



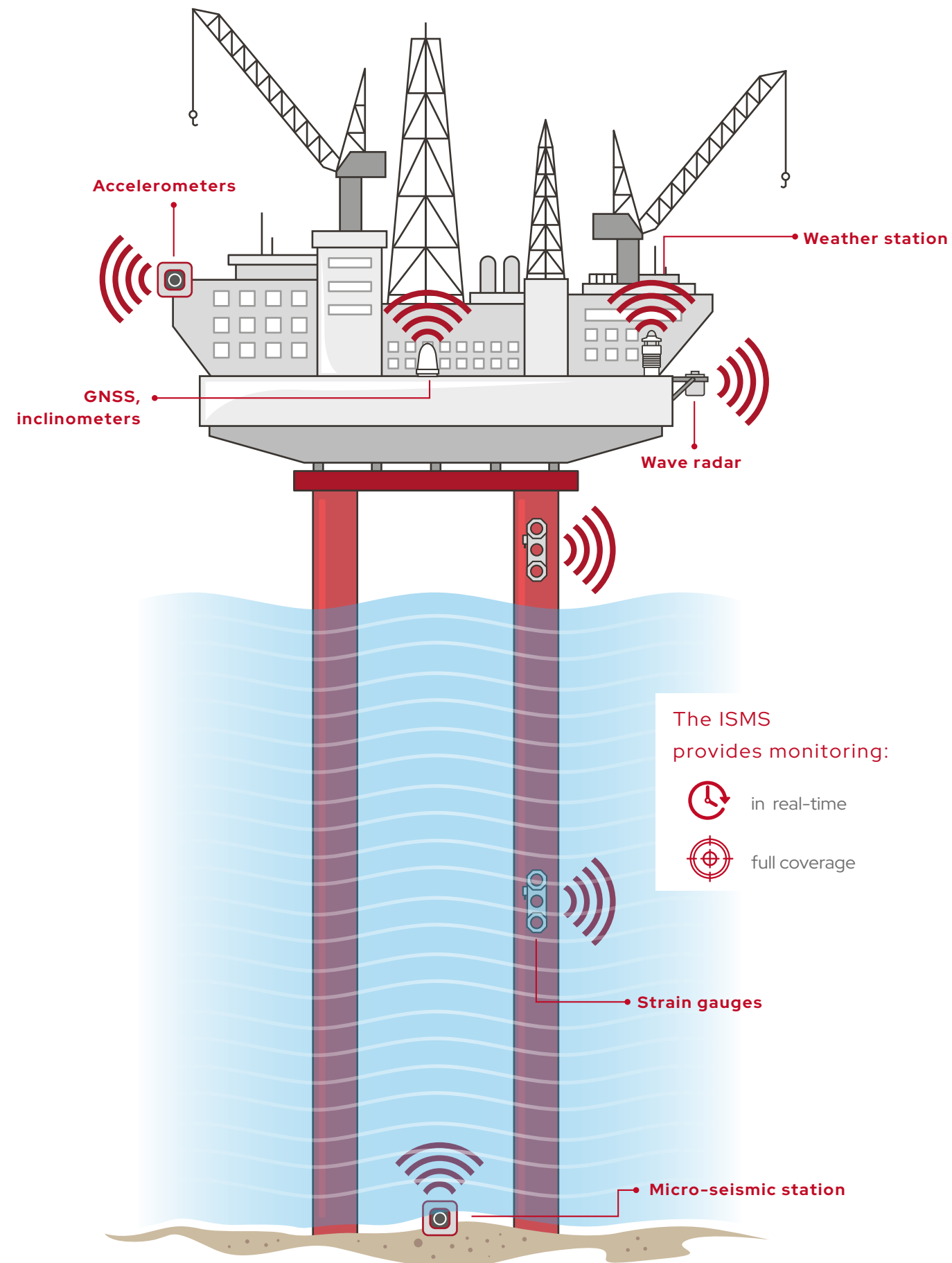
Offshore structures integrity:
awareness and forecast

Integrated Structural Monitoring System (ISMS)



ISMS is fully designed and developed by Solgeo

INTEGRATED STRUCTURAL MONITORING SYSTEM



THE PROBLEM

Offshore platforms are usually not equipped with instruments for measurements of structural health parameters.

This issue impedes the verification of asset integrity and of minimum safety conditions for operations, by becoming a problem especially for aged platforms.

On the other hand, the absence of directly-measured structural data doesn't allow for the assessment of correspondence between the real structure behaviour and its model, essential for the awareness of structural health.

Moreover, the knowledge of the structural behaviour is essential for important purposes like re-certification for life extension, revamping, conversion of use (e.g., for de-carbonization projects), etc.

THE SOLUTION

ISMS is a flexible, cost-effective, turnkey monitoring system for offshore structures. This solution includes different sensor networks, to thoroughly measure the real-time structural response to environmental excitations and for the verification of compliance with predefined threshold limits.

The alarm service provides an early warning on potentially dangerous occurrences and allows to take actions to ensure safety operation and plan maintenance activities.

