



MARITIME INDUSTRY

MARITIME SERVICE OVERVIEW



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The shipping industry is cyclical by nature, and one segment may be going full steam ahead while other segments experience overcapacity and lay-ups. At the same time, global requirements for good environmental performance will become increasingly strict, setting new standards for emissions to air and water. The industry is already seeing new and novel design studies to “fast track” environmental performance.

DNV GL is the leading classification and technical advisor to the global maritime and offshore industries. We provide consistent, integrated services within technical and marine assurance and advisory, risk management and offshore classification, to enable safe, reliable and enhanced performance in projects and operations. Together with our partners, we drive the industry forward by developing best practices and standards. Our people combine industry expertise, multi-disciplinary skills and innovation to solve complex challenges for our customers.

THE IMPORTANCE OF IN-DEPTH KNOWLEDGE

Complexity, uncertainty and change are prevalent within all business functions. As a consequence, the risk profile of every enterprise is constantly changing and evolving. DNV GL can help identify, understand and manage each of the component risks, as well as the overall aggregate risk, in order to maximise opportunities and avoid or mitigate losses.

By providing world-class methodology and expertise in technology, operations, management, risk identification, assessment and control, we help customers improve their business performance in a safe and responsible way. Our service portfolio to the maritime industry is based on our global services:

- Classification
- Verification
- Technology and innovation
- Operational performance
- Environmental performance
- Safety and risk control

Our teams of highly qualified individuals deliver cutting-edge solutions along the entire value chain, from strategic considerations to recycling. We support customers in the following industry sectors:

- Ship owners
- Ship management
- Shipyards
- Material and equipment manufacturers
- Ports and terminals
- The public sector and other organisations

Classification

Our main class rules comprise safety, reliability and environmental requirements with which commercial vessels in international waters must comply. We also offer additional class notations covering specific operational challenges adapted to market needs.

We approve design drawings, oversee the construction phase of a vessel and carry out periodic surveys throughout the vessel's lifetime.

Our comprehensive classification services are performed through our global network of stations and approval centres by systematically trained and well-qualified surveyors, approval engineers and experts, extensively supported by state-of-the-art information technology.

DNV GL is authorised by more than 80 flag administrations to carry out statutory certification on their behalf. Our international network of approval centres and some 300 survey stations in more than 100 countries are essential for our certification activities.

Verification

DNV GL's verification services teams conduct independent and objective appraisals to determine whether an activity, product or service complies with specific requirements. We apply a risk-based and transparent approach and provide independent assurance throughout an asset's life cycle.

Technology and innovation

A challenging maritime market with overcapacity and high oil prices spurs demand for new technology and innovative solutions. DNV GL allocates a significant part of its yearly revenue to projects to bring innovations to the maritime industry and to maintain its position as a leader in selected technology areas. The application of existing and new technologies needs to be proven to demonstrate that an innovation actually works as intended. DNV GL offers recognised processes for qualifying new technology and assists in bringing new solutions efficiently, safely and credibly to the market. Our services can be purely technical or related to the execution of a project.

Operational performance

Operating costs (OPEX) continue to increase even as freight levels reach new lows during this particularly challenging time in shipping. The total operating costs are dominated by the fuel and crew costs and are not likely to drop. DNV GL assists ship owners and operators improving best practices within energy efficiency, fuel saving, maintenance management, condition management and capacity adjustments. We help our customers improve their operational performance, thereby enhancing their bottom line.

Environmental performance

Environmental regulations have a high impact on business, and the selection of an optimal compliance strategy depends on the operational setting. We can help our customers stay ahead of regulatory developments and make the right technology choices. We advise regulators and businesses on environmental regulations and compliance options; measure and benchmark our customers' environmental performance; help our customers make the best business decisions on environmental technology and turn their environmental performance into a marketing advantage.

