MARITIME

YOUR OFFSHORE CLASSIFICATION PARTNER

Safe and compliant operations and improved efficiency for the oil and gas industry with Class from DNV GL
UNLEASH THE POTENTIAL OF MOBILE OFFSHORE UNITS

NEWBUILD
- Pre-contract services
- Design approval services
- Fabrication survey and commissioning
- Certification of offshore systems and equipment

IN OPERATION
- Structural integrity management
- Classification for smarter operations
- Project approach to Class activities
- Conversion
- Layup
- Upgrades
- Class transfer

SELECTION OF RELATED SERVICES
- Noble Denton marine assurance and advisory
- Technical advisory
- Software solutions
- World-leading global testing services

Service overview

source: DNV GL

DNV GL
Your offshore classification partner
As the industry adapts to an era of low oil prices, oversupply and increasing technical complexity, companies are faced with a new set of challenges. They are battling to contain cost in offshore projects and operations, while certification, assurance and regulatory requirements have become more complex.

Demonstrating and assuring the integrity and safety of offshore units has become more important than ever before. Offshore classification plays an important role in this respect and success will rely on new ways of working: reducing complexity and streamlining processes for greater quality and cost efficiency, while analysing increasing volumes of data to manage risks and generate safer, more sustainable operations.

DNV GL’s in-depth knowledge of the offshore industry and its fast-evolving regulatory landscape enables us to offer the most efficient classification services in the industry. We provide customers with dedicated support across the entire asset lifecycle. Drawing on a worldwide network of expertise, we offer specialist local advice and provide offshore unit owners, operators and legislators with a transparent and consistent service based on technical and regulatory knowledge and insight. We provide a comprehensive range of classification and related services to designers, builders, owners and operators of offshore units (MOUs), ensuring safe, reliable and high-performing mobile offshore units.

**Added value beyond compliance**

As a trusted advisor on safety in a complex regulatory environment, we deliver added value to customers by improving efficiency and oversight. With access to dedicated experts in more than 37 countries, DNV GL Offshore Classification deliver local access to global best practice. Our offshore Class services build on our experience as one of the world’s leading ship Class societies and is backed by more than 150 years of experience. We deliver services beyond compliance that help customers to differentiate operations in competitive environments.

**UNITS AND STRUCTURES**

DNV GL offers pre-classification services and Class services for a wide range of mobile offshore units and structure types, among others:

- Ship-shaped and semi-submersible drilling units
- Self-elevating drilling and accommodation units
- Floating production storage and offloading units (oil)
- LNG/LPG production storage and offloading units
- Cylindrical units
- Tension leg units
- Wind turbine installation vessels
- Spar
- Offshore fish farming units
NEWBUILD SERVICES TO ENSURE RELIABILITY, PERFORMANCE AND COST CONTROL

Technical classification services from project inception to construction, installation and commissioning

New technologies and high risk environments are all prominent factors when evaluating concepts for offshore newbuilds. Mistakes made in the planning phase can result in budget overruns and costly project delays.

Companies need to consider the technical challenges involved in any newbuild at the earliest stages of project planning, if they are to ensure reliability, performance and cost control.

DNV GL combines extensive knowledge and hands-on experience in identifying and mitigating risks in projects of all sizes and levels of complexity. Our broad view of the oil and gas industry and related industries enables us to deliver advice and services that save our customers 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.

**Pre-Class contract services**
Pre-Class contract services offer early insights into key challenges of a project, thus significantly reducing the risk of negative impact in the future. Our experts help to ensure that a newbuild project is developed correctly and consistently, and that it complies with all the relevant rules and standards. We review design briefs, ensuring the design complies with the applicable Class notations and relevant project-specific requirements.

As an example of our insights into a project’s key challenges, we evaluate the design’s overall structural strength and review the main scantling drawings with respect to nominal plate thickness, stiffener and girder dimensions, and the grade of material.

**Design approval services**
Getting the right input at the right time is key to efficiency: too early and the design team is not able to take it further, too late and purchase orders have already been issued and steel plates have been cut.

We have organized our services around the main approval centres across the world, ensuring we are located close to end users, design offices and construction yards. Wherever you are located, you will be able to access our specialists ready to assist you in your project.

