Regulations of 17 January 1978 No. 4 on cargo-handling appliances in ships

Legal basis: Laid down by the Norwegian Maritime Authority on 17 January 1978 under the Act of 9 June 1903 No. 7 relating to public control of the seaworthiness of ships, etc. Legal basis to Act of 16 February 2007 No. 9 relating to ship safety and security (Ship Safety and Security Act) sections 2, 9, 11, 12, 13, 16, 21, 43, 45 and 46, cf. Formal Delegation of 16 February 2007 No. 171 and Formal Delegation of 31 May 2007 No. 590.
Amendments: Amended by Regulations of 13 February 1979, 10 June 1986 No. 1275, 14 January 1988 No. 100, 15 September 1992 No. 698, 25 January 2000 No. 170, 4 June 2002 No. 1129, 1 June 2004 No. 804, 29 June 2007 No. 1006 (i.a. legal basis), 19 December 2013 No. 1659, 20 December 2017 No. 2379, 26 June 2025 No. 1372.

Chapter I
General provisions

Section 1
Scope of application

(1) These Regulations shall apply to Norwegian ships, with the specifications referred to in the second to fourth paragraphs.

(2) These Regulations shall apply to cargo-handling appliances on board ships, irrespective of size, used for loading or discharging at quays, in ports or other places in completely sheltered waters.

(3) For cranes to be used for loading and discharging in unsheltered waters, Regulations of 13 January 1986 No. 31 on cranes used on ships in open waters for loading and unloading shall apply correspondingly.

(4) Rules laid down in another country which are fully in line with ILO Convention No. 152 are considered equivalent to the rules of these Regulations.

Amended by Regulations of 29 June 2007 No. 1006 (in force on 1 July 2007), 19 December 2013 No. 1659 (in force on 1 January 2014).

Section 2
Definitions

For the purpose of these Regulations, the following definitions shall apply:

a) "*Recognised standards*": NS (Norwegian Standard), NS-EN (Norwegian Standard-European Norm), NS-ISO (Norwegian Standard-International Standard Organisation) or equivalent international or national standard or body of rules approved by the Norwegian Maritime Authority.[1]

b) "*Existing ship*": Any ship, including a barge, which is not a new ship. Ships purchased from abroad shall be considered to be existing ships.

c) "*Approved*": One single piece of equipment approved by the Norwegian Maritime Authority.

d) "*Cargo-handling appliance*": Crane with crane column, foundations and underlying structure, including provision crane and engine-room travelling crane, as well as mast with boom and winch with permanent accessories such as goosenecks, derrick head fittings, preventer fittings and similar appurtenant cargo-handling gear.

e) "*Cargo-handling gear*": Loose gear such as yokes, grabs, slings, barrel hooks, nets, etc. and accessories such as chains, wire rope, shackles, rings, hooks and swivels, blocks etc. used for hoisting and lowering of cargo.

f) "*New ship*": Any ship, including a barge, the keel of which is laid, or which is at a similar stage of construction, on or after the date of entry into force of these Regulations. Ships converted on or after the said date shall be considered to be new ships.

[1] For instance German DIN, English BS, or Swedish Crane Standards.

Section 3
Exemptions

The Norwegian Maritime Authority may, in individual cases and upon written application, grant exemption from the requirements of these Regulations. There must be special reasons that make the exemption necessary and it must be justifiable in terms of safety. Exemptions can only be granted where they do not contravene international agreements to which Norway has acceded.

Section 4

Requirements for approved yard/workshop and manufacturer

(1) Authorised yard/workshop:

A yard/workshop approved by the Norwegian Maritime Authority, on application, to manufacture, inspect, test and certify cargo-handling appliances. In order to obtain authorisation, the yard/ workshop must have:

a) a competent person of category A, as its permanent employee or associate;
b) calculated, assembled, inspected, tested and certified a complete set of cargo-handling appliances to the satisfaction of the Norwegian Maritime Authority; and
c) necessary testing equipment available.

(2) Qualified yard/workshop:

A yard/workshop approved by the Norwegian Maritime Authority, on application, to carry out periodical inspection, testing and certification of cargo-handling appliances. In order to obtain such approval, the yard/workshop must have:

a) a competent person of category B, as its permanent employee or associate;
b) inspected, tested and certified a complete set of cargo-handling appliances to the satisfaction of the Norwegian Maritime Authority; and
c) necessary testing equipment available.

(3) Foreign yards/workshops and manufacturers:

Abroad, a yard/workshop is regarded as an authorised yard/workshop, a qualified yard/workshop or an authorised manufacturer of gear if the master or the company finds that the yard/workshop has the necessary testing equipment and personnel with sufficient qualifications in the field in question.

Amended by Regulation of 29 June 2007 No. 1006 (in force on 1 July 2007).

Section 5

Competent person

(1) A competent person is a person authorised to carry out design/construction, calculations, inspection, testing and certification of cargo-handling appliances or components thereof.

(2) In Norway, a competent person is authorised by the Norwegian Maritime Authority on application. Candidates must submit documentary evidence of knowledge and practice. Competent persons will be divided into two categories:

a) A competent person of category A is authorised to carry out initial certification of cargo-handling appliances. In order to obtain such authorisation, the applicant must, in collaboration with an authorised yard/workshop, have carried out design/construction, calculations, examination of workmanship, testing, inspection and certification of a complete rig arrangement to the satisfaction of the Norwegian Maritime Authority.
b) A competent person of category B is authorised to carry out periodical certification as well as the certification of existing cargo-handling appliances after minor repairs. In order to obtain such authorisation, the applicant must, in collaboration with a qualified yard/workshop, have carried out periodical examination, testing, survey and certification of a set of existing cargo-handling appliances to the satisfaction of the Norwegian Maritime Authority.

