19-502

RULES FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

Rules for the Survey and Construction of Inland Waterway Ships
2019 AMENDMENT NO.2
Guidance for the Survey and Construction of Inland Waterway Ships
2019 AMENDMENT NO.2

Rule No.120 / Notice No.85 27 December 2019
Resolved by Technical Committee on 22 July 2019

ClassNK
NIPPON KAIJI KYOKAI

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

RULES FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

RULES

2019 AMENDMENT NO.2

Rule No.120 27 December 2019

Resolved by Technical Committee on 22 July 2019

An asterisk (*) after the title of a requirement indicates that there is also relevant information in the corresponding Guidance.

Rule No.120 27 December 2019
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

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

Amendment 2-1

Part 2 CLASS SURVEYS

Chapter 1 GENERAL

1.1 Surveys

1.1.3 Intervals of Class Maintenance Surveys*

Sub-paragraph -3 has been amended as follows.

3 The classed ships are to be subject to Occasional Surveys when they fall under one of the conditions of **(1)** through **(6)** below. Periodical Surveys may substitute for the Occasional Surveys where the survey items of the Occasional Surveys are inspected as a part of the Periodical Surveys. To implement the survey, in lieu of the traditional ordinary surveys where a surveyor is in attendance, the Society may approve survey methods which it considers to be appropriate.

(1) When main parts of hull, machinery or important equipment or fittings which have been surveyed by the Society, have been damaged, or are to be repaired, altered, or modified.
(2) When load lines are to be changed or to be newly marked.
(3) When an alteration affecting the ship's stability is made.
(4) When the Survey is requested by the owner.
(5) When the Survey is carried out to verify that the ships already constructed are in compliance with the retroactive requirements of the Rules.
(6) Whenever the survey is considered necessary by the Society.

Part 8 ELECTRICAL INSTALLATIONS

Chapter 2 ELECTRICAL INSTALLATIONS AND SYSTEM DESIGN

2.9 Cables

2.9.9 Current Rating of Cables

The current rating of cables is to comply with the following **(1)** to **(5)**.

(1) The current rating of cables for continuous service is not to exceed the values given in **Table 8.2.13**.

(2) The current rating of cables for short-time services (30 *minutes* or 60 *minutes*) may be increased by multiplying the value given in **Table 8.2.13** by the following correction factor.

correction factor: $\sqrt{1.12/(1-exp(-ts/0.245/d^{1.35}))}$

ts: 30 or 60 (*min*)
d: overall diameter of the finished cable (*mm*)

(3) The current rating of cables for intermittent services (for periods of 10 *minutes*, of which 4 *minutes* are with constant loads and 6 *minutes* without any loads at all) may be increased by multiplying the value given in **Table 8.2.13** by the following correction factor.

correction factor: $\sqrt{\frac{1-exp(-10/0.245/d^{1.35})}{1-exp(-4/0.245/d^{1.35})}}$

d: overall diameter of the finished cable (*mm*)

The current rating for other intermittent ratings is to be deemed appropriate by the Society.

(4) In cases where more than 6 cables belonging to the same circuit are bunched together, a correction factor of 0.85 is to be applied.

(5) In cases where ambient temperatures are different from those specified in **(1)** to **(3)**, the correction factor in **Table 8.2.14** may be applied.

Table 8.2.13 has been amended as follows.

Table 8.2.13 Current Ratings of Cables (for continuous service)(1)

(Based on Ambient Temperatures of 45℃)

Nominal sectional area of conductor (mm^2)	Current rating in amperes											
	~~*PVC* insulation (general purpose) (70 ˚*C*)~~			*PVC* insulation(2) (heat resisting) (75 ˚*C*)			~~*EP* rubber insulation and~~ Cross-linked polyethylene Insulation(3) and *EP* rubber insulation (90 ˚*C*)			Silicon rubber insulation and Mineral insulation (95 ˚*C*)		
	~~1 core~~	~~2 cores~~	~~3 cores~~	1 core	2 cores	3 cores	1 core	2 cores	3 cores	1 core	2 cores	3 cores
1.5	~~12~~	~~13~~	~~11~~	17	14	12	23	20	16	26	22	18
2.5	~~17~~	~~18~~	~~15~~	24	20	17	30	26	21	32	27	22
4	~~22~~	~~25~~	~~20~~	32	27	22	40	34	28	43	37	30
6	~~29~~	~~31~~	~~26~~	41	35	29	52	44	36	55	47	39
10	~~51~~	~~43~~	~~36~~	57	48	40	72	61	50	76	65	53
16	~~68~~	~~58~~	~~48~~	76	65	53	96	82	67	102	87	71
25	~~90~~	~~77~~	~~63~~	100	85	70	127	108	89	135	115	95
35	~~111~~	~~94~~	~~78~~	125	106	88	157	133	110	166	141	116
50	~~138~~	~~117~~	~~97~~	150	128	105	196	167	137	208	177	146
70	~~171~~	~~145~~	~~120~~	190	162	133	242	206	169	256	218	179
95	~~207~~	~~176~~	~~145~~	230	196	161	293	249	205	310	264	217
120	~~239~~	~~203~~	~~167~~	270	230	189	339	288	237	359	305	251
150	~~275~~	~~234~~	~~193~~	310	264	217	389	331	272	412	350	288
185	~~313~~	~~266~~	~~219~~	350	298	245	444	377	311	470	400	329
240	~~369~~	~~314~~	~~258~~	415	353	291	522	444	365	553	470	387
300	~~424~~	~~360~~	~~297~~	475	404	333	601	511	421	636	541	445

Note:

(1) The values in this table are not applied to cables which do not satisfy the maximum rated conductor temperature of the concerned insulation.

