ENABLING OIL & GAS SOLUTIONS
WWW.RAMBOLL.COM/OIL-GAS
To make it in today’s fast-paced and competitive oil and gas market, companies depend on advanced technical solutions that combine economic efficiency with stringent health, safety and environmental (HSE) safeguards during the production and distribution processes. These elements form an integral part of Ramboll’s independent and multidisciplinary consultancy service, which covers the entire asset life cycle. We excel in onshore consultancy and have designed offshore structures for industry giants such as Maersk Oil, DONG Energy and Statoil since the 1970s. Read more at: www.ramboll.com/oil-gas

OIL & GAS

PLANING & URBAN DESIGN
Ramboll’s holistic approach to urban development encompasses strategy, planning and world class technical design services and is based on an integrated multidisciplinary skills base. We have an extensive track record working with a number of the world’s largest cities to create liveable, sustainable and implementable urban development solutions that are fully adapted to the local context. Read more at: www.ramboll.com/planning-and-urban-design

WATER
Working with municipalities, utilities and industrial clients, Ramboll draws on proven multidisciplinary expertise to manage the most challenging water resources, wastewater, and storm water issues. We integrate treatment processes, selection and engineering, operational services, and regulatory management and planning to deliver innovative solutions that benefit both industry and society. Read more at: www.ramboll.com/water

TRANSPORT
Mobility fuels economic and social development and with 50% of the world’s population now living in urban areas, efficient and reliable transport systems are essential. To meet this need, Ramboll has been working on some of the world’s largest, most innovative infrastructure projects and is the leading consultancy in the Nordic market. We create value for transport authorities, contractors and local authorities by providing multidisciplinary technical excellence and minimising resource usage. Read more at: www.ramboll.com/transport

ENVIRONMENT & HEALTH
As a globally recognized environmental and health consultancy, we have earned a reputation for technical and scientific excellence, innovation and client service. Advances in science and technology, and evolving regulatory, legal and social pressures create increasingly complex challenges for our clients. We evolve to keep pace with these changes – by adding new services, contributing to scientific advances or expanding geographically. Read more at: www.ramboll.com/environment

BUILDINGS
Buildings form a fundamental part of our lives by shaping our communities and daily activities. For these reasons, Ramboll’s design philosophy is to always make room for the human experience. As one of Europe’s top 3 buildings designers with decades of experience in the global market, we create visionary, sustainable and award-winning buildings that improve life for users and enhance the surrounding landscape. Read more at: www.ramboll.com/buildings

ENERGY
Security of power supplies, climate change, energy efficiency and resource scarcity are top priorities on the global agenda. Ramboll is at the forefront of addressing these issues as the global market leader in offshore wind, waste-to-energy and district heating consulting and the leader in Scandinavia for large-scale thermal power consulting. We also have a specialist competence in designing power transmission masts and offshore wind farm masts. Read more at: www.ramboll.com/energy

MANAGEMENT CONSULTING
National, regional and local authorities are responsible for issues that affect us all: from health care, education and day care to strategic planning of infrastructure and climate initiatives. Drawing on 500 management experts, Ramboll acts as a trusted partner to public administrations, creating the insights needed to make informed strategic decisions that promote stronger societies. With unprecedented levels of competition in the global economy, Ramboll focuses on empowering private sector clients with expertise and powerful management tools. Read more at: www.ramboll.com/management-consulting

Unlocking innovative thinking
About us
How we work
Our approach
Covering the project life cycle
World class projects by sector
Energy & infrastructure consulting
Offshore platforms
Floating production
 Pipelines & subsea
Onshore production & refining
Terminals, storages & pipelines
Gas & LNG
Software solutions

