Pulling It All Together

IPM Integrated Services

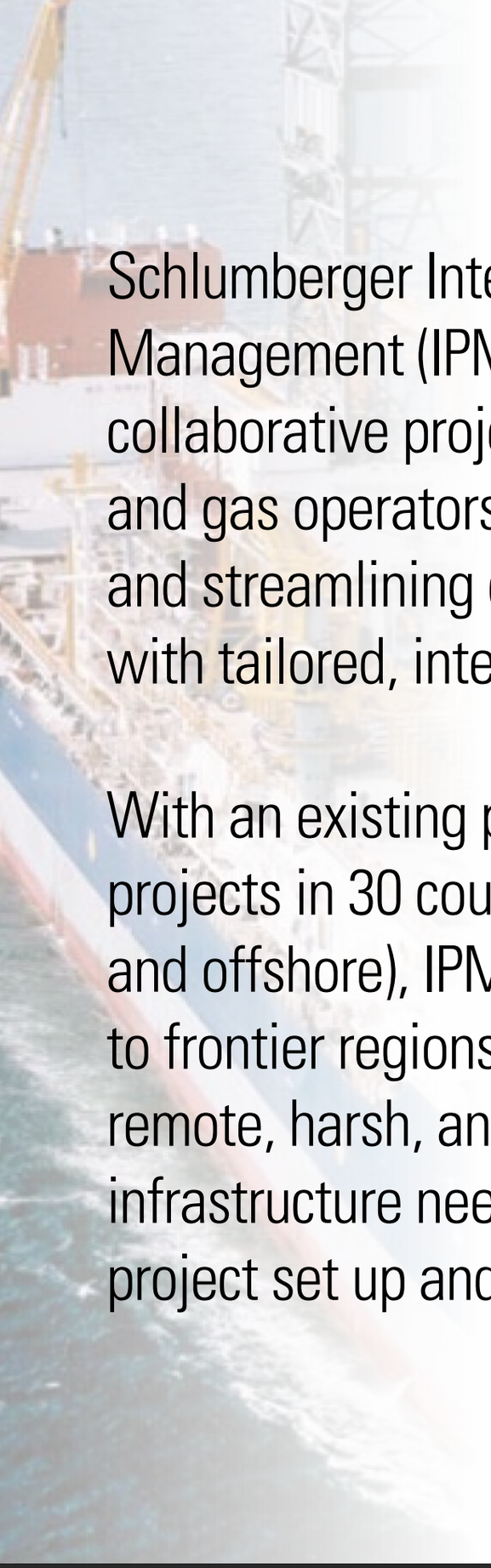
Schlumberger

Worldwide Integrated Project Management

Today, we deliver Integrated Services (IS) projects for clients worldwide, including oil and gas companies, and major resource holders.

Integrate to Simplify

As exploration and development activity moves into ever more technically challenging environments, including deep water, remote, and frontier regions, the hydrocarbons, geology, and logistics involved become increasingly complex. Ensuring collaboration between service providers and operators is critical to the success of an operation.



Schlumberger Integrated Project Management (IPM) undertakes collaborative projects for oil and gas operators, managing and streamlining complex projects with tailored, integrated solutions.

With an existing portfolio of over 50 projects in 30 countries (both onshore and offshore), IPM experience extends to frontier regions, which are often remote, harsh, and lacking in the basic infrastructure needed to facilitate efficient project set up and execution.

IPM provides the expertise and processes to improve performance and increase efficiency by integrating all the services and technologies a project requires, including operations support, logistics, and third-party management.

IPM helps to safeguard primary objectives: to deliver the required workscope on time and on budget.

The Integrated Services (IS) offering is delivered by the Integrated Service Project Manager (ISPM). As the Schlumberger project lead, the ISPM is the client's single point of contact for the duration of the project, coordinating all services within the IS project scope to ensure efficient execution of technical and operational objectives.

Project management is one of the key pillars of any successful operation. Our global experience, combined with our local know-how and infrastructure, makes Schlumberger a valuable partner when improving performance and increasing the efficiency of projects anywhere in the world.

An IS contract addresses a customer's need for oilfield services coordination. The majority of the services in an IS contract are provided by Schlumberger, with complementary services provided by third-party suppliers—all coordinated by the ISPM.

Our ISPMs are exceptional project and people managers and are handpicked to match the specific needs of the project, including technical and geographic complexity. ISPMs have experience in multiple service lines and are specially trained and certified in project management through a combination of classroom training, field exposure, and on-the-job assessment.

