metroscope
GROUPE EDF

Diagnosis software for targeted maintenance

Industrial value added

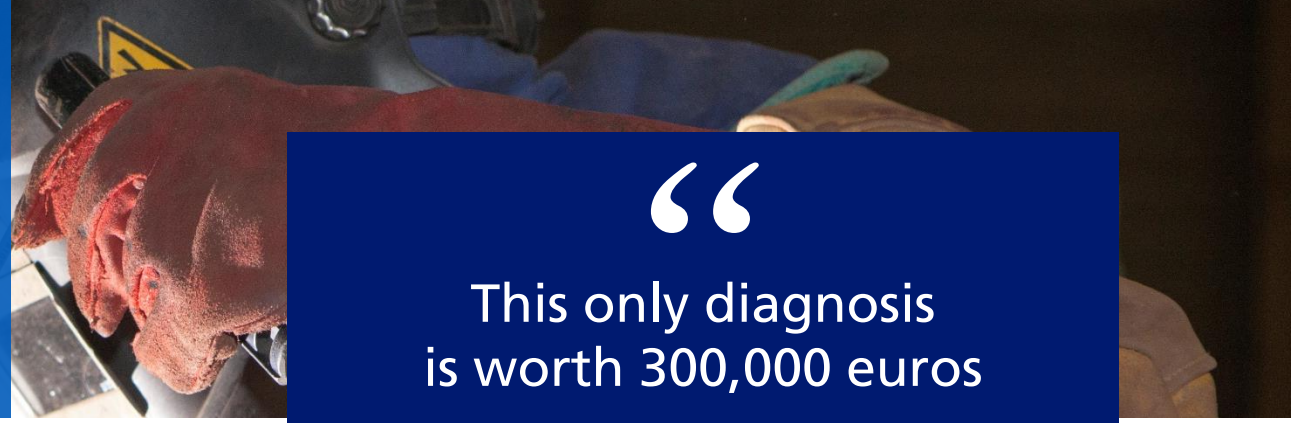
> “
> Metroscope means millions of euros saved!
>
> *Stephane Feutry,*
> *head of nuclear production performance in France*

Metroscope software provides the diagnosis of industrial equipment and processes for early fault identification and targeted maintenance.

- Early fault identification
- Enhanced operational and environmental performance
- Longer equipment lifespan

The technology is running on several EDF nuclear power plants, where it has already brought value.

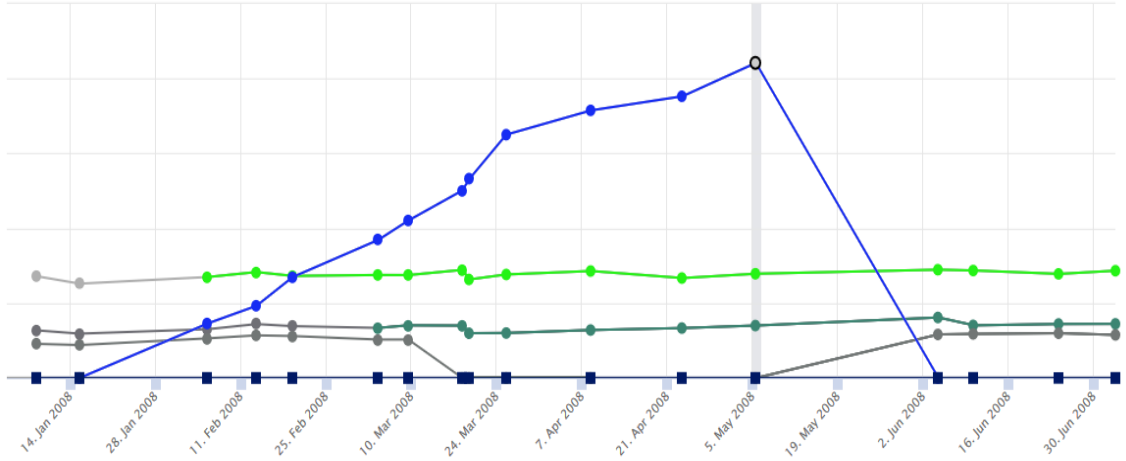
Diagnosis example



> “
> This only diagnosis
> is worth 300,000 euros

The graph below displays a real diagnosis case performed by Metroscope on historical data.

The blue curve represents a fault, starting on January 14th, automatically diagnosed and responsible for an average production loss of 3MW.



During nearly 4 months, the fault has been increasingly affecting the process, until it was located by the operators.

On May 5th, the problem was fixed by maintenance team without interrupting the process.

The problem has costed more than 300,000 euros.

