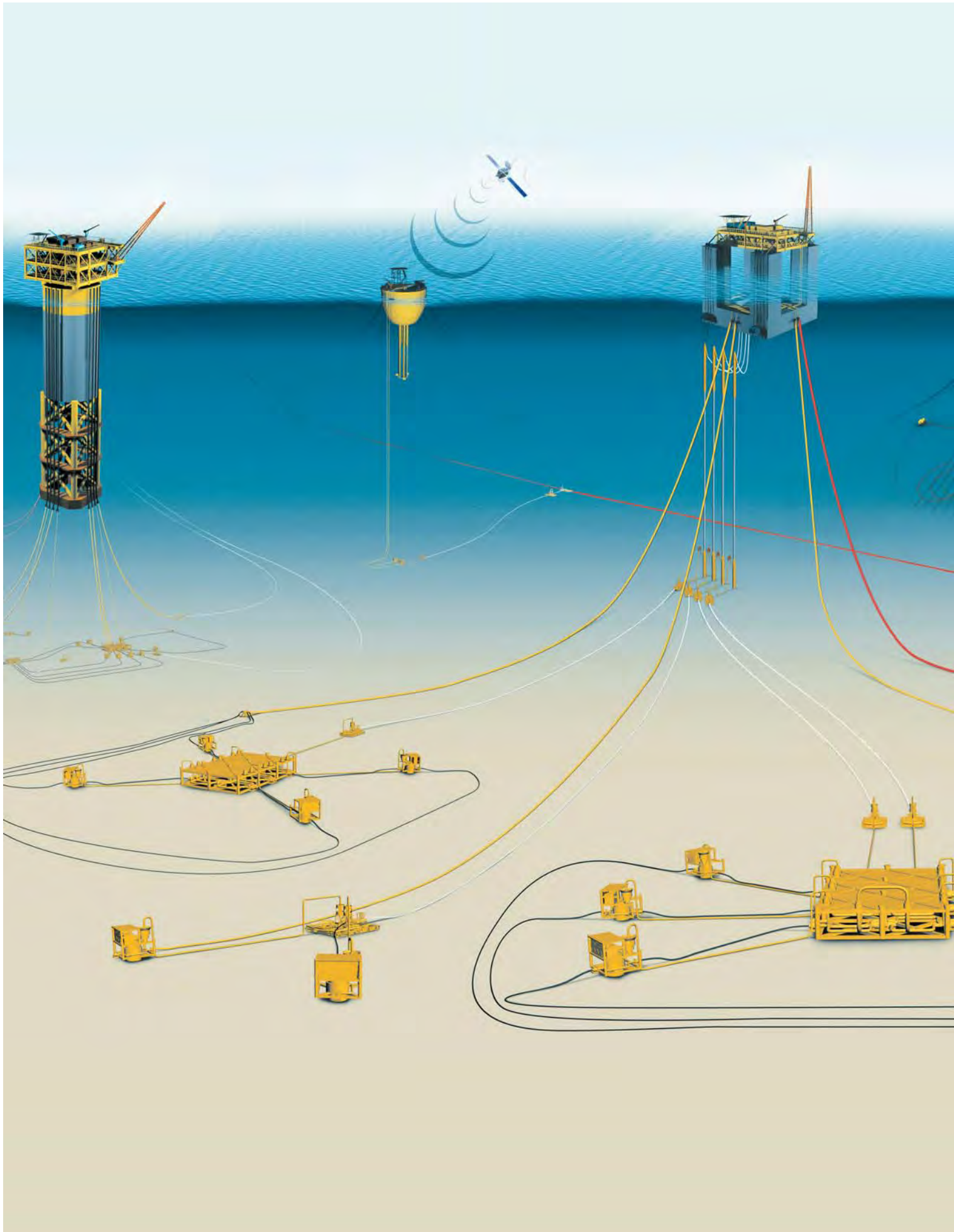




UPSTREAM

Future solutions for today's challenges







FUTURE SOLUTIONS

Onshore and offshore, oil and gas producers face increasingly complex challenges in the exploration and development of energy resources. Successful execution must consider many variables: safety, technical, financial, environmental, regulatory, logistical and cultural, to list just a few.