Chapter II
Design/construction and strength

Section 6

Drawings and calculations

(1) Drawings of cargo-handling arrangements with a part list describing all components, giving position numbers, quantities, designations, safe working load (SWL), quality of materials, references to standards etc., and a key plan of forces for the arrangement shall be carried on board and shall be endorsed “as done”.

(2) The drawings mentioned in the first paragraph shall be made on the pattern of Norwegian Standard NS 2609 “Cargo Gear Particulars Book” (ISO 2333-1972) or some other recognised standard, as far as these are applicable to the rig of the ship in question. For smaller ships, a simpler procedure may be permitted, but as a minimum requirement all data specified in the first paragraph must be included.

Section 7

Methods of calculation and design criteria/construction requirements

(1) Cranes and derrick boom arrangements1 shall be calculated in accordance with the Norwegian standards specified in subparagraphs a) to c) of this paragraph or other approved standards. A competent person shall examine the strength

of the cargo-handling appliance and/or cargo-handling gear and shall ascertain whether the necessary calculations in this connection have been carried out. Forces in running rigging may be ascertained in accordance with NS 2608 or other recognised standard. Crane groups used, design criteria and operational conditions shall be specified in the crane manual for the arrangement, cf. section 13 second paragraph.

a) Cranes and derrick boom arrangements shall be calculated in accordance with NS 5514.
b) Machinery shall be calculated in accordance with NS 5515.
c) Wind forces shall be calculated in accordance with NS 3479.

(2) For special types of hoisting appliances, the Norwegian Maritime Authority may require or permit the arrangement to be constructed in accordance with a specified crane group (cf. NS 5514), or the use of higher or lower safety factors than those specified in the fourth and fifth paragraphs.

(3) Other types of hoisting appliance shall be calculated in accordance with the guidelines given in the first paragraph or in accordance with the fourth paragraph.

(4) Other types of hoisting appliance, and simple cranes and derrick boom arrangements with a safe working load of less than 10 tonnes may, if deemed appropriate and not to affect safety, be dimensioned in accordance with the Norwegian standards mentioned in subparagraphs a and b of this paragraph. In such cases, calculations shall be based on a safety factor or minimum 4.5 relative to the ultimate breaking strength of the material in question.

a) Steel structures shall be calculated in accordance with NS 3472.
b) Aluminium structures shall be calculated in accordance with NS 3471.

(5) Cargo-handling gear such as wire rope, chain, hooks, shackles, blocks, swivels, rings, etc. shall be designed, constructed and calculated in accordance with Norwegian or other recognised standards. The following safety factors against breakage shall be used, the calculations being based on the maximum theoretical load:

	Safety factor
Steel wire rope as a general rule (cf. also section 9 (6) (b))	5
Chain	4.5
Other gear such as hooks, shackles, blocks, swivels, rings, etc.	5
Fibre rope	7

(6) In addition to the above-mentioned requirements, cranes and derrick boom arrangements shall be designed and constructed for a list of 5°, or for the maximum list sustained by the ship from the maximum permitted working load (SWL) and the maximum outreach of boom or crane (the maximum moment). Cranes and booms in stowed position shall be properly secured. If the load moment is great in relation to the ship's displacement, it shall be checked that the ship's list will not exceed the design list of the cargo-handling appliance(s).

Amended by Regulation of 20 December 2017 No. 2379 (in force on 1 January 2018).

Section 8

Requirements for ageing-resistant materials

(1) The only steel permitted in cargo-handling gear is the ageing-resistant kind not needing periodical heat treatment.

(2) For cargo-handling appliances already installed and cargo-handling gear already delivered, the provisions of section 28, Chapter V shall apply.

Amended by Regulation of 20 December 2017 No. 2379 (in force on 1 January 2018).

Section 9

Design/construction details

(1) Drums.

a) Steel wire drums shall be of such a size that only three layers of wire rope are necessary. More layers may, however, be permitted if this does not entail increased wear and tear, and if good winding is achieved. The maximum angle of inlet shall not exceed the one required to achieve good winding with the least possible wear and tear on the steel rope. Grooved drums should not have an angle of inlet exceeding 5° and plain drums should not have an angle of inlet exceeding 3°. Drums and guides for wire rope shall be so designed as to ensure that the rope will not override the drum. When the drum is fully wound, there shall still remain a height on the drum flange equivalent to 2.5 times the rope diameter; alternatively, there shall be some similar safety device to prevent the wire rope from overriding the drum.
b) The ratio between the drum diameter and that of the wire rope shall be in accordance with the specification from the wire rope manufacturer, but not less than 18:1.

c) At least three turns of wire rope shall be left on the hoisting drum when the hook is at its lowest and the boom/crane arm at its highest operational position. The lowest position normally means the bottom of the cargo hold or the lightest draught, whichever is the lower.

d) At least three turns of wire rope shall be left on the derrick hoist drum when the boom/ crane arm is at its lowest position.

(2) Wire rope attachment to drum.

a) All wire rope shall be attached to the drum with steel wire clamps, plate clamps or some other kind of attachment to ensure that the end attachment can withstand at least 80% of the effective breaking strength of the wire rope.

b) Wire rope attachments shall be easy to inspect, and shall have facilities for being retightened.

