

**ΑΚΑΔΗΜΙΑ ΕΜΠΟΡΙΚΟΥ ΝΑΥΤΙΚΟΥ
Α.Ε.Ν ΜΑΚΕΔΟΝΙΑΣ**

ΠΤΥΧΙΑΚΗ ΕΡΓΑΣΙΑ

ΕΠΙΒΛΕΠΩΝ ΚΑΘΗΓΗΤΗΣ: ΜΑΡΙΑ ΠΑΝΑΓΟΠΟΥΛΟΥ

**ΘΕΜΑ
COLLISION REGULATIONS**

**ΤΟΥ ΣΠΟΥΔΑΣΤΗ: ΑΧΙΛΛΕΑ ΠΥΡΙΔΗ
Α.Γ.Μ: 3575**

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<i>A/A</i>	<i>Όνοματεπώνυμο</i>	<i>Ειδικότητα</i>	<i>Αξιολόγηση</i>	<i>Υπογραφή</i>
<i>1</i>				
<i>2</i>				
<i>3</i>				
ΤΕΛΙΚΗ ΑΞΙΟΛΟΓΗΣΗ				

Ο ΔΙΕΥΘΥΝΤΗΣ ΣΧΟΛΗΣ :

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SUMMARY

This paper is a presentation of the Collision regulations as they are enforced nowadays, as well as of a historical recursion presenting briefly the development of such rules over the time, and the potential future development. Furthermore the paper contains an extensive analysis of collisions between merchant ships, highlighting the mistakes leading to these collisions.

The historical recursion looks back to the first appearance of relevant rules regarding collision avoidance among ships in the 19th century. The development of these rules through the 19th until the mid 20th century is included in this historical recursion. The collision regulations of 1972 are presented as legal code with some further analysis or depiction where it deems necessary.

Twelve merchant ship collisions are presented, analyzed and causes and conclusions are drawn. Furthermore the potential future development of these rules is presented taking into account, the continuous increase in ships that travel in earth's oceans, and as a result the increase in difficulty of collision avoidance, as well as the development of technology.

HISTORICAL RECURSION

First appearance of rules regarding ship collision avoidance:

Prior to the development of a single set of international rules and practices, there existed separate practices and various conventions and informal procedures in different parts of the world, as advanced by various maritime nations. As a result, there were inconsistencies and even contradictions that gave rise to unintended collisions. Vessel navigation lights for operating in darkness as well as navigation marks also were not standardized, giving rise to dangerous confusion and ambiguity between vessels at risk of colliding.

With the advent of steam-powered ships in the mid-19th century, conventions for sailing vessel navigation had to be supplemented with conventions for power-driven vessel navigation. Sailing vessels are limited as to their maneuverability in that they cannot sail directly to windward or into the eye of the wind and cannot be readily navigated in the absence of wind. On the other hand, steamships can maneuver in all 360 degrees of direction and can be maneuvered irrespective of the presence or absence of wind.

Evolution of the rules regarding ship collision avoidance through the mid 19th to the mid 20th century:

In 1840 in London, the Trinity House (the official General Lighthouse Authority for England, Wales, the Channel Islands and Gibraltar, responsible for the provision and maintenance of navigational aids, such as lighthouses, light vessels, buoys, and maritime radio/satellite communication systems.) drew up a set of regulations which were enacted by the English Parliament in 1846. The Trinity House rules were included in the Steam Navigation Act 1846, and the Admiralty regulations regarding lights for steam ships were included in this statute in 1848. In 1849 Congress extended the light requirements to sailing vessels on US waters. In the UK in 1858 colored sidelights were recommended for sailing vessels and fog signals were required to be given, by steam vessels on the ships whistle and by sailing vessels on the fog horn or bell, while a separate but similar action was also taken in the United States.

In 1850, English maritime Law was being adopted in the United States. Also in 1850, courts in the England and the United States adopted common law pertaining to reasonable speed within the Assured Clear Distance Ahead.

In 1863 a new set of rules drawn up by the British Board of Trade, in consultation with the French government, came into force. By 1864 the regulations had been adopted by more than thirty maritime countries, including Germany and the United States.

In 1878, the United States codified its common law rules for preventing collisions.

In 1880, the 1863 Articles were supplemented with whistle signals and in 1884 a new set of international regulations was implemented.

In 1889 the United States convened the first international maritime conference in Washington, D.C. The resulting rules were adopted in 1890 and effected in 1897. Some minor changes were made during the 1910 Brussels Maritime Conference and some rule changes were proposed, but never ratified.

The 1948 S.O.L.A.S. International Conference made several recommendations, including the recognition of radar these were eventually ratified in 1952 and became effective in 1954. Further

recommendations were made by a S.O.L.A.S. Conference in London in 1960 which became effective in 1965

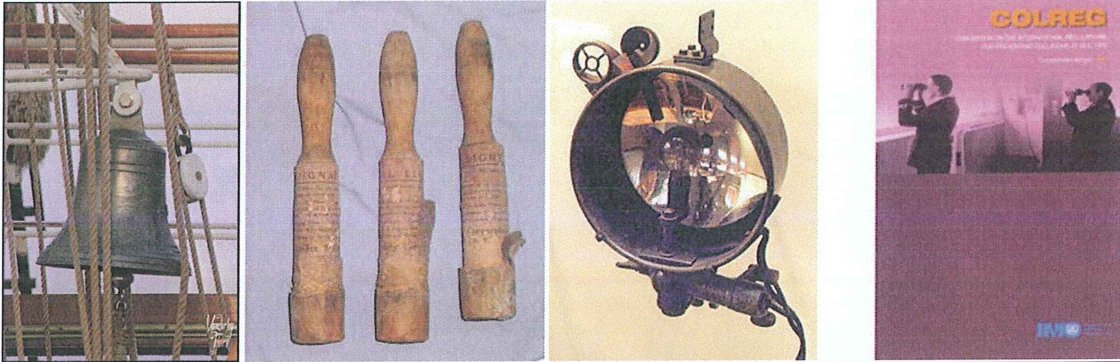
The COLREGS as we know them today:

The *International Regulations for Preventing Collisions at Sea* were adopted as a convention of the International Maritime Organization on 20 October 1972 and entered into force on 15 July 1977. They were designed to update and replace the Collision Regulations of 1960, particularly with regard to Traffic Separation Schemes (TSS) following the first of these, introduced in the Strait of Dover in 1967. As of June 2013, the convention has been ratified by 155 states representing 98.7% of the tonnage of the world's merchant fleets. They consist of 6 Parts (A,B,C,D,E,F,) covering all aspects concerning the avoidance of collision and the actions to be taken. In addition to this Parts 4 Annexes should apply (I,II,III,IV) covering all technical details concerning the equipment characteristics and the best use of them.

They have been amended several times since their first adoption. In 1981 Rule 10 was amended with regard to dredging or surveying in traffic separation schemes. In 1987 amendments were made to several rules, including rule 1(e) for vessels of special construction; rule 3(h), vessels constrained by her draught and Rule 10(c), crossing traffic lanes. In 1989 Rule 10 was altered to stop unnecessary use of the inshore traffic zones associated with TSS. In 1993 amendments were made concerning the positioning of lights on vessels. In 2001 new rules were added relating to wing-in-ground-effect (WIG) craft and in 2007 the text of Annex IV (Distress signals) was rewritten.



Trinity House



.From left to right ships bell, old handheld flares, old signaling lamp, Collision regulations published by IMO

CONVENTION ON THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA, 1972, AS AMENDED

Article I General obligations:

The Parties to the present Convention undertake to give effect to the Rules and other Annexes constituting the International Regulations for Preventing Collisions at Sea, 1972, (hereinafter referred to as "the Regulations") attached hereto.

Article II Signature, ratification, acceptance, approval and accession:

1. The present Convention shall remain open for signature until 1 June 1973 and shall thereafter remain open for accession.
2. States Members of the United Nations, or of any of the Specialized Agencies, or the International Atomic Energy Agency, or Parties to the Statute of the International Court of justice may become Parties to this Convention by:
 - (a) signature without reservation as to ratification, acceptance or approval
 - (b) signature subject to ratification, acceptance or approval followed by ratification, acceptance or approval
 - (c) accession.
3. Ratification, acceptance, approval or accession shall be effected by the deposit of an instrument to that effect with the Inter-Governmental Maritime Consultative Organization (hereinafter referred to as "the Organization") which shall inform the Governments of States that have signed or acceded to the present Convention of the deposit of each instrument and of the date of its deposit.

Article III Territorial application:

1. The United Nations in cases where they are the administering authority for a territory, or any Contracting Party responsible for the international relations of a territory, may at any time by notification in writing to the Secretary-General of the Organization (hereinafter referred to as "the Secretary-General"), extend the application of this Convention to such a territory.
2. The present Convention shall, upon the date of receipt of the notification or from such other

date as may be specified in the notification, extend to the territory named therein.

3. Any notification made in accordance with paragraph 1 of this article may be withdrawn in respect of any territory mentioned in that notification and the extension of this Convention to that territory shall cease to apply after one year or such longer period as may be specified at the time of the withdrawal.

4. The Secretary-General shall inform all Contracting Parties of the notification of any extension or withdrawal of any extension communicated under this article.

Article IV Entry into force:

1. (a) The present Convention shall enter into force twelve months after the date on which at least 15 States, the aggregate of whose merchant fleets constitutes not less than 65% by number or by tonnage of the world fleet of vessels of 100 gross tons and over, have become Parties to it, whichever is achieved first.

The name of the Organization was changed to "INTERNATIONAL MARITIME ORGANIZATION" by virtue of amendments to the Organization's Convention which entered into force on 22 May 1982.

(b) Notwithstanding the provisions in subparagraph (a) of this paragraph, the present Convention shall not enter into force before 1 January 1976.

2. Entry into force for States which ratify, accept, approve or accede to this Convention in accordance with article II after the conditions prescribed in subparagraph 1 (a) have been met and before the Convention enters into force, shall be on the date of entry into force of the Convention.

3. Entry into force for States which ratify, accept, approve or accede after the date on which this Convention enters into force, shall be on the date of deposit of an instrument in accordance with article II.

4. After the date of entry into force of an amendment to this Convention in accordance with paragraph 4 of article VI, any ratification, acceptance, approval or accession shall apply to the Convention as amended.

5. On the date of entry into force of this Convention, the Regulations replace and abrogate the International Regulations for Preventing Collisions at Sea, 1960.

6. The Secretary-General shall inform the Governments of States that have signed or acceded to this Convention of the date of its entry into force.

Article V Revision conference:

1. A conference for the purpose of revising this Convention or the Regulations or both may be convened by the Organization.

2. The Organization shall convene a conference of Contracting Parties for the purpose of revising this Convention or the Regulations or both at the request of not less than one third of the Contracting Parties.

Article VI Amendments to the Regulations:

1. Any amendment to the Regulations proposed by a Contracting Party shall be considered in the Organization at the request of that Party.

2. If adopted by a two-thirds majority of those present and voting in the Maritime Safety Committee of the Organization, such amendment shall be communicated to all Contracting Parties and Members of the Organization at least six months prior to its consideration by the

Assembly of the Organization. Any Contracting Party which is not a Member of the Organization shall be entitled to participate when the amendment is considered by the Assembly.

3. If adopted by a two-thirds majority of those present and voting in the Assembly, the amendment shall be communicated by the Secretary-General to all Contracting Parties for their acceptance.

4. Such an amendment shall enter into force on a date to be determined by the Assembly at the time of its adoption unless, by a prior date determined by the Assembly at the same time, more than one third of the Contracting Parties notify the Organization of their objection to the amendment. Determination by the Assembly of the dates referred to in this paragraph shall be by a two-thirds majority of those present and voting.

5. On entry into force any amendment shall, for all Contracting Parties which have not objected to the amendment, replace and supersede any previous provision to which the amendment refers.

6. The Secretary-General shall inform all Contracting Parties and Members of the Organization of any request and communication under this article and the date on which any amendment enters into force.

Article VII Denunciation:

1. The present Convention may be denounced by a Contracting Party at any time after the expiry of five years from the date on which the Convention entered into force for that Party.

2. Denunciation shall be effected by the deposit of an instrument with the Organization. The Secretary-General shall inform all other Contracting Parties of the receipt of the instrument of denunciation and of the date of its deposit.

3. A denunciation shall take effect one year, or such longer period as may be specified in the instrument, after its deposit.

Article VIII Deposit and registration:

1. The present Convention and the Regulations shall be deposited with the Organization, and the Secretary-General shall transmit certified true copies thereof to all Governments of States that have signed this Convention or acceded to it.

2. When the present Convention enters into force, the text shall be transmitted by the Secretary-General to the Secretariat of the United Nations for registration and publication in accordance with Article 102 of the Charter of the United Nations.

Article IX Languages:

The present Convention is established, together with the Regulations, in a single copy in the English and French languages, both texts being equally authentic. Official translations in the Russian and Spanish languages shall be prepared and deposited with the signed original.

INTERNATIONAL RULES FOR PREVENTING COLLISION AT SEA AS AMENDED 1972 ANALYSIS

PART A – GENERAL

Rule 1 Application:

- (a) These Rules shall apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels.
- (b) Nothing in these Rules shall interfere with the operation of special rules made by an appropriate authority for roadsteads, harbours, rivers, lakes or inland waterways connected with the high seas and navigable by seagoing vessels. Such special rules shall conform as closely as possible to these Rules.
- (c) Nothing in these Rules shall interfere with the operation of any special rules made by the Government of any State with respect to additional station or signal lights, shapes or whistle signals for ships of war and vessels proceeding under convoy, or with respect to additional station or signal lights or shapes for fishing vessels engaged in fishing as a fleet. These additional station or signal lights, shapes or whistle signals shall, so far as possible, be such that they cannot be mistaken for any light, shape or signal authorized elsewhere under these Rules.
- (d) Traffic separation schemes may be adopted by the Organization for the purpose of these Rules.
- (e) Whenever the Government concerned shall have determined that a vessel of special construction or purpose cannot comply fully with the provisions of any of these Rules with respect to the number, position, range or arc of visibility of lights or shapes, as well as to the disposition and characteristics of sound-signalling appliances, such vessel shall comply with such other provisions in regard to the number, position, range or arc of visibility of lights or shapes, as well as to the disposition and characteristics of sound-signalling appliances, as her Government shall have determined to be the closest possible compliance with these Rules in respect of that vessel.

Rule 2 Responsibility:

- (a) Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.
- (b) In construing and complying with these Rules due regard shall be had to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these Rules necessary to avoid immediate danger.

Rule 3 General definitions:

For the purpose of these Rules, except where the context otherwise requires:

- (a) The word vessel includes every description of water craft, including non-displacement craft, WIG craft and seaplanes, used or capable of being used as a means of transportation on water.
- (b) The term power-driven vessel means any vessel propelled by machinery.
- (c) The term sailing vessel means any vessel under sail provided that propelling machinery, if fitted, is not being used.

