

FIELD DEVELOPMENT FEASIBILITY CASE STUDY

SK Innovation - LF12-3 Oil Field
South China Sea, China

AWT DISCIPLINES

Drilling Engineering
Completions Engineering
Production Engineering
Field Development

PROJECT BACKGROUND

The LF12-3 oil discovery is located in Block 17/03 at the east flank of the Lufeng sub-basin on the Pearl River Mouth Basin. The field is located in approximately 240 m water depth approximately 300km southeast of Shenzhen, Guangdong province. The oilfield was discovered in January 2018 with the drilling of the LF12-3-1 well and was appraised by well LF12-3-2 drilled in June 2018.

The crude oil was a medium density, low GOR oil with a high wax content.

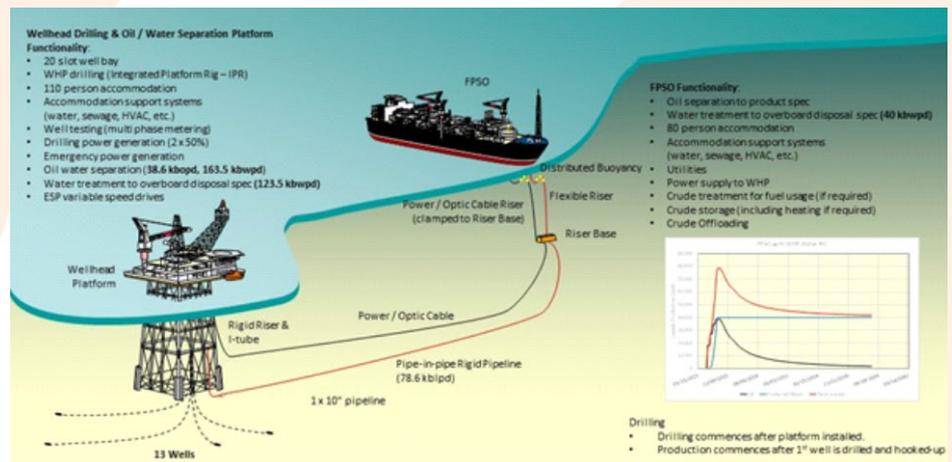
Geological and reservoir engineering work indicated that 13 horizontal wells with artificial lift would be required for the Phase 1 field development, and additional wells could probably be required in the future.

A feasibility study, assessing a range of development options for the field development, was required to allow the preferred concept to be selected and the field development plan to be prepared.

Previous feasibility studies had routinely been conducted by local organisations in China, but due to the tight project schedule, an opportunity was presented for this study to be conducted by international consultants, KBR Consulting and AWT International.

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AWT WORKSCOPE

The AWT Well Engineering Team was responsible for:

- Basis of design, drilling and completion
- Assessment of various rig types for drilling, completion and interventions
- Comprehensive well planning and design including casing design, hydraulics, torque and drag, casing wear, well trajectory planning and collision avoidance
- Production engineering assessment and optimisation of tubing size, metallurgy, wax mitigation, ESP setting depth and power requirements over the life of the field
- Comprehensive completion design including sand control and artificial lift
- Detailed operational well time and well cost estimates for drilling, completion and workover for all wells using various rig types
- Well OPEX estimates, including workovers, manning requirements, platform utilities requirements
- Input into field layout and platform layout considerations

The work was integrated with the KBR facilities engineering scope to ensure consistency with the facilities options selected for the study.

This Included participation in various workshops such as for study framing, concept identification, concept narrowing, option selection, hazard identification and risk assessment and design reviews.

AWT ADDED VALUE

The AWT well engineering team delivered their required contributions for the Feasibility Study in the condensed time frame of 5 months from award of contract.

The LF 12-3 field development Feasibility Study included the comprehensive design and assessment of four facilities/wells options to enable a preferred concept to be selected.

- Wellhead platform with drilling capability, and FPSO
- Wellhead platform with tender assisted drilling, and FPSO
- Subsea wells with FPSO
- Drilling and production platform and FSO

The well engineering work was fully integrated with the various facilities options to ensure that the costs, risks and schedules for each of the development options were appropriately captured.

This allowed the Operator to proceed to the next stage of the field development planning