PRESENTATION OF INSTITUT DE SOUDURE COMPIEGNE

24 | 03 | 2025

RECHERCHE EXPERTISE | FORMATION | INSPECTION CONTRÔLES | CERTIFICATION

isgroupe.com

INSTITUT de SOUDURE GROUPE

APPORTEUR DE SOLUTIONS DEPUIS 1905

Summary

01

IS Compiègne

Location

IS Compiègne (France) - 10 employees

- NDT expert center
- Material and Mechanical testing facility
- (Fatigue test bench, 3-axis test bench, burst test bench, full scale test bench)
- Cryogenic test benches
- 2000 m² Laboratory & Facilities

Expertise: Acoustic emission, Ultrasonic testing, Electromagnetism, Active infrared thermography, Guided Waves, Material & structural engineering

Compiègne

45 min from Charles de Gaulle Airport and Villepinte head office

IS Compiègne Site Presentation

Ressources & Competences

Solutions for Non Destructive Testing

- **NDT**
  - Expertise
  - Studies
- **On site inspection** (ex: nuclear power plants)

Mechanical Engineering

- **Design & Manufacturing**
- **Specific Machine and prototyping**

Material & Structural Engineering

- **Material characterization**
- **Specific environment**

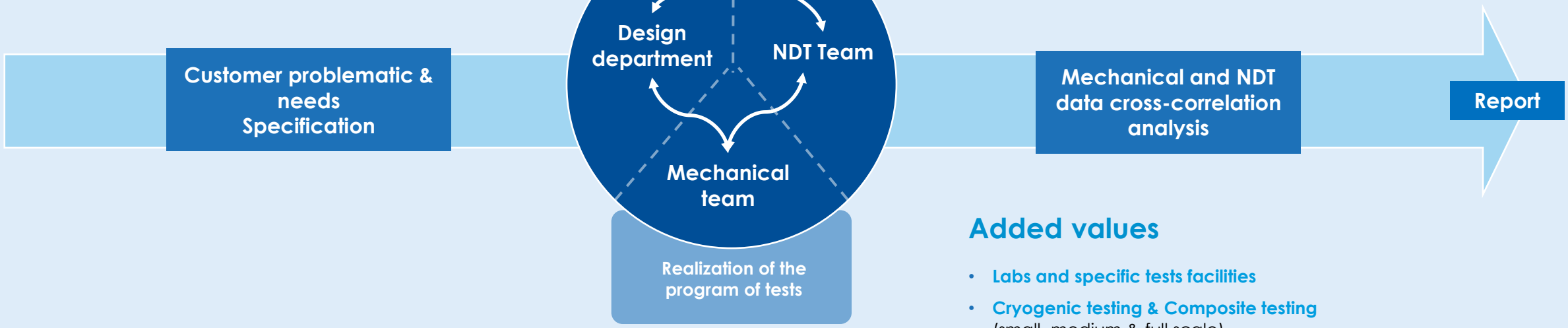
IS Compiègne offer

Added values

- Prototyping
- Short supply chain

Added values

- NDT experts (ultrasound, acoustic emission, thermography…)
- On site and remote monitoring



Added values

- Labs and specific tests facilities
- Cryogenic testing & Composite testing (small, medium & full scale)

02

Solutions for NonDestructive Testing

Solutions for NonDestructive Testing (NDT)

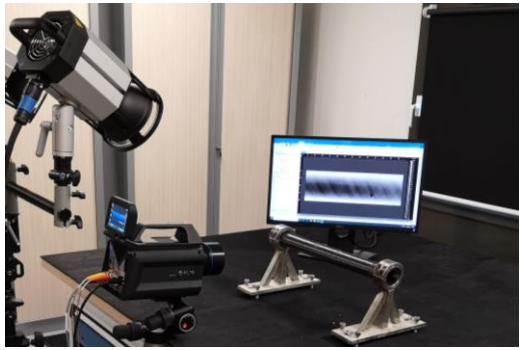
Inspection & monitoring of parts and structures

Synergy between our design office, mechanical laboratory and our NDT solutions to meet the needs of our clients

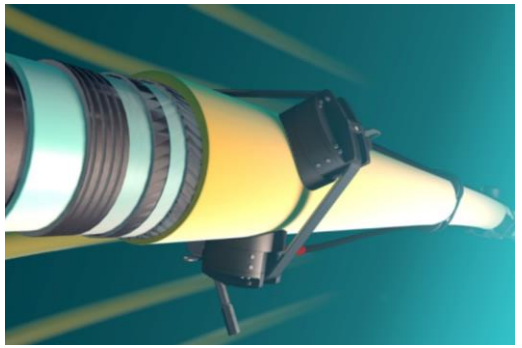
Examples of applications

- Client support for the inspection of new materials and the deployment of dedicated procedures
- Development of inspection / monitoring tools
- Monitoring of damages to structures
- Monitoring of qualification tests in the laboratory or on site
- Monitoring of mechanical tests
- Corrosion detection
- Periodic pressure vessels requalification check