Safety and risk control

Harsh conditions, new technologies and advanced operations make modern vessels increasingly complex. As society gradually adopts a zero tolerance for failure, managing safety and risk is becoming increasingly business critical in the maritime industry. DNV GL's safety and risk services provide a systematic approach that enables companies to reduce the number of accidents, improve their business and operational performance and enhance their reputation. By systematically viewing business through a systems perspective that consists of technical, organisational and human factors and how they interact, DNV GL helps improve business performance through safety excellence.



CLASSIFICATION

Pre-contact	The earlier errors are detected in a newbuilding process, the lower the cost of change. DNV GL's pre-contract services offer valuable insights into key challenges up front, thus significantly reducing the downside risk in projects. Prior to a newbuilding classification contract, DNV GL offers advisory services to the owner, designer and/or yard. These services address operational aspects as well as ship structures and systems and may include concept evaluation; a review of the outline or contract specification; a review of the preliminary design; an evaluation of proposed class notations and regulations; strength evaluations; stability evaluations; fatigue assessments; noise and vibration evaluations and a system design evaluation.
Newbuilding	The newbuilding process comprises the design approval of technical documentation and follow-up of the construction on site. Early design approval lays the ground for fewer building changes and ensures a more efficient production process. The site survey and final testing help ensure compliance with design drawings and corresponding safety and availability requirements.
Certification of material and components	Systems or equipment delivered from around the world require certification to ensure that class and regulatory requirements are met before they arrive at the yard or site for subsequent installation and integration. Ensuring that equipment and systems comply with the correct rules and regulations and have the right certificates is key to avoiding unnecessary delays.
Ships in operation	The purpose of DNV GL's service to ships in operation is to help safeguard life, property and the environment by ensuring a safe and reliable ship with minimum interference to its commercial operations. DNV GL offers efficient service delivery through its customer service managers (CSMs), who act as single points of contact supported by a global network of offices in all major ports. Our broad experience of all major ship types operating in the world's harshest environments has given us leading-edge insight. DNV GL's long-standing position and superior port state record are testimony to the quality of the DNV GL-classed fleet.
Conversions	Major conversions can be challenging and experience shows that efficient conversions are best achieved through well-organised communication and cooperation between the class society, owner, yard and designers. Class and statutory requirements need to be identified and addressed while being integrated with commercial realities and build schedules. DNV GL's dedicated and experienced project managers/approval engineers and on-site approval teams help achieve efficient conversions.
Statutory	DNV GL is authorised by more than 80 flag administrations to carry out statutory certification on their behalf, including in relation to SOLAS, MARPOL, load line, STCW, ballast water management, ISM, ISPS, MLC and tonnage.
Class entry service	DNV GL has made changing class easier by introducing the Class Entry Express process. Our new entry process combined with our local representation helps our customers eliminate any hurdles and confusion. Our CSMs assist in planning and document collection whilst our head office support team helps with communication with the flag administration and the previous class society. This allows the prompt issuance of full-term certificates and a smooth transfer to DNV GL.

VERIFICATION

Strength verification

Structural design is concerned with achieving minimum life cycle costs within the limit of serviceability and safety requirements. Strength analyses covering an assessment of fatigue, excessive yielding, buckling and fast fracture are carried out as part of this assessment. The results are used to document compliance with rules and regulations, improve and optimise designs, assess conditions, plan inspections, maintenance work and repairs, and evaluate the possibility of lifetime extension.

Stability analysis and verification

A change of trade or new technical or operational restrictions might influence ship stability and thus the safety and reliability of a ship. DNV GL's stability advisory team can help owners/operators analyse and verify the vessel's stability in order to ensure safe and efficient operations and compliance with rules and regulations. Stability is often an important parameter when accidents happen, and DNV GL can assist during damage investigation and troubleshooting.

