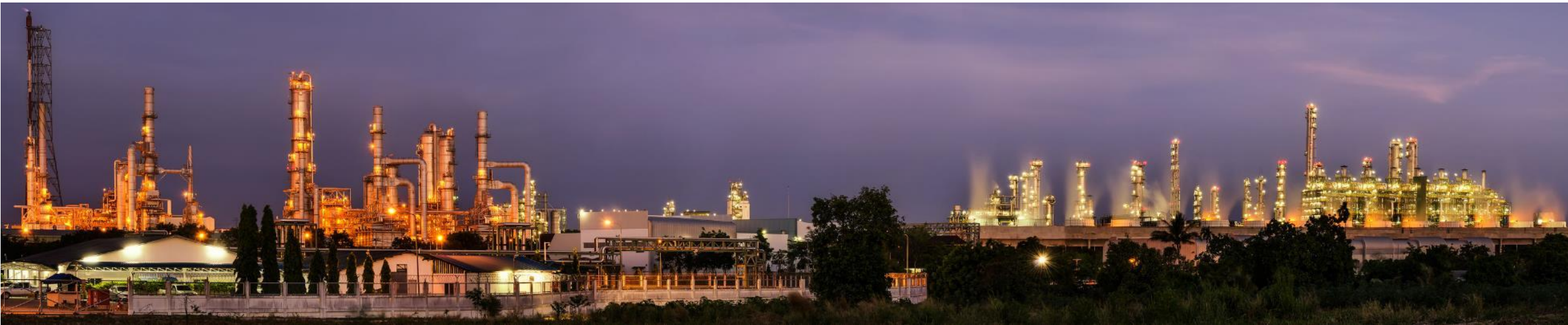




SIM *ENGINEERING*



The Design of Silence



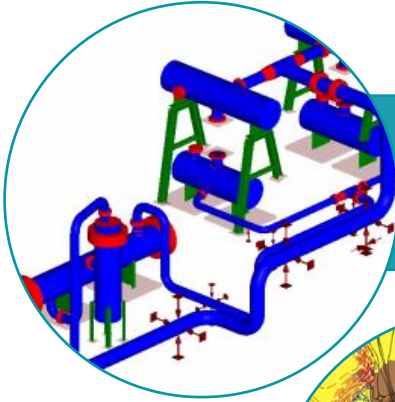
Pulsation & Vibration Control



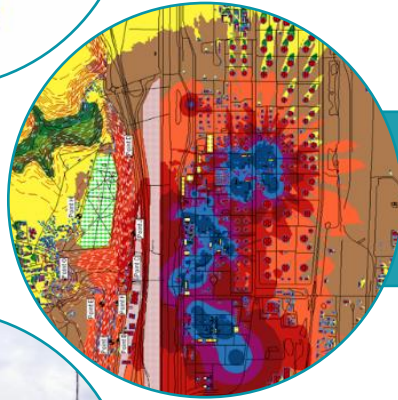


Acoustic and
Vibration
Engineering Services
Oil & Gas and
Chemical Industries

Acoustic and Vibration Engineering Services



Pulsation and Vibration Control

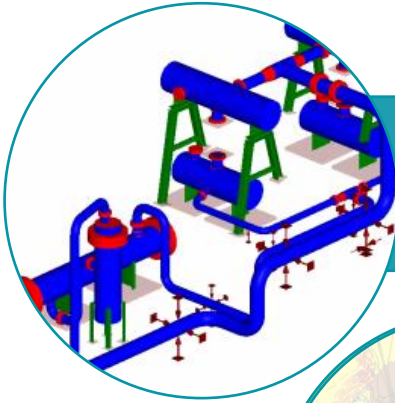


Noise Impact study



Noise, Vibration & Pollution
Monitoring

Acoustic and Vibration Engineering Services



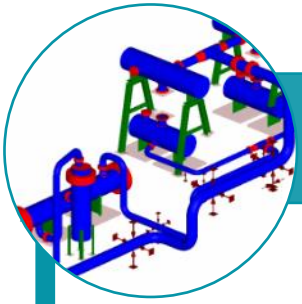
Pulsation and Vibration Control



Noise Impact study



Noise, Vibration & Pollution
Monitoring



Pulsation and Vibration Control

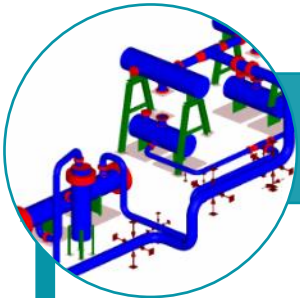
Context

From sites, project,

Rotating equipment and Piping systems,
Vibration issues and Mechanical design...



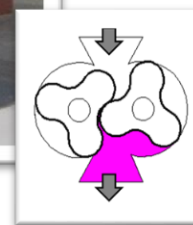
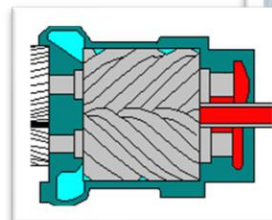
... to
Troubleshooting,
Expertise and
Recommendations



Pulsation and Vibration Control

Rotating Equipment & Piping System

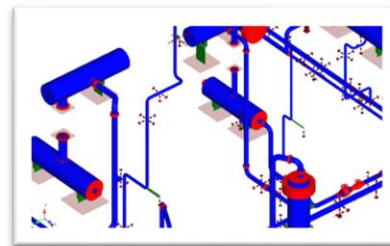
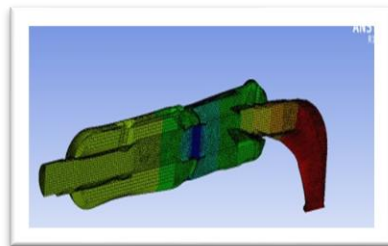
Reciprocating compressors, Roots blower, Screw Compressors

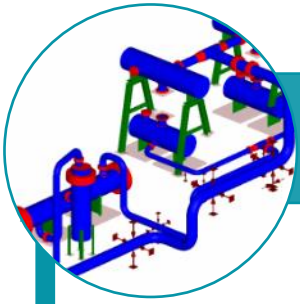


API 618, API 619... Studies

Acoustical Analysis
Pulsation Analysis
Mechanical Response Study

Pulsation dampeners, silencers, restriction orifices, $\frac{1}{4}$ wavelength resonators, piping supports, noise insulation ...





