THE TECHNICAL ADVISOR TO THE OIL AND GAS INDUSTRY
INVESTING IN THE OIL AND GAS INDUSTRY’S FUTURE

The oil and gas industry is venturing into uncharted territory, as increasing energy demand takes operations into harsher environments and greater technical complexity.

The sector faces a new normal in hydrocarbon exploration, production and distribution, and its success will rely on rethinking the boundaries in asset safety, reliability and performance.
DNV GL partners with our customers and the oil and gas industry to promote progress. From creating gas distribution networks for growing cities to extending the lives of oil platforms in mature oil fields and assuring the performance of new pipelines, DNV GL’s 5,500 exceptional industry experts have tackled complex challenges at every stage of the asset lifecycle.

Through world-class marine and onshore technical assurance, advisory and risk management services, we help customers to perform on time, on budget and to high quality standards, often in the most demanding environments.

United by our vision to create a safe and sustainable future, DNV GL works to drive the sector forward by collaborating with industry partners to define internationally recognised practices, standards and systems.

As the leading technical advisor to the global oil and gas industry, we enable safer, smarter and greener operations in every hydrocarbon-producing country in the world.
A NEW COMPANY WITH 150 YEARS OF EXPERIENCE

Our name is new, but our company is backed by 150 years of deep industry experience.

In September 2013, DNV and GL Noble Denton joined forces to bring greater expertise and enhanced innovation capabilities to our customers. We formed DNV GL - Oil & Gas because we had a vision to draw upon our proud heritages to build an industry-leading technical advisor that could drive innovation and standardisation on behalf of the whole sector.

OUR COMBINED HERITAGE IN BRIEF

1864
Det Norske Veritas (DNV) is established as an independent foundation to inspect and evaluate the technical condition of Norwegian merchant vessels.

1867
Germanischer Lloyd (GL) is founded as a maritime classification society.

1904
The Noble Denton Group of companies is founded to provide technical assurance and project execution services to complex marine operations.

1954
DNV opens a dedicated research department to enhance and develop services, rules and industry standards.

1961
Noble Denton expands business offering to include seafaring and gas engineering services in the North Sea.

1970
DNV enters the oil business, in both the offshore installations and cargo sectors, including pipelines and vessels.

1976
GL diversifies to provide technical services to the oil and gas industry.
Together, DNV and GL Noble Denton has become the leading provider of risk management, technical advisory and technical assurance services to the oil and gas industry.

We are an innovation powerhouse with the technical skills, scale and scope to tackle the industry’s most complex challenges. We are a strong and independent third-party advisor that is also working to promote greater transparency in the industry by developing, setting and sharing new standards. And, we are an expert service provider, dedicated to helping our customers achieve safer, more reliable and enhanced performance in their projects and operations.

Our goal is to help our customers to also achieve their visions for growth. As DNV GL, we will continue to invest five per cent of our revenues into research and development, and in creating standards and practices that benefit our customers and the industry at large.

Our strategic goals:
- To be the leading provider of risk management, technical advisory and technical assurance services:
  - to the upstream oil and gas industry in challenging operating environments
  - across the entire gas value chain
- To drive the oil and gas sector to become safer, greener and smarter by offering unique technical competence and innovation.

2004
Noble Denton strengthens R&D, engineering and project management capability through acquisition of BCOME Ltd (UK).

2005
DNV acquires Cortest Columbus Technologies (USA and Canada), specialising in corrosion, pipeline integrity, failure analyses and material evaluation for the oil and gas industry.

2007
GL acquires Advantica (UK), the former R&D arm of British Gas, and Canadian PV Inspection Services.

2008
GL acquires risk management consultancy Trident Consultants (Malaysia); Noble Denton acquires Standard Engineering AS, a Norwegian engineering services and naval architecture company.

2009
GL acquires Noble Denton. GL’s Oil & Gas division and Noble Denton form GL Noble Denton.

2013
DNV and GL Noble Denton join forces to create DNV GL – Oil & Gas.
DNV GL has one of the highest levels of investment in innovation in our sector, dedicating five per cent of annual revenue to the research and development of new technologies and solutions for our customers. By investing in the future today, we will be able to identify and solve tomorrow’s technical challenges, from safety and reliability issues in ageing subsea assets to the prevention of oil spills in the Arctic.

