

HPHT WELL & COMPLETION DESIGN CASE STUDY

GSPC -DDW Field
Offshore Krishna Godavari Basin, India

AWT DISCIPLINES

Completions

Production Technology

PROJECT BACKGROUND

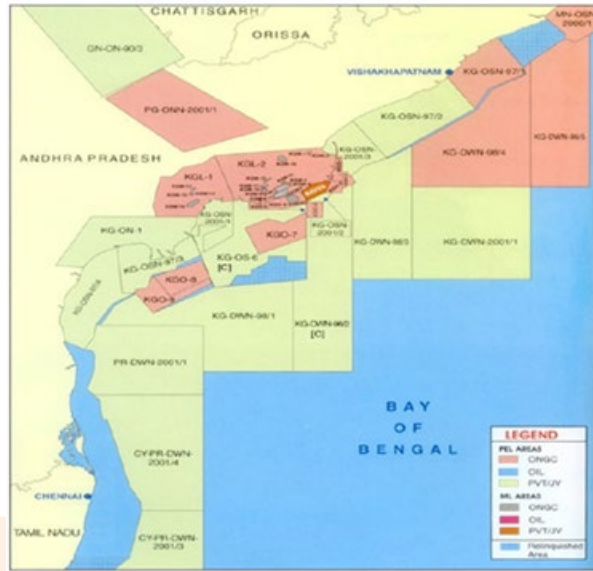
The DDW Field is an HPHT field in the Krishna Godavari basin in the Bay of Bengal, offshore north east India. The field had been extensively appraised by 15 wells to date.

The field:

- Is low permeability ($k < 1\text{mD}$)
- Contains an over-pressured gas bearing sandstone reservoir with bottomhole pressure of 12,000 psi and temperature of 400 °F at 4,500m TVDSS
- Contains corrosive, relatively dry gas (7% CO₂ and 100 ppm H₂S content) with a condensate gas ratio (CGR) of 10 bbl/MMSCF
- Located 120km offshore in 100m water depth

Location:

Bay of Bengal, India



THE WORKSCOPE

AWT was contracted to provide the detailed well construction plan and completion design for the DDW HPHT development wells.

This included:

- The selection and specification of equipment and metallurgy for production casing & tubing and downhole completion
- Preparation of the forward activity workscope required to mature the development of any deepwater discoveries in the block: a scoping schedule, cost forecasts for subsea well construction
- An overall field development plan which integrated well construction activity with surface facilities/product export options

AWT ADDED VALUE

Well configuration i.e high inclination/horizontal vs low inclination has the potential to reduce the number of wells required to develop field. High inclination/horizontal wells achieve this due to the potential provision of acceleration economics benefit without compromising ultimate recovery.

AWT delivered a completion design using proprietary metallurgy for well tubulars.

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THE TECHNICAL ISSUE

The HPHT conditions, combined with corrosive reservoir fluids, demands use of high strength alloy steels for well tubulars, especially for the production casing and tubing.

The low permeability of the reservoir is offset by high pressure. However, sustainable commercial rates (min. 30 MMSCFD) required high angle/horizontal wells through the reservoir. This helped to avoid the need for hydraulic fracturing.

To meet the required well productivity, long sections through the reservoir provide the most cost effective method. However, if this does not achieve the desired results, fracture stimulation may be required. but treating pressures for such operations become extremely high and well costs will increase significantly.

References

<http://www.gujaratpetro.com/operationmilestones.php>