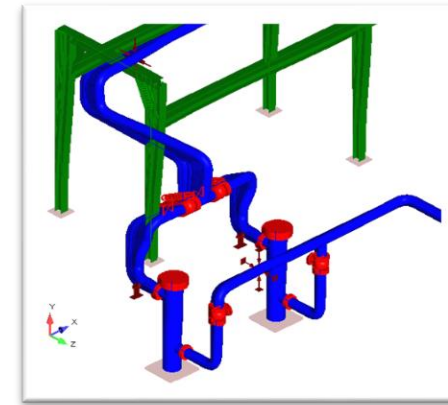
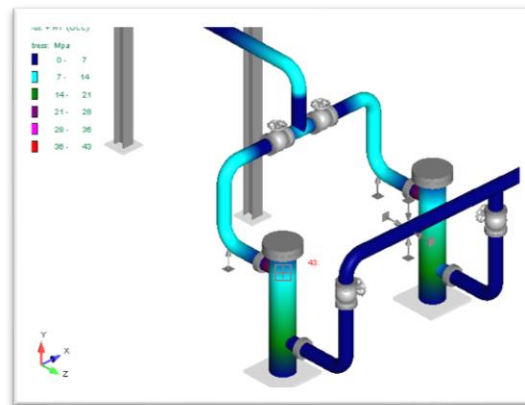
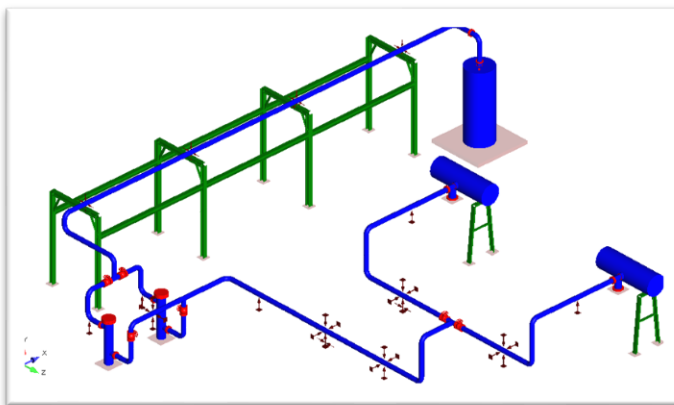
Pulsation and Vibration Control

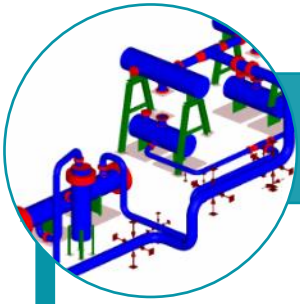
Piping System

Piping Flexibility Analysis & Dynamic vibration Analysis

Gravity, pressure & thermal loads
Flow induced forces, environmental loads (seismic, wind...)

ASME B31.3, EN 13480-3, CODET...





Pulsation and Vibration Control

AIV & FIV

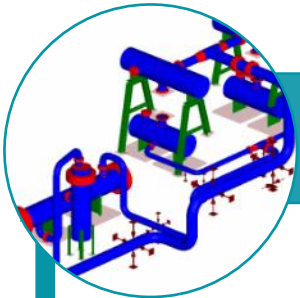
Acoustically Induced Vibration & Flow Induced Vibration Analysis

Identification of potential excitation mechanisms through Qualitative and Quantitative assessments.

Recommendations to mitigate vibration failure risks

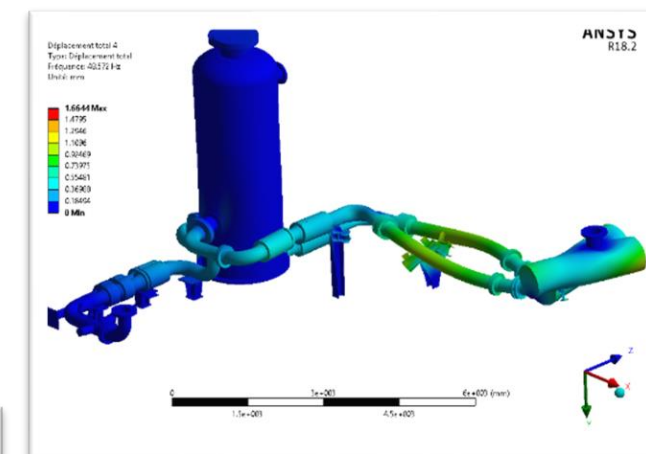
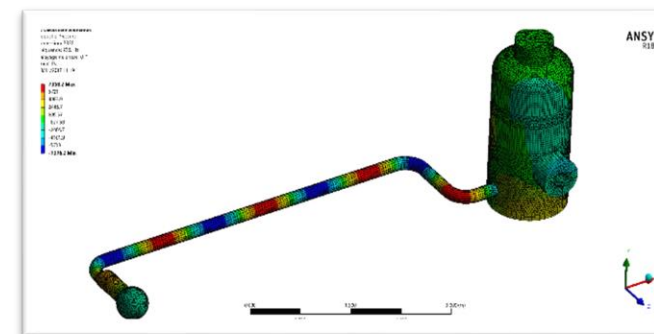
Process piping AIV & FIV