(3) Derrick booms, goosenecks, derrick head fittings and fittings for guys and preventers.

a) Derrick booms shall be designed and constructed according to a recognised standard. Forces from boom slewing guys, etc. shall be considered and, if of significance, be taken into account.

b) Goosenecks shall be designed and constructed in accordance with NS-ISO 6045 and derrick head fittings in accordance with NS-ISO 8314, or other recognised standards.

c) When guys are not calculated for lateral stresses, e.g. when Union Purchase is used, preventers of adequate strength shall be rigged as a safety precaution against breakage of the guy. Guys and preventers shall have separate attachments to derrick booms and deck/rails. Attachments for guys or preventers shall be designed and constructed in accordance with NS-ISO 8148, NS 2624 or some other recognised standard.

(4) Wire rope sheaves and blocks.

a) Wire rope sheaves and blocks shall be designed and constructed in accordance with NS 2675, NS 2680, NS 2681 and NS 2689 or some other recognised standard. The ratio between sheave diameter and wire rope diameter (pitch diameter) shall be in accordance with the wire rope manufacturer's specifications, but not less than 15:1 for running rigging and 11:1 for standing rigging.

b) Open blocks or sheaves on cranes are only permitted when so placed that persons cannot come into contact with them during operations.

c) The running of wire rope from multiple-sheave headblocks on the mast should be avoided, because of pull-distortion and resultant increase in wear and tear. If there are three or more parts in the boom lift wire, the masthead block should consist of at least two blocks, of which the one leading to the winch should be singlesheave.

d) The heel block headspan should be fitted with a friction mechanism for the eye or fork of the heel block, so that the heel block will retain its position even if the pull of the hoisting rope should be slackened.

(5) Swivel, cargo hook and plummets.

a) All cargo-handling appliances fitted with a hoisting rope with a single-sheave block shall be equipped with a swivel to prevent the hoisting rope from twisting. The swivel may also be incorporated in hooks, blockeyes, or plummets.

b) The loading hook shall be so designed that slings are prevented from falling out, and so that it does not foul projections or similar.

c) The load-bearing parts of swivels and hooks shall be made of a material quality S 275 JR (killed steel) NS 10025 or of equivalent material. Welding on hooks is not permitted.

d) A plummet or ball shall be used if the weight of the hook and swivel is insufficient to pull the runner out when the hook is not loaded and is being lowered at full speed. The plummet's loadbearing core shall throughout be of steel.

(6) Wire rope.

a) All wire rope shall be made in accordance with a recognised standard and be suitable for its intended use.

b) Wire rope for standing and running rigging shall be made in accordance with a recognised standard, but with a minimum safety factor against breakage as given below:

Safe working load (SWL) for hook	Safety factor
0–10 tonnes or if single part for the hook	5
10–25 tonnes	5–(SWL–10)/30
25–60 tonnes	4.5–(SWL–25)/70
60 tonnes and above	4.0

c) All wire rope for running rigging shall have a minimum of 114 wires and it shall be of a so-called pre-formed type, i.e. its parts shall remain wound when the wire rope is cut off.

d) Non-rotating wire shall not be used for span rope/boom lifts.

e) Single-rigged parts for cargo runners should be of a non-rotating type.

(7) Slings

a) Wire rope slings used for hoisting and lowering of cargo under 10 tonnes shall have a safety factor of at least 6. Otherwise, slings shall have at least the same safety factor as that applying to the appurtenant wire rope (cf. sixth paragraph subparagraph b).

b) After special consideration of calculations for well-defined lifts of 100 tonnes and above, the Norwegian Maritime Authority may accept safety factors down to 3.0 for the parts of the sling subjected to the greatest

loads. In respect of slings for lifts of less than 100 tonnes, the provisions of subparagraph a) of this paragraph shall apply.

c) All wire rope slings shall be made of certified wire rope.

d) An eye splice in slings shall be made against the direction of lay of the wire rope and have at least three tucks with a whole wire of rope and two tucks with one-half of the wires cut out of each wire. Other equivalent splicing methods, giving the same strength, may also be accepted.

e) Fibre rope slings shall be of certified natural or synthetic fibre rope of the best quality and with pre-determined breaking strength. The safety factor against breakage shall be at least 7. The safe working load (SWL) must never exceed the breaking strength divided by the safety factor.

(8) Thimbles. Thimbles shall be made according to a recognised standard.

(9) Ferrules (talurit). Ferrules shall be correctly designed, and shall also, in Norway, be marked with the manufacturer's trade mark in addition to other required marking, cf. section 16.

(10) Wire rope clamps. Only wire rope clamps with two gripping surfaces shall be used (the U bolt type is not permitted). The number of wire rope clamps shall not be less than three, and the length of the free end of the wire rope shall be at least five times the rope diameter.

(11) Winches. When choosing the type and size of a winch, one must ensure that the remaining components of the appliances are calculated for the load it might be subjected to by the maximum winch pull.

a) The pull of winches used for cargo-handling only shall not normally be permitted to exceed the safe working load of the appurtenant wire rope. If the cargo-handling winch is also intended for other purposes, this must be subject to special consideration.

b) When guys or swinging winches are to be used, the guy forces shall be determined in accordance with NS 2608. The pull of the swinging winch shall not exceed the safe working load on the running part, but must give a minimum stress component equal to the maximum guy forces, allowing for the number of blocks in the guy tackle.

c) All winches shall be equipped with a stopping device capable of holding the maximum design load of the winch.

