Managing mature oil fields in a low oil price world

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About Oil Search

» PNG company, incorporated in 1929, ~1,250 employees

» World class assets
  – ~29% interest in PNG LNG Project (ExxonMobil operator)
  – ~23% interest in PRL15 Papua LNG Project (Total operator)
  – ~60% interest in all PNG’s producing oil fields (OSH operator)
  – 25-70% in 16 quality exploration licences

» Operate all PNG oil production, all liquid exports as well as the associated gas for LNG

» Pursuing major LNG growth opportunities in PNG in partnership with ExxonMobil and Total
  – >10 tcf 2C gross undeveloped gas resource available to support ~8MTPA near term expansion

» New entry to 500mmbbls* Tier 1 oil asset, North Slope Alaska, with material growth potential

» Strategy to maximise LNG growth and oil production while providing PNG social initiatives:
  – Programmes - community development, health, power, infrastructure

Managing mature fields in a low oil price environment

* OSH estimate of gross resource for purposes of the acquisition
PNG’s Oil Industry
OSH operates all the oil fields and strategic oil export system

Oil Fields:
- Kutubu, Agogo, Moran
- Gobe Complex

Oil export system:
- Oil licence production
- PNG LNG condensate

Managing mature fields in a low oil price environment
History of oil production

*Oil Search achievements in extending end of field life*

Excellent track record of mitigating production decline through:

- Infield & near field drilling
- Field rejuvenation
- Incremental workovers
- Optimised reservoir and facilities management

**Challenge being faced:**

- *most of our fields are approaching the tail end of oil production*

Managing mature fields in a low oil price environment
Field management – change focus over field life

Focus in this Phase

- New Fields brought on-line
- Infield drilling to maintain volume
- Improve uptime
- Reduce deferred bbls
- Cost management
- Asset integrity and maintenance strategies for life extension
- Manage rising GOR and sand

Managing mature fields in a low oil price environment
Oil price collapse forced a review of the strategic basis for asset management

- Capital Allocation rationing with declining free cash flow
- Focus on efficiency

Note: Net operating margin only includes direct field operating costs; excludes royalties, development levies, DD&A and taxes, PNG LNG cost sharing

Managing mature fields in a low oil price environment
Levers to manage asset profitability

Strategies to deliver safe, sustainable and profitable operations

1. Cost Management
   - Business Process and Cost Optimisation

2. Incremental oil
   - Profitable incremental oil opportunities

3. Operational Excellence
   - Operational asset management to maximise uptime
   - Approach to integrity management

Let’s take a look at each one of these ...
Cost Management
Business Optimisation

Implemented a transformation to drive cost effectiveness

Business Optimisation project reviewed all operations:

» Structural review
  – Restructured field operations design – moved several groups back to POM
  – Separated work planning off-site vs execution
  – Consolidated Engineering and Projects in Sydney

» Supplier contract review led to significant rate improvements

» Aviation and camp utilisation reviews

» Prioritisation, planning and phasing of work programmes

» Operating costs in 2016, first full year of operation, down 27% on 2013

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Incremental Oil Opportunities
Mitigating decline

Incremental oil added year on year

» Incremental Projects since 2008 now contribute ~80% of current production

» Further incremental opportunities to sustain current production rates into 2020s

Illustrative range of forward production curves from 2017
Moran – edge of field appraisal

Extending the boundaries

» Discovered 1996; first production 1998
» Poor seismic quality – drill bit appraisal
» 2004 success at NW Moran
» SE field boundary yet to be defined – significant potential remains
» Appraisal & exploration strategy

- Planned sidetrack of an existing well
- Extend well to appraise SE limit of field
- Complete appraisal of Moran hangingwall
- Deepen Moran O to test Moran Footwall target

Managing mature fields in a low oil price environment
Hedinia & Agogo Forelimb Development

Not for the faint-hearted….

- The Agogo and Hedinia Forelimb reservoirs contain significant Contingent Resources, sufficient for further development.
- But they are complex.

Managing mature fields in a low oil price environment.
Hedinia 10ST3: Huff & Puff Project
An old trick in a relatively new field

» Hedinia Forelimb well shut in due to low oil rates and low reservoir pressure – no natural support

» Commence injection to re-pressure reservoir via gas lift system
  – 300 MMscf injected over ~3 months

» Results
  – Reservoir pressure increase ~570 psi
  – Initial rate >1300 stb/d
  – Extend well life by ~5 years
  – Add up to ~500 kstb

» Forward Plan
  – 2nd phase injection planned for 2018
  – Plan to install permanent gas injection facility

Historical Production ~1.4 MMstb
Illustrative Forecast ~500 kstb
Production after injection ~70 Mstb in 3 months
Phase 1 Gas Injection ~3 MMscf/d
Press Increase ~570 psi
Gas Injection Phase 1 and planned Phase 2

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Operational Excellence
Safety Performance

Increase in TRIR in 1H17, corrective actions underway

Regular safety improvement workshops to ensure field leadership engagement

Basis for Safe Operations underpins Process Safety Strategy and risk profile

Overall improvement through lead and lag indicator tracking

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Late field life oil production is dependent on GOR optimisation

Maximising gas compression throughput is a key lever for maximising oil production

Advanced surveillance tools permit real-time compression performance analysis

Detection of sub-optimal performance

Automated exception reporting when outside pre-defined limits
Engine degradation detected with a reduction in power and throughput of 8-10%.

Initiated planned engine change-out to rectify performance issues.

Power, thermal efficiency and throughput increased post engine change

- ~6 month payback on investment

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Finally, Our Role in Social Development
An Essential Part of working in PNG

Oil Search approach:

- Active involvement in social development initiatives
- Long-standing commitment to operating responsibly & sustainably
  - Provision of infrastructure, roads, schools, hospitals, community outreach through direct investment, donations and tax credit
    - 287 projects completed, K1.0 billion invested since 1991
  - Provision of health services, women’s empowerment and education through the Oil Search Foundation
    - Child literacy programmes, HIV/Aids, TB and malaria management and treatment
  - Capacity building in State departments and landowner companies

Committed to continue to play a role in the development of PNG

Managing mature fields in a low oil price environment

Operating and political stability essential for long-term industry sustainability and success