- (d) The term vessel engaged in fishing means any vessel fishing with nets, lines, trawls or other fishing apparatus which restrict maneuverability, but does not include a vessel fishing with trolling lines or other fishing apparatus which do not restrict maneuverability.
- (e) The word seaplane includes any aircraft designed to maneuver on the water.
- (f) The term vessel not under command means a vessel which through some exceptional circumstance is unable to maneuver as required by these Rules and is therefore unable to keep out of the way of another vessel.
- (g) The term vessel restricted in her ability to maneuver means a vessel which from the nature of her work is restricted in her ability to maneuver as required by these Rules and is therefore unable to keep out of the way of another vessel. The term vessels restricted in their ability to maneuver shall include but not be limited to:
- (i) a vessel engaged in laying, servicing or picking up a navigation mark, submarine cable or pipeline.
 - (ii) a vessel engaged in dredging, surveying or underwater operations.
 - (iii) a vessel engaged in replenishment or transferring persons, provisions or cargo while underway.
 - (iv) a vessel engaged in the launching or recovery of aircraft;
 - (v) a vessel engaged in mine clearance operations;
 - (vi) a vessel engaged in a towing operation such as severely restricts the towing vessel and her tow in their ability to deviate from their course.
- (h) The term vessel constrained by her draught means a power-driven vessel which, because of her draught in relation to the available depth and width of navigable water, is severely restricted in her ability to deviate from the course she is following.
- (i) The word underway means that a vessel is not at anchor, or made fast to the shore, or aground.
- (j) The words length and breadth of a vessel mean her length overall and greatest breadth.
- (k) Vessels shall be deemed to be in sight of one another only when one can be observed visually from the other.
- (l) The term restricted visibility means any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms, sandstorms or any other similar causes.
- (m) The term Wing-In-Ground (WIG) craft means a multimodal craft which, in its main operational mode, flies in close proximity to the surface by utilizing surface-effect action.

PART B - STEERING AND SAILING RULES

Section I - Conduct of vessels in any condition of visibility

Rule 4 Application:

Rules in this section apply in any condition of visibility.

Rule 5 Look-out:

Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

Rule 6 Safe speed:

Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.

In determining a safe speed the following factors shall be among those taken into account:

(a) By all vessels:

- (i) the state of visibility.
- (ii) the traffic density including concentrations of fishing vessels or any other vessels.
- (iii) the manoeuvrability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions.
- (iv) at night the presence of background light such as from shore lights or from backscatter of her own lights.
- (v) the state of wind, sea and current, and the proximity of navigational hazards.
- (vi) the draught in relation to the available depth of water.

(b) Additionally, by vessels with operational radar:

- (i) the characteristics, efficiency and limitations of the radar equipment.
- (ii) any constraints imposed by the radar range scale in use.
- (iii) the effect on radar detection of the sea state, weather and other sources of interference.
- (iv) the possibility that small vessels, ice and other floating objects may not be detected by radar at an adequate range.
- (v) the number, location and movement of vessels detected by radar.
- (vi) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.

Rule 7 Risk of collision:

(a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.

(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.

(c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.

(d) In determining if risk of collision exists the following considerations shall be among those taken into account:

- (i) such risk shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change.
- (ii) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

Rule 8 Action to avoid collision:

- (a) Any action to avoid collision shall be taken in accordance with the Rules of this part and shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.
- (b) Any alteration of course and/ or speed to avoid collision shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel observing visually or by radar, a succession of small alterations of course and/or speed should be avoided.
- (c) If there is sufficient sea-room, alteration of course alone may be the most effective action to avoid a close-quarters situation provided that it is made in good time, is substantial and does not result in another close-quarters situation.
- (d) Action taken to avoid collision with another vessel shall be such as to result in passing at a safe distance. The effectiveness of the action shall be carefully checked until the other vessel is finally past and clear.
- (e) If necessary to avoid collision or allow more time to assess the situation, a vessel shall slacken her speed or take all way off by stopping or reversing her means of propulsion.
- (f) (i) A vessel which, by any of these Rules, is required not to impede the passage or safe passage of another vessel shall, when required by the circumstances of the case, take early action to allow sufficient sea-room for the safe passage of the other vessel.
- (ii) A vessel required not to impede the passage or safe passage of another vessel is not relieved of this obligation if approaching the other vessel so as to involve risk of collision and shall, when taking action, have full regard to the action which may be required by the Rules of this part.
- (iii) A vessel the passage of which is not to be impeded remains fully obliged to comply with the Rules of this part when the two vessels are approaching one another so as to involve risk of collision.

Rule 9 Narrow channels:

- (a) A vessel proceeding along the course of a narrow channel or fairway shall keep as near to the outer limit of the channel or fairway which lies on her starboard side as is safe and practicable.
- (b) A vessel of less than 20 m in length or a sailing vessel shall not impede the passage of a vessel which can safely navigate only within a narrow channel or fairway.
- (c) A vessel engaged in fishing shall not impede the passage of any other vessel navigating within a narrow channel or fairway.
- (d) A vessel shall not cross a narrow channel or fairway if such crossing impedes the passage of a vessel which can safely navigate only within such channel or fairway. The latter vessel may use the sound signal prescribed in Rule 34(d) if in doubt as to the intention of the crossing vessel.
- (e) (i) In a narrow channel or fairway when overtaking can take place only if the vessel to be overtaken has to take action to permit safe passing, the vessel intending to overtake shall indicate her intention by sounding the appropriate signal prescribed in Rule 34(c)(i). The vessel to be overtaken shall, if in agreement, sound the appropriate signal prescribed in Rule 34(c)(ii) and take steps to permit safe passing. If in doubt she may sound the signals prescribed in Rule 34(d).
- (ii) This Rule does not relieve the overtaking vessel of her obligation under Rule 13.
- (f) A vessel nearing a bend or an area of a narrow channel or fairway where other vessels may be obscured by an intervening obstruction shall navigate with particular alertness and caution and shall sound the appropriate signal prescribed in Rule 34(e).

(g) Any vessel shall, if the circumstances of the case admit, avoid anchoring in a narrow channel.

Rule 10 Traffic separation schemes:

(a) This Rule applies to traffic separation schemes adopted by the Organization and does not relieve any vessel of her obligation under any other rule.

(b) A vessel using a traffic separation scheme shall:

(i) proceed in the appropriate traffic lane in the general direction of traffic flow for that lane.

(ii) so far as practicable keep clear of a traffic separation line or separation zone.

(iii) normally join or leave a traffic lane at the termination of the lane, but when joining or leaving from either side shall do so at as small an angle to the general direction of traffic flow as practicable.

(c) A vessel shall, so far as practicable, avoid crossing traffic lanes but if obliged to do so shall cross on a heading as nearly as practicable at right angles to the general direction of traffic flow.

(d) (i) A vessel shall not use an inshore traffic zone when she can safely use the appropriate traffic lane within the adjacent traffic separation scheme. However, vessels of less than 20 m in length, sailing vessels and vessels engaged in fishing may use the inshore traffic zone.

(ii) Notwithstanding subparagraph (d)(i), a vessel may use an inshore traffic zone when en route to or from a port, offshore installation or structure, pilot station or any other place situated within the inshore traffic zone, or to avoid immediate danger.

(e) A vessel other than a crossing vessel or a vessel joining or leaving a lane shall not normally enter a separation zone or cross a separation line except:

(i) in cases of emergency to avoid immediate danger.

(ii) to engage in fishing within a separation zone.

(f) A vessel navigating in areas near the terminations of traffic separation schemes shall do so with particular caution.

(g) A vessel shall so far as practicable avoid anchoring in a traffic separation scheme or in areas near its terminations.

(h) A vessel not using a traffic separation scheme shall avoid it by as wide a margin as is practicable.

(i) A vessel engaged in fishing shall not impede the passage of any vessel following a traffic lane.

(j) A vessel of less than 20 m in length or a sailing vessel shall not impede the safe passage of a power-driven vessel following a traffic lane.

(k) A vessel restricted in her ability to maneuver when engaged in an operation for the maintenance of safety of navigation in a traffic separation scheme is exempted from complying with this Rule to the extent necessary to carry out the operation.

(l) A vessel restricted in her ability to maneuver when engaged in an operation for the laying, servicing or picking up of a submarine cable, within a traffic separation scheme, is exempted from complying with this Rule to the extent necessary to carry out the operation.

Section II - Conduct of vessels in sight of one another

Rule 11 Application:

Rules in this section apply to vessels in sight of one another.

Rule 12 Sailing vessels:

- (a) When two sailing vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows:
- (i) when each has the wind on a different side, the vessel which has the wind on the port side shall keep out of the way of the other.
 - (ii) when both have the wind on the same side, the vessel which is to windward shall keep out of the way of the vessel which is to leeward.
 - (iii) if a vessel with the wind on the port side sees a vessel to windward and cannot determine with certainty whether the other vessel has the wind on the port or on the starboard side, she shall keep out of the way of the other.
- (b) For the purpose of this Rule the windward side shall be deemed to be the side opposite to that on which the mainsail is carried or, in the case of a square-rigged vessel, the side opposite to that on which the largest fore-and-aft sail is carried.

Rule 13 Overtaking:

- (a) Notwithstanding anything contained in the Rules of part 8, sections I and II, any vessel overtaking any other shall keep out of the way of the vessel being overtaken.
- (b) A vessel shall be deemed to be overtaking when coming up with another vessel from a direction more than 22.5° abaft her beam, that is, in such a position with reference to the vessel she is overtaking, that at night she would be able to see only the sternlight of that vessel but neither of her sidelights.
- (c) When a vessel is in any doubt as to whether she is overtaking another, she shall assume that this is the case and act accordingly.
- (d) Any subsequent alteration of the bearing between the two vessels shall not make the overtaking vessel a crossing vessel within the meaning of these Rules or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

Rule 14 Head-on situation:

- (a) When two power-driven vessels are meeting on reciprocal or nearly reciprocal courses so as to involve risk of collision each shall alter her course to starboard so that each shall pass on the port side of the other.
- (b) Such a situation shall be deemed to exist when a vessel sees the other ahead or nearly ahead and by night she could see the masthead lights of the other in a line or nearly in a line and/or both sidelights and by day she observes the corresponding aspect of the other vessel.
- (c) When a vessel is in any doubt as to whether such a situation exists she shall assume that it does exist and act accordingly.

Rule 15 Crossing situation:

When two power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.

Rule 16 Action by give-way vessel:

Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear

Rule 17 Action by stand-on vessel:

(a) (i) Where one of two vessels is to keep out of the way the other shall keep her course and speed.

(ii) The latter vessel may, however, take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules.

(b) When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision.

(c) A power-driven vessel which takes action in a crossing situation in accordance with subparagraph (a)(ii) of this Rule to avoid collision with another power-driven vessel shall, if the circumstances of the case admit, not alter course to port for a vessel on her own port side.

(d) This Rule does not relieve the give-way vessel of her obligation to keep out of the way.

Rule 18 Responsibilities between vessels:

Except where Rules 9, 10 and 13 otherwise require:

(a) A power-driven vessel underway shall keep out of the way of:

- (i) a vessel not under command.
- (ii) a vessel restricted in her ability to maneuver.
- (iii) a vessel engaged in fishing.
- (iv) a sailing vessel.

(b) A sailing vessel underway shall keep out of the way of:

- (i) a vessel not under command.
- (ii) a vessel restricted in her ability to maneuver.
- (iii) a vessel engaged in fishing.

(c) A vessel engaged in fishing when underway shall, so far as possible, keep out of the way of:

- (i) a vessel not under command.
- (ii) a vessel restricted in her ability to maneuver.

(d) (i) Any vessel other than a vessel not under command or a vessel restricted in her ability to maneuver shall, if the circumstances of the case admit, avoid impeding the safe passage of a vessel constrained by her draught, exhibiting the signals in Rule 28.

(ii) A vessel constrained by her draught shall navigate with particular caution having full regard to her special condition.

(e) A seaplane on the water shall, in general, keep well clear of all vessels and avoid impeding their navigation. In circumstances, however, where risk of collision exists, she shall comply with the Rules of this part.

(f) (i) A WIG craft, when taking off, landing and in flight near the surface, shall keep well clear of all other vessels and avoid impeding their navigation;

(ii) A WIG craft operating on the water surface shall comply with the Rules of this part as a power-driven vessel.

Section III - Conduct of vessels in restricted visibility

Rule 19 Conduct of vessels in restricted visibility:

(a) This Rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.

(b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have her engines ready for immediate maneuver.

(c) Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of section I of this part.

(d) A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible the following shall be avoided:

(i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;

(ii) an alteration of course towards a vessel abeam or abaft the beam.

(e) Except where it has been determined that a risk of collision does not exist, every vessel which hears apparently forward of her beam the fog signal of another vessel, or which cannot avoid a close-quarters situation with another vessel forward of her beam, shall reduce her speed to the minimum at which she can be kept on her course. She shall if necessary take all her way off and in any event navigate with extreme caution until danger of collision is over.

PART C - LIGHTS AND SHAPES

Rule 20 Application:

(a) Rules in this part shall be complied with in all weathers.

(b) The Rules concerning lights shall be complied with from sunset to sunrise, and during such times no other lights shall be exhibited, except such lights as cannot be mistaken for the lights specified in these Rules or do not impair their visibility or distinctive character, or interfere with the keeping of a proper look-out.

(c) The lights prescribed by these Rules shall, if carried, also be exhibited from sunrise to sunset in restricted visibility and may be exhibited in all other circumstances when it is deemed necessary.

(d) The Rules concerning shapes shall be complied with by day.

(e) The lights and shapes specified in these Rules shall comply with the provisions of annex I to these Regulations.

Rule 21 Definitions:

(a) Masthead light means a white light placed over the fore-and-aft centerline of the vessel showing an unbroken light over an arc of the horizon of 225° and so fixed as to show the light from right ahead to 22.5° abaft the beam on either side of the vessel.

(b) Sidelights means a green light on the starboard side and a red light on the port side each showing an unbroken light over an arc of the horizon of 112.5° and so fixed as to show the light from right ahead to 22.5° abaft the beam on its respective side. In a vessel of less than 20 m in length the sidelights may be combined in one lantern carried on the fore-and-aft centerline of the vessel.

(c) Stern light means a white light placed as nearly as practicable at the stern showing an unbroken light over an arc of the horizon of 135° and so fixed as to show the light 67.5° from right aft on each side of the vessel.

(d) Towing light means a yellow light having the same characteristics as the stern light defined in paragraph (c) of this Rule.

(e) All-round light means a light showing an unbroken light over an arc of the horizon of 360° .

(f) Flashing light means a light flashing at regular intervals at a frequency of 120 flashes or more per minute.