1. In the event of power failure, the brake shall be applied automatically and brake and stop the maximum safe working load from the maximum speed, or there shall be a hand brake of the same capacity that can be operated from the operator's position, cf. the thirteenth paragraph.
2. On winches used for cargo-handling only, there shall be a direct coupling between the stopping device, the motor and the drum, so that lowering by free fall cannot be performed.
3. For combined winches, disengagement of the drum may be permitted. The arrangement shall then be such that inadvertent disengagement of the drum will not be possible during normal operation.

d) Gear wheels, cranks and other moving parts on winches and cranes, above as well as below deck, shall be adequately screened. The same applies to engine transmissions to winches, to steam pipes, hydraulic hoses, electric cables, etc. There shall be easy access to facilitate maintenance, etc.

e) When winches are activated by remote control or operated from another position, special screening/guard rails shall be put up to prevent persons from coming into contact with wire rope, blocks, drums or other moving parts. Signs and warning notices shall be posted to the effect that the winch is operated by remote control and may be activated without prior warning.

(12) Control handles.

a) Control handles shall be so fitted as to move in the same direction as the load, with "stop" vertically, "lower" towards the hatch opening, and "hoist" with the handle pointing away from the hatch opening (towards the winch operator).

b) Controls of the manoeuvring arrangement for winches and cranes shall be so arranged that they quickly revert to the marked neutral position ("stop") when released, and shall be capable of being locked in the neutral position when the winch/crane is unattended.

c) Controls shall be permanently marked with clear standard symbols or designations indicating their use.

d) The design of the manoeuvring arrangement shall be based on ergometric principles.

(13) Operating position for winches, cranes, etc.

a) The operating position shall be safe and give the winch operator the best possible view of the hoisting, and the running of the wires and winch drum(s). The operating position shall give the operator the best possible protection from falling loads and injury that might arise from wire breakage.

b) The operating position shall be so arranged as to give the operator a good foothold. Special gratings may be required if the operating position is exposed to flooding, oil spillage, etc.

c) The cable of winches controlled by loose cable transmission shall be sufficiently long to permit the operator to choose a safe place, with good observation of the hoisting operations.

(14) Operator's cabin on cranes.

a) A cargo-handling crane shall normally be equipped with an operator's cabin. This shall be solidly built and shall protect the operator from falling objects.

b) There shall be at least 2.0 metres of headroom in the operator's cabin, it shall be insulated against cold, heat and noise, maximum 80 dB(A), have adequate ventilation and heating facilities, and be fitted with a portable fire-extinguisher of the powder type (minimum 2 kg for the smallest cranes).

c) All windows in the operator's cabin shall be of tempered or laminated glass, and there shall be safe access for cleaning them on the outside. The windows shall be fitted with the necessary number of motor-driven screen wipers, heating elements or fans, so that visibility through the windows will not be significantly impaired by rain, mist, icing, etc.
d) There shall be facilities for safe access to the operator's cabin, and a safe way of escape, irrespective of the position of the cranes.
e) The operator's seat, controls and other equipment shall be designed according to ergometric principles.

(15) Access and passageways.

a) There shall be safe access to operating positions for winches and all parts of cranes and derricks needing maintenance and inspection.
b) Between fixed and moving parts of cranes, winches etc. where people usually pass or where free passage is necessary, the space shall be minimum 0.6 m wide up to a height of 2.0 m.
c) Ladders, railings etc. shall comply with the regulations in force at the time in question concerning arrangements on and below deck.

(16) Stowage of derrick booms. For the stowage of derrick booms and cranes during voyages, boom crutches, fixed or capable of being dismantled, or equivalent stowing arrangements shall be provided. For calculations of these, see section 7 sixth paragraph.

(17) Hydraulic, pneumatic and electrical systems.

a) Hydraulic and pneumatic systems shall be fitted with safety valves. The safety valve shall be sealed by a competent person after load-testing of the cargo-handling appliance, so that it cannot be set higher than the permitted working pressure of the system. If the seal has been broken, a new five-yearly thorough examination shall be carried out by a competent person. After the five-yearly thorough examination (Section 18), resealing shall always be carried out by a competent person.
b) The main pressure systems shall have facilities for connecting up control manometers.
c) Hoses, pipes and cables shall be so placed as to be protected as well as possible from impact, squeezing, heat, vibration, etc. Hoses shall also be protected in such a manner that the operator will not be harmed by hose breakage, and they shall be easy to replace and maintain.
d) Hydraulic cylinders shall be so arranged that they stop or slide slowly in a controlled way in case of power failure or hose or pipe breakage.
e) Pressure systems shall be designed and constructed in accordance with a recognised standard. The standard shall be specified and confirmed by a competent person.
f) Electrical equipment shall be designed and constructed in accordance with a recognised standard which also takes into account the location of the crane on board and its zoning classification. The standard shall be specified in the crane manual and be confirmed by a competent person.

(18) A competent person shall check that the cargo-handling appliances and gear are designed and constructed in compliance with the requirements of this section.

Section 10
Materials

(1) Only certified materials shall be used in important load-bearing components. Steel quality shall be carefully selected, due regard being paid to fatigue, the importance of the structure, the type of load, material thickness, weldability and design temperature.

(2) All steel materials for load-bearing parts of crane and boom derrick arrangements shall be killed or semi-killed and shall be accompanied by a workshop certificate showing the physical and chemical properties of the materials in terms of a recognised standard.

(3) When materials are selected, it shall be ensured that they are suitable for their intended use in the marine environment.

(4) A competent person shall check that the specified materials have been used in cargo-handling appliances and cargo-handling gear.

(5) Type and quality of material, any impairment of weldability owing to repairs, etc., and any temperature limitations on the use of the crane, shall be entered in the certificate/register and crane manual, and be confirmed by a competent person.

Section 11
Workmanship

(1) All welding of load-bearing components shall be carried out by a qualified welder, having a certificate for the type of weld in question.