Shipyard assessment

Shipyards are seeking to improve their business, quality standards and efficiency. Ship owners who are developing next-generation vessels with more sophisticated specifications and concepts need to ensure that the yards are capable of delivering to the agreed cost, quality and schedule. Utilising systematic tools, local expertise and vast international experience, our yard assessment service evaluates a yard's capability and performance according to specific requirements and identifies gaps and room for improvement. DNV GL uses different methods according to the customer's scope and objective - from the production-quality-focused MPQA (Manufacturer Product Quality Assessment) tool, to the management-focused, qualitative Executive Assessment Protocol and DNV GL's Yard Fitness Programme, designed to qualitatively pre-qualify and monitor performance progress.

Verification and certification of competence and training

The certification of training is a four-step verification system aimed at achieving a uniform quality of training within the maritime industry. The four steps include: the certification of maritime education and training; certification of maritime simulator systems; certification of learning programmes; and benchmarking of training providers. Each step/service can also be verified and certified independently. DNV GL's SeaSkill™ helps training providers and manufacturers to properly address, build and retain competence.





TECHNOLOGY AND INNOVATION

Pre-contact	Major energy savings can be achieved and be profitable by challenging conventions and re-thinking the way ships are designed. DNV GL can coordinate the conceptual ship design process, helping customers uncover potential and creating innovative design solutions for next-generation vessels. Through internal innovation projects, DNV GL has developed new ship concepts like the PCTC Momentum, the Quantum container ship, the Triality VLCC, the Catchy fishing vessel and the Ecore bulk carrier.
Newbuilding	Due to environmental concerns and increasing fuel prices, there is today a strong focus on improving the fuel efficiency of ships. Modern analysis tools (using CFD applications) provide a means to improve the fuel efficiency by optimising the hull and propeller in terms of resistance and propulsion efficiency. Operating conditions that will occur throughout the vessel's lifetime should be taken into account in the assessment, as experience shows that there may be a lot to gain at off-design conditions. DNV GL can assist with resistance and propulsion analysis during the concept and design development phase of a new ship, or for ships in operation (e.g. bulb optimisation studies, propeller assessment or evaluation of energy efficiency devices).
Certification of material and components	New technology should either enable a project to be realised or enhance its value. In either case, the operator needs to be confident that the technology will perform as intended. The technology developer needs to build the operator's confidence in the technology, and in turn the operator needs to build the confidence of the other stakeholders in the project before a decision to implement can be taken. Building this confidence requires a systematic risk-based qualification process which clearly documents the technology's performance.
Conversions	Fitness-for-service verification involves being an observer to the qualification process as well as verifying technical documentation and witnessing tests to the extent necessary for issuing the DNV GL qualification statements.
Statutory	Many component or system failures experienced in the maritime industry are related to material selection or quality issues. DNV GL therefore provides a broad range of materials-technology and laboratory-testing services worldwide. DNV GL supports the shipping and global energy sectors with state-of-the-art laboratory services, offering a wide range of testing capabilities combined with strong multidisciplinary knowledge and experience.
Class entry service	To work safely and reliably, new technology needs not only to be qualified, but also to be implemented and operated according to specifications and the assumptions on which the technology qualification is based. To ensure this, DNV GL offers risk-based follow-up of technology qualification programmes, quality surveillance, fabrication follow-up, the qualification of suppliers (e.g. technical audits) and the verification of specifications and procedures.

OPERATIONAL PERFORMANCE

Energy efficiency and fuel saving

DNV GL's energy efficiency services provide a systematic approach to enable shipping companies to reduce fuel costs and improve their environmental footprint. They focus on such factors as the voyage and ship performance, energy consumers, trim optimisation, culture and attitude, strategy, and organisation and performance management. The implementation of energy efficiency solutions also facilitates the clear documentation of improved environmental performance, which may provide a competitive advantage and meet stakeholders' expectations.

Maintenance management

To support our customers in achieving effective maintenance management, DNV GL has developed services based on our experience of all shipping, oil and gas segments. The optimisation of the maintenance plan and spare parts requirements for each ship is always based on an initial risk analysis. Through our in-depth understanding of planned maintenance systems, DNV GL gives advice on how to best utilise the system in order to enhance data quality and enable the monitoring of KPIs in the fleet. DNV GL also advises on the best maintenance strategies and how governing documents and processes should be outlined and implemented in the organisation.