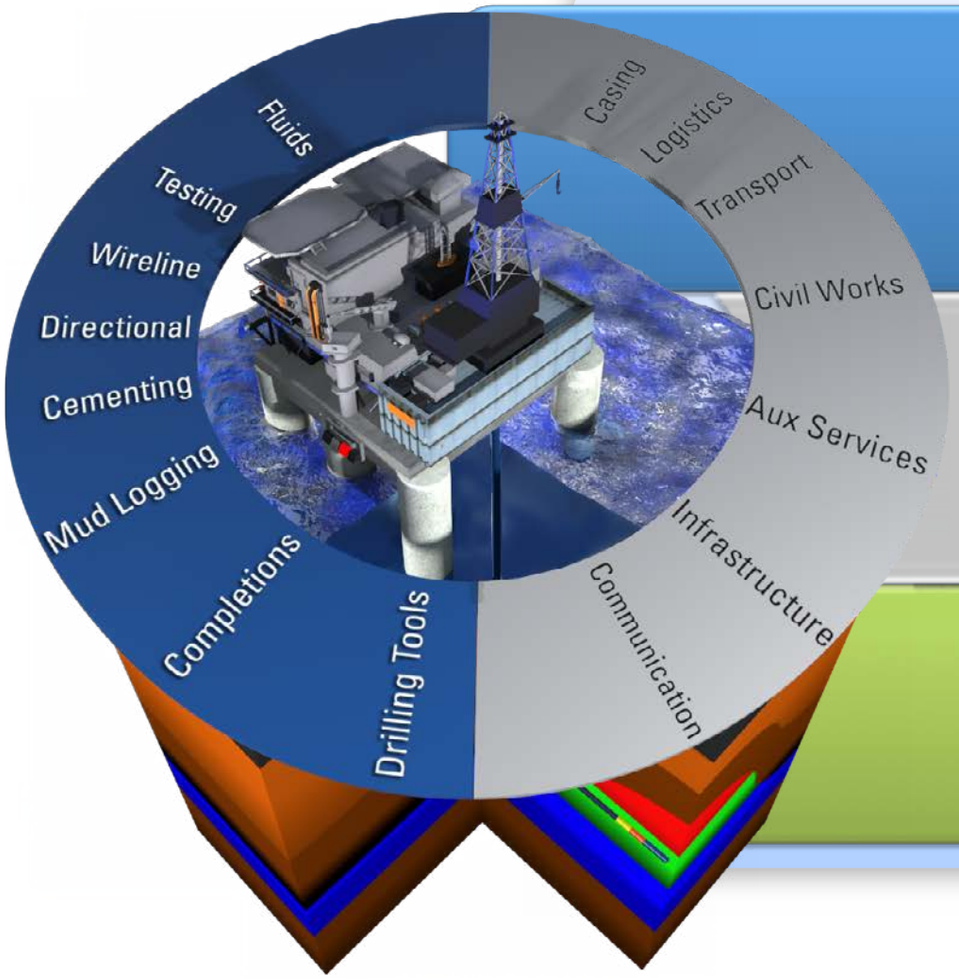
Based in the client's office, the ISPM streamlines service delivery between the rig and office to increase efficiency, reduce NPT, and lower costs.

The ISPM leverages cross-organizational knowledge and experience across all disciplines, providing seamless operational and technical integration, ensuring that there is a clear link between planning, execution, and close out phases.

For our clients, the IS offering optimizes resources and enhances service delivery by providing them access to local experience and infrastructure, thus reducing project overall cost and increasing the value of the project.

Why Integrated Services?

- Alignment of all IS project participants to the objectives
- Promoting collaboration, innovation, and custom solutions
- Immediate access to local knowledge and resources
- Integration of technologies and solutions from all providers
- Effective cost reduction and enhanced efficiency
- Systematic method of technology introduction



Planning
Scope and success criteria
Contractor selection
Project execution plan
Identify the technical challenges
Risk assessment and contingencies

Integration
Define roles and responsibilities
Managed third-party services
Procurement and logistics
Define the technology solutions
Interface management

Execution
Operations support
Logistics management
Knowledge management
Technology implementation
Service quality management

- Focuses on high-profile, frontier, complex operations
- Single contact point
- Simplified interfaces
- Operations support

Case Study:

IPM Provides Fast and Customized Project Solutions, Reducing Well Cost by 40%

A Brazilian oil and gas independent had the objective to explore a remote field for gas reserves. If the campaign proved successful, a thermoelectric power plant would be invested in within the region.