It also requires innovation and creativity, and the passion to deliver. We have these attributes, combined with a proven track record of upstream project delivery.

The upstream sector is a strategically important sector for us at Foster Wheeler and we've invested in acquisitions and in recruiting highly qualified specialists, especially for offshore, to further enhance our offering to our clients.

From concept to commissioning, operations to abandonment, we add value:

- **Strategic thinking**
- **Expertise in industry applications**
- **Innovative designs**
- **World-class HSE performance**
- **Project execution you can trust**

We deliver the right solutions by listening and responding to your needs.

WHY FOSTER WHEELER UPSTREAM?

Our professional and talented engineers are creative, flexible, committed and are able to think like an operator to develop innovative solutions to today's upstream challenges. As a global EPC contractor, we can successfully implement the selected design. In fact our experts are involved in projects from concept to commissioning.





We play a key role in helping independent, international and national oil and gas companies realize their objectives.

Our EPC track record and experience means that as well as being technically innovative, our concepts are constructible and practical, with cost estimates based on real as-built data.

Whether it's handling challenging-to-develop reserves in deepwater, subsea and Arctic 'frontier' areas, difficult reserves of heavy oil, oil sands or stranded gas, or facility upgrades for existing 'brownfield' locations, we offer real added value.

"Our goal is to deliver high quality solutions – the best advertisement for the next project is a previous job done well!"

Upstream, midstream and downstream, we add value to all phases of your project investment; a one-stop-shop for the development of your assets.

And with an array of safety performance awards, of which we are very proud, you can be confident that your project is in safe hands with Foster Wheeler.



A FULL SERVICE

From concept to commissioning and beyond

- Field development planning
- Feasibility studies
- Owner's engineer
- Regulatory support & due diligence
- Conceptual design & pre-FEED
- FEED
- Project management
- Detailed engineering
- Procurement
- Installation management
- Construction management
- Commissioning
- Integrity management
- Abandonment
- Ongoing support through alliances & service agreements

SELECT

DEFINE

EXECUTE

Project development

With our extensive knowledge of global finance markets, all forms of financing, major export credit agencies, and global project execution, we can provide assistance with your project development.

Front-end excellence

Critical to success is defining the right project and then giving your project the right start. We provide objective assistance with technology evaluation and selection, coupled with high-quality conceptual and feasibility studies, pre-FEED and FEED packages. We apply value improvement practices during the early phases of a project, where they deliver the greatest cost benefit.

Project management

We have a reputation for providing world-class project management, as an integral part of our execution of any phase of a project, or working with our clients as their project management consultant.

Engineering

We deliver a quality product with engineering experts who design with a focus on safety, cost, constructability and operability. We think it's important that engineers follow

the project through to site and take an active role in construction and commissioning, to ensure smooth start-up and operations.

Procurement

With our global network of procurement centers and our local knowledge, supported by global e-procurement, we have the expertise, negotiating power and flexibility to match the supply of materials and services to your cost, schedule, quality, local content and export credit needs.

Construction

We have a focus on construction, commissioning and operability from the very start of our projects. Our construction management personnel are highly experienced and work to the same world-class standards wherever they are in the world.

Installation

We can manage or support the installation process, including evaluation, selection and management of fabrication, construction and installation contractors for facilities including structures, floating vessels, subsea system and pipelines.

Delivering our service locally

With a global network of execution centers, we can offer a wide range of execution options to suit your project. But it doesn't stop there. We are developing our own new operations centers to deliver the Foster Wheeler service locally to more of our clients. Sometimes, it makes sense for us to work with a regional or local partner – we have a long list of successful projects where we have done just that, through partnerships or joint ventures.

We have been at the forefront of developing new sources of equipment and material supply, helping local suppliers to develop the systems and quality processes that our clients demand.