(2) Important welds shall be tested by a non-destructive method in accordance with the directions and under the supervision of a competent person.

(3) In general, X-ray photographs shall satisfy the requirements for Mark 4 (blue) in accordance with "II W Collection of Reference Radiographs of Welds", but a slight porosity in accordance with Mark 3 (green) is still acceptable.

(4) A report specifying what has been examined and the result of the examination, confirmed by a competent person, shall be attached to the crane manual, cf. section 13 second paragraph.

Section 12
Safety devices

(1) *Limit switches.*

a) Cranes shall be fitted with a limit switch, limiting the movements of crane, crane boom or hook.

b) Limit switches shall be so placed that no damage or danger will arise even if the crane is stopped by such switches from full speed, due regard being paid to the conditions mentioned in section 7 third paragraph.

c) Activation of the limit switch shall automatically disconnect the drive in the direction affected. Re-connection of the drive or release of the brake shall not be possible till the relevant control device has been returned to neutral position, and then in such a manner that movement can take place to a "better" position only.

d) Bypass of limit switches for the lowest position of boom/crane arm is permitted when necessary for stowage of the boom. The bypass switch shall be placed under a cover and somewhat removed from the other control devices, but so that the operator may reach it from his permanent position. A sign shall be put up, stating that bypass of the limit switch shall not be used for other operations than for stowage of the boom.

e) Instead of limit switches, hydraulic or pneumatic devices may have automatic pressure limiters to stop manoeuvres which, if completed, would lead to unacceptable strains or situations.

f) In special cases, limit switches may also be required in connection with derrick arrangements, particularly for heavy-lift booms.

(2) *Overload switches.* Overload switches are required on cranes capable of hoisting more than their safe working load (SWL). It shall not be possible to re-connect the drive or release the brake until the relevant control device has been returned to neutral position, and then in such a manner that movement can take place to a "better" position only.

(3) *Load moment switch.* Cranes with a SWL that is reduced as the outreach is increased and with a SWL exceeding five tonnes, shall be fitted with load moment switches. It shall not be possible to re-connect the drive or release the brake until the relevant control device has been returned to neutral position and in such a manner that movement can take place to a "better" position only.

(4) *Slack wire stopper.* Cranes with a SWL exceeding five tonnes shall be equipped with a "slack wire stopper" that automatically stops the lowering operation if the wire is paid out too fast from the drum. However, this stopper may be omitted if the operator has an unobstructed view of the drum.

(5) *Emergency stop switches.*

a) All cranes shall be fitted with an emergency stop switch that can be reached from the operator's position. The switch shall be red, and protected by a hoop or equivalent.

b) When the emergency switch is activated, all brakes shall immediately operate to the full, braking all movements in a safe manner and stopping them as quickly as possible.

c) On electrically powered cranes the emergency stop switch shall cut out all phases of the mains supply to the crane.

d) In the event of an emergency stop, all functions shall return/be returned to neutral positions before it is possible to restart the crane.

e) Cranes running on rails or conveying belts shall be fitted – if necessary one on each leg – with emergency stop switches that can be reached from the deck. The emergency switch shall be capable of stopping the crane as quickly as possible. It shall not be possible to neutralise the emergency switch from the operator's cabin.

f) Cranes running on rails or belts shall be fitted with flexible bumpers to prevent the crane from running into anybody. In special cases, the Norwegian Maritime Authority may require limit switches to be fitted, to restrict the movements of the crane.

(6) *Warning signals.* Every crane with an operator's cabin shall be fitted with an audible signal/horn for danger warnings. All railed and crawler cranes shall have warning bells/alarms to give warning just before the crane is set in motion.

(7) A competent person shall check that the cargo-handling appliance has been designed and constructed in accordance with the guidelines in this section.

Section 13
Crane manual

(1) Crane manuals shall be available on board the ship for all types of cranes delivered, including provision cranes, engine-room travelling cranes and large derrick arrangements for which the rig arrangement drawings do not alone give all the necessary information prescribed by the second paragraph.

(2) The crane manual shall contain:

a) a layout drawing and a complete description of the cargo-handling appliance specifying the standard according to which it has been calculated;
b) design criteria, the crane group used, etc.;
c) operational conditions such as SWL, SWM, minimum and maximum crane radius/ derrick boom angle, slewing limitations, etc.;
d) design duration in relation to operational conditions;
e) a drawing showing the quality of materials for the entire crane as well as report of the check carried out by the manufacturers themselves in the form of welding control, product control, etc., confirmed by a competent person, cf. section 11; and
f) drawings/diagrams of all safety devices, layouts of electrical, hydraulic and pneumatic equipment giving maximum permitted pressures, and rules for maintenance and control (the service section). The service section shall, inter alia, contain a detailed description of the control of the slewing bearings/ball race, the moment to which the bolts shall be tightened, etc.