Rule 22 Visibility of lights:

The lights prescribed in these Rules shall have intensity as specified in section 8 of annex I to these Regulations so as to be visible at the following minimum ranges:

In vessels of 50 m or more in length:

- a masthead light, 6 miles;
- a sidelight, 3 miles;
- a stern light, 3 miles;
- a towing light, 3 miles;
- a white, red, green or yellow all-round light, 3 miles.

In vessels of 12 m or more in length but less than 50 m in length:

- a masthead light, 5 miles; except that where the length of the vessel is less than 20 m, 3 miles;
- a sidelight, 2 miles;
- a stern light, 2 miles;
- a towing light, 2 miles;
- a white, red, green or yellow all-round light, 2 miles.

In vessels of less than 12 m in length:

- a masthead light, 2 miles;
- a sidelight, 1 mile;
- a stern light, 2 miles;
- a towing light, 2 miles;
- a white, red, green or yellow all-round light, 2 miles.

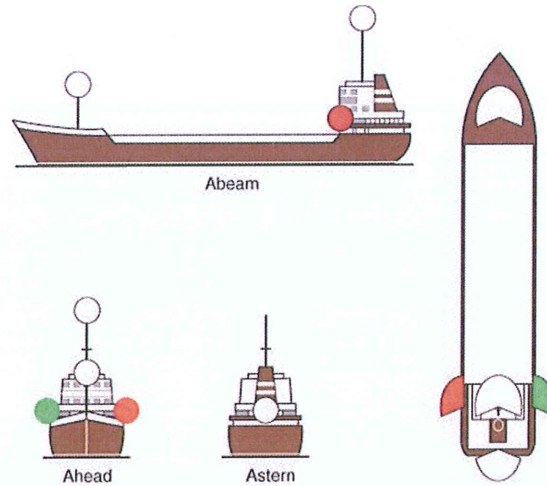
In inconspicuous, partly submerged vessels or objects being towed:

- a white all-round light, 3 miles.

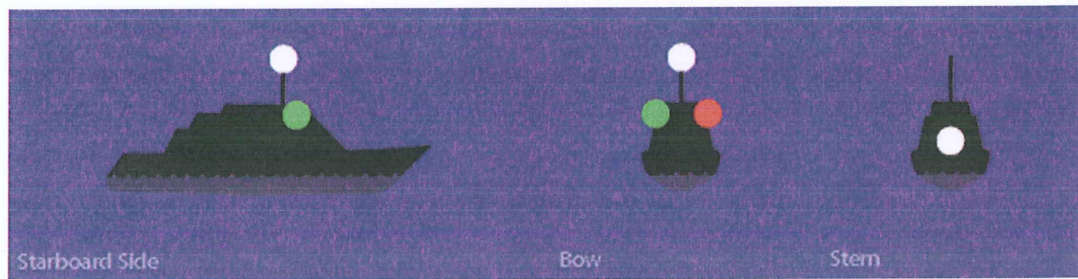
Rule 23 Power-driven vessels underway:

(a) **A power-driven vessel underway shall exhibit:**

- (i) a masthead light forward.
- (ii) a second masthead light abaft of and higher than the forward one, except that a vessel of less than 50 m in length shall not be obliged to exhibit such light but may do so.
- (iii) sidelights.
- (iv) a stern light.

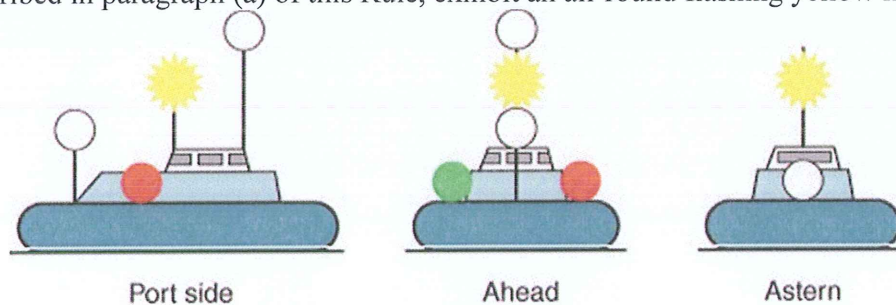


Power-driven vessel under way of length greater than 50m



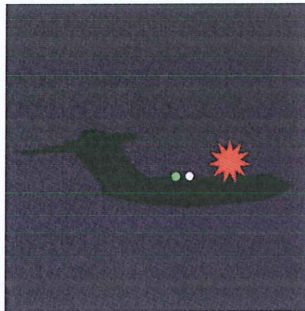
Power-driven vessel under way of length less than 50m

(b) An air-cushion vessel when operating in the non-displacement mode shall, in addition to the lights prescribed in paragraph (a) of this Rule, exhibit an all-round flashing yellow light.



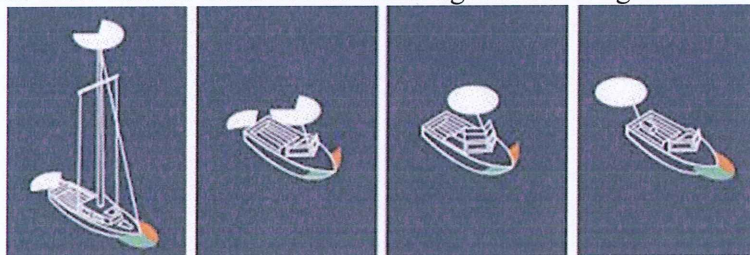
Air suction vessel under way

(c) A WIG craft only when taking off, landing and in flight near the surface shall, in addition to the lights prescribed in paragraph (a) of this Rule, exhibit a high-intensity all-round flashing red light.



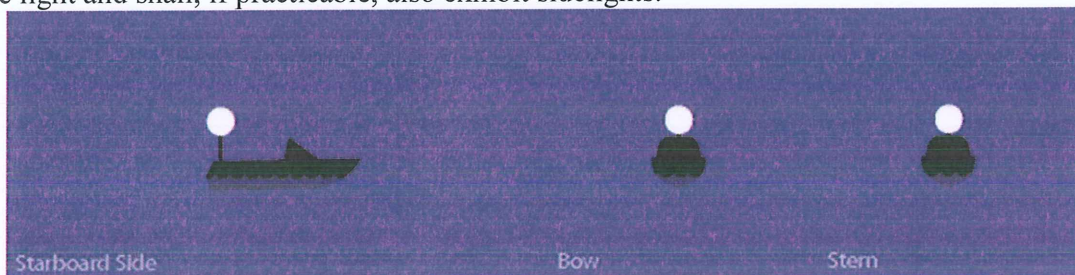
WIG taking off, landing or in flight

(d) (i) A power-driven vessel of less than 12 m in length may in lieu of the lights prescribed in paragraph (a) of this Rule exhibit an all-round white light and sidelights.



Vessels less than 12m, under way.

(ii) a power-driven vessel of less than 7 m in length whose maximum speed does not exceed 7 knots may in lieu of the lights prescribed in paragraph (a) of this Rule exhibit an all-round white light and shall, if practicable, also exhibit sidelights.



Vessel less than 7m in length whose maximum speed does not exceed 7 knots

(iii) the masthead light or all-round white light on a power-driven vessel of less than 12 m in length may be displaced from the fore-and-aft centerline of the vessel if centerline fitting is not practicable, provided that the sidelights are combined in one lantern which shall be carried on the fore-and-aft centerline of the vessel or located as nearly as practicable in the same fore-and-aft line as the masthead light or the all-round white light.

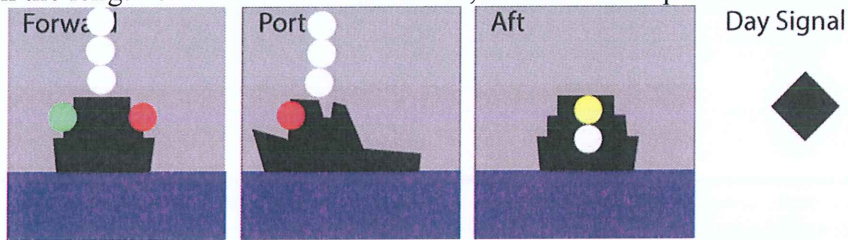
Rule 24 Towing and pushing:

(a) A power-driven vessel when towing shall exhibit:

(i) instead of the light prescribed in Rule 23(a)(i) or (a)(ii), two masthead lights in a vertical line. When the length of the tow, measuring from the stern of the towing vessel to the after-end of the tow, exceeds 200 m, three such lights in a vertical line.

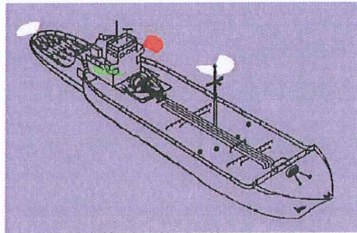
(ii) sidelights.

- (iii) a stern light.
- (iv) a towing light in a vertical line above the sternlight.
- (v) when the length of the tow exceeds 200 m, a diamond shape where it can best be seen.



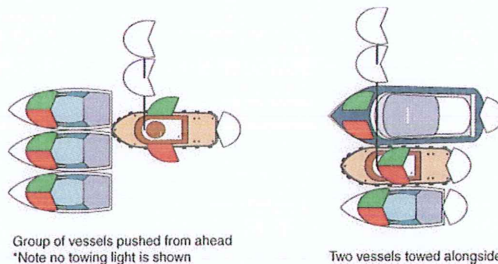
Power-driven vessel towing and the tow exceeds 200m

- (b) When a pushing vessel and a vessel being pushed ahead are rigidly connected in a composite unit they shall be regarded as a power-driven vessel and exhibit the lights prescribed in Rule 23.



Pushing vessel and a vessel being pushed ahead are rigidly connected in a composite unit

- (c) A power-driven vessel when pushing ahead or towing alongside, except in the case of a composite unit, shall exhibit:
 - (i) instead of the light prescribed in Rule 23(a)(i) or (a)(ii), two masthead lights in a vertical line.
 - (ii) sidelights.
 - (iii) a sternlight.



Group of vessels pushed from ahead
*Note no towing light is shown

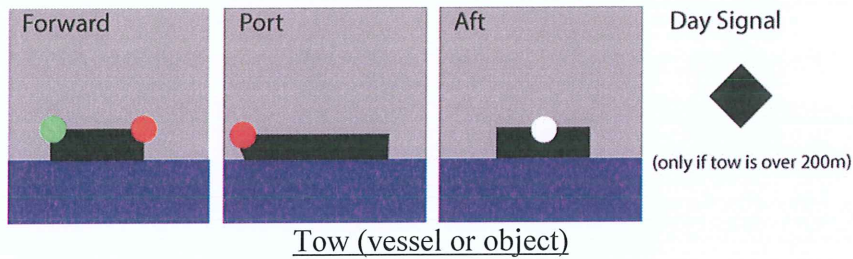
Two vessels towed alongside

A power-driven vessel when pushing ahead or towing alongside, not as a composite unit

- (d) A power-driven vessel to which paragraph (a) or (c) of this Rule applies shall also comply with Rule 23(a)(ii).

(e) A vessel or object being towed, other than those mentioned in paragraph (g) of this Rule, shall exhibit:

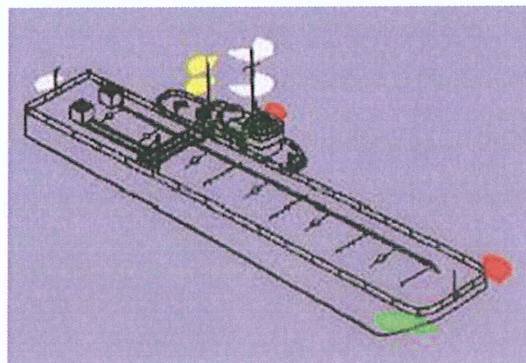
- (i) sidelights.
- (ii) a sternlight.
- (iii) when the length of the tow exceeds 200 m, a diamond shape where it can best be seen.



(f) Provided that any number of vessels being towed alongside or pushed in a group shall be lighted as one vessel,

(i) a vessel being pushed ahead, not being part of a composite unit, shall exhibit at the forward end, sidelights.

(ii) a vessel being towed alongside shall exhibit a stern light and at the forward end, sidelights.



Vessel being towed alongside

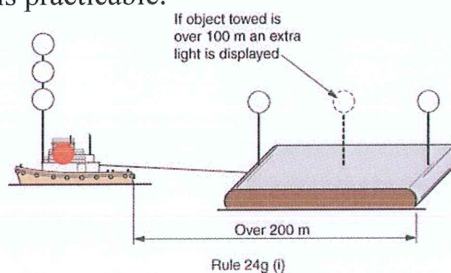
(g) An inconspicuous, partly submerged vessel or object, or combination of such vessels or objects being towed, shall exhibit:

(i) if it is less than 25 m in breadth, one all-round white light at or near the forward end and one at or near the after end except that dracones need not exhibit a light at or near the forward end.

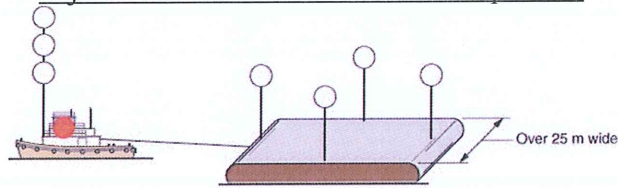
(ii) if it is 25 m or more in breadth, two additional all-round white lights at or near the extremities of its breadth.

(iii) if it exceeds 100 m in length, additional all-round white lights between the lights prescribed in subparagraphs (i) and (ii) so that the distance between the lights shall not exceed 100 m.

(iv) a diamond shape at or near the aftermost extremity of the last vessel or object being towed and if the length of the tow exceeds 200 m an additional diamond shape where it can best be seen and located as far forward as is practicable.

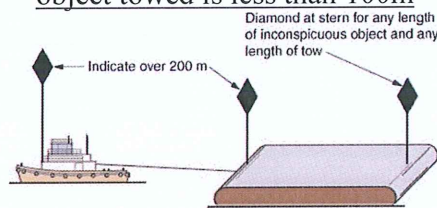


An inconspicuous, partly submerged vessel or object, or combination of such vessels or objects being towed. Tow length is more than 200m and the breadth less than 25m. The length of the object towed is described within the picture.



Rule 24g (ii)

An inconspicuous, partly submerged vessel or object, or combination of such vessels or objects being towed. Tow length is more than 200m and the breadth is greater than 25m. The length of the object towed is less than 100m



Rule 24g (iii)

An inconspicuous, partly submerged vessel or object, or combination of such vessels or objects being towed. Tow length is more than 200m

(h) Where from any sufficient cause it is impracticable for a vessel or object being towed to exhibit the lights or shapes prescribed in paragraph (e) or (g) of this Rule, all possible measures shall be taken to light the vessel or object towed or at least to indicate the presence of such vessel or object.

