

MSIS 10 Rev 4.0

MCA Survey of Lights and Signaling Equipment - Instructions for the Guidance of Surveyors

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Foreword

Earlier edition of this document, the Third Edition of the Survey of Lights and Signalling Equipment, Instructions for the Guidance of Surveyors, published in 1987, has now been superseded by this document.

The instructions contained in this document are not in themselves statutory, but they draw attention to the principal legislation on lights and signals and provide guidance on how the requirements of this legislation may be met. They also provide recommendations which are made in the light of experience.

The requirements are contained in the International Regulations for Preventing Collisions at Sea, 1972, as amended (COLREGs) which are reproduced in Merchant Shipping Notice, MSN 1781, as amended. The COLREGs are enforced in the UK by the Merchant Shipping (Distress and Prevention of Collisions) Regulations 1996 (SI 1996 No. 75).

For the purpose of these Regulations, the “date of entry into force of these Regulations” in Rule 38 (Exemptions) of the COLREGs means:

- (i) In the case of a United Kingdom vessels, 15 July 1977; and
- (ii) In the case of a vessel registered outside the United Kingdom, the date of entry into force of the COLREGs for the State whose flag the vessel is entitled to fly.

CHAPTER 1

General

1.1 *Object of these Instructions*

These Instructions are issued by the Maritime and Coastguard Agency for the guidance of surveyors in inspecting ships' navigation lights, sound and visual signalling equipment. They also indicate to surveyors, ship-owners, masters, skippers, shipbuilders and manufacturers the requirements which must be met so as to comply with the various statutory provisions relating to these items and to satisfy the conditions for the approval of equipment intended for use at sea.

1.2 *Statutory Provisions*

1.2.1 The principal statutory requirements relating to lights and signals are contained in the Merchant Shipping Act of 1995 and the Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996 (S.I. 1996 No. 75) which implement the International Regulations for Preventing Collisions at sea, 1972 (COLREGs), (as amended). The Regulations (COLREGs) are reproduced in Merchant Shipping Notice MSN 1781, as amended. Other relevant Instruments in their amended form are the Merchant Shipping (Safety of Nav regs.) Regulations; Merchant Shipping (Passenger Ship Construction) Regulations 1980, the Merchant Shipping (Survey and Certification) Regulations 1995; the Merchant Shipping (Cargo Ship Construction) Regulations 1997 and the Fishing Vessels (Safety Provisions) Rules 1975.

1.2.2 The broad effect of these various regulations is that:

- 1.2.2.1 All vessels (irrespective of class or size) which navigate by night must carry and exhibit lights;
- 1.2.2.2 The lights for different classes and sizes of vessel are specified;
- 1.2.2.3 on all United Kingdom vessels the lights must be of a type approved to Marine Equipment Directive standards, by a UK Notified Body (see paragraph 3.2);
- 1.2.2.4 all United Kingdom registered vessels of more than 150 GT engaged on international voyages, and all fishing vessels of 12 metres registered length or above, must carry an efficient daylight signalling lamp which shall not be solely dependent upon the ship's main source of electrical power; and
- 1.2.2.5 All vessels must carry a means of making sound signals.

1.2.3 Failure to comply with these requirements is an offence; in addition, a ship may be detained if the proper lights and means of making sound signals are not provided.

1.3 *M Notices and Surveyor Advice Notes (SAN)*

1.3.1 MSN/MGN/MIN and SANs may be issued by the MCA from time to time on the subject of lights and signalling equipment.

1.3.2 Surveyors should bring to the attention of ship-owners, masters, shipbuilders and others interested, of any new requirements or recommendations, as opportunity offers, and be prepared to discuss their effect in specific cases.

1.4 *Unified Interpretations (UI)*

1.4.1 The IMO Maritime Safety Committee, from time to time, approves and publishes various UIs with a view to providing more specific guidance for certain Rules contained in IMO instruments, which includes COLREGs, which are open to different interpretations. These instructions will be updated in accordance with those UIs as they are published. The latest UI relevant to COLREGs, MSC.1/Circ.1427 (28 May 2012), has been incorporated within these instructions.

CHAPTER 2

Surveys, reports and fees

2.1 Statutory inspections

2.1.1 Every United Kingdom registered passenger ship must have a Passenger, or Passenger and Safety Certificate. A cargo ship registered in the United Kingdom, of 500 GT or over, plying on international voyages, must have a Cargo Ship Safety Equipment Certificate. A fishing vessel of 12 metres registered length and over must have a United Kingdom Fishing Vessel certificate. Surveys are carried out every year for the issue of Passenger, or Passenger and Safety, certificates. Cargo ships are surveyed biennially for renewal of the Safety Equipment Certificate, with either an annual or intermediate survey within the period of its validity. Fishing vessels are surveyed every four years for renewal of the Fishing Vessel certificate with periodical inspections within the period of its validity. Such surveys include the inspection of lights and signalling equipment.

2.2 Other inspections

2.2.1 Ships which are not required by law to have such surveys must, nevertheless, comply with the COLREGs which apply to vessels of every type and size; and their owners may therefore wish to have the required equipment inspected regularly to satisfy themselves that it does so comply.

2.2.2 Surveyors are empowered by Section 258 of the Merchant Shipping Act, 1995, to visit ships at any reasonable time to examine their lights and signalling equipment.

2.2.3 On the conclusion of an inspection, if the lights and signalling equipment have been found to comply fully with the COLREGs and other Regulations as applicable, a report will be given to the master, owner or agent, if one is requested. The report will be confined to those matters which the surveyor has examined and it should be understood to be simply a statement of fact that on a certain date the lights and means of making signals were examined and found to comply with the Regulations.

2.3 Inspection of lights on board

2.3.1 *Surveyors, when inspecting lights, should see:*

2.3.1.1 That all the appropriate lights are on board and that they are in good order. Attention should be paid to all parts of the lantern including the provision of electrical connections, the lamp-holder and the lens; and to the

screening. Particular attention should be paid to the Navigation Light Controllers (NLC). Function of the NLC is to provide means of control and monitoring of the status of navigation lights onboard the vessel to the Officer of the Watch (OOW).

2.3.1.2 That the colour quality of the red and green (and if appropriate yellow) lights is correct. This can be assumed to be the case if there is no sign of fading in the coloured shade or lens when compared with spares; if fading has occurred the shade or lens should be renewed and a suitably recorded, e.g. within a CM file.

2.3.2 *Small craft*

Surveyors, when inspecting small craft, should ensure that the navigation lights are in good order and are fitted so that they can readily be seen, as a number of casualties to such vessels, some involving loss of life, have been caused at least partly through their showing inadequate lights. Thus, although surveyors will bear in mind the limitations imposed by lack of space in small vessels, they cannot condone any departure from the essential requirements of the COLREGs. It should be noted that whether or not small craft are registered or owned in the United Kingdom, it is required that their lights are type-approved.

2.3.3 *Harbour craft*

The lights fitted in vessels operating within harbour limits may be required to comply with port authority by-laws which in some cases modify the COLREGs. However, the essential requirements that navigation lights have the proper ranges and are suitably placed always apply.

2.4 *Inspection of signalling equipment*

2.4.1 Surveyors should ensure that the sound and visual signalling equipment provided is in accordance with the appropriate requirements and is in good order.

2.5 *Procedure for dealing with defects*

2.5.1 All defects must be made good to the surveyor's satisfaction. Repairs must be carefully carried out and parts requiring renewal must be replaced with fully equivalent items suitable for the light in question. If it is not possible for the work to be completed before the vessel's intended time of sailing then surveyors may, at their discretion, allow the vessel to depart if they are satisfied that the deficiencies will not endanger the vessel, or other vessels, and that there is no reason to expect delay in their being rectified. If the vessel is bound for another port in the United Kingdom then surveyors in that port should be informed so that a further inspection can be carried out there to verify that compliance is achieved.

If the vessel is bound to a port within Europe covered by the *Paris Memorandum of Understanding on Port State Control (Paris MoU)*, the deficiency should be reported in accordance with the procedure laid down by that MoU.

