



Downstream Oil & LNG Terminal Operations

WSense is redefining safety and sustainability for off-shore LNG terminals with its wireless real-time monitoring technology. Our solution delivers continuous insights into structural integrity, methane concentrations, and environmental conditions—without the limitations of cables or costly manual inspections. WSense enables operators to detect leaks early, monitor mooring stability, and ensure compliance with the latest regulations. This proactive approach reduces operational risks, accelerates response times, and minimizes environmental impact, while supporting autonomous operations through AUV integration and satellite coordination.

Functionality Overview

AUV & Satellite Integration

Coordinates Autonomous Underwater Vehicles and integrates satellite data for comprehensive monitoring.

Digital Twin Integrated Subsea-Surface

Combines underwater sensor data with surface vehicles, satellite imagery and remote sensing.

SeaFencing

Uses AI-driven analytics to detect and classify potential threats near critical subsea infrastructures.

Hose Integrity

Monitors in real time pressure and temperature inside double-carcass loading hoses.

Mooring System Integrity

Tracks strain, vibration, and pressure on mooring systems and structural components.

Environmental Hazard Response

Continuous monitoring of concentrations of parameters and dispersion rates in the water column layers in real time.

Structural Subsidence

Analyzes sediment movement and seabed shifts around anchoring points and pipelines.

Benefits of IoUT for Downstream Oil & LNG Terminal Operations



Monitors cumulative signs of fatigue

and generates an alarm signal during loading and unloading phases in the event of a hose integrity event.



Prevents failures under harsh marine conditions

improving safety and operational continuity.



Protects infrastructure stability

and mitigates risks of structural damage.



Supports sustainability goals

and minimizes ecological impact during LNG operations.



Enhances surveillance and predictive maintenance

and enables autonomous offshore operations.



Provides early warning of potential threats

or operational anomalies, enhancing security and situational awareness.

WSense's IoUT in action

WSense, in partnership with the Italian National Institute of Geophysics and Volcanology (INGV), has developed a new class of real-time wireless underwater monitoring systems designed to detect and track gas dispersion (CH_4 , CO_2 and other geochemical parameters) even in the most complex marine environments.

Tested in extreme natural laboratories in volcanic areas, these systems have proven their ability to operate where traditional cabled solutions fail — in high-temperature zones, corrosive waters, unstable seabeds,

and dynamic hydrothermal fields. Building on this field-validated experience, WSense now brings the same resilient multi-hop acoustic network technology to the industrial domain, offering a scalable solution for monitoring offshore wells, decommissioned platforms, subsea pipelines, LNG terminals, and other critical infrastructures.

The system enables continuous leak detection, early warning, and remote environmental surveillance across large and distributed sites — without the cost, fragility, or operational constraints of subsea cabling.

Read more on wsense.it or get in touch at wsense@wsense.it

