West Franklin

*How Geophysical Tenacity Led a Modest Franklin Satellite to a Full-Blown Field Development*

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The Elgin-Franklin Development

**WEST FRANKLIN**
- U Jurassic ‘Fulmar B&C’ sands
- 2 Producing wells (Franklin WHP)
- GDT = 6077m
- Temperatures >200°C
- Initial Pressures >1100 Bar
- Hyper-critical fluid (GOR ~1200 m3/m3)

22/30c Total

**GLENELG**

**ELGIN**

**FRANKLIN**

**CG CORE AREA**

Total production
>600 Mboe
Plateau rate
~230Kboe

1986 Discovery (Franklin)
Start-up in 2001

Expected to produce for another 20 years

Deepest production wells in the North Sea

HP/HT Exploration, Drilling & Production
Seismic Database

1996
3D Seismic Survey (Baseline)

2005
3D Seismic Survey (4D Monitor 1)

2009
7km 3D Long Offset Survey

2011
3D Seismic Survey (4D Monitor 2)

1996
PSTM Processing

2002
PSDM Processing (1996 Survey)

2005
PSDM Processing (Base & Monitor)

2008
PSDM Re-processing (1996 Survey)

2010-2011
PSTM & PSDM Processing (7km LO Survey)

Phase 1 INVERSION

Phase 2 INVERSION
**Discovery Well: 29/5b-F7z (2003)**

- **F7z Exploration well drilled on down-faulted panel west of the Franklin structure:**
  - PSDM imaging essential for initial well planning and target definition

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**F7z results aided by improved imaging and reservoir characterisation de-risked volumes on the western culmination of the structure**

- **2002 Top Fulmar Depth Map**
- **1996 PSTM**
- **2002 Anisotropic PSDMT**
- **F7z POROSITY LOG**

An appraisal target to the West was identified using new 3D PSDM seismic and inversion data...

...however F9y had far exceeded expectations:
- Reservoir thickening from F7z to F9y
- Rapid facies change over 2.2km

Semi-regional structural model needed revisiting
West Franklin – Structural Setting

2008 Re-processed PSDM (1996 baseline acquisition) Post-F9y

PSDM Re-processing of 1996 data improved imaging below reservoir level, helping to establish:

1. Large scale tectonic events (better migrated image)
2. Local deformation related to thick salt

Regional picking improved the understanding and significance of the Pod-Interpod relationship between West Franklin and Franklin
Schematic Structural Restoration of West Franklin – 2008 PSDM

Rapid over-thickening of reservoir sequence on West Franklin attributed to differential sediment loading and timing of salt withdrawal
7km Long Offset 3D Seismic (2009)

Distinct area of seismic amplitude degradation seen to the west.

Possible causes:
- Gas Cloud?
- Seismic Artefact?

New Long Offset seismic displays promising results in poorly imaged areas.
4D Seismic - 2\textsuperscript{nd} Monitor Survey (2011)

2005 4D Monitor 1 Time-strain (PSDM)

Reservoir compaction

Overburden stretching

...however 2005 picture is out-dated:

- West Franklin start-up in 2007
- ~350Bar depletion in last 4 years

4D acquisition is scheduled Summer 2011

4D Monitor 1 (2005) captured the ‘Arching Effect’ over Elgin and Franklin...

...however 2005 picture is out-dated:

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4D acquisition is scheduled Summer 2011
Conclusions

Continued investment in seismic data will help to ensure mature areas such as West Franklin remain in the spotlight.
Acknowledgements