

The background is a collage of industrial images: blue electric motors, large metal gears, a worker in a hard hat and safety vest using a laptop, and a factory interior with large machinery. The collage is overlaid with a white geometric pattern of triangles.

FLUKE®

Reliability

apliquem uO

FRS solution

Luca Barraco

About Us



FLUKE®



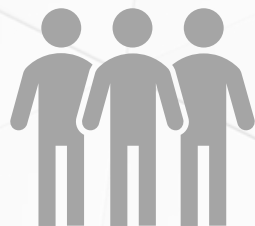
FLUKE CMA

BY THE NUMBERS



7,400+

**CUSTOMER
MAINTENANCE
TEAMS SERVED**



700+

EMPLOYEES



18

OFFICES

**AROUND
THE WORLD**



**Serving maintenance &
reliability leaders**

70,000

CUSTOMERS



116

COUNTRIES



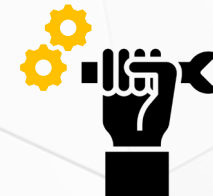
150,000

USERS



10 MILLION

ASSETS MANAGED



7,253

EXPERT SERVICES DELIVERED

3,416,669+

MACHINES FIXED



164,547,896

WORK ORDERS MANAGED



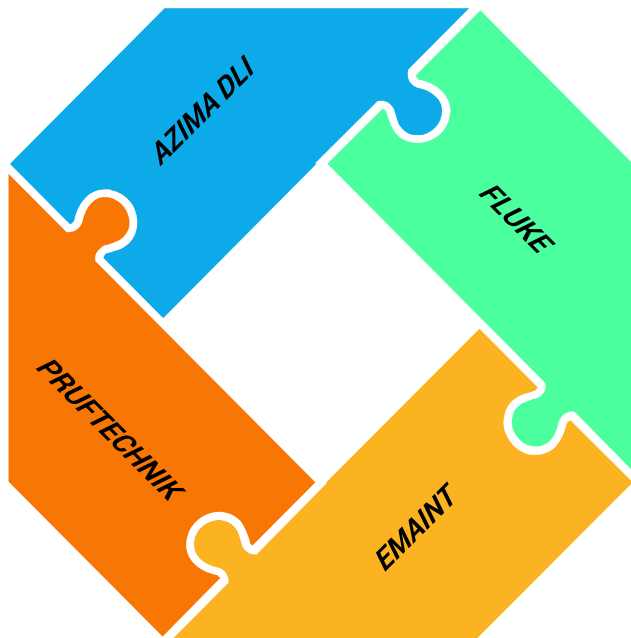
FLUKE®

Reliability

Fluke CMA

Fluke CMA, a B.U. of Fluke Corporation, offers reliability solutions combine hardware, software and services.

Part of FRS are the brands of:



- ✓ **AZIMA DLI**
Edge Computing con support AI
- ✓ **FLUKE CONNECT**
Condition Monitoring for electrical inspections
(Thermography, Power Monitor & Leak Detection)
- ✓ **EMAINT**
CMMS Software for maintenance management
- ✓ **PRUFTECHNIK**
Specialist services, vibrational analysis and laser alignment



Part of Fluke – a global leader in measurement instrumentation



Solutions to increase reliability in maintenance



910 employees



70,000 customers



24 offices in 20 countries



Current Challenges for Increasing Reliability in Maintenance



- **How you monitor critical assets**
... with limited resources?
- **How do you make and implement the most important decisions?**
... with incomplete information?
- **How do you implement and integrate a reliability program?**
... we are always busy for emergencies!

Why Pruftechnik / FRS



INDUSTRY 4.0

Bring maintenance programs to a high level ensuring production continuity Ensure machine reliability



FAULT COVERAGE

Detection and diagnosis of electrical, mechanical, operational and energy faults.



ACCURACY OF DIAGNOSIS

Proven accuracy: Identify and perform appropriate maintenance actions with greater than 90% accuracy.



PREDICTIVE MAINTENANCE

Monitoring with simple and easy-to-interpret information. Traffic light-style warning systems and automatic fault dispatch to HMI and e-mail.



RETURN ON INVESTMENT R.O.I.