Our R&D centres and testing laboratories generate industry-leading solutions, many of which have been produced in collaboration with our customers and the industry at large. We lead more than 100 joint industry projects annually, combining our expertise with that of the sector to identify and find solutions to its most complex technical challenges. Every year, we also run around 70 internal technology projects, all of which are aimed at building new technical competences so that we can bring our customers greater value.

For generations, we have collaborated with some of the oil and gas sector’s best-known operators, suppliers, regulators and industry bodies to develop and maintain industry best practice, and we have a firm commitment to continuing this work for a global impact on safeguarding life, property and the environment.

DNV GL sets the benchmark in oil and gas industry best practice, offering open access to more than 170 oil and gas industry standards and recommended practices.

**UNPARALLELED INVESTMENT IN R&D**
- Five per cent of annual revenue reinvested into research and development every year
- R&D centres in the Netherlands, Norway, Singapore, the UK and the US. These include our high pressure natural gas calibration and testing facility in Groningen, the Netherlands, and our Spadeadam large-scale test centre in northern England
- More than 100 collaborative industry projects managed annually, from developing new practices in oil spill response readiness verification to devising new safety standards for Arctic exploration and creating energy-efficient and environmentally-friendly offshore vessels
- Around 70 internal technology projects run annually to ensure that we remain at the forefront of new developments.
"Joint industry projects play an important role in developing DNV GL’s competence, industry standards and recommended practices. By combining forces with key players across the industry – many of whom are our customers – we are able to benefit from a wide field of expertise, and to approach and solve complex problems from a number of different perspectives.

“I am currently DNV GL Project Manager for a joint industry project targeted at determining a more accurate vortex-induced vibration (VIV) assessment of complex jumper systems. In particular, we are looking to study the potential future impact of incorporating U, M and Z-shaped pipeline systems into new projects, which allow for design flexibility, but are at greater risk of VIV-related fatigue. Currently, no software or validated methodology exists to assess risk or damage on such complex structures, and our work will seek to bridge this gap by obtaining the technical knowledge needed to establish best practice and promote real progress in this area.”

Aravind Nair, Project Manager
EXCEPTIONAL PEOPLE

An acute shortage of skilled professionals is affecting every area of the oil and gas industry’s development. As our customers focus on increasing their standards of global delivery, it is critical that they partner with a trusted, independent and globally consistent source of support and expertise.

DNV GL meets that need head-on, offering access to more than 5,500 exceptional technical experts with a passion for solving the most complex technical safety, reliability and performance challenges in projects and operations.

Our global network of experts includes the industry’s forefront specialists in every major operational area from subsea and floating production platforms, semi-submersible rigs and pipelines to receiving terminals, and even national and city gas distribution networks.

Our customers tell us that they choose to partner with us because our people work hard to understand their needs and deliver the highest standards of expertise to match.

We invest in developing the competencies of our employees, helping DNV GL’s experts to stay at the cutting edge of their technical fields through internal and industry qualification and training schemes, as well as technology programmes with academic partners, such as the University of California at Berkley. This enables our people to develop further their core competencies and ensures consistent global delivery across our services.

CHALLENGING GAS FIELDS IN AUSTRALIA

“The Wheatstone gas field megaproject is a large and complex development that has drawn in-depth technical expertise from DNV GL’s local team in Australia as well as our specialists around the world. Due to the project’s unique size, design and demanding location, our customer needed access to a specific range of services. Our experts were able to tackle the company’s complex engineering challenges head-on, in addition to verifying the fabrication and installation of the infrastructure, and applying DNV GL’s offshore standards across the design and construction phases.”

Darren McFarlane, Project Sponsor
Technical assurance
Certification and verification services
Underpinned by world-class standards and recommended practices, DNV GL’s independent certification and verification services are trusted by companies across the world. Our network of engineers and surveyors verify and certify the integrity and performance of assets, issuing reports, certificates and statements of compliance to ensure our customers’ plans, procedures and assets meet the required regulatory, financial and operational requirements.

Inspection services
Our global network of inspectors and dedicated customer coordinators provide peace of mind that companies are complying with the latest regulatory and quality assurance demands across the lifecycle of their assets. We use years of experience and pioneering software to test, monitor and record...
items and equipment at every stage of an asset’s development.