2.5.2 However, if a defect is such as to cause a vessel to be in breach of COLREGs were it to go to sea, then she must not be allowed to sail and, if it is necessary in order to prevent her doing so, the power of detention given in Regulation 7 of the Merchant Shipping (Distress Signals and Prevention of Collisions) Regulations 1996 must be invoked in the manner laid down (see also paragraph 2.6).

2.5.3 All cases involving, or which may lead to, detention should be reported to Enforcement Branch, Headquarters.

2.6 *Ships not owned or registered in the United Kingdom*

2.6.1 When the safety equipment of a vessel is surveyed on behalf of its Government, the lights and signalling equipment will be examined as part of the survey. Otherwise, such equipment should only be inspected, when there is a reason to suppose that it does not comply with the Regulations, during the carrying out of Port State Control inspection as stipulated within the Paris MoU. In either case, strict compliance with these instructions should not be sought - for example, a vessel not registered in the United Kingdom and not belonging to the EU, Norway or Iceland cannot be required to carry MED type-approved lights - but only compliance with the standard laid down in the COLREGs is required.

2.6.2 The vessel must not be allowed to sail if the surveyor considers that by so doing the vessel would be in breach of the COLREGs. If it is necessary to prevent sailing out, the vessel should be detained under Section 95 of the Merchant Shipping Act 1995.

2.7 *Fees*

2.7.1 The fee for the inspection of lights and means of making sound signals on passenger ships is included in the fee for the annual Passenger, or Passenger and Safety, Certificate. Similarly the fee for the inspection of the lights and sound signals on cargo ships of 500 GT and over, engaged on international voyages, and fishing vessels of 12 metres or more in length is included in the fee for the respective certificates.

2.7.2 Owners of ships and fishing vessels which are not required to undergo regular surveys for one of the certificates mentioned above may nevertheless apply for an inspection of the ship's safety equipment at any time; this will include inspection of lights and sound signals and the fee charged will, again, cover such inspection.

2.7.3 Owners may, on payment of the appropriate fee, apply for a separate inspection of lights and sound signals on their ships. A fee will be charged if at any time a surveyor, making an inspection not requested by the owner, finds that the lights or sound signals are defective. No fee is charged if the equipment is in proper order and the owner has not asked for the inspection.

2.7.4 Fees are charged in accordance with Merchant Shipping (Fees) Regulations 2006, as amended.

CHAPTER 3

Lights and Shapes: General Requirements for Acceptance and Approval

3.1 Approval

3.1.1 COLREGs Annex 1, Section 14 states: *“The construction of lights and shapes and the installation of lights on board the vessel shall be to the satisfaction of the appropriate authority of the State whose flag the vessel is entitled to fly.”*

3.1.2 At present vessels of all sizes whether registered or not are required to carry lights and shapes which are type-approved to the satisfaction of an appropriate authority. In the UK, Notified Bodies carry out the type-approval as outlined in MSN 1734, Type Approval of Marine Equipment (EC Notified Bodies), as amended.

3.1.3 The approval of shapes rests on surveyors who are carrying out the survey, who should satisfy themselves that the required shapes are carried, and that they are of the correct dimensions (bearing in mind the provisions of COLREGs Annex I, Section 6(c) for small craft) and colour, and that they are in good order and condition.

3.1.4 The type-approval of lights is covered by the MED, as detailed in MSN 1734.

3.1.5 Chapter 4 of these Instructions provides guidance on the siting and installation of lights.

3.2 Application for approval

3.2.1 From 10 December 2011, the procedures for seeking type-approval for navigation lights became part of the MED standards, as detailed in MSN 1734, as amended.

3.3 Acceptance of lights on ships transferred to United Kingdom Ship Register (UKSR)

3.3.1 The navigation lights on ships transferred to the UKSR may be accepted, if the surveyor is satisfied that the lights are in good condition and that their fitting and positioning on board the ship complies with the COLREGs, and:

3.3.1.1 the lights are MED approved; or

3.3.1.2 in the case of lights not MED approved, they may be accepted as alternative lights on ships whose construction commenced before 15 July 1977 provided that type-approved primary lights are fitted; and

3.3.1.3 if not MED approved, they may be accepted provided they are approved to the same IMO standards in accordance with guidance in Instructions to Surveyors – Survey & Inspection, Ch 6.5.6.4.

3.4 Design of lights

3.4.1 Design of lights on ships whose construction commenced on or after 15 July 1977

3.4.1.1 The MCA considers it impracticable and undesirable to specify standard designs of lantern, as any light which meets the requirements of the COLREGs and which meets the prescribed testing standard defined in the MED, will be considered acceptable.

3.4.1.2 Current performance standards for navigation lights (MSC.253(83)) provided for special requirements for lights using LEDs. MGN 393 details those requirements and other guidance.

3.4.2 Lights on ships whose construction commenced before 15 July 1977

3.4.2.1 The electric lights specified in previous editions of these Instructions proved satisfactory after many years service and may continue to be accepted as alternative lights, where appropriate, provided that primary lights constructed and approved in accordance with the preceding subparagraph are fitted. (see para 5.1.2)

3.5 All-round lights

3.5.1 The use of well-glass all-round lights is no longer acceptable for vessels whose construction commenced after 31 December 1979. Such vessels should be fitted with type-approved lights.

3.5.2 Vessels, the construction of which commenced before 31 December 1979, may be permitted to retain all-round lights fitted with dioptric lenses or well-glasses subject to the satisfaction of the surveyor.

3.6 *Flashing lights for Fishing Vessels*

3.6.1 Reference to these lights is made in Annex II(3) of the COLREGs. When fitted, the light and flashing mechanism must be type-approved by a Notified Body.

CHAPTER 4

The Provision of Lights on Board Ship

4.1 Position of lights - General

4.1.1 The positions on board a ship in which the various lights are to be carried are laid down in the COLREGs, principally in Annex I, Sections 2 and 3, which should be read in conjunction with Rule 21. It is accepted that exact compliance with these requirements is not always practicable with some types of specialist vessels and exemption is allowed by Rule 1(e). However, such exemptions are to be kept to a minimum, and they will only be granted if the MCA is satisfied that all reasonable efforts have been made to comply as closely as possible, and that no dangerous confusion will be caused by the alternative disposition of the lights. All requests for exemption should be referred to Navigation Safety Branch, Headquarters with surveyors' assessments as detailed in Operational Advice Note (OAN) 463. This does not apply to permanent exemptions granted under Rule 38.

4.2 Height of Lights

4.2.1 Height of foremast light

In power driven vessels of 20 metres or more in length the height of the foremast light is laid down in Annex I, Section 2(a)(i) and this height is measured in accordance with the definition at Annex I, Section 1. The height of the mainmast light and side lights is related to that of the foremast light by Annex I, Sections 2(a)(ii), 2(b) and 2(g).

4.2.2 Height of side lights

4.2.2.1 The height of the side lights should also be measured in accordance with the definition in Annex I, Section 1, i.e. height above the uppermost continuous deck at ship's side. This height should not exceed three quarters of that of the foremast light. If possible the vertical separation should be greater than the minimum distance required as the ideal height of the side lights is about half that of the foremast light, but the side lights must be clear of any accommodation lighting which might impair their visibility or distinctive character.

4.2.2.2 Vertical separation of masthead lights: two requirements are laid down in Annex I, Sections 2(a)(ii) and 2(b). These are illustrated in Appendix B to these Instructions.

4.2.3 Height of stern light

4.2.3.1 The height of the stern light is not specified in the COLREGs and the surveyor needs only verify that it is carried high enough for its visibility, and normally not to be impaired by waves. (This is particularly important with small craft).

4.2.4 Height of Anchor and Special Purpose Lights

4.2.4.1 The definition in Annex I, Section 1 should also be used in relation to compliance with the minimum height requirements for anchor lights and special purpose lights set out in Annex I, Section 2(i) and 2(k).

