

Wissey Field Development

Client:

Tullow Oil PLC

Location:

Horne & Wren, Southern Sector, North Sea

Equipment:

Proserv multiplexed electro-hydraulic subsea control system

Background

The Horne & Wren platform is designed to accept up to two surface Xmas Trees controlled from a small Wellhead Control Panel. All power is generated using a wind turbine and gas burning generator for backup, power is stored in 24Vdc batteries. The Wissey Field is developed using a single well tied back to the Horne and Wren platform. The platform operates as a unmanned installation and is located in Block 53/3c, approximately 10 km (6.2 miles) to the west. The well is located in approximately 39 m (128 ft) of water.

Project Description

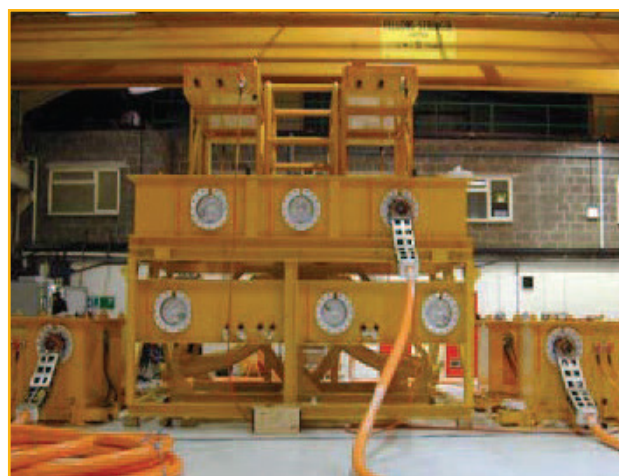
As the platform power is self generated and stored in local batteries, it is important that the system offer a stable subsea communication system capable of reliable operation in a highnoise/ interference environment. The system had to ensure low electrical power consumption, which is continually monitored and managed. In the event of failing power, the control system is designed to shutdown non-essential systems first and manages the power usage. Ultimately a loss of power will instigate a well shutdown in a controlled and monitored manner.

The Surface Control Sub-Surface Safety Valve (SCSSV) is the only open-loop hydraulic control valve. There is an inevitable risk of hydrocarbon gas returning back up the control line, through the umbilical and eventually to the platform. The SCSSV therefore remains an open-loop control venting control line fluid to sea when closed. The surface control equipment is mounted within a single control panel on the Horn and Wren Platform. Whereas typically an electro-hydraulic subsea control system would

comprise of separate MCS, EPU, HPU and TUTU on the host facility, the Wissey control system incorporates the operation of all of these components into a single unit on the upper deck, with only an umbilical interface plate on the lower deck.

The Wissey MCS / EPU PLC electrical system comprises 2 off 22-33VDC unregulated supply feeds from the Horne and Wren platform power generation system. One feed is distributed to dual 500W 24VDC to 24VDC converters and dual 500VA 24VDC to 230VAC inverters to clean and convert the power for subsea transmission. The second unregulated supply is distributed to supply the two 750W LP motors and the 1.1KW recirculation motor of the HPU where a clean power supply is less important.

Operating control is achieved remotely from the Great Yarmouth Control Centre with all MCS functions available via a remote link for control and diagnostics. This interface



allows the system to be commissioned and operated locally for diagnostic purposes.

A hydraulic and electrical jumper bundle connects to the Subsea Accumulation Module (SAM) on the over-protection structure and the Subsea Control Module (SCM) on the tree. The SCMMB interfaces with the SAM and the Umbilical Termination Jumpers, and connects directly into the Xmas Tree hydraulic functions using hard steel tube to each actuated valve. Located within the SCM cover is the horizontally mounted subsea electronics module (SEM) housing. The Subsea Electronics unit is surface removable and replaceable without the need to disturb the module's dielectric oil filled hydraulics chamber.

Scope of Work

Proserv to provide the tie into the Horn and Wren platform for a single well control system, Subsea Hydraulic Intensifiers used to generate HP fluid in SAM. Closed loop hydraulic fluid control system and combined safe area HPU and MCS for use on an unmanned platform with limited access and power.

The Benefits

- A fail safe operation ensures that any loss of signal or emergency action allows the efficient shut down of the well and production system in a safe manner
- High availability and reliability based on equipment selection, design principals and dual redundancy ensures that expensive diver intervention is eliminated or limited
- The system is designed for remote operation and reset without the need for operator direct intervention at the platform after the initial start up of the system
- The hydraulic system of the HPU generates dual 207 bar pressure headers using low power 24Vdc motors and hydraulic accumulation