Metroscope had seen it from the start.

Perimeter

The first Metroscope was designed for thermal cycles in nuclear facilities.

Metroscopes applied to gas turbine and other conventional plants are under development.

Any industrial process can have a Metroscope.

Our current main focus are: hydraulic distribution, compressed air networks, cooling systems…

Technology: AI diagnosis

See industrial faults
5 times faster
with 90% assurance*

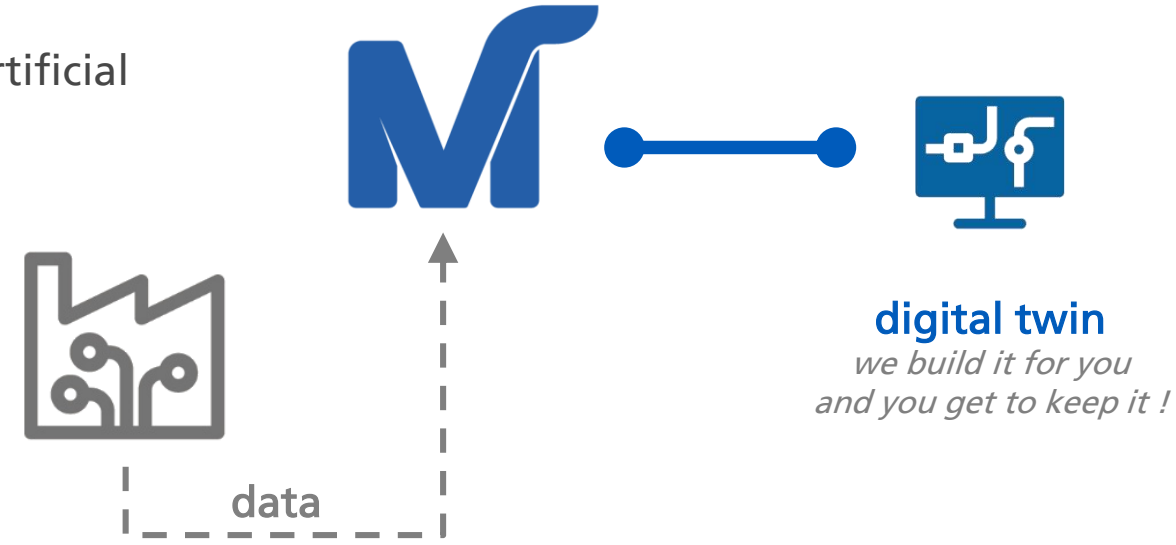
*based on EDF experience

Metroscope diagnosis relies on 2 blocks:

- the **digital twin,** a numerical model that simulates your process
- the **software,** powered by our proprietary artificial intelligence.

Metroscope AI uses stochastic algorithms connected to the digital twin, to investigate thousands of scenarios before giving its results.

The technology is patented. It was developed at EDF lab, one of the biggest R&D centers in Europe.



digital twin
we build it for you
and you get to keep it !

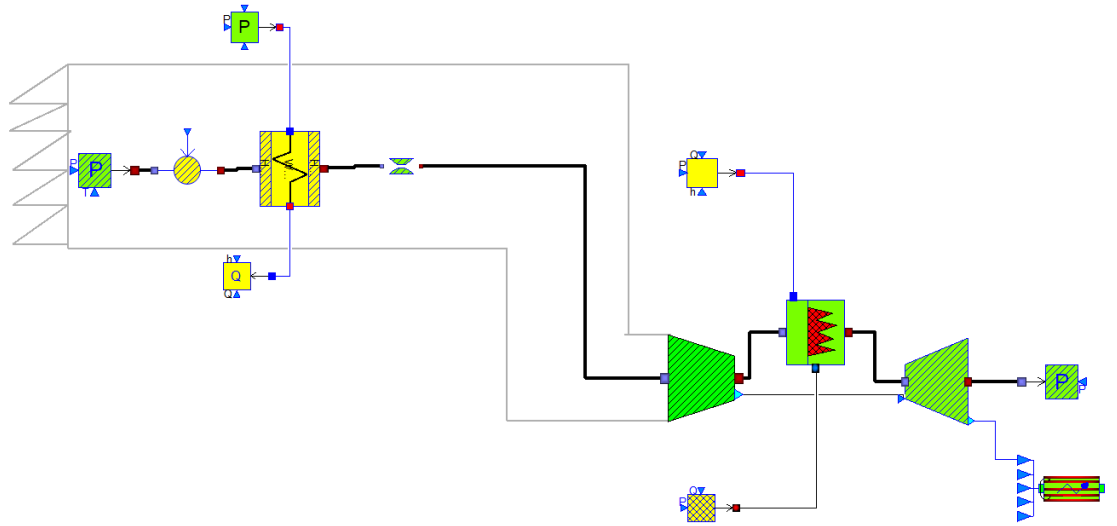
The digital twin

> “
>
> Models are just like puzzles,
> in less than 3 months we can model
> a full nuclear thermal cycle from zero
>
> *Julien Lagarde, product manager at Metroscope*

Numerical models get the best out of your data and physical sciences. They are designed to simulate complex behavior, impossible to address with machine learning approaches whose inputs are limited to the existing data.

