

Cayley & Shaw Greenfield Development

Client:
Repsol Sinopec

Location:
North Sea, UK Sector

Equipment:
Proserv Multiplexed Fibre Optic-
Electro-Hydraulic Subsea Control
System

Depth:
95 m

Step out distance:
10 km to Cayler manifold, 18 km to
Shaw manifold

Project Background

As part of Repsol Sinopec's Montrose area redevelopment (MAR) project, Proserv was selected to provide the subsea control system for the Cayley and Shaw field developments. The two fields tie back to a new bridge linked platform (BLP) to the Montrose Alpha platform, approximately 210 kilometres east of Aberdeen.

Solution

The subsea control system provided by Proserv ties back to the newly installed Montrose BLP. The Cayley development uses a bundle arrangement while Shaw uses conventional umbilical and manifolds. The system uses subsea fibre optic communications channels to the manifolds where open communications hubs (OCH) provide the interface between the Proserv SCMs and the third party multi-phase flowmeters. SCMs, each with 25 hydraulic functions, perform the control and monitoring of the subsea tree and downhole hydraulically operated valves, as well as subsea instrumentation including wet gas flowmeters.

Scope

MCS/EPU's, HPU, 3 SSIV control panels, 3 TUTU 7 SCMs (two Cayley, three Shaw production, one Shaw injection and one spare), 5 OCHs (one spare), subsea pressure and temperature instruments, flying leads (electrical, hydraulic chemical, fibre-optic), 2 subsea distribution unit, 2 subsea shuttle valve assembly, and 3 subsea accumulation modules.

Fibre optic cores were included within the umbilical (Shaw) and bundle (Cayley) and open communications hubs (OCHs) were fitted to the manifold and towheads allowing high bandwidth fibre optic communications and higher transmission voltages to be used at these locations. The OCHs convert the transmission power and fibre optics communications to communications-on-power for onward transmission to the diver intervention and deployment SCMs and Ethernet to the manifold mounted multi-phase flowmeters.

Should both fibre optic communications interfaces fail, the system will automatically switch to communications-on-power links between the platform and manifolds, providing four possible communications channels between the subsea manifolds and the platform mounted MCS.

The control system is designed to support the two fields with a master control station (MCS) providing dual 600 VAC outputs and primary fibre optic communications to subsea, with the fall back to communications on power for each field. Topside communications interfaces are implemented between the MCS and the Montrose platform control system as well as a direct data hand off to the Pi system.

A platform mounted hydraulic power unit (HPU) supplies HP and LP pressure to the subsea control system, and three SSIV control panels provide the control and monitoring of three SSIVs. The HPU is equipped with a PLC to allow autonomous control and operation.

Conclusion

This was the first opportunity for Proserv to combine the fibre optic subsea communications technology used for subsea instrumentation and cameras with the subsea production control system.