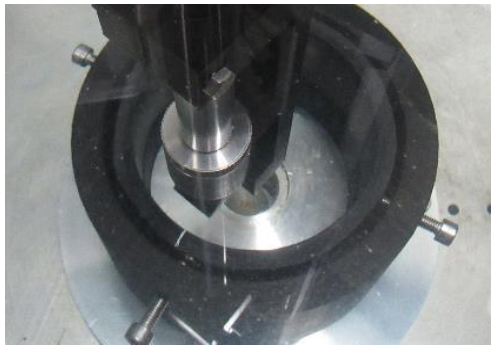
NDT expertise



Infrared Thermography



Acoustic Emission



Ultrasound

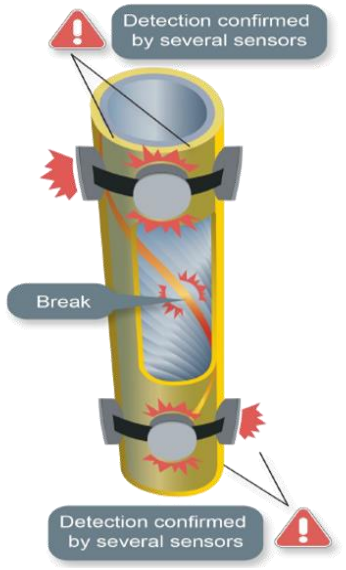
Dedicated NDT laboratory

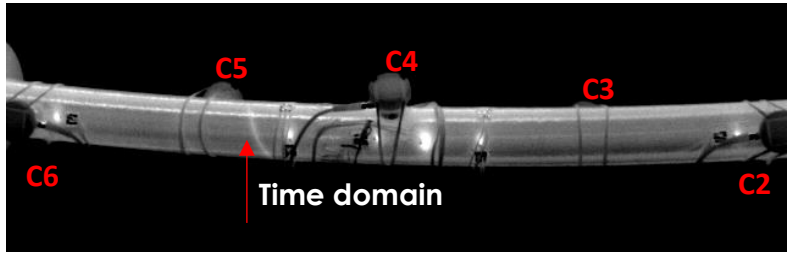
Solutions for NonDestructive Testing (NDT)

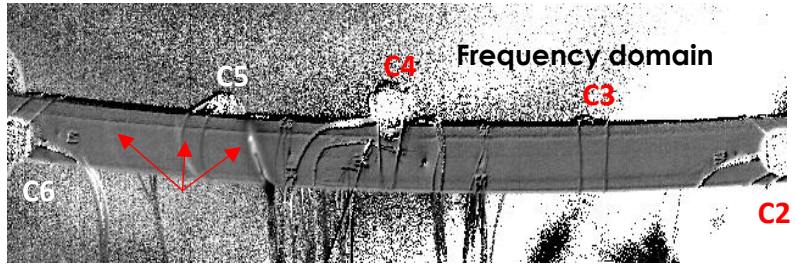
Inspection & Monitoring / Acoustic Emission

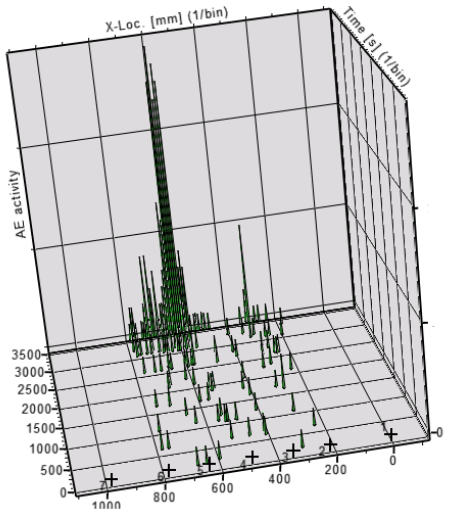
Example of application : structure integrity monitoring

Double expertise in acoustic emission and mechanics for the integrity control of materials and structures submitted to mechanical stresses









Cross correlation analysis

03

Mechanical, Material & structural engineering

Mechanical & Material Engineering

Our strength: double expertise in materials engineering and NonDestructive Testing & Evaluation