ENERGY

OIL & GAS

WATER

PLANNING & URBAN DESIGN

13,000 EXPERTS
300 OFFICES
35 COUNTRIES

COUNTRIES WITH PERMANENT OFFICES
NORDIC REGION: Denmark – Copenhagen, company head office; Finland, Greenland, Norway, Sweden; EUROPE: Belgium, Cyprus, France, Germany, Italy, Netherlands, Poland, Romania, Russia, Spain, Switzerland, United Kingdom; MIDDLE EAST: Kingdom of Saudi Arabia, Qatar, United Arab Emirates, ASIA-PACIFIC: Australia, China, India, Indonesia, Malaysia, New Zealand, Singapore, THE AMERICAS: Brazil, Chile, Mexico, USA; AFRICA: South Africa; USA - Houston, New York, Washington, D.C., USA - Los Angeles, California USA - San Francisco, USA - Miami, USA - Minneapolis, USA - Atlanta, USA - Chicago, USA - Houston, USA - San Francisco, USA - New York, USA - Washington, D.C., USA - Los Angeles, California USA - San Francisco, USA - New York, USA - Washington, D.C., USA - Los Angeles, California USA - San Francisco, USA - New York, USA - Washington, D.C., USA - Los Angeles, California USA - San Francisco, USA - New York, USA - Washington, D.C., USA - Los Angeles, California USA - San Francisco, USA - New York, USA - Washington, D.C., USA - Los Angeles, California USA - San Francisco, USA - New York, USA - Washington, D.C., USA - Los Angeles, California USA - San Francisco

AFRICA:

ASIA-PACIFIC:

NORTH AMERICA:

LATIN AMERICA:

EUROPE:

MIDDLE EAST:

AMERICAS:

AFRICA:
FEASIBILITY STUDY FOR ARTIFICIAL ISLANDS IN THE ZAKUM OIL FIELD

With the purpose of increasing the oil production, operator ZADCO decided to develop the Zakum Field - one of the largest oil fields in the world - by establishing a series of artificial islands as an alternative solution to establishing numerous platforms. The decision was based on extensive flammability studies of the effects on existing facilities and environment.

UNLOCKING INNOVATIVE THINKING
As global energy consumption continues to grow, oil and gas will continue to play an important role in the world's energy mix.

Our roots in the energy market run deep. In our 40 years of experience with oil and gas solutions, our expert knowledge and solutions have evolved with the needs and challenges facing the industry both offshore and onshore.

Ramboll is a truly people-based organisation. We believe that the key to our success lies in the motivation, persistence, skills and commitment of our employees.

We base our services on integrity, deep specialist insight, and absolute independence of third party providers. In this way, we contribute to the safe, responsible and sustainable development of the oil and gas market.

Civil engineering and other consultancy disciplines are a part of our combined service portfolio in the Ramboll Group. With our staff of some 600 oil and gas experts backed by our 12,400 colleagues in the Ramboll Group, we are able to mobilise large project teams across geography and disciplines.
HOW WE WORK

PROJECT MANAGEMENT MODEL

Ramboll’s ambition is to be known as the consultancy and engineering partner that sets the industry benchmark for excellence within project management and innovation.

In particular, we are committed to exceeding client expectations and creating successful partnerships by consistently delivering optimised solutions, on time and within budget.

To achieve this, we have a common approach to project management across the Ramboll Group. This includes a stage gate model covering all project phases and practical tools that are based on internationally recognised standards and best practices developed by Ramboll experts.

Ramboll’s approach to project management has been designed to maximise performance and client benefits while providing a clear road map throughout the project life cycle. Our model facilitates a full understanding of client and project needs to ensure that all strategic goals are met.

Risk management lies at the heart of our project management model, and is conducted in order to anticipate possible challenges in relation to time, cost, and quality.

It involves the identification of risks and the proactive initiation of risk control and risk mitigating measures.

A shared approach to project management across Ramboll also creates a strong platform for providing clients with access to the most advanced multidisciplinary expertise regardless of geographical location.

This means that clients can expect the highest standards and the best results regardless of project size, type or complexity.