Our engineers are expert at modeling complex industrial processes.

At Metroscope we use and develop "state of the art" industrial libraries.



The digital twin above represents a Gas Turbine ,
Up to 30 measurements are monitored by the Metroscope

Software Insights

Dive into our 3 steps diagnosis:

1. Check the measurements
2. Detect the symptoms using the digital twin
3. Diagnose the problem with AI

Log In

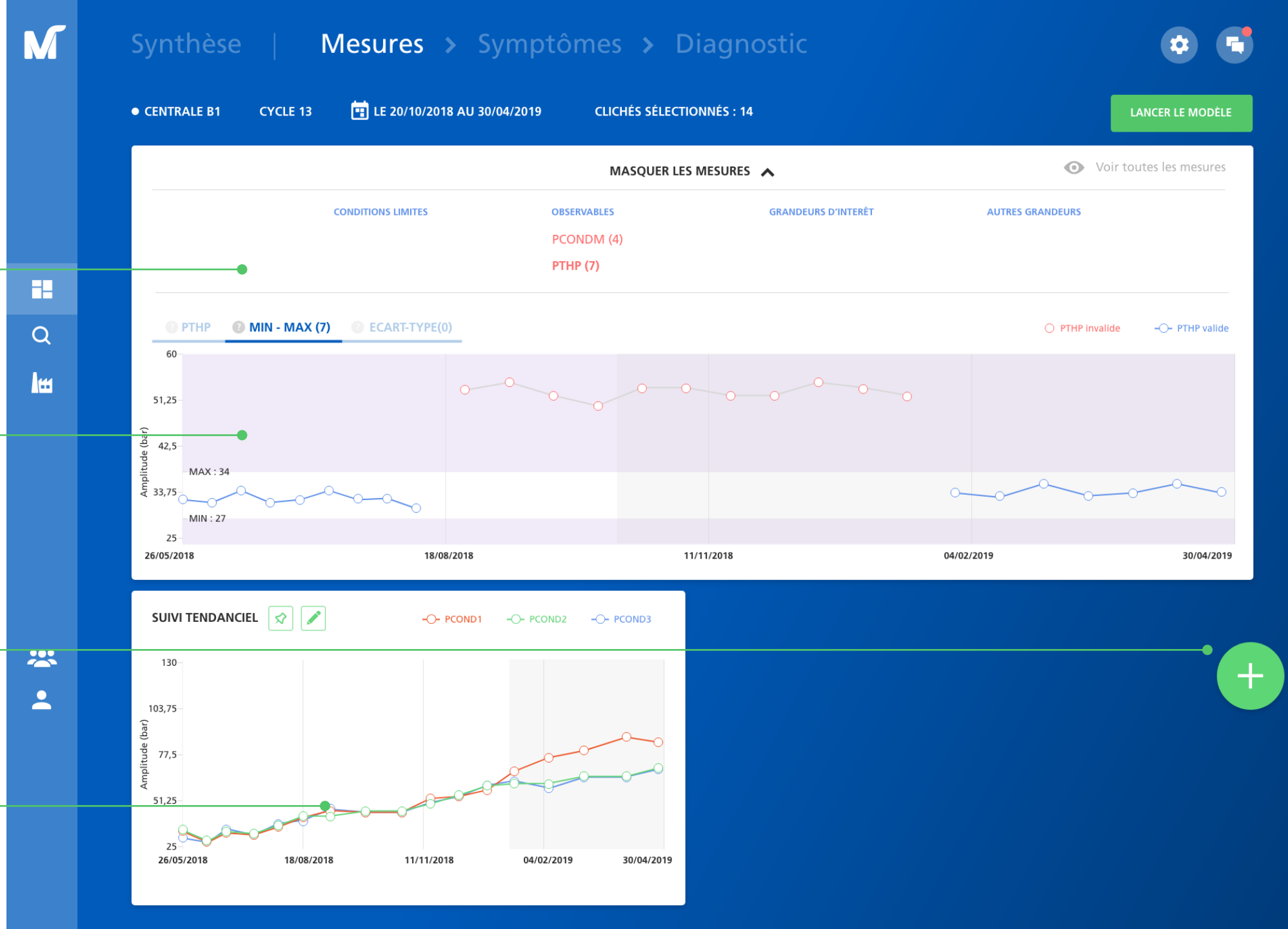
Check
the measurements

