

WELL WORKOVER PROGRAM CASE STUDY

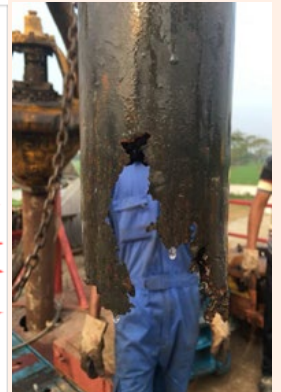
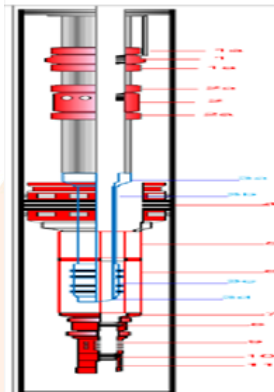
Bangladesh Gas Fields Company Limited - Titas Gas Field
Surma Basin, Bangladesh

AWT DISCIPLINES

Completions

Workover Supervision

Petroleum Engineering

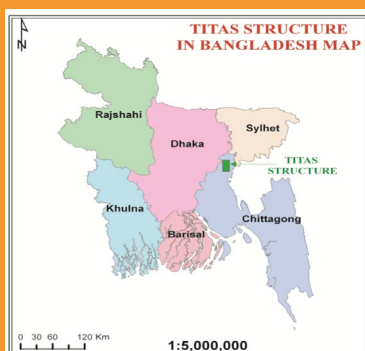


PROJECT BACKGROUND

Following on the Gas Seepage Study (Phase I) carried out by AWT in 2012, BGFCL planned to work-over five (5) wells namely Titas #01, #02, #05, #10 and #11. All these wells showed unacceptably high levels of pressure in the A annulus, suggesting a leakage from the production tubing.

Hence, the workover plans included replacing the production tubing in 5 wells. Due to the age of these wells, an investigation into the condition of the production casing by electric logging was also required with the remedial plan to be updated once the logging results became available.

Located near the town of Brahmanbaria and approx. 100km to the east north-east of Dhaka. The Titas structure in the south-central part of the Surma Basin is an elongate north-south asymmetrical anticline measuring 23 x 10.5 km within the 4600m contour area.



AWT WORKSCOPE

The well workover program (Phase II) commenced in Q4 2015 and AWT workscope included:

- Preparation of the Basis for Design
- Supervision of workover/remedial works for five wells, the suspected for causes of gas seepage at the Titas gas field.
- Submission of workover completion reports for each well.
- Provision of Team Leader Well Control Specialist and Petroleum Engineer (Seepage Control).

AWT ADDED VALUE

The workover of the five wells was completed in January 2017 with Titas #01 was the last well to be worked-over.

By working over of the proposed wells, the field's gas production capacity was increased, a safer working environment was provided by rectifying the well integrity issues and rectifying the seepage of gas into the surrounding areas, and the loss of gas reserves due to gas migration and seepage was remedied.

The Workover Completion Report was issued in March 2017 with the following key results & recommendations.

- A slick line service should be permanently engaged.
- The BAPEX rig must be fitted with proper API well control equipment, notably a working choke panel and a Drillers PVT system with as a minimum requirement.
- Tubing strings in the Titas wells should be routinely replaced at regular and much shorter intervals. After 27 years in service, the Titas #11 tubing string was severely corroded to such an extent that sizeable and complex fishing operations had to be performed to remove the tubing string and packer.
- Compatibility of the existing wellhead systems of future wells must be checked against the DRILEX system.
- A lot of time was lost sourcing appropriate fishing equipment highlighting the need for engaging a fishing service on future interventions.
- Ensure that the Xmas tree is cleaned from grease before installation. Grease picked up by the wireline tools can inhibit the jarring action.
- Best effort is made to retain information from previous workovers so future project teams enter into their endeavours with the greatest possibility for