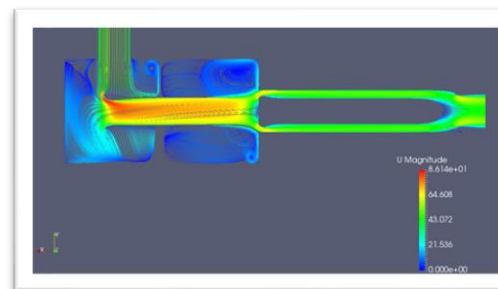
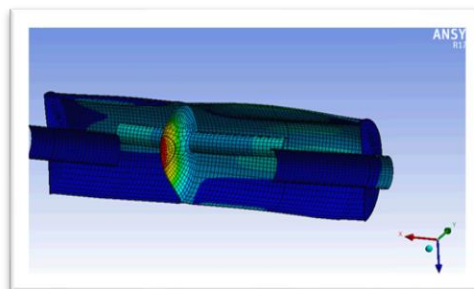
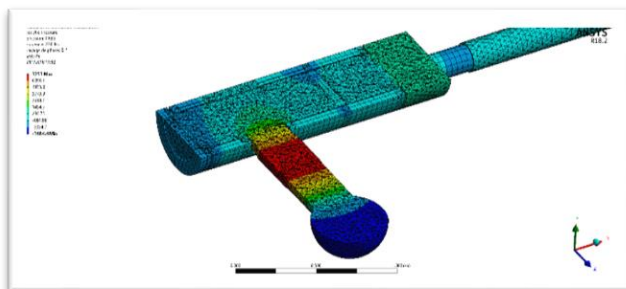
Pulsation and Vibration Control

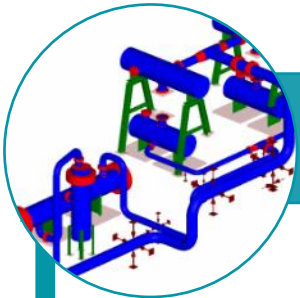
FEM & CFD Studies



Acoustic & Mechanical Design

Acoustic performance
Pressure drops
Mechanical integrity





Pulsation and Vibration Control

Troubleshooting On-shore & Off-shore Facilities



Vibration survey and troubleshooting

Vibration measurements

Pulsation measurements

Operating deflection shape and modal analysis

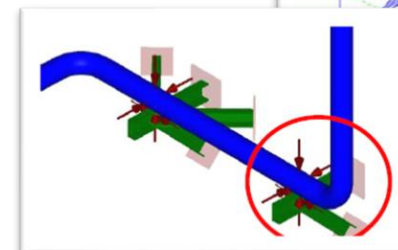
Mitigation



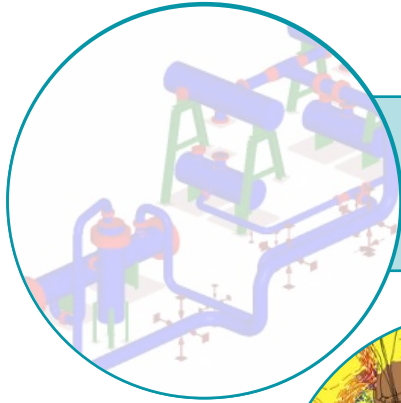
Vibration assessment of operational unit

Establishment of appropriate preventive actions

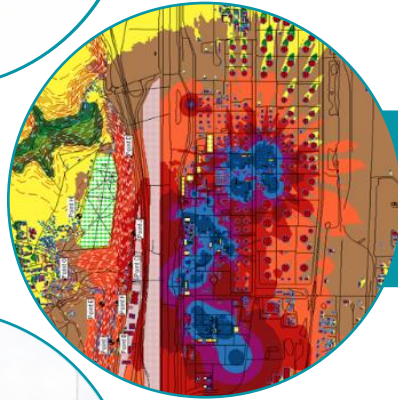
Possible corrective actions before failure



Acoustic and Vibration Engineering Services



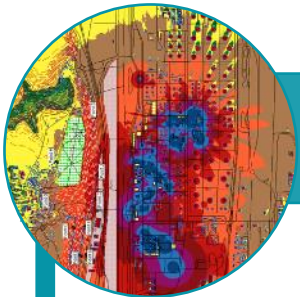
Pulsation and Vibration Control



Noise Impact study

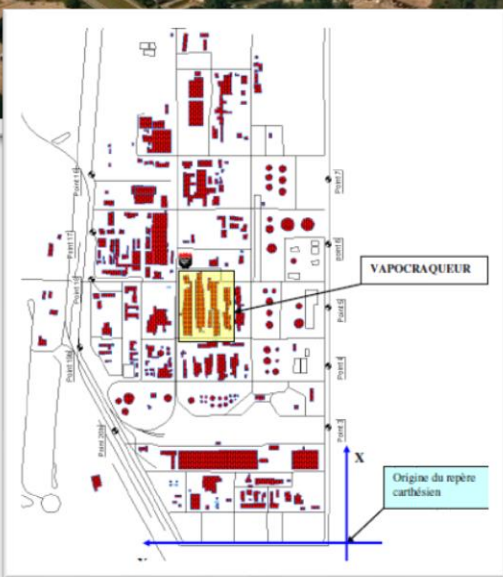
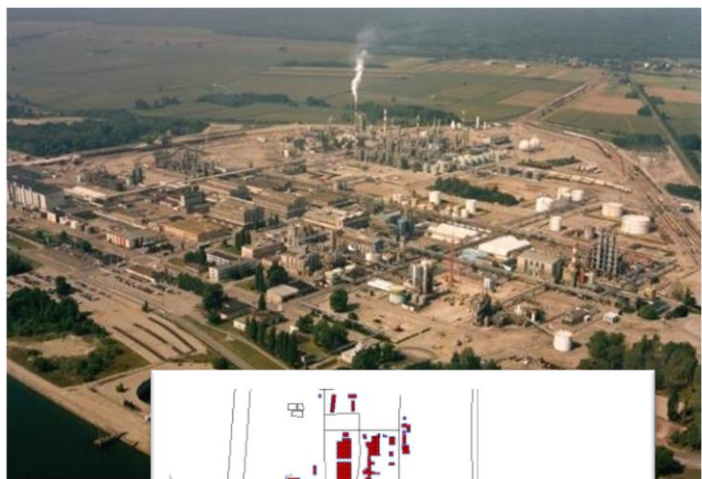


