



Silvertech Schiehallion

Designed for Success

Results

- State-of-the-art, integrated control and safety system in operation 24/7
- The CPS, F&G and ESD systems are all integrated within the HMI/SCADA system
- The network is linked to the onshore corporate LAN via a powerful firewall
- With the functionality and ease of development and implementation of Proficy HMI/SCADA – CIMPPLICITY*, the whole system was developed within the planned six month timeframe

'Silvertech developed a state-of-the-art, integrated control and safety system, using as much as possible of the original installed hardware infrastructure. This ensured the ability to test the existing and new systems in parallel and ensures an uninterrupted, smooth transition to the new infrastructure.'

Oil Handling

Proficy* software chosen for 'Fields of the Future' oil installation

Silvertech was chosen by BP to develop a state-of-the-art, integrated control and safety system for a Floating Production Storage and Offloading (FPSO) vessel operated in the Schiehallion oil field west of the Shetland. Silvertech chose the HMI/SCADA software from GE Fanuc's Proficy production and automation software suite in response to a BP initiative looking at 'best practice' solutions within their "Fields of the Future" project. The design solution provided the capability to test the existing and new systems in parallel to ensure an uninterrupted, smooth transition to the new infrastructure.

The oil handling infrastructure

The Schiehallion field is situated to the north of Scotland and to the west of the Shetland Isles. It is located in the Shetland Trough area of the north-east Atlantic in 400m of water. Four of the five blocks in the field are operated by BP with all its well-heads tied back to the FPSO. A turret swivel, fixed to the sea-bed, acts as the conduit for the oil pipelines, power lines and control system cables between the FPSO and the well-heads on the sea-bed.

The FPSO weathervanes around the turret to cope with the rough seas experienced in the area. The FPSO itself is 246m long, can process up to 142,000 barrels of oil per day and can store up to 950,000 barrels. Shuttle tankers visit in 4-6 day cycles, offloading around 600,000 barrels of oil in a 24 hour period for transportation to the onshore oil markets.

Need for new control and monitoring software

BP carried out an obsolescence study and capacity review which included the Schiehallion field. They were faced with UNIX-based legacy monitoring and control systems that were nearing the end of their supportable life. As part of BP's 'Fields of the Future' review looking at 'best practice' and how to implement it, Silvertech was asked to help develop a new 'life of field' strategy for control and safety for the Schiehallion production infrastructure.

Silvertech developed a state-of-the-art, integrated control and safety system, using as much as possible of the original installed hardware infrastructure. This ensured the ability to test the existing and new systems in parallel and ensures an uninterrupted, smooth transition to the new infrastructure. The system is in operation 24/7 so it had to be robust but also easy to transfer while running live.

Hardware upgrades

At the heart of the HMI/SCADA system are three servers each with a matching server to provide redundancy. These act as Masters to a number of Slave PC workstations located in the central control room, and local viewers located fore and aft on the vessel. Another matching pair of servers provides the SQL database.

The original twisted pair network has been replaced by fibre optic cables in order to handle the significant increase in traffic created by the CIMPLICITY polling methodology. Every server, workstation and PLC is connected to two redundant, parallel fibre-optics networks to