Chapter III
Testing, certification, periodical inspection and examination

Section 14
Testing of cargo-handling gear

(1) Before being taken into use, all new gear shall be tested by a competent person with the following test loads:

Component	**Safe working load SWL**	**Test loads**
Chain, ring, hook, shackle, swivel, multiple sheave block, etc.	Up to and incl. 25 tonnes	2 X SWL
	Up to and incl. 30 tonnes	55 tonnes
	Up to and incl. 35 tonnes	65 tonnes
	Up to and incl. 40 tonnes	70 tonnes
	Up to and incl. 45 tonnes	75 tonnes
	Up to and incl. 50 tonnes	85 tonnes
	Up to and incl. 55 tonnes	90 tonnes
	Up to and incl. 60 tonnes	95 tonnes
	Up to and incl. 65 tonnes	100 tonnes
	Up to and incl. 70 tonnes	110 tonnes
	Up to and incl. 75 tonnes	115 tonnes
	Up to and incl. 80 tonnes	120 tonnes
	Up to and incl. 85 tonnes	125 tonnes
	Up to and incl. 90 tonnes	130 tonnes
	Up to and incl. 95 tonnes	135 tonnes
	Up to and incl. 100 tonnes	145 tonnes
	Up to and incl. 110 tonnes	155 tonnes
	Up to and incl. 120 tonnes	165 tonnes
	Up to and incl. 130 tonnes	175 tonnes
	Up to and incl. 140 tonnes	190 tonnes
	Up to and incl. 150 tonnes	200 tonnes
	Up to and incl. 160 tonnes	215 tonnes
	Up to and incl. 170 tonnes	230 tonnes
	Up to and incl. 180 tonnes	240 tonnes
	Above 180 tonnes	1.33 X SWL
Single sheave block		4 X SWL
Single sheave block with becket		6 X SWL
Wire rope		Braking load
Lifting yoke, grab, etc.		2.0 X SWL

(2) By test load for blocks is meant the resultant load on the head fitting, cf. section 16 fifth paragraph (a) and (b).

(3) For single-sheave blocks with or without becket, the test load may be reduced according to the above table when the permitted resultant load on the head fitting exceeds 25 tonnes.

(4) A sample shall be taken of every length and dimension made. If it is not possible to test an entire piece, threads or wires may be tested to breakage and the total strength calculated.

(5) Lifting yokes, grabs, etc. with safe working loads exceeding 20 tonnes may be tested together with cargo-handling appliances.

(6) After completed load-testing, the objects not tested to breakage shall be carefully examined for possible damage or deformation. The sheaves shall be taken out of blocks for examination of axle pins and bearings, to the extent deemed necessary by the competent person.

(7) Testing and inspection in accordance with the first and sixth paragraphs shall be carried out by a manufacturer of gear or by an authorised yard.

(8) After testing and examination, a competent person shall issue a certificate on form No. 3 or No. 4 in the register for hoisting appliances and cargo-handling gear on ships.[1]

(9) A manufacturer or dealer who has had a consignment of gear certified shall, on the sale of any part thereof, deliver to the buyer a copy of the original certificate, with the gear in question specially marked.

(10) On application to the Norwegian Maritime Authority, permission may be granted for standard mass-produced gear to be certified on the basis of random sampling in accordance with a specified method.

[1] Prescribed by the Norwegian Maritime Authority.

Section 15

Initial examination and testing of cargo-handling appliances

(1) Before being put into use, cargo-handling appliances shall be tested, examined and certified by a competent person.

(2) Before cargo-handling appliances are tested on board, the competent person shall ensure that there are supporting documents as prescribed in section 6 and section 13 and that certificates have been produced for all cargo-handling gear.

(3) After completed installation on board, cargo-handling appliances shall be load-tested by a competent person with the following test loads:

SWL	Test load
up to 20 tonnes	1.25 x SWL
from 20 to 50 tonnes	SWL + 5 tonnes
over 50 tonnes	1.1 x SWL

(4) The test load shall be hoisted by the ship's own appliance, and the derrick boom shall not incline more than 15° from the horizontal. If this is not possible, or if the derrick boom is designed for an angle that is greater or smaller than 15°, the derrick boom shall be set at the smallest possible angle or at the design angle of the arrangement. After hoisting of the test load, the arrangement shall be function tested with the test load; i.e. hoisting, lowering, slewing and topping (if this can be carried out with a load hanging in the hook), and braking of the above-mentioned movements shall be tested.

a) If possible, the ship shall be given a list of 5°, or the maximum list when loaded with the maximum permitted working load in order to make the test as realistic as possible (see section 7 sixth paragraph).

b) The smallest angle used in the test, alternatively the greatest (if the derrick can be topped while loaded) shall be entered in the certificate.

(5) Derrick booms used in Union Purchase shall be tested together with a test load as stipulated in the third paragraph and the SWL for this method of cargo-handling. The test shall be carried out with the booms in the most adverse positions. Preventers shall be rigged, and the examination shall also comprise preventer guy plates and the parallel running of winches by hoisting, transfer, lowering and stopping of the test load.

(6) Cranes and other hoisting gear shall be load-tested with overloads as stipulated in the third paragraph. The test load shall be hoisted, lowered, slewed, and conveyed, and the radius of the crane arm shall be varied. Braking of these movements shall be tested. The crane arm shall be tested with the stipulated test load at its greatest and at its smallest radius. Where it is impossible to hoist the test load by hydraulic winch owing to limitation of pressure, it is sufficient to hoist the heaviest possible load. After the load-testing, the safety valve shall be adjusted to the pressure corresponding to its safe working load (SWL).

(7) All load-testing of cargo-handling appliances shall preferably be carried out with loose weights (hanging loads). For new arrangements, no exception to this rule will be permitted. In connection with replacements or renewals, spring or hydraulic weights may be used if loose weights cannot be procured. Only reliable and accurate spring weights or hydraulic weights may be used, and the test load shall be applied with the loading appliances swung out as far as possible, first in the one direction and then in the other. The test is not satisfactory unless the indicator remains immobile for at least two minutes.

(8) Before and after the testing a competent person shall ascertain that the cargo-handling appliance with accessories is in compliance with the drawings and whether any part thereof has been damaged or has sustained permanent deformation after being tested. The competent person shall decide whether any parts shall be dismantled for examination.

(9) A competent person shall certify the testing on form 2 for derricks and cranes and form 2 (U) for Union Purchase and cranes, and make entries in the register, cf. section 19.

