Apache Subsea Projects
NORTH SEA REGION

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INTRODUCTION TO APACHE

 Presenter
 Richard Stark, Project Services Manager, Apache North Sea

 Itinerary
 Safety
 Apache Corporation
 Apache North Sea
 Projects Group
 Subsea and Major Projects
 Developments
 Procurement
 Questions

 45 minutes
APACHE SAFETY

Expectations and Values

- Working Safely is non-negotiable & will not be compromised
- Personal Responsibility for Safety is a key expectation
- APEX Standards (Apache HSE Expectations) must be followed

Performance Measurement & Driving Continual Improvement

- Regular Auditing to confirm compliance
- Challenging Key Performance Indicator’s set annually
- Certified Environmental Management System in place
THE SAFETY MESSAGE

- SAFETY
- COMPLIANCE
- PRODUCTION

“IN THAT ORDER“
Corporation

1954 - today
APACHE – A GLOBAL COMPANY

- North Sea
- Egypt
- Australia
- Central
- Argentina
- GOM Shelf
- Julimar – tie back to platform
- Conniston – Tie back to FPSO
- Wheatstone - LNG plant
- Macedon - Onshore
- Balnaves – FPSO
- Deepwater
- Permian
- Kittimai pipeline
- Canada
- Surinam
- Kenya
- New Zealand
- Argentina
STRONG, INDEPENDENT AND GROWING

- 3 billion boe of proved reserves
- 5,300 employees worldwide
- Traded on the NY stock exchange
- $35 billion market capitalisation
- Member S&P 100
- No 154 in 2012 Fortune 500
- $15 billion of acquisitions since 2010
- Top 10 UK tax payer

2012: 6-9% Growth

NOTES:
1. Established 1954
MAINTAINING FINANCIAL DISCIPLINE

2011 Net Debt / EBITDA

NOTES:
1. Source: Goldman Sachs. Peer companies in group displayed: Anadarko, Berry, Bill Barrett, Cabot, Chesapeake, Devon, EnCana, EOG, Forest, Hess, Newfield, Noble, Occidental, Pioneer, Plains, Quicksilver, Range, SandRidge, Southwestern, Talisman and Ultra
2. EBITDA – Earnings Before Interest, Taxes, Depreciation and Amortization
2012O- $17.0 billion revenue
Liquids = 83% of revenue
International = 57% Revenue
Oil Brent Linked = 72%
APACHE’S POSITIONING

% Production Outside of North America

2011 MBOE/D
In the North Sea

2003 - today
APACHE – NORTH SEA ASSETS AND GROWTH

- April 2003 – Acquired Forties from BP
- May 2011 – Acquired Total’s non-op interest in Nelson
- Dec 2011 - Acquired Mobil North Sea Limited interests (incl Beryl operatorship)
- 2012
  - Zero to 40 subsea wells
  - 15 to 80+ pipelines
  - 0% to 20% production from subsea
- Bacchus – 1st Forties subsea development
  - Well 1 April 2012
  - Well 2 July 2012
- FASP
BEATING THE TREND AT FORTIES...AND BERYL

Forties Production

Beryl Production

Forties Drilling

Beryl Drilling
CNS – FORTIES PLATFORMS

- 5 x platforms + FASP
- Oil export through Forties Charlie via FPS
- Limited gas (power)
CNS – SUBSEA FORTIES AREA

- 14 x infield pipelines
- 1 (+) x subsea well (Bacchus)
- Impressed Current Cathodic Protection (ICCP)
NNS – BERYL PLATFORMS

- Beryl Bravo
  - Steel jacket
  - Oil and gas export to Beryl Alpha
  - 1 x drilling rig
  - Nevis / Ness / Linnhe

- Beryl Alpha
  - Condeep structure
  - RAT and flare tower
  - 2 x drilling rigs
  - Tanker export (oil)
  - SAGE export pipeline (gas)
  - Buckland / Skene / Nevis / Ness / Lewis
  - Gryphon
APACHE NORTH SEA – NEW LOCATION
The mission of the Projects Group is to provide Apache North Sea with safe, best in class project delivery in order to maximize the return on investment for the Corporation.