Noise, Vibration & Pollution
Monitoring



Noise Impact Study

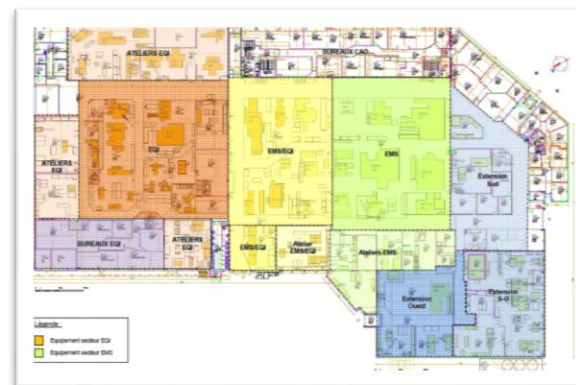
Context

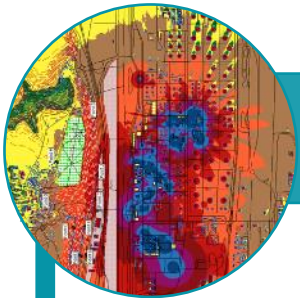


Outdoor Noise issue

In-door noise issue

Actual Site
&
Future project

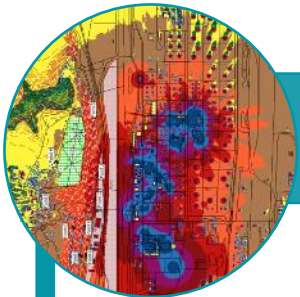




Noise Impact Study

Industries
On-Shore & Off-Shore Sites





Noise Impact Study

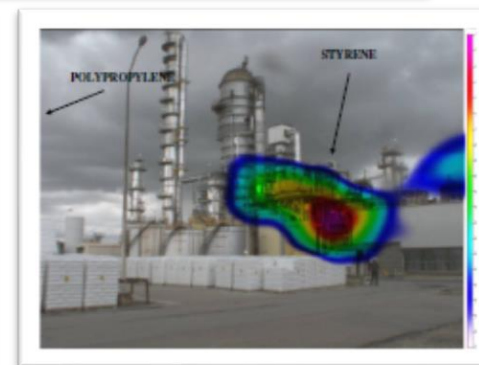
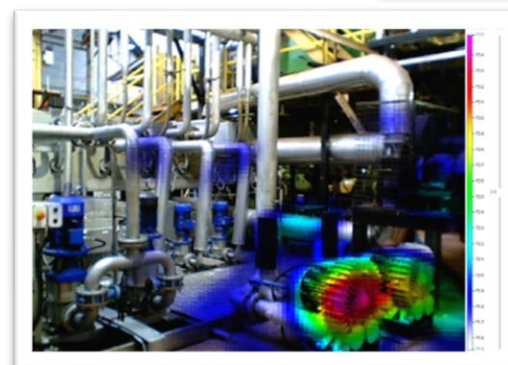
Survey

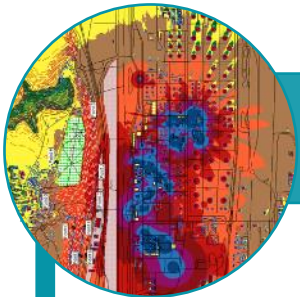
Expertise & Measurement on sites

Environmental Noise and Nearfield Measurements



Troubleshooting - acoustic camera

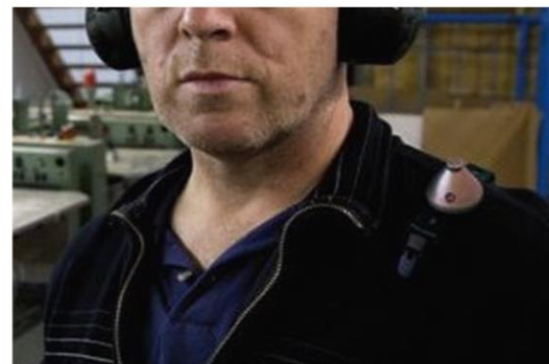




Noise Impact Study

Survey

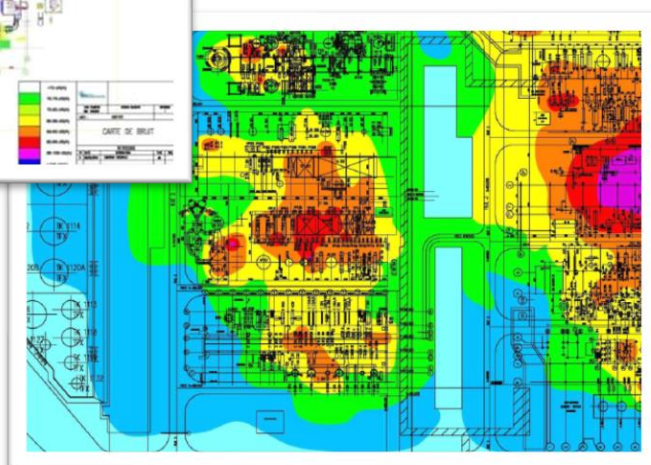
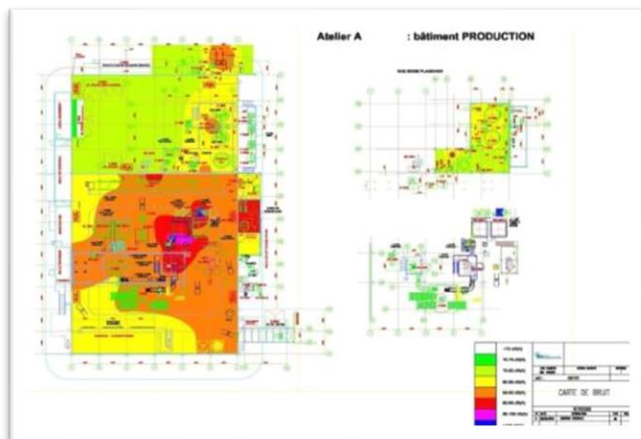
Expertise & Measurement on sites