Automated detection of abnormal metrological behaviors of the measurements

Intuitive visualization of time series and alert criteria

Build your dashboard with widgets to display the information needed by experts

Example of graph showing redundant measurements



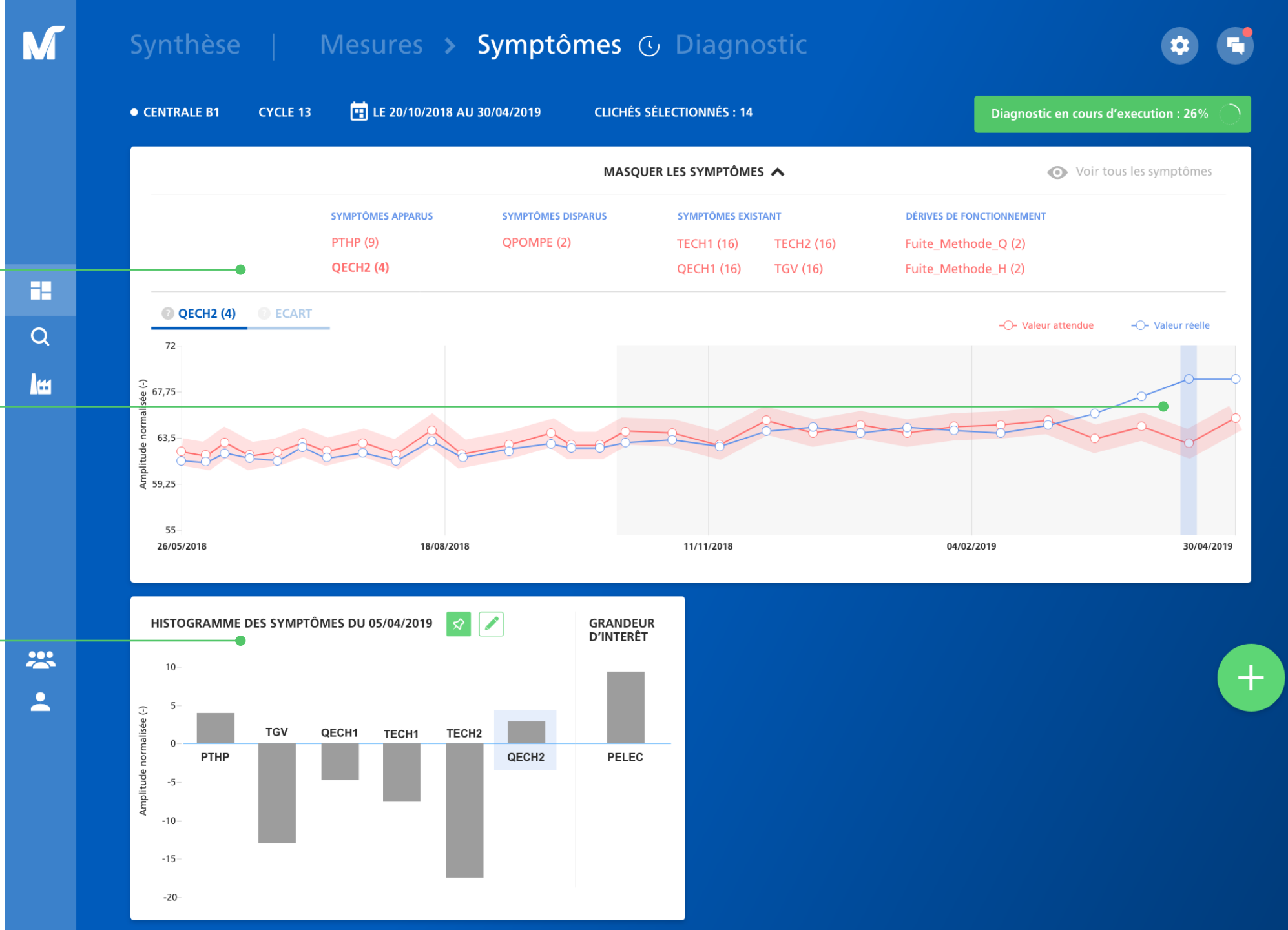
Symptoms
from the digital twin

List of main symptoms on the process

A symptom is a deviation between input data and expected values delivered by the digital twin

