

Oil & Gas

GL Noble Denton



ASSURE

DELIVERING RESULTS

Tight regulations, demanding environments and increased cost pressures have made oil and gas operations more challenging and complex than ever. But there's no compromise when it comes to maintaining high safety standards, delivering top quality performance and ensuring technical integrity.

Finding a partner to deliver world-class, independent technical advice at excellent value is crucial.

From planning field development in fragile ecologies to managing pipeline construction in the Arctic, GL Noble Denton is trusted by oil and gas industry leaders to implement change and deliver results. We offer independent technical advice to help make on- and offshore operations compliant, safer, more reliable and more efficient.

Using unmatched innovation, experience and intelligence, together with market-leading software solutions, GL Noble Denton helps mitigate risk, comply with stringent regulations and improve performance at every stage of the asset lifecycle, from design to decommissioning.

Our award-winning teams of industry thought leaders have provided pioneering solutions and technical advice to sector-leading organizations in more than 100 countries.



We deliver results.

TRUSTED BY INDUSTRY LEADERS THE WORLD OVER

Assurance underpins every aspect of the oil and gas industry, and our clients need complete confidence that their plans, procedures and assets meet regulatory, financial and operational requirements at all times.

GL Noble Denton's proven assurance services are trusted by industry-leading organizations across the world, and our elite team of engineers have in-depth experience in providing assistance on a wide range of projects, from subsea and floating production inspection to national and city gas distribution development.

GL Noble Denton's global assurance services include:

Safety and Risk Consulting

We offer a full range of technical consulting services that help manage risk mitigation across the oil and gas value chain. From the delivery of technical and safety training at an offshore site, to the execution of full-scale destructive experiments on an asset at our unique test center in the North of England, industry leaders trust GL Noble Denton to provide results that keep their people and their brands away from harm.

Marine Warranty

Our independent and unbiased expertise is trusted by insurance underwriters to evaluate the operational risks and feasibility of working practices across the industry. We're proud to be recognized as thought leaders in marine warranty services, and the guidelines that we frequently publish are often adopted as industry best practice.

Certification and Verification

Our design appraisal and inspection experts identify and assess the safety, environment and business-critical elements of an asset, helping to maximize its safety and reliability throughout its lifecycle.

Inspection and Quality Assurance

GL Noble Denton's expert teams monitor the manufacture, 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 clients.



SAFETY AND RISK CONSULTING

From concept to decommission, safety is the most critical element of an asset. Operators need to rely on a partner that will consistently deliver world-class risk management services, protecting both their people and their brands.

GL Noble Denton has a proven track record in delivering effective risk mitigation advice to some of the oil and gas industry's best known organizations. We continue to invest heavily in innovation and safety related research, and play a lead role in developing industry best practice.

Safety Cases and Compliance

We work hand-in-hand with clients across the world to prepare safety cases and other documents that are required to prove compliance with the law, industry regulation and corporate governance procedures. We are widely recognized as market leaders in identifying, assessing and managing asset hazards and risks, helping operators develop procedures to prevent a range of incidents from occurring, from noise pollution to structural failure.

Quantitative Risk Assessment

GL Noble Denton has developed quantitative risk assessment (QRA) studies for a broad range of on- and offshore oil and gas assets, comparing environmental, employee and public risk levels against regulatory risk criteria. We support clients across the world with the identification and assessment of potential accidents that could contribute to the overall risk of a facility, as well as the specification of measures to reduce risk.

Incident Investigation

Over the past 25 years, GL Noble Denton has gained considerable experience in conducting technical investigations into incidents and the failure of assets across the industry. Our expert teams are counted upon by organizations across the world, from industry operators to national governments, to provide detailed incident reports and act as expert witnesses where necessary.

On-site investigations are supported by a range of sophisticated instrumentation within our laboratories, mathematical models to predict the consequences of incidents and metallurgical and engineering assessments to determine the causes of failures.

Technical and Safety Training

GL Noble Denton provides safety training to some of the oil and gas industry's key players. Our courses are run by experienced professionals, and are specifically developed to match clients' needs. Courses can be delivered face-to-face and via e-learning platforms.

