



# OptaSense Develops Novel Data Streaming Solution for Wellbore Digitalization

North Sea

## The Challenge

Producing offshore fields in the North Sea often present both technical and economic challenges to operators. Typically, oil and gas recovery rates for these fields are approximately 40% of what was originally predicted. One particular field was brought online with an expected full production rate up to 660,000 barrel of oil per day. The asset group for this field was tasked with increasing the recovery rate to 70%.

To achieve this goal, the operator wanted real-time flow monitoring on all wells in the field so all production and injection wells could be optimized. There are up to 48 wells coming online in the field. Around half are standard production/injection wells from the drilling platform with the remaining consisting of long reach wells (>20km) from the riser platform. The

field is also a pioneer in using technology and digitalization to monitor the reservoir and optimize production. This desire to “digitize” wellbores in the field would result in huge amounts of data being transmitted from the wells.

The operator had telecommunications fiber running from the platforms back to their onshore server but no means of streaming the data. To minimize costs, they chose the Apache Kafka open-source streaming software platform to achieve data transmission of 10kHz bandwidth at 1m resolution. No real-time data streaming systems for that volume of data existed so they need one developed. With the number of providers able to accommodate the need being very limited and a small delivery window (due to delays in tendering the work,) the operator was

## Problem:

- Need for real-time flow monitoring on multi-well field
- Large amount of data from monitored wells
- No streaming system available for volume of data

## Solution:

- OptaSense Distributed Acoustic Sensing Production Flow Monitoring
  - On-demand monitoring in real time
  - Built to interface with open-source software platform
  - Fiber cable agnostic

## Value Delivered:

- Full real-time field monitoring
- New wells brought online efficiently and ahead of schedule
- Significant cost savings
- Maximized production

concerned about getting the field into production on schedule as planned.

### The Solution

To address the data streaming challenge, the operator turned to OptaSense to provide real-time data streaming services using the existing fiber-optic network. OptaSense engineers were tasked with developing the software and hardware required to interface with the client's streaming software system to ensure the project was delivered on time and within budget.

The OptaSense data-streaming solution included building and delivering OptaSense ODH5X™ interrogator units (IU) as well as developing new software that allowed the ODH5X IU to interface with the client's open-source platform. Training for the client was also provided, allowing full remote operation of equipment from the client's offices rather than on the platform (thereby reducing HSE risks as well as on-site personnel costs.)

The fiber-agnostic hardware provided by OptaSense allowed the client to monitor long-reach wells with standard communications fiber, negating the need for costly, engineered fiber cable. In addition to meeting the client's specification requirements, the ODH5X also offers the flexibility to monitor from standard all the way up to 40+ kilometers, ensuring the equipment remains compatible for all future operations.

By using OptaSense solution, the client can use differential temperature properties and the high channel capability of the IU to monitor flow all the way up through the umbilical and manifold. This information will provide failure indicators that are valuable for preventative maintenance. Software developed by OptaSense allows for full remote operation using a multiplex capable of switching up to eight wells into any IU.

### Delivered Value

By using the OptaSense solution, the client was able analyze data in real-time, gaining valuable information and production and well integrity, reducing downtime. Significant cost savings have been realized from bringing wells online more efficiently with maximized production. Because of the increased efficiency in bringing wells online, the field was able to reach plateau production for the first phase several months earlier than expected.

With the real-time data streaming capability, the client has been able to achieve true wellbore digitalization. The expectation is that full real-time field monitoring will facilitate the efficient depletion of the reservoir, ultimately achieving the 70% recovery rate target.

In addition to the work done for this field, the client has partnered with OptaSense on other offshore projects in region. There has been interest in setting up a second system on a smaller scale in a nearby field with the intention of extending across the client's global portfolio based on system success. Other operators have also shown interest in similar systems.

The OptaSense real-time data streaming solution was the first system of its kind in industry. Having the ability to interface with open-source software systems will allow potential clients to adopt this system and realize the cost savings and efficiency improvements for their projects.

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