The Projects Group will, as a minimum, provide the following services:

- Modifications and field development project management to the CNS (Forties and Bacchus), NNS (Beryl and SAGE), and new opportunities
- Management of the implementation of all topsides and subsea projects
- Support worldwide projects as requested
- Education, advice and training to; the management team, partners, operations and support services in Apache North Sea in project management and project implementation
- Provision of documentation to support project, subsea and pipeline works in order to maintain compliance with all laws, regulations and Apache standards
- Management of projects from the end of concept definition through to completion and close out
Pace, Innovation and Excellence

Unity of effort, focus and momentum whilst empowering individuals to use their own discretion and initiative within the implementation process.

- Sense of urgency
- Devolved decision making
- Responsible and accountable
- Best answers win
- Respect for the dignity of others
- Integrity

- Utilisation of Market Conditions and Momentum
- Basis of Design and Functional Specification
- Target Cost Contracting
- Schedule Driven and Incentivised
- Responsibility and Discipline
- Collaboration between Company and Contractor
- Stakeholder Involvement
- Technology
- Global and Local Compliance
- Transparent Relationships
PROJECTS GROUP ROLLING AND 2012 BUDGETS

Spend (£)

FASP
Forties Subsea
SAGE
Beryl Subsea
Bacchus
Maule
BA
BB
Forties Field
FD
FE
FC

Spend to Dec 2011
2012 Spend (£)
Spend 2013 onwards (£)
Subsea and Major Projects
2012 and beyond
FORTIES D - C EXPORT PIPELINE REPLACEMENT

- Small leak identified 1 year after flexible installation
- New hard pipeline installed Apr 2012
- Hooked up in Aug 12 TAR
**1ST BERYL CAMPAIGN – NEVIS SOUTH REPAIR**

- Well N13 leaking hydraulic fluid
- 165 Litres per day being discharged
- Decision taken to mobilise DSV
- Original schedule was 3 days for Nevis works
- SCM changed out in 10 hours
- All Nevis works completed in 1.5 days
- Well now back online, no leaks reported

Leak at N13 (greenish fluid)

Airbag change out of SCM
Around 500 unsupported pipeline lengths, freespans, have been identified on the SAGE pipeline (lengths 10m-57m/ gaps 0.1-2.0m)

5 of these were addressed in detail as the spans fail the pre-determined criteria

1 freespan was rectified in March 2012 at the Beryl Alpha SSIV (44m) to prevent any potential for further growth and requirement for annual monitoring

4 remaining critical spans will be re-inspected in 2012
FORTIES CHARLIE SSIVS

- Subsea Isolation Valves
  - 36” MOL export to Cruden Bay
  - 30” Brae import pipeline

- Valves
  - Petrovalve

- Pipe and bends
  - Corus

- Structures and storage
  - Global Invergordon

- Install
  - 36” SSIV in 2013 (BP dependant)
  - 30” SSIV in 2014 (Marathon dependant)
GAS RINGMAIN REPAIR

Equipment Legend:
1. Top-side End-Fitting
2. Hang-Off Assembly
3. Flexible Fisber
4. I-Tube
5. Mean Sea Level (MSL)
6. Breach at 22.5m below hang-off
7. 33kV Power Cables

External plastic sheath
Crosswound tensile armours
Inner plastic pressure sheath
Inner interlocked steel carcas
BACCHUS SUBSEA TIE-BACK

Forties Development
Bacchus Field Location and Layout
FLX/APP-015/0F-003/1-A4

Video
FORTIES ALPHA SATELLITE PLATFORM (FASP)

- Built by OGN
  - 1,800,000 manhours (Tyneside)
  - Jacket – 5700 t, installed 2012
  - Topsides – 6000 t, install 2013
  - Bridge – 90 m, install 2013

- Capability
  - Full processing
  - 18 slots
  - Power
  - Crane
  - Drilling via jack-up
Developments
2013 and beyond
“GROWTH THRU THE DRILL BIT”

2012

- CNS
  - 2 drill crews on 4 x platform rigs
  - Gorilla VII
- NNS
  - 2 x non-op BA rigs
  - 1 x operating BB rig (5,000psi)
- Signed 3 year+ platform drilling contract with Archer