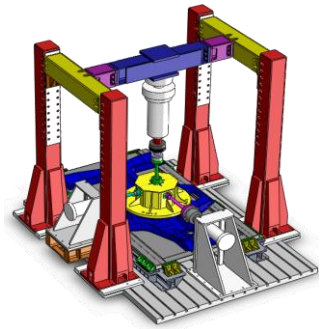
We are able to perform tests on specimens from small-scale to full-scale

Mechanical tests and analysis
On different kind of materials

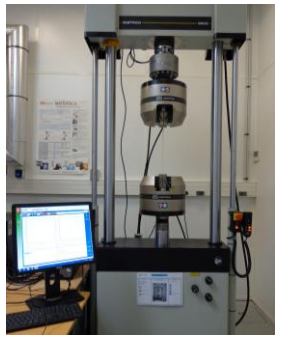
Characterization and qualification programs
From the simplest to the most complex configurations and boundary conditions

Support of the NDT team
Monitoring of the damage

Wide range of modular test benches



Tri-axial mechanical test platform



Mono-axial static and fatigue test bench

Specific fatigue test bench

Creep test bench

Main application

- Standard tests or according to customer specifications
- Loading types : tension, bending, torsion, compression,...
- Static and fatigue tests
- Creep and Relaxation testing
- Low and high temperature testing (from -170°C to +300°C)
- Hydraulic pressure tests up to 2000 bars

Mechanical & Material Engineering

Design / Development & Realization of specific test systems

From design to operation in our laboratories

Identification of the customer need
- Based on specifications

Technical proposal
- Solution adapted to specifications

Engineering
- Study, dimensioning, modeling, integration, risk analysis and validation of solutions (using SolidWorks CAD software)

Development of the technical file
- Manufacturing file, user's guide and instructions, maintenance booklet,…

Commissioning
- Assembly, adjustments and acceptance tests

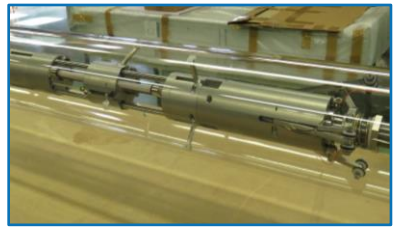
Offer / Expertise

Development
of test fixtures adapted to specific specimen shapes to be installed on our test benches

Design & Assembly
of test fixtures adapted to specific specimen shapes to be installed on our test benches or in safety in our outdoor test facilities

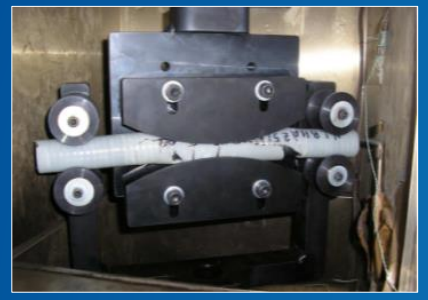
Management
of innovative benches in our facilities with delivery of a "turnkey" solution without the constraint of an implementation on customer site

Examples of achievements



Mechanical & Material Engineering

A wide range of expertise on different kind of materials and structures



Polymer / resin

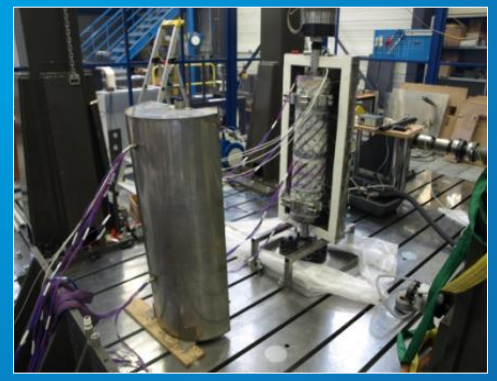
Wood

Kevlar tapes

Composite

Steel

O&G industry



Transport industry

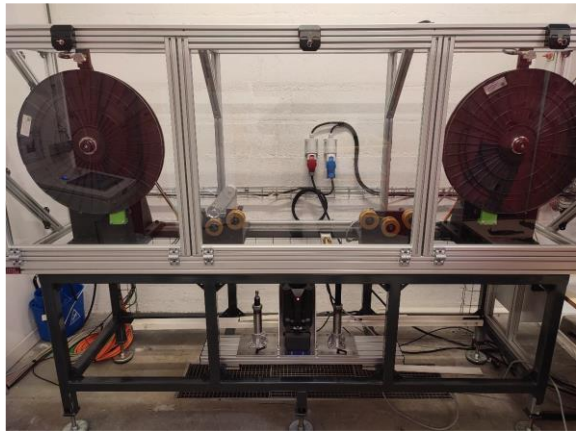
04

Example of realized NDT projects

Development of in-line control solutions using active IR thermography

Assessment of material health on thermoplastic project around two critical issues:

- Control of composite tapes (semi-finished products) used for filament winding (tube manufacturing)



- Layer-by-layer control of composite tube manufacturing

AT A GLANCE

Over 4 years

- 1200h
- 2 engineers (NDT/DO)
- 2 external partners (automation and software)

Spooling machine project

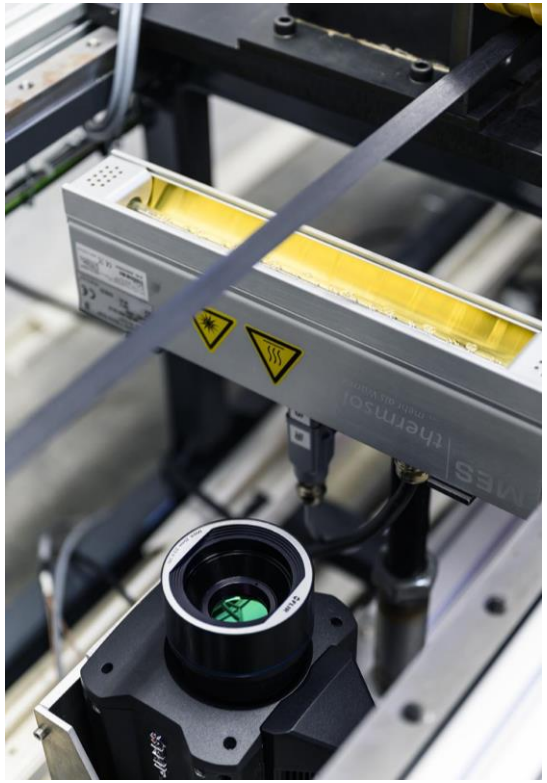
THIR technology and applications to unidirectional composite tapes

Substitution for conventional vision control - Improved performance

- Camera face and opposite face detection
- Internal defect detection

Use under industrial conditions to control subcontractor standards

- Integration into the production line with no deterioration in performance (quality and productivity)



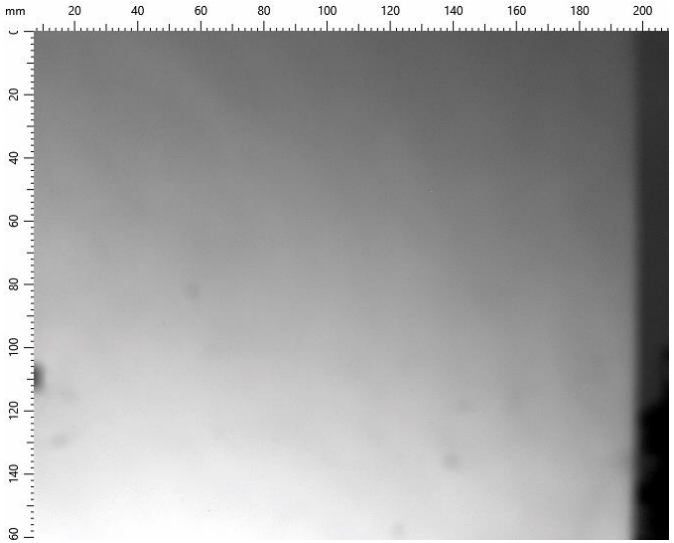
In-line tube control project

Layer-by-layer inspection of filament-wound strip laying.

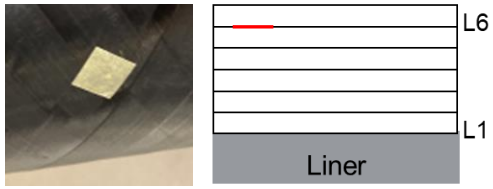
- Detection of inter-layer defects (inclusions, delaminations, etc.)
- Evaluation of the effect of bending on the appearance of post-lay-up defects

Use under industrial conditions

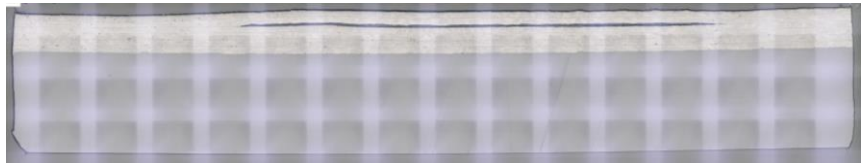
- Integration of feed speed and temperature parameters into R&D developments



Paper L5/L6 (foreign body)



(15x15mm)



AEClamp monitoring system

Objective:

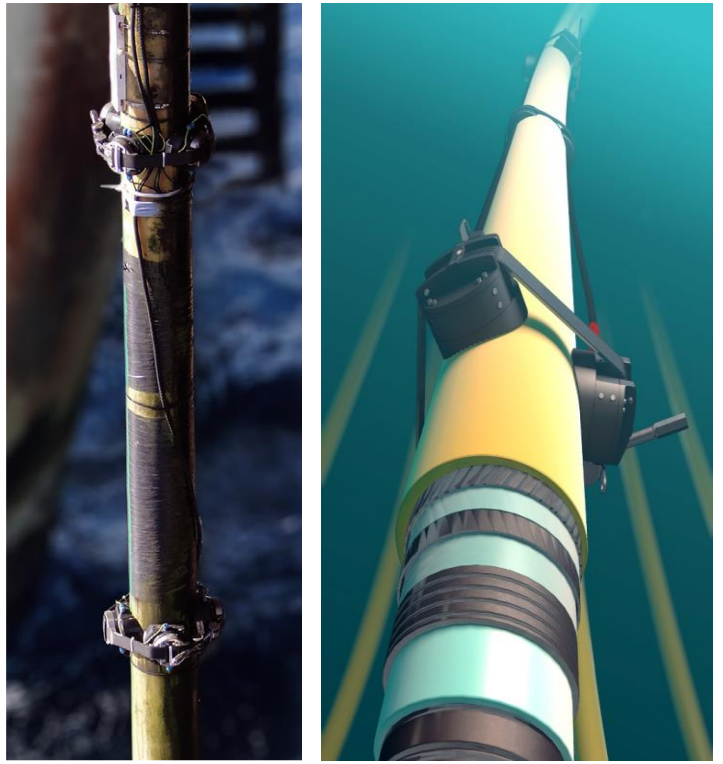
- Flexible Riser Armor Wire Rupture Detection
- Real Time & Continuous Monitoring
- Multilayer Detection

Physical Measurements:

- Acoustic Emission (AE)

Main Fields of Application:

- Greenfields / Brownfields – Subsea
- Aerial and Subsea Applications

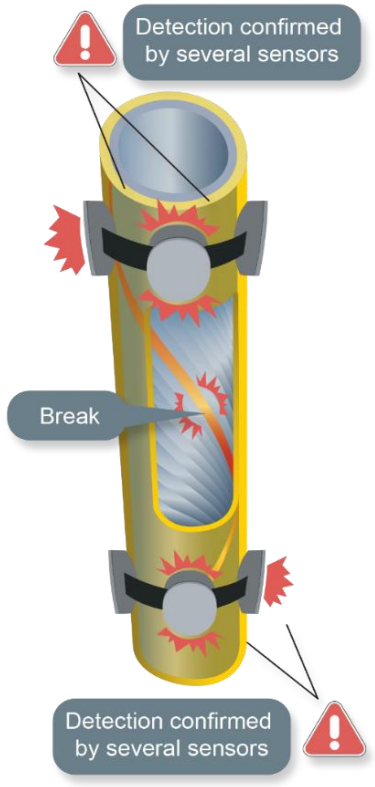


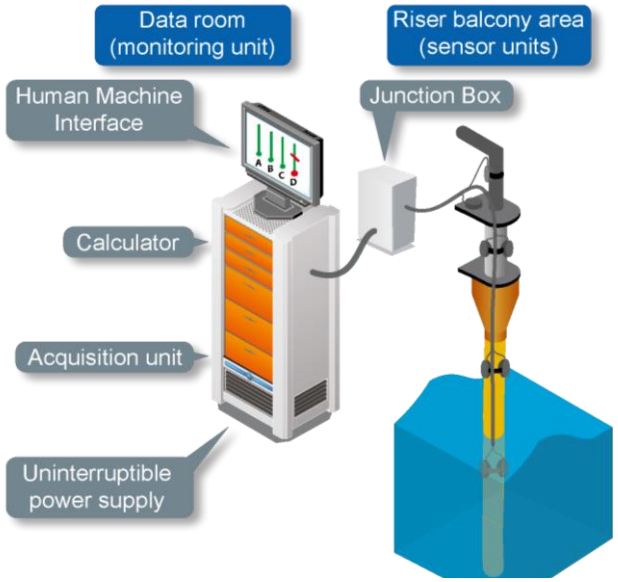
AE Clamp

AEClamp monitoring system – General architecture

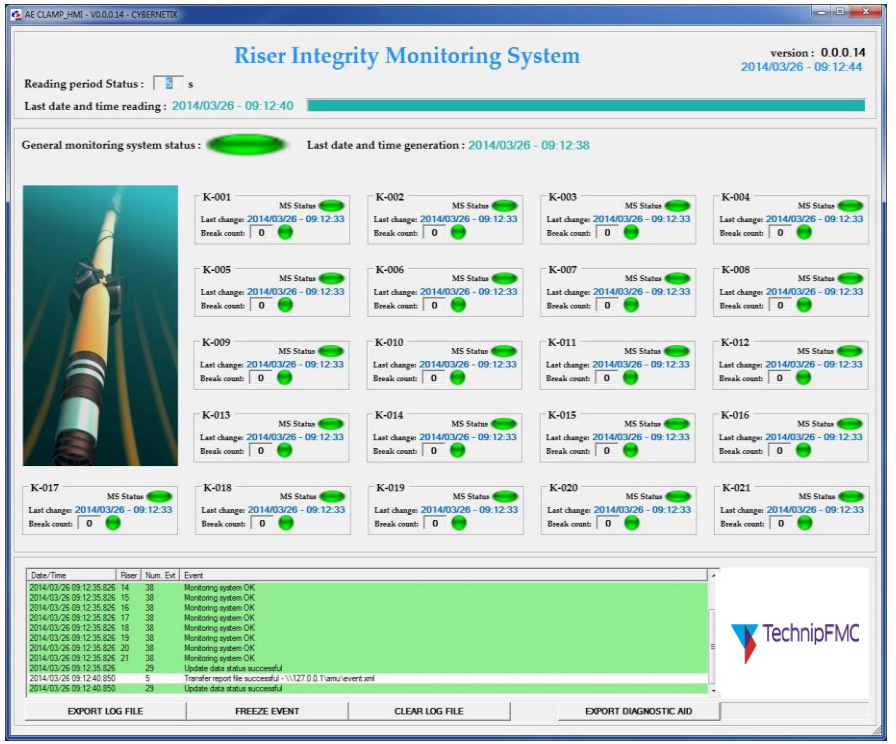
In case of alarm:

- Operator & client are informed in real time and can check and process the data to confirm the breakage



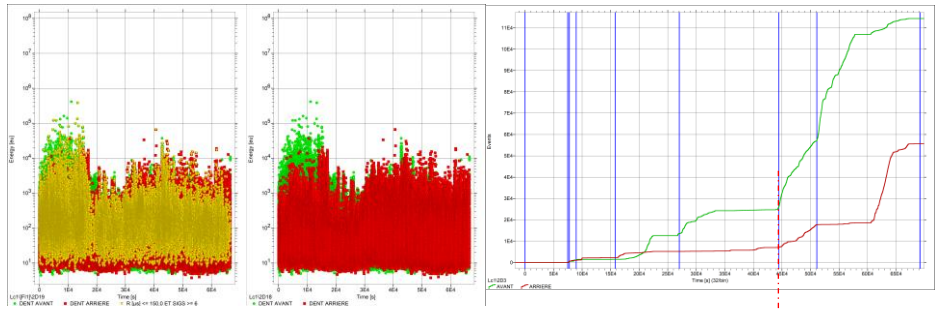


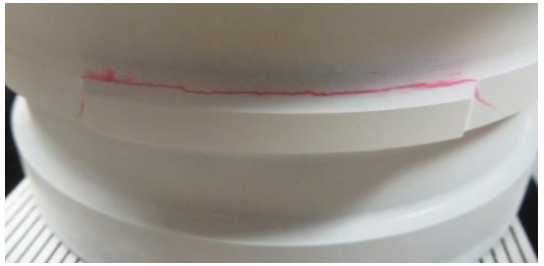
General configuration



AE monitoring of riser connector

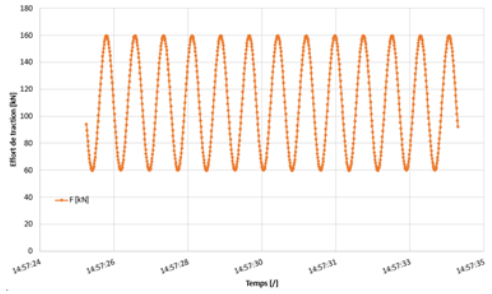
Integration of data processing by Machine Learning