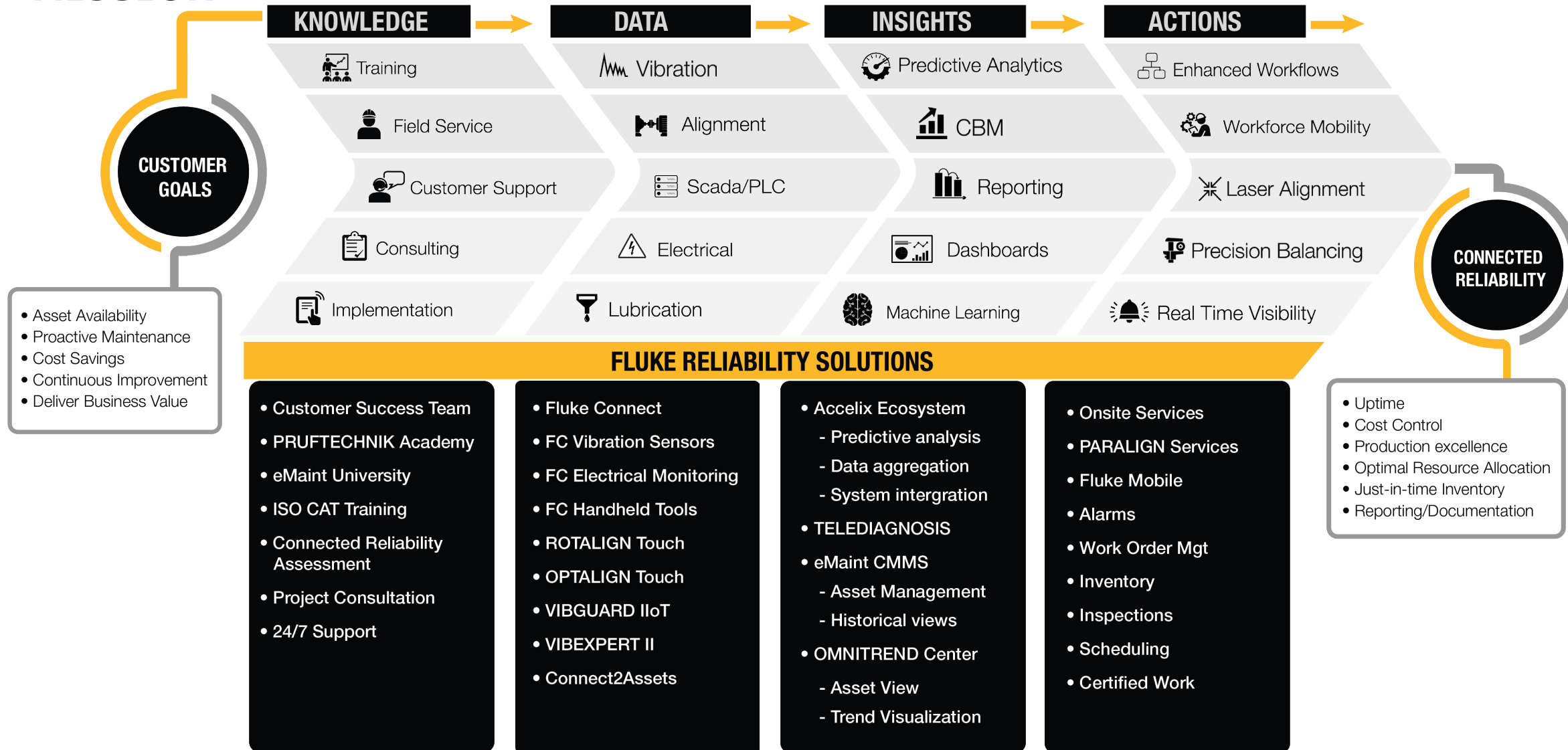
Increase in productivity by at least 5%; 4% energy savings; Up to 50% reduction in maintenance costs by extending the life of your equipment.



