Cost Efficient Drilling Operations

From Rig to Vessel in Exploration Drilling
FFU Seminar 2010

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From Rig to Vessel in Exploration Drilling

• Prelay mooring
• Preinstallation of wellheads and conductors
• Rig chase

~5-10 MNOK/day

~1 MNOK/day
Who is Norse Cutting & Abandonment?

- Norwegian owned oilfield service company with head office in Tananger
- 500MNOK/yr revenue – 220 employees
- Global operation – offices in Aberdeen, Houston, New Orleans and Dubai
From Rig to Vessel in Exploration Drilling

Benefits

- Reduced rig time -> more time available for drilling
- Activities moved from a ~5-10 mill NOK/day rig spread to a ~1 mill NOK/day vessel spread
- Work moved from critical path to flexible timing

⇒ Reduced cost
⇒ Reduced risk (schedule and cost)
⇒ Economies of scale by bundling pre and post rig activities (multiwells and multi client campaigns)
Pre Rig Activities from Vessel

- **Prelay of Mooring Spread**
  - Complete mooring spread installed prior to rig arrival
  - Rig is hooked up to prelay mooring instead of using its own mooring equipment

- **Installation of well foundation and conductor**
  - CAN (Conductor Anchor Node) installation - a more solid foundation for the wellhead
  - Conductor driving with hydraulic hammer
Post Rig Activities from Vessel

- Removal of Prelay Mooring Spread
  - Recovery of chain, buoys, fibers and anchors
  - Reinstallation on new location

- Removal of CAN & multistring conductor
  - Cutting of multistring conductor
  - Subsea wellhead removal
  - Recovery of CAN/subsea wellhead – reinstallation on new location
Case Studies

Case Study 1
Gjøa prelay

Case study 2
Peon CAN & conductor installation

Case study 3
Trolla rig chase
Prelay of Temporary Mooring System

Case 1
Gjøa Prelay Project
Gjøa Prelay Mooring Project

- Prelay mooring spreads for 6 different well locations on the Gjøa field in 2009
  - 8 x Rig 1000m chain on BCD location
  - 16 x 1000m chain on E&F location
  - 8 x 800m Fiber
  - 16 x 15Te Vryhof Mk 6 anchors

- Saved approx 3 rig spread days per location
- Reduces loads on the AHTS – safer + can use lower spec and fewer AHTSs
Preelay of Rig Mooring (video)
Summary - Prelay of Temporary Mooring System

- Proven concept from several projects over the last years
- Prelay = approx 3 rig spread days saved per well
- Savings: 20-30MNOK/well less cost for vessel and mooring spread
- Reduced risk of weather delays
- Can install the mooring system with fewer and lower spec AHTSs
- Additional HSE benefits: Reduces loads on the AHTS (ref Bourbon Dolphin)
- Moves activities from critical path for the rig to flexible timing for a vessel
Wellhead and Conductor Installation

Case 2
Peon CAN and Conductor Installation

NeoDrill AS
Peon CAN and Conductor Installation

- Pre-installation of CAN and conductor on the Peon field in 2009
- Vessel: Island Constructor
- The Peon CAN
  - Dimensions: Ø: 6m x H: 12m
  - Weight: 80 ton (dry) – 72 ton (wet)
  - Penetration: 11m
  - Deployed by crane over the side and installed within 12 hours
- The Peon conductor
  - Dimension: Ø: 30” x 1”wt x L: 33m (in one length)
  - Driven by subsea hammer (toe drive) to 30m in approx 6 hours
- Saved approx 3 rig spread days + made drilling on Peon possible (due to soil and reservoir conditions)
Peon CAN deployment:

- CAN weight, air: 80t
- CAN weight, sea: 72t
- Crane Cap. (AHC): 140t
- Crane ops. time: 1 ½ hrs

=> Safe & efficient CAN deployment demonstrated!
THE WORLD LEADING
DECOMMISSIONING
SPECIALIST
Peon Conductor Installation on *Island Constructor*
Peon Conductor Installation w/ToeDrive hammer
Summary - Wellhead and Conductor Installation

- Proven concept from Peon and other projects
- Technically as good or better compared to conventional methods

- Vessel based CAN and conductor installation saves approx 3 rig days per well for moderate water depth
- Significantly higher time savings on deeper water (10-15 days)
- Total cost savings: 15-75MNOK/well less cost for vessel, CAN and conductor driving services

- Moves activities from critical path for the rig to flexible timing for a vessel

- The CAN offers a significantly better foundation for the wellhead than conventional methods
  - Can make drilling possible and more reliable on certain fields (soil and reservoir)
  - Can make drilling possible and more reliable from certain rigs (heavy BOPs)
Case 3
Trolla Rig Chase
Trolla Rig Chase

- Subsea wellhead located on the Trolla field
- The well permanently abandoned (cemented) by the rig
- The wellhead was left behind for future removal from a vessel
- Wellhead removed by use of the Olympic Zeus in Nov 2009
- NCA’s patented Subsea Wellhead Picker
- Well data:
  - Casing configuration: 9 5/8”-20”-30”
  - Water depth: 270m
  - Net guard installed above the wellhead

- Saved 2 rig spread days per well

- Moves activities from critical path for the rig to flexible timing for a vessel
Trolla Rig Chase (video)
Summary – Subsea Wellhead Removal

- Proven concept from 12 subsea wells in the North Sea
- Technically as good or better compared to conventional methods (mechanical cutting from rig)

- Vessel based wellhead removal saves approx 2 rig days per well for moderate water depth
- Total cost savings: 5-10MNOK/well less cost for vessel and cutting services

- Moves activities from critical path for the rig to flexible timing for a vessel
Benefits

- Reduced rig time -> more time available for drilling
- Activities moved from a ~5-10 mill NOK/day rig spread to a ~1 mill NOK/day vessel spread
- Work moved from critical path to flexible timing

⇒ Reductions in cost (total 35-55MNOK/well for mod. WD)
⇒ Reductions in risk (schedule and cost)
⇒ Economies of scale by bundling pre and post rig activities
Where do we go from here?

Pre rig activities
- Install prelay
- MOON installation
- Conductor installation

All activities done from a vessel off critical path

Post rig activities
- Remove prelay
- Conductor cutting
- Wellhead CAN removal

All activities done from a vessel off critical path
Thank You for the Attention!

Questions?