LOCAL PARTNER, GLOBAL KNOWLEDGE

CREATION + INITIATION

PLANNING

EXECUTION

RISK

CONCEPT

DETAILING

IMPLEMENTATION

PROJECT CLOSING

BENEFIT REALISATION

© Gassco
OUR APPROACH

HSEQ
It is our trademark to integrate Health, Safety, Environment and Quality (HSEQ) into every aspect of our projects, and our consultancy services are built on hands-on experience with designing, implementing and maintaining HSEQ management systems.

We are committed to observing client and authority requirements, and complying with laws and regulations.

Our HSEQ system is based on the Ramboll project management model, addressing the full project life cycle from proposal to planning, execution and completion. We execute our projects according to Lean principles focusing on elements such as front loading, visual planning, Key Performance Indicators (KPIs) and continuous improvement.

Certificates
Ramboll Oil & Gas is certified according to ISO 9001, ISO 29001, ISO 14001 and OHSAS 18001. Our services meet both national and international standards such as NORSOK, API, ANSI and ASME. Ramboll is registered in the Achilles JQS, Supply-Line and the First Point Assessment (FPAL) databases.

Business integrity
In Ramboll we have a set of tools that help us to uphold our Code of Conduct.

As part of our Corporate Responsibility activities, we carry out a common training course for all employees to increase awareness of why we have a Code of Conduct, how it influences our daily work, and what we should do to maintain our ethical standards for business behaviour.

In order to provide all employees with the opportunity to report on possible illegal acts and unethical occurrences related to the company’s business practices, a common whistleblower function has been established.

Another important tool is our Business Integrity Management Systems (BIMS) which is an integrated part of our HSEQ system. The Code of Conduct and the BIMS are based on the FIDIC business integrity guidelines and the ten principles of the UN Global Compact.

EPCM PARTNER FOR HESS – A MILESTONE PROJECT
The South Arne asset operated by Hess Denmark, consists of some 30 wells. For a decade Ramboll has carried out a number of significant brownfield projects on the platform with constant focus on HSE. The long list of projects includes a flare gas recovery system, which reduces the CO₂-emissions. In 2010, Hess Denmark decided to expand their activities further, leading to the construction of two additional wellhead platforms which produced first oil in 2014. Ramboll carried out this tie-in project with SEMCO Maritime, and today we hold a framework contract to provide end-to-end services and handle the full responsibility for design, procurement, installation and construction projects at South Arne.

(Image right: © Hess Denmark)
AL SHAHEEN – OFFSHORE IN THE ARABIAN GULF

This complex field development project called for the drilling of more than 160 production and water injection wells and construction of 15 new platforms in total. Ramboll was in-house engineering consultant to Maersk Oil for seven years. Being a part of the client’s organisation prompted vital knowledge sharing and smooth project execution. Ramboll was responsible for the brownfield design including modifications. Qatar holds the world’s third-largest proven gas reserves, and today Al Shaheen produces around 40% of Qatar’s oil and gas output.

COVERING THE ASSET LIFE CYCLE

Ramboll is a truly multi-disciplinary engineering, design and consultancy company working across all services covering the entire asset life cycle.

- Financial studies
- Conceptual studies
- FEED
- Detailed engineering
- EPC projects
- Project management
- Modifications & maintenance
- Decommissioning
EPC CONTRACT FOR MAERSK RIG INSPIRER

The Inspirer is the world’s largest and most advanced jack-up drilling rig with integrated process facility and wellhead module. Under a full EPC contract, Ramboll executed a project to increase well capacity by incorporating a new production well and a water injection well.

Ramboll has substantial global experience with oil and gas projects. Since the 1970s we have been involved in major greenfield development projects and brownfield operational support ranging from modifications to maintenance.

We enjoy a high client satisfaction rate as we are able to meet key success criteria such as minimal commissioning and shutdown time, deep technical insight and solutions tailored to clients’ requirements.

Every project is a unique endeavour with specific requirements. Successful implementation of production facilities or systems requires experienced, knowledgeable management – to plan ahead, resolve issues and keep everything on track.