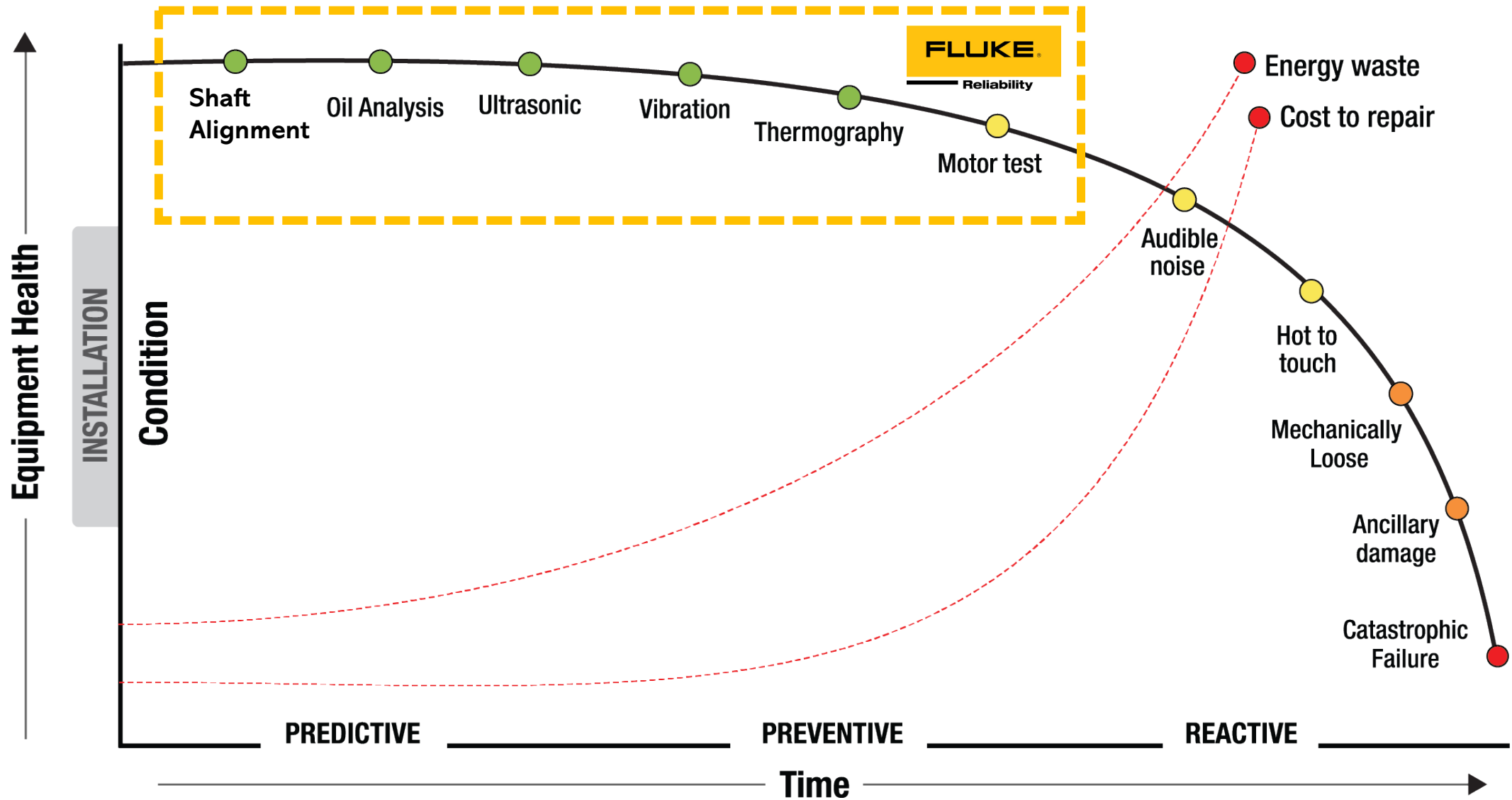
EARLY FAULT DETECTION

Fault detection 6 months in advance. Even before problems arise, such as abnormal vibrations, heat or acoustics

MISSION

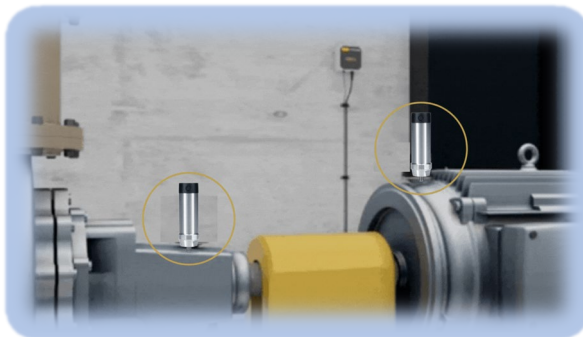


PF Curve



Condition Monitoring – survey methodologies

Vibration Analysis



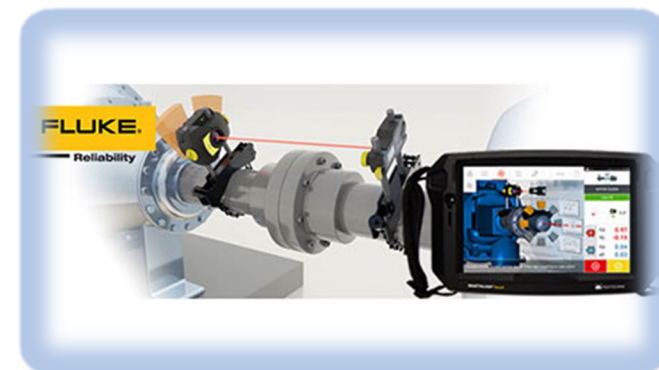
Motor Current Analysis



Energy efficiency



Laser alignment



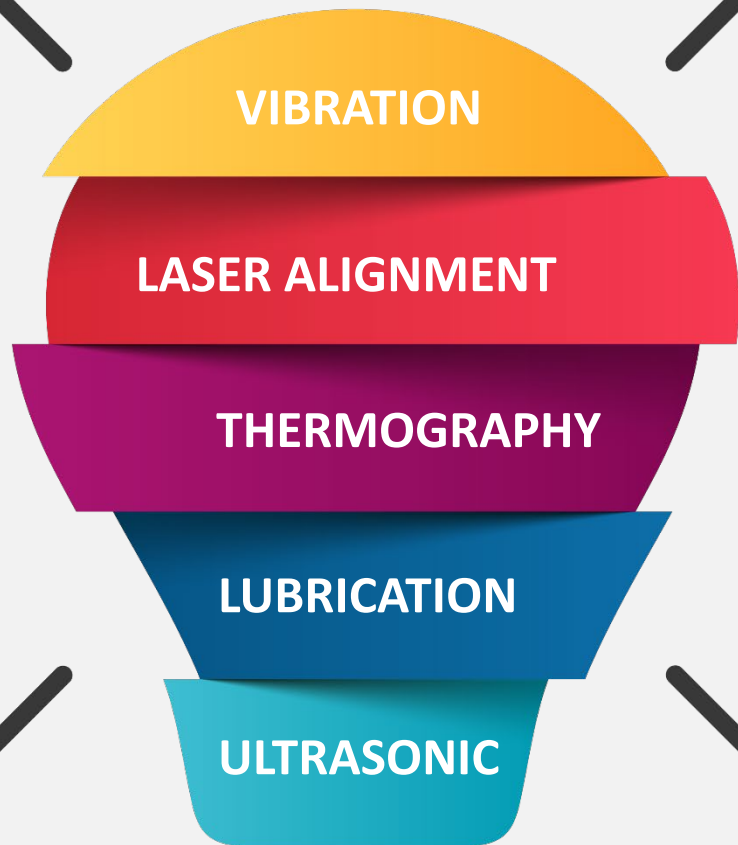
Industrial Thermography



Oil quality analysis



Solutions



Solutions



IIoT solutions, cloud base, vibrometers, laser aligners, thermal imaging cameras, acoustic chambers, etc



Specialist services on request or on a periodic contract, remote diagnosis



Certified training courses



Field vibration analysis
Cyclical contracts with on-field or
remote acquisitions
Remote diagnosis
Field balancing
Laser Shaft Alignment
Geometric Alignment & Tracker
Thermography
Compressed air leak detection
Motion Amplification
Video endoscopy

Remote diagnosis

TELEMONITORING OPERATION SCHEME :



STEP ONE



Acquisition by permanently installed sensors or by patrol (acquisition with a portable instrument)

STEP TWO



The received data is stored in a customer or pruftechnik database locally or in the cloud. Pruftechnik-certified staff analyzes the data and generates a specific report.