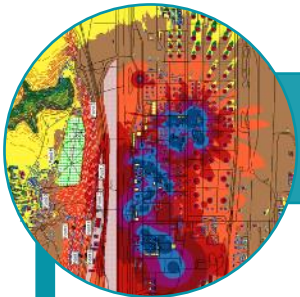


Workers Exposure

Noise Mapping

Noise & Vibration Exposure





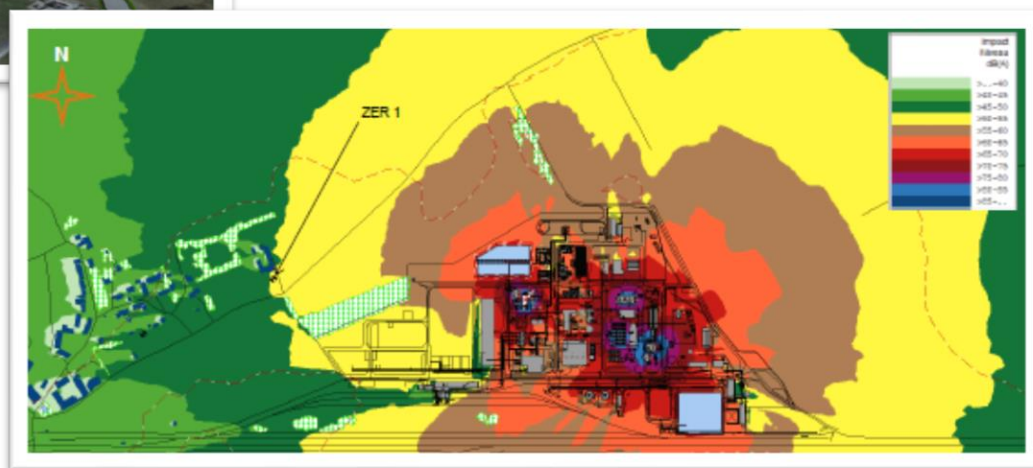
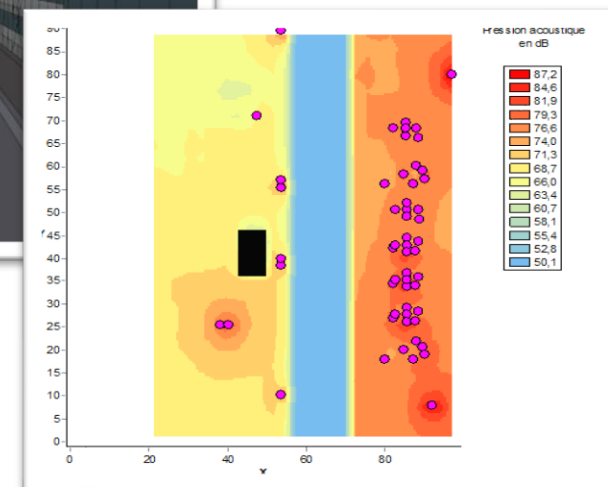
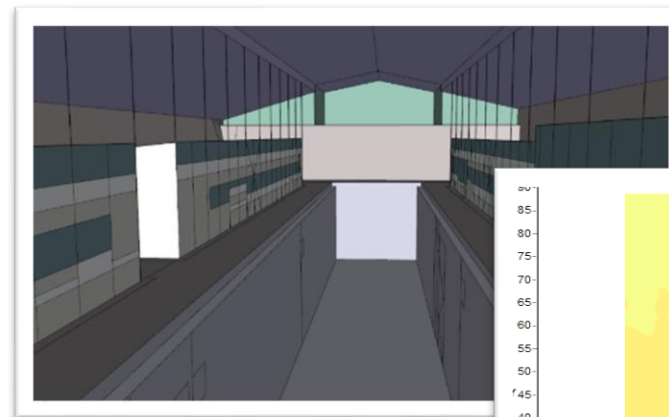
Noise Impact Study