4.2.4.2 It should be noted that all-round lights, except anchor lights, need to be placed so as to be clear of obstructions in order to meet the requirements of Annex I, Section 9(b).

4.2.4.3 Permanent exemption from the requirement of Annex I, Section 9(b) is given by Rule 38(h) to vessels whose construction commenced before 15 July 1987.

4.2.5 Manoeuvring light

4.2.5.1 The requirements for the manoeuvring light are set out in Annex I, Section 12.

4.3 Fitting of navigation lights

4.3.1 Safe Access

4.3.1.1 During the life of a ship access to the lights is necessary for lamp replacement, repairs and inspection. Surveyors should, at an early stage, bring to the attention of shipbuilders and ship owners the need to provide adequate hand holds, foot rests, hoop rails and positions for securing safety harness lifelines as appropriate.

4.3.2 Vertical sectors

4.3.2.1 Annex I, Section 10 specifies requirements for vertical sectors of lights 'as fitted'. The vertical sectors measured from the top and bottom of the lens should not be obscured by the structure of the ship. The vertical sectors of electric lights, as fitted, with the exception of lights on sailing vessels, should ensure that at least the required intensity is maintained at all angles from 5° above to 5° below the horizontal when measured at even keel.

4.3.3 Horizontal positioning

4.3.3.1 Requirements for the principal lights are laid down chiefly in Rule 21 and in Annex I, Section 3 of the COLREGs. For all-round lights the requirement of Section 9(b) mentioned above is also relevant, as are those of Section 4 for direction-indicating lights. Rule 23 requires that a masthead light be carried 'forward'. This is amplified in the Annex as meaning within a quarter of the ship's length from the stem, where two masthead lights are prescribed; but in vessels only required to carry a single masthead light it is considered to mean 'forward of amidships'.

4.3.3.2 Masthead lights are to be placed 'over the fore-and-aft centreline' of the vessel (Rule 21) and this requirement will be satisfied if they are within one-twentieth of the ship's beam of the exact centreline and both offset identically. The requirement that sidelights are to be placed 'at or near the side of the vessel' (Annex I, Section 3(b)) the term "near the side" is interpreted as being a distance of not more than 10% of the breadth of the vessel inboard from the side, up to a maximum of 1 metre (refer IMO Unified Interpretation, MSC.1/Circ.1260). Where the application of above requirement is impractical (e.g., small ships with superstructure of reduced width) exemption may be given. Care must be taken to ensure that each sidelight is visible between one to three degrees across the fore and aft line through the light. (See Appendix B, Figure 3).

4.3.3.3 In order to comply with the 1-mile requirement in 9(b)(ii), the all-round lights shall be screened less than 180° . However, as a light source is not a point but has a certain extension, it may be accepted that all-round lights are screened up to 180° . Screening details are to be considered by Classification Societies when carrying out the drawing approval process (refer IMO Unified Interpretation, MSC.1/Circ.1260).

4.3.4 Screening

4.3.4.1 The COLREGs require that sidelights (except when they form part of a combined light) shall be fitted with in-board screens which must be painted matt black. No details as to dimensions are laid down and there is no specific requirement for a chock to be fitted. Such details must therefore be considered by the surveyor in conjunction with the shipbuilder in each particular case, bearing in mind that screens potentially fulfil two purposes: firstly that of preventing undesirable light on board ship, and secondly that of aiding compliance with the horizontal sector requirements.

4.3.4.2 From the above point of view, the extent of screens to be provided must depend on the individual ship and must be decided on a practical basis accordingly; it may be that in some instances a coat of matt black paint on a small area of the ship's structure in way of the lantern will suffice. On the other hand, the screening (if any) required to enable the light to shine correctly over the prescribed sector depends on the construction of the light in question, and will therefore be considered in the course of testing.

Manufacturers may, if they wish, supply details of such screening as they consider necessary when they submit lights for type-approval.

4.3.4.1 The requirements are that:

- .1 the full intensity of the light can be seen from right ahead of the light; and
- .2 the light can be seen at least 1° but not more than 3° across the fore and aft line through the light.

4.3.4.2 To achieve this, if cut-off is not provided by the structure of the lantern, the inboard screens should be provided with a suitable chock. Generally, approved lights will be supplied with makers' instructions relating to the screen and chock dimensions, but when these are not available chocks may be set using the following principles (see also Appendix B).

4.3.4.3 Many side lights are fixed on to doors which swing inboard for ease of access to the lights. It is important that these doors should remain in good condition and properly fitting, to maintain the correct arc of visibility of the light.

4.3.4.4 Subject to requirements of 4.3.2.1 masthead lights need only be screened so as not to dazzle watch keepers on the bridge or fo'c'sle head. (See Appendix B).

4.3.4.5 Stern lights should not require any screening beyond that incorporated in the construction of the light.

4.4 Onboard check of side light cut-off

4.4.1 COLREG Annex I, section 9(a)(i) requires the full intensity of the side lights to be maintained in the forward direction of 1° outside the prescribed sector with the practical cut-off between 1° and 3° . This is needed to enable other vessels to determine a "head-on-situation" as per COLREGs Rule 14.

4.4.1.1 After installation of side lights on board, surveyors can check compliance with Annex I, Section 9(a)(i) by sighting the lights from the positions found by the method of calculation shown at Appendix B, Figure 3.

4.4.1.2 On vessels with side lights forward it may be necessary to calculate the limits within which the side lights should be visible when viewed from the extended centre line ahead of the vessel.

4.4.1.3 Sectorised lights require to be accurately aligned parallel to the ship's fore and aft centre line.

4.5 Duplication of navigation lights

4.5.1 To comply with the IMO Navigation Lights performance standards (MSC.253(83), 1 Jan 2009), and to ensure that the provisions of the COLREGs can be complied with continuously, ships of 50 metres or more in length should be provided with primary and alternative ('standby') lights for each of the masthead, side and stern lights required by the COLREGs.

4.5.1.1 Double tier lights

4.5.1.1.1 Particular attention should be paid to the access for lamp changing; if access to one light is less easy (usually the lower one) this light should be specified in the maker's instructions as the 'standby' light.

4.5.2 Vessels less than 50 metres registered length

4.5.2.1 Such vessels need not in general be provided with alternative masthead, side and stern lights unless in a particular case, for example high speed passenger carrying craft, the Surveyor deems it necessary for safe operation. In order that lights can be shown continuously as required by the COLREGs, surveyors should ensure that where lights are not duplicated then lamps can be replaced easily and within 3 minutes.

4.5.3 Special purpose lights

4.5.3.1 In vessels of 50 metres or more registered length which are normally required to show the special purpose lights prescribed by Rules 24, 26, 27 (excluding Not-Under-Command) and 29 should be fitted with duplicate lights. However, when the fitting of duplicated lights is impracticable a single set of lights may be fitted provided that the navigation light controller in the wheelhouse is supplied from two sources of power one of which shall be independent from the main electrical installation.

4.6 Exemptions

4.6.1 Where strict compliance with the Regulations regarding the positioning of lights is not possible, provision is made under Rule 1(e) of the COLREGs for exemption to be granted if compliance would interfere with the special function of the vessel. Requests for exemptions should be forwarded to the Navigation Safety Branch, HQ using the Annex in OAN 463. First exemptions would normally be issued by HQ with renewals being issued by local marine offices.

4.6.1.1 Sidelights

4.6.1.1.1 Exemptions are not required for the horizontal positioning and spacing of sidelights provided that they are not placed in front of the forward masthead lights and, in the professional judgement of the surveyor, they are placed at or near the side of the vessel.

4.6.2 *All-round lights*

Exemption from Annex I, Section 9(b) will not be issued in cases where compliance can be achieved by simple modifications such as the fitting of a spar to carry the lights clear of obstructions or by the provision of a combination of lights on each side of such obstruction.