(2) Polyvinylchlorid insulated wires for control equipment wiring, etc.

(3) Single core, flame retardant cross-linked polyethylene insulated flexible switchboard wire, etc.

2.9.12 Earthing of Metallic Coverings*

Sub-paragraph -3 has been deleted.

1 (Omitted)

2 (Omitted)

~~**3 Lead sheaths of lead-sheathed cables are not to be used as the sole means of earthing any non-current carrying parts of electrical equipment.**~~

2.9.17 Cables in Refrigerated Spaces*

Sub-paragraph (2) has been amended as follows.

(1) (Omitted)

(2) Cables are to have ~~lead sheaths or~~ sheaths made out of materials with good water resistant

properties and be capable of withstanding the low temperatures of refrigerated spaces.

(3) (Omitted)

(4) (Omitted)

(5) (Omitted)

Chapter 5 BARGES

5.9 Tank Barges

5.9.4 Electrical Installations in Hazardous Areas*

Sub-paragraph -5 has been amended as follows.

5 All cables are to be one of the following types. In cases where some corrosion is to be expected, *PVC* or chloroprene sheaths are to be applied over any armour or metallic sheaths of cables for corrosion protection.

(1) Mineral insulated and copper sheathed

~~(2) Lead alloy sheathed and metal armoured~~

(~~3~~2) Non-metallic sheathed and metal armoured

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 27 December 2019.

Amendment 2-2

Part 7 MACHINERY INSTALLATIONS

Chapter 1 GENERAL

1.3 General Requirements for Machinery Installations of Tugs and Pushers

1.3.1 General*

(-1 to -3 are omitted.)

4 Main propulsion machinery and prime movers for driving generators, and auxiliary machinery (excluding auxiliary machinery for specific use etc.) and their prime movers that are installed in the ships are to be designed to operate under the conditions given in **Table 7.1.1**. However, deviation from the angles given in **Table 7.1.1** may be permitted after taking into consideration the type, size and service conditions of the ship.

(-5 to -8 are omitted.)

Table 7.1.1 has been amended as follows.

Table 7.1.1 Angle of Inclination

Type of machinery installation	Athwartships(2)		~~Bow~~Fore-and-~~stern~~aft(2)	
	Static inclination (List)	Dynamic inclination (Rolling)	Static inclination (Trim)	Dynamic inclination (Pitching)
Main propulsion machinery Essential boilers Prime movers driving generators auxiliary machinery (excluding auxiliary machinery for specific use, etc.) and their driving units	15°	22.5°	5°(3)	7.5°
Switchgears(1) (Circuit breakers, etc.) Automatic or remote operated equipment	22.5°	22.5°	10°	10°

Notes:

(1) ~~Up to an angle of inclination of 45°,~~ No undesired switching operations or operational changes are ~~not~~ to ~~be caused~~occur.

(2) Athwartships and ~~bow~~fore-and-~~stern~~aft inclinations may occur simultaneously.

(3) Where the length of the ship exceeds 100 *m*, the fore-and-aft static angle of inclination may be taken as follows:

$\theta = 500/L$

θ : The static angle of inclination ~~in degrees~~ (°)

L : Length of the ship specified in **2.1.4, Part 1** (*m*)

Part 8 ELECTRICAL INSTALLATIONS

Chapter 1 GENERAL

1.1 General

1.1.7 Ambient Conditions*

Sub-paragraph -2 has been amended as follows.

1 The ambient conditions given in **Table 8.1.1** and **Table 8.1.2** are to be applied, unless otherwise specified, to the design, selection and arrangement of electrical installations in order to ensure their proper operation.
2 All electrical equipment ~~are~~is to be designed sufficiently enough to withstand any vibrations that occur under normal conditions.

Table 8.1.2 has been amended as follows.

Table 8.1.2 Angle~~s~~ of Inclination

Installation Components	Athwartships(~~1~~2)		~~Bow~~Fore-and-~~stern~~aft (~~1~~2)	
	Static inclination (List)	Dynamic inclination (Rolling)	Static inclination (Trim)	Dynamic inclination (Pitching)
Electrical installations excluding those items started below	15°	22.5°	5°(~~2~~3)	7.5°
Switch gears (circuit breakers, etc.), electric appliances and electronic appliances(1)	22.5°	22.5°	10°	10°

Notes:

1. No undesired switching operations or operational changes are to occur.

~~1~~2. Athwartships and ~~bow~~fore-and-~~stern~~aft inclinations may occur simultaneously ~~occur~~.