Section 16

Marking

(1) Cargo-handling appliances and gear shall be permanently marked (by means of chiselling, punching, steel stamping) with their SWL and certificate/registration number. Derricks and cranes shall also be marked with reference numbers corresponding to their position on the rig arrangement drawing/key plan, NS 2609 form 3, or equivalent.

(2) Derrick booms.

a) Derrick booms shall be marked with SWL with single part and for an angle of 15°, or with the smallest angle exceeding 15° to which the boom(s) can be lowered owing to the arrangement on board; example: No. 3 SWL 5 T 15°.

b) If the same derrick boom is designed to hoist 10 tonnes when rigged with one fixed and one loose block, double parts, the marking will be thus: No. 3 SWL 5-10 T 15°.

c) The heavy-lift derrick boom shall be marked with the smallest angle and the heaviest load for which the boom and gear are designed. Example: SWL 60 T 30°.

d) If there is danger of stalling, the greatest permitted boom angle must also be given. Example: SWL 15 T 15–60°.

e) When two derrick booms can work together in what is termed Union Purchase, special marking to this effect shall be in the form of a separate plate, set up in a suitable place, between the derricks/ masts. Example: Nos. 3+4 SWL (U) 2 T.

f) Derrick/crane No. and SWL shall be in 80 mm high figures and letters, while the boom angle may be in 60 mm high figures and letters. The marking shall be permanent.

(3) Cranes.

a) Cranes with a constant SWL for all radii shall be marked with crane number, SWL and the minimum and the maximum radius for this load. Example: No. 5 SWL 5 T 414 M.

b) Cranes for which the SWL varies with the radius of the crane arm shall be marked with the maximum and the minimum safe working load and the corresponding radius. Example: No. 5 SWL 15 T 5 M, SWL 5 T 15 M.

c) Crane number and SWL shall be in 80 mm high figures and letters, while crane radius may be given in 60 mm high figures and letters.

d) When two cranes can work in conjunction, there shall be special marking to this effect on a separate plate, posted in an appropriate place between the cranes.

(4) Gear/accessories shall be marked in accordance with the requirements stated below, and the marking shall be such as to remain legible throughout the useful lifetime of the gear.

(5) Blocks.

a) Safe working load (SWL) for a single-sheave block is equal to the pull on the wire rope (i.e. half the force on the head fitting) when the block is used as a single loading block. The SWL for a single sheave block with becket is also equal to the pull on the wire rope, which in this case is one-third of the force on the head fitting. In both cases the block shall be marked with SWL equal to the pull on the wire rope.

b) The SWL of a multiple-sheave block is equal to the pull on the head fitting and equal to the SWL with which the block shall be marked.

(6) Chain, rings, hooks, shackles, swivels etc. shall be marked with the SWL for which the relevant part is certificated.

(7) Wire rope shall be accompanied by a certificate stating for which derrick/crane and for what purpose (cargo runner, masthead rope, guy, etc.) the rope is intended. If the entire length of rope is not used for the stated purpose, the amount used and any remnant shall be specified in the certificate. This entry shall be dated and signed by a competent person at the initial examination and subsequently by the chief officer, alternatively the master where the latter is the only deck officer on board.

(8) Slings shall be marked with SWL in easily legible figures or letters, either on the sling itself or on a plate or ring of durable material securely fixed to the sling, or the SWL shall be posted on notices easily legible by all concerned. Wire rope fitted with ferrules (talurit) shall have its SWL stamped into the ferrule.

(9) Lifting yokes, grabs etc. shall be marked with their SWL and their own weight.

(10) A competent person shall check that cargo-handling appliances are marked in conformity with this section.

Amended by Regulation of 29 June 2007 No. 1006 (in force on 1 July 2007).

Section 17

Annual inspection

(1) Cargo-handling appliances shall be inspected at least once every twelve months.

(2) The annual inspection shall comprise examination and function-testing of all the ship's cargo-handling appliances and cargo-handling gear and visual examination as regards stretching, wear and tear, corrosion, breakage and cracking, etc. The inspection shall be so carried out as to provide the most reliable knowledge possible of the safety of the parts examined.

(3) If a part has been replaced, the certificate number of the new part shall be entered in part V of the register and the certificate shall be attached, whereas the certificate for the replaced part shall be removed, cf. section 27 fourth paragraph.

(4) A competent person or the chief officer and chief engineer or first engineer of the ship shall carry out the annual inspection and attend to the entries in the register. On small vessels lacking such officers, the master shall attend to the said inspection and entry in the register.

Amended by Regulation of 29 June 2007 No. 1006 (in force on 1 July 2007).

Section 18

Five-yearly thorough examination

(1) All the ship's cargo-handling appliances with accessories shall be thoroughly examined and tested every five years.

(2) The five-yearly thorough examination shall normally comprise the complete opening/dis-mantling of appliances and gear so that all components may be inspected for stretching, wear and tear, corrosion, breakage and cracking. In respect of derrick arrangements, boom parts shall be lifted, derrick head fittings dismantled, blocks and winches opened, etc. Cranes shall be dismantled and examined according to the specifications of the service section of the crane manual.

(3) The five-yearly thorough examination shall be carried out by an authorised yard/workshop or at a qualified yard/workshop.

(4) After the examination prescribed by the first paragraph, the parts shall be reassembled and the cargo-handling appliance load-tested and examined in compliance with section 15.

(5) A competent person shall carry out the five-yearly thorough examination and issue new certificates, but may also certify the examination and testing with the stamp, date, and signature of the yard/workshop endorsed on the reverse side of the existing form 2 for lifting appliances or form 3 for gear. The competent person shall then make entries in the register.