Courses include:

- Hazard awareness training
- HAZOP training
- Leadership in an emergency
- Preparing a plant for maintenance
- Quantitative risk assessments
- Ship/shore interface
- Storage tank design; and
- Total asset integrity management



LARGE SCALE HAZARDS TESTING

GL Noble Denton's Spadeadam Test Site

Located in Cumbria UK, GL Noble Denton's Spadeadam test site is one of the world's only centers designed to carry out wide-ranging tests on oil and gas assets, simulating real-world environments. Our team of on-site scientists and engineers have the operational expertise to construct bespoke test scenarios for a broad assortment of equipment and materials, helping the industry to validate models and design codes, and provide accurate test measurements.

The site's remote location and secure access has given many oil and gas organizations access to some of the world's most advanced destructive and non-destructive test facilities to carry out discreet research and design with complete confidentiality.

Gas Explosion Testing

GL Noble Denton has more than 30 years' experience of testing large scale gas explosions in both confined and unconfined areas, or within regions of pipework and vessels typical of process sites. The Spadeadam test site has extensive facilities, enabling the controlled release of pressurized gas or volatile liquids. The resulting gas cloud accumulations can be measured to determine concentration levels.

Blast and High Explosive Testing

With the capability to carry out tests up to a net explosive quantity of 500kg TNT equivalent, our qualified explosives engineers are able to analyze the blast loading effects of a wide variety of fully instrumented structures, coupled with high speed data acquisition and video photography.

Fire Testing

GL Noble Denton Spadeadam has developed the facilities and expertise to perform a wide variety of fire tests including ISO standard interim jet fire impingements and various liquid pool fires. Test rigs and programs can be designed to meet specific client requirements or existing facilities may be utilized to provide a more cost-effective approach.

Corrosion and Materials Testing

We have provided clients from across the world with access to facilities that are able to deliver intensive and long-term testing on the resistance of materials subjected to corrosive environments, for example gaseous and multi-phase liquid mixtures involving H₂S or CO₂.



MARINE WARRANTY

Working on behalf of the world's leading insurance underwriters, GL Noble Denton is widely regarded as a leading authority in evaluating operational risks and assessing the feasibility of working practices across all aspects of the oil and gas industry's marine operations.

Our leadership position in marine warranty has seen marine contractors and operators – and even our competitors – adopt and reference the guidelines that we set.

GL Noble Denton issues marine warranty approvals for some of the world's largest field developments, and our innovative approach to the industry guarantees our involvement with pioneering concepts such as tension leg platforms, spars and the world's first floating production facility. We provide marine warranty services for complex operations associated with construction, the towage and installation of steel jackets, concrete structures, floating

production facilities, pipelines and subsea equipment. We also provide approvals for the decommissioning and removal of a wide range of offshore production facilities.

GL Noble Denton leads the field in the site-specific approval of MODUs, including jack-ups, semi-submersibles and drill ships, and our involvement in establishing international standards for such approvals enables our teams to provide the most accurate and informed decisions for our clients.



DYNAMIC POSITIONING

As the offshore oil and gas industry continues to explore deeper waters, the need to rely on computer systems to automatically maintain a vessel's position and heading becomes increasingly important. GL Noble Denton provides market-leading Dynamic Positioning (DP) assurance services that ensure the risk of DP failure is analyzed and mitigated at every level.

GL Noble Denton's global DP team provides first class independent technical reviews of marine systems, including design and failure analysis of redundancy concepts for DP Class vessels. Our DP assurance, failure mode effects analysis (FMEA) and failure mode effects and criticality analysis (FMECA) services are used on all types of offshore support vessels – from large drill ships to smaller, high-speed crew boats.

Through our global DP Center of Excellence, we are committed to developing and maintaining the highest possible industry standards, and our extensive guidelines are used by key players on many technically challenging projects. Each of our regional DP centers and local offices works to international, national, Class and IMCA standards, as well as equipment-specific regulations, such as those for diving or crane equipment.



CERTIFICATION AND VERIFICATION

For more than 35 years, GL Noble Denton has been a trusted provider of independent certification and verification services to the worldwide oil and gas industry.