We focus on close integration between the design and the approval process, bringing the customer’s design team and our experts together to achieve a common set of objectives and to make sure the design meets the expectations of the end user.
ENSURE RELIABILITY, PERFORMANCE AND COST CONTROL

Our project teams help to ensure seamless delivery for all parties involved, and provide the experience and expertise needed to successfully commission and complete projects. We assure that the design meets essential safety compliance standards and, at the same time, that the design allows for further efficiency and functional improvements. We base our approval on Class-leading offshore standards, incorporating the latest technical and regulatory developments with further detailed interpretations. This ensures an efficient design and supports transparency and control of the building project.

Fabrication survey and commissioning

Today’s MOUs are challenging from a construction and commissioning point of view. A successful project requires an overall perspective, from design to completion, while engaging all parties involved. Prior to start of fabrication, DNV GL assesses the set-up and control at the yard and major sub-contractors’ facilities. This approach includes a project team on site with a close link to our design approval team.

We also define a risk-based survey plan, focusing on the project’s specific risk and taking into account the proficiency of the yard and its experience with the design and other relevant elements. This helps to prevent costly production delays, in particular during the commissioning phase, and avoids future quality issues. Our added value goes beyond the direct project scope improving in addition the yard’s efficiency and production control.

Certification of offshore systems and equipment

Offshore systems and equipment delivered from around the world must be certified to Class and regulatory requirements before they arrive at the yard or site for subsequent installation and integration. Our certification service eliminates unnecessary supply chain delays and provides reliable technical support, design reviews and surveys to ensure compliance with the relevant rules and requirements for offshore systems or equipment. Our certification process for offshore machinery and components takes into account the criticality of the product involved, the process applied in manufacturing the product and the vendor’s proficiency. This ensures that we can focus on the critical points and the efficiency of the certification process, without losing confidence or traceability of the results.

Through our dedicated coordinators, we make sure that the certification of complex integrated systems runs smoothly, so customers can profit from timely delivery.

Preparation for digital services

The newbuilding phase can be utilized to plan for and enable future smarter operations in service. DNV GL has the experience and systems to help designers and owners with this task.
IN OPERATION SERVICES TO SAFETY STANDARDS
Introducing Classification for Smarter Operations

DNV GL Fleet in Service is now offering Classification for Smarter Operations. This is a concept promoting survey arrangements and methodologies with a focus on enabling the owner to minimize out-of-service time and optimize the utilization of their unit, hence reducing OPEX.

DNV GL is at the forefront when it comes to suggesting and promoting survey arrangements and solutions that enable owners to maximize usage of their assets and minimize downtime.

By adapting to industry needs and remaining relevant with sustainable services, DNV GL Offshore classification presented the new concept "Classification for Smarter Operations". Taking a holistic approach, this concept offers various arrangements and methods which serve as enablers to reduce out-of-service time and create a basis for digitization:

- Use of alternative systematics and methods
- Use of sensor data and data analytics
- Inspection and maintenance according to condition and utilization
- Classification activities performed on a continuous basis
- Credit for owner’s testing and inspection
- Inspection and testing performed according to change in operation

Classification for Smarter Operations provides a basis for digitization and enables the use of new technologies for testing, inspection and reporting, as well as the collection of sensor data and use of data analytics. By taking new technologies into use, the traditional five-year class cycle with regular annual surveys may be replaced with a condition-based and more dynamic class follow-up. Equipment under continuous monitoring by sensors may be covered by approved condition based maintenance (CBM) and planned maintenance system (PMS); stretched inspection intervals of structure and systems may be enabled through risk-based inspection planning approved by the society. As a result, equipment and structural items can be surveyed and overhauled based on their actual condition, and not purely based on the calendar.

DNV GL offers various survey arrangements that combine well with modern predictive and preventive maintenance strategies used by the owner. These survey arrangements can be matched with Classification for Smarter Operations. For more details, please see DNV GL rules for classification: DNVGL-RU-OU-0300

Fleet in service.