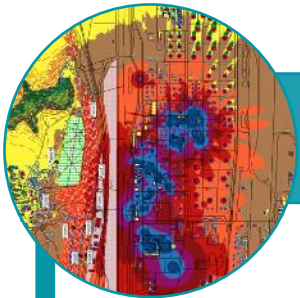
Survey Noise prediction

Acoustical Numerical Simulations

Outdoor prediction

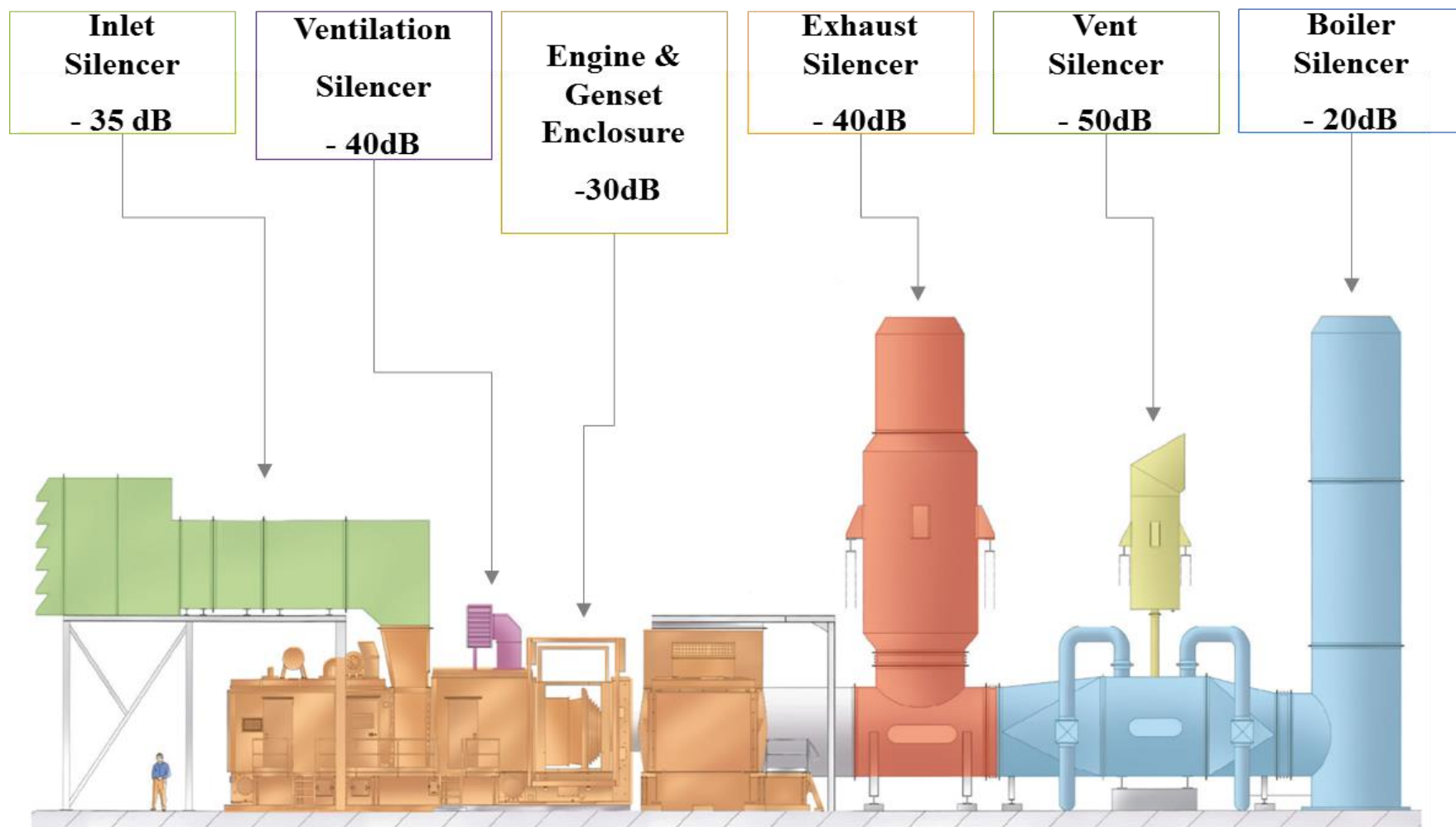
In-door prediction

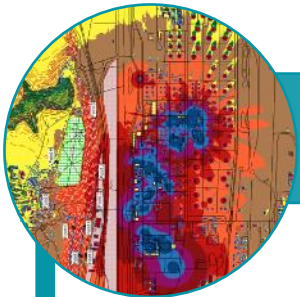




Noise Impact Study

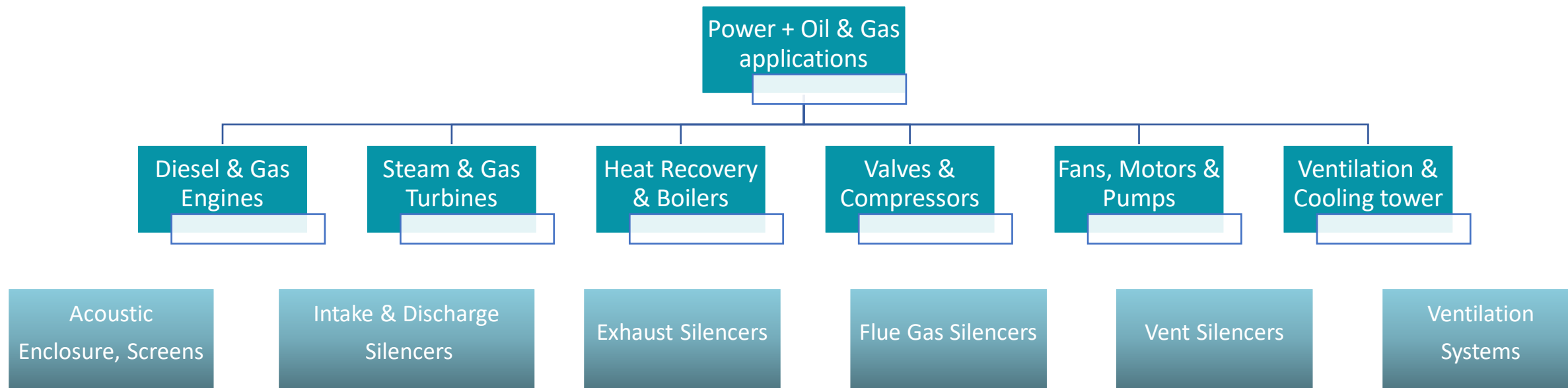
Recommendation of treatments Example of Solutions