The initial objective of this operation was to confirm reserves and quickly implement a field development plan that would tie in with the near-future demand for additional energy in the region.

Remote project benefits from new Schlumberger logistics hub

Schlumberger Integrated Project Management (IPM) was selected as partner to provide integrated services coordination.

Field data communication and remote operations surveillance was also provided by Schlumberger from the client office, 3,000 km from the field.

The integration of Schlumberger and third-party services in the remote location was aided by the new Schlumberger logistics hub, created to improve logistics management and reduce associated costs.

Combined technologies from Pathfinder, Schlumberger, and M-I SWACO improved operational performance, providing solutions to project challenges such as low ROP, cement isolation, directional control, environmental impact, and formation damage.

IPM Integrated Services (IS) project success leads to rapid project development

The first exploration well was spud in August 2010. The exploration campaign started with one 1,500-hp drilling rig, expanding to two in March 2011, when the client added a second exploration rig. The drilling campaign quickly developed into a field development campaign with a third drilling rig added in March 2012.

In less than 2 years from spud of the first well, the operation's production wells were drilled, completed, tied in to surface equipment, and ready to produce.

IPM achieves objectives with 40% well cost reduction

Operations continued uninterrupted and had low nonproductive time (NPT). In fact, NPT relating to Schlumberger performance was less than 2%. The operation's total well cost was reduced by 40% and the completion design was customized for project needs in preparation for the client's first producing well, which was ready in January 2012 (four months earlier than planned).

Key facts

- Fast and customized solutions as per client's needs
- Well cost reduction of 40%
- Outstanding well design optimization
- Excellent QHSE performance

Case Study:

Schlumberger Lends Expertise in Argentine Unconventional Resource Project

Oil companies entering the Argentine market have limited in-house resources and require a complete suite of services when executing well completions operations. These range from subsurface petrotechnical support to perforating and hydraulic fracturing stimulation using the frac plug drill out (FPDO) technique, through to well clean up and production.

Project management and integration of services are key to achieving success in unconventional resource projects. In early exploration pilot projects, the quality and fidelity of multidisciplinary data acquisition is critical to reduce major uncertainties. As projects mature, fit-for-purpose technologies must be employed to reduce cost, increase efficiency, and improve overall economics.

Essential services offered to companies with limited in-house resources

Integrated Project Management (IPM) coordinated a 25,000-hp pumping fleet, well intervention coiled tubing, Schlumberger wireline perforating, copperhead plugs and micro seismic, M-I SWACO FPDO and flow back, and Schlumberger petrotechnical services data integration and evaluation.

Schlumberger also put forward an integrated completions cell concept, maximizing the efficiency of the operation and the coordination of all service partners.

Schlumberger establishes Center of Excellence in Buenos Aires

A team of experts in unconventional resources assisted in importing the North American multidisciplinary shale workflow to Argentina. As a result, Schlumberger created the Latin American Unconventional Resources Center of Excellence in Buenos Aires.

The Schlumberger tailored approach in integrating services for unconventional resource projects, gave our clients the opportunity to enhance their knowledge by tapping into our expertise and experience. Based on these, the clients then developed

techniques, solutions, and best practices that could be easily standardized to ensure repeatability and an improved chance of success.

There was also strong quality, health, safety, and environmental (QHSE) commitment and leadership at the wellsite.

Single-platform Integrated Services (IS) offering assists factory mode of operation

The first steps in achieving a factory mode of operation have been successfully taken and operating costs were reduced. The single-platform IPM IS offering achieved seamless integration from seismic to stimulation, setting the benchmark for IS in Argentina.

Key facts

- Schlumberger offers the first well completion IS package for the unconventional plays of Argentina
- Largest hydraulic fracturing fleet in country
- Operation assisted by Buenos Aires Center of Excellence
- Access to North American unconventional expertise and experience

Case Study:

Integrated Services (IS) Assistance Reduces Operating Time by 40% for Mansarovar, Colombia

In 2008, Mansarovar Energy Colombia began a field development campaign of the Girassol field. This heavy oil reservoir with productive layers of 10 to 20 ft, required drilling horizontal wells that were producing oil of 11° API.

The campaign commenced with input from three companies providing a number of services, including well planning.