4.6.3 *Exemptions for Offshore Supply Vessel(OSV)*

4.6.1 *Masthead lights*

4.6.1.1 Flag-in of an OSV

4.6.1.1.1 There have been cases at the flag-in of some OSVs of 50m or more in length where they only had a single masthead light with general exemption for the second one by their flag State. In such cases exemptions may be issued (after due consideration by Navigation Safety Branch and assessing surveyors, and subject to risk assessment, on a temporary basis with the proviso that a new masthead light will be fitted at the following dry dock.

4.6.1.2 New OSV

4.6.1.2.1 No exemptions (in respect of 2nd Masthead light) will be issued for Newbuild OSVs of 50m or more in length.

4.6.2 *Stern and towing lights*

4.6.2.1 Due to difficulties with positioning stern and towing lights right aft it will be acceptable to fit these lights on the after end of the accommodation structure. No exemption will be required.

4.6.2.2 However, as such a position may be as much as two-thirds of the vessel's length from the stern and, if this area is not illuminated by deck

lights, the owner's and Master's attention should be drawn to the provisions of Rule 36.

4.6.2.3 When helicopter operations are envisaged every endeavour should be made to fit the stern light right aft to avoid glare.

4.6.5 Navigation lights on large yachts

4.6.5.1 All navigation lights should be provided with main and emergency power supply. With due regard to accessibility, the requirement for duplication for navigation lights required to be shown whilst underway may be satisfied by having spare lamps that can be easily fitted within three minutes. However, on yachts over 500 GT these must be duplicate lights.

4.6.5.2 Certain designs of large yachts between 24 metres and 50 metres length are fitted with the single masthead light well aft of mid ships thereby not complying with Annex I, 3(d). For new buildings the design should comply with this Regulation. For existing vessels exemption can be considered for a single masthead light situated within 10%L abaft amidships. If this cannot be achieved a forward masthead light should be fitted at or near the bow. This may require repositioning of sidelights. In such cases exemptions will be considered for the height of the lights above the deck.

CHAPTER 5

Electrical Systems

5.1 *Electrical arrangements*

5.1.1 The Merchant Shipping Construction Regulations apply to electrical arrangements for all passenger ships and for cargo ships of 500 GT and over. For fishing vessels the corresponding provisions are contained in the Fishing Vessels (Safety Provisions) Rules. The regulations require ships subject to them to comply with one of the approved standards listed in Marine Guidance Note (MGN) 359, which lists the relevant edition of the BS 8450:2006 “Code of Practice for Installation of Electrical and Electronic Equipment in Ships” issued by the British Standards Institution, as applicable to the age of a ship.

5.1.2 The performance standards for navigation lights, navigation light controllers and associated equipment, IMO resolution MSC.253(83), adopted on 8 october 2007 applies from 1 January 2009. These performance standards outline, among others, all electrical requirements for the navigation lights, their controllers and associated equipment.

5.1.3 SOLAS Ch II-1; Part D, Regulation 42 and 43 detail the requirements of self-contained emergency source of electrical power, providing for continued operation of navigation lights among other things, for various ship types

CHAPTER 6

Sound Signals

6.1 Bells

6.1.1 All vessels of 12 metres or over in length must be provided with an efficient bell.

6.1.2 The bell should be hung in the fore part of the vessel clear of obstructions, and must be not less than 300 mm in diameter at its mouth, except in vessels of 20 metres or less in length when a diameter not less than 200 mm may be accepted.

6.1.3 The bell is to be fitted with a suitable striker fitted with a short lanyard. The mass of the striker of the bell must be at least 3 per cent of the mass of the bell itself.

6.1.4 The appliance shall be capable of producing a sound pressure level of 110 dB referred to a distance of 1 metre from it.

6.1.5 For vessels built before 15 July 1977, bells made to these dimensions may be accepted without formal test if the surveyor is satisfied that they are well-made, in good condition, and give a clear ringing tone. After that date each bell supplied should be provided with certification from the manufacturer attesting compliance with Annex III 2(a) sound pressure level requirement.

6.2 Gongs

6.2.1 Vessels of 100 metres or more in length must be provided with a gong for sounding in the after part of the vessel.

6.2.2 No dimensions are laid down for this appliance, but like the bell it shall be capable of producing a sound pressure level of 110 dB referred to a distance of 1 metre from it, and its tone and sound must be distinct from that of the bell.

6.2.3 For vessels built before 15 July 1977, it is considered that well made gongs of at least 400 mm diameter with a flange at least 50 mm deep may be accepted in the same way as bells following visual and aural inspection by the Surveyor. After that date each gong supplied should be provided with certification from the manufacturer attesting compliance with Annex III 2(a) requirement.

6.3 Automatic bell and gong systems

6.3.1 These may be used, provided they meet the sound pressure level criterion mentioned above and that either:

6.3.1.1 they are capable of manual operation in the event of a power failure; or

6.3.1.2 they are not so capable (if for example they simulate the bell and gong sound electronically) and a separate manual bell and gong are supplied.

6.3.2 Such systems must be type-approved as per MSN 1735: Type Approval of Marine Equipment (UK Nominated Bodies).

6.4 Whistles

6.4.1 All vessels of 12 metres in length and above whose construction commenced on or after 15 July 1977 must be provided with a whistle which must meet the specification laid down in Annex III, Section 1, of the COLREGs.

6.4.2 Vessels of less than 12 metres need not carry a whistle but must have some suitable means of indicating their presence by sound.

6.5 Approval of sound signals

6.5.1 Whistles and other Sound Signalling Appliances (except bells and gongs) must be of an approved type. Manufacturers wishing to obtain certificates of type-approval should apply directly to the nominated bodies in accordance with MSN 1735, as amended.

6.6 Fitting of whistles on board ship

6.6.1 Attention is drawn to Annex III, Sections 1(e), (f) and (g) of the COLREGs. With regard to the last sentence of Section 1(e), the term 'listening posts' should be taken to mean bridge wings and fo'c'sle head. The positions with reference to the whistle at which the sound pressure level has reduced to 110 dB(A) and 100 dB(A) will be recorded at the time of its testing and the whistle must either be so placed that listening posts are beyond the former (and if possible beyond the latter), or the noise intensity otherwise reduced, by for example the fitting of acoustic screens, and the reduction demonstrated by test.

6.7 Fitting of additional whistles

6.7.1 Owners, particularly of very long ships, may wish to fit two or more whistles; attention is drawn therefore to Annex III, Sections 1(f) and (g).

6.7.1.1 With a 'combined whistle signal' where the whistles are so arranged as to sound simultaneously they must differ in frequency from each other by at least 10 Hz.

6.7.1.2 If they are over 100 metres apart they must not sound simultaneously, but there is no requirement for different frequencies.

6.8 Alternative source of power

6.8.1 There is no requirement for a second whistle to be fitted to allow for the possibility of failure. However, where only one electric whistle is fitted the following precautions are to be taken:

6.8.1.1 An alternative source of power, which may be a second generator, must be available for the whistle.

6.8.2.1 In passenger ships of Class I, II and IIA it must be possible for power for the whistle to be taken from the main and from the emergency source of power.

6.8.2.3 Provision should be made for the supply to the whistle to be transferred to an alternative circuit. One of the circuits must be led clear of fire hazard areas and adequately protected against damage.

6.9 Whistle control system

6.9.1 The whistle or whistles must be capable of operation from the bridge. Where this is achieved by the provision of an electric control circuit, the wiring must be led so far as possible clear of fire hazard areas and must be protected against damage.

6.9.2 Two independent means of control of the operation of the whistle should be provided. One of these may be a wire pull lanyard.

CHAPTER 7

Visual signalling apparatus

7.1 Signalling lamps - general

7.1.1 All British ships registered in the United Kingdom of over 150 GT engaged on international voyages are required to be provided with an efficient portable signalling lamp of an approved type capable of being used both by day and by night .

7.1.2 In this context an international voyage is a voyage from a port in one country to a port in another country, either of those countries being a Maritime Administration to which the SOLAS Convention applies.

