RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part L Equipment

2011 AMENDMENT NO.1

Rule No.27 30th June 2011

Resolved by Technical Committee on 3rd February 2011

Approved by Board of Directors on 25th February 2011

Rule No.27 30th June 2011
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Rules for the survey and construction of steel ships" has been partly amended as follows:

Part L EQUIPMENT

Amendment 1-1

Chapter 3 CHAINS

3.2 Offshore Mooring Chains

3.2.5 Processes of Manufacture

Sub-paragraph -2 has been amended as follows.

2 In cases where the studs for Grade *R*3 offshore chains and Grade *R*3*S* offshore chains are welded, the following **(1)** to ~~**(3)**~~**(4)** are to be complied with:

(1) Both ends of the stud are to be a good fit into the link and are not to be fitted on the flash butt weld of the link as far as practicable, and the full periphery of the stud end is to be welded. Welding of both ends of the stud is not permitted unless specially approved by the Society.
(2) Welding position is to be flat as possible.
(3) All welds are to be carried out before the final heat treatment of offshore chains.
(4) The welds are to be free from defects such as clacks, lack of fusion, gross porosity and undercuts exceeding 1*mm.*

Paragraph 3.2.7 has been amended as follows.

3.2.7 Heat Treatment

1 Offshore chains are to be heat treated as normalized, normalized and tempered or quenched and tempered in a continuous furnace. In principle, batch heat treatment is not permitted. In cases where tempering is carried out, a control standard for the combination of holding temperature and time is to be established and such standard is to be complied with. Cooling after tempering is to be appropriate to avoid temper embitterment.

2 Accessories of offshore chain are to be heat treated as normalized, normalized and tempered or quenched and tempered.

3 Offshore chains are to be austenitized in accordance with the established control standard for the combination of austenitizing temperature and time.

Paragraph 3.2.9 has been amended as follows.

3.2.9 Dimensional Tolerances

(-1 to -5 are omitted)

6 If links are found to be defective or not to meet the dimensional tolerance requirement specified in **-1**, defective links may be cut off and a connecting common link ~~or joining shackle~~ inserted in their place. In this case, proof tests are to be carried out again after insertion of a connecting common link ~~or a joining shackle~~, and dimensions of a connecting common link ~~or a joining shackle~~ are to be measured.

7 (Omitted)

8 If link diameter, length, and stud alignment do not conform to the required dimensions, these are to be compared to the dimensions of 40 more links; on each side of the affected link. If a single of the aforementioned dimensions fails to meet the required dimensional tolerance in more than 2 of the sample links, all links are to be examined and comply with **-6** above.

Paragraph 3.2.11 has been amended as follows.

3.2.11 Breaking Tests

1 The breaking test for offshore chain is to be carried out by the following procedures after final heat treatment.

((1) to (6) are omitted)

(7) If either or both results of the additional test and failure investigation specified in **(5)** and **(6)** fail, the sampling length of offshore chain represented will be rejected. If a single link is found to be defective or not to meet the requirement of breaking test, defective links may be cut out and connecting common link ~~or joining shackle~~ inserted in its place and retest of breaking test may be carried out. If the result of the retest is found satisfactory, the sampling length of offshore chain represented may be passed.

(8) For chain diameters over 100*mm*, alternative breaking test proposals to the above breaking test will be considered whereby a one link specimen is used. Alternatives are to be approved by the Society, every heat is to be represented, the test frequency is to be in accordance with **Table L3.11**, and it is to be demonstrated and proven that the alternative test represents an equivalent load application to the three link test.

2 The breaking test for accessories of offshore chain and connecting common link is to be carried out by the following procedures after final heat treatment.

((1) to (4) are omitted)

(5) In the event of a failure of the breaking test, the entire batch represented is to be rejected unless the cause of failure has been determined and it can be demonstrated to the Surveyor's satisfaction that the condition causing the failure is not present in any of the remaining accessories.

Paragraph 3.2.12 has been amended as follows.

3.2.12 Proof Tests

1 The proof test is to be carried out for the entire length of offshore chain by the following procedures after final heat treatment.

((1) to (3) are omitted)

(4) In the event that two or more links in the proof loaded length fail, that length of offshore chain is to be rejected. An investigation and retest are to be carried out in accordance with the following **(a)** to **(c)** and where these results are found satisfactorily, this length of offshore

chain may be accepted.