All the symptoms on the process are summarized in a unique histogram, giving the operator an overview of his process

Next step Metroscope will look for the potential faults responsible for those symptoms



Diagnosis

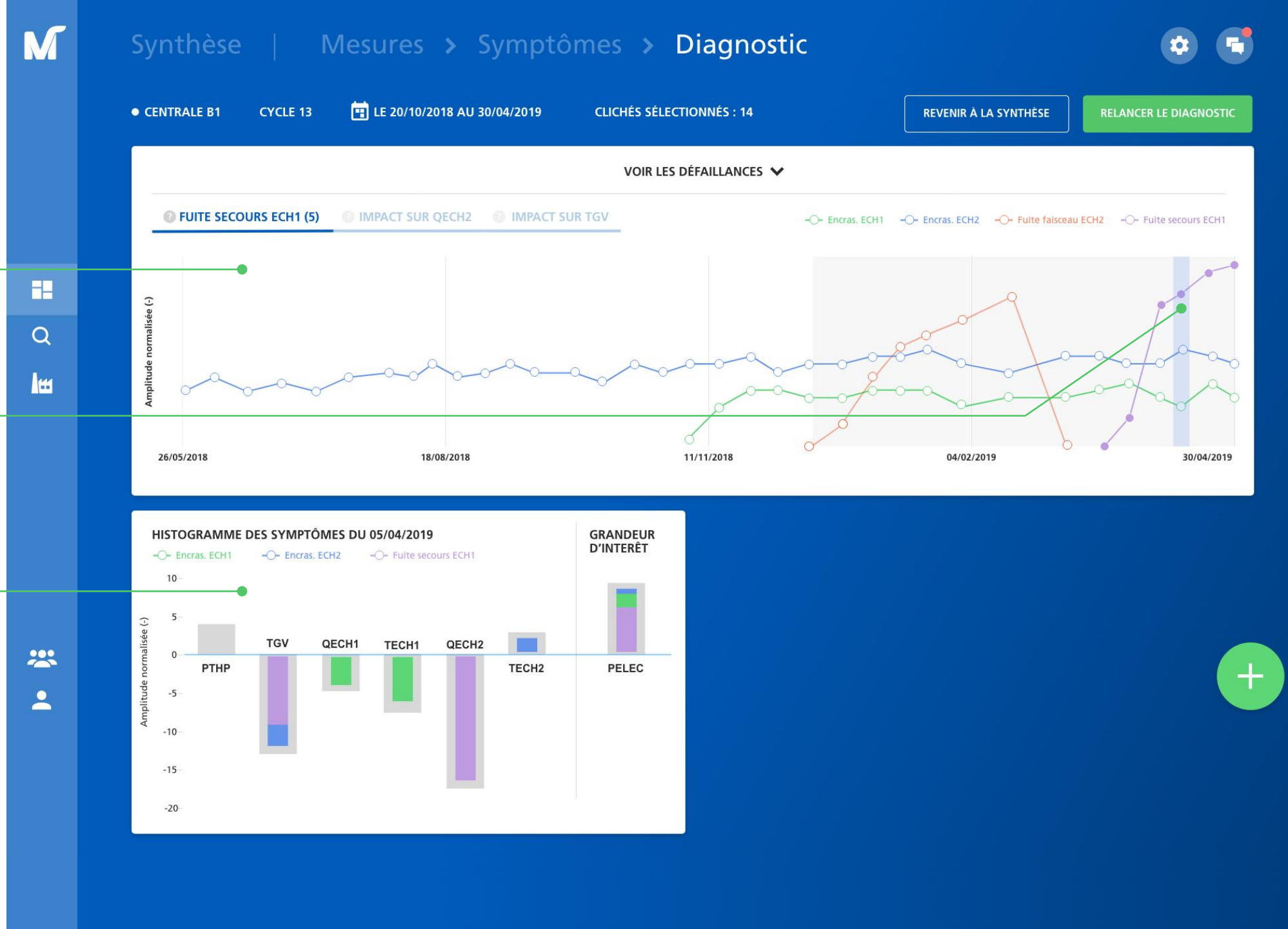
Results from AI

Visualization of all faults diagnosed by Metroscope

The purple curve represents an increasing valve leakage that requires an imminent maintenance

The previous symptoms histogram is now completed with the signature of every detected fault

We can see that the leakage (purple) is responsible for a 5MW loss



Edited by

Publicity

- Official press release [web link]
- Newspapers (french) [web link]
- See the video [web link]

Find us on EDF.fr

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