Through our structural integrity management (SIM) tool, full traceability and the history of structural inspections is provided, thereby enabling users to plan and prioritize maintenance activities and present status overviews to stakeholders such as oil companies and regulatory authorities. As an additional benefit, the SIM tool, as part of the shared structural inspection (SSI) survey arrangement, can be used for reporting tank inspections carried out and reported by the owner and, subsequently, credited by class. This, in combination with the surveys reported by class, gives owners the means to measure any structural degradation mechanisms on their unit and thereby proactively plan for compensating measures. If there are findings reported after a survey, alerts will inform owners immediately, giving information about the type of finding and its location. For owners controlling a fleet of units, aggregated information on the entire fleet level is available to ease fleet management.

Owners planning for continuous operation on a location for an extended period of time beyond the five-yearly class interval should consider taking advantage of Classification for Smarter Operations. This can be useful for floating production and storage, drilling, and accommodation units. As an example, extended drilling activities may be carried out continuously over longer periods without risking interference with class activities, given that the operations are well prepared and aligned with the survey activities required by class.
Requirements for a bottom survey on-site as defined by the MODU code may also be carried out using alternative approaches, e.g. by surveying the unit’s outer plating below still water level from the inside of the hull.

**Barrier Reporting**
As a supplement to the regular reporting of findings from surveys, DNV GL has introduced Barrier Reporting for all offshore units, except loading buoys. A central element is one or more defined top concern(s) that should be mitigated at all time to prevent an accident. A typical central element could be fire in category A machinery space, compromised floating stability or loss of well control. For each top concern, a generic barrier model is established. It connects preventing and mitigating barrier functions to the top concern which are controlled and reported on by the surveyor.

**The benefits for our customers are:**
- More insights from our surveys in a top-down dashboard for an entire fleet intended for the customer management team
- Data which can be used for decisions on safety measures and investments
- Data aggregation into a visual dashboard for an entire fleet that will help the customer to identify relevant safety areas that need attention while also providing functionality for drill down to review the details of the findings

Currently, there are standard top concerns used per segment. It is planned to open to customer-specific top concerns and to more data sources in addition to our periodical surveys. In this way, DNV GL may adapt additional owners-focused barriers in future survey scopes.

**Remote Survey**
A new measure to reduce cost and increase effectiveness in the class service is the use of Remote Survey, allowing for crediting of selected class scope on short notice and without physical attendance by the DNV GL surveyor. Owners may request a survey through My services on Veracity, the DNV GL portal, to undertake remote surveys to close open conditions, accept repairs or credit survey elements which may have been left out from previous surveys.

**Smart Survey Booking**
Smart Survey Booking is introduced as an automatic trigger for annual surveys on Fleet Status. This service provides a timely reminder of upcoming surveys to the owner with a clear specification of scope. This automatic service ensures that the necessary class surveys are planned for and agreed with class in due time.

**Direct Access to Technical Experts (DATE)**
For any clarifications or questions related to the Fleet in Service class scope or requirements, you may contact DNV GL through our DATE (Direct Access to Technical Experts) services. Requests can be made directly through My services on Veracity or through My Fleet, our mobile application which can be downloaded to your smartphone.

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**BENEFITS OF OFFSHORE CLASS WITH DNV GL**

- 24/7 support from more than 300 offices in 37 countries
- Access to Class services through a dedicated key account manager, fleet responsible (FR) and rig coordinator (RC)
- In-service inspection plan considering the actual documented structural condition of each rig
- Authorized by more than 130 flag states to issue statutory certificates
- Added value delivery, improved quality and operational efficiency through our broad combined knowledge base from the maritime, oil and gas, energy, business assurance, software and our Noble Denton Marine assurance and advisory services
- Access to our web-based structural integrity management system (SIM), providing an overview and insights to assure structural integrity management of assets
- Support through condition-based survey arrangements for structure and equipment with the potential to extend periods between yard stays
- Jack-up centres in Dubai, Singapore, Houston, Norway and London available for quick approval and operational technical support
- Access to the world’s largest geotechnical database
- FPSO service centres in Singapore, Rio, Busan, Houston, Oslo and London available for quick approval and operational technical support
CONVERSIONS, UPGRADES AND CHANGES

We secure the operational preparedness and unit condition to meet changing market conditions and to utilize business opportunities

**Conversions**

The increasing number of new regulations makes conversion projects challenging. Structural items added to an existing unit with limited availability of the original documentation can be another hurdle. In addition, conversion projects often need to be realized within strict cost and time constraints.