(i) Where from any sufficient cause it is impracticable for a vessel not normally engaged in towing operations to display the lights prescribed in paragraph (a) or (c) of this Rule, such vessel shall not be required to exhibit those lights when engaged in towing another vessel in distress or otherwise in need of assistance. All possible measures shall be taken to indicate the nature of the relationship between the towing vessel and the vessel being towed as authorized by Rule 36, in particular by illuminating the towline.

Rule 25 Sailing vessels underway and vessels under oars:

(a) A sailing vessel underway shall exhibit:

- (i) sidelights.
- (ii) a stern light.

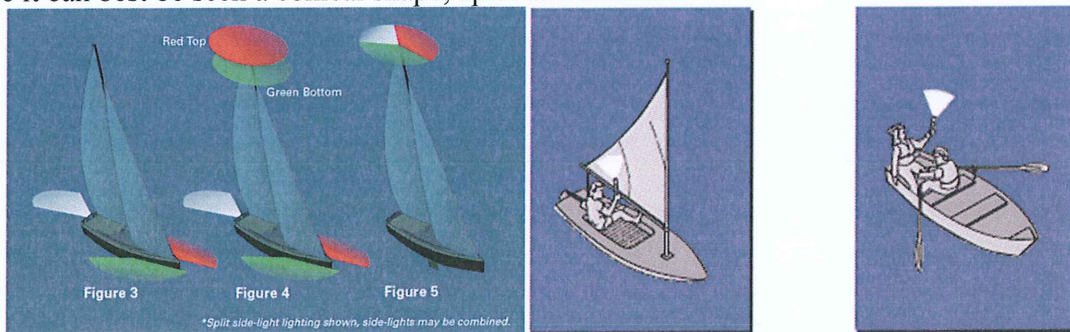
(b) In a sailing vessel of less than 20 m in length the lights prescribed in paragraph (a) of this Rule may be combined in one lantern carried at or near the top of the mast where it can best be seen.

(c) A sailing vessel underway may, in addition to the lights prescribed in paragraph (a) of this Rule, exhibit at or near the top of the mast, where they can best be seen, two all-round lights in a vertical line, the upper being red and the lower green, but these lights shall not be exhibited in conjunction with the combined lantern permitted by paragraph (b) of this Rule.

(d) (i) A sailing vessel of less than 7 m in length shall, if practicable, exhibit the lights prescribed in paragraph (a) or (b) of this Rule, but if she does not, she shall have ready at hand an electric torch or lighted lantern showing a white light which shall be exhibited in sufficient time to prevent collision.

(ii) A vessel under oars may exhibit the lights prescribed in this Rule for sailing vessels, but if she does not, she shall have ready at hand an electric torch or lighted lantern showing a white light which shall be exhibited in sufficient time to prevent collision.

(e) A vessel proceeding under sail when also being propelled by machinery shall exhibit forward where it can best be seen a conical shape, apex downwards.



From left to right, a sailing vessel underway, a sailing vessel underway with extra all around lights, a sailing vessel underway with length less than 20m, a sailing vessel of less than 7 m in length, a vessel under oars of less than 7 m in length

Rule 26 Fishing vessels:

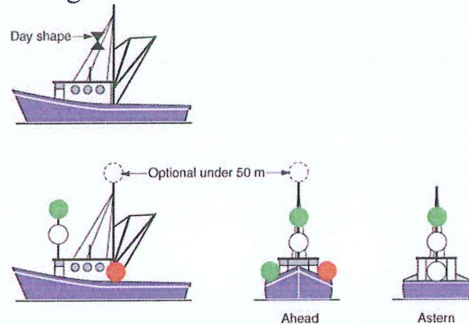
(a) A vessel engaged in fishing, whether underway or at anchor, shall exhibit only the lights and shapes prescribed in this Rule.

(b) A vessel when engaged in trawling, by which is meant the dragging through the water of a dredge net or other apparatus used as a fishing appliance, shall exhibit:

(i) two all-round lights in a vertical line, the upper being green and the lower white, or a shape consisting of two cones with their apexes together in a vertical line one above the other.

(ii) a masthead light abaft of and higher than the all-round green light, a vessel of less than 50 m in length shall not be obliged to exhibit such a light but may do so.

(iii) when making way through the water, in addition to the lights prescribed in this paragraph, sidelights and a stern light.



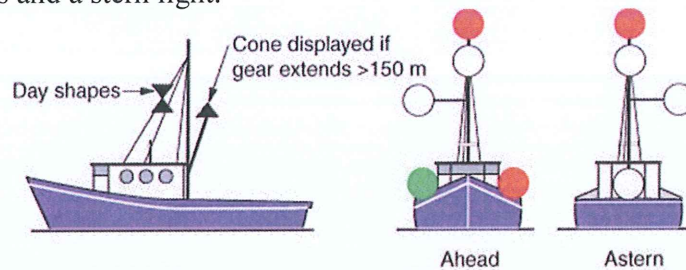
Vessel engaged in trawling and under way

(c) A vessel engaged in fishing, other than trawling shall exhibit:

(i) two all-round lights in a vertical line, the upper being red and the lower white, or a shape consisting of two cones with apexes together in a vertical line one above the other.

(ii) when there is outlying gear extending more than 150 m horizontally from the vessel, an all-round white light or a cone apex upwards in the direction of the gear.

(iii) when making way through the water, in addition to the lights prescribed in this paragraph, sidelights and a stern light.



Vessel engaged in fishing other than trawling with outlying gear more than 150m to the starboard side, under way.

(d) The additional signals described in annex II to these Regulations apply to a vessel engaged in fishing in close proximity to other vessels engaged in fishing.

(e) A vessel when not engaged in fishing shall not exhibit the lights or shapes prescribed in this Rule, but only those prescribed for a vessel of her length.

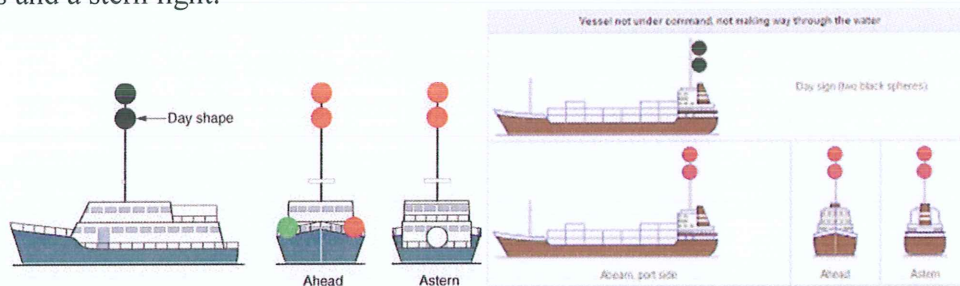
Rule 27 Vessels not under command or restricted in their ability to maneuver:

(a) A vessel not under command shall exhibit:

(i) two all-round red lights in a vertical line where they can best be seen.

(ii) two balls or similar shapes in a vertical line where they can best be seen.

(iii) when making way through the water, in addition to the lights prescribed in this paragraph, sidelights and a stern light.



From left to right, Vessel not under command but making way, and vessel not under command and not making way.

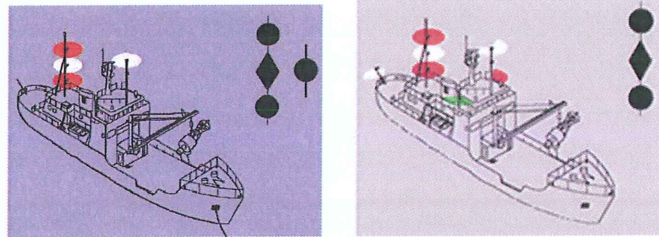
(b) A vessel restricted in her ability to maneuver, except a vessel engaged in mine clearance operations, shall exhibit:

(i) three all-round lights in a vertical line where they can best be seen. The highest and lowest of these lights shall be red and the middle light shall be white;

(ii) three shapes in a vertical line where they can best be seen. The highest and lowest of these shapes shall be balls and the middle one a diamond.

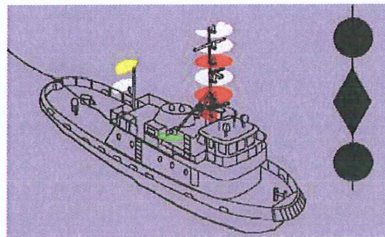
(iii) when making way through the water, a masthead light or lights, sidelights and a sternlight, in addition to the lights prescribed in subparagraph (i).

(iv) when at anchor, in addition to the lights or shapes prescribed in subparagraphs (i) and (ii), the light, lights or shape prescribed in Rule 30.



From left to right, vessel under 50m restricted in her ability to maneuver and at anchor. Vessel under 50m restricted in her ability to maneuver and under way.

(c) A power-driven vessel engaged in a towing operation such as severely restricts the towing vessel and her tow in their ability to deviate from their course shall, in addition to the lights or shapes prescribed in Rule 24(a), exhibit the lights or shapes prescribed in subparagraphs (b)(i) and (ii)



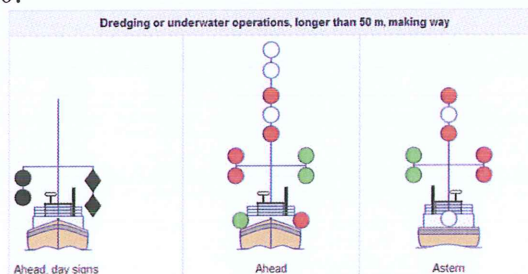
Vessel under 50m towing a tow over 200m long and restricted in her ability to maneuver.

(d) A vessel engaged in dredging or underwater operations, when restricted in her ability to maneuver, shall exhibit the lights and shapes prescribed in subparagraphs (b)(i), (ii) and (iii) of this Rule and shall in addition, when an obstruction exists, exhibit:

(i) two all-round red lights or two balls in a vertical line to indicate the side on which the obstruction exists.

(ii) two all-round green lights or two diamonds in a vertical line to indicate the side on which another vessel may pass.

(iii) when at anchor, the lights or shapes prescribed in this paragraph instead of the lights or shape prescribed in Rule 30.

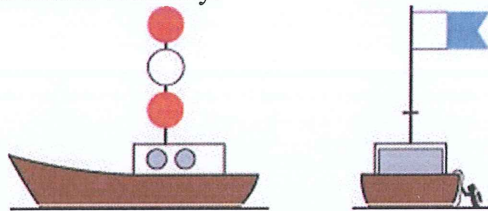


A vessel engaged in dredging or underwater operations, when restricted in her ability to maneuver and under way. The obstruction is on her starboard side and the other vessels may pass on her port side.

(e) Whenever the size of a vessel engaged in diving operations makes it impracticable to exhibit all lights and shapes prescribed in paragraph (d) of this Rule, the following shall be exhibited:

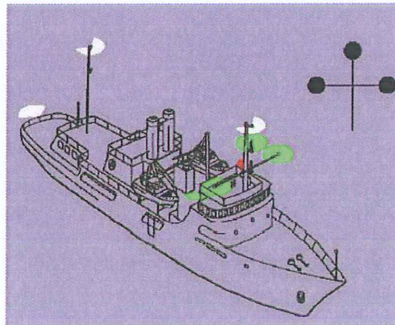
(i) three all-round lights in a vertical line where they can best be seen. The highest and lowest of these lights shall be red and the middle light shall be white.

(ii) a rigid replica of the International Code flag "A" not less than 1 m in height. Measures shall be taken to ensure its all-round visibility.



Vessel engaged in diving operations that can not exhibit all lights and shapes prescribed in paragraph (d)

(f) A vessel engaged in mine clearance operations shall in addition to the lights prescribed for a power-driven vessel in Rule 23 or to the lights or shape prescribed for a vessel at anchor in Rule 30 as appropriate, exhibit three all-round green lights or three balls. One of these lights or shapes shall be exhibited near the foremast head and one at each end of the fore yard. These lights or shapes indicate that it is dangerous for another vessel to approach within 1000 m of the mine clearance vessel.



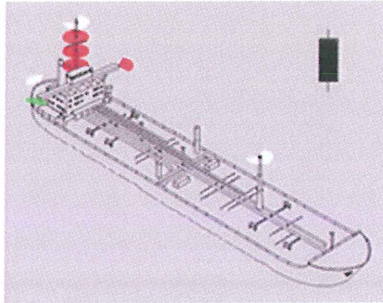
A vessel engaged in mine clearance operations with length over 50m and under way.

(g) Vessels of less than 12 m in length, except those engaged in diving operations, shall not be required to exhibit the lights and shapes prescribed in this Rule.

(h) The signals prescribed in this Rule are not signals of vessels in distress and requiring assistance. Such signals are contained in annex IV to these Regulations of this Rule.

Rule 28 Vessels constrained by their draught:

A vessel constrained by her draught may, in addition to the lights prescribed for power-driven vessels in Rule 23, exhibit where they can best be seen three all-round red lights in a vertical line, or a cylinder.



Vessel constrained by her draught with length over 50m and under way.

Rule 29 Pilot vessels:

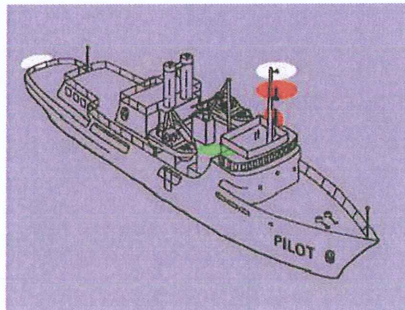
(a) A vessel engaged on pilotage duty shall exhibit:

(i) at or near the masthead, two all-round lights in a vertical line, the upper being white and the lower red.

(ii) when underway, in addition, sidelights and a stern light.

(iii) when at anchor, in addition to the lights prescribed in subparagraph (i), the light, lights or shape prescribed in Rule 30 for vessels at anchor.

(b) A pilot vessel when not engaged on pilotage duty shall exhibit the lights or shapes prescribed for a similar vessel of her length.



Vessel engaged on pilotage duty under way.

Rule 30 Anchored vessels and vessels aground:

(a) A vessel at anchor shall exhibit where it can best be seen:

(i) in the fore part, an all-round white light or one ball.

(ii) at or near the stern and at a lower level than the light prescribed in subparagraph (i), an all-round white light.

(b) A vessel of less than 50 m in length may exhibit an all-round white light where it can best be seen instead of the lights prescribed in paragraph (a) of this Rule.

(c) A vessel at anchor may, and a vessel of 100 m and more in length shall, also use the available working or equivalent lights to illuminate her decks.