(a) (Omitted)

(b) (Omitted)

(c) Defective links may be cut out and connecting common link ~~or joining shackle~~ inserted in its place and retest of proof load test is to be carried out.

2 All kinds of accessories and connecting common links are to be proof tested in accordance with the following:~~to the proof test loads specified in **Table L3.10**, in accordance with the kinds and diameters of the offshore chains to be connected therewith, and they are to be withstand the tests without crack, breakage or any other defects. This test may be carried out simultaneously with the proof test for the offshore chains or together with any offshore chains of the same diameter with which accessories are connected.~~

(1) They are tested to the proof test loads specified in **Table L3.10**, in accordance with the kinds and diameters of the offshore chains to be connected therewith, and they are to withstand the tests without cracking, breaking or any other defects. This test may be carried out simultaneously with the proof test for offshore chains or together with any offshore chains of the same diameter with which the accessories are connected.

(2) In the event of a failure of the proof test, the entire batch represented is to be rejected unless the cause of failure has been determined and it can be demonstrated to the Surveyor's satisfaction that the condition causing the failure is not present in any of the remaining accessories.

3.2.13 Mechanical Tests

Sub-paragraph -2 has been amended as follows.

2 Mechanical tests for accessories of offshore chains and connecting common links are to be carried out in accordance with following manner after final heat treatment and proof loaded.

(1) One tensile test specimen and one set (3 pieces) impact test specimen are to be taken at the frequency specified in **3.2.11-2(1)** and in the locations specified in **Fig. L3.4** of accessories of offshore chains and connecting common links and mechanical tests are to be carried out. The locations of mechanical tests of other accessories with complex geometries are to be approved by the Society.

(a) The mechanical test pieces of cast shackles and cast Kenter shackles are to be taken from the straight part or crown of the accessory.

(b) The mechanical test pieces of forging shackles and forging Kenter shackles are to be taken from the crown of the shackle. In cases where the diameter of shackle is small or the geometry does not permit a tensile specimen from the crown, tensile test pieces may be taken from the straight part of shackles.

(c) The mechanical test pieces of pins of shackles are taken as per **Fig. L3.4** from the mid length of a sacrifice pin of the same diameter as the final pin. For oval pins the diameter taken is to represent the smaller dimension. Mechanical tests may be taken from an extended pin of the same diameter as the final pin that incorporates a test prolongation and a heat treatment buffer prolongation, where equivalence with mid length test values have been established. The length of the buffer is to be at least equal to 1 pin diameter which is removed after the heat treatment cycle is finished. The test coupon can then be removed from the pin. The buffer and test are to come from the same end of the pin as per **Fig. L3.5**.

(2) Mechanical properties are to comply with the requirements specified in **Table L3.12**.

(~~2~~3) Where the test results specified in **(1)** and **(2)** above do not conform to the requirements, additional tests may be carried out by the two tensile test specimens and 2 sets impact test specimens taken from the same lot specified in **(1)** above. The results of the retest of impact test specimens are to be added to those previously obtained to form a new average. Where one tensile test does not conform to the requirement specified in **Table L3.12**, the sampling rot represented is to be subjected to rejection and where the new average value does not comply with the requirements specified in **Table L3.12**, the sampling rot represented is to be subjected to rejection.

(4) For individually produced accessories or accessories produced in small batches (less than 5), alternative tests may be accepted provided they are deemed appropriate by the Society.

(5) In the event of a failure of the mechanical test, the entire batch represented is to be rejected unless the cause of failure has been determined and it can be demonstrated to the Surveyor's satisfaction that the condition causing the failure is not present in any of the remaining accessories.

Fig. L3.4 has been added as follows.

Fig L3.4 Sampling locations of test pieces for shackles

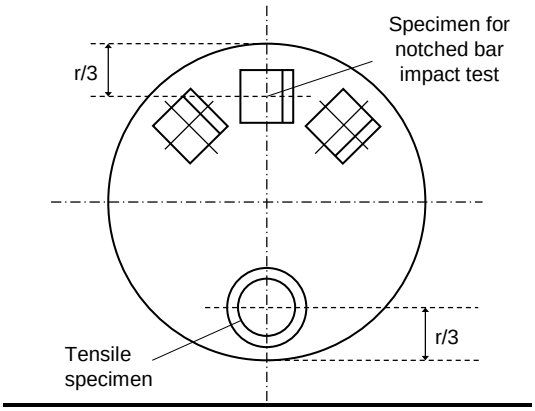
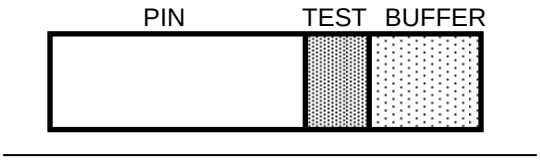


Fig. L3.5 has been added as follows.