Noble Denton marine assurance and advisory
DNV GL has set the standard in marine assurance and advisory services since the offshore oil and gas industry’s inception. Our experts provide an extensive range of services to help customers reduce operational risk by partnering with a single global marine advisor. We are the leading authority on regulatory compliance, code development and international offshore standards.

Risk management advisory
DNV GL’s risk management advisory services are among the most renowned in the oil and gas industry. We have a proven track record in delivering effective risk identification, assessment and mitigation advice to customers, and our team of safety and risk experts extends to every major energy centre in the world. We invest in innovation and safety-related research to ensure that our customers consistently receive world-class technical advice to safeguard life, property and the environment.

Technical advisory
DNV GL is an industry leader in oil and gas technical advisory services, drawing upon the exceptional engineering skills of a global network of specialists to provide technology qualification, technical assessment and operational integrity services across the asset lifecycle. Our experience provides customers with the deep technical expertise they require to ensure projects and on-going operations are safe and fit for service, irrespective of scale, complexity or location.

Offshore classification
DNV GL’s Maritime business area assists customers in their work to ensure safety and reliability at all phases of a mobile offshore unit’s design, construction and operation. We have a distinguished heritage of defining risk-based procedures and requirements for MOUs, and of verifying that the required safety standards are met throughout the design, construction and operational phases of those assets.

Software solutions for the oil and gas industry
DNV GL’s complete range of oil and gas software solutions provides companies with the systems they need to improve safety, reliability and performance across their asset portfolios. Our software solutions support the full asset lifecycle, providing planning, simulation and management tools that help companies to manage risk and integrity, and to optimise production and output.
SERVICES FOR PROJECT STRATEGY, CONCEPT AND FEASIBILITY

As companies battle with more complex capital cost structures, the need to ensure the highest standards of asset safety, reliability and performance begins at the earliest stages of project planning.

DNV GL provides access to decades of hands-on experience in identifying and mitigating risks in an oil and gas operation. We enable our customers to save considerable amounts of time and money by avoiding the need to go back to the drawing board to address an issue later down the line.

Enterprise risk management services
DNV GL gives customers the guidance they need to make the right investments in new oil and gas projects. Our expert enterprise risk management advisors have conducted value chain assessments, commercial risk investigations and technical due diligence studies for some of the world’s most capital-intensive projects.

Concept and engineering support
DNV GL enables companies to overcome complex technical hurdles as they move from concept to realisation of a project. Our field development concept services can identify practical and viable solutions that can be taken to the FEED project phase, and our specialists study field operating environments to plan the installation of floating structures into offshore locations. We’re supported by worldwide subsea, umbilical, risers and flowlines (SURF), technology qualification and process engineering teams, who understand what it takes to deliver appropriate and pragmatic concepts.

Project certification and verification
Our experienced risk-based verification teams provide companies with decades of independent appraisal expertise to ensure that projects are developed in accordance with their objectives, the latest regulatory requirements and the most advanced production technologies.

Safety and risk management services
DNV GL supports customers with safety and risk management from the earliest phases of a project.

Our environmental impact assessments offer industry-leading advice on the potential effects of a project on its surroundings, and we specialise in robust safety case development to ensure it meets regulatory requirements.

We also partner with national, international and independent operators to set up effective management system and performance management strategies, and our team of human factors psychologists helps customers to determine what will drive the frontline risks of a project.

Technology qualification and assessment
Backed by our world-renowned testing facilities and on-going investment in R&D, DNV GL is able to offer customers deep insight into the structural integrity of the new technologies that are being developed to address ever more complex projects and environments.

Our systematic risk-based technology qualification process clearly documents the performance of new innovations in challenging environments, while our risk and reliability analysis experts help to develop practical solutions to technical challenges before new technologies come into operation. This is further supported by our industry-leading value optimisation services, which help to increase the operating efficiency of assets.

Technical advisory
DNV GL’s technical experts assist operators, insurers and contractors from the earliest stages of project
DEVELOPING AN OFFSHORE SAFETY FRAMEWORK FOR IRELAND

“DNV GL worked with Ireland’s Commission for Energy Regulation to develop a new Petroleum Safety Framework for the country’s growing upstream industry. Best regulatory practices, including ALARP, verification and Safety Cases, were identified by DNV GL and have been incorporated into the framework, to make it one of the most advanced regulatory systems in the world.”

