

Dear Sir or Madam,

A busy year comes to an end. In the last navigator of 2009, we would like to inform you about a long list of new rules and guidelines issued by Germanischer Lloyd in recent weeks and months. This list contains for example the reviewed Rules for ships intended for specialised offshore services, Guidelines for the Safe Return to Port Capability of Passenger Ships and the Guideline on Inspection of Mechanical and Electrotechnical Products as well Guidelines for the Analysis of Alternative Ship Design and Arrangements. All together some 22 rules and guidelines had been reviewed by our experts in the course of the last twelve months.

Thanks for your continued interest and Happy New Year

Your "n@vigator" team

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New GL Rules: Offshore Service Vessels

New rules for ships intended for offshore support and supply, offshore towing, well stimulation and other specialised offshore services.

On 1 January 2010 new Rules for Hull Structures of Offshore Service Vessels come into force. These rules apply to ships intended for offshore support and supply, offshore towing, well stimulation and other specialised offshore services. For such ships the notation OFFSHORE SERVICE VESSEL will be assigned, complemented by optional further notations, e.g. HNLS for ships carrying hazardous and noxious liquid substances, AH for anchor handling, WSV for well stimulation vessels, WTIS for wind turbine installation and construction support.

Sections 2 to 21 of these Rules are based on the proven GL Hull Structural Rules for Seagoing Ships adjusted to the relevant design aspects for Offshore Service Vessels. Amended requirements within these Sections concern particular reinforcements of superstructures and weather deck due to green sea forces and concentrated loads induced by heavy cargo items. Scantlings of side shell and frames are increased to account for berthing impacts on offshore installations. The Rules also cover the option to make use of aluminium in the design of helicopter decks including respective requirements for structural fire protection.

The “Hull Outfit” Section incorporates specific provisions regarding the arrangement of side scuttles and windows and specifies applicable design loads as well as requirements for glass panes and thickness.

Section 22 “Structural Fire Protection” was subdivided into special requirements for ships with a total of 60, 240 or more than 240 persons. The SPS code has also been considered with 12, 36 or more than 36 special personnel on board. Furthermore, requirements for the carriage of crude oil and petroleum products were included.

From Section 26 onwards, requirements for particular ship types, services and operational profiles are specified, such as vessels for carrying hazardous and noxious substances, which are equipped with systems for vapour detection and alarm as well as emergency shutdown.

The following Section contains design criteria for anchor handling and towing ships under particular consideration of substructures and foundations for winches, stern rollers, etc. and stability requirements for towing operation.

Further types and functions covered are Well Stimulation Vessels, Fire Fighters, Oil/Chemical Recovery Vessels and Special Purpose Ships. The final Section addresses wind turbine installation, distinguishing classification of ships with or without jack-up capability.

Besides publication on the GL website the [new Rules](#) are also available as a printed edition.



New GL Guidelines: Analysis of Alternative Design and Arrangements

GL’s recommendations and requirements for the process of alternative design and arrangements.

Objectives of these guidelines are:

- to provide an overview of the aims and working tasks of the alternative design process,
- to provide recommendations on the implementation of the alternative design process and
- to support GL customers applying the alternative design process efficiently to benefit from the new design opportunities offered.

Alternative design and arrangements are solutions which deviate from the prescriptive requirements of SOLAS regulations, but which are suitable to satisfy the intent of the respective regulations. Such designs and arrangements include a wide range of measures, e.g. alternative shipboard structures and systems based on novel designs or traditional shipboard structures and systems that are installed in alternative arrangements or configurations. Alternative design and arrangements as specified in SOLAS can be focused on particular systems, subsystems or individual components, or can

extend to the whole concept of the ship.

The application of alternative design and arrangements has been open with respect to fire safety (SOLAS Chapter II-2) since 2002. From July 2010 the application will also be open to machinery and periodically unattended machinery spaces (SOLAS Chapter II-1, Parts C and E), electrical installations (SOLAS Chapter II-1, Part D), as well as life-saving appliances (LSA) and arrangements (SOLAS Chapter III).

The process for analysing safety equivalency for alternative designs and arrangements is outlined in the IMO circulars MSC/Circ. 1002 and MSC.1/Circ. 1212. This process typically is based on a holistic risk assessment, which to date has not been widely used in the maritime industry. Hence, GL decided to share its experiences from consultancies in various alternative design projects by providing these guidelines to owners, yards and designers.

To facilitate usability, the GL Guidelines for the Analysis of Alternative Design and Arrangements contain the full text of IMO circulars, which is enriched by comprehensive recommendations for the practical implementation of the individual steps of the alternative design process; hence providing a direct link between IMO recommendations and GL experience.