~~2~~3. Where the length of the ship exceeds 100 *m*, the fore-and-aft static angle of inclination may be taken as follows:

$\theta = 500/L$

θ : The static angle of inclination (°)

L : Length of the ship specified in **2.1.2, Part 1** (*m*)

Chapter 2 ELECTRICAL INSTALLATIONS AND SYSTEM DESIGN

2.6 Circuit-breakers, Fuses and Electromagnetic Contactors

2.6.1 Circuit-breakers

Sub-paragraph -2(4) has been amended as follows.

2 The construction of circuit-breakers is to comply with the following **(1)** to **(6)**:
((1) to (3) are omitted.)
(4) Circuit-breakers are to be such that no accidental opening and closing occur due to ship vibrations~~, and~~; furthermore, there are to be no malfunctions caused by ~~lists of angles of 30°~~ an inclination in any direction under the conditions given in **Table 8.1.2**.
((5) and (6) are omitted.)

2.6.3 Electromagnetic Contactors

Sub-paragraph -2(1) has been amended as follows.

2 The construction of electromagnetic contactors is to comply with the following **(1)** to **(3)**:
(1) Electromagnetic contactors are to be such that no accidental opening and closing occur~~s~~ due to ship vibrations; furthermore, there are to be no malfunctions ~~is to be~~ caused by ~~any list of an angle of 30°~~ an inclination in any direction under the conditions given in **Table 8.1.2**.
((2) and (3) are omitted.)

2.7 Control Appliances

2.7.2 Ambient Conditions

Sub-paragraph -2 has been amended as follows.

2 Control appliances are not to cause any malfunctions such as undesired switching motions or change ~~in status in cases where they are inclined to angles of 45°~~ in an inclination in any direction under the conditions given in **Table 8.1.2**. ~~However, electromagnetic contactors are to comply with **2.6.3-2(1).**~~

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships 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 2-3

Part 7 MACHINERY INSTALLATIONS

Chapter 2 DIESEL ENGINES

2.2 Materials, Construction and Strength

2.2.1 Materials

1 Materials intended for the principal components of diesel engines and their non-destructive tests as well as surface inspections and dimension inspections are to conform to the requirements given in **Table 7.2.1**. However, with respect to ultrasonic testing as well as surface inspections and dimension inspections, submission or presentation of test results to the Surveyor may be considered sufficient. In cases where deemed necessary by the Society, tests or inspections may also be required for any parts not specified in **Table 7.2.1**.

2 (Omitted)

Table 7.2.1 has been amended as follows.

Table 7.2.1 Application of Materials and Non-destructive Tests as well as Surface Inspections and Dimension Inspections to Principal Components of Diesel Engines

Principal components			Cylinder bore D (*mm*)								
			$D \le 300$			$300 < D \le 400$			$400 < D$		
			I	II	III	I	II	III	I	II	III
1	Welded bedplate		○	○		○	○		○	○	
2	Bearing transverse girders (cast steel)		○	○		○	○		○	○	
3	Welded frame box		○	○		○	○		○	○	
4	Welded cylinder frames (5)		○	○		○	○		○	○	
5	Engine block (spheroidal graphite cast iron)(6)		○			○			○		
6	Cylinder liner					○(7)			○(7)		
7	Cylinder head (cast steel or forged steel)					○	○		○	○	
8	Piston crown (cast steel or forged steel)								○	○	
9	Crankshaft	made in one piece	○	○	○	○	○	○	○	○	○
		Web, pin and journal for all built-up and semi-built-up types	○	○	○	○	○	○	○	○	○
		Others (including coupling bolts)	○	○	○	○	○	○	○	○	○
10	Piston rod (5)								○	○~~(8)~~	
11	Cross head (5)		○	○~~(8)~~		○	○~~(8)~~		○	○~~(8)~~	
12	Connecting rods together with connecting rod bearing caps		○	○	○	○	○	○	○	○	○
13	Bolts and studs (for cylinder heads, connecting rods, main bearings)					○	○	*TR*~~(8)~~	○	○	*TR*~~(8)~~
14	Tie rod (5)		○	○	*TR*~~(8)~~	○	○	*TR*~~(8)~~	○	○	*TR*~~(8)~~
15	Fuel injection pump body		○(9)			○(9)			○(9)		
~~15~~ 16	High pressure fuel injection pipes including common fuel rail		○			○			○		
~~16~~ 17	High pressure common servo oil system		○			○			○		
~~17~~ 18	Heat exchanger, both sides (~~9~~10)					△			△		
~~18~~ 19	Accumulator ~~of common rail fuel or servo oil system~~ (11)		○			○			○		
~~19~~ 20	Piping, pumps, actuators, etc. for hydraulic drive of valves (12)		○(13)			○(13)			○(13)		
~~20~~ 21	Pipes, valves and fittings attached to engines classified in **Chapter 10** as either Group I or Group II. (excluding items listed in this table)		○			○			○		
~~21~~ 22	Bearings for main, crosshead, and crankpin (12)		*TR*(14)	*TR*(15)	○	*TR*(14)	*TR*(15)	○	*TR*(14)	*TR*(15)	○
~~22~~ 23	Turbine discs, blades, blower impellers and rotor shafts of exhaust driven turbochargers (16)		○	○		○	○		○	○	
~~23~~ 24	Casings of exhaust driven turbochargers (16)		○(17)			○(17)			○(17)		

Notes:

(1) Materials intended for the components marked by "○" or "*TR*" in Column I are to comply with the requirements in

Part K of the Rules for the Survey and Construction of Steel Ships. However, the components marked by "*TR*" in Column I may be in accordance with Note (9). In addition, materials intended for the components marked by "△" in Column I are to comply with the requirements in **Chapter 8**.