The results produced by the ISMS represent a valuable input for Model Update and Digital Twin, and for verification of Asset Integrity, re-certification for operative life extension, revamping for conversion projects, relaxation of inspections periodicity.



SENSOR NETWORKS

The ISMS is composed of different sensor networks, that work independently to each other:

- Accelerometers
- Strain Gauges
- GNSS
- Wave Radar
- Weather Station
- Micro-Seismic Station

HALLMARKS

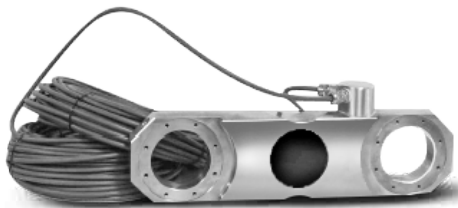
- Integration of different sensors in a single system
- Cost-effective solution for structural monitoring
- Tailored system, ad hoc solutions
- Detection of global behaviour and local damage
- Real-time data processing and alarm service
- Automated data management
- Ideal for Digital Twin and Model Update

ISMS: TURNKEY MONITORING SYSTEM

The ISMS is a complete solution, from data acquisition (design, supply, manufacturing, installation, commissioning, calibration) to visual representation and interpretation, together with full post-sales assistance service.



Accelerometer



Strain gauge



GNSS



Wave radar

CASE HISTORY

- 2018: 5 ENI platforms offshore Loango (Congo)
- 2021: 3 INA platforms in the Adriatic Sea (Croatia)
- 2021: Lotos Petrobaltic platform in the Baltic Sea (Poland)
- 2022: ENI Gela 1 platform (Italy)
- 2023: integration of ISMS on Lotos Petrobaltic platform

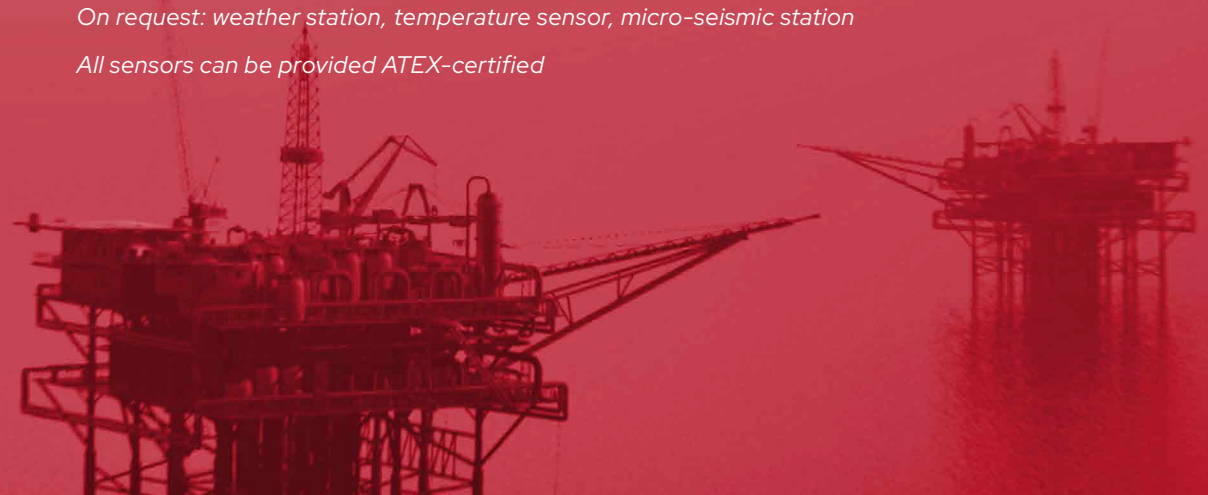
MAIN FEATURES

Accelerometer	Range: ± 2 g, $0 \div 400$ Hz, noise: $7 \mu\text{g}/\sqrt{\text{Hz}}$, operative T: $-20/+80^\circ\text{C}$
Strain gauge	Range $\pm 500 \mu\epsilon$, resolution: $1 \mu\epsilon/\epsilon$, operative T: $-40/+65^\circ\text{C}$
Geodetic (GNSS) system	Resolution: 1 mm H, 3 mm V, operative T: $-40/+55^\circ\text{C}$
Inclinometer	Range: $\pm 5^\circ$, resolution: 0.001°, non-linearity: $<0.5\%$ F.S., operative T: $-40/+55^\circ\text{C}$
Wave radar	Wave direction: $0 \div 360^\circ$, wave height: $0 \div 60$ m

Requirements: power supply, Internet connection

On request: weather station, temperature sensor, micro-seismic station

All sensors can be provided ATEX-certified





KEEPING A WATCHFUL EYE ON YOUR ASSET



USER INTERFACE

The ISMS provides real-time results and alarms through a dedicated, user-friendly interface, where all the monitoring activity can be easily visualized.

FULL AFTER-MARKET SERVICE

- The services related to ISMS cover all needs:
- Training of personnel
 - Remote and on site assistance for hardware and software
 - Reporting
 - On demand, ad hoc interpretation analysis
 - Warranty extension (standard warranty: 12 months from release of the system)

Contact now your dedicated consultant:
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