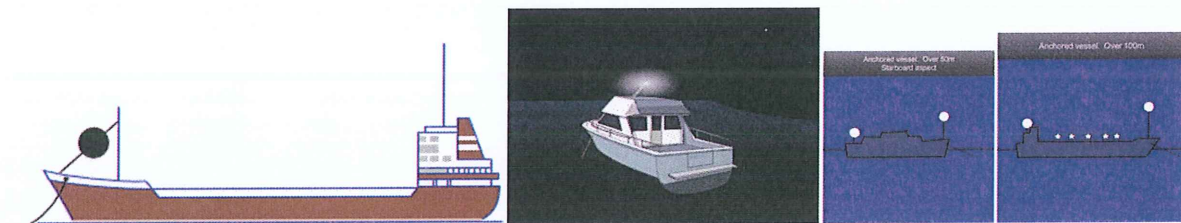
(d) A vessel aground shall exhibit the lights prescribed in paragraph (a) or (b) of this Rule and in addition, where they can best be seen:

(i) two all-round red lights in a vertical line;

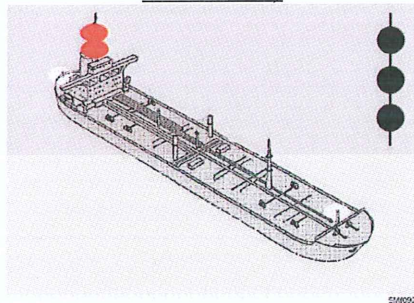
(ii) three balls in a vertical line.

(e) A vessel of less than 7 m in length, when at anchor, not in or near a narrow channel, fairway or anchorage, or where other vessels normally navigate, shall not be required to exhibit the lights or shape prescribed in paragraphs (a) and (b) of this Rule.

(f) A vessel of less than 12 m in length, when aground, shall not be required to exhibit the lights or shapes prescribed in subparagraphs (d)(i) and (ii) of this Rule



From left to right, anchored vessel longer than 7m. Vessel of less than 50m anchored. Vessel longer than 50m but lesser than 100m anchored. Vessel anchored (probably her length is greater than 100m)



Vessel aground. Her length is greater than 50m

Rule 31 Seaplanes:

Where it is impracticable for a seaplane or a WIG craft to exhibit lights and shapes of the characteristics or in the positions described in the Rules of this part she shall exhibit lights and shapes as closely similar in characteristics and position as is possible.

PART D - SOUND AND LIGHT SIGNALS

Rule 32 Definitions:

- (a) The word whistle means any sound signaling appliance capable of producing the prescribed blasts and which complies with the specifications in annex III to these Regulations.
- (b) The term short blast means a blast of about one second's duration.
- (c) The term prolonged blast means a blast of from four to six seconds' duration.

Rule 33 Equipment for sound signals:

(a) A vessel of 12 m or more in length shall be provided with a whistle, a vessel of 20 m or more in length shall be provided with a bell in addition to a whistle, and a vessel of 100 m or more in length shall, in addition, be provided with a gong, the tone and sound of which cannot be confused with that of the bell. The whistle, bell and gong shall comply with the specifications in

annex II I to these Regulations. The bell or gong or both may be replaced by other equipment having the same respective sound characteristics, provided that manual sounding of the required signals shall always be possible.

(b) A vessel of less than 12 m in length shall not be obliged to carry the sound signaling appliances prescribed in paragraph (a) of this Rule but if she does not, she shall be provided with some other means of making an efficient sound signal.



Rule 34 Maneuvering and warning signals:

(a) When vessels are in sight of one another, a power-driven vessel underway, when maneuvering as authorized or required by these Rules, shall indicate that manoeuvre by the following signals on her whistle:

one short blast to mean "I am altering my course to starboard".

two short blasts to mean "I am altering my course to port".

three short blasts to mean "I am operating astern propulsion".

(b) Any vessel may supplement the whistle signals prescribed in paragraph (a) of this Rule by light signals, repeated as appropriate, whilst the maneuver is being carried out:

(i) these light signals shall have the following significance:

one flash to mean "I am altering my course to starboard".

two flashes to mean "I am altering my course to port".

three flashes to mean "I am operating astern propulsion".

(ii) the duration of each flash shall be about one second, the interval between flashes shall be about one second, and the interval between successive signals shall be not less than ten seconds.

(iii) the light used for this signal shall, if fitted, be an all-round white light, visible at a minimum range of 5 miles, and shall comply with the provisions of annex I to these Regulations.

(c) When in sight of one another in a narrow channel or fairway:

(i) a vessel intending to overtake another shall in compliance with Rule 9(e)(i) indicate her intention by the following signals on her whistle:

- two prolonged blasts followed by one short blast to mean "I intend to overtake you on your starboard side".
- two prolonged blasts followed by two short blasts to mean "I intend to overtake you on your port side".

(ii) the vessel about to be overtaken when acting in accordance with Rule 9(e)(i) shall indicate her agreement by the following signal on her whistle:

one prolonged, one short, one prolonged and one short blast, in that order.

(d) When vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately

indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least five short and rapid flashes.

(e) A vessel nearing a bend or an area of a channel or fairway where other vessels may be obscured by an intervening obstruction shall sound one prolonged blast. Such signal shall be answered with a prolonged blast by any approaching vessel that may be within hearing around the bend or behind the intervening obstruction.

(f) If whistles are fitted on a vessel at a distance apart of more than 100 m, one whistle only shall be used for giving maneuvering and warning signals.

Rule 35 Sound signals in restricted visibility:

In or near an area of restricted visibility, whether by day or night, the signals prescribed in this Rule shall be used as follows:

(a) A power-driven vessel making way through the water shall sound at intervals of not more than 2 minutes one prolonged blast.

(b) A power-driven vessel underway but stopped and making no way through the water shall sound at intervals of not more than 2 minutes two prolonged blasts in succession with an interval of about 2 seconds between them.

(c) A vessel not under command, a vessel restricted in her ability to maneuver, a vessel constrained by her draught, a sailing vessel, a vessel engaged in fishing and a vessel engaged in towing or pushing another vessel shall, instead of the signals prescribed in paragraphs (a) or (b) of this Rule, sound at intervals of not more than 2 minutes three blasts in succession, namely one prolonged followed by two short blasts.

(d) A vessel engaged in fishing, when at anchor, and a vessel restricted in her ability to maneuver when carrying out her work at anchor, shall instead of the signals prescribed in paragraph (g) of this Rule sound the signal prescribed in paragraph (c) of this Rule.

(e) A vessel towed or if more than one vessel is towed the last vessel of the tow, if manned, shall at intervals of not more than 2 minutes sound four blasts in succession, namely one prolonged followed by three short blasts. When practicable, this signal shall be made immediately after the signal made by the towing vessel.

(f) When a pushing vessel and a vessel being pushed ahead are rigidly connected in a composite unit they shall be regarded as a power driven vessel and shall give the signals prescribed in paragraphs (a) or (b) of this Rule.












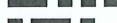


(g) A vessel at anchor shall at intervals of not more than one minute ring the bell rapidly for about 5 seconds. In a vessel of 100 m or more in length the bell shall be sounded in the forepart of the vessel and immediately after the ringing of the bell the gong shall be sounded rapidly for about 5 seconds in the after part of the vessel. A vessel at anchor may in addition sound three blasts in succession, namely one short, one prolonged and one short blast, to give warning of her position and of the possibility of collision to an approaching vessel.

(h) A vessel aground shall give the bell signal and if required the gong signal prescribed in paragraph (g) of this Rule and shall, in addition, give three separate and distinct strokes on the bell immediately before and after the rapid ringing of the bell. A vessel aground may in addition sound an appropriate whistle signal.

(i) A vessel of 12 m or more but less than 20 m in length shall not be obliged to give the bell signals prescribed in paragraphs (g) and (h) of this Rule. However, if she does not, she shall make some other efficient sound signal at intervals of not more than 2 minutes.

(j) A vessel of less than 12 m in length shall not be obliged to give the above-mentioned signals but, if she does not, shall make some other efficient sound signal at intervals of not more than 2 minutes.

(k) A pilot vessel when engaged on pilotage duty may in addition to the signals prescribed in paragraphs (a), (b) or (g) of this Rule sound an identity signal consisting of four short blasts.

SIGNALLING	
	turning to starboard
	turning to port
	astern
	unsure of your intentions
	overtaking starboard side
	overtaking port side
	OK
	approaching bend or obstruction
FOG	
	power-driven vessel
	power-driven: stopped
	other vessels
	towed vessel (in response)
	anchored: warning
	pilot vessel
BELL	anchored
BELL + GONG	anchored >100m

Sound or light signals

Rule 36 Signals to attract attention:

If necessary to attract the attention of another vessel any vessel may make light or sound signals that cannot be mistaken for any signal authorized elsewhere in these Rules, or may direct the beam of her searchlight in the direction of the danger, in such a way as not to embarrass any vessel. Any light to attract the attention of another vessel shall be such that it cannot be mistaken for any aid to navigation. For the purpose of this Rule the use of high-intensity intermittent or revolving lights, such as strobe lights, shall be avoided.

Rule 37 Distress signals:

When a vessel is in distress and requires assistance she shall use or exhibit the signals described in annex IV to these Regulations.

PART E – EXEMPTIONS

Rule 38 Exemptions:

Any vessel (or class of vessels) provided that she complies with the requirements of the International Regulations for Preventing Collisions at Sea, 1960, the keel of which is laid or which is at a corresponding stage of construction before the entry into force of these Regulations may be exempted from compliance therewith as follows:

- (a) The installation of lights with ranges prescribed in Rule 22, until four years after the date of entry into force of these Regulations.
- (b) The installation of lights with colour specifications as prescribed in section 7 of annex I to these Regulations, until four years after the date of entry into force of these Regulations.
- (c) The repositioning of lights as a result of conversion from Imperial to metric units and rounding off measurement figures, permanent exemption.

- (d) (i) The repositioning of masthead lights on vessels of less than 150 m in length, resulting from the prescriptions of section 3(a) of annex I to these Regulations, permanent exemption.
- (ii) The repositioning of masthead lights on vessels of 150 m or more in length, resulting from the prescriptions of section 3(a) of annex I to these Regulations, until nine years after the date of entry into force of these Regulations.
- (e) The repositioning of masthead lights resulting from the prescriptions of section 2(b) of annex I to these Regulations, until nine years after the date of entry into force of these Regulations.
- (f) The repositioning of sidelights resulting from the prescriptions of sections 2(g) and 3(b) of annex I to these Regulations, until nine years after the date of entry into force of these Regulations.
- (g) The requirements for sound signal appliances prescribed in annex III to these Regulations, until nine years after the date of entry into force of these Regulations.
- (h) The repositioning of all-round lights resulting from the prescription of section 9(b) of annex I to these Regulations, permanent exemption.

SUPPLEMENT JANUARY 2016

Amendments to the Convention on the International Regulations for Preventing Collisions at Sea, 7912, were adopted by resolution A.1085(28) on 4 December 2014. These amendments entered into force on 1 January 2016.

After existing part E (Exemptions), a new part F is added to read as follows:

PART F-VERIFICATION OF COMPLIANCE WITH THE PROVISIONS OF THE CONVENTION

Rule 39 Definitions:

- (a) Audit means a systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which audit criteria are fulfilled.
- (b) Audit Scheme means the IMO Member State Audit Scheme established by the Organization and taking into account the guidelines developed by the Organization.
- (c) Code for Implementation means the IMO Instruments Implementation Code adopted by the Organization by resolution A.1070 (28).
- (d) Audit Standard means the Code for Implementation.

Rule 40 Application:

Contracting Parties shall use the provisions of the Code for Implementation in the execution of their obligations and responsibilities contained in the present Convention.

Rule 41 Verification of compliance:

- (a) Every Contracting Party shall be subject to periodic audits by the Organization in accordance with the audit standard to verify compliance with and implementation of the present Convention.

- (b) The Secretary-General of the Organization shall have responsibility for administering the Audit Scheme, based on the guidelines developed by the Organization.
- (c) Every Contracting Party shall have responsibility for facilitating the conduct of the audit and implementation of a program of actions to address the findings, based on the guidelines developed by the Organization.
- (d) Audit of all Contracting Parties shall be:
- (i) based on an overall schedule developed by the Secretary-General of the Organization, taking into account the guidelines developed by the Organization, and
 - (ii) conducted at periodic intervals, taking into account the guidelines developed by the Organization.

Annex I Positioning and technical details of lights and shapes:

1) Definition:

The term height above the hull means height above the uppermost continuous deck. This height shall be measured from the position vertically beneath the location of the light.

2) Vertical positioning and spacing of lights:

(a) On a power-driven vessel of 20 m or more in length the masthead lights shall be placed as follows:

(i) the forward masthead light, or if only one masthead light is carried, then that light, at a height above the hull of not less than 6 m, and, if the breadth of the vessel exceeds 6 m, then at a height above the hull not less than such breadth, so however that the light need not be placed at a greater height above the hull than 12 m;

(ii) when two masthead lights are carried the after one shall be at least 4.5 m vertically higher than the forward one.

(b) The vertical separation of masthead lights of power-driven vessels shall be such that in all normal conditions of trim the after light will be seen over and separate from the forward light at a distance of 1000 m from the stem when viewed from sea-level.

(c) The masthead light of a power-driven vessel of 12 m but less than 20 m in length shall be placed at a height above the gunwale of not less than 2.5 m.

(d) A power-driven vessel of less than 12 m in length may carry the uppermost light at a height of less than 2.5 m above the gunwale. When, however, a masthead light is carried in addition to sidelights and a stern light or the all-round light prescribed in Rule 23(d)(i) is carried in addition to sidelights, then such masthead light or all-round light shall be carried at least 1 m higher than the sidelights.

(e) One of the two or three masthead lights prescribed for a power driven vessel when engaged in towing or pushing another vessel shall be placed in the same position as either the forward masthead light or the after masthead light; provided that, if carried on the after mast, the lowest after masthead light shall be at least 4.5 m vertically higher than the forward masthead light

(f) (i) The masthead light or lights prescribed in Rule 23(a) shall be so placed as to be above and clear of all other lights and obstructions except as described in subparagraph (ii).

(ii) When it is impracticable to carry the all-round lights prescribed by Rule 27(b)(i) or Rule 28 below the masthead lights, they may be carried above the after masthead light(s) or vertically in between the forward masthead light(s) and after masthead light(s), provided that in the latter case the requirement of section 3(c) of this annex shall be complied with.

(g) The sidelights of a power-driven vessel shall be placed at a height above the hull not greater than three quarters of that of the forward masthead light. They shall not be so low as to be interfered with by deck lights.

(h) The sidelights, if in a combined lantern and carried on a power-driven vessel of less than 20 m in length, shall be placed not less than 1 m below the masthead light

(i) When the Rules prescribe two or three lights to be carried in a vertical line, they shall be spaced as follows:

(i) on a vessel of 20 m in length or more such lights shall be spaced not less than 2 m apart, and the lowest of these lights shall, except where a towing light is required, be placed at a height of not less than 4 m above the hull;

(ii) on a vessel of less than 20 m in length such lights shall be spaced not less than 1 m apart and the lowest of these lights shall, except where a towing light is required, be placed at a height of not less than 2 m above the gunwale;

(iii) when three lights are carried they shall be equally spaced.

(j) The lower of the two all-round lights prescribed for a vessel when engaged in fishing shall be at a height above the sidelights not less than twice the distance between the two vertical lights.