(2) Materials intended for the components marked by "○"or "*TR*" in Column II are to be tested by a magnetic particle test or a liquid penetrant test as well as an ultrasonic test.

(3) Materials intended for the components marked by "○"or "*TR*" in Column III are to be tested by a surface inspection and a dimension inspection.

(4) For items marked by "*TR*", submission of a test report which compiles all test and inspection results in an acceptance protocol issued by the manufacturer may be accepted. The test report is to include the following. ~~be signed by the manufacturer and state that components comply with specifications stipulated by the manufacturer. Such specifications are to be submitted to the Society in advance.~~ Tests or inspections may be carried out on samples from the current production.

(a) Signature of the manufacturer

(b) Statement that components comply with specifications stipulated by the manufacturer

(5) Only for crosshead diesel engines.

(6) Only when engine power exceeds 400 *kW*/*cyl*. Chemical composition analysis may be omitted.

(7) Materials may be in accordance with Note (9) ~~which comply with the requirements of national or international standards such as *ISO*, *JIS*, etc. may be used~~, except when used for steel parts.

~~(8) After final machining, a magnetic particle test or a liquid penetrant test is to be carried out again.~~

(~~9~~8) Only for threaded bolts and studs used for connecting rods or tie rods.

(9) Materials which comply with the requirements of national or international standards such as *ISO*, *JIS*, etc. may be used.

(10) Charge air coolers need only be tested on the water side.

(11) Only when capacity exceeds 0.5*l*.

(12) Only when engine power exceeds 800 *kW*/*cyl*.

(13) Materials ~~which comply with the requirements of national or international standards such as *ISO*, *JIS*, etc. may be used~~ intended for pumps and actuators may be in accordance with Note (9).

(14) Mechanical property test may be omitted.

(15) Magnetic particle tests and liquid penetrant tests may be omitted. An ultrasonic test is to be carried out for full contact between the base material and bearing metal.

(16) In cases where the manufacturer has a quality system deemed appropriate by the Society, materials and non-destructive tests for categories *A* and *B* turbochargers may not require the presence of a Society surveyor. In such cases, the submission or presentation of test records may be required by the Society.

(17) Chemical composition analysis may be omitted.

2.6 Tests

2.6.1 Shop Tests*

1 For components or accessories specified in **Table 7.2.6**, hydrostatic tests are to be carried out on the water or oil side of the component at the pressures shown in the Table. In cases deemed necessary by the Society, tests may also be required for any components not specified in **Table 7.2.6**.

Table 7.2.6 has been amended as follows.

Table 7.2.6 Hydrostatic Test Pressure

Part		Cylinder bore D (mm)		Test Pressure~~(1)~~(2)(MPa)
		$D \leq 300$	$300<D$	
Cylinder block (gray cast iron or spheroidal graphite cast iron) ~~(2)~~ (3) (4)		○	○	1.5P
Engine block (gray cast iron or spheroidal graphite cast iron) (3) (4)		○	○	1.5P
Cylinder liner ~~(3)~~(4)			○	1.5P
Cylinder head (gray cast iron, spheroidal graphite cast iron, cast steel or forged steel)			○	1.5P
High pressure fuel line	Fuel injection pump body	TR(6)	○	1.5P or P +30, whichever is smaller
	fuel injection valves (5)			
	fuel injection pipes including common fuel rail (5)	TR(6)	○	
High pressure common servo oil system		TR(6)	○	1.5P
Turbocharger, cooling space (7)		○	○	0.4 or 1.5P, whichever is greater
Heat exchanger, both sides			○	1.5P
Exhaust gas valve cage ~~(2)~~(8)		○	○	1.5P
Accumulator ~~of common rail fuel or servo oil system~~ ~~(8)~~(9)		○	○	1.5P
Piping, pumps, actuators, etc. for hydraulic drive of valves ~~(9)~~(10)		○	○	1.5P
Engine driven pumps (oil, water, fuel, bilge) ~~(9)~~(10)		○	○	1.5P
Piping system other than those listed in this Table		○	○	Apply the requirements in **~~1~~2.6**

Notes:

(1) Materials intended for the components marked by "○"or "*TR*" are to be tested by hydrostatic test.

(~~1~~2) P is the maximum working pressure (MPa).

(~~4~~3) Only when engine power exceeds 400 kW/cyl.

(~~3~~4) Hydrostatic tests are also required for those parts filled with cooling water that have the ability to contain water which is in contact with the cylinder or cylinder liner.

(5) Only when not autofretted.

(6) For items marked by "*TR*", submission of a test report which compiles all test and inspection results in an acceptance protocol issued by the manufacturer may be accepted. The test report is to include the following. ~~be signed by the manufacturer and state that components comply with specifications stipulated by the manufacturer. Such specifications are to be submitted to the Society in advance.~~ Tests or inspections may be carried out on samples from the current production.