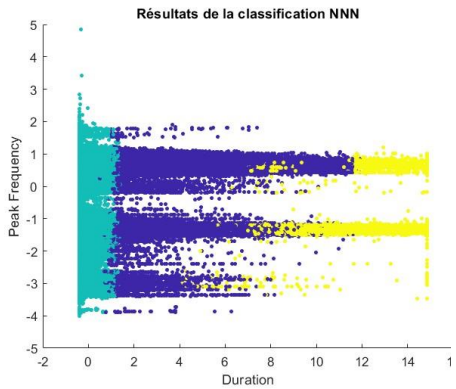


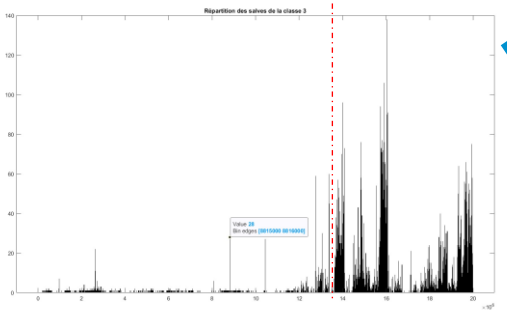


Multiparametric approach => qualitative analysis

Machine learning approach => quantitative analysis

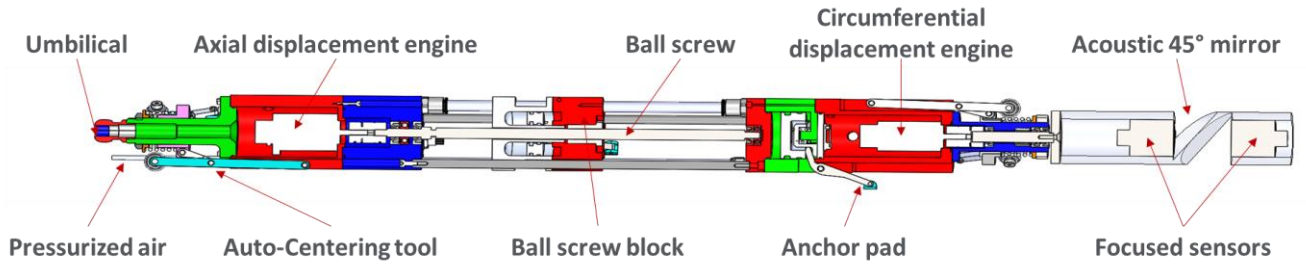




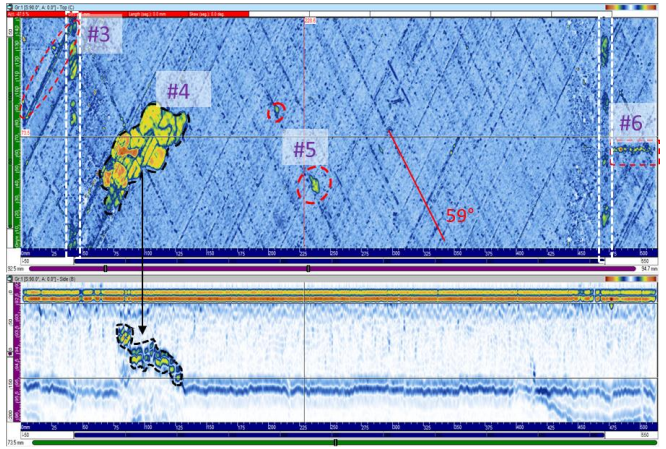


Bore inspection tool

UT control of internal structure of small diameter composite pipes



Inspection tool designed to move inside small-diameter composite pipes (minimum 3" internal diameter) for ultrasonic NDT damage detection



05

Example of mechanical & materials engineering projects

Mechanical & Material Engineering

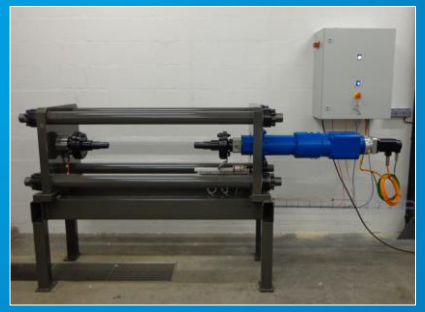
Example of developed testing rigs for polymeric materials testing

Multi-post fatigue test bench (-20°C/+80°C, +/-10kN)

Ageing test bench

Compressive/shear combined test bench (300 bar/400kN)

Pure bending test bench (+/-90°)

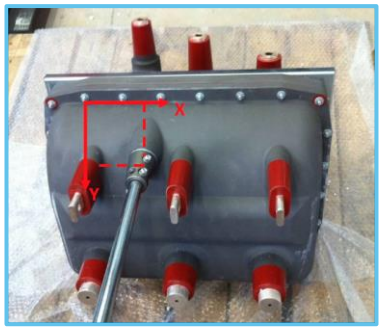


Creep test benches (up to 600 kN)

Cryogenic-bending fatigue test bench (250 kN)

Mechanical & Material Engineering

Example of application: Composite (structure & pressure vessel)

