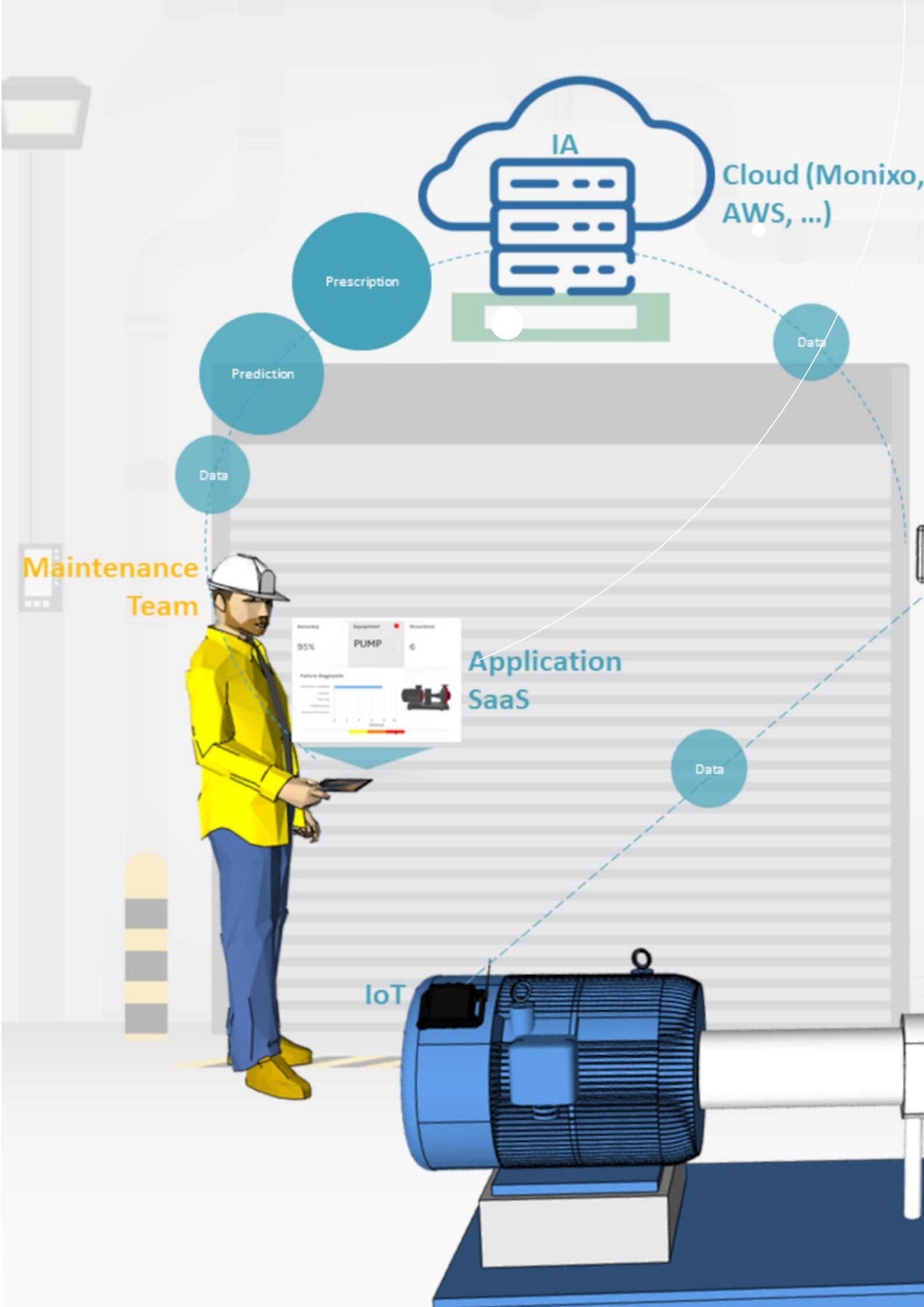


eramet

Louis Alain,

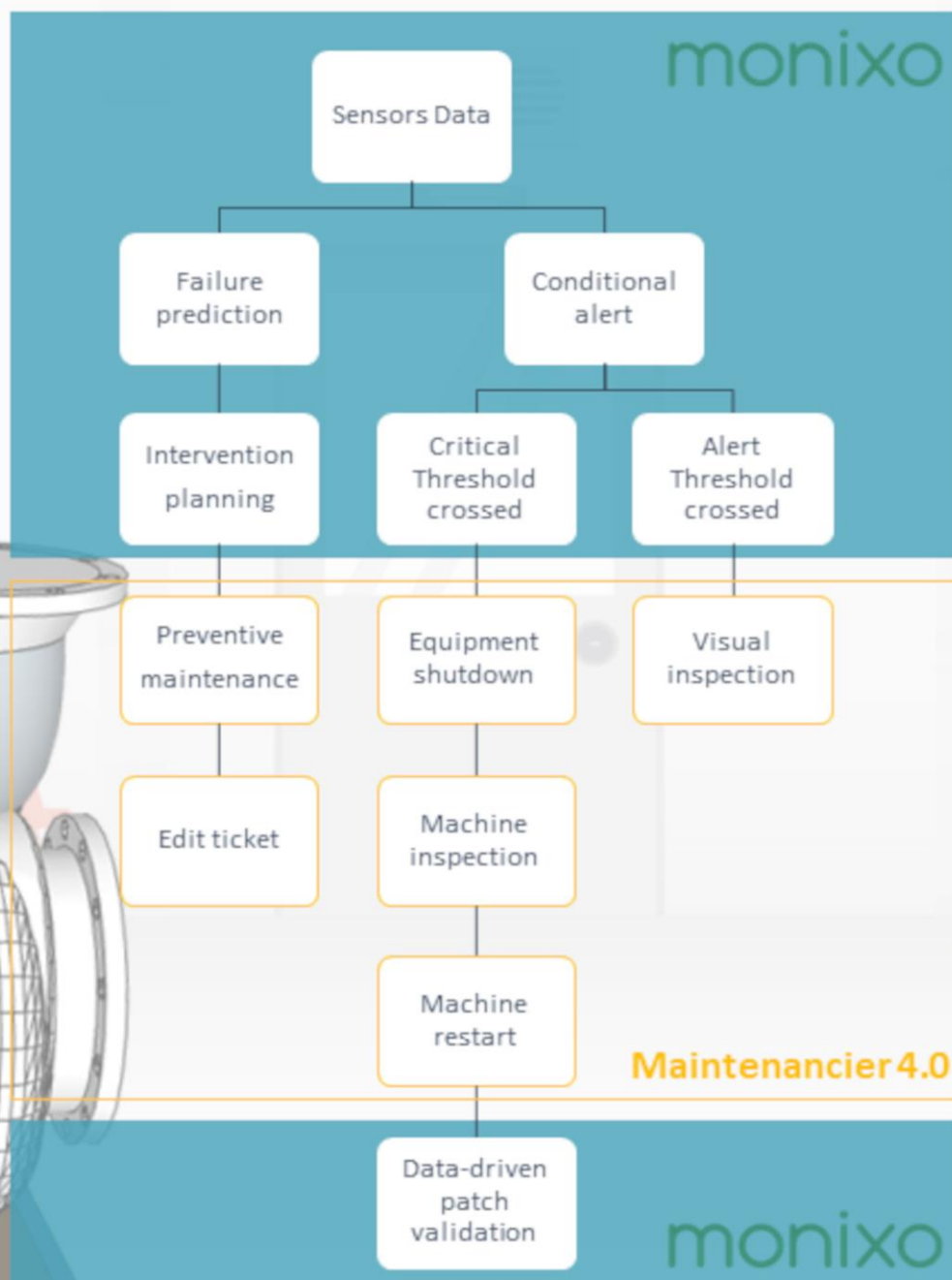
Responsible for the digital transformation of Eramet's metallurgical processes

"The agility, speed and availability of Monixo, which was able to respond to our problems, were decisive in leading the group to deploy the solution on a larger scale in Gabon, Norway, Senegal, France and New -Caledonia. After a little less than a year of deployment and taking into account the number of breakdowns that this allowed us to avoid, the project has paid off. Our operations take place in remote regions where logistical supply problems are complicated to resolve and where anticipation of breakdowns is important"



The “Zero breakdown” program is a mission driven by data and centered on the 4.0 maintainer, who, augmented by it, is capable of proactively directing his action and coordinating it with production objectives. In addition to not experiencing breakdowns, but being able to anticipate them, maintenance teams have tools to analyze the impact of preventive/curative measures on the condition of the machine. “Have I correctly corrected the reported fault? »: To this question, Monixo will answer with “yes” or “no”. Beyond being predictive, maintenance 4.0 is also prescriptive.