(k) The forward anchor light prescribed in Rule 30(a)(i), when two are carried, shall not be less than 4.5 m above the after one. On a vessel of 50 m or more in length this forward anchor light shall be placed at a height of not less than 6 m above the hull.

3) Horizontal positioning and spacing of lights:

(a) When two masthead lights are prescribed for a power-driven vessel, the horizontal distance between them shall not be less than one half of the length of the vessel, but need not be more than 100 m. The forward light shall be placed not more than one quarter of the length of the vessel from the stem.

(b) On a power-driven vessel of 20 m or more in length the sidelights shall not be placed in front of the forward masthead lights. They shall be placed at or near the side of the vessel.

(c) When the lights prescribed in Rule 27(b)(i) or Rule 28 are placed vertically between the forward masthead light(s) and the after masthead light(s) these all-round lights shall be placed at a horizontal distance of not less than 2 m from the fore-and-aft centerline of the vessel in the athwart ship direction.

(d) When only one masthead light is prescribed for a power-driven vessel, this light shall be exhibited forward of amidships; except that a vessel of less than 20 m in length need not exhibit this light forward of amidships but shall exhibit it as far forward as is practicable.

4) Details of location of direction-indicating lights for fishing vessels, dredgers and vessels engaged in underwater operations:

(a) The light indicating the direction of the outlying gear from a vessel engaged in fishing as prescribed in Rule 26(c)(ii) shall be placed at a horizontal distance of not less than 2 m and not

more than 6 m away from the two all-round red and white lights. This light shall be placed not higher than the all-round white light prescribed in Rule 26(c)(i) and not lower than the sidelights.

(b) The lights and shapes on a vessel engaged in dredging or underwater operations to indicate the obstructed side and/or the side on which it is safe to pass, as prescribed in Rule 27(d)(i) and (ii), shall be placed at the maximum practical horizontal distance, but in no case less than 2 m, from the lights or shapes prescribed in Rule 27(b)(i) and (ii). In no case shall the upper of these lights or shapes be at a greater height than the lower of the three lights or shapes prescribed in Rule 27(b)(i) and (ii).

5) Screens for sidelights:

The sidelights of vessels of 20 m or more in length shall be fitted with inboard screens painted matt black, and meeting the requirements of section 9 of this annex. On vessels of less than 20 m in length the sidelights, if necessary to meet the requirements of section 9 of this annex, shall be fitted with inboard matt black screens. With a combined lantern, using a single vertical filament and a very narrow division between the green and red sections, external screens need not be fitted.

6) Shapes:

(a) Shapes shall be black and of the following sizes:

(i) a ball shall have a diameter of not less than 0.6 m.

(ii) a cone shall have a base diameter of not less than 0.6 m and a height equal to its diameter.

(iii) a cylinder shall have a diameter of at least 0.6 m and a height of twice its diameter.

(iv) a diamond shape shall consist of two cones as defined in (ii) above having a common base.

(b) The vertical distance between shapes shall be at least 1.5 m.

(c) In a vessel of less than 20 m in length shapes of lesser dimensions but commensurate with the size of the vessel may be used and the distance apart may be correspondingly reduced.

7) Color specification of lights:

The chromaticity of all navigation lights shall conform to the following standards, which lie within the boundaries of the area of the diagram specified for each color by the International Commission on Illumination (CIE).

The boundaries of the area for each color are given by indicating the corner co-ordinates, which are as follows:

(i) White

X	0.525	0.525	0.452	0.310	0.310	0.443
y	0.382	0.440	0.440	0.348	0.283	0.382

(ii) Green

X	0.028	0.009	0.300	0.203	y	0.385	0.723	0.511	0.356
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(iii) Red

X 0.680 0.660 0.735 0.721 y 0.320 0.320 0.265 0.259

(iv) Yellow

X 0.612 0.618 0.575 0.575 y 0.382 0.382 0.425 0.406

8) Intensity of lights:

The minimum luminous intensity of lights shall be calculated by using the formula: $I = 3.43 * 10^6 * T * D^2 * K^{-D}$

Where

- I is luminous intensity in candelas under service conditions,
- T is threshold factor $2 * 10^{-7}$ lux,
- D is range of visibility (luminous range) of the light in nautical miles,
- K is atmospheric transmissivity.

For prescribed lights the value of K shall be 0.8, corresponding to a meteorological visibility of approximately 13 nautical miles.

A selection of figures derived from the formula is given in the following table:

Range of visibility (luminous range) of light in nautical miles	Luminous intensity of light in candelas for K= 0.8
.....D.....I.....
1	0.9
2	4.3
3	12.0
4	27.0
5	52.0
6	94.0

9) Horizontal sectors:

(a) (i) In the forward direction, sidelights as fitted on the vessel shall show the minimum required intensities. The intensities shall decrease to reach practical cut-off between 1 degree and 3 degree outside the prescribed sectors.

(ii) For stern lights and masthead lights and at 22.5° abaft the beam for sidelights, the minimum required intensities shall be maintained over the arc of the horizon up to so within the limits of the sectors prescribed in Rule 21 . From 5° within the prescribed sectors the intensity may decrease by 50% up to the prescribed limits; it shall decrease steadily to reach practical cutoff at not more than so outside the prescribed sectors.

(b) (i) All-round lights shall be so located as not to be obscured by masts, topmasts or structures within angular sectors of more than 6°, except anchor lights prescribed in Rule 30, which need not be placed at an impracticable height above the hull.

(ii) If it is impracticable to comply with paragraph (b)(i) of this section by exhibiting only one all-round light, two all-round lights shall be used suitably positioned or screened so that they appear, as far as practicable, as one light at a distance of one mile.

10) Vertical sectors:

(a) The vertical sectors of electric lights as fitted, with the exception of lights on sailing vessels underway, shall ensure that:

(i) at least the required minimum intensity is maintained at all angles from 5° above to 5° below the horizontal.

(ii) at least 60% of the required minimum intensity is maintained from 7.5° above to 7.5° below the horizontal.

(b) In the case of sailing vessels underway the vertical sectors of electric lights as fitted shall ensure that:

(i) at least the required minimum intensity is maintained at all angles from 5° above to 5° below the horizontal.

(ii) at least 50% of the required minimum intensity is maintained from 25° above to 25° below the horizontal.

(c) In the case of lights other than electric these specifications shall be met as closely as possible.

11) Intensity of non-electric lights:

Non- electric lights shall so far as practicable comply with the minimum intensities, as specified in the table given in section 8 of this annex.

12) Maneuvering light:

Notwithstanding the provisions of paragraph 2(f) of this annex, the maneuvering light described in Rule 34(b) shall be placed in the same fore-and-aft vertical plane as the masthead light or lights and, where practicable, at a minimum height of 2 m vertically above the forward masthead light, provided that it shall be carried not less than 2 m vertically above or below the after masthead light. On a vessel where only one masthead light is carried, the maneuvering light, if fitted, shall be carried where it can best be seen, not less than 2 m vertically apart from the masthead light.

13) High-speed craft:

(a) The masthead light of high-speed craft may be placed at a height related to the breadth of the craft lower than that prescribed in paragraph 2(a)(i) of this annex, provided that the base angle of the isosceles triangles formed by the sidelights and masthead light, when seen in end elevation, is not less than 27 degrees.

(b) On high-speed craft of 50 m or more in length, the vertical separation between foremast and mainmast light of 4.5 m required by paragraph 2(a)(ii) of this annex may be modified provided that such distance shall not be less than the value determined by the following formula:

$$Y = (a + 17 \Psi) * C / 1000 + 2 \quad \text{where:}$$

Y is the height of the mainmast light above the foremast light in meters.

a is the height of the foremast light above the water surface in service condition in meters.

Ψ is the trim in service condition in degrees.

C is the horizontal separation of masthead lights in meters.

14) Approval:

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.

Annex II Additional signals for fishing vessels fishing in close proximity:

1) General:

The lights mentioned herein shall, if exhibited in pursuance of Rule 26(d), be placed where they can best be seen. They shall be at least 0.9 m apart but at a lower level than lights prescribed in Rule 26(b)(i) and (c)(i). The lights shall be visible all round the horizon at a distance of at least 1 mile but at a lesser distance than the lights prescribed by these Rules for fishing vessels.

2 Signals for trawlers:

(a) Vessels of 20 m or more in length when engaged in trawling, whether using demersal or pelagic gear, shall exhibit:

- (i) when shooting their nets: two white lights in a vertical line.
- (ii) when hauling their nets: one white light over one red light in a vertical line.
- (iii) when the net has come fast upon an obstruction: two red lights in a vertical line.

(b) Each vessel of 20 m or more in length engaged in pair trawling shall exhibit:

- (i) by night, a searchlight directed forward and in the direction of the other vessel of the pair.
- (ii) when shooting or hauling their nets or when the nets have come fast upon an obstruction, the lights prescribed in 2(a) above.

(c) A vessel of less than 20 m in length engaged in trawling, whether using demersal or pelagic gear or engaged in pair trawling, may exhibit the lights prescribed in paragraphs (a) or (b) of this section, as appropriate.

3) Signals for purse seiners

Vessels engaged in fishing with purse seine gear may exhibit two yellow lights in a vertical line. These lights shall flash alternately every second and with equal light and occultation duration. These lights may be exhibited only when the vessel is hampered by its fishing gear.

Annex III Technical details of sound signal appliances:

1) Whistles:

(a) Frequencies and range of audibility:

The fundamental frequency of the signal shall lie within the range 70-700 Hz. The range of audibility of the signal from a whistle shall be determined by those frequencies, which may include the fundamental and/or one or more higher frequencies, which lie within the range 180-700 Hz (± 1 %) for a vessel of 20 m or more in length, or 180- 2100 Hz (± 1 %) for a vessel of less than 20 m in length and which provide the sound pressure levels specified in paragraph 1 (c) below.

(b) Limits of fundamental frequencies:

To ensure a wide variety of whistle characteristics, the fundamental frequency of a whistle shall be between the following limits:

- (i) 70-200 Hz, for a vessel 200 m or more in length;
- (ii) 130-350 Hz, for a vessel 75 m but less than 200 m in length;
- (iii) 250-700 Hz, for a vessel less than 75 m in length.

(c) Sound signal intensity and range of audibility:

A whistle fitted in a vessel shall provide, in the direction of maximum intensity of the whistle and at a distance of 1 m from it, a sound pressure level in at least one 1/3 -octave band within the range of frequencies 180- 700 Hz (± 1 %) for a vessel of 20 m or more in length, or 180-2100 Hz (± 1 %) for a vessel of less than 20m in length, of not less than the appropriate figure given in the table overleaf.

The range of audibility in the table overleaf is for information and is approximately the range at which a whistle may be heard on its forward axis with 90% probability in conditions of still air on board a vessel having average background noise level at the listening posts (taken to be 68 dB in the octave band centered on 250 Hz and 63 dB in the octave band centered on 500 Hz).

length of vessel in meters	1/3-octave band level at 1m in dB referred to $2 \times 10^{-5} \text{ N/m}^2$	Audibility range in nautical miles
200 or more	143	2
75 but less than 200	138	1.5
20 but less than 75	130	1
Less than 20	120* 115! 111"	0.5

* When the measured frequencies lie within the range 180- 450 Hz

! When the measured frequencies lie within the range 450- 800 Hz

“ When the measured frequencies lie within the range 800-2100 Hz

In practice the range at which a whistle may be heard is extremely variable and depends critically on weather conditions; the values given can be regarded as typical but under conditions of strong wind or high ambient noise level at the listening post the range may be much reduced.

(d) Directional properties:

The sound pressure level of a directional whistle shall be not more than 4 dB below the prescribed sound pressure level on the axis at any direction in the horizontal plane within $\pm 45^\circ$ of the axis. The sound pressure level at any other direction in the horizontal plane shall be not more than 10 dB below the prescribed sound pressure level on the axis, s.o that the range in any direction will be at least half the range on the forward axis. The sound pressure level shall be measured in that 1/3-octave band which determines the audibility range.

(e) Positioning of whistles:

When a directional whistle is to be used as the only whistle on a vessel, it shall be installed with its maximum intensity directed straight ahead.

A whistle shall be placed as high as practicable on a vessel, in order to reduce interception of the emitted sound by obstructions and also to minimize hearing damage risk to personnel. The sound pressure level of the vessel's own signal at listening posts shall not exceed 110 dB and so far as practicable should not exceed 100 dB.

(f) Fitting of more than one whistle:

If whistles are fitted at a distance apart of more than 100m, it shall be so arranged that they are not sounded simultaneously.

(g) Combined whistle systems:

If due to the presence of obstructions the sound field of a single whistle or one of the whistles referred to in paragraph 1 (f) above is likely to have a zone of greatly reduced signal level, it is recommended that a combined whistle system be fitted so as to overcome this reduction. For the purposes of the Rules a combined whistle system is to be regarded as a single whistle. The whistles of a combined system shall be located at a distance apart of not more than 100 m and arranged to be sounded simultaneously. The frequency of any one whistle shall differ from those of the others by at least 10 Hz.

2) Bell or gong:

(a) Intensity of signal:

A bell or gong, or other device having similar sound characteristics shall produce a sound pressure level of not less than 110 dB at a distance of 1 m from it.

(b) Construction:

Bells and gongs shall be made of corrosion-resistant material and designed to give a clear tone. The diameter of the mouth of the bell shall be not less than 300 mm for vessels of 20 m or more in length. Where practicable, a power-driven bell striker is recommended to ensure constant force but manual operation shall be possible. The mass of the striker shall be not less than 3% of the mass of the bell.

3) Approval:

The construction of sound signal appliances, their performance and their installation on board the vessel shall be to the satisfaction of the appropriate authority of the State whose flag the vessel is entitled to fly.

Annex IV Distress signals

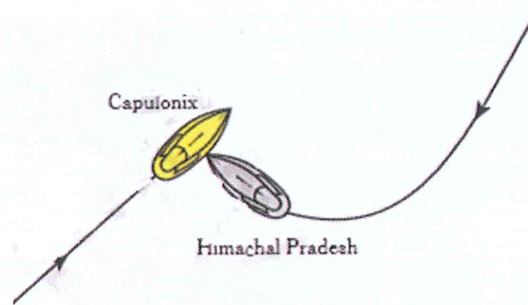
- 1) The following signals used or exhibited either together or separately, indicate distress and need of assistance:
 - (a) a gun or other explosive signal fired at intervals of about a minute.
 - (b) a continuous sounding with any fog-signaling apparatus.
 - (c) rockets or shells, throwing red stars fired one at a time at short intervals.
 - (d) a signal made by radiotelegraphy or by any other signaling method consisting of the group ...---... (SOS) in the Morse code.
 - (e) a signal sent by radiotelephony consisting of the spoken word " Mayday".
 - (f) the International Code Signal of distress indicated by N.C..
 - (g) a signal consisting of a square flag having above or below it a ball or anything resembling a ball.
 - (h) flames on the vessel (as from a burning tar barrel, oil barrel, etc.).
 - (i) a rocket parachute flare or a hand-flare showing a red light.
 - (j) a smoke signal giving off orange-colored smoke.
 - (k) slowly and repeatedly raising and lowering arms outstretched to each side.
 - (l) the radiotelegraph alarm signal.
 - (m) the radiotelephone alarm signal.
 - (n) signals transmitted by emergency positioning-indicating radio beacons.
 - (o) approved signals transmitted by radio communication systems, including survival craft radar transponders.
- 2) The use or exhibition of any of the foregoing signals except for the purpose of indicating distress and need of assistance and the use of other signals which may be confused with any of the above signals is prohibited.
- 3) Attention is drawn to the relevant sections of the International Code of Signals, the Merchant Ship Search and Rescue Manual and the following signals:
 - (a) a piece of orange-colored canvas with either a black square and circle or other appropriate symbol (for identification from the air);
 - (b) a dye marker.

