Chevron Subsea Projects

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Energy Technology Company

Subsea UK
Lunch and Learn
29/05/2012
20+ Major Capital Projects in queue
2015 Production > 800MBOED
Chevron Global Subsea Presence

Production/MCPs
Exploration Opportunities
NOJV
Chevron Global Subsea Projects
Technology plays a vital role

<table>
<thead>
<tr>
<th>Project</th>
<th>15 KSI</th>
<th>Instrumented pipeline protection (HIPPS)</th>
<th>Multiphase Flowmeters</th>
<th>Subsea Sampling</th>
<th>Chem. Inj Distribution</th>
<th>Intelligent Well Completion</th>
<th>Subsea Boosting</th>
<th>Power</th>
<th>Direct Elec Heating</th>
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Gorgon Foundation Project

Runs through a three-train (15 million tonne per annum) LNG and Domestic Gas facility on Barrow Island.

It is the largest LNG plant ever to be fed by a subsea system.

The Greater Gorgon Area represents Australia's largest known gas resource, estimated to contain 40 trillion cubic feet of gas – equivalent to 25% of the country's total known gas resources.
Gorgon
- 3 drill centres
- 8 wells
- 250 metre depth
- 70 km tie-back to plant
- 34” carbon steel pipeline
- High CO2 content (15%)

Jansz
- 2 drill centres
- 10 wells
- 1350 metre depth
- 147 km tie-back to plant
- 30/34” CS pipeline
Gorgon Foundation Project
Typical Arrangement of Subsea Equipment
Jack & St Malo
Wilcoxon Trend

- Location – GoM WR 718
- Water Depth – ~7000'
- Semi-submersible Host FPU centrally located between Jack and St. Malo
- Shared process facilities initially sized for 170,000 BOPD and 42.5 MMCFD
- 3 Subsea drill centres
- Mobile Offshore Drilling Unit drilling and completion operations
- Dual 10” production flowlines from each field to the Host
- Oil and gas export pipelines operated by third parties
- Provisions for third party tie-backs
- Provisions for future development
Jack & St Malo Project

- Design SITP/Temp: 13,000psi
- Tie-back Distance: 12 miles for both fields
- Three drill centers
- Three single phase pumps
- Well MPFMs on manifold
- Subsea sampling on manifold
- CIMV future expansion
- Artificial Lift Method: Seabed pumping
- 1 – Oil Export SCR
- 1 – Gas Export SCR
Jack & St Malo Project
Typical Arrangement of Subsea Equipment
Jack & St Malo Project
Framo SPP Pump Station with Retrievable Modules

1) Pump Module
2) Transformer Module
3) SCM
4) Recycle Line Choke

Pump Station Dimensions:
Length: 45 ft
Width: 35 ft
Height: 34 ft
Reservoir
- Upper Jurassic Sandstone
- 14,700 ft tvdss
- HPHT gas condensate

Location – UKCS Block 15
- Water Depth – 150 metres
- Tie-back Dist. – 28 Km
- Design SITP – 694 bar
- Design Temp – 135 C

Host - Britannia BLP
Alder
Subsea System

- Subsea tie-back to Britannia Bridge Link Platform (BLP).
- Subsea manifold containing:
  - Two fully populated wellbays
  - Subsea HIPPS
  - Manifold mounted split Cooling loop
  - Well and HIPPS SCMs
  - Umbilical termination and distribution
  - Chemical injection points (various)
- Subsea structures “Fishing Friendly” / designed for required snag loads.
• Manifold piping and cooling spool design
  – Cooling loop made out of two “coils” - for flexibility - self-draining
  – HIPPS valves
  – Production Valves
  – Manifold piping orientated to meet area subsea architecture requirements, predominant current direction, etc
  – Interface with temporary Subsea Pig launcher.
Alder
Subsea Trees

- HPHT: 15ksi, 350°F requirement.
- Pressure Rating driven by Chemical injection requirement. (Methanol bull heading)
- “Enhanced Vertical Design”
- Separate protective structure
- Tree mounted Flow Module (Choke)
Rosebank
Rosebank

Location

- 150km NW of Shetland Islands
- Water Depth – 1,100M
- Tie-back Dist. – 6 Km
- Design SITP – 3600 psi
- Design Temp – 200 f

Layout

- Shipshape FPSO
- 4/6 well subsea clusters
- Flexible risers
- Gas export pipeline
Chevron Subsea Projects