Future

- CNS
  - 2 f/t drill crews
  - Gorilla / Jack up
- NNS
  - 2 x drill crews on 3 x platform rigs (10,000psi)
  - 1 x jack up
  - 1 x semi-sub
- Subsea
  - Light Well Intervention Vessel campaigns
VESSEL CAMPAIGN SUMMARY 2012

❖ Forties
  ❖ Survey and ROV Inspection – 81 Days
  ❖ Subsea Construction (Non Diving) – 37 Days
  ❖ Diving Support Vessel Works (DSV) – 66 Days
  ❖ Pipelay & Trenching – 34 Days

❖ Beryl
  ❖ Survey and ROV Inspection – 92 Days
  ❖ Subsea Construction (Non Diving) – NIL
  ❖ Diving Support Vessel Works (DSV) – 5 Days
  ❖ Pipelay & Trenching – NIL

❖ SAGE
  ❖ Survey and ROV Inspection – 6 Days
  ❖ Subsea Construction (Non Diving) – NIL
  ❖ Diving Support Vessel Works (DSV) – NIL
  ❖ Pipelay & Trenching – NIL

Riser Installation – Scaffold Structure

At Forties Alpha, Bravo in the Distance
SKENE RISER UMBILICAL REPLACEMENT

Solution
- Procure replacement umbilical (~400m)
- Pull up redundant production riser
- Tie in directly to bundle tow-head
- Redundancy for future issues
- 2Q/3Q2013 installation

Issue
- Electrical insulation resistance failing – power to wells
- Testing carried out 2010 & 2011
- Bundle OK, riser section failing
- ~600 bbl/d & 20 Mscf/d
S64 RECONNECT

Solution

- Procure replacement flexible (~2000m)
- Install in place of failed section
- Flow S64 back to BB
- Redundancy – provides secondary export route BB to BA
- 3Q/4Q2013 installation

Issue

- 2010 – Part of S64 flex to BB failed
- MNSL – installed 200m jumper to S66 & share PL2357
- S64 & S66 not possible to co-mingle (pressure & commercial)
- S64 ~ 1000 bbl/d & 24 Mscf/d
NEVIS IR JUMPER REPLACEMENT PROGRAM

**Issue**
- Historic IR failures in power jumpers
- 2 wells running blind, 7 at risk
- Nevis: 10,000 bbl/d & 54 Mscf/d

**Solution**
- Procure replacement jumpers & contingency spares
- Extensive DSV testing & replacement campaign
- 2Q/3Q2013 installation

Nevis South
2013 WORK PROGRAM @ BERYL

- **BB SSIV Repair**
  - **Issue**
  - SSIV hydraulic accumulator, pitting corrosion
  - Failure leaves valve as-is
  - 1 bottle at risk, 3 OK
  - **BB Gas: 51 Mcf/d**

- **SS20 Anode Retrofit**
  - **Issue**
  - Low CP on tree
  - Valve integrity concerns
  - **2 Mcf/d**
  - **Solution**
  - Attach replacement anode skid

- **Solution**
  - Procure replacement accumulator skid
  - Isolate/replace corroded bottle

- **Alvehim Tee Inspection**
  - **Issue**
  - Spare slot on Tee planned for 3rd party tie-in to SAGE
  - Valve not tested/inspected
  - **Solution**
  - Close Visual Inspection with divers
  - Valve function tests
OTHER UPCOMING WORK

- SAGE Line Preparation for Pigging
- Aviat
- SPM 3 Removal & Replacement
- K Prospect
- Support for Semi-Sub or Jack Up Opportunities

Aviat Flaring

SPM
Aviat-1 was drilled in 3Q 2010 and successfully tested
Fuel gas for Forties Field
26kM from Forties Alpha
Two well tie back
A final appraisal well currently being planned
Project delivery planned for 2014
Engineering works will commence Q3 2012
QUALIFICATION FOR WORK

- FPAL
- Apache MSA
- Non-exclusive major contracts
  - Onshore Engineering / Offshore Construction
    - Petrofac
  - Subsea Project Management
    - Flexlife
  - Subsea Engineering Detailed Design
    - JP Kenny
SUMMARY

- Apache have been in the North Sea for almost a decade
- Forties has been a great success for Apache
- “Do with Beryl what we did with Forties”
- “Growth thru the drill bit”
PROCUREMENT CONTACTS

- Apache North Sea
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