ANALYSIS OF RELEVANT ACCIDENTS

Collision of M/V State of Himachal Pradesh with M/V Capulonix, as a result of non-compliance with rule 5:

- 1) Collision occurrence:

The Motor Tanker Capulonix sailed with direction to Mumbai transferring 48,000 MT Iranian crude oil at night. To her starboard bow was sailing M/V State of Himachal Pradesh, which was outbound of Mumbai Port and had a speed of 2 knots in order to disembark the pilot. None of the two ships was at risk of collision, provided they maintained the current course and speed. The oil tanker changed the course to port, so that she stays in the deep part of the channel and M/V Pradesh showed the "GREEN" side light and had enough maneuvering space. Suddenly, after the pilot disembarked, M/V Pradesh altered course about 90 degrees to starboard, while increasing speed as her master had the intention to pass at the bow of the oil tanker, causing the two ships to collide.



2) Causes:

The main cause of the collision was the turning of M/V Pradesh to starboard. If she kept her course, passing "GREEN to GREEN" and then turned to starboard, passing at the stern of M/V Capulonix in order to sail to Cochin, the collision would have been avoided. The master of M/V Pradesh should, according to Rule 5, maintain an appropriate visual and radar surveillance of the whole area around the ship, to gain the intelligence needed and then maneuver the ship. But as it seems, he was more concerned with the pilot disembarkation on the port side, than the Surveillance of the voyage area. Even before the crash, if the M/V Pradesh turned to the left, the collision would have been avoided.

3) Conclusion:

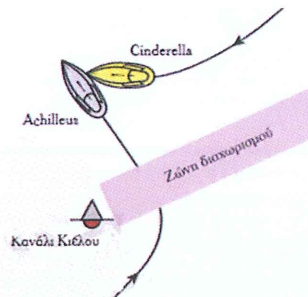
The court ascribed 85% of the liability to the master of M/V Pradesh and 15% to the Master of M/V Capulonix. The conclusion is that it is indispensable to maintain the bridge team alerted conducting continuously the appropriate surveillance, as foreseen in Rule 5.

Collision of M/V Achilles with M/V Cinderella, non-compliance with provisions 10 (a), 10 (e) and Rule 15:

1) Collision occurrence:

In the Baltic Sea near the canal of Kiel, the Cypriot ship M/V Achilles and Swedish ship M/V Cinderella collided while sailing within the Vessel traffic separation (VTS). M/V Achilles had just exited the Kiel Strait and had entered the right traffic lane of the VTS as she should. In the opposite lane sailed M/V Cinderella, moving towards Kiel strait. M/V Achilles initially altered

course a little to port in order to create a leeward side for the pilot to disembark but the bridge team failed to control this alteration. So the ship crossed and entered the opposite traffic lane with a vertical angle to it and found his self at the port bow of M/V Cinderella, causing the two ships to collide.



2) Causes:

The main causes of the collision were:

- a) M/V Achilleus failed to control her turn to port and to maintain the course inside the correct traffic lane as required under provision 10b (i), resulting in crossing and not complying with provisions 10b (ii) and 10 (e), which do not allow the passage of ships from the segregation zone.
- b) In addition, M/V Achilleus, despite not complying with provision 10 (e), has additionally violated paragraph 10 (a), which states that ships in VTS's are not exempted from their obligation for compliance with the sailing rules 11-18. He also violated the rule 15 as a give-way vessel did not take appropriate action to avoid collision with M/V Cinderella which was the stand-on vessel, showing his port side.
- c) Also, M/V Cinderella failed to carry out essential maneuvering in time to avoid collision as soon as it became apparent that the liable ship is not give-way.

3) Conclusions:

The court ascribed 70% of the liability to M/V Achilleus and 30% to M/V Cinderella.

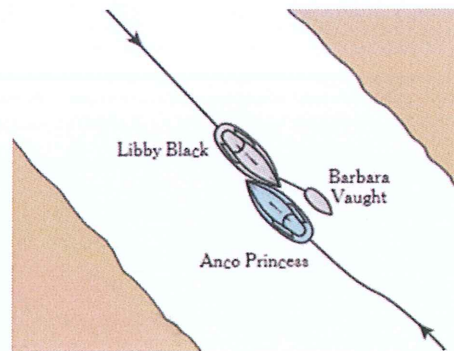
Conclusions from this collision are that the rules for VTS's must be followed and the officers on watch must be are ready to maneuver at any time their ship to avoid collision especially in the last stages before collision.

Collision of M/V Libby Black with M/T Anco Princess, non-compliance with the Rules 9 and 14:

1) Collision occurrence:

Three ships, M/V Libby Black, which was towed from the tug boat Barbara Vaught and M/T tanker Anco Princess collided in the lower part of the Mississippi River. M/V Libby Black had the current pushing from the stern while M/T Anco Princess from bow. M/T Anco Princess was entering the river and after the pilot boarded, she was sailing very fast on the right side of the river, about 400 feet distance to the coast. M/V Libby Black with the tug boat were sailing to leave the river, with the current from stern. The accident occurred in the afternoon and the visibility was very good. The pilot of tanker visually detected the tug at distance of 5 nm, but did not attempt to communicate via radiotelephone or any other signal from Rule 34, to propose a way to pass. When the ships approached less than 1 nm, the pilot of M/V Anco Princess

having the understanding that M/V Libby Black was very close to the east coast of the river, ordered alteration of course by 5 degrees to port, so that the three vessels pass clear from each other GREEN with GREEN or right with right side. This maneuver proved false and resulted in the collision of the two larger vessels.



2) Causes:

The main causes of the collision were:

- a) The misperception of the pilot about the approach taken and this alteration of the course to port was enough to ensure the clear passage GREEN to GREEN. With this action has been violated provision 14 (b), which determines that visual surveillance and assessment must be continuously carried out at all times.
- b) Incorrect decision to pass GREEN to GREEN, or keeping the port sides of ships on the boundaries of the channel and the violation of Rules 7, 9 and 14 that explain in which cases this kind of passage is allowed despite the fact that in the inland waters of the USA this passage is allowed after an agreement.
- c) M/V Libby Black failed to signal the doubt/wake up signal, in accordance with provision 34 (d), when M/T Anco Princess did not respond to the VHF radiotelephone calls.

3) Conclusions.

The court attributed 85% of the responsibility to M/V Libby Black and 15% to M/T Anco Princess.

The conclusions from this collision are that:

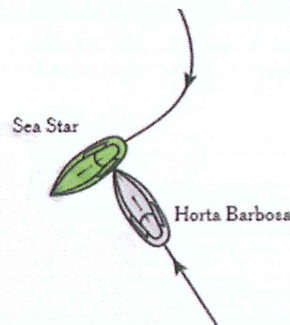
- a) In the case of an approach with opposite or almost opposite courses, you should constantly check visually the approach and when there is doubt rule 14 should be applied.
- 2) When approaching with opposing or almost opposite courses, alteration to port should be avoided in accordance with rule 14 (a). Even when this is allowed by local rules (US and Canadian), the passage should be agreed in time to ensure safety.

Collision of M/T Horta Barbosa with M/T Sea Star, non-compliance with the Rules 5, 7 and 14:

1) Collision occurrence:

The Brazilian Tanker Horta Barbosa sailed in ballast condition to the Gulf of Oman. In the same area was sailing the Korean Tanker Sea Star, which was outbound of the Gulf of Oman with Rio De Janeiro as destination. She was fully loaded with crude oil. These ships collided in open sea, in the at evening, with very good visibility. Both ships detected each other via radar

at a distance of 16-14 nm. At a distance of 6 nm they visually identified the navigation lights of each other. Their courses were almost opposite so this was a head on situation. Their speed was 16 knots. For about six minutes there was an absence of a bridge team on the bridge of M/T Horta Barbosa, because the officer on watch was fixing the ships position in the chartroom while the cadet and the AB had gone to wake up their replacements. According to the statement given from the OOW, when the surveillance stopped, M/T Sea Star was at distance 3-4 nm and the relative bearing was 30 degrees to starboard. Just before 04:00, the AB returned to the bridge and immediately called the OOW because he saw M/T Sea Star cross-over at close distance. The OOW put the machines immediately in reverse at maximum speed, but the two ships collided, resulting in an explosion and fire on M/T Sea Star, which then burned completely and sunk. Eleven crew members of M/T Sea Star lost their lives, including 4 of the 5 who were on the bridge. Only the cadet who was in the chart room was saved.



2) Causes:

The main causes of the collision were:

- a) Incorrect maneuvering of M/T Sea Star to starboard, just before the ships would pass clear GREEN to GREEN without creating any risk of collision. Rule 7 and 14 were violated from M/T Sea Star.
- b) The absence of surveillance on the bridge of M/T Horta Barbosa in the latter stages of the approach, violating any concept of proper surveillance and assessment of the existing dangers, in accordance with Rules 5 and 7.

3) Conclusion:

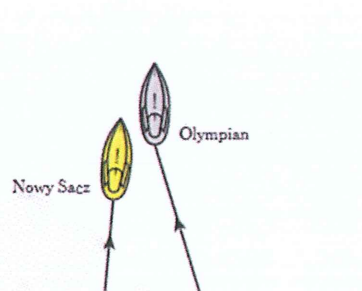
The court attributed 75% responsibility to M/T Sea Star and 25% to M/T Horta Barbosa. The conclusion from this collision is that when selecting GREEN to GREEN passage it is necessary to continuously ensure that there is no risk, until the ships pass by at a safe distance and are clear.

Collision of M/V Olympian with M/V Nowy Sacz, Non-compliance with Rule 13 and 17 (b):

1) Collision occurrence:

Two ships, M/V Olympian and M/V Nowy Sacz, were sailing north at a speed of 14.5 knots and 12.5 knots respectively, at night. At 02:45, M/V Nowy Sacz took a relative bearing of the M/V Olympian, about 115 to 120 degrees to starboard. At 03:00, M/V Nowy Sacz took a smaller relative bearing of 112.5 degrees to starboard, of M/V Olympian. Also to M/V Olympian the GREEN side light of M/V Nowy Sacz was now visible. At 03:30, the Olympian was

approximately on the starboard side of the M/V Nowy Sacz and sailed at about 25 to 30 degrees different course than M/V Nowy Sacz, resulting in continuously getting closer. At 3:50 AM, M/V Nowy Sacz signaled with the aldis light five flashes (signal of doubt, provision 34 (d)) but did not receive any response, so she initially reduced the speed and then stopped her engine. When the Olympian was at 300-400 yards distance, she sounded a short blast and turned with the maximum rudder angle to starboard. M/V Nowy Sacz put her engines astern, signaled three short blasts and set the rudder hard to starboard. At 03:57 the ships collided when the bow of M/V Nowy Sacz hit the port side of M/V Olympian.



2) Causes:

The main causes of the collision were:

- a) The understanding of M/V Olympian that the approach of the two ships was not a case of overtaking but a crossing situation. Olympian acted as the stand on vessel.
- b) At the same time, M / V Nowy Sacz considered it to be a overtaken ship and also acted as the stand on vessel not changing course or speed until the last stages of approach.
- c) There is confusion in the definition of "overtaking ship" between seafarers. This is explained in rule 13 (b) and specifies that:
 - (i) For a ship to be "overtaking", his bearing from the overtaken ship must be greater than 22.5 degrees abaft his beam, in addition, it must converge towards the "overtaken" vessel by reducing the distance.
 - (ii) Ships must be in sight of each other. However, even if there is doubt that a ship is "overtaking", provision 13 (c) states that, when in doubt, the ship will consider to be the overtaking vessel.
- d) The delayed and insufficient actions of M/V Nowy Sacz as stand on vessel in the last stages prior to the collision, in order to avoid it, not complying with rule 17 (b).

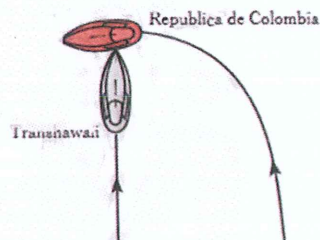
3) Conclusion:

The court attributed 75% responsibility to M/V Olympian as overtaking vessel and 25% to M/V Nowy Sacz. The conclusion from the collision is that the OOW's should be aware of the situation and have good knowledge of the COLREGS in order to ensure the safety of the passage.

Collision of M/V Transhawaii with M/V Republica de Colombia, non - compliance with Rules 5, 7 and 8 (d), 17 (b):

1) Collision occurrence:

M/V Republica de Colombia with a length of 554 feet, was in the same area as M/V Transhawa, 634 ft long, and transporting containers. They had parallel courses and the first vessel overtook at a safe distance of about 1000 yards the second one and continued on her course with greater speed. On M/V Transhawaii, the OOW and the AB stopped to pay attention to M/V Republica de Colombia as soon as she passed clear on their starboard side. M/V Republica de Colombia was using the autopilot steering system, which when the ship passed Transhawaii had a failure and set the rudder to port at 10 to 15 degrees. As a result the ship turned constantly to port towards M/V Transhawaii. Four minutes later, M/V Transhawaii collided with M/V Republica de Colombia, resulting in the death of an engine crew member of the and the severe damage to the vessel, which could not be repaired.



2) Causes:

The main causes of the collision were:

- a) M/V Transhawaii Bridge Team did not perform adequate surveillance, not complying with Rule 5. Also, the two ship bridge teams were not constantly investigating to detect the existence of a risk, so as to take the necessary actions in case of danger, in accordance with Rule 7.
- b) In addition to the above, M/V Transhawaii did not perform any maneuvering in the final stage before the collision, in order to avoid or mitigate the consequences, in accordance with Rule 17 (b).
- c) M/V Republica de Colombia, despite overtaking the other ship at a distance of 1000 yards and there was no safety problem, it was subsequently proved that in the event of steering failure the distance was not adequate and thus did not comply with provision 8 (d), which requires the maneuvering to result in a safe distance.