Condition assessment

CAP is a quality measurement tool for older vessels that focuses on their technical and functional condition. CAP is required by most major oil companies in connection with the vetting of tankers that are more than 15 years old and bulk carriers that are more than 25 years old, but may well be used for other types of tonnage and at any age. CAP is a voluntary service to ship owners and is a supplement to classification. CAP describes and specifies the actual standard on board at the time of inspection.

Hull integrity management

Based on DNV GL's knowledge and hull expertise, Hull Integrity Management (HIM) empowers the ship officers to take a more active role in assessing the hull condition. It helps owners and operators keep their ship's hull fit for purpose through continuous monitoring of the hull condition, thereby creating business advantages and reducing maintenance costs.

Docking

Docking is one of the most expensive maintenance costs for a ship owner. DNV GL's docking services provide a systematic approach through training, a systematic software tool and technical support to help owners gain control of the docking project and avoid unexpected overruns. A successful docking will ultimately result in reduced maintenance costs, thus having a significant impact on the bottom line.

Lay-up

DNV GL's lay-up services provide systematic and cost-optimal preparation for lay-ups with a focus on safe and cost-effective maintenance. A well-planned lay-up site and mooring arrangement will reduce the risk of a laid-up vessel. A well-preserved ship during lay-up will ultimately result in reduced recommissioning time and cost. DNV GL's declaration on lay-up acts as a requirement during lay-up, while the preservation declaration may have a positive effect on the insurance risk after recommissioning.

Technical due diligence

Technical due diligence is a service that identifies, assesses and mitigates technical, operational and environmental risks related to shipping transactions and the financing of shipping and maritime projects. The service focuses on technical and associated risk factors that have potential economic consequences for banks, underwriters, owners and investors. Through a structured and systematic way of working, we produce reports that are useful for project decision-making, marketing and loan syndication.





ENVIRONMENTAL PERFORMANCE

Technology evaluation and selection

To comply with stricter environmental regulations, ship owners must implement new technologies and solutions on board vessels. DNV GL can help customers select the solution best suited for their vessels and operations. We provide information and analysis on a range of technologies and solutions, including LNG, scrubbers, NOx-reducing technologies, alternative energy sources, batteries, hybrid solutions and ballast water management.

Environmental information system

Through a combination of various ship-specific data sources, DNV GL has established an AIS-based (Automatic Identification System) environmental accounting system and a system for providing high-resolution data input to various risk analyses, for example of ship collision risk, grounding and environmental risk. Through specialised traffic and performance analysis, we can help flag states and ship owners monitor and report emissions in specific areas and calculate the effects of introduced or proposed mitigation measures.

Environmental management and strategy

Shipping companies must comply with an increasing number of environmental regulations and are facing pressure to improve environmental performance from stakeholders such as charterers, flag states, ports, investors and society. We can help customers prepare plans and procedures for specific environmental issues and develop an environmental management system to keep track of their environmental risk and performance. We also help authorities conduct impact assessments as part of the development of regulations.

Ship recycling and inventory of hazardous materials

Reliable information on hazardous materials on board is crucial for the safe and environmentally sound decommissioning and recycling of ships and installations. DNV GL's approach to the preparation of an inventory of hazardous materials (IHM) for existing vessels leaves a minimum of work to the ship owner by taking care of all the required steps for establishing information as an Expert Party. The resulting IHM complies with the IMO requirements and makes it easier for a contracting recycling facility to implement targeted and cost-effective steps to deal with the specific hazards, as well as for the operator to take action to safeguard the crew's working environment during the remaining period of operation. DNV GL also assesses the ability of facilities to recycle ships in a safe and environmentally sound manner, in accordance with the Hong Kong Convention.

