DNV GL rules for classification: Ships (DNVGL-RU-SHIP)
Publication January 2017
New and amended rules were formally approved on November 28th 2016 and are included in the 2017 January edition of the rules.

Entry into force date is generally 1\textsuperscript{st} of July 2017.

Please note the immediate entry into force for hull related parts of the rules (to be found in Pt. 3 and Pt. 5); entry into force date being 1\textsuperscript{st} of January 2017.

The changes to the rules may be categorized into three:

1. New class notations
2. Implementation of external requirements (IACS unified requirements and relevant IMO codes)
3. General updates and corrections
DNVGL-RU-SHIP
Pt.2 Materials and welding
**Opportunity and incentive (Why)**

- Alignment with IACS UR W16 “High strength steels for welded structures” (i.e. extra high strength steels in DNV GL Rules)
- Establish test requirements for $t>100\text{mm}$ for normal and high strength grades

**Scope of work (What)**

- Alternative calculation formula for carbon equivalents for extra high strength steels (CET as alternative to $C_{eq}$)
- Clarification of tensile test requirements for $t>100\text{mm}$ for all steel grades

**Safety/value delivered/market benefit (Impact)**

- More flexibility market in line with the technical state of the art and market expectation
- Introduced additional quality assurance for thicker plates

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<tr>
<td><strong>Contacts</strong></td>
<td>Christian Wildhagen/ Eva Junghans/ Marit Norheim</td>
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<tr>
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<td><strong>Entry into force</strong></td>
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Opportunity and incentive (Why)
- Operational experience on clarity of the rules
- Alignment with IACS UR W16 “High strength steels for welded structures”

Scope of work (What)
- Clarifications
  - Specifying standard for corrosion testing
  - Clear definition of test pressure requirements for hydrostatic leak tightness test aligned with European Standard
  - Heat treatment: location of thermocouples
  - Forged crankshafts: specimen location
- Implementation of IACS UR W16
  - Plate thickness up to max. 250 mm accepted by the rules
  - Introduction of 2 new strength grades VL 890 and VL 960

Safety/value delivered/market benefit (Impact)
- Clearer requirements in line with the technical state of the art and market expectation
Opportunity and incentive (Why)

- Internal and external feedback that DNVGL rules are more strict than IACS UR/Rec. and market expectations:
  - IACS UR W11 “Normal and higher strength hull structural steels”
  - IACS UR W28 “Welding procedure qualification tests of steels for hull construction and marine structures”
  - IACS Rec.No.47 “Shipbuilding and Repair Quality Standard”
- Rule clarifications needed

Scope of work (What)

- Removed requirement for specially approved steel plates when high heat input welding is applied.
- Introduced new steel groups for welding consumables
- More clear and specific requirement for vertical-down fillet welds on structural steel grades A to F40
- Clarification on requirements for welding workshop approval (WWA)
- Test temperature for austenitic stainless steels has been specified

Safety/value delivered-market benefit (Impact)

- Meeting market expectations on rules content
Opportunity and incentive (Why)

- DNVGL-RU-SHIP Part 3 was introduced as a completely new rule book in Oct 2015
- Customer feedback is received from the application of the rules and we are following up proposals for improvement with this rule change
- The changes streamline the application, refine scantling impact and correct misprints

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<td>Contacts</td>
<td>Pål Saltvedt/ Lars-Chr. Andersson</td>
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## DNVGL-RU-SHIP Part 3 - Overview main changes (1/2)