STEP THREE



Once the complete report with guidelines for visualization and maintenance has been received, short-term and long-term corrective actions are defined

STEP FOUR



If required, components, bearings, alignment and/or balancing practices are replaced

Monitoring Center

In order to be able to provide remote condition monitoring projects around the world internationally, we have set up targeted monitoring centres:



Ismaning – Germany – Lloyd-certified monitoring centre for wind power and wind project applications – up and running for over 10 years



Wrocław – Poland – monitoring centre for industrial applications and focused on turbomachinery in operation for more than 7 years

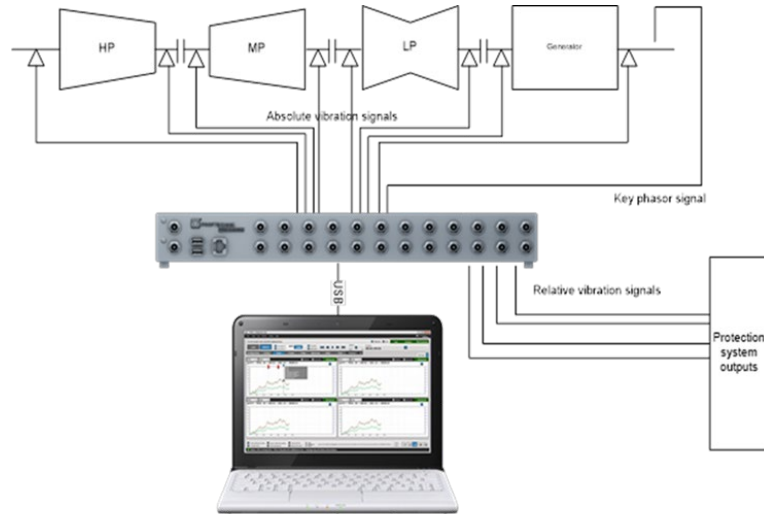


Antwerp – Belgium – focused on maritime applications monitoring centre for more than 10 years of problematic machines



Italy – Milan: With the support of our team of 11 technical engineers, we are able to cover almost all application-related projects.

Service on turbomachinery



Vibration balancing and Alignment

- ▶ Troubleshooting and emergency interventions in the field
- ▶ On-site turbine generator rotor balancing trim balancing
- ▶ Failure analysis and prevention
- ▶ Customized instrumentation design for special application purposes
- ▶ Remote condition monitoring
- ▶ Alignment to the joint
- ▶ Internal alignment of steam and gas turbines



Paralign service & Laser Tracker

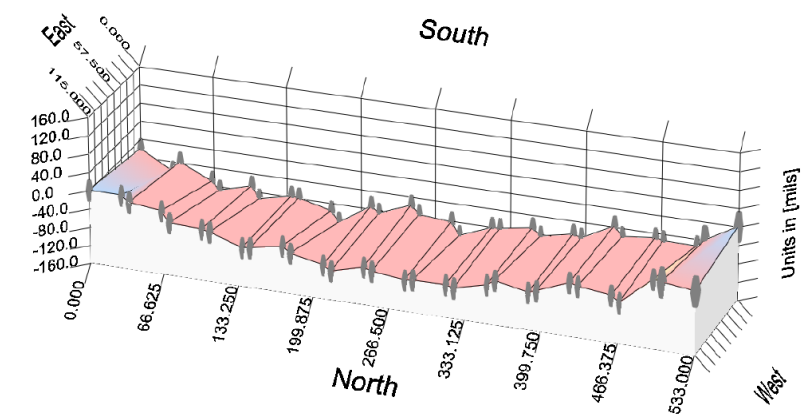
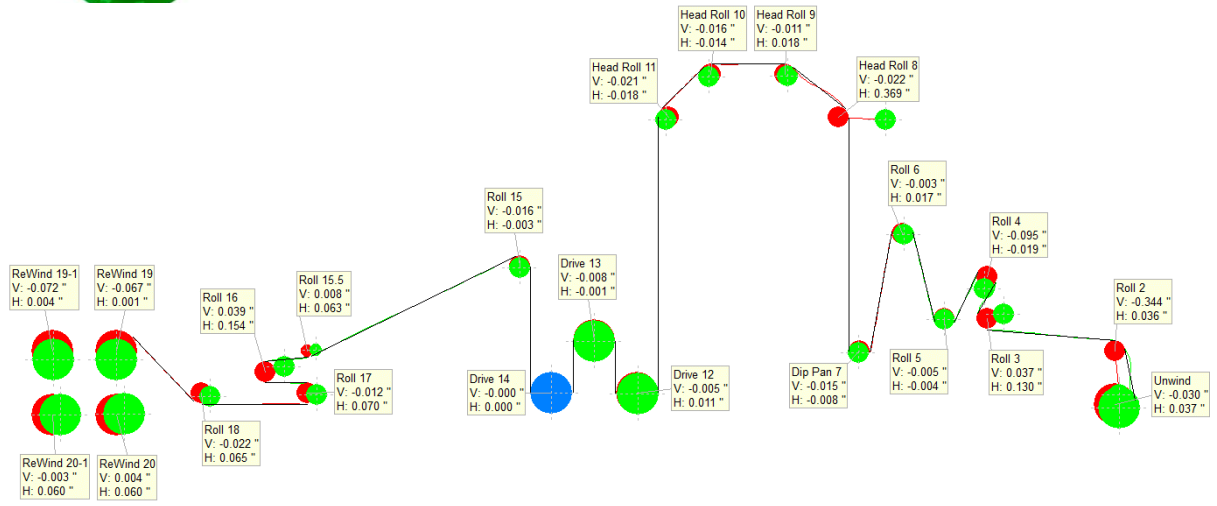