We have also played a key role in developing local skills and expertise, ranging from sharing international project management best practice with our client's personnel in Iraq, to training a local workforce, comprised primarily of subsistence farmers, on safe construction techniques in Mozambique.

So, whether you want your project engineered locally, or whether you have challenging targets for local material and equipment supply and use of local labor, we have the experience and flexibility to meet your objectives.

AN INDUSTRY LEADER

Foster Wheeler has played a key role in the onshore and offshore upstream oil and gas industry for decades.

We pioneered crude oil stabilization in Iraq in the 1930s. Since then, we've successfully delivered oil and gas projects around the world, in the Middle East, Africa, North Sea, Asia, the Americas, Australia and the FSU, including some of the world's largest oil and gas field and gas processing developments.



We have a reputation for delivering very high quality conceptual and feasibility studies, FEEDs, EPC and project management.

Wellhead to Consumer

Our proven project management skills and quality technical designs, in both large and small EPC projects, mean that you can be confident in your selection of Foster Wheeler Upstream.

The scale of some of the projects in which we are involved is truly breathtaking. Developing, managing, engineering, integrating and building large, complex projects in remote locations is one of our key core skills. Let us help you manage the risk of your large, strategic investments to deliver project success.

A Total Solution

Onshore and offshore

- Field development planning
- Conventional
 - Gathering systems
 - Process plants and facilities
 - Pipeline and riser systems
 - Terminals
 - Storage (above/below ground)
- Unconventional
 - Oil sands
 - Heavy oils
 - Arctic
 - Acid gas
 - Coal-bed methane
 - Shale gas
- Shallow water
- Deepwater
- Subsea mechanical systems
- Subsea field architecture
- Flow assurance
- Downhole technology
- Pipelines, flowlines & tiebacks
- Jackets/structures
- Topsides
- FPSOs
- Floating facilities
- Marine & seismic zone engineering
- SPMs
- Wellhead production
- Gas/oil separation
- NGL/LPG extraction
- Compression
- Gas conditioning
- Integrated SIS/BCS/SCADA & security systems

MEETING THE CHALLENGE

The oil and gas industry continues to face new challenges in the search and development of new production.

Foster Wheeler Upstream seeks to find the right balance of all factors that have an impact on a field's development and reduce CAPEX and OPEX costs while maintaining a realistic development schedule and producing safe and environmentally acceptable solutions.

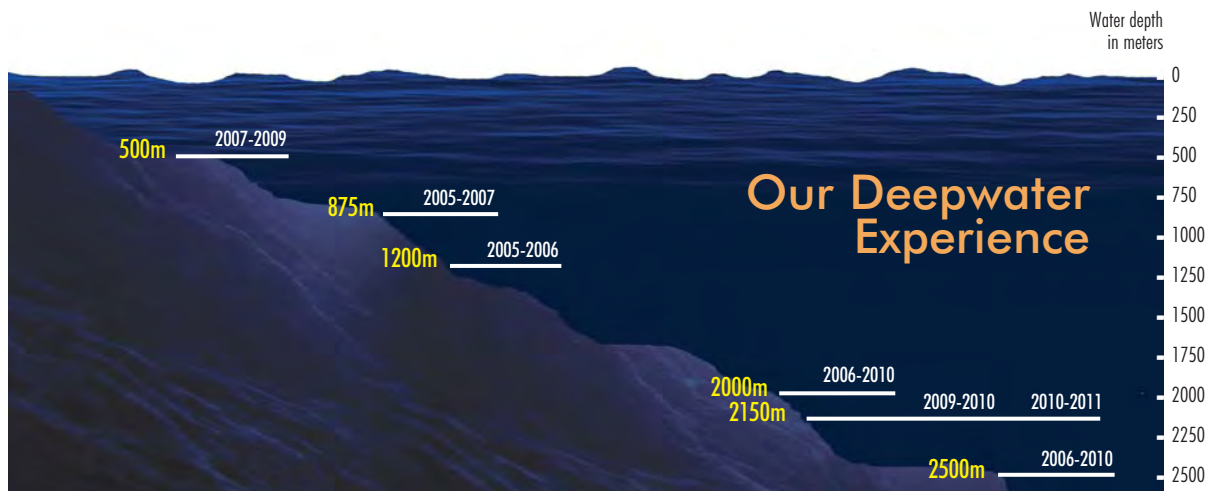
This ability is underpinned by our knowledge of technology and its application, our global reach and the experience of our staff.