Dr John Morgan, Head of Consulting and Compliance

concept and development, whether they require support on field development planning, project due diligence or analysis and engineering consulting on a specific technical aspect.

Noble Denton marine advisory

Drawing on specialist offshore experience and detailed asset knowledge, Noble Denton’s global team of experts works with customers during the concept selection phase of a project. Advisory services for the upstream oil and gas industry are performed for the purpose of marine suitability and include FPSO conversion, pre-purchase inspections, MODU suitability, audits and on/off hire surveys.

Offshore classification

The offshore classification services provided by DNV GL’s Maritime business area assist customers during the pre-contract and concept phases of a new offshore drilling or production unit by detecting and resolving potential areas of concern. As part of the concept evaluation phase, our experts will also assess the proposed facility for consistency, materials and structural strength.
Services for Project Design, Construction, Installation and Commissioning

Access to knowledge, detailed analysis and practical experience plays an important role in the safe and secure launch of any new asset or operation. Drawing on decades of technical insight, state-of-the-art software and hands-on support, DNV GL’s experts can provide guidance from the earliest stages of project design through to construction, commissioning and beyond.

Technical due diligence and project risk management

DNV GL’s expert technical due diligence teams have extensive sector experience in helping customers to evaluate and monitor project delivery. We provide independent assessments of asset risks and controls to financial institutions, ensuring projects will be completed on time, on budget and to quality standards.

Our tailored quantitative risk assessment services, including value chain and supply chain assessments, and project risk management and risk response planning, help to put safety measures in place during project design, construction, installation and commissioning.

Technical assurance

Certification and verification services

Our global network of specialists performs independent design verification and surveys to DNV GL’s world-class industry standards, and other recognised codes of practice, for all types of assets and equipment intended for our customers’ projects. This helps companies to reduce possible risks, as well as to improve the quality and performance of the end product.

Inspection and quality assurance services

DNV GL’s expert team of inspectors monitors the design, construction, installation, commissioning and operations of oil and gas projects across the world. Our work is supported by market-leading software solutions that ensure bespoke scheduling, execution and reporting processes are delivered to the individual requirements of our customers.

THE TALLEST STRUCTURE EVER MOVED BY MAN

“Our Noble Denton marine assurance and advisory team has played a key role in the inspection, towage and installation of some of the world’s most important and innovative offshore structures. This has included providing marine warranty services to the tallest structure ever moved by mankind: the 472-metre high Troll A platform in the North Sea.

“Installing any new asset takes careful planning, but the Troll A posed additional challenges due to its considerable size and 656,000-ton weight. DNV GL’s staff of experienced mariners and technical advisors supported the customer throughout the design, construction and implementation phases of the new platform, evaluating the operational risks, inspecting the design, plans and progress, and overseeing load-out, deck-mating, tow-out and installation, in order to ensure the project’s success.”

Mike Hoyle, Head of Advanced Engineering
We use tried-and-tested quality assurance and control methods – from ISO standards testing to vendor assessment and internal auditing – to help achieve quality standards in procurement and supply on time and to budget.

**Noble Denton marine advisory**

Our industry-leading Noble Denton marine advisory services draw upon 150 years of experience to deliver fast, reliable and innovative solutions to complex technical challenges during project design and development.

DNV GL’s team of master mariners, naval architects and specialist engineers provide in-depth technical marine and engineering assessments, including dynamic positioning advisory services, vessel suitability studies and advanced vessel towing and installation programmes. Our geotechnical, jack-up and structural engineering teams also assist customers in navigating complex structural and material problems for safe operations.

**Classification of mobile offshore units**

DNV GL’s Maritime business area supports customers during the design, fabrication and commissioning of mobile offshore units, including certifying the materials and components used. Our design brief review and approval services ensure that new projects comply with relevant standards and classification rules, while our maritime specialists conduct surveys and audits to ensure that the unit is built to the approved drawings and plans. This includes monitoring the yard and sub-contractors using frequent spot checks and inspections to assure quality control at every phase of a project’s construction.
SERVICES FOR ASSET OPERATION, LIFE EXTENSION AND DECOMMISSIONING

It is crucial to proactively manage the safety, reliability and performance of an oil and gas asset once it is operational. DNV GL’s transparent and independent approach to asset integrity management, asset optimisation, and technical and marine assurance enables customers to monitor, predict and ensure the safe performance of all their installations.