Pilot well performance puts IS ahead

After four wells, Mansarovar took the decision to exclusively use the Integrated Project Management (IPM) IS offering to continue its drilling campaign. The decisive factor for this was the successful design and good performance of the pilot wells which were planned and executed according to IPM standards and procedures.

Latest technology and software combined for success

Among others, technologies implemented included the PeriScope* bed boundary mapper, TeleScope* high-speed telemetry-while-drilling service, rotating cementing casing job (torque ring), and stand-alone MeshRite* stainless-steel compressed mesh screens completion with thermal packer.

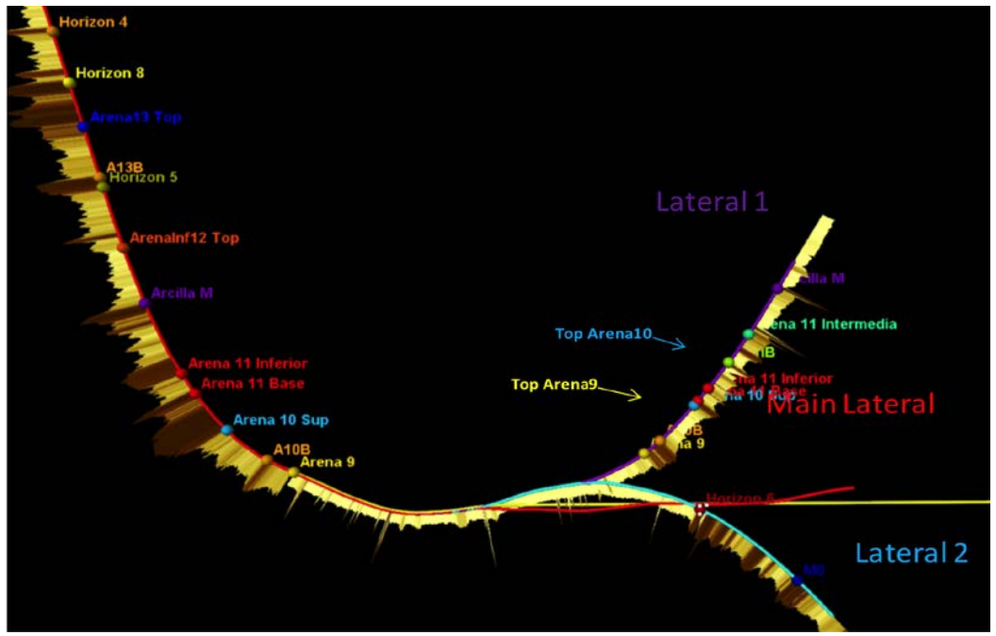
Well placement navigation was also used. Trajectories were uploaded to the Petrel* E&P software platform to define the well trajectory on the Girassol, Under River, Moriche, and Abarco fields.

