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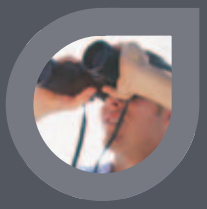
AWT INTERNATIONAL



DELIVERING SOLUTIONS

Fast-track Developments
Product Optimisation
Well Construction Project Management
Global Experience

AWT International is a leading independent provider of Innovative solutions for the global upstream oil and gas industry.

AWT has a proven capacity to unlock the potential of technically stranded assets. From concept definition through to execution and abandonment, our focus is on maximising the commercial life of the asset.

AWT has integrated the necessary disciplines required to understand its client's technical drivers from a fundamental comprehension of the reservoir, through well construction, sandface completion design and interfacing with the operations team. This integrated approach to development solutions provides for complete, life-of-asset flow assurance from reservoir to storage tank.

By customising the appropriate blend of engineering disciplines to suit the solution, AWT will continue to provide a cost effective and experienced team, delivering commercially pragmatic outcomes for its clients.

HIGH PROFILE PROJECTS
DELIVERY OF REAL INNOVATION

The core areas in which AWT applies its engineering services:
Field Evaluation – Review and expert report on reserves
Field Refurbishment – optimising recovery from existing fields, and
Field Development – from an early conceptual planning stage,
with key focus on maximising value through optimised life-of-field design.
Some of the projects AWT has completed include:

- Providing complete EPCM type project management, for onshore tight gas well including well design, HSE, stimulation design and logistical planning in Perth before mobilizing team for in country for execution.
- AWT provided the Well Engineering, Procurement and Construction Management (EPCM) services and support team for Galoc Production Company (GPC) for the Galoc sub sea field development in the Philippines.
- Conceptual field development planning, including conceptual design of a field incorporating an FPSO and a small wellhead platform (WHP) template plus an additional two outlying fields tied back with a subsea pipeline via the WHP to the FPSO.
- A full field review / FDP study was carried out for a cluster of onshore African fields with the objective of rejuvenating these fields. The review/study led to a significant increase in the estimated field recovery factors and the identification of significant potential undeveloped reserves in a neighbouring block.
- AWT was responsible for the conceptual design, detailed engineering and execution management of a Rigless Abandonment of the Buffalo Platform offshore Australia. This Rigless intervention resulted in a significant cost saving of ~$8 Million and dramatically diminished offshore field abandonment liabilities for the Operator.
- Well completion and artificial lift concept selection, detailed design and implementation for a shallow water, waxy crude development which incorporates **ESPs** (electrical submersible pumps) **deployed on CT** (Coiled Tubing) on an unmanned platform. Post implementation AWT has been contracted to manage all well servicing activities including the maintenance and operation of the CT intervention unit.
- AWT developed a network model encompassing 14 oil and gas fields. The model included all the fields' production system infrastructure and was used to optimise the gas production as a function of CO2 composition to maximise gas sales revenue.
- In conjunction with a UK based specialised advanced drilling technologies company, AWT managed the conceptual design, detailed planning and execution of a field refurbishment programme onshore Australia utilising **CT (coil tubing) UBD (under balanced drilling)** techniques. A significant increase in production was achieved as a result of this technology application.

THE AWT TEAM

AWT employs more than 60 people having a broad mix of knowledge, experience and understanding of clients' field development requirements.

As the world-wide shortage of experienced oil and gas personnel bites deeper, AWT leads its region in the development of a younger breed of engineer: highly qualified and confident in their knowledge and application of new technologies.

When you partner with us, our skills become your skills, delivered with the support and mentoring of our globally experienced senior Technical Executives. We proudly stand by our record of achievement and the competence of our people.

FIELD REFURBISHMENT & PRODUCTION OPTIMISATION

Global energy economics has spurred a renewed interest in the rejuvenation of mature, marginal and decommissioned assets. AWT has undertaken numerous asset evaluation studies and field operations reviews to assist potential purchasers or farm-in candidates as well as helping existing owners to realise optimal redevelopment strategies.

Productivity enhancements have been realised as a result of the application of techniques such as integrated field and advanced reservoir modelling, rig and rigless sidetracking, hydraulic fracturing, fit-for-purpose production chemistry, artificial lift and water injection to name a few.

With an overarching mission to maximise the ultimate field recovery and minimise the required capital investment, AWT has contributed to the liberation of additional recoverable reserves from technically stranded reservoirs in a range of challenging field locations.

AWT EXPERTISE & EXPERIENCE

AWT provides high-end engineering input at every stage of the asset lifecycle from early concept development through to FEED, detailed engineering, execution and production operation. The focus is on providing fit-for-purpose solutions aimed at maximising value through optimised life-of-asset design.

Subsurface Engineering & Geoscience

AWT provides practical subsurface engineering solutions through all stages of the life of the field from Seismic gathering/ interpretation, exploration, and appraisal, through development, production optimisation and to final field abandonment.

AWT Subsurface Engineering focuses on management of the interfaces between different disciplines, from the assessment and quantification of reservoir uncertainty to the impact of well construction and facilities on production and reserves.

AWT Subsurface Engineering provides the dynamic subsurface input for successful project implementation.

AWT provides:

- Integrated subsurface teams for field development planning to assist its clients in determining expected field flow potential from exploration/appraisal activities. Reservoir management strategies can then be developed to maximise ultimate recovery.
- Integrated teams for field rejuvenation projects where subsurface uncertainty definition has an impact on the well engineering solutions required.