Figure 2: 3-Dimensional View of the Original Hot Plates Positions

Predictive Maintenance Products



- Laser Alignment:
- Laser Aligners Shafts (Joint)
- Aligners pulleys (belts)
- Induction heaters
- Correction Thicknesses
- Geometric aligners (flatness, squareness)



- Vibration analysis:
- Portable instruments with FFT
- Tools for balancing on the pitch
- Protection systems
- Vibration transmitters 4 20 mA
- Cloud wifi systems
- Advanced condition monitoring systems



Laser shaft alignment



Benefits Longer service life
Increased MTBF and uptime
Lower energy consumption
Temperature reduction, vibration and mechanical repairs
Lower operating costs
Higher product quality

Solutions Shaft alignment
Measurement of machine geometry
Hole alignment
Monitor positional changes
Cylinder alignment with PARALIGN
Laser Tracker



CORE

ELITE

EXPERT

Move Simulator
Advanced vertical alignment
Diagnosis of lame foot

ADVANCED

Spacer Coupling
Thermal Growth & Coupling Targets
Vertical Alignment

STARTER

Live Move H and V
SoftFoot
8-Point Active clock
Static Feet & Multiple Feet
Short-Flex Coupling
Tolerances
Quality Factor & SD

EXPERT

ADVANCED

PLUS

STARTER

14 Machine Train
Multi-Coupling
Live Trend

In-situ Cardan Shaft
Intelli modes
& Vibration

Move Simulator
Advanced Vertical & VertiSweep
SoftFoot Diagnose

Live Move H and V
SoftFoot
8-Point Active clock
Static Feet & Multiple Feet
Short-Flex Coupling
Tolerances
Quality Factor & SD
Spacer Coupling
Thermal Growth and Coupling Targets
Vertical Alignment
Continuous Sweep & MultiPoint
Post Processing by Edit Points and Measurement Video Replay
3 & 6 Machine Train
Pass Mode
Cardan Shaft

LASER ALIGNMENT ACCESSORIES

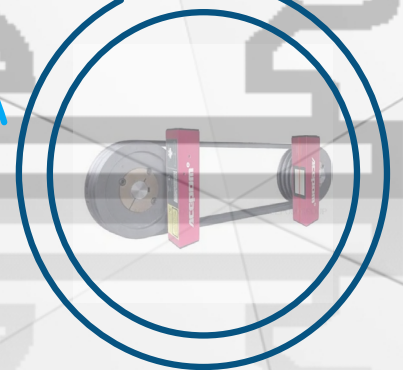
SHIMS

BRACKETS

INDUCTION

SOFTWARE

PULLALIGN



More info: <https://1drv.ms/p/s!ApRuUnYoFLg5gmHhGQ5UOuow6Er4?e=irclPX>

Condition Monitoring – Vibrational Analysis



Benefits

- Early detection of machine problems
- Elimination of the cause before failure occurs
- Reduced vibration and wear
- Increased machine availability
- Reduced operating costs
- CM powers Condition Based Monitoring (CBM) programs and asset reliability

Solutions

- Portable data collectors and analyzers
- Online condition monitoring
- Oil quality monitoring
- Machine protection

Portable Vibrometers

BASIC



- RMS [mm/s]
- Acceleration [g]
- Crest factor (bearings)
- Temperature
- Download data to excel

[T805](#)



ADVANCED



- Basic feature +
- FFT (spectrum, waveform, etc)
- RONDA data collection
- Triaxial sensor
- MQTT & Asset View
- Report OMNITREND Center

[VIBSCANNER II](#) >

EXPERT



- Advanced feature +
- Two channels / six channels
- Optional balancing
- Transitional measures
- Noise analysis
- Bump Test (resonances)
- Orbits
- Connection of protection systems
- Optional Ex
- Noise measurement db (third octaves)
- Current measuring clamp

[VIBXPert II](#)



To balance



ADVANCED

- Two-plane balancing
- Laser sensor as a trigger
- Interface with protection systems
- Dynamic Polar Pattern
- Start-up transient analysis
- FFT up to 800 Hz
- Low frequency from 0.5 Hz

[VIBXPERT II](#) >



EXPERT

- Advanced feature +
- Up to 6 channels
- Real Time Readings
- IIoT
- WiFi connectivity
- Innovative report
- 8" Touch Display
- FFT up to 5,000 Hz
- Low frequency from 0.1 Hz

