Fulmar Field
Coiled Tubing Campaign Boosts Production

DEVELOPMENT
15th May 2013
Nathalie Franck
Fulmar - Field Background

Reservoir
- U. Jurassic Fulmar Sandstone
- Gross Thickness: 700 ft TVD (1,500 ft TVD max)
- API: 40°
- Initial Pressure: 5,700 psia
- STOIIP: 822 MMstb
- Cum Oil at end 2012: 560 MMstb

History
- 1975: Discovery
- 1982: 1st Oil Shell Operated
- 2006: Talisman Operated
- 2008: Halley Reinstatement
- 2010: Auk North Online

Active Producers:
- FA01, FA06, FA14, FA15, FA20, FA23, FA33

Active Injectors:
- FA03, FA07, FA12, FA21, FA28

6 Active Producers: FA01, FA06, FA14, FA15, FA20, FA23
5 Active Injectors: FA03, FA07, FA12, FA21, FA28
Fulmar Historical Production 1982-2012

- Gas Injection
- Water Injection

- Oil export bopd
- Water production bwpd

Graph showing historical production data from 1982 to 2012.
Fulmar Platform Upgrades 2006 - 2012

- HVAC upgrade in TR and process modules
- Deluge piping internal cleaning
- Controls upgrade
- Inst air supply upgrade
- Water Injection plant maintenance
- Increased PFP/painting
- Small bore tubing Upgrade programme
- Process Control valves
- Lifeboats upgrade
- Jacket repairs
- Upgrade PA system
- Biocide AFA
- REPLACE CAISSONS
- F&G system upgrade
Objectives of the Well CT campaign

- Re-instate high potential wells that are shut due to integrity & scale
- Conduct operations safely and with no environmental impact
- Gather data to assess further remaining opportunities
- Boost oil production rates

• FA15, FA14, and FA33
Talisman Sinopec Energy UK Limited

- Completed in Sep. 1987
- Cumulative Oil Production: 30MMstb
- Well S/I since Nov 2006
  - Suspended with Halliburton HX-4 RBP set at 9,556 ft BRT.
  - Equalising Prong Recovered in 2007 but unable to recover plug with slickline due to restricted access / scale (no access to the fish neck of the RBP)
FA15 Operations & Performance Summary

- Perform tubing drift run & scale clean out to HX-4 RBP at 9,556 ft
- Perform tubing and annulus pressure test for integrity purposes
- Recover HX-4 RBP from the well
- Identify tubing-annulus leak path with MFCT & PLT (tbg leak point ~ 9050 ft BRT)
- Set modular straddle and repair tubing-annulus leak
- Set SSSV
- Perform SISQ
- Hand well back to production

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<thead>
<tr>
<th>Oil Rates</th>
<th>Predicted</th>
<th>Actuals</th>
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<tbody>
<tr>
<td>FA15</td>
<td>320 – 480 – 640</td>
<td>1,900</td>
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- Last well test:
  12/03/2013  1,500bopd (93%BSW)
FA15 success explained

Gravity Segregation

Sw in Nov. 2006

Sw in Mar. 2011

Sw increasing (%)

WE
• Completed in Jul. 1987
• Cumulative Oil Production: 12MMstb
• Well S/I since July 2006 & 99% Water Cut
  – Known scaling issues in tubing above SSSV
  – PLT data from 1997
    • No contribution from Clyde Fm
    • All flow from Lydell
**FA14 Operations and Performance Summary**

- **Oct. 2011 - Reperf Lydell**
  - CT Turbo Mill
  - Perforate Lydell
  - 200 bopd (99% BSW)

- **Jan. 2012 - Reperf Clyde**
  - Perforate Clyde
  - Set Baker Bridge Plug at 10,805ft to isolate Lydell
  - Perform SISQ
  - Hand well back to production

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<td>FA14</td>
<td>60 – 325 – 590</td>
<td>580</td>
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- **Last well test:**
  - 12/03/2013 350bopd (75%BSW)
FA14 success explained

Clyde Fm. – future well infill target

Perm increasing (mD)

Sw increasing (%)

Sw in Jan. 2012
FA33 Log and History

- Completed in Nov. 1994
- Cumulative Oil Production: 1.5MMstb
- Well S/I since Jan 2001
  - Workover attempted in 2002 but suspended due to LSA scale
  - Well suspended with 2 shallow plugs
FA 33 Operations and Performance Summary

- Confirm access to well and recover two shallow set tubing plugs
- Clean out scale in tubing to SSSV and recover BB packer c/w storm choke
- Clean out scale in tubing/liner to ensure access for perforating guns
- Pressure test ‘A’ annulus to confirm integrity
- Re-perforate reservoir and flow to clean-up
- Perform SISQ (on coiled tubing)
- Re-set storm choke on BB packer at 1,020 ft BRT
- Trip and inflow test storm choke
- Hand well back to production

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<td>FA33</td>
<td>199 – 354 – 508</td>
<td>2,500</td>
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- Last well test:
  12/03/2013 750bopd (91%BSW)
FA33 Success Explained

Gravity Segregation

Sw in Jan. 2001

Sw in Jan. 2012

Sw increasing (%)

Talisman Sinopec Energy UK Limited
Fulmar 2011-2012 Green Plot
Export Barrels

Talisman Sinopec Energy UK Limited

FA14 online
FA33 online
FA15 online

Date (mmm yy)
Oil Rate (bopd)
Way Forward…

Future Opportunities:
- FA02 CT Reinstatement
- Regular wireline interventions
- Looking at rig upgrade
- Possible infill well campaign
- Potential near field exploration