The world's largest cylindrical FPSO, Goliat, appreciates Beamex calibration accuracy

Eni Norge AS, Norway

BEAMEX CASE STORY

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A BETTER WAY TO CALIBRATE

Goliat is the largest cylindrical FPSO (floating, production, storage and off-loading unit) in the world. It is located offshore Norway and the first oil field ever moored in the Barents Sea.

The platform, based on a proven cylindrical hull concept, is huge; 115m wide, 100m tall and weighs 64,000 tons. The platform concept is designed for operations under the challenging conditions encountered in the Barents Sea and introduced new winterization systems, among other things. It is also equipped to meet the strict environmental requirements stipulated for operations in the Arctic Ocean.

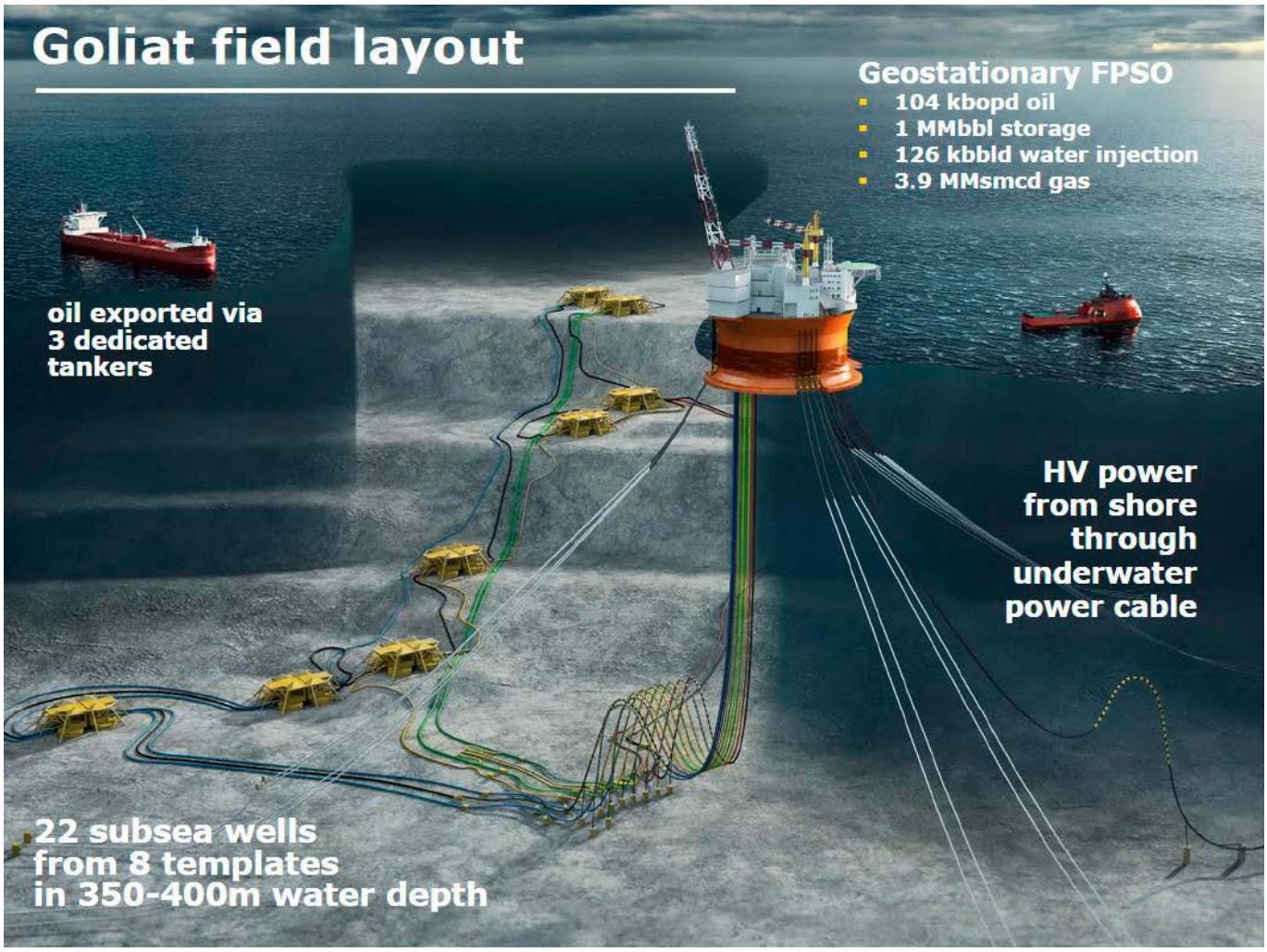
The Goliat field is operated by Eni Norge AS who also owns the majority, 65%. The second owner is Statoil with 35% of the shares. The estimated recoverable oil reserves are 28 million Sm^3 / 174 million barrels and the estimated recoverable gas reserves are 8 billion Sm^3. The annual operating costs are approximately 180 million euros.

