THE CHALLENGE

A major oil production operator enlisted ENGlobal’s expertise in developing a ‘universal’ oil production control system. The control system must support expansion of up to 100 subsea wells/manifolds and 20 umbilicals.

The control system must be developed using a standardized object-based control software with drag and drop development capabilities and the ability to communicate to any subsea equipment.

Communications between the subsea equipment and a conventional Master Control Station (MCS) is proprietary, based on protocols unique to each subsea equipment supplier. The ENGlobal UMCS overcomes this fundamental design limitation. A UMCS allows the operator to plan for additional wells regardless of subsea manufacturer without requiring additional control equipment.

SCOPE OF WORK

Work executed included:

• Monitor and control the Julia subsea and topside equipment located on the Jack – St. Malo platform
• Design of network architecture and security
• Established a interface to the existing DCS
• Development of subsea shutdown sequences and interlocking scheme
• Creation of power and communication cable interconnection diagrams
• Integration support for DCS, 3rd party devices, historian and subsea equipment vendor
• Provided object-based subsea and topside simulators
• Designed, built and deployed control system cabinets two years prior to offshore commissioning
• Offshore commissioning support
THE SOLUTION
The Universal Master Control Station (UMCS) establishes a global solution for operator interface, data exchange, and control execution. The standardized approach encompasses; graphics, screen navigation, object structure, communication interface, diagnostics, operator interfaces, alarming, security, 3rd party device control, hardware, and cabinet build.

The objective of the UMCS development program was to create a system that utilized commercially available, off-the-shelf components to be configured with little or no programming effort. Likewise, the graphics, control routines, interlocking scheme, and functionality would be consistently designed and implemented to provide operations a recognizable control system. A standard interface (communication protocol) would establish a common communication link for the UMCS enabling concurrent data exchange to multiple subsea vendors. This interface allows connectivity to any subsea equipment vendor or DCS system, or combination thereof, for future expansion.

Business Impact
The result is a patented oil production control system that is capable of controlling subsea equipment from any manufacturer. This single feature allows an abundance of choices during future phase expansion. The combination of ‘Client Configurability’ and multi-vendor communications, empowers the production company with the maximum amount of flexibility when choosing a subsea vendor for future field modifications or expansions.

The expense of factory acceptance testing, commissioning, and startup has been significantly decreased due to a standardized software scheme. A sharp decrease has been realized with the cost and schedule impact from late design changes, which include data exchange additions for the Distributed Control System (DCS), interlock requirements, and shutdown sequence modifications.