HINZ

A Rockwell Automation Company

Tri Ocean Engineering Ltd./Lasmo Nova Scotia Ltd
Cohasset/Panuke
Offshore Oil Production Project

The Client:

Lasmo Nova Scotia Ltd. is a wholly owned subsidiary of Lasmo PLC., one of the largest independent producers of oil in the world, with major reserves in Indonesia and the North Sea. The Cohasset Field, offshore Nova Scotia, is the first offshore field to be developed in Canada.

Tri Ocean Engineering is a Calgary based independent engineering company with extensive experience in the design and specification of offshore drilling units, used in the production of oil offshore.

The Requirement:

The Cohasset Field, offshore Nova Scotia, has recoverable oil reserves of over 60 million barrels of a sweet, light, premium crude oil.

Lasmo Nova Scotia determined this marginal field would be financially viable if recovery of the reserve was implemented utilizing two small unmanned automated wellhead platforms connected via pipeline to a mobile jack-up drilling rig, specially converted for oil production, stationed in the field and in turn connected via pipeline to a floating storage facility (a converted 175,000 ton tanker).

Tri Ocean Engineering were contracted by Lasmo to provide detail designs of the topsides of both platforms and also the oil/gas separation and production equipment to be installed on the jack-up rig Rowan Gorilla III. Hinz was sub-contracted by Tri Ocean Engineering, to carry out the detailed design of the electrical and control systems to be utilized. This included site supervision of the installation and commissioning of all such systems.

The requirements can be broken down into three distinct areas of responsibility:

a) Design of the control system, including emergency fire and safety systems;
b) Design of the electrical power system, including 10 Km of sub-sea cable and a cable bridge to interconnect the various components;
c) Supervision of the construction, installation, and commissioning of all the electrical components, and overall system design compliance with the very stringent requirements of all regulatory bodies, including Canadian Regulations for Oil and Gas Installations, Lloyds Registry of Shipping Requirements, American Bureau of Shipping, as they pertained to the jack-up rig, IEEE 45 and A.P.I. 14R. This being the first offshore installation to be carried out in Canadian waters, the regulatory bodies could be expected to be particularly vigilante in ensuring their codes and regulations were adhered to precisely.

The Design Solution:

Two unmanned automated wellhead platforms, identified as PANUKE and COHASSET were designed. The Panuke platform is a remote platform, 10 Km Southeast of the Cohasset platform and connected by oil pipelines and a 2,000 KVA, 13.8 kV 3 Phase sub-sea cable. This cable also contains a 4 fiber, fiber optic bundle for data/control signal transmission.

The Panuke platforms comprises 3 decks plus a helideck. The lowest deck carries 5 automated wellheads, a complete electrical room with step-down transformer, 7 day U.P.S. system, MCC and step-up transformers for down -hole pumps, an instrument room fitted with a stand alone Bailey DCS system, M.T&T communications rack containing both radio and fiber optic TX/RX systems, an independent Pepperl-Fuchs ESD system, 4 computerized oil analyzers and flow meters, a CCTV system utilizing 8 remote cameras, a P.A. system, and a fire/gas control panel. Both rooms are air-conditioned and fire protected with C02 flooding.

The middle deck contains a 5 well hydraulic wellhead control panel, a 200 H.P. hydraulic power pack, a wireline work-over unit, and an 8 man accommodation module. Inside the module are the fire/gas remote displays, P.A. console, cooking facilities, hot water tank, etc.

The top deck carries the utility room with air handling units, water tanks, fire main controllers, navigation aids, alarms and foghorns, the emergency generator room with 350 KVA CAT diesel generator set, automatic transfer switch and associated MCC, the oil export manifold, and a 7 ton hydraulic crane.

The deck area to support all of this equipment is 12m X 12m, consequently, Hinz engineering staff worked in close cooperation with Tri Ocean staff to ensure all equipment was accessible and could be installed in compliance with all codes.

The Cohasset platform contains 10 wellheads, but as the jack-up Rowan Gorilla III is stationed alongside, the electrical system on the jacket is somewhat simpler than the Panuke. A 30 meter cable bridge connects the jacket to the RGIII. The bridge not only carries all power/control signals required for wellhead control on Cohasset, but also the 13.8 kV feeder cable for Panuke. A splice box on Cohasset connects this feed cable to the sub-sea cable.

The only independent control system on Cohasset is a hydraulic wellhead control panel. The fire/gas sensors, CCTV cameras, and all production sensors, operators and transmitters, are fed back to a main control room on the RGIII for processing.

The oil processing and export system installed on the RGIII was designed as five major, pre-fabricated, skid mounted units that were positioned on the RGIII and interconnected. The RGIII original power generation was deemed insufficient for the new requirement, so two 2,800 kW Solar gas turbine generators and associated control equipment were added.

One of the prefabricated units was an electrical equipment room which contained the main distribution switchboard for interconnecting the RGIII power generation and the new turbines, the Bailey INFI90 D.C.S. control system, which controlled both platforms and all processing functions, 3 MCCs, 5-step transformers, and VFDs for down hole pumps, the main communication racks, and various utility/lighting transformers and boards. A new control room was added to the accommodation module of the RGIII. This control room houses the Bailey INFI90 control desk, the Solar turbine control panels, the fire/gas control and alarm panel, the E.S.D. main panel, and the C.C.T.V. control console.

The Bailey control desk has 4 CRTs and keyboards, and associated alarm printers. The desk can display and control all processor functions, including P.I.D. loop and motor stop/start.

The ESD is a stand-alone fail safe Pepperl/Fuchs units. All inputs to the ESD panel are repeated to the Bailey INFI90. Three levels of E.S.D. are utilized, depending on the severity of the failure encountered.

The system was commissioned in June, 1992 and is, at present, producing over 25,000 bpd. from 3 wells.

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System Specifications:

- Power Generation 2 - Solar Centaur Turbines, 2800Kw each
- Control System - Bailey INFI 90
- Switchgear - Siemens Marine Type 80
- Fire/Gas Detection - SIEGER G.D.A.C.S.
- E.S.D. - Pepperl/Fuchs
- U.P.S. System - SAFT/NIFE
- Communications - M.T.& T.
- Existing generating capacity 6 CAT/GE diesel generator sets 800 KW each.
- Total connected load 9800 KW
- 5-ABB 500HP variable speed drives
- 2-Relcon 50HP variable speed drives
- Digital I/O Points: 1800
- Analog I/O Points: 200
- PID Loops: 25

For further information or to contact a Hinz office near you, please check our website at:

www.hinz.com