By working on different projects, with different challenges and in different geographies, we learn and we develop our people and our solutions. Diversity becomes the driver for development, which enables us to offer our clients state-of-the-art expertise and all-round knowledge within oil and gas engineering.

Based on a multidisciplinary profile, Ramboll Oil & Gas works across the sectors: Energy & infrastructure consulting, Offshore platforms, Floating production, Pipelines & subsea, Onshore infrastructure, Onshore production & refining, and Gas & LNG.
The global energy market is undergoing major changes driven by the opening of free markets, constantly changing production, fluctuating prices, supply-security concerns, and the deployment of renewable energy. Energy companies have seen socioeconomic, political and stakeholder management issues emerge on their agenda, and with the impact of their undertakings, they have to base their decisions on comprehensive market reviews and expert evaluations.

The combination of technical and economic know-how enables Ramboll to evaluate a wide range of energy and infrastructure related projects over the entire value chain to actual implementation. We carry out financial studies on all levels – from policies and market analyses at a societal macro level to isolated investments for oil and gas facilities at operational micro level.

**BALTIC INTERCONNECTION PLAN**

Ramboll conducted a study on natural gas infrastructure projects around the Baltic Sea for the EU with the purpose of fully integrating the East Baltic States into the European energy market. The study also provided recommendations on how to address the depletion of gas reserves in the North Sea as well as the gas transmission capacity from Russia. (Image top)

**CREATING ONE SINGLE ARAB ENERGY MARKET**

To determine the best options for electrical and gas interconnections creating one single energy market for 20 Arab countries, Ramboll proposed feasible infrastructure options to ensure energy availability, identify implementation methods and outline an energy trade strategy among Arab countries. The options were backed by techno-economic feasibility analyses of several scenarios and involved managing relations with almost 60 stakeholders. (Image bottom)
OFFSHORE PLATFORMS

FOUR DECADES OF EXPERIENCE
Ramboll’s impressive platform portfolio spans a large number of geographies stretching from the Gulf of Mexico and Brazil, over West African waters to the Arabian Gulf, into Russia and even further up north to the hostile environment of the North Sea and to the extreme challenges of the Arctic. Our multidisciplinary service portfolio covers the entire project life cycle from early phase studies and detailed design to modifications, lifetime extension projects, complete or partial revamps, tie-ins, maintenance, and process improvements – all tailored to fit each client’s purpose and demands.

FROM FIELD DEVELOPMENT TO PRODUCTION OPTIMISATION AND LIFETIME EXTENSION
Ramboll has substantial global experience with offshore platforms, and with one of Europe’s biggest structural departments, we have unique expertise within jacket structures, substations and cost-effective platforms. Since the 1970s we have been involved in major greenfield development projects and brownfield operational support ranging from modifications to maintenance.

Topping Ramboll’s agenda on all projects is safeguarding personnel and environment throughout the entire oil recovery process while enabling the facility to stay in operation and keeping costs down.

TYRA EAST RATIONALISATION PROJECT
The mature Tyra Field is the largest gas field in the Danish North Sea and faces lower reservoir pressure and a decline in production. In order to reduce operation costs, the project included optimisation of the complex and gas infrastructure by reducing capacities to match production forecasts. The tail-end production was accelerated by adding additional wellhead compression, increasing the overall recovery from the field. Ramboll provided detailed engineering and project management.

WELL HEAD PLATFORM AT NORWEGIAN SNORRE FIELD
Challenged with a water depth of 330 m, a Ramboll concept and feasibility study examined and prioritised elements that impacted technical feasibility and economy for two different platform solutions. Further, the study included a complete cost and time estimate for the recommended solution.

HP/HT DEVELOPMENT PROJECT: HEJRE
One of the largest and most complex Danish development projects in recent years is the high pressure/high temperature field, Hejre, located at 68 m water depth. To evaluate scenarios and production solutions, Ramboll conducted feasibility and conceptual studies, which formed the technical basis for the development of the field. A FEED study served as basis for an overall platform and jacket EPC tender. DONG Energy plans to produce first oil and sales gas in 2015 from this central hub for future discoveries in the North Sea.