Fig L3.5 Location of buffer and test pieces for extended pins



Paragraph 3.2.14 has been amended as follows.

3.2.14 Non-destructive Test

1 Offshore chains and accessories of offshore chains are to be free from harmful defects in use such as of pipe, cracks, notches, cuts, flakes and lack of fusion.

2 All offshore chains are to be subjected to the non-destructive test specified in the following **(1)** and **(2)** after proof tests.

(1) Visual examination

All surfaces of every link are to be examined visually. Chains are to be positioned in order to have good access to all surfaces.

(~~1~~2) Magnetic Particles test or Dye Penetrant Test

(a) Magnetic particles tests or dye penetrant tests for each link is to be employed to examine the flash butt welded area including the area gripped by the clamping dies.

(b) For 10% of the links, magnetic particles test are to be carried out on all accessible surfaces.

(~~b~~c) At least 10% of all studs welds within each length of offshore chains are to be examined by magnetic particles test or dye penetrant test where studs are set to link by welding. If cracks or lack of fusion are found, all welded parts are to be examined.

(~~2~~3) Ultrasonic Test

Ultrasonic tests are to be performed for all links to examine the flash weld fusion.

3 Visual examinations and ~~M~~magnetic particles tests or dye penetrant tests for every accessory of offshore chains and connecting common links are to be performed after proof tests. In the event of a failure of the above tests, the entire batch represented is to be rejected unless the cause of failure has been determined and it can be demonstrated to the Surveyor's satisfaction that the condition causing the failure is not present in any of the remaining accessories.

4 Non destructive examination operators are to be appropriately qualified in performing non destructive examinations.

Paragraph 3.2.16 has been amended as follows.

3.2.16 Markings

Where offshore chains and accessories of offshore chains have satisfactorily passed the tests and inspections required by **3.2**, they are to be marked as follows:

(1) Places of markings

At stud of each end of offshore chains

At stud of each end at intervals not exceeding 100*m*

On connecting common link (Stud links are marked at the stud. Studless links are marked at the outside of straight parts without flash butt welds.)

On the studs of common links next to connecting common links or ~~joining~~ shackles, all kinds of accessories of offshore chains

(2) Kinds of markings

(Omitted)

Paragraph 3.2.18 has been amended as follows.

3.2.18 Records

1 Manufacturers producing offshore chains and accessories of offshore chains are to make records with regard to the manufacturing processes tests and inspections required to offshore chains and accessories of offshore chains, and the results of them, and such records are to readily available

to the Surrey or when requested.

2 For the manufactures of offshore mooring chains and accessories which are grades *R*4*S* and *R*5, the following information for each heat is to be included on test certificates.

(1) The results of the microscopic examinations for non-metallic inclusions

(2) The results of macro etched examinations in order to confirm that there is no injurious segregation or porosity

(3) The results of Jominy hardenability tests

EFFECTIVE DATE AND APPLICATION (Amendment 1-1)

1. The effective date of the amendments is 1 July 2011.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to offshore chain and accessories of offshore chain for which the application for survey is submitted to the Society before the effective date, or offshore chain and accessories of offshore chain used for offshore units and single point mooring systems for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or

(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.

Amendment 1-2

Chapter 3 CHAINS

3.2 Offshore Mooring Chains

Paragraph 3.2.1 has been amended as follows.

3.2.1 Application

Offshore mooring chains (hereinafter referred to as “offshore chain”) and shackles and swivels which are connected to the offshore chain (hereinafter referred to as “accessories for offshore chain”) are to comply with the requirements in **3.2** or to be of equivalent quality.

Where, an offshore chain is used for mobile offshore drilling units and special purpose barges defined in **Part P**.

EFFECTIVE DATE AND APPLICATION (Amendment 1-2)

1. The effective date of the amendments is 30 December 2011.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to ships for which the date of contract for construction is before the effective date.