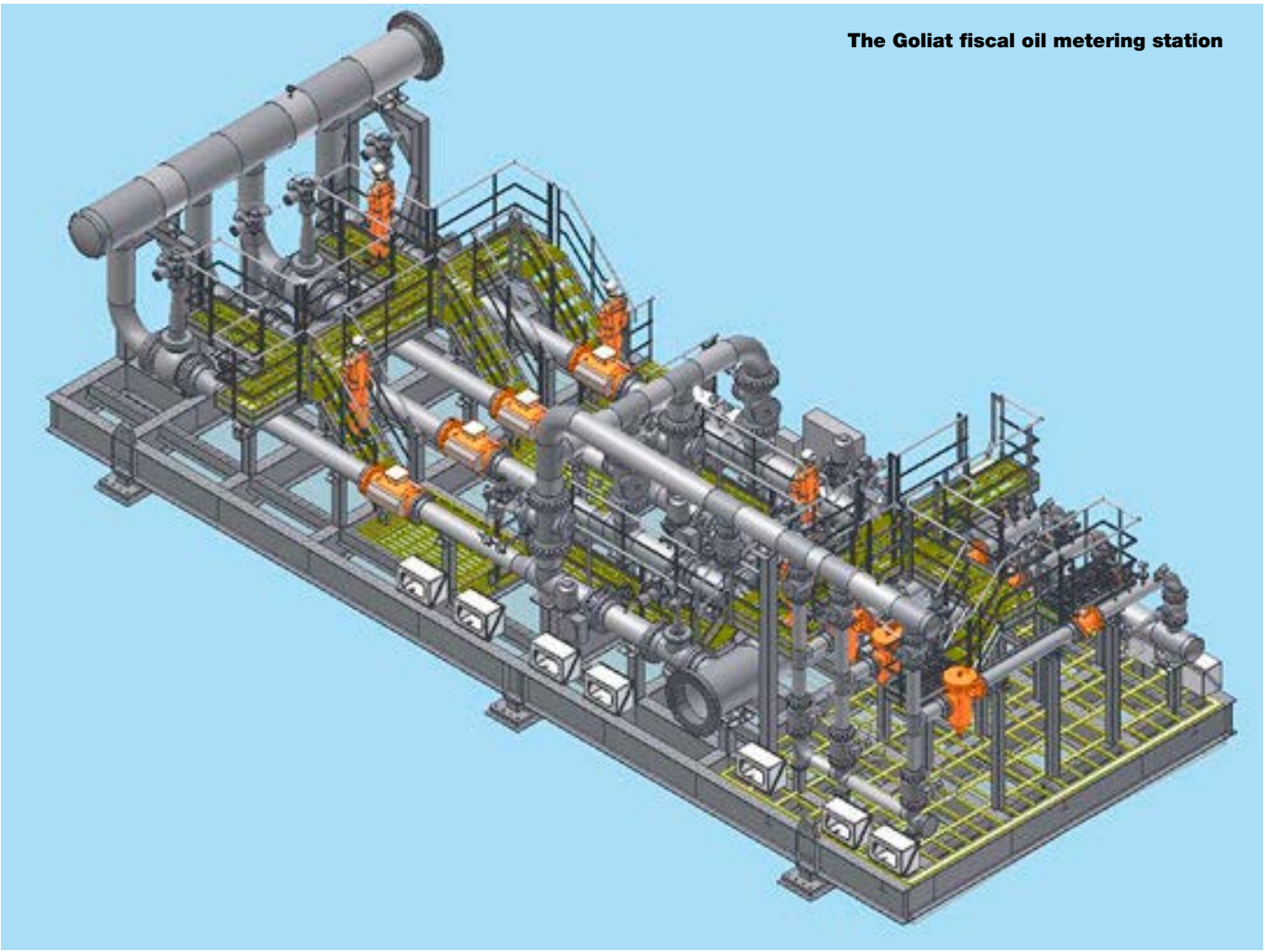
Accuracy in focus

All companies in Norway producing crude oil and gas are subject to very strict regulations on measurement of all hydrocarbons going out and into their systems in conjunction with sale and custody transfer. This is being done in a fiscal metering system. The results and the condition of the system shall periodically be reported to the Norwegian Petroleum Directorate. The fiscal metering system on board on a production unit shall have a predictive maintenance and calibration program to ensure that the measured results at any time are within tolerances. Relatively large volumes and high value are at stake.