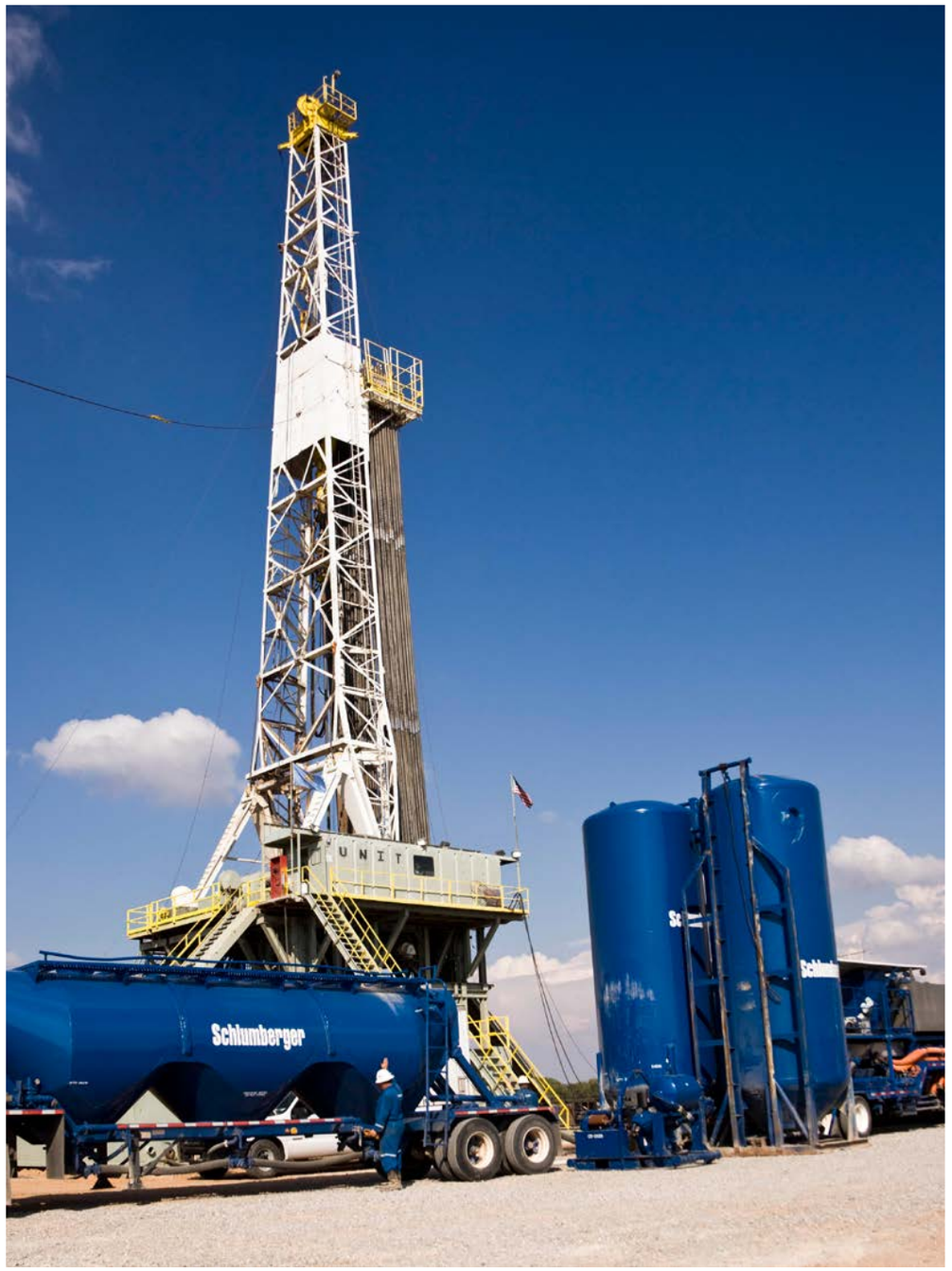
IS performance prompts contract extension for IPM

More than 100 wells were drilled with excellent results in every stage from planning to the delivery of the wells. The results achieved by IS prompted the operator, Mansarovar, to extend the Schlumberger IPM contract.

Key facts

- Over 100 horizontal wells drilled
- An average 40% reduction in operating time
- 20% cost savings
- Improved net-to-gross pay zone ratio





Case Study:

Interdisciplinary Exploration of a New Basin Results in Important Discovery for the Operator

Thorough planning and effective project management enabled successful drilling of a deviated deepwater wildcat exploration well in challenging subsurface conditions, hundreds of kilometers from the nearest analog well.

Tullow Oil plc is a UK-based company with assets in Africa, Asia, and South America. In 2010, Tullow identified a drilling target for the Zaedyus exploration well in 2,048 m water depth approximately 150 km from the coast of French Guiana, with the objective of proving a new hydrocarbon system.

Intensive prejob planning addresses challenges of new basin

Tullow finalized the conceptual well design and made strategic direct awards for services to Schlumberger for key well construction services under the Integrated Services (IS) umbrella.

Planning for the GM-ES-1 wildcat well would need to address a range of challenges:

- The deepest offshore well for Tullow and their first well in South America
- No relevant offset data
- No established supply chain and unfamiliar regulatory environment
- A new and unfamiliar rig
- No oilfield infrastructure

Co-located in the Tullow Cayenne office, the Integrated Services Project Manager (ISPM) coordinated intensive prejob planning and risk management processes following Schlumberger deepwater guidelines.

Co-location results in faster, more-informed decision making

An exploration project of this magnitude necessitated structured project planning to ensure project objectives were met. The wildcat nature of the well often created drilling situations requiring rapid response. Co-location improved communication, simplified coordination, and expedited information flow, resulting in faster and more informed decisions—all critical to drilling this type of wildcat well.

One example of our risk management processes is the Drill Well on Paper (DWOP) exercise held by Schlumberger to ensure the project management team and rig crew would be able to work through the issues in a coordinated manner. Furthermore, a project risk register was created and tracked by the ISPM in sync with the drilling time line, ensuring that risks and corresponding mitigation plans were continuously reviewed.