Bridge
(Gateway)



Maintenancier 4.0

Predict

Analyse

Connect

Moniteur

Complete turnkey solution,
set up in 15 min



Avoid unnecessary
maintenance operation

Vibration



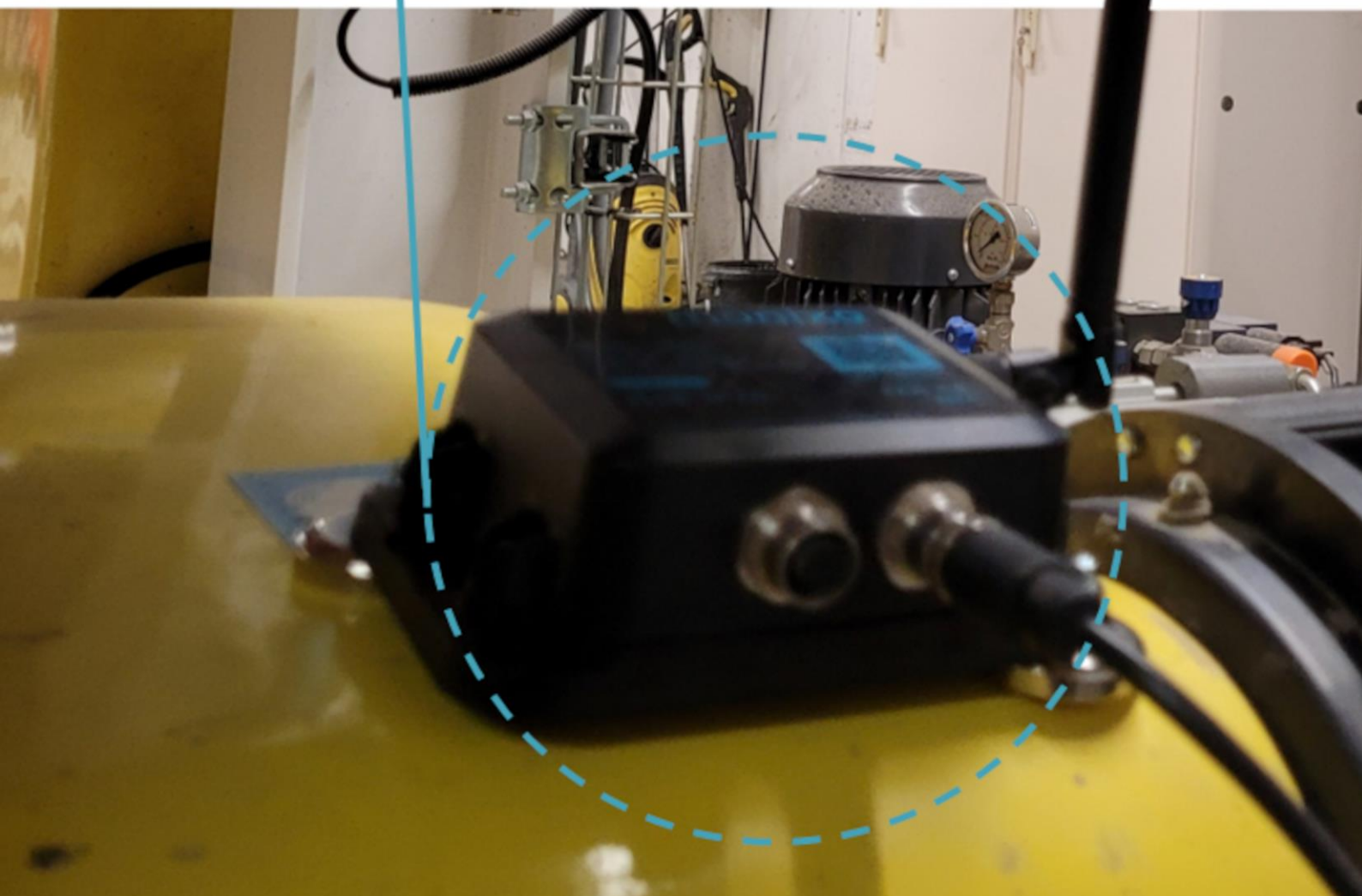
Temperature



Acoustic



Power



Bridge

Wireless	Lora 4G/5G
Function	Gateway Relay
IP code	IP68
Capacity	1200 sensors

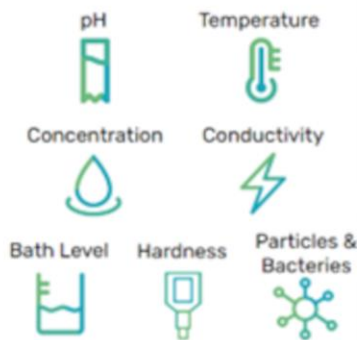


FluidMiner

IIoT for Metalworking Fluid
Measure continuously
Regulate automatically



Take care of your Metalworking Fluid
and **gain in productivity**



NE PAS
COUPER
L'ARMOIRE

IIoT

Sensor

Type

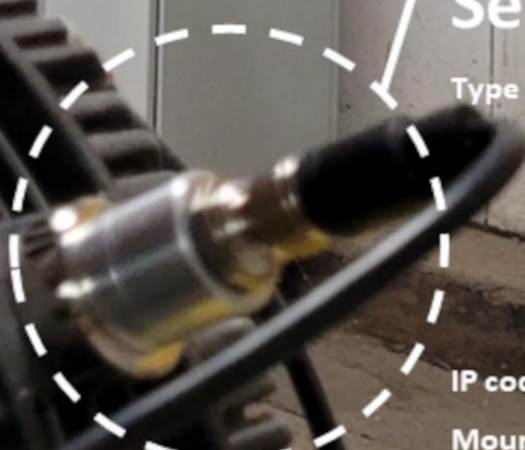
Vibrations
Temperature
Acoustic Emission
Pressure/Delta P
Current/Voltage
Fluid Level
Ultrasonic flow rate

IP code

IP68 & IK10

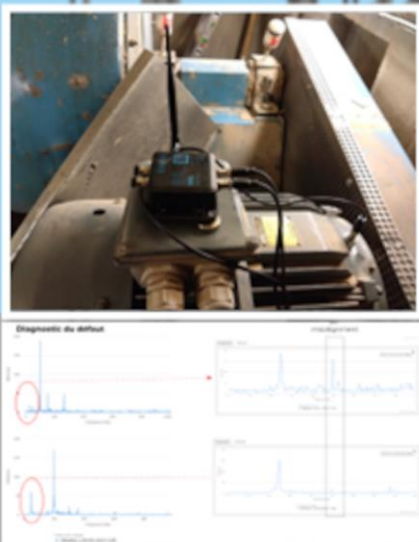
Mounting

Magnet/Glue



Improve the operation and efficiency of your machines with digital twins and AI

Monixo AI makes it possible to act early enough to avoid major and costly breakdowns, but never too early to avoid unnecessary expenses and downtime by capitalizing on designed and proven anticipation models. These models take into account the typology of the instrumented organs as well as the specificity of the sensors deployed.



Advanced diagnosis

In this case, an alignment fault is detected early based on the acquisition and automatic analysis of vibration spectrum.



Condition-based maintenance