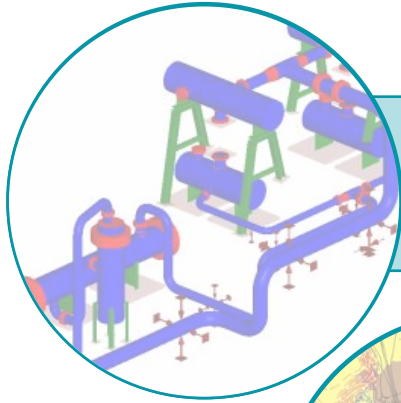


Noise Impact Study

Product Engineering & Supply Project Management Assistance



Acoustic and Vibration Engineering Services



Pulsation and Vibration Control



Noise Impact study



Noise, Vibration & Pollution
Monitoring



Noise, Vibration & Pollution Monitoring

Context
Environmental Impact Monitoring

➡ *Operational sites*
➡ *Construction sites*

Traceability

- Measurement Traceability

Impact Management

- Continuous measurement

Data base

- Real-time data base construction

Action program

- Proposition of action plan to mitigate the nuisance





Noise, Vibration & Pollution Monitoring

Connected Station

Developed by SIM Engineering

Multi-physical

Acoustic and/or Vibration and/or Pollution



Distance and Real-time monitoring
Station developed by SIM ENGINEERING

Monitoring Platform

Developed by SIM Engineering

Distance and real-time analyses

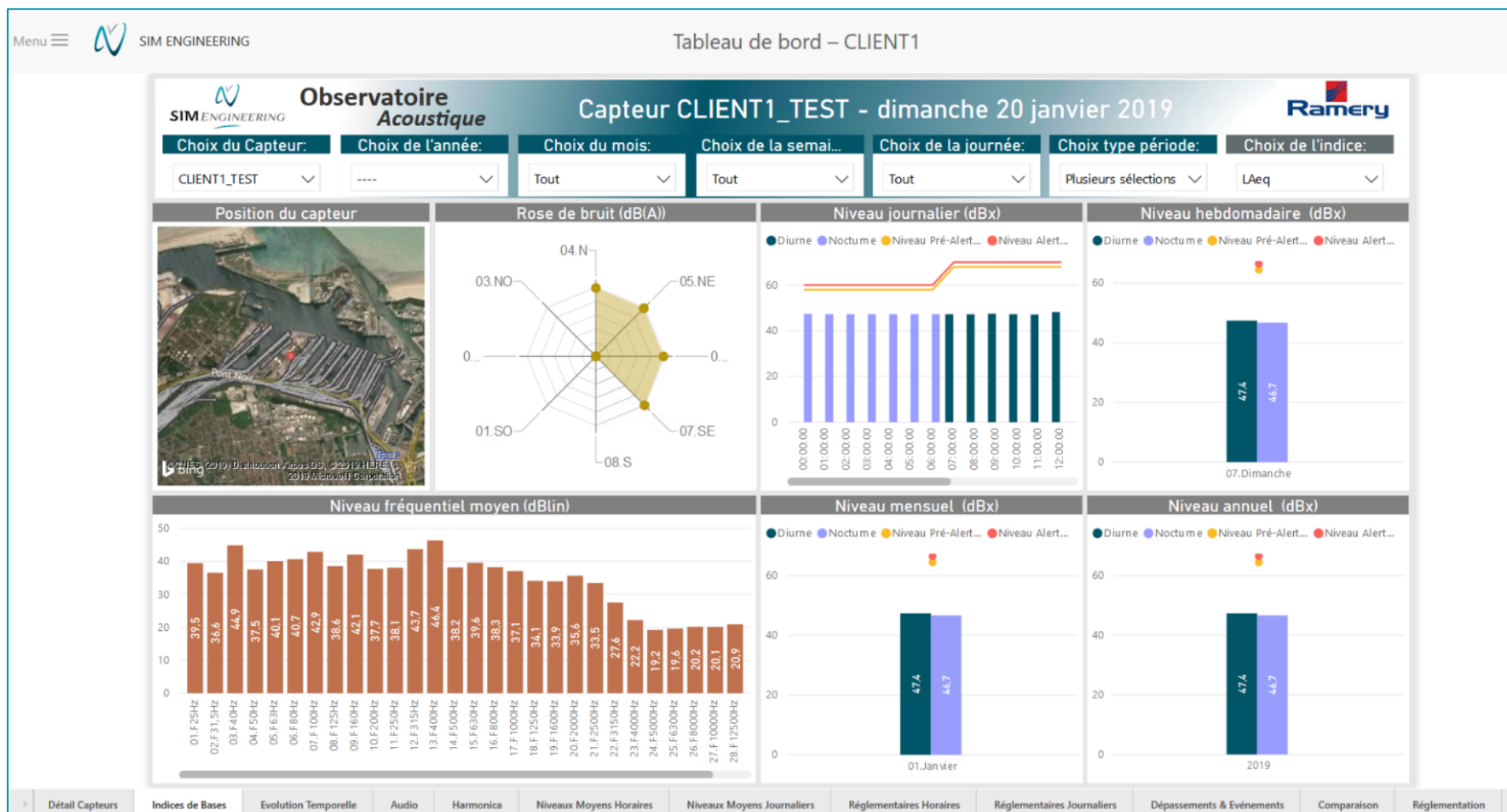


SIMENGINEERING



Noise, Vibration & Pollution Monitoring

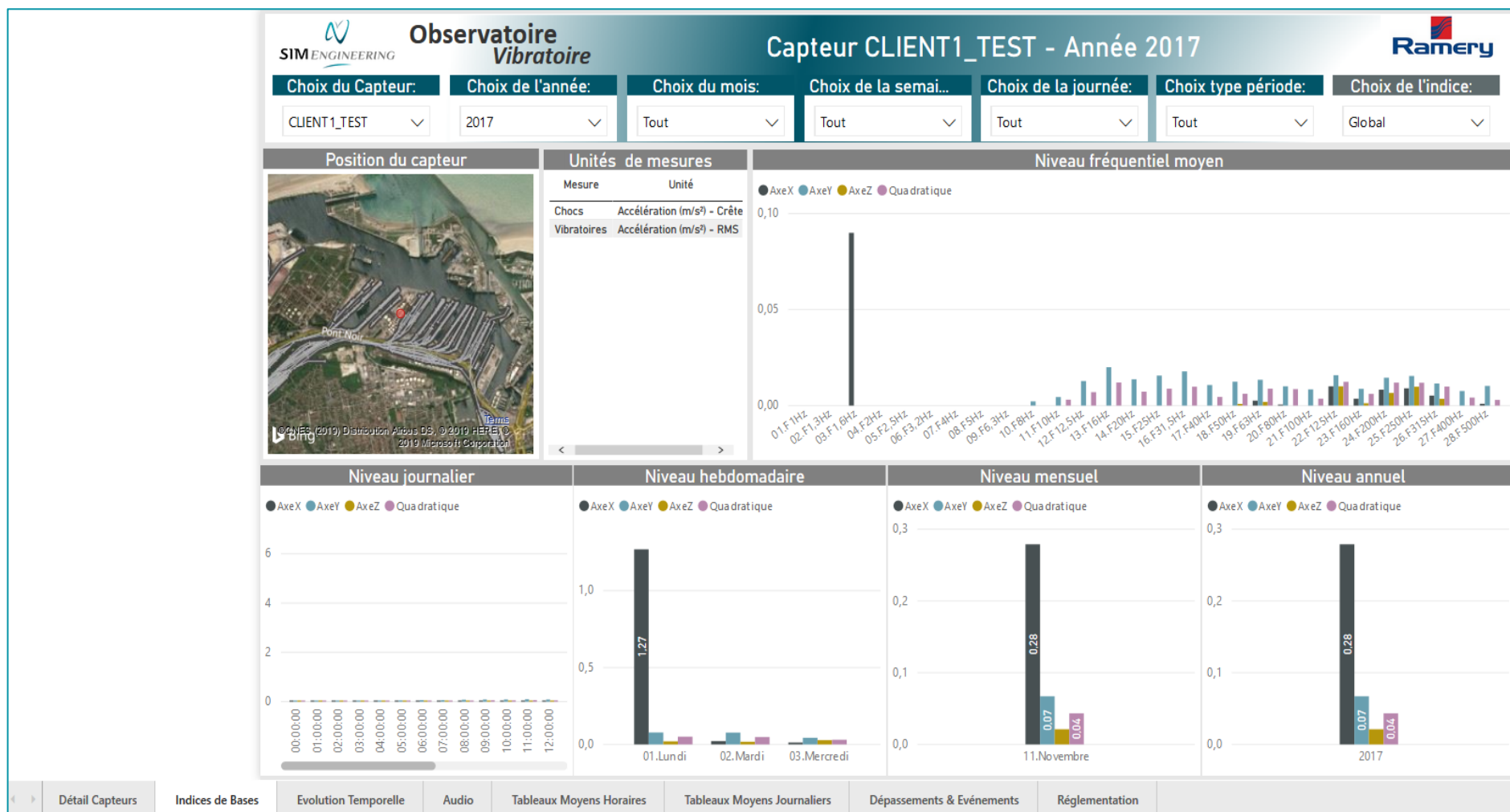
Noise Monitoring Station developed by SIM ENGINEERING