Interdisciplinary synergy brings benefits for all

Throughout the drilling program, multidomain experts in an Operations Support Center (OSC) in Houston worked with the onsite team, the ISPM, and Tullow, sharing real-time data via a secure online collaboration system. This enabled a combined approach to problem solving and led to efficiency gains. One of the many instances of this was the bit optimization in tight windows and unconsolidated formations. Working together, Smith Bits and Schlumberger drilling services produced an optimal combination of hole cleaning and hydraulic horse power for drilling longer intervals, thereby eliminating costly tripping.

Logistically, considerable planning was required for transporting equipment in, through, and out of Trinidad, Suriname, and French Guiana. Strict rules governed the importation, transportation, and use of explosives and radioactive materials required for drilling activities, with some approvals taking almost a year to obtain. Schlumberger leveraged its global presence and expertise from our research center near Paris, extending existing French licenses to include the materials required for the project.

Despite the challenges of this project and the limited planning period, no time was lost waiting for any equipment, thus validating the planning and project management approach adopted to run the operation. The well encountered 72 m of net oil pay in two turbiditic sandstone fans. Tullow's objectives were achieved with an important new discovery for the company. Also, the operation's rig passed its one-year LTI-free milestone during the project, with over 625,000 personnel hours worked.

Case Study:

Services Integration Facilitates Multiple Discoveries

Schlumberger delivers an integrated package in the North Sea, where planning, provision, and integration of multiple services and providers was executed flawlessly.

PA Resources, in cooperation with their partner, the Danish Energy Agency, intended to explore the Broder Tuck and Lille John prospects located 250 km west of Esbjerg, Denmark. Requiring equipment and services critical to such an operation, and being newcomers to North Sea exploration, the operator chose to use Schlumberger Integrated Services (IS).

IS drafted to assist operator's first North Sea operation

The North Sea is a complex and challenging exploration environment for even the most experienced operator. Being new to the North Sea and drilling in a region of low hydrocarbon prospectivity made this a particularly challenging project.

PA Resources' mission to drill and evaluate both prospects in the most efficient and safe manner would entail a project of substantial complexity. The operator recognized the need for process simplification, overheads reduction, efficiency enhancement, and comprehensive contingency planning, while achieving their objectives with minimal operational personnel.

IS offers process simplification

Schlumberger assigned an Integrated Services Project Manager (ISPM) to plan and co-ordinate all the services and technology the project would require. These included drilling, reservoir evaluation, well testing, operational support, logistics, and third-party management.

With certified personnel and technology being sourced from land locations all around the North Sea, the ISPM successfully ensured the right resources were available at the right times.

The Schlumberger drilling portfolio provided seamlessly integrated services from Smith Bits, M-I SWACO (drilling fluids), and Geoservices (mud logging, directional, and measurement-while-drilling services). This provided 360-degree vision over the drilling operation which facilitated the exchange of real-time information and ideas, enabling optimal adjustment of drilling parameters and delivering more productive drilling. Schlumberger also delivered high downhole tool reliability.

Flawless execution of project objectives brings about new discoveries

Schlumberger planning, provision, and integration of multiple services and providers was executed flawlessly.

The ISPM reduced project NPT to only 21 hours of NPT encountered during 186 operational days by Schlumberger IS. Lessons learned were quickly implemented; of those 21 NPT hours, 20 occurred during the first well and only 1 during the second well. Schlumberger operational efficiency was above 99.4%, with no lost time incidents.

Drilling services enjoyed particular success, making 20 BHAs in various hole sizes (from 24 in to 6 in), drilling sections in one single run, and experiencing no downhole tool failure. Having drilled 6,992.5 m, Smith Bits achieved the required dogleg and ROP on schedule as planned.

The first exploration well was drilled on the Broder Tuck prospect, discovering a high-quality gas with condensate.
The second well, drilled on the Lille John prospect, also encountered hydrocarbon pay—at the extraordinarily shallow depth of 930 m below mean sea level.

The Danish Energy Agency was very pleased with these results. Having established itself as a successful operator in North Sea operations, PA Resources was satisfied with Schlumberger performance and expressed an interest in contracting Schlumberger IS for future projects.

“The Schlumberger basket of services accelerated our procurement process and simplified operational logistics.”
Graham Goffey, Managing Director, PA Resources

IPM

www.slb.com/ipm

Schlumberger