LONG-TERM PARTNER
Over a 10-year period, Ramboll left a solid footprint on the Halten field development project with a significant number of studies and detailed designs for topsides, modules and a total of six jackets.

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From Field Development to Production Optimisation and Lifetime Extension
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Long-Term Partner
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Four Decades of Experience
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POLVO FIELD DEVELOPMENT, BRAZIL
Ramboll provided engineering and design services for a fixed production and drilling platform at 100 m water depth connected via two pipelines and a submarine cable to an FPSO. The project also comprised sizing the pipelines to carry production to the FPSO and injection water from FPSO to platform. 

UNMANNED MINIMUM PLATFORM
A cost-effective, light-weight structure with reduced steel weight and optimised topsides facilities has proven to be a unique alternative to subsea solutions on marginal fields. It can be used as stand-alone or satellite platform for the successive development of existing fields.

LIVING QUARTERS
A feasibility study on the Norwegian Oseberg C platform allowed operator Statoil to evaluate the possibilities of extending cabin capacity including lifeboat installation.

3D SCANNING OF PLATFORMS
In connection with modification projects offshore, precision survey scanning converted into 3D models allowed Maersk Oil to control new components prior to implementation. The result was reduced shutdown time and less offshore trips, and avoiding inherent geometrical problems from retrofit designs.
FLOATING PRODUCTION

WEIGHT, SAFETY AND SPACE ARE KEY CONCERNS

Long-term prospects remain promising for the floating production sector as semisubmersible platforms and FPSO type vessels continue to be the best answer on deep-water fields.

Weight is a main challenge, and Ramboll offers precision weight monitoring allowing modifications to take place while observing changes in weight distribution and centre of gravity.

Safety is a key concern on all installations and we have therefore made risk and safety studies an integral part of our floating production service portfolio.

The confined space calls for optimised topsides designs, which is one of Ramboll’s key areas of expertise. Our service portfolio includes project management, conceptual studies, FEED and detailed design of topsides facilities.

Drilling rig projects are also part of Ramboll’s portfolio with a track record of projects to increase well capacity and convert water injection wells to oil producers.

WEIGHT, SAFETY AND SPACE ARE KEY CONCERNS

DRILLING MODULES FOR THE FIRST FDPSO
For the Azurite FDPSO producing offshore The Democratic Republic of the Congo, Ramboll designed ten drilling modules, which became permanent fixtures to the ship. The Azurite is the world’s first FDPSO, which combines features of a drillship and an FPSO on a single ship. It is a robust concept with potential for broader applications as the industry seeks new ways to monetise isolated fields. (Image right)

TECHNICAL SAFETY ON GOLIAT FPSO, BARENTS SEA
In order to ensure safe operation in arctic conditions, Ramboll carried out a winterization project to study the effects of the cold climate on the structure and on the working conditions of the crew. (Image top)

GENERIC SHIP-SHAPED FPSO
For the Nexus project, Ramboll carried out pre-engineering and detailed design of all topsides structures and facilities, including layout and assessment of process facilities on deck. The team also conducted a number of key environmental and safety studies which optimised the design and improved safety considerably. (Image right)
PIEINES & SUBSEA

WORLD RECORD FOR DEEP WATER INSTALLATION OF A 36” PIPELINE

Based on experience from a broad spectrum of pipeline projects, Ramboll provides subsea operation services and optimised design of subsea structures.

We have designed some of the most challenging pipeline systems in the world using state-of-the-art solutions and technical engineering tools, adopted to provide cost-effective and robust solutions for our clients. Our services cover oil and gas transmission pipelines as well as infield flowline systems.

Especially on subsea tie-back projects with topographical challenges combined with high pressure and high temperature operation, we have exceeded expectations.

For maturing pipelines we handle all brownfield engineering aspects related to reassessment of structural integrity, reinforcement works and inspection planning.