7.2 Fishing vessels

7.2.1 The Fishing Vessels (Safety Provisions) Rules, 1975 require, in Rule 71, that all fishing vessels of 12 metres in length and over shall carry an efficient signalling lamp, irrespective of whether or not they are engaged on an international voyage.

7.2.2 The same Rules also require fishing vessels on distant water voyages to carry a full complement of International Code Flags.

7.3 Specification and approval

7.3.1 From 10 December 2011, the approval of daylight signal lamps is covered by the marine equipment directive (MED) as an Annex 1 item (A.1/4.52), noting the two year lead-in time, then from 10 December 2013, new daylight signal lamps will need to be MED approved. MSN 1734, as amended refers.

7.3.2 Prior to this date, they are considered as an Annex A.2 item (A.2/4.4) and should be approved by a UK nominated body (MSN 1735 refers. Applications for approval should be addressed to a nominated body (listed in Merchant Shipping Notice MSN 1735). Appendix A provides more guidance for surveyors.

7.4 Other visual signalling apparatus

7.4.1 All vessels are expected to be able to comply with the COLREGS Annex IV Distress Signals and to display appropriate signals when communicating with Search and Rescue units in accordance with Regulation

29 of SOLAS Chapter V and it is therefore considered that all such ships should carry an International Code of Signals and a set of Code flags.

7.4.2 There is no requirement for Morse signalling apparatus other than the portable lamp referred to above, and the signalling torches in survival craft, and such items, if provided, are not in general subject to survey. However, an all-round light which serves the dual purpose of Morse signalling light and manoeuvring light is covered by the requirements of the COLREGs relating to the latter, and it must therefore conform to Annex I, Section 12.

APPENDIX A

1. Signalling Lamps

1.1 An acceptable standard (where MED approval is not required) for a signalling lamp is as follows:

1.1.1 The apparatus shall consist of a boxed signalling lantern and a boxed battery which together shall not weigh more than 19 kilograms. The lantern and battery must be in separate boxes, each of which is to be fitted with a carrying strap.

1.1.2. The lantern shall be of robust construction and the casing shall be light-tight and spray proof. The lantern shall be capable of being used by the operator when standing or supporting themselves against the ship's structure, and its weight shall not exceed 4.5 kg.

1.1.3. The illumination shall be by enclosed filament electric lamp with a pre-focus cap; two spare lamps shall be provided in the lantern box, but if signalling is effected by keying the current through the lamp (see 7(c) below) four spares shall be carried. The life of the lamp shall be not less than 50 hours when run at the voltage given by the battery after 15 minutes of discharge. Any lamp supplied for use with the lantern shall, when fitted, give a beam which complies with the requirements stated in later paragraphs of this Specification.

1.1.4. The light from the lamp shall be concentrated into a beam by means of mirrors and/or lenses.

1.1.5. The axial luminous intensity of the beam shall be not less than 60,000 candelas.

- The luminous intensity of the beam in every direction within an angle of 0.7° from the axis shall not be less than 30,000 candelas.
- The luminous intensity of the beam in every direction within an angle of 3° from the axis shall be not less than 6,000 candelas.
- A neutral filter to reduce axial luminous intensity of the lantern to between 8 and 15 candelas shall be provided. This filter shall fit securely on the front of the lantern and be capable of being removed or refitted as necessary.

1.1.6. The lantern shall be fitted with a suitable sighting arrangement capable of directing the beam on to the receiving station.

1.1.7. Signalling shall be effected by:

- (a) movement of mirrors and/or lenses;
- (b) movement of shutters; or
- (c) keying the current through the lamp.

1.1.7.1 If (a) is employed the beam when not on the line of the sight must be directed downwards so that the upper edge of the beam when so directed will clear the lower edge of the beam when on the line of sight.

1.1.7.2 If (b) is employed the shutter shall move in one piece or in several pieces, each piece being hinged about a line through its centre.

1.1.7.3 If (c) is used, particular care should be taken to ensure that the lantern meets the requirements in paragraph 8 below, and double the number, i.e. 4 spare lamps should be carried in the lantern box.

1.1.8. The light shall be switched on by pressure of the handle grip or other approved method. The movement of the mirror, lens or shutter shall be effected by a key or trigger having a positive action, and construction shall be such that an operator even when wearing very thick gloves shall be able to transmit at a rate of up to 12 words a minute.

1.1.9. Current for the lantern shall be provided by a secondary battery and the lantern may also be provided with a transformer or resistance of enable the current to be derived from the ship's mains. The lantern and associated electrical apparatus should be electrically safe against shock hazard and should be earthed where voltages in excess of 55V are used, unless otherwise protected.

1.1.10. The battery providing the current shall be of sufficient capacity to operate the lantern continuously for not less than 2 hours and shall be suitably boxed for protection against mechanical damage. The weight of the boxed battery shall not exceed 11.8kg. The box shall be proofed on the inside to withstand the effects of electrolyte spilt from the battery.

1.1.11. The terminals of the battery shall be connected to sockets on the outside of the container box for plug connections, the plug and socket to form a waterproof electric connection. The plug shall be attached to a flexible tough rubber sheathed electric cable leading to the lantern.

1.1.12. Where an adaptor is supplied to connect the lantern to the mains the adaptor shall be spray proof and must not over-heat in operation.

1.1.13. The lantern and battery and all components shall be of such construction as to be unaffected by extremes of cold, heat or humidity. All ferrous parts shall be rust-proofed by an approved process, and the casing of the lantern shall be effectively protected against corrosion.

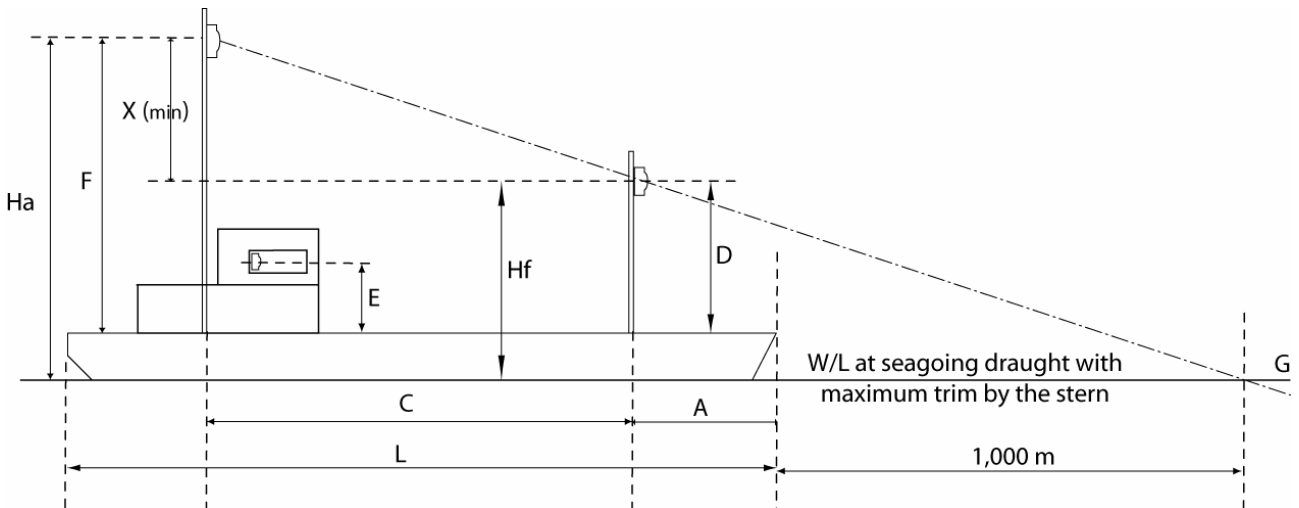
1.1.14. Signalling lamps which are shown to conform to the above specification will be approved by the MCA for use on ships that are not required to comply with MED standards.

APPENDIX B

POSITIONING OF NAVIGATION LIGHTS AS REQUIRED BY COLREGs, AND RECOMMENDATIONS OF INSTRUCTIONS TO SURVEYORS.