[VIBXPERT III](#) >

Protection systems



VIBROTECTOR

- ✓ Dual Output and Temperature Option
- ✓ EX Option
- ✓ Several Options

VIBROTECTOR



VIBREX

- ✓ Output 4 20 mA
- ✓ Diagnosis option
- ✓ Bearing Analysis

Vibrex

Fixed online systems with Analysis and CLOUD option



VIBGUARD

- ✓ Advanced diagnosis
- ✓ Complex kinematics
- ✓ IIoT & 4.0

[Vibguard](#)

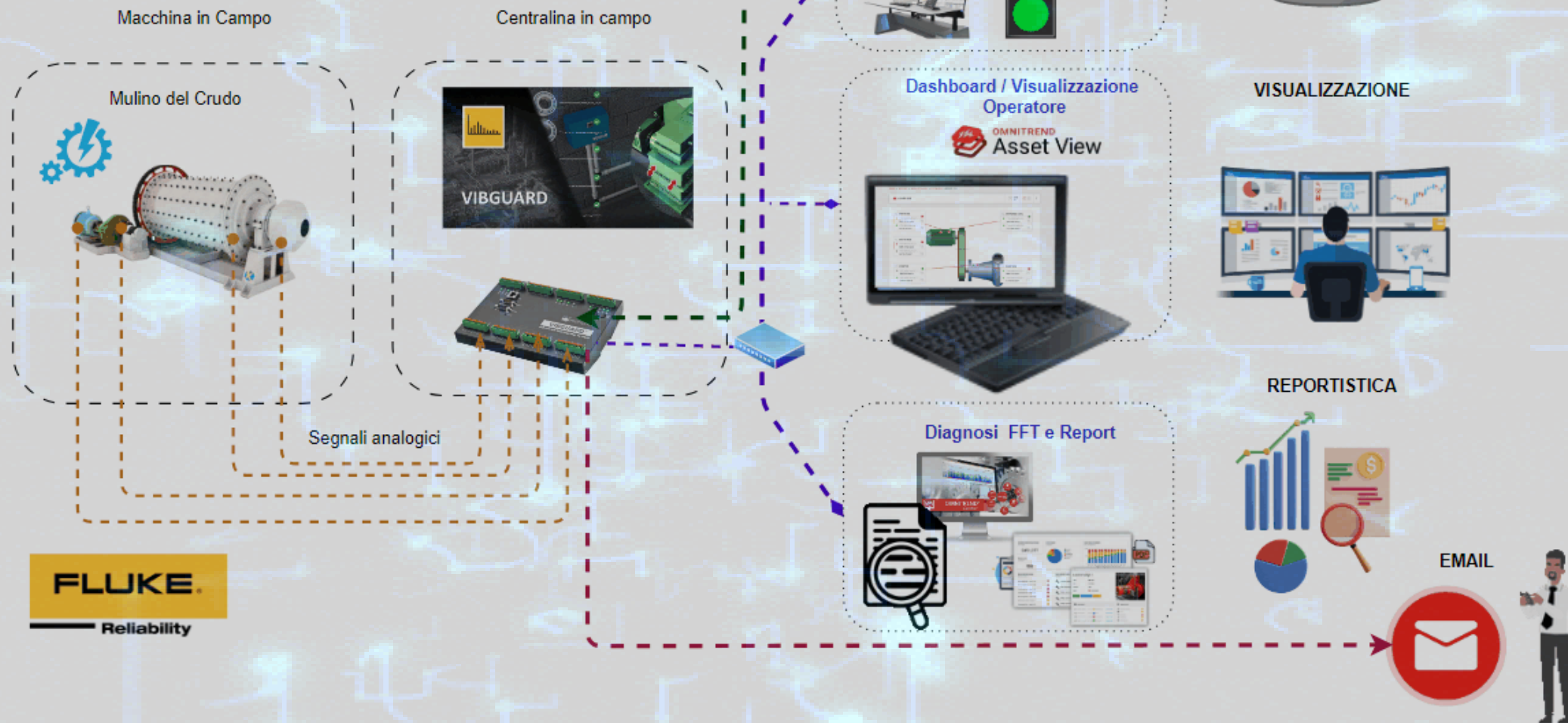


WATCHMAN AIR

- ✓ Integrated A.I.
- ✓ Mesh
- ✓ WiFi

[Azima](#)

Punti di misura: Mulino del crudo		
Motore elettrico	3 punti di misura	
Riduttore 3 assi	6 punti di misura	
Supporti	4 punti di misura	



Sensore vibrazione in campo collegato via cavo

Centralina Installata in campo o in locale tecnico

Protezione | Visualizzazione | Diagnosi FFT

Created by Luca Barraco

AZIMA SOLUTION

Condition Monitoring WiFi con analisi diagnostica automatizzata tramite A.I.

Monitoraggio delle condizioni wireless, economico e scalabile

- I sensori WiFi creano in autonomia una rete scalabile senza limiti distanza e/o punti
- I sensori usano avanzati algoritmi a bordo in base all'applicazione
- I dati vengono acquisiti da uno o più gateway
- Viene costruita una piattaforma di dati con machine Learning
- Vengono generati report automatici con specifici guasti e severità



Certificato

Certificato per l'uso in atmosfere potenzialmente pericolose con certificati ATEX, IECEx e HazLoc.