Section 19

Keeping of register and rig record book

(1) Inspection and examinations of cargo-handling appliances shall be entered in the register prescribed by the Norwegian Maritime Authority in accordance with the printed instructions therein.

(2) In order to keep track of current maintenance and replacement of cargo-handling gear, the chief officer, alternatively the master, of the ship shall fill in the required data in part V of the register.

(3) On ships with comprehensive cargo-handling appliances, the chief officer may keep a separate rig record book instead of filling in part I of the register. The rig record book shall have columns for the designations of the parts overhauled or replaced (name, dimensions, markings, SWL, quantity, certificate no.), room for explanatory remarks, date and signatures.

(4) The register, certificates and the rig record book, if any, shall at all times be available to the Norwegian Maritime Authority, to the authorities of other countries and to competent persons. They shall be kept for at least five years from the date of the last entry.

Amended by Regulation of 29 June 2007 No. 1006 (in force on 1 July 2007).

Section 20

Examination in connection with alterations/modifications

(1) Alterations/modifications or renewals of cargo-handling appliances shall be carried out at an authorised yard/workshop.

(2) Load-testing and examination shall be carried out in accordance with section 15.

Chapter IV
Various provisions relating to the use of cargo-handling appliances on board ships

Section 21

Repealed by Regulation of 25 January 2000 No. 170.

Section 22

Inspection prior to the commencement of loading/discharging

Cargo-handling appliances shall, to the necessary extent, be inspected before and during use, and entries regarding this shall be made in the deck log-book.

Section 23

Treatment of cargo-handling gear

(1) Chains shall not be shortened by means of knots. To prevent links from coming into contact with sharp edges when hard and heavy objects are hoisted, suitable intermediate protection shall be fitted.

(2) Wire rope shall preferably be stowed in a dry hold at even temperature. When being rigged, wire rope shall be drawn from the drum by the outer end in order to prevent kinks. All wire rope in running rigging shall be regularly lubricated with a suitable lubricant that will penetrate to the core of the rope.

(3) Slings made of wire rope shall be stowed so as to avoid damaging bends.

(4) Cargo-handling gear that is not in use shall be stowed in a suitable place where it is easy to find gear with the appropriate SWL.

Section 24

Winch operator, crane operator, signaller, etc.

(1) All winches and windlasses in operation shall be manned.

(2) Only persons having passed 18 years of age shall be assigned as winch operators, crane operators or signallers. Wherever necessary for the safety of the workers, one or more signallers shall be assigned.

(3) Whenever high hatch coamings or other obstructions impair the view of the signaller, fixed or movable platforms shall be set up.

Amended by Regulation of 26 June 2025 No. 1372.

Section 25

Loads on cargo-handling appliances

(1) Cargo-handling appliances shall never be loaded beyond their SWL.

(2) Cranes and derricks shall be used only for vertical hoisting or lowering of cargo (i.e. the load shall hang vertically under the cargo block/crane sheave) unless it appears from the register or crane manual that the arrangement is specially intended for other use (e.g. Union Purchase).

(3) If a derrick or crane is used to remove or replace hatch covers, the cargo runner shall be led through a snatch block rigged vertically under the cargo block or crane sheave.

Section 26

Cargo-handling

(1) The master shall ensure that suitable gear is being used when the ship's cargo-handling appliances are in use.

(2) No person may be put to other work in areas where loading or unloading is in process. Particular care must be taken when the working space in the hold is limited to the area below the hatch opening.

(3) No safety devices that have to be removed to provide access for loading or unloading, such as railings, ladders, lights, etc., shall be moved without warning being given to the work foreman or responsible officer, and these devices shall as soon as possible be returned to their proper places.

Section 27

Replacement of gear/wire rope

(1) Gear and wire rope that is worn, corroded or damaged shall be immediately replaced, and an entry to this effect shall be made in part II of the register, or in the separate rig record book.

(2) Gear apart from wire rope shall be replaced if corrosion or wear and tear has reduced its weight or sectional area by 20%, however so that no reduction in any dimension exceeding 10% is permitted.

(3) Wire rope shall be replaced if over any length equal to 8 diameters the total number of visible broken wires exceeds 10% of the total number of wires, if it shows signs of heavy wear and tear or internal or external corrosion, has been permanently deformed by overloading, has other defects such as kinks, crushing of cordels, a tendency to spiral or other deformities making it unsuitable for use.

(4) A certificate on form 3 for new gear and form 4 for wire rope shall be attached to the register, but the wire rope certificate may also be attached to the separate rig record book, where appropriate. The certificates for the parts replaced shall be removed from the register or rig record book to be kept separately.

Chapter V
Special provisions

Section 28
Entry into force

(1) These Regulations enter into force on 17 July 1978.

(2) Cargo-handling appliances in existing ships shall comply with the provisions of these Regulations not later than at the first five-yearly thorough examination after the entry into force of these Regulations, however so that section 9 up to and including section 13 need be complied with only to the extent deemed practicable and reasonable by the Norwegian Maritime Authority.

(3) As from the date mentioned in the first paragraph, Regulations of 8 July 1955 concerning loading and unloading machinery and gear in ships and concerning protective measures against accidents on board during loading and unloading, as amended, are repealed. Additionally, from the same date, Instructions of 8 July 1955 for testing, examination, heat treatment, marking etc. of hoisting machinery and gear in ships, as amended, are repealed.

Amended by Regulation of 29 June 2007 No. 1006 (in force on 1 July 2007, formerly section 29).