<table>
<thead>
<tr>
<th>Part</th>
<th>Ch</th>
<th>Sec.</th>
<th>Change</th>
<th>Consequence</th>
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<tbody>
<tr>
<td>Pt.3</td>
<td>Ch.3</td>
<td>Sec.3</td>
<td>Net scantling approach for beam analysis: Removed the need for subtracting 0.5 ( t_c ) from scantlings applied in beam analysis models.</td>
<td>More convenient application and aligned with the procedure for FEM. Slightly reduced scantling requirements.</td>
</tr>
<tr>
<td>Pt.3</td>
<td>Ch.3</td>
<td>Sec.6</td>
<td>Simplified requirement to tripping bracket arm length based on customer feedback.</td>
<td>More convenient application, and aligned the requirements with industry practise.</td>
</tr>
<tr>
<td>Pt.3</td>
<td>Ch.3</td>
<td>Sec.6</td>
<td>Added requirement to fitting of brackets to prevent local bending of plate in tank boundaries.</td>
<td>Normally no consequence as this is in line with design practise. The added requirement provides a rule reference to require brackets fitted where needed.</td>
</tr>
<tr>
<td>Pt.3</td>
<td>Ch.4</td>
<td>Sec.2</td>
<td>Increased horizontal bending moment in line with torsional moment</td>
<td>No consequence on scantlings observed. The adjustment is introduced to improve technical consistency.</td>
</tr>
<tr>
<td>Pt.3</td>
<td>Ch.4</td>
<td>Sec.5</td>
<td>Sea pressure in oblique sea at waterline tuned. The existing formulation led to an increased pressure in side in a limited area aft, resulting in a complicate design and approval process</td>
<td>More convenient application of the rules and avoid performing a separate scantling check within a limited area of the vessel.</td>
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<tr>
<td>Pt.3</td>
<td>Ch.4</td>
<td>Sec.3</td>
<td>Reduction of accelerations for small vessels based on approval findings and investigation of design waves applied</td>
<td>Reduced design accelerations on small vessels to avoid unnecessary strengthening due to unrealistic/unphysical accelerations</td>
</tr>
<tr>
<td>Pt.3</td>
<td>Ch.6</td>
<td>Sec.3</td>
<td>Reduced minimum thickness requirements for upper part of superstructure side typically on passenger and ro-ro ships by ~1mm based on strong customer feedback</td>
<td>Reduced scantlings in upper part of superstructure not exposed to sea pressures. This reduction has a positive effect on stability and associated requirements for these vessels.</td>
</tr>
<tr>
<td>Pt.3</td>
<td>Ch.6</td>
<td>Sec.5</td>
<td>Increased permissible stress for flooding (accidental) loads. Scantling requirements aligned with previously approved designs</td>
<td>Reduced scantling requirements for container vessels. Overall safety is maintained since the modified acceptance criteria implies a sufficient reserve capacity to prevent an ultimate collapse in an accidental case.</td>
</tr>
<tr>
<td>Pt.3</td>
<td>Ch.8</td>
<td>Sec.1</td>
<td>Revised buckling requirement for Permanent Means of Access (PMA) stringers. Current prescriptive formulation (taken from CSR) is being disputed by major yards. The requirements have been modified to require a general buckling check as for other structural members.</td>
<td>Reduced required scantlings of PMA stringers. Able to accept proven and previously approved yard standards without compromising safety.</td>
</tr>
<tr>
<td>Pt.3</td>
<td>Ch.8</td>
<td>Sec.2</td>
<td>Requirement to maximum distance between tripping brackets has been refined, targeting to reduce number of required tripping brackets for decks where stiffener spacing is very small (typically car decks).</td>
<td>Reduction in the required number of brackets. Alignment with the requirements with industry practise.</td>
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</table>
Pt.4 Systems and components
Opportunity and incentive (Why)

- Separate certification requirement to ancillaries like pumps, cables etc., when integrated as part of the unit (thruster, reduction gear etc.) are found to be impractical
- Modify rules for crash stop for vessels with thrusters or pods to be in compliance with industry standard and maritime practice. The aim is to perform effective stopping without harming vessel or equipment.

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<tr>
<td>Contacts</td>
<td>Svein-Olav Hannevik</td>
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<tr>
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Scope of work (What)

- Removed separate certification requirements to ancillaries integrated as part of larger units.
- Crash stop rules for vessels with thrusters or pods
  - DNVGL requirement of 2 [rpm] turning speed for steering gear is removed.
  - Procedures with combination of steering & propulsion are accepted for means going astern, alternative to change direction of rotation for propeller.

Safety/value delivered/market benefit (Impact)

- Simplified and clarified certification and approval process for ancillaries.
- Crash stop rules aligned with the needs of the industry and safety level is maintained.

Service line | Ship classification
---|---
Contacts | Svein-Olav Hannevik
Publication date | January 2017
Entry into force | July 2017
Opportunity and incentive (Why)

- Align with the rules systematics on installations not being important function as defined within the class scope. (EGCS is not important function).
- IACS UR M77 for ammonia storage and handling coming into force in January 2018.
- Need detailed rules for the most common systems (NaOH and Urea solution systems).
- Increase safety for inline scrubber units.

Scope of work (What)

- All remaining redundancy requirements for EGC systems removed (e.g. filters to be redundant or fitted with bypass, minimum two sea chests required for scrubber systems).
- Specific section for urea based systems incorporating relevant requirements from fuel oil system rules, kept in line with IACS UR.
- Specific section for NaOH based systems incorporating relevant requirements from fuel oil system requirements, with same logic as for urea systems.
- New requirements for inline exhaust gas cleaning systems, taking into account increased risk of backflow and consequences of structural failures in scrubber unit.

Safety/value delivered/market benefit (Impact)

- Improved clarity of rules for most common systems (Urea and NaOH systems).
- Reduced class scope on exhaust gas cleaning systems (no redundancy check).
- Improved safety for systems with inline scrubber units.