Niente Cavi

L'assenza di cablaggio consente bassi costi di installazione e manutenzione, rendendola la soluzione economica per il rilevamento di ogni macchina in fabbrica.



Completamente configurabile

Indicatori di prestazioni basati sull'accelerazione e sulla velocità come RMS, PEAK e Kurtosis, insieme a FFT o forma d'onda di accelerazione ad alta risoluzione quando necessario per l'analisi con strumenti di analisi esterni.

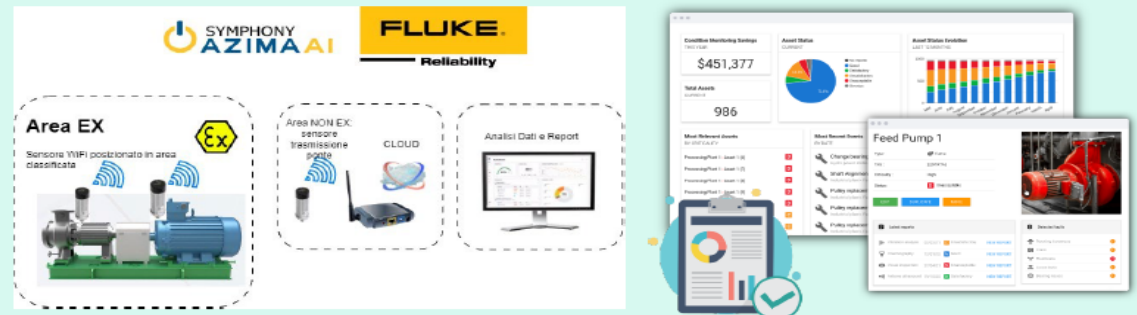


Scalabile

Da decine a migliaia di sensori wireless possono lavorare insieme in una rete mesh intelligente per consentire il monitoraggio delle condizioni su larga scala.