RUSSIAN KIRINSKOEY FIELD – ENGINEERING IN THE ARCTIC REGION

The Kirinskoye gas and condensate field operated by the world’s largest gas producer Gazprom is located 28 km off the island of Sakhalin in the Sea of Okhotsk. This Arctic region posed serious challenges with up to seven months of ice cover per year, a strong wind and vigorous waves, and one of the most important tasks was to act fast and be precise. Ramboll carried out critical installation analyses and assisted in developing the pipeline installation procedures for the challenging Okhotsk Sea conditions including state-of-the-art dynamic finite element modelling of the pipeline installation.

RECORD-BREAKING POLARLED PIPELINE

This unprecedented 481 km pipeline crossing the Arctic Circle on an extremely uneven seabed connects new fields in the Norwegian Sea with existing infrastructure to secure future energy supply to Europe. The pipeline will be installed at water depths reaching 1,265 m, setting a world record for deep water installation of a 36” pipeline. Ramboll has been instrumental in designing the pioneering technical solution for the pipeline, incl. FEED, detailed design, route optimisation, pipeline tie-in, geotechnical foundation design, risk and safety, EIA, and interface coordination. (Image top)

NORD STREAM PIPELINE, BALTIC SEA

The Nord Stream pipeline is the world’s largest gas pipeline and was built to supply natural gas to Europe from Russia. It transports up to 55 billion m³ of gas per year, which is sufficient to supply more than 26 million households. The route designed by Ramboll through the Baltic Sea traverses unique ecosystems as well as busy shipping routes along with areas where chemical munitions were dumped and dangerous sea mines are abundant. Ramboll handled permitting procedures and stakeholder relations, and due to the early-stage environmental planning and input into the construction design, the pipeline was built without significant environmental impact. (Image bottom: © Nord Stream AG)

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ONSHORE PRODUCTION & REFINING

STATOIL REFINERY
The level of harmful substances in gasoline and diesel oil was reduced at Statoil’s Kalundborg refinery after a long line of green projects including major modifications on the existing facility with the aim to reduce hydrocarbon discharge into the atmosphere. Ramboll provided HSE studies, concept studies and detailed design for key elements of the various projects i.e. the installation of a degasser module, a visbreaker train, a new splitter and diesel reactors, improving the production facilities and benefiting the environment. (Image left)

SMOKELESS FLARE AT FAHAHIL STRIPPING PLANT, QATAR
The Dukhan oil field on the west coast of Qatar had for years suffered from polluting smoke from the flares. By remodelling and enlarging an existing old flare system, improving combustion technology, as well as finding a method for reclaiming some of the gas that would otherwise be burnt in the tower, we were able to minimise the adverse environmental effects at the Fahahil stripping plant. (Image right)

With the constant need to upgrade existing facilities, Ramboll offers our clients vast practical experience within a wide range of areas relating to onshore production and refining.

Apart from oil and gas expertise, we offer our clients within the onshore sector assistance on Ports & marine and Roads & urban development. In this way we provide our oil and gas clients with easy access to integrated civil engineering services.

INTEGRATED CIVIL ENGINEERING SERVICES

TERMINALS, STORAGES & PIPELINES

ADDING EXPERTISE ON LOCAL REGULATORY FRAMEWORKS

Ramboll has provided consultancy services to the midstream sector for years, and our solutions have evolved with the needs and challenges facing the industry.

Our involvement comprises terminals, cross-country pipeline systems and large-scale gas storage projects ranging from depleted reservoirs to aquifer reservoirs and salt caverns. We provide integrated project work that covers all areas of engineering, economics and environmental & authorisation regulations.