Please note: Besides [publication on the GL website](#) the new Guidelines are also available as a printed edition.

Contact

Dr. Karsten Loer

Phone +49(0)40 36149-163

Email: safety@gl-group.com



Harmony Class Rules for Cargo Ships

New rules on rating noise and vibration on cargo ships come into force in 2009. Is your crew getting a good rest?

These rules on rating noise and vibration on cargo ships are intended to support owners and shipyards to specify requirements regarding the comfort of the crew on board.

For ships complying with these rules, the Harmony Class Notation will be assigned. The Notation HC for cargo ships specifies three comfort levels, i.e. HC(3) for acceptable comfort, HC(2) for moderate comfort and HC(1) for high comfort. In the case of additional passenger cabins on the cargo ship, reasonable comfort levels are also indicated in these rules.

To reflect the different situation of small and large cargo ships with regard to noise and vibration, the limit values distinguish between an aft and a more forward deck house position.

Apart from detailed tables of limit values for the different spaces on board, the rules contain information on acoustic and vibration standards as well as technical terms used. Together with recommendations on theoretical investigations, the rules support designers regarding this complex matter and help to estimate the effort of the rating envisaged.

You can access the New Harmony Class Rules for Cargo Ships on the [GL website](#). In addition, they can be ordered in a printed version via [E-mail](#).



New GL Guidelines for the Environmental Service System

The update of the guidelines for an optional certification of the environmental properties of ships considers the developments in terms of environmental technology and legislation.

The update of these guidelines for an optional certification of the environmental properties of ships considers the developments in terms of environmental technology and legislation which have taken place since the two previous editions. Due to the setting into force of IMO regulations, a number of requirements have become mandatory which previously were optional for the assignment of the notation EP (ENVIRONMENTAL PASSPORT).

In order to maintain the notation EP to represent an above-average environmental standard, additional requirements have been incorporated. For example the NOx emissions of diesel engines on board a vessel have to meet the limit of the so-called "Tier II". According to the new amendment of MARPOL Annex VI, this emission limit comes into force for ships constructed on or after 1 January 2011 (in general keel laying date).

Based on internal GL analyses as well as on feedback from clients, provisions were made to certify, on the client's request, additional environmental properties in the ENVIRONMENTAL PASSPORT which significantly exceed environmental or legislative standards. In this spirit, the updated guidelines recommend equipping a vessel with an approved Inventory of Hazardous Materials (IHM) according the new agreed IMO Code for Ship Recycling and to take part in the GL CO2 Indexing System based on ship operational dates, both voluntarily.



Ultrasonic testing for ship propellers

Ships propellers are difficult to inspect for defects. But now cavities, inclusions, pores and cracks can be detected with respect to their size and position.

An ultrasonic testing technique specifically developed for ship propellers was recently presented at the Annual Conference of the German Society for Non-destructive Testing DGZfP in Münster, Germany and also on the occasion of the 350th Meeting of the DGZfP Study Group Hamburg at Blohm + Voss Shipyards.

Dipl. Ing. Hans Rieder and Dr. Martin Spies of the Fraunhofer Institute for Industrial Mathematics ITWM in Kaiserslautern, Germany presented the new inspection technique and their research results. Both scientists have been awarded the Berthold Prize 2009 of the DGZfP for exceptional scientific research and development work. They have developed an efficient mechanised ultrasonic procedure for the non-destructive testing of complex components, such as ship propellers made of Cu3 alloys (Cu-Al-Fe-Ni alloys).



The newly-developed ultrasonic technique is based on a mechanised mobile scanning system and a tomographic imaging algorithm for post-processing of the raw inspection data. With the implemented SAFT++ algorithm (Synthetic Aperture Focusing Technique), it is possible to image contours and any defects of the inspected components three-dimensionally. Internal defects such as cavities, inclusions, pores and cracks can be detected and characterised with respect to their size and location. Thus, for the first time, non-destructive testing can be successfully applied to such components.

The research work was performed in close cooperation with Germanischer Lloyd (GL). GL set up a BMWi-sponsored research project with the acronym "ProRepaS" – which stands for propeller repair by means of welding – in 2004 already. Project partners were Fraunhofer ITWM Kaiserslautern, Wartsilä Propulsion Netherlands, GKSS Geesthacht as well as GL and Germanischer Lloyd testing laboratory in Hamburg.