ECA compliance

The shipping industry is facing major changes and challenges due to environmental regulations enforced by the IMO and national port authorities. The industry has a limited number of options to choose from to become ECA compliant. The choices are very different by nature and will lead to significant differences in ship CAPEX and OPEX. DNV GL helps customers perform feasibility assessments for their entire fleet, showing how ECA regulations will affect their operations and which technologies - scrubber, fuel switch or LNG - are economically most viable in a short or long perspective.

SAFETY AND RISK CONTROL

Pre-contact

The human factors and safety culture services address the human element in SHE performance, both in terms of factors leading to human error for specific scenarios and the broader factors defined by the safety culture. The aim of both services is to reduce human errors that contribute to accidents. DNV GL works closely with customers, helping design processes and work systems that accommodate people issues carefully and systematically, through both the development of positive cultures and the minimisation of human error.

Newbuilding

When it is impossible to meet perspective requirements, novel technologies and designs may still be approved provided an equivalent or higher safety level can be demonstrated through risk assessment and analysis. DNV GL's approach to safety equivalence assessments is based on the IMO Formal Safety Assessment (FSA) process supported by our extensive technical and operational experience and advanced risk methodologies and tools. When required, the risk assessments are supplemented by advanced analyses, such as fire and explosion analysis and evacuation analysis, to evaluate and mitigate the consequences.



Risk assessment	Under certain circumstances, e.g. for gas-fuelled vessels, risk assessments are required for approval by the flag state and the IMO. In other cases, e.g. for advanced marine operations, the charterer may require a risk assessment before the operation takes place. DNV GL's risk assessment approach applies Hazard Identification (HAZID) studies, Hazard and Operability (HAZOP) studies, Failure Mode Effect and Consequence (FMECA) studies and an advanced Qualitative Risk Analysis (QRA).
Navigational risk assessment	Navigation incidents represent more than 50% of all incidents in shipping. Consequences are often severe in the form of oil pollution, loss of life and damage to the vessel. DNV GL helps charterers, regulators and ship owners assess navigational risk and implement necessary risk-reducing measures.
Emergency response	DNV GL's Emergency Response Service (ERS) provides prompt access to shore-based expert assistance for the assessment of the damage stability and residual strength of a vessel in distress. ERS is a fast, reliable, around-the-clock professional assessment of the condition of a ship in an emergency situation. Our team of dedicated experts help make the best decisions for the vessel when the company and crew are in a very stressful situation. Enrolment with DNV GL's ERS will ensure that the vessel complies with MARPOL Annex I, Ch.5, Reg.37(4), the requirements of the USCG Oil Pollution Act (OPA'90) and the relevant 33CFR155.240. DNV also helps prepare a Shipboard Oil Pollution Emergency Plan (SOPEP) and ensure compliance with the International Safety Management Code (ISM).
Incident investigation	In the case of an incident, DNV GL conducts independent and objective investigations into how and why the incident occurred. The incident investigation process includes evidence collection, fact systemisation and root-cause analysis. Central to the methodology is DNV's Loss Causation Model, which is the basis for the M-SCAT (Marine Systematic Cause Analysis Technique) and has been further refined to identify the root cause of an incident. DNV GL's incident investigation reports include recommendations and actions that enable the customers to further enhance their safety management systems.
Safety performance and management systems	Through our management systems and performance measures service, we share best practices for SHE management using a globally accepted template (ISRS™) and allow facilities to measure and benchmark their performance. Areas for improvement are indicated along with suggested ways of achieving the improvement. Using proven risk methodologies, we work with our customers to identify and evaluate opportunities and threats.

SAFER, SMARTER, GREENER

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DNV GL

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 & gas, and energy industries. We also provide certification services to customers across a wide range of industries. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping our customers make the world safer, smarter and greener.

DNV GL is the world's leading classification society and a recognised 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. Together with the industry, we invest heavily in research and development to find solutions to strategic, operational or regulatory challenges.

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