DNV GL’s conversion services enable customers to meet these challenges. We guide customers through the applicable regulations and standards, and define a clear path to achieve a compliant conversion.

We secure fast and efficient conversion projects by working in close collaboration with yards, designers, system suppliers and owners, taking into account budget and build schedules.

**Upgrades**

As the costs associated with refurbishing older units are high and increasing, it is extremely important for owners to have the information needed to make decisions as to whether to refurbish or scrap them.

In the case of refurbishment, it is important to document clearly the results of investments made and to show that the refurbished unit meets the latest required standards and is fit for purpose for the planned operational period.

DNV GL has established a methodology and Class notation to ensure that ageing assets comply with the latest building standards and to estimate/analyse the remaining life of a unit. The resulting insight supports decision-making and provides assurance that the required system upgrades and structural improvements (also with regards to life time expectation) are effectively implemented.

**Class transfer services**

Change of Class to DNV GL is fast and efficient causing no disturbance to operations. DNV GL’s team of classification experts guides customers through the complexities of offshore regulations. We take care of the entire documentation process and guarantee an efficient Class transfer of assets free of charge.

**Lay-up**

When offshore units become idle, further operation is evaluated on a cost/benefit basis, considering different technical and economic conditions. Special considerations will be made as to whether and how the asset will be preserved and maintained during a cold or hot lay-up. DNV GL advises on lay-up procedures and documentations, provides surveys and requirements depending on the type of lay-up, securing hassle-free reactivation once the lay-up period is over.
OPTIMIZING OPERATIONS AT AN ASSET LIFECYCLE

Offshore classification underpinned by decades of expert knowledge and hands-on experience

Noble Denton marine assurance and advisory

Our Noble Denton marine assurance and advisory services have worked at the forefront of the offshore technology for more than a century. In ever more challenging environments we are instrumental in developing guidelines which are respected as industry standard, and working closely with The Joint Rig Committee and other industry bodies to establish industry best practice.

Noble Denton supports clients on complex marine, subsea and engineering challenges. We provide recognized technical knowledge combined with comprehensive project management skills and we are trusted to deliver marine and engineering consultancy, dynamic positioning (DP), naval architecture, structural engineering, geotechnical engineering and oceanography services.

Our marine and DP advisory and assurance programmes support the pre-purchase, suitability, conversion and operation of all categories of vessels, including mobile units and FPSOs.

We have industry-recognized experience in our execution of:
- Warranty
- Jack-up engineering and operations
- Drilling unit mooring and riser analysis in harsh environments and deepwaters
- Mooring integrity for floating production
- DP & marine assurance including FMEA and FMECA
- Rig moving

Technical advisory

We draw upon the knowledge and experience of a global network of experts 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.
OPTIMIZING OPERATIONS AT EVERY STAGE OF AN ASSET LIFECYCLE

Offshore classification underpinned by decades of expert knowledge and hands-on experience

Software solutions
DNV GL’s oil and gas software solutions support companies in improving safety, reliability and performance across their asset portfolios. Our software solutions support the full asset lifecycle, providing planning, analysis, compliance and management tools that help manage risk and integrity and optimize quality, production and environmental performance.

World-leading global testing services
DNV GL operates 14 laboratories across three continents, offering a broad range of testing services. By combining advanced testing with technical expertise and industry standards, we help our customers apply technology safely, efficiently and cost effectively.

Whether we are investigating the failure of inch-long valves, conducting full-scale validation tests to a load of 2,500 tons, or retrieving organisms from the Arctic seabed, we provide global insight and local expertise for safer, smarter and greener operations.

Our laboratories span eight dedicated testing disciplines, including testing of software which protect operations against undesired incidents and non-productive time. Hardware-in-the-loop testing enables thorough testing of control systems, their robustness and failure handling capability, and covers risks related to software and integration.

Maritime Advisory and Noble Denton Marine Services are independent units within DNV GL and projects are strictly separated from classification activities.
TECHNOLOGY FORESIGHT

As oil and gas industry operations become more complex and costly, we believe that greater collaboration and the pan-industry development of new technology and innovation are key to solving common challenges. That’s why we invest around five percent of our annual revenue into research and innovation.

