

West Delta Deep Marine (WDDM)

Conceptual Design, Front End
Engineering Design for subsea
equipment, Technical Assurance
and Commissioning support

CUSTOMER Burullus Gas Company

**EXECUTING
OFFICE** INTECSEA Woking

**PROJECT
LOCATION** Idku - Egypt

IDENTIFY > EVALUATE > DEFINE > EXECUTE > OPERATE

HIGHLIGHTS

- Among the longest Subsea Tie-backs
- Scarab/Saffron - 90 km offset, 650m Water Depth
- Simian - 105 km offset, 1040m Water Depth
- Scarab/Saffron (Phase I) First Gas on time
- Simian/Sienna (Phase II) First Gas on time
- Scarab/Saffron expansion (Phase IV) First Gas early
- Sequoia (Phase VI) First Gas on time

- System Expansion (Phases VIIIa & VIIIb) First Gas on time
- Achieving over 2,200 mmscf/day production

PROJECT DESCRIPTION

The WDDM concession directly abuts the existing shallow water Rosetta concession. The WDDM development prospects extend in water depth from around 300m down to 1200m, so diverless subsea technology, selected from GoM and North Sea, has been employed. The first phase of development was dedicated to the domestic market in Egypt, but the core infrastructure of the main transmission pipelines from the Pipe Line End Manifold (PLEM) to the shore reception facilities was designed to allow for expansion. Subsequent phases are dedicated to both the domestic market and an adjacent LNG plant. The subsequent

expansion programs have been designed to maintain a production plateau throughout a field life of 25 years. These phases utilise expansion connections provided in the PLEM hub.

The Scarab/Saffron fields were the first to be developed, using a total of 8 wells connected to 2 production manifolds controlled directly from the shore terminal. Twin 20" main export pipelines commence at a water depth of 415m and run for 30 kms to the PLEM at a depth of 95m, where 24" and 36" export lines convey the product to the shore terminal. A 4" pipeline conveys MEG from shore to the field for hydrate inhibition by direct injection at the trees.

The Simian/Sienna (Phase II) and Sapphire (Phase III) fields were the first 2 expansions to provide gas to the new LNG plant. There are six Simian, two Sienna and eight Sapphire wells. The flows from the new fields are brought together at

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the PLEM where gas from all the fields is commingled into the export pipelines to shore. The Simian wells are designed for large bore/high production capable of 150mm³/d. The subsea wells, in water depths in excess of 1000m, are controlled from shore through an electro hydraulic multiplexed system, with controls, hydraulic power and methanol injection equipment mounted on a controls platform, strategically positioned in shallower water close to the PLEM.

Phase IV was a 7 well and 2 manifold expansion, centered on the Scarab/Saffron production hub. An expansion in excess of initial control system design, which allowed for an expansion of 4 wells and 1 manifold. Phase VI, Sequoia, comprised 3 additional wells to the existing Sapphire development through the existing infrastructure at the M2 manifold via a new production jumper connected to the North Sequoia manifold.

Having invested in booster compression (Phase V), additional pipeline capacity and main compression (Phase VII) the

continued development of WDDM has required additional reserves to be accessed. This is being achieved by drilling more wells. Phases VIII and IX of the WDDM development are likely to add in excess of 30 subsea wells over several installation campaigns. The wells will be drilled over a four to five year period.

CUSTOMER CHALLENGES

- Maintaining Production Plateau
- Expansion Beyond Original Expectations
- Brownfield Developments
- Demanding project delivery schedules

PROJECT SERVICES

INTECSEA has continually worked alongside Burullus Gas through nine phases of field development and expansion. The initial eight wells in the development have grown to forty wells today with the possible expansion of more than 30 plus wells in the future.

INTECSEA has been responsible for the conceptual design, Front End Engineering Design (FEED)

and the Technical Assurance for all phases of the WDDM development to date, and is currently supplying a Technical Assurance support and commissioning team to Burullus on the latest Phase VIII development. Package Management for the subsea controls equipment and subsea trees purchase orders are also within INTECSEA's scope of work.

RESULTS

- Burullus maintain continued production at required rates.
- INTECSEA provide a continued project history, being involved since inception in 2000.
- First gas dates achieved early on phase IV.
- Field expansion successfully achieved beyond initial design expectation.
- Value added by optimizing designs such that production shutdowns were minimised during field expansion operations.

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