CHECK-LIST FOR SURVEYORS

FIGURE 1



L = Length overall

B = Maximum breadth

H_f = Height to centre of forward masthead light above the waterline in normal seagoing condition with maximum stern trim.

H_a = Height to centre of after masthead light above the waterline in normal seagoing condition with maximum stern trim.

NOTE 1: Surveyors are reminded that this checklist SHOULD NOT be used in isolation, the COLREGs (presently contained in MSN 1781) and Instruction to Surveyors (Survey of Lights and Signalling Equipment) should ALWAYS be referred to during the approval process and completion of the checklist.

“Annex” references are to COLREGs. “Paragraph” references are for Instructions to Surveyors

NOTE 2: For compliance with the requirements of Annex I 9(b) (ii) - screening of double all round lights – shipbuilders/ship-owners may consider utilising a masthead light screen (135°) on one light and a

stern light screen (225°) on the other, thus ensuring that an approaching ship will pick up the arc of only one light at any time. These screens can be slid in when the top of the light is removed.

NOTE 3: The Compliance column should be completed Y (yes), N (no) or NA (not applicable). If N is used and the issue cannot be resolved, consideration must then be given to the issue of an exemption.

1. Masthead light (For'd) Rule 23. Vessels 20m or more in length.

			Complies Yes/No/NA	Comments
(a)	D = B but not less than 6m and need not be more than 12m	ANNEX I, 2(a)(i)		
(b)	A=not more than 0.25 L (0.5 L if only one light required)	ANNEX I, 3(a) or 3(d), para 4.3.3.1		
(c)	Clear of and above other lights and obstructions	ANNEX I, 2(f)(i)		
(d)	Duplication	para 4.5.1		
(e)	Within 0.05 B of centre line	para 4.3.3.1		

2. Masthead light (Aft) Rule 23. Vessels 20m or more in length.

			Complies Yes/No/NA	Comments
(a)	Not less than 4.5m above foremast light (see also (f) below)	ANNEX I, 2(a) (ii)		
(b)	C not less than 0.5 L but need not be more than 100m	ANNEX I, 3(a)		
(c)	Clear of and above other lights and obstructions	ANNEX I, 2(f) (i)		
(d)	Duplication	para 4.5.1		
(e)	Within 0.05 B of centreline	para 4.3.3.1		

(f)	Vertical separation of masthead lights from 1000 m ahead	ANNEX I, 2(b); Appendix F		
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To calculate X (min)

$$(i) \frac{X(\min)}{C} = \frac{Hf}{A+1000} \quad \therefore X(\min) = \frac{C \times Hf}{A+1000} \text{ metres}$$

$$(ii) X(\text{actual}) = F - D = (\quad) \text{ metres}$$

Actual vertical separation must be greater than X min + 450mm

3. Sidelights Rule 23

			Complies Yes/No/NA	Comments
(a)	Abaft forward masthead light in vessel of 20 metres or more	ANNEX I, 3(b)		
(b)	E=not more than 0.75 D	ANNEX I, 2(g)		
(c)	Height above hull measured directly below light	ANNEX I, 1		
(d)	Ideal height 0.5 D	para 4.2.2.1		
(e)	Clear of and above deck lights	ANNEX I, 2(g)		
(f)	Horizontal sector cut out across bow	ANNEX I, 5, 9(a)(i), Appendix D Fig 2		
(g)	Duplication	para 4.5.1		
(h)	Within 0.1 B (up to max 1 m)	para 4.3.3.1		

4. Stern light *Rule 21(c), 23.*

			Complies Yes/No/NA	Comments
(a)	As high as practicable	para 4.2.3.1		
(b)	As nearly as practicable at the stern (this will NOT be practicable for Rig Supply Vessels, tugs etc)	Rule 21(c) para 4.6.3		
(c)	Duplication	para 4.5.1		

5. Anchor light (for'd) *Rule 30.*

			Complies Yes/No/NA	Comments
(a)	In fore part (as near fore end as possible but within 0.25 L) or if L less than 50m, where best seen	Rule 30(a)		
(b)	All round	ANNEX I, 9(b)(i)		
(c)	Not less than 6m above the hull in vessels 50m or more in length	ANNEX I, 2(k)		
(d)	Duplication	para 4.5.3		

6. Anchor light (aft) *Rule 30.*

			Complies Yes/No/NA	Comments
(a)	Near Stern	Rule 30(a)(ii)		
(b)	Not less than 4.5m below fore anchor light	ANNEX I, 2(k)		
(c)	All round	ANNEX I, 9(b)(i)		
(d)	Duplication	para 4.5.3.		

7. Not-Under-Command Rule 27(a).

			Complies Yes/No/NA	Comments
(a)	Not less than 2m apart (not less than 1 m if L = less than 20m)	ANNEX 2(i)(i),(ii)	I,	
(b)	Lowest not less than 4m above hull (not less than 2m if L less than 20m)	ANNEX 2(i)(i),(ii)	I,	
(c)	All round (obstruction not more than 6°) <u>NOTE 2 on page 29</u>	ANNEX 9(b)(i) & 9(b)(ii)	I &	
(d)	Where best seen	Rule 27(a)(i)		
(e)	Duplication	para 4.5.3		

8. Restricted manoeuvrability/draught constraint Rule 27(b) (i), and Rule 28

			Complies Yes/No/NA	Comments
(a)	Not less than 2m apart (not less than 1m if L less than 20m)	ANNEX 2(i)(i),(ii)	I,	
(b)	Lowest not less than 4m above hull (not less than 2m if L less than 20m)	ANNEX 2(i)(i),(ii)	I,	
(c)	All round (obstruction not more than 6°) <u>NOTE 2 on page 29</u>	ANNEX 9(b)(i) & 9(b)(ii)	I &	
(d)	Below or above clear of masthead or between masthead lights and not less than 2m off centre line	ANNEX 3(c)	I,	
(e)	Where best seen	Rule 27(b)(i)		
(f)	Equally spaced	ANNEX 2(i)(iii)	I,	
(g)	Duplication	para 4.5.4		

9. Dredging/obstruction Rule 27(d).

			Complies Yes/No/NA	Comments
(a)	Not less than 2m apart (not less than 1m if L less than 20m)	ANNEX I, 2(i)(i),(ii)		
(b)	Lowest not less than 4m above hull (not less than 2m if L is less than 20m)	ANNEX I, 2(i)(i),(ii)		
(c)	All round (obstruction not more than 6°) <u>NOTE 2 on page 29</u>	ANNEX I 9(b)(i) & 9(b)(ii)		
(d)	At least 2m horizontally from '8' above	ANNEX I, 4(b)		
(e)	Upper light below lowest light in '8' above	ANNEX I, 4(b)		
(f)	Duplication	para 4.5.4		

10. Lights for vessel engaged in towing (white) Rule 24.

			Complies Yes/No/NA	Comments
(a)	One in same position as forward or aft masthead	ANNEX I, 2(e)		
(b)	Not less than 2m apart - (not less than 1m if L less than 20m)	ANNEX I, 2(i)(i),(ii)		
(c)	Lowest not less than 4m above hull	ANNEX I, 2(i)(i)		
(d)	Equally spaced	ANNEX I, 2(i)(iii)		
(e)	Duplication	para 4.5.4		

11. Towing light (Yellow)

			Complies Yes/No/NA	Comments
(a)	Not less than 2m above stern light (not less than 1m if L less	ANNEX I, 2(i)(i),(ii)		

	than 20m)			
(b)	Duplication	Para 4.5.4		

12. Manoeuvring Light Rule 34(b)

			Complies Yes/No/NA	Comments
(a)	In same fore and aft plane as masthead	ANNEX I, 12		
(b)	Not less than 2m above forward masthead light and not less than 2m above or below after masthead light	ANNEX I, 12		
(c)	All round (obstruction not more than 6°) NOTE 2 on page 29	ANNEX I 9(b)(i) & 9(b)(ii)		