3) Conclusions:

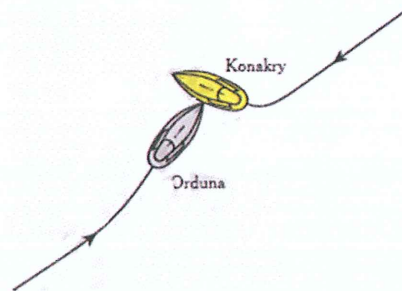
The conclusions from the collision are:

- a) Appropriate surveillance must always be carried out and the bridge team should constantly be vigilant for every possibility when overtaking a ship and when being overtaken.
- b) In addition to other factors, the bridge team must take into account the case of a failure of some control system for the ship's ability to operate when assessing and deciding the safe distance for passage.

Collision of M/V Orduna with M/V Konakry, non-compliance with Rules 8 (a), 17 (c) and Rule 16:

1) Collision occurrence:

M/V Orduna and M/V Konakry were sailing in the same area and were in a crossing situation. M/V Konakry originally took a relative bearing of Orduna about 8 degrees to port. M/V Konakry maintained a steady course and speed and did not alter course to starboard as she was obligated until she found herself at a distance of 500 yards from the M/V Orduna. M/V Orduna as a stand on vessel maintained her course and speed until it was apparent that the aforementioned distance from M/V Konakry was dangerously close and that the other vessel was not altering her course, so they turned to port. Soon after the two ships collided.



2) Causes:

The main causes of the collision were:

- a) Turning M/V Orduna to port, not complying with rule 17 (c), which states that if the stand on vessel is in a situation referring to rule 17 (a) (ii), as soon as it becomes apparent that the give way vessel is not maneuvering appropriately to avoid collision, she is not allowed to alter course to port, if circumstances allow.
- b) The late turn to starboard of M/V Konakry, not complying with Rule 16 8 (a), which defines that the give way vessel is required to alter course ample time and with due regard to the observance of good seamanship. Any alteration of course and/or speed to avoid collision shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel.
- c) The confusion of M/V Orduna, which considered that when the other vessel turned the rules regarding a crossing situation do not apply any more. This view is not correct, because the rule stops to be valid only when the vessels safely pass and move away.

3) Conclusions:

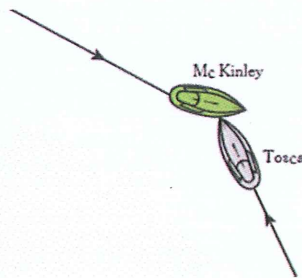
The conclusions from the collision are:

- a) Give way vessel must take timely sufficient action to avoid collision.
- b) A stand on vessel, if required to take action, should not turn to port side.
- c) The characterization of the performed approach does not change until the safe passage of the ships.

Collision of M/V Tosca with M/V McKinley, non-compliance with rule 17 (a) (ii):

1) Collision occurrence:

In the area of the coast of Oregon, the 649 feet long car carrier M/V Tosca collided with the 75 feet long fishing vessel McKinley. McKinley was the give way vessel, in this crossing situation and M/V Tosca was the stand on vessel as she showed her red side light to McKinley. The collision took place during the night, with good visibility, on the high seas and had as result the death of one crew member of M/V McKinley.



2) Causes:

The main causes of the collision were:

- a) M/V McKinley made a series of mistakes. The officer on watch was found to be completely unable to carry his duty, as he had fundamental lack of knowledge of the collision regulations.
- b) In addition, M/V McKinley failed to maintain a continuous watch, such as is stated in rule 5, and taking timely and essential actions to avoid collision in accordance with Rule 16.
- c) Also, M / V Tosca failed to use the radar properly and delayed to spot the lights of the fishing vessel, approaching from his port bow. Mainly M/V Tosca failed to take timely and essential action to avoid collision, as soon as it became clear that the give way vessel does not alter course, as provided for in rule 17 (a) (ii).

3) Conclusions:

The court attributed 65% of the responsibility to M/V McKinley and 35% to M/V Tosca. Although the the word used in rule 17 (a) (ii) is “may” the court considers it obligatory (should or will).

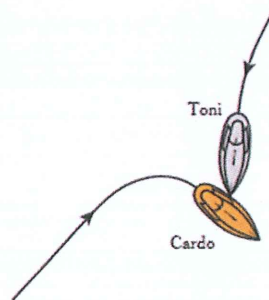
The conclusions from this collision are that:

- a) When it becomes obvious that the give way vessel does not take action, the stand on vessel must maneuver in order to avoid collision.
- b) The officer on watch of every ship should always keep in mind that the ability of the other vessel’s bridge team is not always sufficient and should not be taken as granted.

Collision of M/V Cardo with M/V Toni, non-compliance with Rule 15 and 17 (a) (ii):

1) Collision occurrence:

The Norwegian 830 feet long Tanker *Cardo*, was sailing a course of 056 degrees at a speed of 15.5 knots. In the same area, at the south east coast of Africa, sailed at the same time the Somali 470 feet long ship *M/V Toni*, , at a course of 221 degrees and a speed of 10 knots. It was at night with very good visibility. Their courses had a discrepancy of 15 degrees to be opposite. *M/V Toni* was spotted at a relative bearing on *Cardo*'s port bow. As the ships approached each other, *M/V Toni* altered slightly her course to port , while *M/V Cardo* did a significant alteration to starboard. Soon afterwards the ships collided.



2) Causes:

The main causes of the collision were:

- a) The turn of *M/V Toni* to port as a give way vessel. This was not supposed to be executed, because this action would lead to the passage in front of the bow of *M/V Cardo*.
- b) *M/V Cardo* did not perform the required maneuvering in accordance with rule 17 (a) (ii), so to avoid the collision when it became apparent that the obligated vessel was not taking correct action.
- c) Insufficient surveillance and risk assessment by the bridge teams of both vessels, not complying with Rules 5 and 7.
- d) The not totally clear case of approach, between the crossing situation and the head on situation, which has created confusion about the type of approach that is unfolding.

3) Conclusion:

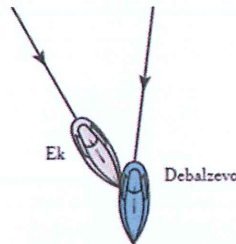
The conclusion drawn from this collision is that several times the inappropriate emphasis in risk assessment leads to confusion of the implemented approach and hence in the obligations of the stand on and the give way vessel, lead to misconduct. The most serious error was the turn to port in.

Collision of M/T Ek with M/V Debalzevo, non-compliance with Rules 5, 7, 15 and 17 (a) (ii), 17 (b):

1) Collision occurrence:

The Russian ship *M/V Debalzevo* and the Norwegian Tanker *Ek* were in the same area at a distance of 1 nautical mile, and both heading in a general south direction. Both ships believed

they were sailing with parallel courses up to four minutes before the collision, where M/V Debalzevo realized that it was not so and estimated that M/V Ek had turned to port.



2) Causes:

The main causes of the collision were:

- a) The bridge teams of both ships did not perform proper lookout and risk assessment, not complying with Rules 5 and 7, considering that the two ships were moving in parallel, something which was in fact not correct.
- b) There was confusion as to the type of the performed approach.
- c) M/V Debalzevo, as the give way vessel, in a crossing situation did not alter course early enough to starboard, so that it passes clear at the stern of M/V Ek, in accordance with Rule 15. Even at the fourth stage of the approach, M/V Debalzevo should had maneuvered to port to avoid collision.
- d) M/V Ek as a stand on vessel, when ships arrived at the fourth stage before the collision, had to maneuver in the best possible way, to avoid collision, in this case turning to starboard, in accordance with the definitions in rule 17 (b). But M/V Ek did not take any action.
- e) Of course, it was clearly preferable to have maneuvered timely in the third stage before the collision, in accordance with rule 17 (a) (ii).

3) Conclusion:

The conclusion from this collision is that:

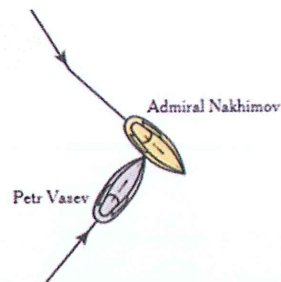
Inappropriate lookout and confusion about the type of the unfolding approach are two important causes in which several maritime accidents are due.

Collision of M/V Admiral Nakhimov with M/V Petr Vasev, non-compliance with rules 2, 15 and 16:

1) Collision occurrence:

Russian passenger ship M/V Admiral Nakhimov and Russian general cargo ship M/V Petr Vasev, sailed during the night hours, with good visibility, in the Black Sea. M/V Admiral Nakhimov sailed from Novorossiysk to Sochi at a course of 160 degrees and with 884 passengers on board. M/V Petr Vasev was spotted at the starboard bow of Admiral Nakhimov sailing at a course of 036 degrees and therefore was the stand on vessel in this crossing situation. When the ships approached to a distance of 7 nm, they agreed via VHF radiotelephone communication not to comply with Rule 15 and M/V Petr Vasev would give priority to M/V Admiral Nakhimov and then pass at her stern. However, M/V Petr Vasev did not follow the

agreement, while M/V Admiral Nakhimov delayed to take appropriate action to avoid collision. Eventually Admiral Nakhimov altered course to port but the ships collided. As a result the passenger ship sunk and 423 passengers lost their lives.



2) Causes:

The main causes of the collision were:

- a) Non-compliance with Rules 15 and 16. Rather than following the rules, the two ships made an agreement via VHF radiotelephone, which, finally, was not executed.
- b) Non-compliance with clause 2 (a), which requires ships to follow the collision regulations. Non-compliance with the rules is only allowed if there is an imminent danger, according to rule 2 (b). In this case, there was no risk.
- c) The alteration of the course to port of M/V Admiral Nakhimov, Non Compliance with Rule 15.

3) Conclusions:

The court attributed co-responsibility to both masters and sentenced them to 15 years imprisonment.

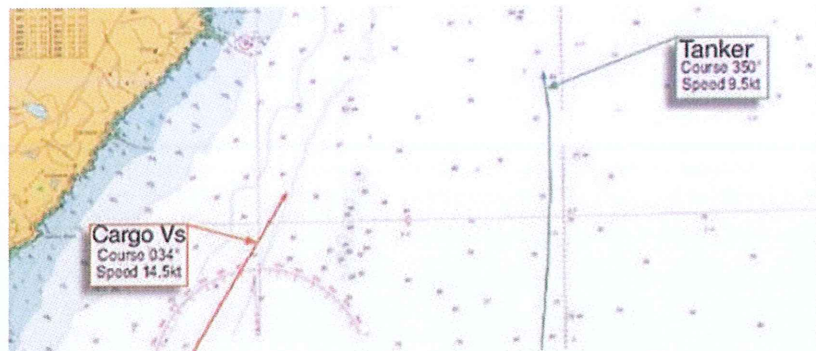
The conclusion from this collision is that:

- a) Agreements in contradiction of the rules are prohibited, and non-compliance with the collision regulations, because it suits some ships, is to be avoided.
- b) The bridge team should consider the possibility that the agreement could not be followed by the other ship. Even if an agreement is made for some reasons in accordance with provision 2 (b), the bridge team must be vigilant and monitor the situation until the ships have passed clear safely.

Tanker barge collision with small cargo ship:

A small oil bunker barge was loaded and underway. Manned only by the Master and a deckhand, the vessel was proceeding on autopilot steering mode at 9.5 knots with the Master on the bridge. He observed several AIS targets on the vessel's ECS display and noted the nearest CPA was predicted to be one nautical mile. He adjusted the autopilot to 350° and then left the bridge. Later on he noticed a general cargo vessel approaching from astern but was neither surprised nor alarmed. Soon after, he returned to the bridge and sat on a chair on the port side of the

wheelhouse. Meanwhile, the general cargo vessel was approaching the barge's port side at a speed of 14.5 knots with the autopilot set to 034°. The OOW was sitting in the bridge chair on the starboard side of the bridge. There was good visibility and smooth seas.



After about eight minutes, with each OOW sitting in their respective chairs, the cargo vessel's bow struck the bunker barge's port side. The bunker barge was driven sideways and within seconds had heeled over 90° to starboard. Seawater rushed into its bridge, accommodation areas and engine room through the vessel's open watertight doors. About 15 seconds later the barge broke free, rolled back upright and passed down the cargo vessel's port side. As the barge came upright, the Master found himself clinging to the bridge roof. The deckhand was washed out of the mess room and over the ship's side as the floodwater rushed back out through the open door.

The barge, in danger of sinking, was eventually towed to a nearby port.

Some of the findings of the official report include:

- A proper lookout was not being kept on either vessel.
- Complacency and poor watch keeping practices were systematic on board the cargo vessel. A lack of mentorship and direction from the vessel's Master contributed to this situation.
- Lone watch keeping was a normal practice for both vessels. The risks associated with this had not been properly assessed.
- Both vessels violated the Collision regulations leading to this accident.

POTENTIAL EVOLUTION OF THE RULES IN THE FUTURE:

Technological evolution is very high nowadays. This evolution potentially could have an impact to the COLREGS. Below the concept of function of a new automated collision avoidance system is presented, so it becomes obvious that if such a system is used in the future the COLREGS will

be surely amended. The following system is based on a computing system that receives information from all available navigational aids. Blocking area is the area in which we don't want another ship to enter.

Utilizing the blocking area, procedure of judgment for collision avoidance is examined as follows. The navigation haze in the procedure is categorized into the following three phases:

- (1) Normal navigation,
- (2) Evasive navigation, and
- (3) Return navigation.

The first phase represents normal navigation in original speed on original course. On this phase, own ship investigates motion of ships which exist in circumference continuously and estimates contents of the watching area of the target ships. Once overlap of the watching area of own and the target ships occur, it is recognized that collision risk is arising and it is examined if our own ship should change course or not. If our own ship is regarded as the give-way vessel and own blocking area wrap over the watching area of the target ship, navigation phase is moved on to the second phase. At the second phase, a ship does an action of evasion to avoid collision with other ships. When our own ship starts evasive navigation, three virtual ships, which have same speed and heading as the real ship, are introduced to the computing system, in order to find suitable course to avoid collision. Simultaneously, blocking area is set for each virtual ship. They are named as A0, A1 and A2. Positions of these virtual ships are revealed after the evaluation of content of overlapped areas of our own and the target ship's blocking area. The virtual domain which has the smallest overlapped area in the three and which has the smallest course change angle is adopted as the objective area where our own ship should turn in order to avoid collision. Then own ship will begin to change her course. When overlap of the blocking areas disappears, a evaluation of the safety of navigation of our own ship is secured. Then Ship begins to return toward her original course. This Motion is defined as the third phase.

Furthermore the growth of the international merchant fleet which has a result a dense traffic especially in specific areas of the globe could have a future impact on the COLREGS.

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- <https://www.sciencedirect.com> (Potential evolution of the rules in the future)

Information from the above sources was used. Please note that some of the original text is retained in his original form but large portions have been modified.