

Cost efficient and reliable removal of subsea wellheads in the North Sea

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July 8, 2019

Agenda

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SCOPE OF WORK

CURRENT TECHNOLOGY

DEVELOPMENT OF THE NEW WELLHEAD RECOVERY SYSTEM



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Scope of work

Subsea P&A phases



Minimize / Optimi<mark>ze t</mark>ime spent in phase 2

Phase 1



Wireline / Coil tubing: Check Wellheads Kill wells Wireline / Slickline Set primary barrier and or prepare for X-mas tree removal X-mas tree removal Phase 2









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Subsea P&A operation overview







Technology

Combined runs

Pull Wear bushing & cut casing in a single run:

- WBRRT Wear bushing running/retrieving tool
- MS-casing cutter and Ultra X-treme motor
 - METAL MUNCHER™ Advanced Milling Technology (AMT)carbide knives



Pull seal assembly & pull casing in a single run

- SRT Seal Running Tool
- Hydraulic casing spear with pack-off
 - Allow to circulate out mud in annulus & observed for gas via kill / choke line





Wellhead cutting & surface plug

Vessel deployed multiple circulation / cement tool

- WASP Well Abandonment Straddle Packer
- Perforation Guns
 - Placing surface plug by vessel



Cut & Pull Wellhead

- UWRS Universal Wellhead Retrieving System
- Hercules Multi String Cutter
 - Cutting can be performed offline on rigs with dual derricks



- Average cutting time: 4 hours, Quickest cut: 43 minute, 27 cuts in less than 2 hours
- 73 wellhead successfully recovered





The NEW wellhead recovery system

The new wellhead recovering system

Overview:

- Vessel deployed system Marine operation
- Combine legacy products to create new systems
- Low cost subsea removal option
- Applicable for exploration and production wells
- No depth restrictions
- No surface deck spread





The new wellhead recovering system

Development progress:

- Project kicked off Q4 2018
- Order all parts Finish Q1 2019
- Test program and objective defined Finish Q1 2019
- Interface check of equipment Finish 13.June 2019
- Cut 20" X 36" wellhead, planned two cuts unsupported and two cuts in cemented – Ongoing June – August 2019







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