Using a risk-based approach, we enable our customers to benchmark their operations with best practice at every stage of the oil and gas value chain.

By investing in the future today, we can identify and solve tomorrow’s technical challenges, from using Big Data to deliver cost efficiencies to detecting cyber-security threats and preventing oil spills in the Arctic.

Our research strategy combines dedicated R&D resources, collaboration with industry peers and internal innovation projects in which all employees are invited to engage.

New technologies with long-term impact
Our strategic research and innovation unit focuses on developing new knowledge and technology areas that have a long-term impact on the industry. Our teams of experts explore emerging opportunities, identify future technology and pinpoint risk management trends to provide customers with relevant insights for the future.

Industry collaboration for a safe and sustainable future
We manage more than 100 ongoing joint industry projects (JIPs) every year, providing a neutral ground for our people, our customers and a range of industry stakeholders to create pioneering solutions to complex
industry challenges. By joining forces, we are able to safely improve business performance and drive innovation as an entire industry.

All JIPs seek to solve a specific technical need and, where possible, to develop a new standard, recommended practice or technology that benefits the industry at large.

**Building knowledge with bold ideas**

Our extraordinary innovation projects (EIPs) encourage all employees to explore future theories and models in technology that will impact the industries in which we operate. These projects, which are managed by international teams of DNV GL experts, aim to develop new concepts that have the potential to become industry-relevant within two years. Recent EIPs have resulted in methodologies to turn wasted gas from flaring and venting into a profitable economic product, and a new, unmanned floating LNG concept.

**FOCUSED ON THE FUTURE**

- Around five per cent of our annual revenue is invested into research and development (R&D). We use this to foster collaboration and solve pan-industry challenges.
- We have been involved in developing game-changing technologies across the sector, including the intelligent pig, polyethylene piping and the condensing boiler.
- We operate 14 laboratories across three continents, combining advanced testing with technical expertise and industry standards to help customers apply technology safely, efficiently and cost effectively.
- We manage more than 100 joint industry projects annually, adding to our openly-accessible library of more than 170 industry standards, recommended practices and technologies.
- We run approximately 70 internal technology projects each year to ensure that we remain at the forefront of new developments.
Mastering change
Our regulatory foresight and industry outlook enables customers to master the changing business environment and to prepare for upcoming developments. By knowing what’s coming in the future, understanding technologies and economic trends, operators can adapt quickly to changing requirements and stay at the competitive edge.

DNV GL offers transparency and predictability through comprehensive Class rules. We provide the bridge between the regulator and market, ensuring safety, reliability and performance.

Through systems, work tools and our predictable and standardized approach, customers can be assured of compliance from a company with a 150-year heritage.

We have developed rules and standards, based on modern safety principles and the latest advances in design and dimensioning principles, providing both detailed guidance and enabling alternative solutions.

Continuous development
DNV GL is continuously developing its standards and guidelines in order to be in the forefront and to ensure that offshore units are safe, efficient and reliable.

Many rules, standards and guidelines have been developed in close cooperation with our customers and partners worldwide in order to solve existing business needs.

DNV GL’s rules and standards are aligned with the IMO MODU Code, International Association of Classification Societies (IACS) Unified Requirements and other relevant international standards and codes. In addition, they include comprehensive interpretations to make it easier to access and implement the requirements.

We are member of all major standardization and industry bodies and directly engaged in the development of industry guidelines.
AND WORLD LEADING
LOCAL EXPERTISE WITH A GLOBAL PRESENCE

DNV GL is a global quality assurance and risk management company. Driven by our purpose of safeguarding life, property and the environment, we enable our customers to advance the safety and sustainability of their business. Operating in more than 100 countries, our professionals are dedicated to helping customers in the maritime, oil & gas, power and renewables and other industries to make the world safer, smarter and greener.

DNV GL is the world’s leading classification society and a recognized advisor for the maritime industry. We enhance safety, quality, energy efficiency and environmental performance of the global shipping industry – across all vessel types and offshore structures. We invest heavily in research and development to find solutions, together with the industry, that address strategic, operational or regulatory challenges.