GASSCO EMDEN GAS RECEIVING FACILITY
After more than 50 years of operation, the Norsea Gas Terminal securing a steady supply of energy to Europe needed to be refurbished to maintain safe and reliable gas transportation. The major scope of work included new receiving-, gas heating-, utilities and process facilities. Ramboll carried out the FEED study proposing the technical solution for the major revamp, which ensured continued operation. (Image: © Gassco)
GAS & LNG

BRINGING SOCIO-ECONOMIC, ENVIRONMENTAL AND TECHNICAL INSIGHTS TO ENERGY DECISION MAKERS

For the gas sector, it is of particular interest that Ramboll carries out comprehensive market analyses and feasibility studies, which form a necessary basis for all decision making on long-term strategic gas projects. Our specialisation in early-phase studies for LNG projects is a good example of this.

Ramboll has been involved in large-scale transmission and gas storage projects covering services such as feasibility studies, project concepts, environmental impact studies, basic and detailed engineering, risk analysis, authority management, and project & construction management.

The emergence of unconventionals has promoted a holistic approach to creating development plans, which cater for all the needs arising from massive demographic and infrastructural changes. Ramboll has vast civil engineering expertise within Ports & marine, and Roads & urban development to respond to this development.

Upgrade of LNG Berth at Ras Laffan, Qatar
Ras Laffan is the centre of LNG and GTL activities in Qatar and the port is considered one of the largest LNG export facilities in the world. Ramboll provided the detailed engineering for a series of modifications of the berth facilities necessary to accommodate the new generation of large LNG carriers. (Image left)

GAS Utilisation Study, Yemen
With poor infrastructure in Yemen, a study to estimate the current and future availability of natural gas was an important part of an international project to replace oil, the main source of energy in Yemen, with natural gas and reach remote parts of the country. (Image right top)

LNG Import and Regasification Facility in Finland
A feasibility study by Ramboll investigating LNG import and regasification plant options in Finland paved the way for connecting the Baltic States to the existing natural gas transmission system in the Baltic Sea region. The study involved investigation into novel onshore and offshore techniques for offloading and regasification of LNG in special consideration of navigating in the narrow Finnish archipelago in cold climate. (Image right bottom)
SOFTWARE SOLUTIONS

One of the cornerstones of our business is the in-house software solutions developed to cater for specific project needs.

Our cutting-edge analysis software programmes RONJA and ROSAP are indispensable tools for new design, modification work and lifetime extension assessments of onshore and offshore steel structures. The software programmes can document additional capacity or be applied for the re-evaluation of existing facilities. (images 1, 4 and 5)

Our P&ID tagging programme developed for and owned by Maersk Oil, enables easy access to information of asset equipment. By clicking the tags on the diagram the user is instantly provided with all available information, increasing safety on the platform. (Image 2)

For all offshore investments, precision weight and cost engineering is key for the bottom line. Ramboll has developed the software system MON for monitoring and controlling weight, loads and centre of gravity. MON functions as an inexpensive insurance against instability and structural overutilisation. Our WEPS tool has proven its efficiency providing accurate cost estimates based on historic weight data.

To address issues such as thermal buckling of pipelines, Ramboll has developed the comprehensive design analysis package GOLIAT (General Offshore Linepipe Analysis Tool) for the oil and gas industry. The end result for the client is a cost-optimised design with a documented safety level. (Image 3)

Ramboll Smart Inspection makes it possible to collect and store inspection data during routine check-ups, rendering a full overview of installation conditions and remote access to accurate data at all times. (Image 6)

HISTORICAL DATA IN WEPS

The database provides exact information regarding equipment lists, area requirements, dry weights, costs, man hours, norms and rates. Key project data such as a field’s forecasted oil and gas production can be benchmarked against close-out reports and as-built information.

AWARD-WINNING PIPELINE DESIGN ON TYRIHANS

Ramboll carried out detailed design of infield HP/HT flowlines on the Statoil-operated Tyrihans field, developing it with four subsea production templates connected to the Kristin platform through a production pipeline. GOLIAT was applied to predict the 3D buckling behaviour of HP/HT pipelines, thereby enabling us to optimise the seabed intervention work required for a safe and sound operation of the pipeline. In 2010, the pipeline project was awarded the Five Star Award at the Deep Offshore Technology Conference in Houston. (Image bottom right: © Statoil)
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