

## ROC OIL LTD

### 12-8 EAST AND 12-8 WEST OFFSHORE FACILITIES

#### Wellhead Platform Conceptual Design, Beibu Gulf, China

The 12-8 East and 12-8 West oil fields are located in Block 22/12 in Beibu Gulf, China. These fields are being developed by Roc Oil.

ICON Engineering was commissioned in mid 2003 by Roc Oil to complete conceptual engineering design and the preparation of the applicable engineering documents. The concept was developed for feasibility purposes, to be included within an "Overall Development Plan" to be presented to the Chinese authorities.

The initial development consisted of a 4 slot wellhead platform at 12-8 West (12-8-1) and an unmanned "hub" facility at 12-8 East (12-8-2). The oil was to be pumped via pipeline to custody transfer at Weizhou Island.



Overall Field Development

The 12-8 West (Wellhead Platform) was designed for 10kbfpd and consisted of:

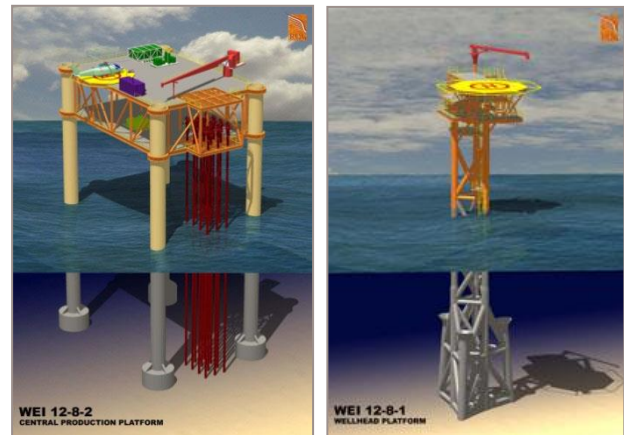
- Wellheads
- Artificial Lift System (PDP Pumps)
- Power Fluid System
- Production Test Facilities
- Helideck
- Craneage

The "hub" 12-8 East (Central Process Platform) was designed for 25kbfpd and consisted of:

- Wellheads
- Artificial Lift System (PDP Pumps)
- Power Fluid System
- 3 Phase Separation
- Produced Water Handling
- Oil Export Pump
- Craneage

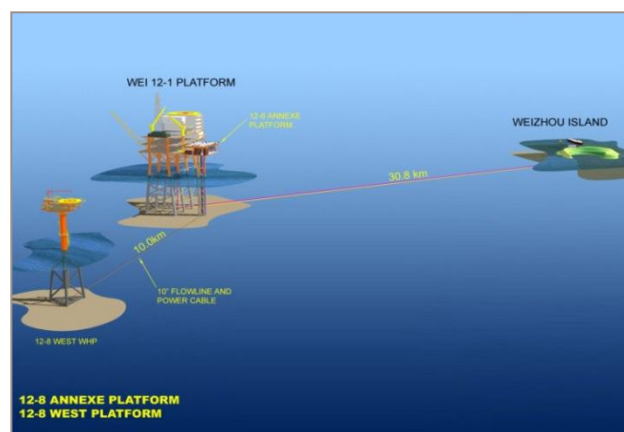
ICON prepared the concept documents and drawings, such as the BOD, PFD's, P&ID's, Equipment Layouts for both facilities, electrical block diagrams and installation concept schematics.

Subsequent to the initial concept development work, revised reservoir models resulted in Roc Oil discussing the development options with CNOOC. As a result, an early development of 12-8 West producing direct into the existing 12-1 Platform was proposed.



3D CAD Models Were Built of the Proposed Facilities Using Autoplant Software

The revised 12-8 West development consisted of a wellhead platform designed for 15kbfpd, production to 12-1 Annex platform, which acted as a "hub" for tie-back of further facilities, with 3 phase separation, water handling facilities and custody transfer.



CNOOC/Roc Development Option for the 12-8 West Field

Roc Oil commissioned CNOOC Research to prepare the final ODP to expedite approvals. ICON worked closely with Roc Oil as part of an expert team to assist CNOOC Research to complete the basic engineering for the development. This involved many trips to China as part of the Roc Oil expert team for kick-off and review meetings.