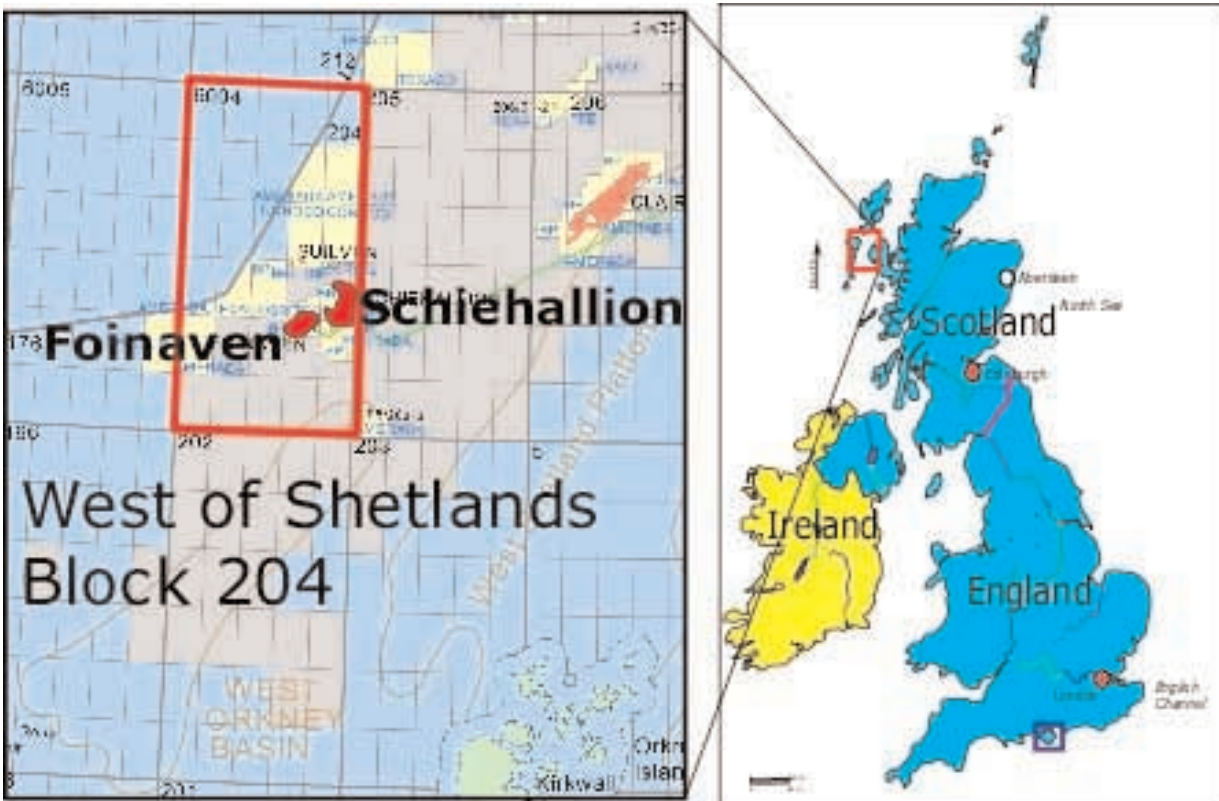
provide easy switch over should a problem arise in one network. The Ethernet modules on the redundant pairs of GE Fanuc 90-70' PLCs on the FPSO were also replaced in order to handle the fibre optic signalling.

Redundant pairs of 90-70 PLCs located throughout the FPSO handle the process Control and Process Shutdown (CPS) I/O, while two other 90-70s control HVAC systems for the fore and aft of the FPSO. A separate pair of 90-70s handles the Fire and Gas (F&G) systems, while a hard wired Silvertech system handles the Emergency Shut-Down (ESD). These PLCs on the FPSO act as the interface for all the I/O for the topsides process control and safety systems.

Integrated control & safety system

ICS Triplex Silvertech ("Silvertech") is an independent, global organization with facilities in the UK, Middle East, USA and SE Asia offering a range of engineering services for the process industries. Silvertech offers true independence and provides unique solutions to exacting standards by utilizing best in class products without compromise to match the requirements of its clients. Silvertech offers total lifecycle support from consultancy, initial design services, engineering design and build, installation to long term support.

The CPS, F&G and ESD systems are all integrated within the new HMI/SCADA system. The development was based on Silvertech's standard approach to systems which require redundancy to fulfill the safety and high integrity control demands. The adoption of this



approach has provided the ideal way to compare the new system to the legacy system for systems testing and verification. It should also prove to be straightforward to maintain.

All the graphics inevitably had to be replaced and the point database had to be updated. The total number of points is in the region of 50,000 with around 5,000 hardwired I/O. The number of screens that had to be developed numbered in the thousands. However, with the functionality and ease of development and implementation of Proficy HMI/SCADA – CIMPLICITY, the whole system was developed within the planned six month timeframe. The timescale was also supported by the GE Fanuc bundled hardware and software.