Emergency planning and response services
DNV GL works with operators to create clear strategies for action should the worst occur. We develop emergency response plans, oil spill contingency analysis and well risk assessments for some of the world’s most complex operations, and our team of technical experts is on standby to help identify the root cause of an incident though material and failure analysis, and marine casualty investigation.

Asset optimisation services
DNV GL’s asset optimisation services provide tools and systems to optimise asset energy, production and processing. We are highly experienced in increasing production revenue and reducing operating expenditure through quantitative risk assessments, advanced simulation and modelling, and flow assurance services.

Our experience in environmental technology management and carbon capture and storage consultancy also helps to optimise asset energy usage, manage emissions and reduce environmental effects.

Verification and certification during asset operations
DNV GL’s independent follow-up during the lifetime of an asset provides assurance that pipelines, offshore installations and process facilities are installed, maintained and operated in line with project objectives and requirements from regulators and operators. Re-certification and periodical control of equipment documents compliance, and provides confidence for future operations. Our teams of experts provide assessments according to international and national regulations, in addition to DNV GL standards.

In-service offshore classification
Our Maritime business area offers regular surveys of mobile offshore units to ensure that they are operated and maintained to the build’s original safety standards. Damage, such as cracks, serious corrosion and indentations, is recorded alongside risk and consequence assessments, enabling operators to identify and prioritise areas for repair.

Asset integrity management
DNV GL’s asset integrity management services enable customers to review, benchmark and improve the performance of their oil and gas operations. From reliability, availability and maintainability (RAM) studies to maintenance inspection management and pipeline up-rating, our operation performance services have been designed to safeguard the capabilities of every asset.

Enterprise Risk Management
Our enterprise risk management services assist customers in their goals to safely extend the working lives and optimal output of their assets by combining both technical and economical risk considerations. This includes basin reference planning to evaluate the structural integrity of existing facilities in light of technical challenges and operating costs, as well as the potential applications of new technologies to increase longevity, efficiency and performance.
BRENT FIELD DECOMMISSIONING

“DNV GL helps customers to identify the ecological and societal implications of decommissioning ageing assets, and to balance regulatory requirements with cost, resource and waste considerations. The decommissioning of four complex platforms in the North Sea’s Brent Field posed a number of technical challenges and considerations in this regard. DNV GL’s team included underwater noise, drill-cutting and marine toxicology specialists to provide safe and sustainable options for the disposal of these assets.”

Mark Purcell, Project Manager

Asset life extension and decommissioning

DNV GL partners with asset owners and operators to provide deep technical expertise on extending the output of existing facilities beyond their intended working lives. Our asset life extension services include structural reliability analysis to address safety issues around ageing infrastructure, while our decommissioning services help to ensure the safe and complete disposal of installations once they become redundant, in line with regulations and best practice.

Noble Denton marine assurance

Our specialist team of mariners and naval architects has set the standard in marine warranty surveys, developing technical audits to assess the readiness of marine operations and providing insurers with the impartial technical advice they need to support their decisions.

Our proven dynamic positioning assurance, FMEA and FMECA services are used on all types of offshore support vessels to safeguard operations, even in the most extreme operating environments.
LOCAL EXPERTISE WITH A GLOBAL PRESENCE

DNV GL offers access to more than 5,500 oil and gas industry technical experts around the world. We have offices in 39 countries and a presence in every hydrocarbon-producing country.
WE HAVE MULTIPLE OFFICES IN A RANGE OF KEY COUNTRIES:

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Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organisations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries.

Combining leading technical and operational expertise, risk methodology and in-depth industry knowledge, we empower our customers’ decisions and actions with trust and confidence. As a company, we continuously invest in research and collaborative innovation to provide customers and society with operational and technological foresight. With our origins stretching back to 1864, our reach today is global. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping customers make the world safer, smarter and greener.