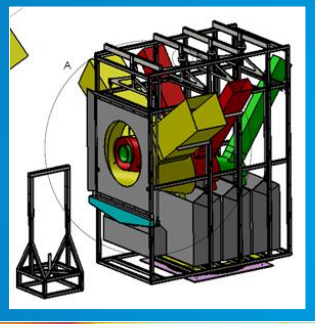


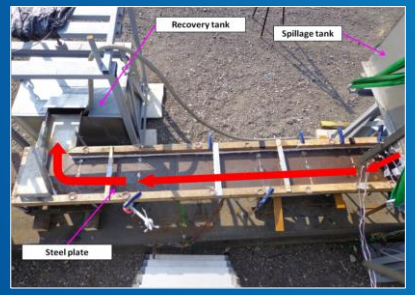
Developed Expertises / skills :

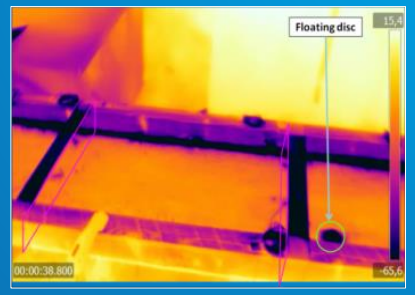
- Strain Monitoring
- Damage Monitoring using acoustic emission and IR
- Specific boundary conditions
- Control of singularities/constraints during tests using contactless methods
- Specific instrumentation LVDT, laser…
- Mastery in instrumented pressure/burst tests
- Ultrasonic inspection
- Mechanical/damage behavior understanding

Mechanical & Material Engineering

Example of application: Cryogenic tests



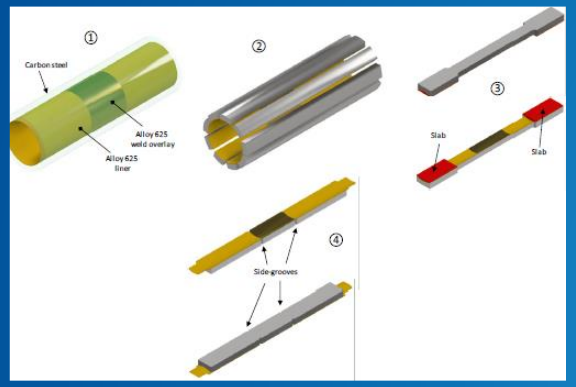


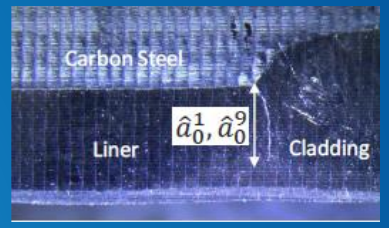


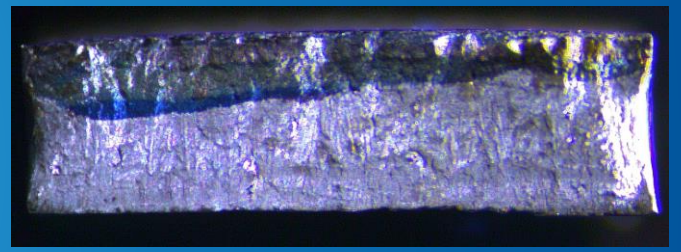
- Close collaboration with HSED Paris during a JIP dedicated to cryogenic spillage
- Development of specific fatigue test bench for LNG flexible qualification
- Outside hazardous tests (spillage of cryogenic liquid)
- Standard tests on small size specimens

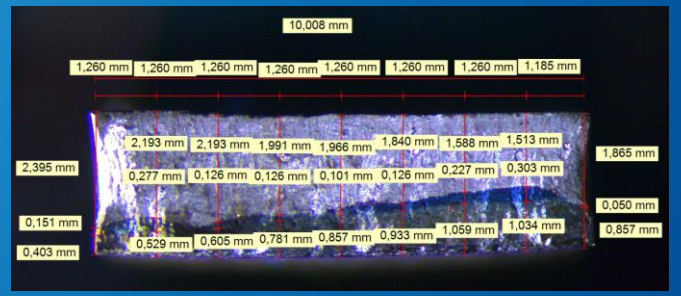
Mechanical & Material Engineering

Example of application: Monitoring of crack propagation on welds









- Determination of defect acceptance

PROVIDING SOLUTIONS
TO MAKE THE INDUSTRY SAFER AND SUSTAINABLE

RESEARCH EXPERTISE | TRAINING | INSPECTION TESTING | CERTIFICATION

isgroupe.com

INSTITUT de SOUDURE GROUPE

WHAT LINKS US
MAKES US STRONGER