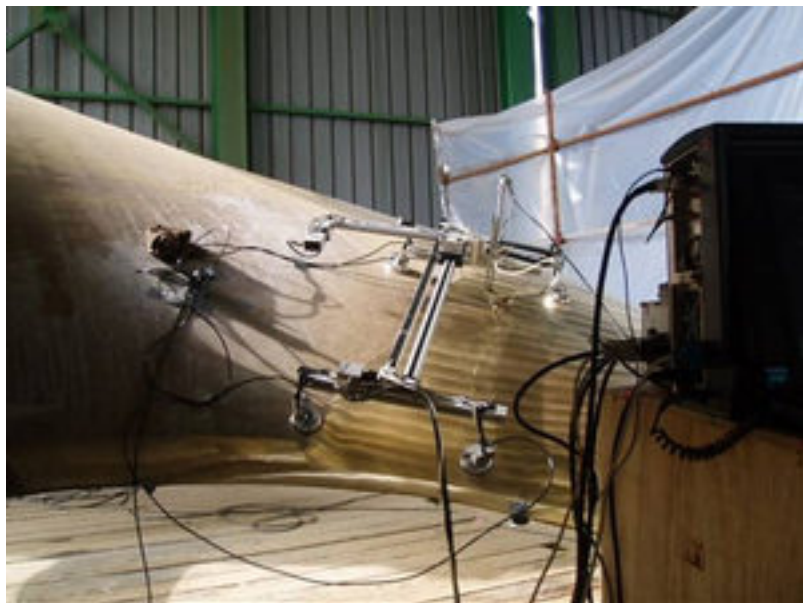
The main focuses of the project were on the

- determination of fracture mechanical values characteristic for the Cu3 propeller material (e.g. critical crack sizes, crack

resistance),

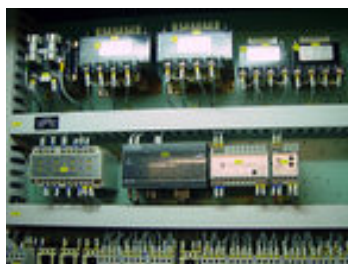
- development of an ultrasonic testing and imaging technique for defect detection and characterisation,
- definition and verification of allowable defect sizes.

The application of the new ultrasonic inspection technique including SAFT++ allows for volumetric testing in the highly-stressed "B" and "A" zones of propeller blades for the first time. With GL the supervising classification society, it is now possible to approve weld repairs that extend into zone "A" where welding has usually been prohibited according to IACS W24.



Thus, repairs of serious propeller damage can be performed instead of replacing the blade or propeller by a new one. This is associated with an enormous cost reduction as well as a more rapid deployment of the ship on the planned route. During the past year a set of variable-pitch propeller blades (propeller diameter up to five meters) has been repaired and inspected to ensure the integrity of the repair weld. Some fixed pitch propellers followed.

Further applications deal with the inspection of spare blades or even new blades in view of porosity. Also, an application of the new ultrasonic technique to other testing problems such as the inspection of thick-walled cast stainless steels, cast irons or welded thick-walled ship structures is possible. Future applications aim at the inspection of components specific to structures in the oil and gas industries, the chemical industry or in the area of wind energy.



Inspection of Mechanical and Electrotechnical Products

Manufacturers becoming involved in the product testing process gain greater flexibility in the performance of tests required for certification purposes.

Under the scheme described in these Guidelines, manufacturers of components and systems may become involved in the product testing process, thereby gaining greater flexibility in the performance of tests required for certification purposes. Products are assigned to specific test modules which specify, among other things, which tests are required and who is responsible for each test. Depending on the product and its categorization, the presence of a surveyor may no longer be required to the same extent as under the traditional certification procedure.

Prerequisite for the greater involvement of a manufacturer is the successful completion of an audit-based recognition process leading to a formal recognition certificate. The scheme has been warmly welcomed by industry with the first recognition certificates already issued and further renowned manufacturers currently undergoing the recognition procedure.

Besides publication on the [GL website the new Guidelines](#) are also available as a printed edition.



Speed up drawing exchange

“globe” allows shipyards, manufacturers and suppliers to submit their documents, records and certificates online to GL for plan approval.

The demand for a fast approval process is undoubted. The efficiency of the plan approval process in combination with CAA (Computer Aided Approval) can be increased by convincing even more shipyards and design offices to use the new electronic method of submitting documents for plan approval.

The benefits of electronic data exchange

“globe” stands for “global exchange” and consists of a dedicated Internet portal accessible via any standard browser, where plan approval documents are transferred electronically in PDF format. Customers simply log in and upload all documents. GL then receives a job notification and starts the approval process. As soon as the approval procedure is completed, GL uploads the approved documents (PDF) onto the globe portal and the customer receives a confirmation email stating that his documents are available for download. All without any printed papers and no time-consuming postal services.