La rivoluzione nella diagnosi vibrazionale con intelligenza artificiale



Accel 310 Wireless Sensors



Accel Gateway



ALERT 5 Diagnostic Software

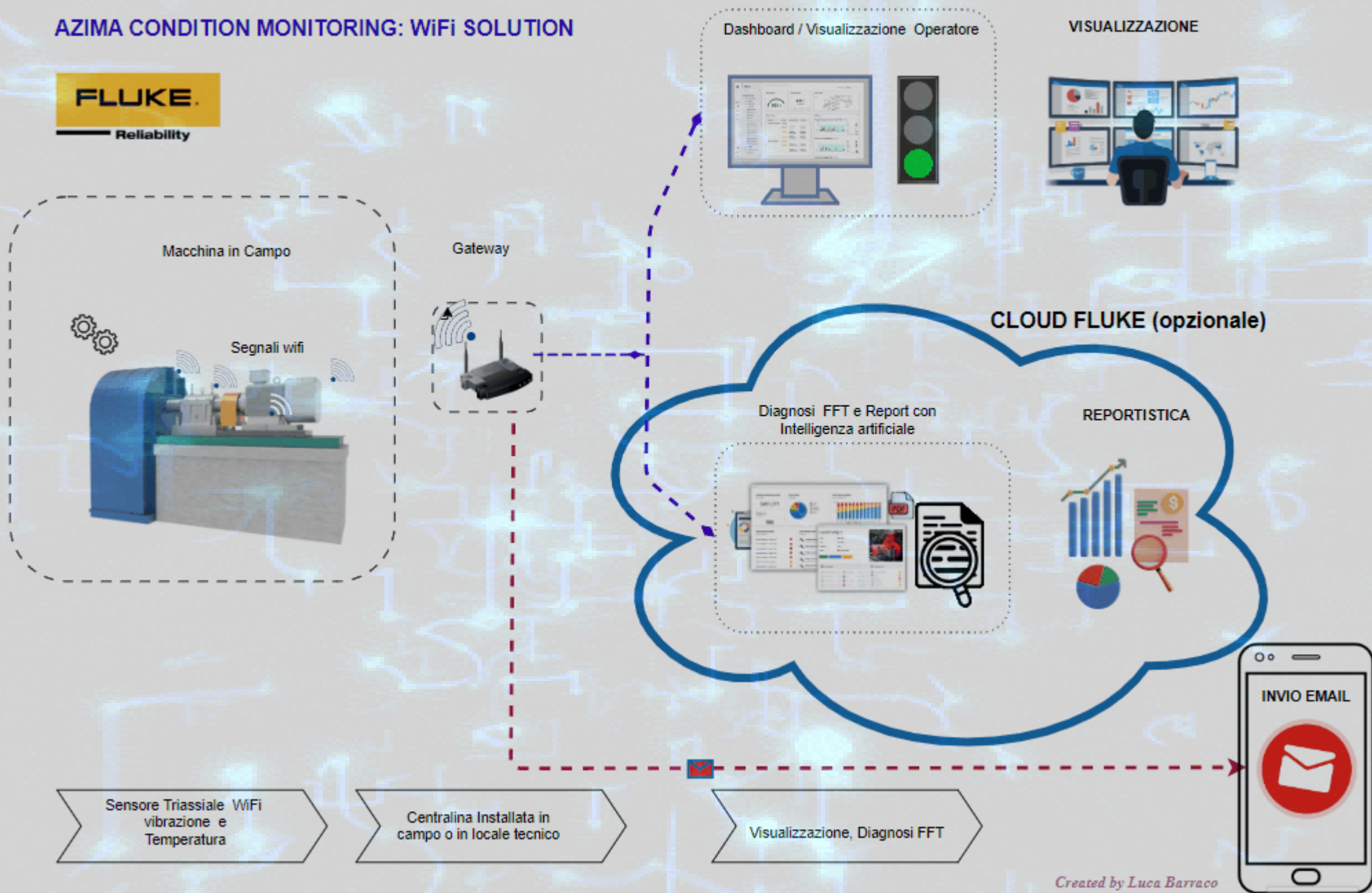


PredictivePortal™

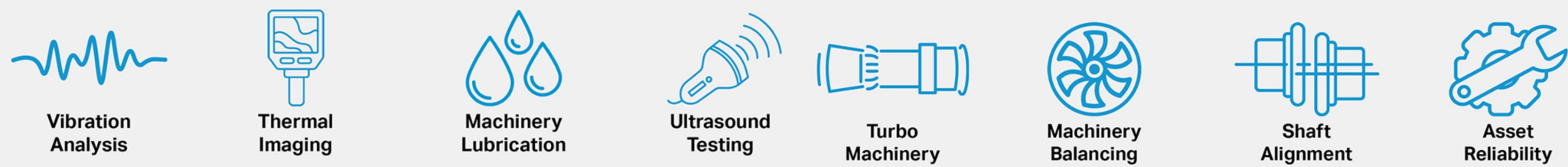
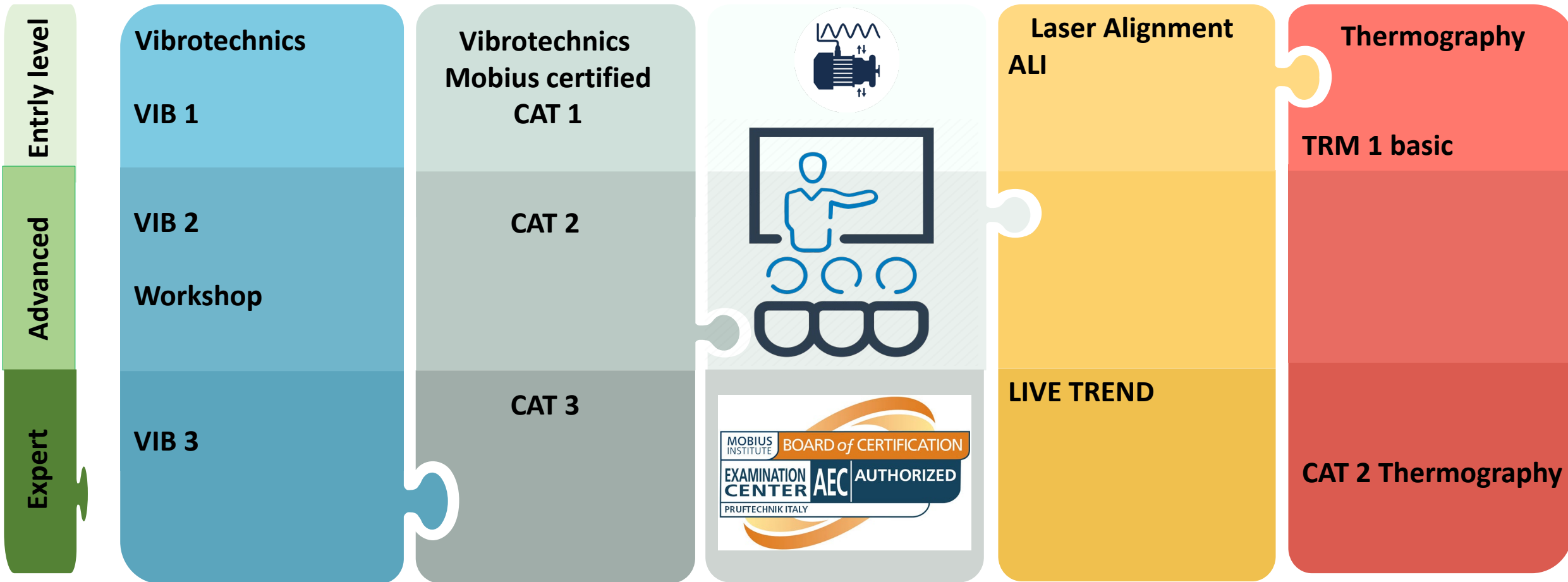
Analisi - Diagnostica Automatizzata

- 6000+ regole diagnostiche addestrate
- 1200+ condizioni di guasto
- Calcolo automatico della media di base
- Ricerca automatica dei codici di errore

AZIMA CONDITION MONITORING: WiFi SOLUTION



Training courses: Pruftechnik Specialist Training



Calibration & Repair

Pruftechnik Laser Aligners

Portable Vibrometers

Piezo sensors and measuring chains

Internal laboratory insitu



Fluke Reliability Solution



Solutions in Condition Monitoring & IIoT



Commissioning & Training



Field service and remote diagnostic service structure

Our main sectors



| AUTOMOTIVE



| OIL & GAS



| ENERGY



| CEMENT



| PHARMACEUTICAL



| WATER TREATMENT



| FOOD & BEV



| WIND



| TRANSPORT



| IRON AND STEEL



| PAPER & FILM



| NAVAL



Clicca per far partire il video!



FLUKE®

Reliability

apliquem uO

THANK YOU!