> "WE PERFORM APPROXIMATELY 50 CALIBRATIONS PER YEAR ON FISCAL EQUIPMENT WITH THE MC5-IS, BUT WE KEEP TRACK OF MORE 100 ITEMS IN THE BEAMEX CMX DATABASE," SAYS METERING TECHNICIAN BENJAMIN ROSNES.

The metering station consists of metering systems for crude oil, fuel gas and flare and injection gas with different kinds of reference meters such as ultrasonic meters (USM), turbine master meters, orifice and cone meters. All of these are equipped with dual temperature and pressure transmitters as secondary references.





The Goliat fiscal oil metering station

Accurate measurements are focused on through the whole supply chain; starting with a plan for development and operation and finishing with daily operations. When it comes to the Goliat project development and production phase, there have been three employees primarily working with ensuring the quality of fiscal metering, secondarily other process-related quantity and quality related measurements.

Measurement uncertainty is equal to huge financial losses

Calibration is a very essential task and plays a central role, as this is the reference point for taxes to the state and settlement between seller and buyer. Calibration is required by shareholders, customers and the Norwegian Petroleum Directorate (OD). “We perform approximately 50 calibrations per year on fiscal equipment with the MC5-IS, but we keep track of more 100 items in the Beamex CMX database,” says Metering Technician Benjamin Rosnes.

When it comes to fiscal metering there are always major economic values at stake. Any measurement uncertainty in this system will mean that either party will experience a financial loss. Even small measurement errors can result in big financial losses. The seller and the buyer want to know exactly what is being delivered and received. The uncertainty for the calibrators needs to be 3-10 times less than the instrument that is calibrated. All calibrations are documented. Due to circumstances within fiscal metering it’s very beneficial to avoid all kind of manual entry. The calibration intervals are set according to governmental requirements and internal quality procedures.

Insourced and automated paperless calibration brings benefits

Beamex was the chosen supplier thanks to good references within calibration for fiscal metering in the oil and gas industry. “The Beamex calibrator is accurate and gives us the possibility to document our calibration records,” describes Benjamin Rosnes. “Beamex MC5-IS is approved as an intrinsically safe calibrator which fits the tasks very well. It has great capabilities for calibrating pressure transmitters on the metering station. The documenting function makes it easy to document records within the measurement loop. In our instrument workshop we have a Beamex MCS100 calibration workbench for performing calibrations in the workshop. Two other MCS100 workbenches are used for electrical and electronic testing and maintenance. We also use the Beamex CMX calibration management software. We save all certificates that belong to the metering station, even for equipment that we do not calibrate ourselves.”

Eni Norge has experienced cost savings and increased profitability thanks to calibrations being made on site instead of outside the house. There has also been improvements in efficiency and productivity through automated calibration, both on an

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DESCRIPTION

- Beamex MC5-IS intrinsically safe multifunction calibrator
- Beamex CMX calibration management software
- Beamex professional services: product training
- Beamex MCS100 test benches for Electro, Instrument and Telecom

MAIN BENEFITS

- Improved accuracy and quality
- Possibility to document records
- Paperless calibration
- Cost savings and increased profitability
- Improvements in efficiency and productivity

CASE STORY IN BRIEF

operative level as well as administrative.

The quality has been enhanced thanks to accurate measurements and an optimized calibration process.

"We have only had Beamex calibrators for 1½ years and we can already see the improvements of the calibration process. It looks very promising. We are still in the learning phase, but so far, we are very satisfied," Metering Technician Benjamin Rosnes confirms.

> "WE HAVE ONLY HAD BEAMEX CALIBRATORS FOR ONE YEAR AND WE CAN ALREADY SEE THE IMPROVEMENTS OF THE CALIBRATION PROCESS. IT LOOKS VERY PROMISING. WE ARE STILL IN THE LEARNING PHASE, BUT SO FAR, WE ARE VERY SATISFIED," METERING TECHNICIAN BENJAMIN ROSNES CONFIRMS.

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