Up to now over 1,200 GL customers from all over the world are using the service and about 55,000 incoming pages are transferred monthly via globe. This is equivalent to 35% of all incoming plan approval documents for GL’s maritime sector. “globe” has processed some 1.6 million pages within the last four years.

Faster document transfer: “globe” speeds up the process by cutting out the time previously spent processing and photocopying paper-based documents and sending them by post. Submitting even large numbers of documents is perfectly simple.

Lower costs: “globe” reduces not only the amount of paper involved, but also the general administrative costs of plan approval for shipyards, engine manufacturers, equipment suppliers and GL itself.

Convenient to use: “globe” comes with a user-friendly interface and allows documents to be easily checked on a computer screen instead of on oversized sheets of paper. All comments and corrections are easy to read, documents can be securely accessed by authorised persons from any location and subsequent digital archiving is perfectly simple.

Status tracking for full transparency: “globe” allows continuous access to documents and the status of project documentation. You can easily keep track of the plan approval process.

Increased efficiency: CAA enables corrections to be provided electronically on the document pages as well as separately on a list. Process the electronic corrections of submitted documents directly and integrate them into internal workflows.

Find the "globe" online access [here](#).



New GL Guidelines: Safe Return to Port Capability of Passenger Ships

On 15 December 2009, GL’s “Preliminary Guidelines for Safe Return to Port Capability of Passenger Ships” came into force.

The International Maritime Organization (IMO) has defined performance requirements for the functionality of essential systems on passenger ships under predefined casualty scenarios. The SOLAS requirements regarding “Safe Return to Port” require for the assessment of defined flooding as well as fire casualties the application of different and more risk-based methods. The relevant amendments to SOLAS refer to both Chapter II-1 (new regulation 8-1) and Chapter II-2 (regulations 21-22). The regulations are mandatory for passenger ships constructed on or after July 1, 2010 with a length of 120 metres or more or with three or more main vertical zones.

These vessels have to be able to return to port after a casualty case not exceeding a defined flooding or fire casualty threshold and provide all persons on board with basic services in so-called “safe areas”. For fire casualty cases exceeding

the casualty threshold but not exceeding one main vertical fire zone, systems for supporting orderly evacuation have to be available for three hours.

In addition to the increased safety for passengers and crew, a ship design which conforms to Safe Return to Port regulations will offer further benefits for the operator. Not only will the operation of the vessel be more efficient and flexible through additional system capabilities, but the down time of systems during normal operation will also be reduced, ensuring a smooth operation of the vessel.

As the strategies for complying with the new regulations have to be considered in an early stage of design already, GL is intending to assist designers, ship yards and owners with its Preliminary Guidelines for Safe Return to Port Capability of Passenger Ships. These guidelines have been established following the international discussions at IMO.

A copy of the guidelines is available in English on GL's website [here](#).

The new guidelines provide explanatory notes on the application of the new rules. The assessment process is described and guidance on the technical requirements on the systems' performance during safe return to port operation is given.

GL issued its guidelines to assist operators, designers and yards in the challenges ahead for new passenger ship design. GL also provides in-depth consultancy services regarding all matters relating to safe return to port, beginning with early-stage design support and offering overall assessment and also detailed assessment, if required.

Contact

Dr. Daniel Povel
Germanischer Lloyd
Engineering Solutions
phone +49 40 36149-7524
daniel.povel@gl-group.com



Design and Construction of Large Modern Yacht Rigs

A revised edition of the Guideline for Design and Construction of Large Modern Yacht Rigs has now been published.

A substantial fraction of all large modern sailing yachts have been certified to GL's now worldwide-acknowledged standard. As development in the field of mega sailing yachts is continuously ongoing, written standards have to keep up with these changes.

GL has now incorporated provisions for sailing catamarans as well. Not only do the rig configurations vary completely from the ones seen on monohulls, but the design criterion is also different. Where the righting moment is a very common basic design parameter for monohulls, this is not so for most of the cruising catamarans.

Those vessels often provide excessive stability. Consequently, an approach involving the wind pressure directly is chosen.

A major development has taken place in using polymer fibre cables for standing rigging purposes. Those can provide a weight reduction in standing rigging of up to 75% and are replacing the classic solid-steel-rod rigging elements more and more. GL has already issued a separate guideline for the certification of such cables. In addition, the new Guidelines include a new part addressing these new developments.

You can access the GL Guidelines for Design and Construction of Large Modern Yacht Rigs as a PDF [here](#). In addition, they can be ordered as a printed version via [email](#).