Pipeline engineering

Particularly offshore, operators face unprecedented challenges as the industry moves into deep and ultra-deep water, with harsh conditions, regulatory and environmental pressures, and project execution issues. In these new frontiers, you need an entirely new level of engineering expertise to deliver cost-effective solutions.

Our capability includes buckle arrestors, corrosion, route selection, instability, vortex-induced vibration and engineering critical assessments for infield flowlines, export pipelines, trunk lines, chemicals/water/gas injection lines, and specialty lines, including pipe-in-pipe, LNG and LPG.



Subsea engineering

Our subsea engineering team has expertise from reservoir to production interface, and in-depth knowledge of subsea equipment, control systems and umbilicals, subsea boosting and processing, raw water injection, ROV interfacing and installation, and development and operation of HIPPS subsea and other technologies.

Our systematic approach to subsea field development is supported by an expertise in flow assurance that uses a combination of state-of-the-art simulation software and field experience to deliver workable and practical solutions. Our experience includes reservoir and production fluid characterization, steady-state and transient analyses, heat transfer FEM, slugging analysis, pigging studies, chemical injection studies and commissioning and operating philosophy development.

We have developed a unique design tool to facilitate the design of subsea plate mudmats. Our design programme, which includes automation and built-in intelligence, significantly improves the engineering efficiency and reduces the potential for human error in mudmat design.

Acid gas

Increasing energy costs and growing demand for natural gas have driven the development of sour gas fields around the world. Acid gas composition in these reserves can be very high, emission regulations are getting tighter and there is increasing requirement to achieve higher levels of sulfur removal and recovery.

We understand the many treatment processes available and can help guide you through the key parameters such as composition, pressure, temperature, impurities and final product specifications to find a solution that can meet economic, reliability, versatility and environmental considerations.

Coal-bed methane

Our experience in coal-bed methane projects includes working with client sub-surface teams to jointly develop an optimized field development plan that minimizes surface facility cost while giving good operational flexibility and recovery.

We recognize the challenges in designing gathering systems with the typically low wellhead flowing pressures from coal-bed methane reservoirs and our models have been validated against actual brownfield hydraulic data and confirmed by third party review.

We are also experienced in the injection of coal-bed methane gas into conventional natural gas reservoirs for storage, and in the removal of heavy hydrocarbon contaminants from the residual natural gas. Our design experience also extends to further processing of the coal-bed methane into LNG.

Shale gas

Shale gas has become an increasingly important source of natural gas and is expected to expand worldwide energy supply significantly. Our experience includes conceptual and detailed engineering and construction management services, incorporating phase separation, compression, dehydration, H₂S and CO₂ removal, tankage and metering. Our experience in gas monetization options such as GTL and LNG is extensive.

A GLOBAL TRACK RECORD



Pipeline vs tanker

Study comparing tanker versus subsea pipeline transportation options to deliver crude from an offshore oilfield to an onshore refinery. We considered alternative subsea pipeline routes and shore approaches. Shipping logistics have been analyzed to determine optimum tanker size and storage volumes.

LPG plant revamp

We have completed a study analyzing options for process plant configurations for a gas plant revamp to accommodate a 75% increase in associated gas throughput. The study included licensor evaluation and selection for the LPG recovery plant and determined the optimum LPG recovery levels and existing plant utilization.

Deepwater offshore Brazil

Our conceptual engineering of fast-track development schemes for heavy oil in deepwater included preliminary field development plans for deep water discoveries, and outline development concepts for deepwater leads and prospects, all based on subsea completions, FPSOs, spars and TLPs.