13. Fishing lights Rule 26

			Complies Yes/No/NA	Comments
(a)	Not less than 2m apart (not less than 1m if L less than 20m)	ANNEX I, 2(i)(i),(ii)		
(b)	Lower light not less than 2x13(a) above side lights.	ANNEX I, 2(j)		
(c)	All round (obstruction not more than 6°) <u>NOTE 2 on page 29</u>	ANNEX I 9(b)(i) & 9(b)(ii)		
(d)	Where best seen			
(e)	Duplication	para 4.5.4		
(f)	Masthead light above and abaft upper green light (optional for trawlers of less than 50m in length)	Rule 26(b)(ii)		
(g)	Gear lights not less than 2m and not more than 6m from vertical lights	ANNEX I, 4(a)		
(h)	Gear lights between sidelights and lower light	ANNEX I, 4(a)		

14. Sailing vessels Rule 25

			Complies Yes/No/NA	Comments
(a)	See '3' and '4' above			
(b)	Optional red/green all round lights	Rule 25(c), ANNEX 1,2(i)(i)		
(c)	Not less than 2m apart (Not less than 1m apart if L less than 20)	ANNEX I, 2(i)(i),(ii)		
(d)	Lowest not less than 4m above hull (not less than 2m above hull if L less than 20m)	ANNEX I, 2(i)(i),(ii)		
(e)	All round (obstruction not more than 6°) <u>NOTE 2 on page 29</u>	ANNEX I 9(b)(i) & 9(b)(ii)		
(f)	At or near top of mast	Rule 25(c)		

15. Miscellaneous

			Complies Yes/No/NA	Comments
(a)	Navigation lights (Vertical Sectors +/- 5° required)	ANNEX I, 10(a)(b)		
(b)	Power supply	para 5.1		
(c)	Shapes	ANNEX I, 4(b), 6		
(d)	Bell and gong	ANNEX III, para 6.1 to 6.3		
(e)	Whistle	ANNEX III, para 6.4 to 6.9		
(f)	Sound pressure levels at listening posts	ANNEX III, 1(e)		
(g)	Means of Access	Para 4.3.1		

SCREENING OF SIDELIGHTS

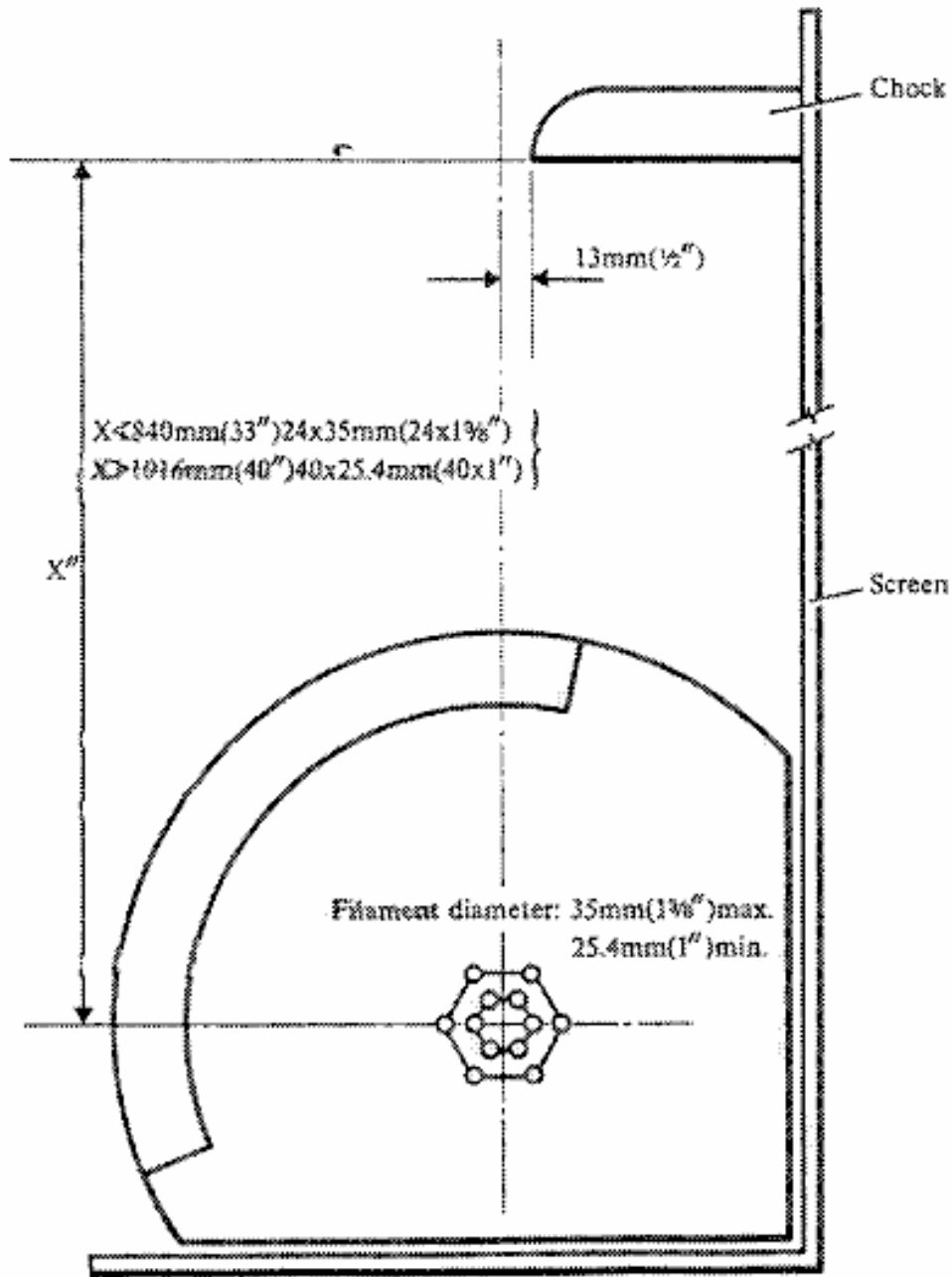
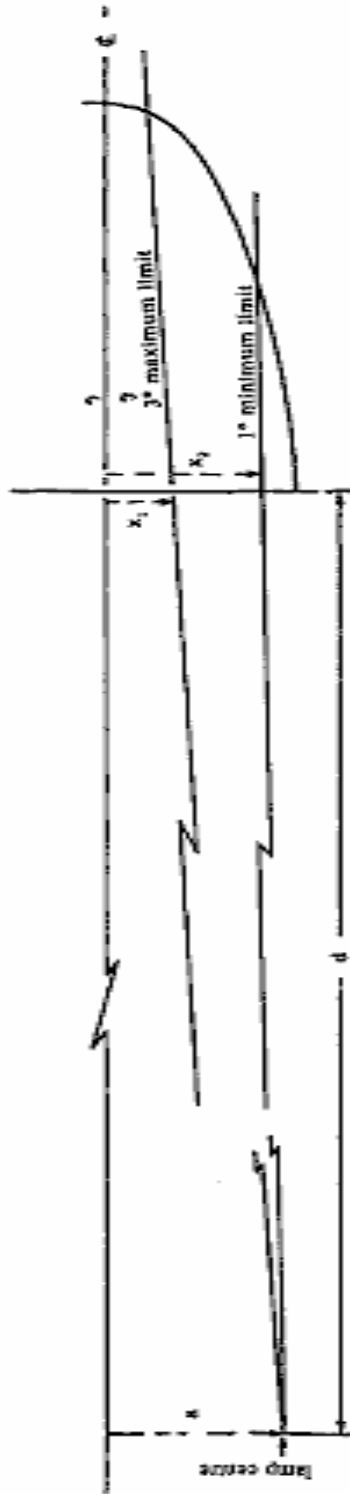


Figure 2

Example of suitable screening for a port side navigation lantern fitted with a squirrel-cage lamp to EN 14744: 2005. Compliance with Collision Regulations Annex I, Section 9(a) (i), i.e. cut-off ahead, is achieved by fitting a chock; compliance with 9(a) (ii), i.e. cut-off abaft the beam, is achieved by the lantern housing. The screen is to be painted matt black to minimise unwanted light.



a: Distance of lamp centre from suitable datum e.g. centre line
 d: Distance from lamp centre to suitable observation position
 x_1, x_2 : Limits for Section $\theta(\alpha)(\theta)$ Annex 1 Compliance measured from suitable datum e.g. centre line

FIGURE 3

EXAMPLE OF A METHOD TO CHECK SIDE LIGHT CUT-OUTS.