Production Technology

AWT has a range of integrated Production Technology capabilities covering a diverse range of specialities, such as sand control, artificial lift, field modelling and well operability strategies. Our personnel have designed and implemented life-of-field production technology strategies to unlock challenging/marginal reserves and realise optimal long term flow assurance.

In addition, AWT's Production Chemistry team can specify and coordinate the necessary studies for the evaluation of issues such as corrosion, scale, hydrates, wax etc, where appropriate, and apply the outcomes to ensure well and system designs incorporate the necessary elements and strategies to meet the expected challenges for the life of the asset.

Key aspects of our Production Technology skill set include:

Software
Nodal analysis/well performance studies
Production optimisation/network studies
Reservoir fluid analysis/characterisation
Mechanical completion design and TSA
Integrated field modelling

Analysis
Sand prediction and sand management
Evaluation of waxing/scaling tendencies
Evaluation of suitability of 'new technologies'
Remedial work over studies

Design
Design of artificial lift systems
Design of appropriate sand control/ management mechanism
Design of permanent downhole monitoring systems
Stimulation and perforation design and performance evaluation
Multi-lateral and horizontal well design

Sand Control

AWT can conduct and/or coordinate the necessary studies to deliver information on sand production prediction and wellbore stability, leading to recommendations on the requirement for sand control and/or sand management strategies. These studies can provide critical information to be used in the well design and construction process.

Flow Assurance

Flow Assurance auditing enables the reliable, manageable and profitable flow of fluids from the reservoir to point of sale. The field development design process should include, where appropriate, analysis of the following issues:

- Well bore damage & emulsion blocks
- Piping of high viscosity fluids
- Wax & sphaltene deposition
- High BS&W in export crude
- High oil levels in disposal water

AWT has an experienced Flow Assurance and Production Chemistry team which can design and execute studies to evaluate and clarify flow assurance issues. When coupled with its engineering input, this provides clients with integrated Flow Assurance solutions. Furthermore, this expertise can add value to all phases of field life from concept through to abandonment.

Field & Well Modelling

The value of preparing thoroughly tested well and field models cannot be overstated, with direct benefits including improved cost estimates, justified long term productivity profiles, reduced risk and enhanced asset performance for investors and operators.

AWT's field and well modelling expertise includes:

- Single stand-alone well models to multiple well (+200) and multiple field modelling, (using MBAL and GAP)
- Dry and wet gas, oil and water wells, producers and injectors, all types of artificial lift
- Modelling of horizontal and multilateral wells
- PVT matching and modelling (including full EOS modelling where necessary)
- Stimulation and perforation design and performance evaluation

Well Construction

Drilling Engineering

AWT provides a broad spread of Drilling Management services ranging from conceptual well designs and budgetary cost estimates through to management of entire drilling projects.

We have the in-house capabilities to act as your outsourced drilling and completions team managing all aspects of engineering, procurement and construction of any exploration, appraisal or development drilling campaign.

Our experience includes operations in oil, gas and coal seam methane programmes, HPHT wells, large bore gas production, gas and water disposal wells and deep water operations.

Completion & Subsea Engineering

AWT has a wealth of experience in general completion design, procedure preparation and installation supervision. The team has extensive experience with horizontal well technology, sand control, intelligent completions and subsea wells.

Commencing with conceptual engineering design input, AWT works closely with clients and manufacturers in supervising design, manufacture and comprehensive QA testing. Our personnel are intimately familiar with downhole completion components, artificial lift systems, control systems, flowline interfaces, permanent monitoring interfaces, installation and workover systems, flowline tie-in and testing, ROV interfaces and deployment and recovery of subsea wellhead and tree systems.

AWT has also been involved in managing the refurbishment, modification, testing and installation of used subsea trees in existing producing fields and new field developments.

Well Test Engineering

A core section of AWT's expertise is in the provision of well testing management and supervision for exploration and appraisal programmes. Our status as a truly independent engineering consultancy is seen as important to many of our clients seeking independent, nonaligned advice.

Our engineers have experience on floating, jack-up, deep water, platform and land based testing operations. Our extensive regional experience, well-defined test management process (Well Test Framework) and learning system database (CapItAL) means we offer efficient and cost effective well test management to our clients.

AWT Well Test Experience Envelope Range:

- Water Depths up to 1350 mSS
- H2S up to 20%
- Gas Flow Rates up to 135 MMSCFD
- Oil Flow Rate up to 10,000 BPD

Well Intervention & Workover

AWT has extensive experience in horizontal well intervention operations including coiled tubing intervention, well tractor conveyed perforation and production logging. Our philosophy is based on fit-for purpose, life of well design which allows for the possibility to conduct remedial interventions at some point in the future, if required.

AWT would ideally be involved from pre-job planning and equipment selection, through execution to post job follow-up and reporting. Our experience includes interventions in vertical, deviated and horizontal wells, onshore and offshore, for platform based and subsea projects.

“OUR STATUS AS A TRULY INDEPENDENT ENGINEERING CONSULTANCY IS SEEN AS IMPORTANT TO MANY OF OUR CLIENTS SEEKING INDEPENDENT, NON-ALIGNED ADVICE.

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