Deepwater, South America

Analysis of the design of FPSO topsides for a deepwater field development, working with the client to identify the potential of a current FPSO design, including analyzing process performance, identifying bottlenecks and evaluating the capability of the facility to handle alternative field fluids.

Blow-down systems in Europe

EPC contract from **GASSCO AS** for the implementation of the blow-down system modification at its Zeebrugge terminal, Belgium, and concept development, pre-engineering and EP services for the blow-down system modifications at its Dunkerque terminal in France, following successful completion of the study phase.

Santos' GLNG® upstream project, Australia

FEED for the extraction, collection, compression and transportation of coal-seam gas from fields in Central Queensland to a transmission pipeline and to a planned onshore LNG facility. Associated infrastructure and services, including power generation and water treatment facilities. We also completed a FEED for the planned CSG-LNG facility.

Deepwater pipelines in Angola

Detailed design for 17 subsea flowlines, plus PLETs, jumpers and umbilical systems for the second phase of a major development in offshore Angola, in 400 meters of water.

Deepwater pipelines

Design, installation engineering, pre-commissioning and commissioning for one of the deepest offshore pipelines in the Gulf of Mexico, at a water depth in excess of 2500 meters.

Deepwater pipelines & topside engineering

Design and installation engineering for a 34-mile oil and gas pipeline serving a floating production system in the Gulf of Mexico, in water depth in excess of 2000 meters.

Subsea pipelines

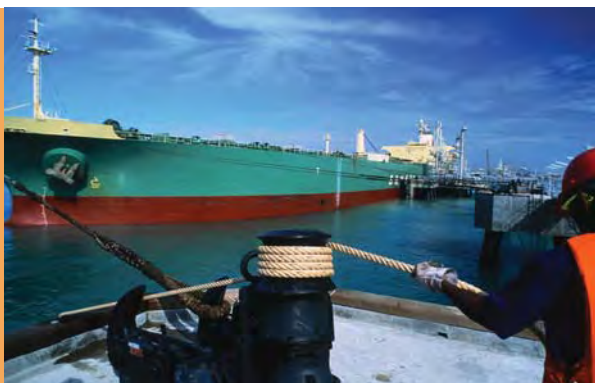
Detailed engineering and design of export gas pipeline, in-line SLEDs, PLET, and associated jumpers for pipeline development in 1200 meters of water in the Gulf of Mexico.

Early production facilities

Pre-FEED and FEED for **ENI/Repsol YPF** JV for early production facilities at the Perla field in the Gulf of Venezuela. Includes offshore structures, trees, controls, offshore processing, flowlines and pipelines, shore approach, utilities and tie-ins.

Pipeline system debottlenecking

Pre-FEED and FEED to define the debottlenecking of the Forties Pipeline System crude degasification facilities for **BP** at the Kinneil Terminal in Scotland, and pre-FEED for the refrigerated LPG chiller upgrade.



Oil terminal expansion, Iraq

Basic engineering and project management consultancy for the expansion of **South Oil Company's** Al-Basrah Oil Terminal, which is a vital export route for Iraqi crude. The expansion includes two 48-inch pipelines, three single-point moorings and an offshore control manifold and metering platform with the aim of increasing export capacity to 4.5 million bpd.

Ugandan oilfield

Feasibility study for the **Ugandan Government**, assessing options for the development of an oilfield, including crude transportation, and an evaluation of the relative economics of developing a new 150,000 bpd refinery versus alternative options, including pipelines, for exporting the crude oil.

Field development in Algeria

Basis of design, development of technical data, specifications and requisitions, and detailed cost estimate in order to define the EPC scope of work for the **In Salah Gas** Southern Fields Development, the largest dry gas joint-venture development in Algeria, involving the development of seven proven gas fields in the southern Sahara.

Integrated onshore and offshore

Conceptual and basic engineering for the offshore and onshore facilities for a gas field located 100km offshore in the Middle East. Facilities included three offshore platforms, single-point mooring and wet sour gas pipelines, and risers from the offshore platforms to the onshore gas terminal.