(a) Signature of the manufacturer

(b) Statement that components comply with specifications stipulated by the manufacturer

(7) In cases where the manufacturer has a quality system deemed appropriate by the Society, hydrostatic tests for categories *A*

and *B* turbochargers may be substituted for by manufacturer tests. In such cases, the submission or presentation of test records may be required by the Society.

(~~2~~8) Only for crosshead diesel engines.

(~~8~~9) Only when capacity exceeds 0.5*l*.

(~~9~~10) Only when engine power exceeds 800 *kW/cyl*.

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Rules, the current requirements apply to diesel engines for which the application for approval is submitted to the Society before the effective date.

Amendment 2-4

Part 7 MACHINERY INSTALLATIONS

Chapter 2 DIESEL ENGINES

2.4 Safety Devices

2.4.5 Crankcase Oil Mist Detection Arrangements*

Sub-paragraph -1 has been amended as follows.

1 Crankcase oil mist detection arrangements are required for diesel engines of 2,250 *kW* maximum continuous power and above or having cylinders of more than 300 *mm* bore, and in cases of engine failure, the following means are to automatically be employed. However, in cases where alternative devices deemed appropriate by the Society are provided, such devices may be used instead of crankcase oil mist detection arrangements. In this case, the following means are also to be automatically employed.

(1) In the case of ~~crosshead~~ low speed diesel engines (a rated speed of less than 300 *rpm*), alarms are to activate and speeds be reduced. (However, in cases where alternative measures such as activating alarms to request such speed reductions are taken, the manual reduction of speeds may be accepted).

(2) In the case of ~~trunk piston~~ medium speed diesel engines (a rated speed of 300 *rpm* and above, but less than 1,400 *rpm*) and high speed diesel engines (a rated speed of 1,400 *rpm* and above), alarms are to activate and diesel engines are to be stopped or have their fuel supply shut off.

EFFECTIVE DATE AND APPLICATION (Amendment 2-4)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Rules, the current requirements apply to diesel engines other than those which fall under the following:

(1) diesel engines for which the application for approval is submitted to the Society on or after the effective date; or

(2) diesel engines installed on ships for which the date of contract for construction* is on or after 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 2-5

Part 8 ELECTRICAL INSTALLATIONS

Chapter 1 GENERAL

1.1 General

Paragraph 1.1.6 has been amended as follows.

1.1.6 Drawings and Data*

The drawings and data to be submitted are as follows. In cases where the Society deems it to be necessary, the submission of drawings and data other than those specified below may be requested.

~~1~~(1) Tugs and pushers

(~~1~~a) Drawings:

(~~a~~i) Sectional assembly of generators, motors and electromagnetic slip couplings for electric propulsion equipment including their complete ratings, main dimensions, main materials used and weights

(~~b~~ii) Key diagrams and explanations of electric propulsion controlgears

(~~c~~iii) Sectional assembly of generators (main and reserve) of 100 *kW* (or *kVA*) and over, including their complete ratings, main dimensions, main materials used and weights

(~~d~~iv) Arrangement plans (including specifications of main parts such as circuit breakers, fuses, instruments and cables) and circuit diagrams of main switchboards and emergency switchboards

(~~e~~v) Plans of arrangement of electrical equipment and of cable installation

(~~f~~vi) Diagrams of wiring systems including normal working currents, rated currents, prospective short-circuit currents in circuits, line drop of voltages, type of cables, cable sizes, ratings and settings of circuit breakers, ratings of fuses and switches, and breaking capacities of circuit breakers and fuses

(~~g~~vii) Semiconductor converters for power for electric propulsion and for electric generators (including dimensions, electric equipment particulars, sectional assembly)

(~~2~~b) Data:

(~~a~~i) Explanations of electric propulsion systems

(~~b~~ii) Investigation tables of electrical power

(~~c~~iii) The following data in cases of ships where harmonic filters are installed on the main busbars of ~~the~~ electrical distribution systems ~~on board a ship includes harmonic filters~~, except in cases where the filters are installed for single application frequency devices such as pump motors.

~~i~~1) Total Harmonic Distortion (THD) calculation report

~~ii~~2) Harmonic filter operation guide

~~2~~(2) Barges

(~~1~~a) Drawings specified in ~~1~~**(1)** above, as applicable

(~~2~~b) Drawings indicating any hazardous areas and lists of any electrical equipment installed in such hazardous areas

Chapter 2 ELECTRICAL INSTALLATIONS AND SYSTEM DESIGN

2.12 Semiconductor Converters for Power

2.12.4 Harmonic Filters

Sub-paragraph -1 has been amended as follows.

1 Where harmonic filters are installed on the main busbars of ~~the~~ electrical distribution systems ~~on board a ship includes harmonic filters~~, except when the harmonic filters are installed for single application frequency drives such as pump motors, the ship is to be fitted with facilities to continuously monitor the Total Harmonic Distortion (THD) values experienced ~~on~~by the main busbars as well as to alert the crew in cases where the value exceeds the upper limits given in **2.1.2-4**. The Total harmonic distortion (THD) value is to be recorded in the engine log book, but this reading may be logged electronically in cases where the engine room is provided with systems which automatically log such values.