SCREENING OF MASTHEAD LIGHTS

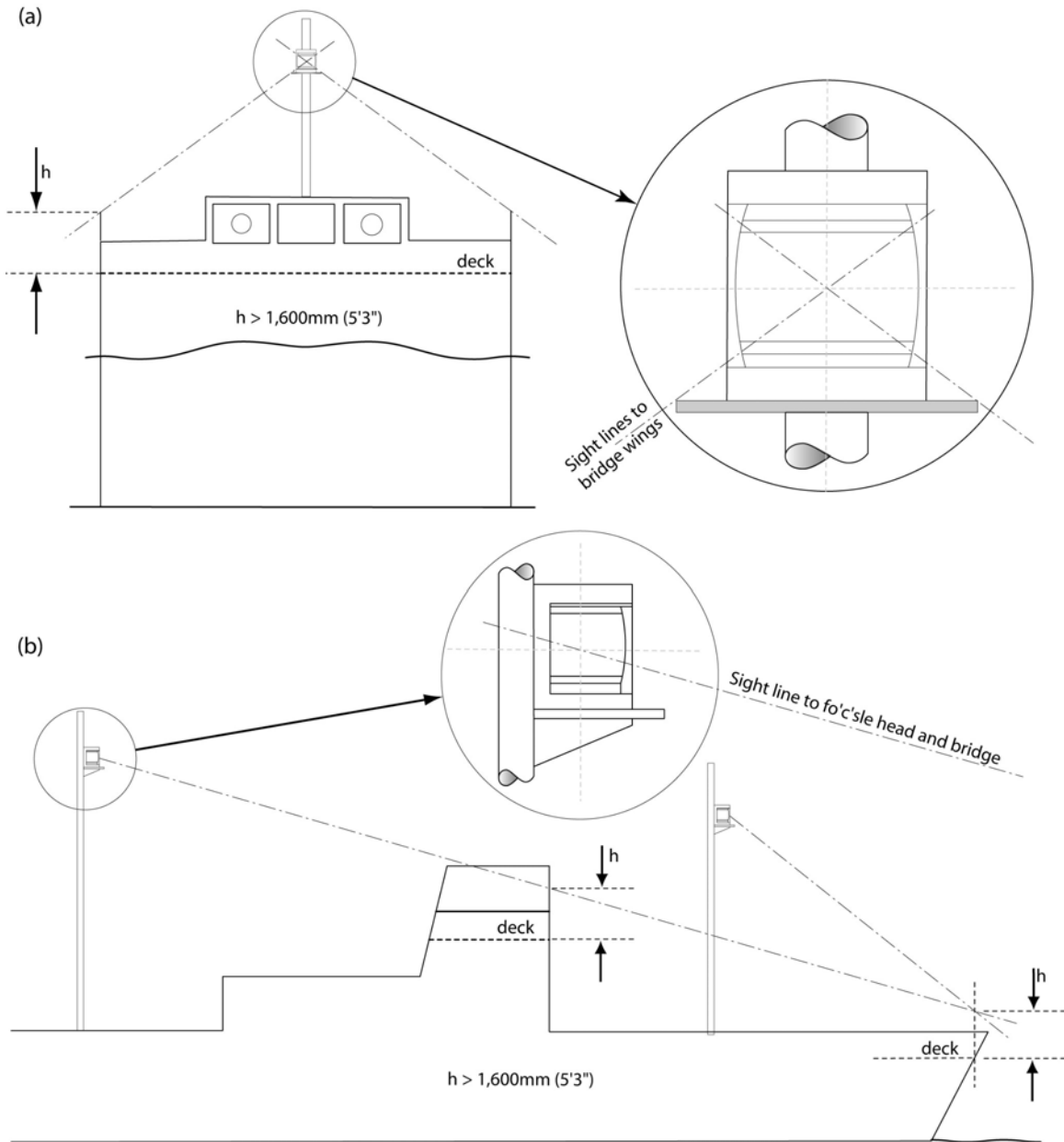


Figure 4

A direct line from the centre of the lamp filament just touching the upper edge of the lantern platform should pass at least 1600mm (5'3") clear of the extremities of the bridge wings (figs. 4(a) & 4(b)) and of the look-out post at the fo'c'sle head (fig. 4(b)). Surveyors need not insist on this screening they are satisfied that the light is fitted sufficiently far from the look-out position for dazzle to present no problems, for example a light on the after mast of a long vessel will not normally dazzle a look-out on the fo'c'sle head.

VERTICAL SEPARATION OF MASTHEAD LIGHTS WHEN TOWING

Figure 5a

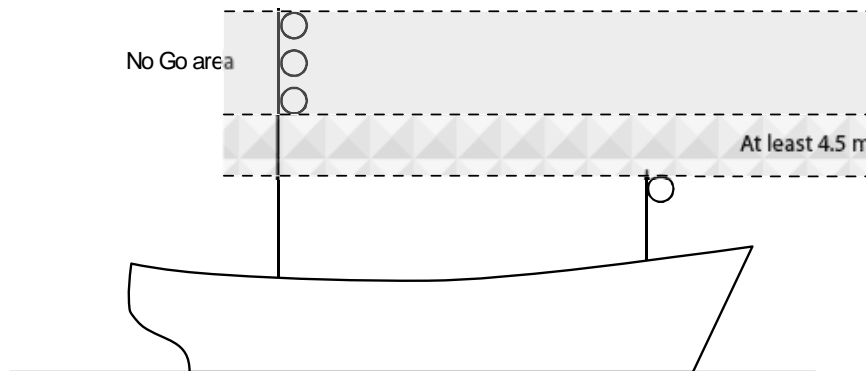
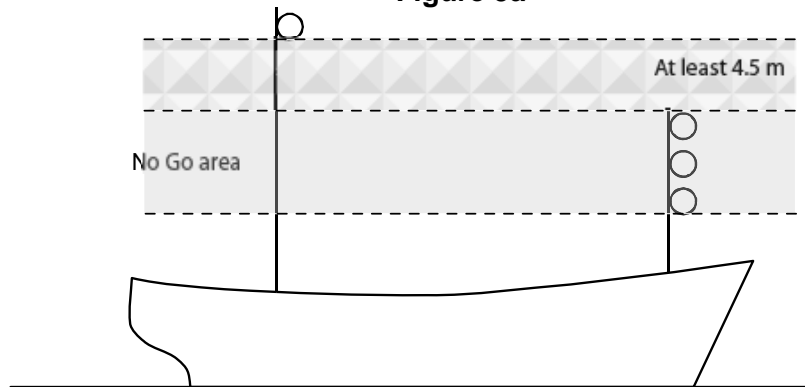


Figure 5b

Although Annex I, 2(e) allows *any one* of the two or three masthead lights (when towing) to be placed in the same position as either the forward masthead light or the after masthead light, in applying Annex I, 2(a) (ii) the vertical separation must be measured between the *uppermost* of the foremast lights and the after masthead light (Fig 5b).

When it is impracticable to carry the Rule 27(b) (i) RWR lights above or below the masthead lights as required by Annex I, 2(f) (ii) they may be carried vertically in between the forward masthead light(s) and the after masthead light(s) provided they are offset not less than 2 metres from the fore and aft centreline of the vessel.

For the purpose of complying with Annex I, 3(c) it is important to note that the RWR all-around lights may be carried *only* within the shaded band indicated in Fig 5(a) and (b) above - that is between the highest light on the foremast and the lowest light on the after mast. Intermingling can be avoided by strict adherence to this requirement.