Gathering and production facilities

Flow modeling and FEED for multi-phase production handling from large-scale drilling progressive programs, for natural gas shale plays throughout the USA and for two heavy oil developments in Venezuela. Defined the drilling and P&A program for each to accommodate consistent target levels of production.

Challenging environments

Our three-year involvement from concept through to EPC evaluation for a greenfield development comprising well sites, gathering network, in-field transfer lines, treatment and processing facilities and oil and gas export pipelines, involved many challenges. The field, in degraded marshland, had significant problems of unexploded ordnance, seasonal flooding, weak and saliferous soils, and lack of roads and other infrastructure.

Underground salt cavern, rock & depleted reservoir storage

Comprehensive EPCm services for multiple facilities throughout the USA providing multi-cycle injection and delivery storage of natural gas, NGLs and refined liquid fuels. Governmental EPCm assistance services with crude oil storage and delivery.

Natural gas field enhanced recovery

EPCm services for multiple tertiary recovery facilities through the USA, involving water and CO₂. Services included providing field system compression at numerous locations, centrifugal compressors and systems to significantly enhance recovery, and providing boost to main facility primary reciprocating movers.

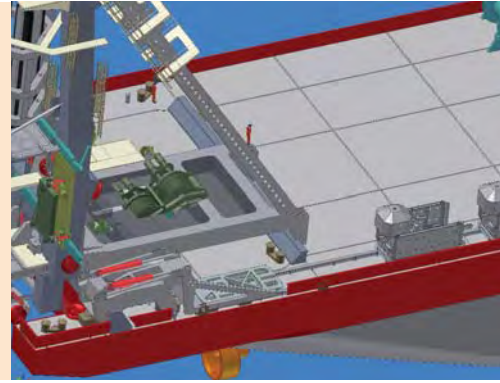
Sour field redevelopment

Redevelopment of a large onshore sour field with multiple installations. Studies and pre-FEED for a 400,000 bpd facility.

Enbridge deepwater pipelines

Detail design for the deepwater Walker Ridge Gathering System export gas pipelines and the deepwater Big Foot export oil pipeline in the Gulf of Mexico.

A GLOBAL TRACK RECORD



Manifa Arabian heavy crude program

This is one of the most significant and important projects for **Saudi Aramco**, adding 900,000 bpd of crude oil to Saudi Aramco's production. We executed the FEED for the central processing facility and the Khursaniyah expansion.

Offshore Nigeria

In a JV with **NETCO** of Nigeria, we undertook further design engineering for the massive Tubu and Madu offshore oilfield developments and also worked on the Olokola Gas Supply Project, both for Chevron Nigeria Ltd.

Offshore super-complexes in the UAE

The **Khuff Gas** development for **ADMA-OPCO** in the UAE comprises two major offshore super-complexes for which we were the project manager. The new facilities included a new gas gathering network, two new gas-processing platforms and modifications to 15 existing platforms. We were the PMC contractor.

Arctic modularization

We have completed several modularization studies, including optimum configurations for pre-assemblies in order to minimize site construction work for the Arctic environment. We addressed process, layout, procurement and construction strategies together with cost, schedule and risk assessment.

Acid gas management

Our expertise covers the evaluation and design of state-of-the-art options for safely handling large volumes of highly sour gas and product acid gas. We have experience ranging from world-scale acid gas removal, enrichment, and sulfur recovery and handling facilities, to a detailed techno-economic study for potentially the world's largest-ever acid gas injection facility, handling 40% acid gas.

Environmental enhancement

The objective of **ADCO** for the Sahil, Asab and Shah oilfield development in the UAE was not only to increase production, but also to enhance the environmental performance of the fields and to provide adequate facilities for their operations. We completed the FEED for this challenging project.

Marginal fields in Asia Pacific

We have been looking at the potential to convert trading tankers to FPSOs to exploit marginal fields. A modularized pre-fabricated design will enable rapid installation and hook-up of modules on the selected hull.

