



# Retrofit Christmas Tree Sensor Seetooth® Saves Production



## Customer Profile

Our client successfully opened a new field in the Niger Delta, which has a production capacity of over 35,000 barrels of oil per day and storage capacity of over 700,000 barrels. The field is located in a water depth of 300 meters and is known as a potential High Temperature and High Pressure (HP/HT) field.

## New Challenges

- Subsea tree system was operational but faulty.
- Severe loss of production and revenue anticipated.
- Major system architecture rework potentially required resulting in further cost.
- Wired instrumentation replacement was ruled too cost prohibitive in time and revenue loss.

## Key Benefits

- Overall project from inquiry to successful implementation took 6 weeks.
- Prevented a multi-million dollar replacement initiative.
- Maintained 35,000 barrel production with no loss of revenue.
- Enabled accurate, real-time temperature sensing in-situ wirelessly without major system rework.

## How do you replace a faulty temperature sensor 300m below sea level without interrupting oil production?

Our client successfully opened a new field in the Niger Delta, which has a production capacity of over 35,000 barrels of oil per day and storage capacity of over 700,000 barrels.

The production from this field was made possible by procuring a re-conditioned Christmas Tree and manifold system.

When producing oil from the new West African field installation it was observed that the flowing temperature recorded using the installed subsea instrumentation was showing a value of 105 °C.

The temperature value being measured had catastrophic potential, if it was true, as the maximum design temperature of the equipment was 90°C, and could have required pro-

duction from the field to be limited, or even shut down completely while the tree was recovered and re-worked.

Our client conducted an industry wide search to determine if there was a suitable, non-invasive, temperature sensor solution that could be procured in a short period of time to initially determine the actual flowing temperature. A wired system was deemed too cost prohibitive due to the lead time and inflexible due to the physical constraints of the existing installation.

CSIGNUM Technologies was engaged at an engineering and systems level to obtain details of the system architecture and investigate a range of potential wireless solutions to ensure that there was no loss of production and subsequent revenue.

*“This is just another example of how a Seetooth Subsea IOT wireless sensor can be retrofitted with no disruption to existing production, saving millions.”*

*Brendan Hyland, CEO*

## CSIGNUM Technologies Solution

Retrofit Subsea IoT Device with no interruption to production.

Real-Time monitoring and calibration of temperature.

Non-intrusive, wireless assembly magnetically installed.

After discussions it was found that there was a flowline location within the subsea system manifold with sufficient access to allow the installation of a non-invasive, retrofit wireless Seatooth® temperature sensor.

The magnetically installed sensor assembly was designed to match the flowline dimensions, fabricated and shipped to the end user within a short time period. This assembly was configured to measure and calibrate the flowing temperature using the ambient water depth and a sensor on the outer diameter of the flowline.

The device was supplied with a subsea controller to allow system integration on the vessel before deployment to verify the wireless interface and set the duty cycle for the temperature measurements. The device

was then installed subsea using light work class ROV. After logging for a period of time the sensor data was retrieved and analysed and it was found that the flowing temperature was in fact 83°C.

The project was successfully carried within six weeks of enquiry. This timely and cost effective solution was implemented with no loss to production or revenue and provided confidence in the continued viability of the wireless subsea system.

The temperature sensor has since been redeployed and used to provide ongoing verification and calibration of the subsea system production flowing temperature, proving the modularity and flexibility of the CSIGNUM solution.



Seatooth PipeLogger Mk2

CSIGNUM Technologies is a world leader in subsea wireless automation, Internet of Things (IoT) and Edge Computing Networks for the energy industry, including Offshore wind, Tidal, and Oil and Gas projects. CSIGNUM solutions cover a range of real-time monitoring and predictive maintenance use cases which work both under the ocean and underground, making them perfect for Smart City applications also. The discrete and modular patented system make it ideal for the defence industry and fits most subsea C4ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) implementations.

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