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<td>Hans Jacob Horgen</td>
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Opportunity and incentive:

- Update in accordance with IACS UR E24 “Harmonic Distortion for Ship Electrical Distribution System including Harmonic Filters”
- Prepare for new marine technology
- Clarify requirements for standby generators

Scope

- Added req. to documentation, on-board testing, and req. to protection and monitoring (IACS)
- Implement acceptance criteria for new technology in marine use:
  - Cables with aluminium conductors
  - Permanent magnet electrical machines
- Clarified requirements for certification of slip ring units, added reference to IEC 60092-501
- Removed acceptance of one dedicated standby generator

Safety/value delivered/market benefit:

- Compliance with IACS UR E24
- Acceptance of new maritime technology
Opportunity and incentive (Why)

- Extensive use of glass side walls on recent cruise project where the side walls consist of several glass panes and not supported on all edges
- Rules need to specify test requirements for these cases

Scope of work (What)

- Update rules with test requirement for glass side walls consisting of more than one element or not supported on all four edges
- Provide acceptance of glass side walls not supported on all four sides,

Safety/value delivered/ market benefit (Impact)

- Provided designer with clear requirements to glass side walls in line with cruise design trend and present practice

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Opportunity and incentive (Why)

- DNV GL rules introduced an increased minimum thickness requirement side and bottom plating compared to that of previous rules.

Scope of work (What)

- Reduced minimum thickness requirements with 0.5 mm for side and bottom plating of fishing vessels.

Safety/value delivered/market benefit (Impact)

- Minimum thickness requirements in DNVGL rules are aligned with well proven / existing designs

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<td>Maciej Jozwiak (MCANO878)</td>
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Pt.6 Additional class notations
Opportunity and incentive (Why)

- Modernize the rules for DP station keeping assessment by replacing “environmental regularity numbers”; ern* calculations with “Station keeping capability calculations” according to new DNVGL-ST-0111 Assessment of station keeping capability of dynamic positioning vessels

Scope of work (What)

- Replace ern* with DP capability calculations according to DNVGL-ST-0111

Safety/value delivered/market benefit (Impact)

- Modernized station keeping capability assessments
- Station keeping assessment for ship-shaped mono-hulls can be performed by DNV GL and customers in the new and free DNV GL web application

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Opportunity and incentive (Why)
- Need for aligning NAUT rules with the IMO performance standards for bridge alert management – BAM

Scope of work (What)
- Harmonizing rule requirements with IMO Performance standards

Safety/value delivered/market benefit (Impact)
- Enhance the safety of operation through the BAM protocol
- Smooth implementation process for yards

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<td>MCANO 383 – BULUK</td>
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Opportunity and incentive (Why)

- The existing additional notation Container covers primarily certification of lashing equipment and lashing computer for ships other than Container ships (general cargo ships, MPV’s etc).
- The notation also needs to cover requirements to securing arrangements for non-typical container arrangements.
- Current requirement to lashing computer to strict for vessels with limited container carriage

Scope of work (What)

- Implement new requirements for “equipped for carriage of containers”
- Approval of lashing computer limited to vessels with more than 2 tiers on deck and/or 3 in hold.

Safety/value delivered/market benefit (Impact)

- Specific requirements for container stowage on general cargo ships provided
- Removed requirement for approved lashing computer for the vessels with limited container intake

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<td>Andree Orth/Daniel Abt</td>
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Opportunity and incentive (Why)

- Need to clarify where aluminum-steel transition joints (bi-metallic connections) can be used in helideck construction
- Align requirements intended to provide drainage of helicopter decks on ships with industry practice and intentions of regulatory requirements (NMD and CAP 437)

Scope of work (What)

- Clarify that aluminum-steel transition joints shall not be used when exposed to tensile loads
- Remove requirement for deck cambering. Replaced with general requirement for the deck to be constructed so that fluids will not accumulate on the deck

Safety/value delivered/market benefit (Impact)

- Bi-metallic connections not to be used for helideck structure in tensile exposed areas in line with current practice.
- Gives more flexibility to designer and manufacture while maintaining the same safety level

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<td>Marcus Wallenborg Grzegorz Seredyka</td>
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Opportunity and incentive

- DNV GL has been involved in many Walk2work projects as a ship classification society, marine consultant, safety & regulatory compliance advisor, and in a wider risk management role
- Operators in both oilfield and offshore wind turbine operation are increasingly focusing on alternative means of personnel transfer; i.e. other than helicopter, basket transfer and boat landing

Scope of work

- Requirements include:
  - certification of the gangway in accordance with DNVGL-ST-0358 Certification of offshore gangways for personnel transfer
  - station keeping ability. If handled by a DP system, class notation for DP is made mandatory.
  - stability and hull supporting structure
- Updating certification requirements for accommodation units as governed by DNVGL-RU-OU-0101
- An associated update of DNVGL-ST-0358 for gangways

Safety/value delivered.market benefit

- Increased transparency and predictability for personnel transfer systems
- Offer ship owners a way to document capability and integrity of offshore gangways installed
- Increased safety in personnel transfer operations

Service line | Ship classification
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Contacts | Per-Egil Rosenblad,
| Per Arild Åland,

Publication date | January 2017
Entry into force | July 2017
Opportunity and incentive

- Detailed stability and strength calculations for each step in the ballast exchange sequence are not considered necessary for vessels with an approved loading computer.

Scope of work

- Removing requirement for detailed calculations in the BWM plan for sequential exchange of ballast water when an approved loading computer is on board.

Safety/value delivered-market benefit (Impact)

- More efficient documentation process for client.

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<td>Tone Knudsen Fiskeseth Geir Knudsen</td>
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Thank you!

Geir Dugstad

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