AI monitors the status of equipment in real time and automatically triggers maintenance orders based on predictive data.

Predictive modeling

Predictive models estimate when a part or piece of equipment will require maintenance.

Beyond estimating the RUL (Remaining Useful Life), AI reveals the root causes of failures, classified by criticality.



Évolution des défauts



- UNBALANCE
- ANGULAR_MISALIGNMENT
- LOOSENESS_ROTATING
- BENT_SHAFT
- BRIDGE_OR_CRACKED_MOTOR
- PARALLEL_MISALIGNMENT
- STRUCTURAL_LOOSENESS
- LOOSE_CONNECTION_PHASE
- BEARING_COCKED

tenance

equipment in real
time, triggers alerts or
actions on the observed

AI



MINES 4.0: a source of data for maintenance

Eramet is a French mining and metallurgical company with activities spread across 17 mining and industrial sites in 15 countries. Eramet is one of the world's leading producers of: alloy metals, nickel and manganese, used to improve the properties of steels notably.

The project

Started in 2018 with a pilot (PoC/PoV) at the Doniambo nickel processing plant in New Caledonia, this project will be launched at the end of 2019 across all of the group's subsidiaries.

H1 2020 results: €267,000 + €134,000 = €401k in cost of avoided breakdowns, in the first half of 2020, significantly more than the overall cost of the project for one of the group's subsidiaries. More generally, the entire project was profitable in 1 year by Eramet.

Results: More than 700 machines connected in 2022.