EFFECTIVE DATE AND APPLICATION (Amendment 2-5)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Rules, the current requirements apply to ships for which the date of contract for construction* is before the effective date and that are not newly fitted with harmonic filters on or after 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 2-6

Part 8 ELECTRICAL INSTALLATIONS

Chapter 2 ELECTRICAL INSTALLATIONS AND SYSTEM DESIGN

2.4 Rotating Machines

2.4.2 Characteristics of Governors*

Sub-paragraph -1 has been amended as follows.

1 The characteristics of governors on prime movers for main generators are that such governors be capable of maintaining speeds within the following limits:

(1) Momentary speed variations are, in principle, to be 10% or less of the maximum rated speed when the rated loads of generators are suddenly thrown off. However, ~~I~~in cases where it is difficult to meet the above requirements, the characteristics of such governors may be acceptable in the following cases. ~~are to be deemed appropriate by the Society.~~

(a) In cases where momentary variations are 10% or less of the rated speed when the maximum load on board is suddenly thrown off and the speed is returned to within 1% of the final steady speed in not more than 5 *seconds*, momentary variations in excess of 10% of rated speeds may be acceptable in cases where rated loads of such generators are suddenly thrown off.

(b) The momentary variations given in **(a)** above, in cases where rated loads of generator are suddenly thrown off are less than any adjusted values of the intervention of overspeed devices as required by **2.4.1-4, Part 7**.

(2) Momentary speed variations are, in principle, to be 10% or less of the maximum rated speed when 50% of the rated loads of generators are suddenly thrown on followed by the remaining 50% of such loads suddenly being thrown on after an interval to restore the steady state. Speeds are to return to within 1% of final steady speeds in not more than 5 *seconds*. In cases where it is difficult to meet the above requirements or in cases where certain installations require different characteristics~~,~~ and the prime movers have mean effective pressures of 1.35 *MPa* or more, the following methods of throwing-in-steps may be acceptable: ~~the characteristics of such governors are to be as deemed appropriate by the Society.~~

Total throw-on loads at the 1st power stage (%) = $80/P_{me}$
Total throw-on loads at the 2nd power stage (%) = $135/P_{me}$
Total throw-on loads at the 3rd power stage (%) = $180/P_{me}$
Total throw-on loads at the 4th power stage (%) = $225/P_{me}$
Total throw-on loads at the 5th power stage (%) = $270/P_{me}$
Total throw-on loads at the 6th power stage (%) = 100

P_{me} : Declared power mean effective pressure (*MPa*)

However, in cases where the above throwing on methods apply, manufacturers or shipyards are requested to submit throw-on power calculation sheets to the Society for approval, and such sheets are to demonstrate that the throw-on loads and base loads at each step of the operation do not exceed those values determined by the formulae above under any of the **(a)** to **(d)** circumstances given below:

(a) at times of power restoration after blackout,

(b) at times of sequential starting,

(c) at times of starting with large start-up loads, or

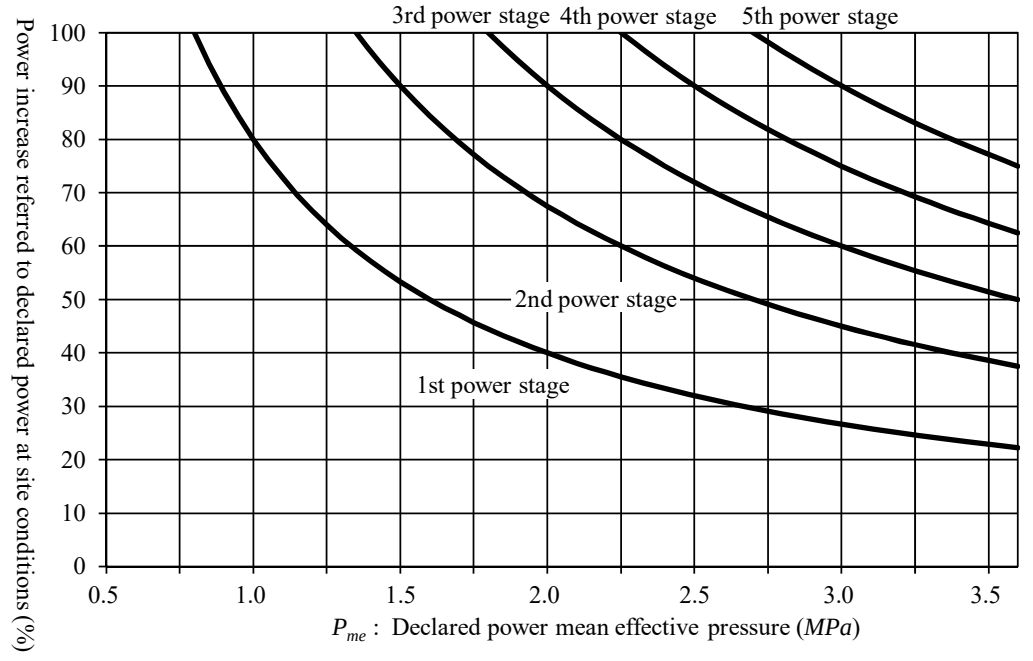
(d) at times of instantaneous load transfers in cases where one set of generators fails (during parallel running).

