

SUBSEA WELL COMPLETION DESIGN CASE STUDY

Folawiyo Aje Services Limited - Aje Oil Field
Offshore Benin Embayment, Nigeria

AWT DISCIPLINES

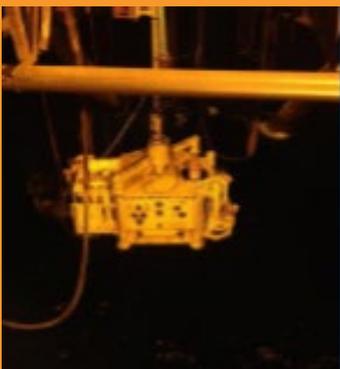
Well Completions
Subsea Completions
Equipment Specification
Procurement, Inspection &
Testing

PROJECT BACKGROUND

The Aje oil field was discovered in 1996 and declared commercial in 2009. Aje was located in OML 113, an offshore oil concession block located in the Nigerian sector of the Benin Embayment approximately 24km offshore in a water depth of approximately 295m.

FASL required subsea oil production well completion design for the first phase of their Aje field development which involved the drilling and completion of the new well (Aje 5) and the re-entry and completion of existing Aje-4 well. The reservoir has two main productive intervals and the key drivers in the completion design were simplicity and operational effectiveness.

Location:
OML 113 area Offshore Nigeria



For more information contact:
Tel: (+603) 2162 3127 or visit our
website at: www.awtinternational.com



AWT WORKSCOPE

From June 2014 to April 2016 AWT carried out the engineering design, equipment specification, inspection & procurement, well completion programme preparation and well start-up procedure preparation for 2 subsea oil production wells.

FASL had procured surplus subsea trees (SST) from another operator and had a production manifold, flowlines and jumpers manufactured. AWT also oversaw the stack-up and system integration testing of the subsea trees and electro-hydraulic controls system.

AWT ADDED VALUE

The selected completion design included a simple conventional packer and locator seal combination, with tubing conveyed perforating (TCP) guns run on the production packer. This simplified the completion installation, allowing correct location perforating guns when setting the packer. Artificial lift was provided by gas lift and each well included two pre-sheared shear orifice gas lift valves.

Benefits of the selected design were:

- Well completed and SST installed prior to perforating with unbalance - no well control issues.
- Pre-sheared gas lift valves allowed commencement of gas lift as soon as compression facilities were available, potentially providing production acceleration.
- Simplicity of well design reduced capital expenditure on downhole equipment, which was tried and tested and readily available.
- Underbalance perforating using high shot density TCP provides excellent connectivity to the reservoir.
- Surplus subsea trees and controls purchased from another operator were successfully refurbished and tested, minimising cost and lead time for the project