On video



Factory 4.0

Eramet has partnered with **the startup Monixo** to implement an innovative and **competitive predictive maintenance solution**.

A success with:

- 400 sensors deployed in less than 1 year
- 800 additional sensors installed
- A ROI done before the end of deployment by the end of 2020





Connected bottling plant and brewery

Danone Waters is a division of Danone specializing in the production and distribution of bottled water and water-based beverages. Its portfolio includes renowned brands such as Evian, Volvic, Aqua and Bonafont, each with its unique characteristics and market presence.

This use case takes place in Volvic. In this plant, Monixio monitors the heart of the process, the water filling line.

Breakdowns avoided

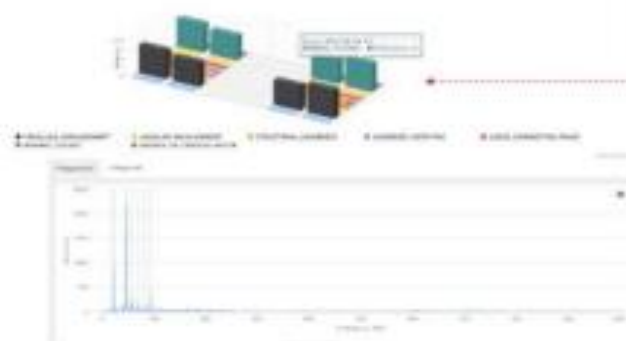
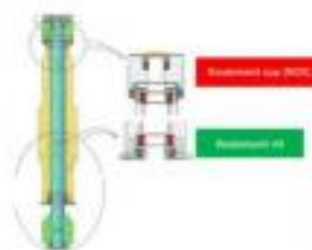
The image below clearly shows two states of health of the upper bearing, the one suffering the most imbalance: the drift during a breakdown and also the result of curative maintenance: the vibrations return to their values normal after 06/10/2023.



The fault diagnosis is carried out precisely: "BEARING_COCKED" and an estimate of the RUL (Remaining Useful Life) is carried out. The maintenance team can then confirm the diagnosis and plan maintenance operations to prevent further critical damage to the star.



As we have seen, the replacement of the bearings is carried out on 06/10/2023, i.e. a Saturday, outside the production framework, without any unnecessary stoppage or haste.



Monitored machines :

- Bottling machines
- Bearings
- Depalletizer
- Palletizer
- Triblock





Predictive maintenance of centrifugal pumps

EDF is the leading producer and supplier of electricity in France and Europe. Its main subsidiaries are: Enedis, RTE, Dalkia, EDF Renewables, Framatome, Edvance, Edison, Cyclife France, EDF Energy, Luminus, SOWEE

The context

RTE & Enedis (EDF subsidiaries) wanted implement predictive maintenance on its equipment in order to validate:

- The ability to collect data continuously and in real time
- That the information collected makes it possible to deduce reliable detection and anticipation models

Monixio has been able to capitalize on its predictive models and its experience in order to meet all of the above objectives concerning the monitoring of centrifugal pumps on conversion stations.



But also in cases of less traditional industrial assets such as pylons (HV overhead line) or transformers.



1 - Installation

L'instrumentation d'une pompe se fait en moins de 5 minutes sur la base d'un modèle 3D fourni



Pompe Centrifuge

2 - Prédiction

Les premières prédictions sont émises au-delà d'une courte phase d'apprentissage automatique.
Durée : 7 jours (en moyenne)



Evolution des défauts



Défaut principal
origine de la panne

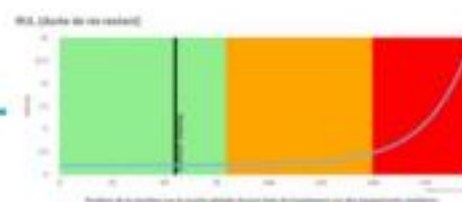
Diagnostic - 3



800 est le nombre de type de défauts diagnostiqués par nos modèles.

4 - Estimation RUL

Quand intervenir ?
Monixio permet d'agir suffisamment tôt pour éviter les pannes lourdes et coûteuses mais jamais trop tôt pour éviter les dépenses et arrêts inutiles.



AGENDA



Your predictive maintenance project
starts here
(FREE, Activated 12/6/2023)



*We are offering you this TAG so that you can benefit from
our new sensorless predictive maintenance service free of
charge. Available December 6, 2023.*

event 1

event 2