(3) At all loads in ranges between no loads and rated loads, any permanent speed variations are to be within ± 5% of the maximum rated speed.

2 (Omitted)

Fig. 8.2.1 has been added as follows.

Fig. 8.2.1 Reference values for maximum possible sudden power increases as a function of brake mean effective pressure (P_{me}) at declared power (four-stroke diesel engines)



EFFECTIVE DATE AND APPLICATION (Amendment 2-6)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Rules, the current requirements apply to diesel engines other than those which fall under the following:

(1) diesel engines for which the application for approval is submitted to the Society on or after the effective date; or

(2) diesel engines installed on ships for which the date of contract for construction* is on or after 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.

GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

GUIDANCE

2019 AMENDMENT NO.2

Notice No.85 27 December 2019
Resolved by Technical Committee on 22 July 2019

Notice No.85 27 December 2019
AMENDMENT TO THE GUIDANCE FOR THE SURVEY AND CONSTRUCTION OF INLAND WATERWAY SHIPS

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

Amendment 2-1

Part 2 CLASS SURVEYS

Chapter 1 GENERAL

1.1 Surveys

1.1.3 Intervals of Class Maintenance Surveys

Sub-paragraph -10 has been added as follows.

10 The wording "the Society may approve the survey methods which it considers to be appropriate." in **1.1.3-3, Part 2 of the Rules** means survey methods which the Society considers to be able to obtain information equivalent to that obtained through traditional ordinary surveys where a surveyor is in attendance.

Part 8 ELECTRICAL INSTALLATIONS

Chapter 2 ELECTRICAL INSTALLATIONS AND SYSTEM DESIGN

2.1 General

2.1.4 Earthing

Sub-paragraph -2 has been amended as follows.

2 Earthing may be made under the requirements specified below:
(1) (Omitted)
(2) (Omitted)
~~(3) Lead cable sheaths are not to be used as the sole earthing means under any circumstances.~~
(~~4~~3) Nominal cross-sectional areas of all copper earthing conductors are to be as given in **Table**

8.2.1.4-1. In cases where earthing conductors other than copper are used, their conductance is to be of more than that of those copper conductors given in this table.

(~~5~~4) Connections between earthing conductors and hull structures are to be made in accessible positions, and to be secured by screws made of brass or some other corrosion-resistant-materials that have a diameter not less than 4 *mm* and which are to be used for this purpose only. In any case, contact faces are to have glossy metal surfaces when these screws are tightened.

Table 8.2.1.4-1 has been amended as follows.

Table 8.2.1.4-1 Sizes of Earthing Conductors

Types of earthing conductors		Cross-sectional areas of current-carrying conductors	Minimum cross-sectional areas of copper earthing conductors
Earthing conductors in flexible cables or flexible cords		Up to and including 16 mm^2	100% cross-sectional area of current-carrying conductors
		Exceeding 16 mm^2	50% cross-sectional area of current-carrying conductors (at least 16 mm^2)
Insulated ~~E~~earthing conductors incorporated in fixed cables	~~Insulated earthing conductors~~	Up to and including 16 mm^2	100% cross-sectional area of current-carrying conductors (at least 1.5 mm^2)
		Exceeding 16 mm^2	50% cross-sectional area of current-carrying conductors (at least 16 mm^2)
	~~Bare earthing wires in direct contact with lead sheaths~~	~~1 – 2.5 mm^2~~	~~1 mm^2~~
		~~4 – 6 mm^2~~	~~1.5 mm^2~~
Separate earthing conductors		Up to and including 3 mm^2	100% cross-sectional area of current-carrying conductors (at least 1.5 mm^2 for stranded earthing connections or 3 mm^2 for unstranded earthing connections)
		Exceeding 3 mm^2 Up to and including 125 mm^2	50% cross-sectional area of current-carrying conductors (at least 3 mm^2)
		Exceeding 125 mm^2	64 mm^2

2.9 Cables

2.9.3 Choice of Protective Coverings

Sub-paragraph -1 has been amended as follows.

1 The term “metallic sheath” represents ~~lead alloy metals,~~ stainless steel and copper sheaths. In cases where the use of ordinary steel or light metal alloy sheaths is intended, adequate protection against corrosion is to be provided.

EFFECTIVE DATE AND APPLICATION (Amendment 2-1)

1. The effective date of the amendments is 27 December 2019.

Amendment 2-2

Part 2 CLASS SURVEYS

Chapter 3 ANNUAL SURVEYS

3.3 Annual Surveys for Machinery

3.3.1 General Examinations

Sub-paragraph -3 has been amended as follows.

3 In general examinations specified in **3.3.1, Part 2 of the Rules**, for ships ~~equipped with~~ where harmonic filters are installed on the main busbars of electrical distribution systems ~~which include harmonic filters~~, except in cases where the filters are installed for single application frequency drives such as pump motors, it is to be ascertained that the harmonic filters are placed in good order and either of the following **(1)** or **(2)** is to be verified~~, except in cases where the filters are installed for single application frequency drives such as pump motors~~.

