

## Ardmore Subsea Wells Removal

### Summary

NCA successfully performed a combined cutting and retrieval operation of 3 suspended subsea wells on the Ardmore field in the UK sector of the North Sea. The cutting and retrieval was done with the *Subsea Wellhead Picker*, which combines NCA's Internal Multistring Cutting Tool based on Abrasive WaterJet Cutting and a wellhead connector. The Subsea Wellhead Connector allows the wellhead to be cut and pulled in one operation. The operation was done from a construction vessel utilizing the heave compensated crane for deployment and retrieval operations and ROV for guiding and surveillance. No divers were used on the project.

### Project Facts

Location: North Sea, Block 30/24 UK sector, Ardmore Field, 80m water depth  
Timing: November 2007  
Client: Acergy Ltd  
End client: Acorn Oil and Gas Ltd

### Scope of Work

The scope of work was to cut and retrieve 3 wellheads located in a subsea drilling frame. The cuts were to be done 15ft below mudline. NCA provided the following services:

- ✓ Well bore cleaning service
- ✓ Cold cutting service
- ✓ Wellhead retrieval service

The 3 wells had the following 4 string casing configuration; 30" (1,5" WT), 20" (1,5" WT), 13 3/8" (1/2" WT) and 10 3/4" (1/2" WT).

### Project Execution

NCA used Abrasive Water Jet Cutting (AWJC) with the Internal Multistring Cutting Tool (IMCT) for severance of the wellheads. All the conductor casings were cut from inside out in one operation. This is proven technology with a track record of more than 80 conductors cut, ranging from conductors on 30metres water depth to 5 string conductors on 300metres water depth.

The NCA developed a Subsea Wellhead Picker for this project that was used in combination with the IMCT. The IMCT is connected to the wellhead picker allowing the cut and retrieval of the wellheads to be done in one operation. This features a safe recovery reducing numbers of deck handling and rigging operations.



The operation was done from the subsea construction support vessel Norman Mermaid. The cutting and retrieval of the wellhead casings were done using the 150Te heave compensated crane onboard in combination with ROV for guiding of tool and surveillance. The operational limitations were set by the crane heave compensation capacity and the practical limitations for deck operations. The first wellhead was cut and retrieved in a significant wave height (Hs) of 2.5-3.0m, while the two last ones were retrieved in Hs of approximately 1.0m.

All 3 wellheads were successfully cut and safely retrieved on the first attempt.

## Achievements

- ✓ The method was the first ever done without use of traditional methods as explosives or mechanical cutting.
- ✓ This was a technological breakthrough promoting an environmental, cost efficient and safe method for cutting and retrieving abandoned wells.
- ✓ The NCA method for cutting conductors won the OTC Spotlight award in 2005.
- ✓ The method using the Subsea Wellhead Picker in combination with the IMCT won the NOF Energy Innovation and Technology award in December, 2007, and was nominated for the ONS Innovation Award in 2004.
- ✓ NCA's IMCT technology is patented.

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