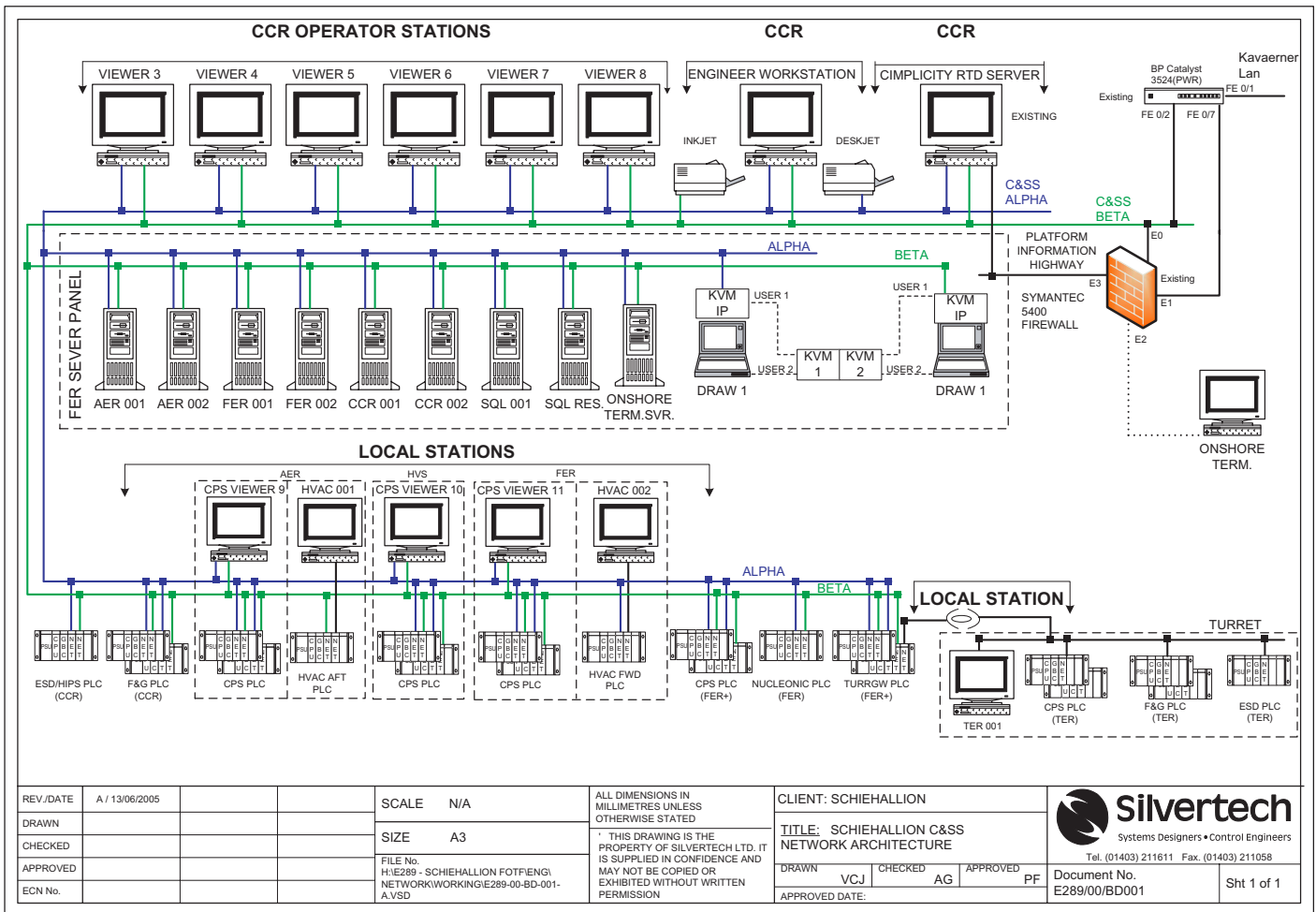
Also the network has an engineering workstation to provide access to the system for software maintenance and a CIMPLICITY RTD server. The RTD Server provides a means to process the data stored on the SQL servers in real time to plot trends. The network is also linked to the onshore corporate LAN via a powerful firewall so that the system can be viewed by authorized personnel throughout the world via the company intranet.

Outlook

The initial feedback from prospective operators and users of the system has been that they have been impressed by the look and feel of the new system. The “Field of the Future” project placed significant emphasis on the long term support of the solution and by choosing products from GE Fanuc, a major international company and a leader in production and automation software, Silvertech was able to provide confidence to BP that it would be able to provide the ongoing support and development for the system.

System Benefits

- Capability to test the existing and new systems in parallel
- Every server, workstation and PLC is connected to two redundant, parallel fibre-optics networks to provide easy switch over should a problem arise in one network
- Used as much as possible of the original installed hardware infrastructure
- Easy to transfer while running live
- Based on Silvertech’s standard approach to systems which require redundancy.





GE Fanuc Automation Information Centers

Americas:
1 800 GE FANUC or 434 978 5100

Asia Pacific:
86 21 3222 4555

Europe, Middle East and Africa:
800 1 GE FANUC or 800 1 4332682
or 1 780 401 7717

Europe, Middle East and Africa (CNC):
352 727979 1

©2006 GE Fanuc Automation. All Rights Reserved.
*Trademark of GE Fanuc Automation.
All other brands or names are property of their respective holders.

Additional Resources

For more information, please visit
the GE Fanuc web site at:

www.gefanuc.com