(1) ~~For harmonic filters included in the electrical distribution systems described in either the following **(a)** or **(b)**,~~ For ships fitted with facilities to continuously monitor ~~the records of~~ the Total Harmonic Distortion (THD) values experienced by the main busbars as specified in **2.12.4-1, Part 8 of the Rules**, records of THD values are to be verified.

~~(a) Electrical distribution systems on board ships for which the date of contract for construction is on or after 1 July 2017.~~

~~(b) Electrical distribution systems on board ships for which the date of contract for construction is before 1 July 2017, but which are newly fitted with harmonic filters on or after 1 July 2017.~~

(2) For ~~harmonic filters~~ ships other than **(1)~~(a) or (b)~~** above, correct operation of harmonic filters is to be confirmed by verifying that the maximum Total Harmonic Distortion (THD) value of the main busbar on board the ship is measured under typical seagoing conditions as close as possible to the date of the Annual Survey and the value does not exceed the acceptable limit.

Part 8 ELECTRICAL INSTALLATIONS

Chapter 1 GENERAL

1.1 General

Paragraph 1.1.6 has been amended as follows.

1.1.6 Drawings and Data

1 The wording "lists of any electrical equipment installed in such hazardous areas" specified in **1.1.6-~~2~~(2)(b), Part 8 of the Rules** means such lists are to include the following information:

(1) The installation arrangement, kind of construction, type (including the certificate number and the name of any testing institution), manufacturer name, quantity and usage of any explosion-protected electrical equipment

(2) Relevant documents related to how conditions impact such things as ventilation ratios, pressurizations or air-locks of each type of hazardous areas in order to confirm the effectiveness of such equipment (in cases where applicable)

2 "Total Harmonic Distortion (THD) calculation report" specified in **1.1.6-~~1(2)(e)ii)~~(1)(b)iii)1), Part 8 of the Rules** is to be include the following information:

(1) Results of the calculation of the Total Harmonic Distortion (THD) value experienced when a failure of a harmonic filter occurs.

(2) With respect to **2.1.2-4, Part 8 of the Rules**, the acceptable limit of the Total Harmonic Distortion (THD) value.

3 The "harmonic filter operation guide" specified in **1.1.6-~~1(2)(e)ii)~~(1)(b)iii)2), Part 8 of the Rules** is to include the following information:

(1) The permitted operating mode of the electrical distribution system while maintaining the Total Harmonic Distortion (THD) values within acceptable limits during normal operation.

(2) The permitted operating mode of the electrical distribution system in the case of failure of any combination of harmonic filters.

4 Data specified in **-2** and **-3** are to be submitted by the system integrator of the distribution system.

EFFECTIVE DATE AND APPLICATION (Amendment 2-2)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to the periodical surveys for which the application is submitted to the Society before the effective date.

Amendment 2-3

Part 8 ELECTRICAL INSTALLATIONS

Chapter 2 ELECTRICAL INSTALLATIONS AND SYSTEM DESIGN

2.4 Rotating Machines

Sub-paragraph 2.4.2 has been deleted.

~~**2.4.2 Characteristics of Governors**~~

~~**1** The wording "to be deemed appropriate by the society" in **2.4.2-1(1), Part 8 of the Rules** means as follows:~~

~~(1) In cases where momentary variations are 10% or less of the rated speed when the maximum load on board is suddenly thrown off and the speed is returned to within 1% of the final steady speed in not more than 5 *seconds*, momentary variations in excess of 10% of rated speeds may be acceptable in cases where rated loads of such generators are suddenly thrown off.~~

~~(2) The momentary variations given in **(1)** above, in cases where rated loads of generator are suddenly thrown off are to be less than any adjusted values of the intervention of overspeed devices as required by **2.4.1-1, Part 7 of the Rules**.~~

~~**2** For prime movers with mean effective pressures of 1.35 *MPa* or more to which the application of those methods of throwing on rated loads of generators specified in **2.4.2-1(2), Part 8 of the Rules** are impossible, the following three or four steps throwing on method in accordance with the formulae below is to be used notwithstanding the above requirements:~~

~~Total throw-on loads at the 1st step (%) = 80/*BMEP*~~
~~Total throw-on loads at the 2nd step (%) = 135/*BMEP*~~
~~Total throw-on loads at the 3rd step (%) = 180/*BMEP*~~
~~Total throw-on loads at the 4th step (%) = 100~~
~~*BMEP*: Brake mean effective pressure (*MPa*)~~

~~However, in cases where the above throwing on method apply, manufacturers or shipyards are requested to submit throw-on power calculation sheets to the Society for approval which demonstrate that the throw-on loads and base loads at each step of the operation do not exceed those values determined by the formulae above under any circumstances.~~

~~(1) At times of power restoration after blackout~~
~~(2) At times of sequential starting~~
~~(3) At times of starting with large start-up loads~~
~~(4) At times of instantaneous load transfers in cases where one set of generators fails (during parallel running)~~

EFFECTIVE DATE AND APPLICATION (Amendment 2-3)

1. The effective date of the amendments is 1 January 2020.

2. Notwithstanding the amendments to the Guidance, the current requirements apply to governors whose applications for approval are submitted to the Society before the effective date installed on ships 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.