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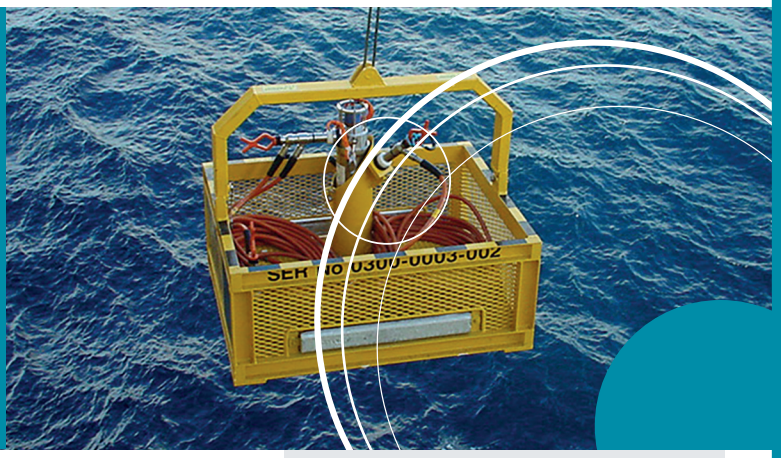
Wireless Well Solutions

Reducing uncertainty in reservoir connectivity during Clair Field Appraisal – CaTS™ world first wireless gauge installation enables well monitoring to continue beyond abandonment



Objectives

- The Clair Field is located 75km west of Shetland in water depths of up to 140 meters. It comprises a naturally fractured sandstone reservoir, which over the scale of the Clair Field made reservoir connectivity and compartmentalisation risk key uncertainties for field development planning
- The 206/8-13Y Clair Ridge appraisal well was located 8km from the existing Clair production platform and designed to confirm the next stage of development of the field
- An opportunity was identified to instrument the well with a CaTS gauge at the time of final abandonment, thus converting it to a long-term monitoring asset. Observing for interference effects resulting from production or injection events on adjacent assets would demonstrate wide-scale reservoir connectivity

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- A DST was performed on the well using a permanent packer and tailpipe
- On completion of the final pressure build up, a CaTS gauge was conveyed into the well through-tubing and hung off below a bridge plug set at the bottom of the tail pipe
- The DST string was then recovered to surface and the well permanently abandoned in accordance with the applicable UK regulations
- After installing a CaTS subsea receiver on the seabed, the rig departed the abandoned well location allowing the reservoir pressure and temperature data being transmitted from downhole to be collected at the receiver
- Provides a unique wireless reservoir monitoring solution in a permanently abandoned subsea appraisal well

Value to client

- 18 months of high quality reservoir data was recovered from the permanently abandoned subsea appraisal well at low incremental well cost
- The correlation of the reservoir pressure responses and trends between the Clair phase 1 platform and the Clair Ridge appraisal well provided clear evidence of reservoir connectivity
- Cost effective Advanced Reservoir Testing in an abandoned subsea appraisal well provided high value data to steer the future development planning on Clair

The Expro CaTS wireless communications technology transmits data and control commands using electromagnetic (EM) communications. The EM signal uses the steel construction of the well, namely casing, liner or tubing as a signal conduit.

CaTS does not require a tubing string in the well and is not affected by cemented pipe, cement, plugs, or bridge plugs lending itself naturally to monitoring in abandoned or suspended wells without compromise to the integrity of the well. The system is addressable with up to 20 discrete zones being monitored in a single abandoned well.

Another world first was the subsea deployment of the Expro Cableless Telemetry System (CaTS) on one of the Clair Ridge appraisal wells. This tool provides a unique insight into the pressure across the field, helping to give BP and its partners a better understanding of Clair's complex reservoir and rock formations.

Technical paper reference

B.P. Champion, Expro; I.R. Seale, BP; R.K. Pollard, BP, "Clair Field: Reducing Uncertainty in Reservoir Connectivity During Reservoir Appraisal – A First Time Application of a New Wireless Pressure Monitoring Technology in an Abandoned Subsea Appraisal Well", SPE 108435, Offshore Europe, Aberdeen, UK (September 2007)

Contact

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