A leading advisor on best practice, GL Noble Denton's certification team draws upon decades of experience to help clients meet strict technical requirements and operate their on- and offshore assets in a safe and sustainable manner. Our certification services cover every safety-critical detail of an asset throughout its life, from basic design to construction, operations and decommissioning.

Design

Working in close partnership with all stakeholders, GL Noble Denton reviews every critical element of an asset's design to produce a design document register and provide independent certification or verification of the design in compliance with the appropriate project standards.

Procurement

GL Noble Denton provides thorough vendor inspections for critical elements defined during the design of an asset, and comprehensive equipment certificates and release notes are issued upon the successful completion of our rigorous tests. We also ensure that the steel required for the main structure of an asset is fully certified.

Construction

Our experienced teams make frequent visits to fabrication yards to conduct in-depth inspections of our clients' assets. From quality system assessments to design compliance studies, we are trusted across the world to ensure the production of leading industry assets meets the very highest industry standards.

Hook-up and Commissioning

Our specialist inspectors provide on-site assessments throughout the hook-up and commissioning of an asset. Activity includes pressure, loop and function testing and adjusting safety-critical procedures. Clients receive regular, detailed inspection reports and test record endorsements in the lead-up to GL Noble Denton issuing a certificate of safe operation for their assets.

Operations

GL Noble Denton is committed to providing world-class assurance of the certification and verification of an asset throughout its operational life. Our expertise in keeping licence to operation and certification of safe operations is trusted by industry leaders across the world.

INSPECTION AND QUALITY ASSURANCE

GL Noble Denton provides leading oil and gas organizations with reassured confidence in the quality of their products and equipment.

Our global network of surveyors and dedicated client quality managers are thought leaders in regulatory, quality and social responsibility compliance, using years of experience and pioneering software to test, monitor and record every stage of the production lifecycle.

Third Party Inspection

GL Noble Denton uses tried and tested quality assurance and control methods – from ISO standards testing to vendor assessment and internal auditing – to help clients achieve exceptional standards in procurement and supply within budget and on time.

Advanced Inspection Techniques

Using pioneering technology, our advanced non-destructive testing (advanced NDT) techniques assess the safety, reliability and environmental performance of on- and offshore installations, pipelines and terminals across the world. Our proven methodologies can target crack growth and aggressive corrosion in assets before they become dangerous.

FPSO and FSO Inspection

GL Noble Denton's experience in FPSO and FSO inspection includes shipyard services for hull fabrication and module fabrication for topside and integration. We've provided warranty services and technical support for more than a dozen FPSO projects around the world, including the issuing of warranty approvals to the world's first FPSO vessel.

Material and Failure Analyses

We offer a world-class range of comprehensive non-destructive examination, metallography services and chemical analyses, in addition to large-scale hazardous and non-hazardous asset test services at Spadeadam, one of the world's only dedicated test sites for the oil and gas industry (see page 7).

Manufacturer Capability Certification (MCC)

GL Noble Denton's highly developed MCC services form an integral element of the procurement aspect of a project, providing assurance that suppliers have the competence and resources to deliver on time and within budget.





YOUR GLOBAL OIL AND GAS PARTNER

GL Noble Denton helps oil and gas industry leaders to **plan, design and develop, operate and optimize, and assure** their assets.

Our clients operate at every point in the value chain from investors and insurers, to on- and offshore operators and contractors, and transmission network providers. We work with:

- Financial institutions
- Insurers and underwriters
- Mobile offshore drilling units
- Mobile offshore production units
- Fixed platforms
- Subsea, risers, umbilicals and flowlines
- Offshore support vessels
- On- and offshore pipelines
- Onshore production
- Hydrocarbon storage
- Import terminals
- LNG production, transport, storage and distribution
- Refineries and petrochemical specialists
- Transmission and distribution networks



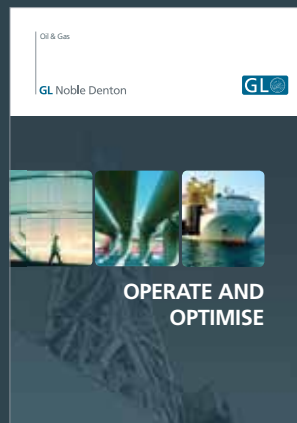
GL Noble Denton

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