Noise, Vibration & Pollution Monitoring

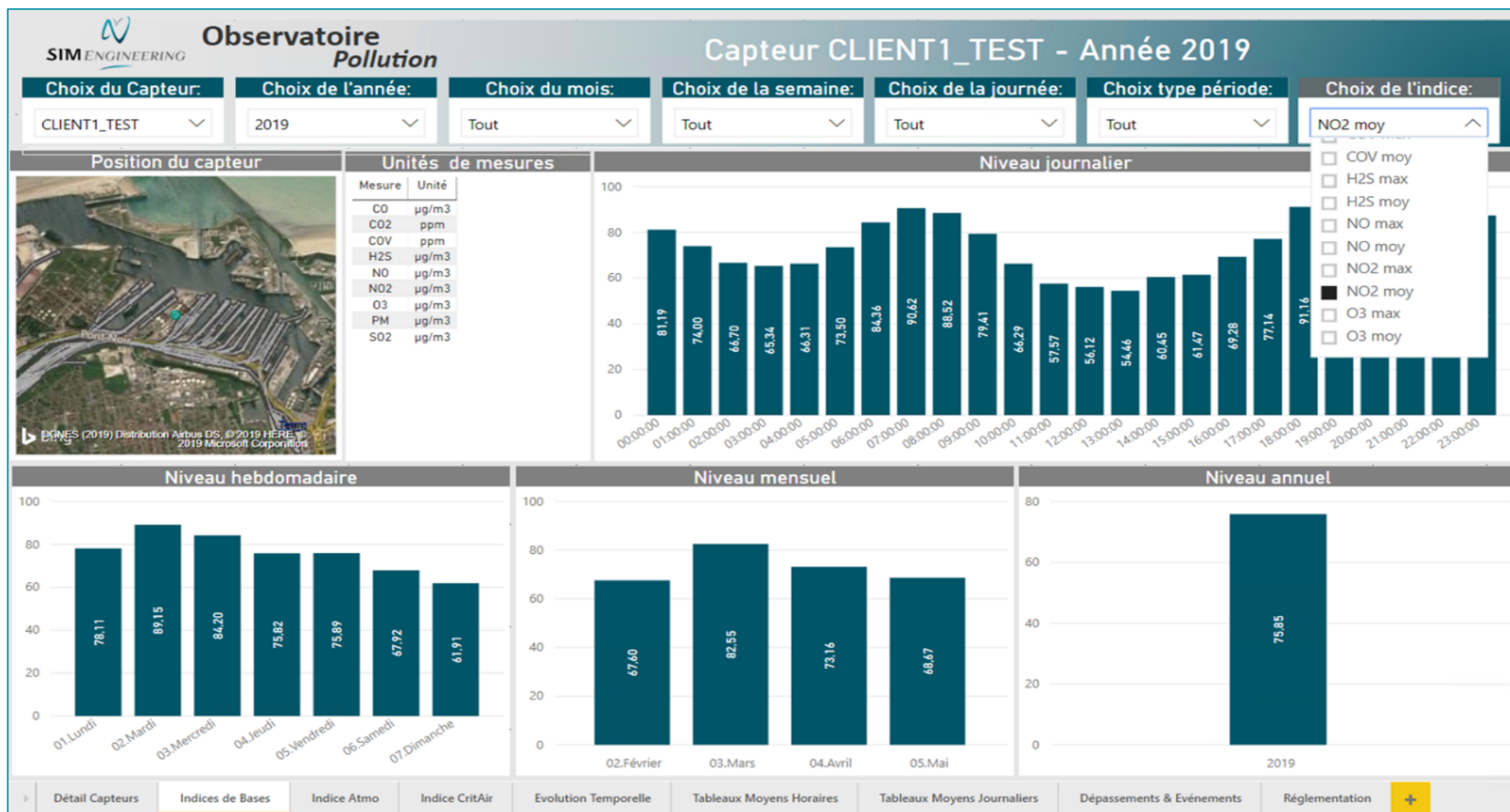
Vibration Monitoring Station developed by SIM ENGINEERING





Noise, Vibration & Pollution Monitoring

Gas & Particles Monitoring Station developed by SIM ENGINEERING





Some References





contact@sim-engineering.com
+33 (0)3 20 05 88 55