3. Notwithstanding the provision of preceding **2.**, the amendments to the Rules may apply to ships for which the application is submitted to the Society before the effective date upon request by the owner.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

GUIDANCE

Part L Equipment

2011 AMENDMENT NO.1

Notice No.41 30th June 2011
Resolved by Technical Committee on 3rd February 2011

Notice No.41 30th June 2011
AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Guidance for the survey and construction of steel ships" has been partly amended as follows:

Part L EQUIPMENT

L3 CHAINS

L3.2 Offshore Mooring Chains

Paragraph L3.2.11 has been amended as follows.

L3.2.11 Breaking Tests
1 (Omitted)
2 (Omitted)
3 With respect to **3.2.11-2(1), Part L of the Rules,** a batch is defined as accessories that originate from the same heat treatment charge and the same heat of steel.
~~**3**~~**4** (Omitted)
~~**4**~~**5** Where the accessories for offshore chains complied with requirement in ~~-3~~**4** have not been passed the breaking test specified in **3.2.11-2(1)** and **3.2.11-2(2), Part L of the Rules**, the requirement of **3.2.11-2(3), Part L of the Rules** is not to be applied thereto.

Paragraph L3.2.13 has been amended as follows.

L3.2.13 Mechanical Tests
1 Where applying the **Notes(3)** of **Table L3.12 of the Rules**, manufacturer is to submit the documents indicating that manufacturer and purchaser agreed to conduct impact test in accordance with **Notes(3)** of **Table L3.12 of the Rules**, to the Society for approval.
2 With respect to **3.2.13-2(4), Part L of the Rules,** a batch is defined as accessories that originate from the same heat treatment charge and the same heat of steel.

Paragraph L3.2.14 has been added as follows.

L3.2.14 Non-destructive Test
1 With respect to the visual examinations specified in **3.2.14-3, Part K of the Rules,** special attention is to be paid to machined surfaces and high stress regions. All non machined surfaces are to be sand or shot blasted.
2 **"**to be appropriately qualified in performing non destructive examinations" specified in **3.2.14-4, Part K of the Rules**, means those qualified Level II or higher in accordance with *ISO* 9712 or an equivalent qualification deemed appropriate by the Society.

L3.2.18 Records

Sub-paragraph -2 has been amended as follows.

2 Records of testings and inspections are to indicate the following **(1)** to **(4)**:
(1) (Omitted)
(2) (Omitted)
(3) The results, procedure, and acceptance/rejection criteria of the non-destructive tests required by **3.2.14, Part L of the Rules**.
(4) (Omitted)

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 July 2011.

2. Notwithstanding the amendments to the Guidance, the current requirements may apply to offshore chain and accessories of offshore chain for which the application for survey is submitted to the Society before the effective date, or offshore chain and accessories of offshore chain used for offshore units and single point mooring systems for which the date of contract for construction* is before the effective date.

* "contract for construction" is defined in the latest version of IACS Procedural Requirement (PR) No.29.

IACS PR No.29 (Rev.0, July 2009)

1. The date of "contract for construction" of a vessel is the date on which the contract to build the vessel is signed between the prospective owner and the shipbuilder. This date and the construction numbers (i.e. hull numbers) of all the vessels included in the contract are to be declared to the classification society by the party applying for the assignment of class to a newbuilding.

2. The date of "contract for construction" of a series of vessels, including specified optional vessels for which the option is ultimately exercised, is the date on which the contract to build the series is signed between the prospective owner and the shipbuilder.

For the purpose of this Procedural Requirement, vessels built under a single contract for construction are considered a "series of vessels" if they are built to the same approved plans for classification purposes. However, vessels within a series may have design alterations from the original design provided:

(1) such alterations do not affect matters related to classification, or
(2) If the alterations are subject to classification requirements, these alterations are to comply with the classification requirements in effect on the date on which the alterations are contracted between the prospective owner and the shipbuilder or, in the absence of the alteration contract, comply with the classification requirements in effect on the date on which the alterations are submitted to the Society for approval.

The optional vessels will be considered part of the same series of vessels if the option is exercised not later than 1 year after the contract to build the series was signed.

3. If a contract for construction is later amended to include additional vessels or additional options, the date of "contract for construction" for such vessels is the date on which the amendment to the contract, is signed between the prospective owner and the shipbuilder. The amendment to the contract is to be considered as a "new contract" to which **1.** and **2.** above apply.

4. If a contract for construction is amended to change the ship type, the date of "contract for construction" of this modified vessel, or vessels, is the date on which revised contract or new contract is signed between the Owner, or Owners, and the shipbuilder.

Note:
This Procedural Requirement applies from 1 July 2009.