Supporting ADCO in Abu Dhabi

Project management consultancy for three strategic projects: Bida Al Qemzan oilfield development, Bab field expansion and Qusahwira field development.

Khurais - Saudi Arabia's largest ever crude increment program

We completed the FEED for the whole development and, in JV, are the EPC contractor for the central processing facility.

Extending North Sea platform life

We worked with **Aibel AS** on modifications to extend the life of existing platforms in the Norwegian North Sea for ConocoPhillips, providing FEED, engineering, management and supply chain management services.

Novel Caribbean FLNG

Feasibility study for **Centrica Resources** for a floating LNG facility, developing and optimizing the configuration of the subsea gas-gathering network, mooring system, risers, turret and the hull, liquefaction topsides, and storage and offloading facilities.



FEED framework agreement

FEED services to support the development of **Statoil's** Kårstø oil and gas processing plant in Norway – the third largest LPG export facility in the world.

Onshore gas plant, UK

We were the EPC contractor for **Shell's** Goldeneye onshore gas processing facility, part of an innovative development concept. A modular construction approach was adopted as the new plant was built on a live operating facility.

Deepwater gas-to-power

We executed the EPC, commissioning, maintenance, training and initial operations for **Shell's** two-train plant producing 900 mmscfd sales quality gas, part of its trailblazing gas-to-power project in the Philippines.

'Made in Africa'

Feasibility study, FEED and EPC contractor for the upgrade of the natural gas pipeline which runs from the Temane gas field in Mozambique to Secunda in South Africa. We played a significant role in the Temane field development, the first major upstream development in Mozambique, serving as the FEED and EPC contractor for the Temane wellsites, flowlines and the new central gas processing facility.

Floating LNG terminal

Project management consultant for a new floating LNG receiving terminal in Indonesia for **PGN**.

Marine terminal in Thailand

FEED and project management contractor for a new marine terminal and associated facilities for **PTT** in Map Ta Phut.

Monetizing shale gas

Feasibility study for a planned GTL facility in Canada, converting shale gas to GTL, naphtha, diesel and LPG, on behalf of the **Sasol/Talisman Energy** partnership.

Karan gas field

FEED and program management services contractor for **Saudi Aramco's** Karan onshore gas processing facilities at Khursaniyah. The onshore gas processing facilities will process 1.8 bscfd of gas from the Karan offshore gas field.

Offshore field development and LNG

We developed a technical definition and cost estimate for an integrated offshore field development and onshore LNG plant. The study also included a review of existing local infrastructure and any required upgrades.

CO₂ solution in Norwegian Sea

Concept study and FEED associated with CO₂/amine absorption at the Åsgard B offshore production facilities for **Statoil**.

Heavy oil field development in Venezuela

We worked on the **Lasmo** Dacion development, including increasing 18° API oil production from 30,000 b/d to 120,000 b/d, heavy oil and water separation, gas separation, dehydration and compression, wellpads, manifolds, flowlines and pipelines.

Cameroon LNG

Pre-FEED for an onshore LNG plant and offshore gas gathering infrastructure for **GDF SUEZ** and **SNH**.

Finding the right solution for ZADCO

Availability and reliability study for the expansion of the Zirkum oil processing facilities in Abu Dhabi.

LPG expansion in Bahrain

Feasibility study and techno-economic evaluation for the modification and expansion of the **BANAGAS** LPG facilities to allow the plant to increase gas throughput.



contact us at:
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A truly global list of clients with whom we have worked:

ADCO	GDF Suez
ADMA-OPCO	ONGC
ADNOC	PdVSA
Aibel	PETRONAS
Apache	PTT
BANAGAS	Repsol
BAPCO	Santos
BP	Sasol
Centrica	Saudi Aramco
Chevron	Shell
ConocoPhillips	South Oil Company
Enbridge	Statoil
ENI	Talisman
ExxonMobil	TNK-BP
GASCO	ZADCO
GASSCO	