

Field development Don Southwest & West Don Subsea control system



Client:

Enquest

Location:

Central North Sea

Equipment:

Proserv multiplexed electro-hydraulic subsea control system



Background

Proserv were selected to provide a Subsea Control System for the Don Southwest and West Don Fields Developments in the North Sea. The developments are located in the East of Shetland in approximately 200 m (656 ft) of seawater. The two drill centres tie back to the Northern Producer Floating Production Facility (FPF), which is sited between the two developments.

Project Description

The Subsea Control System provided by Proserv is installed on the Northern Producer, on the seabed and on the Xmas Trees. This provides control of the subsea and downhole hydraulically operated valves and a data link to the platform control system conveying subsea and downhole operating parameters and performance. Gas lift, water injection and gas export Subsea Isolation Valves (SSIVs) will be positioned at the Northern producer riser base structure.

The accelerated nature of the first subsea equipment necessary for installation and testing with each Xmas Tree required a fast and flexible approach by Proserv for the Subsea Control Module (SCM) Mounting Base and other Tree mounted equipment.

The control system is designed to support a total of 13 wells across the two fields using a twin bay Master Control Station (MCS) located in the control room of the Northern Producer. The MCS and accompanying Operator Control Station provide primary control interface for the FPF, with interfaces into the ESD system and read only monitoring from the vessel Central Control System (CCS) with SCMs mounted on the Xmas Trees. Although the system is a diver only intervention and deployment design, an ROV style 'base connection' solution was adopted for the SCM to keep the number of interfaces to a minimum and connections between the SCM functions and tree actuators neat and compact. A platform mounted hydraulic power unit supplies HP and LP pressure to the subsea control system and SSIV control. The HPU is equipped with a PLC to allow autonomous control and operation. Diver installation and intervention with SCM base stab connectors.

Scope of Work

- Two 8 and 6 - Slot Subsea Distribution centres at Don Southwest and West Don
- Total of 12 installed SCMs, 8 at Don Southwest and 4 at West Don
- SCMs located on FMC trees
- Topsides system located on Northern Producer FPF
- System upgraded to include manifold data modules with Chemical Injection Metering Valve control and monitoring

The Benefits

- The SCM mounting bases were provided with a short lead time to meet demanding Tree schedule
- Multiplexed communications are provided independently within the same umbilicals from Communications Electronics Modules (CEM)
- Operations completed from standalone subsea control station provided with the system
- Topsides footprint and interfaces was reduced due to SSIV control to the HPU
- Subsea chemical metering retrofit installed using compatible subsea data modules within the distribution centres
- Expanded system using standard control modules to increase system water injection capacity