

THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISION AT SEA (COLREG) BETWEEN UNDERSTANDING AND APPLICATION

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1.0 ABSTRACT

In the past few years, Maritime collision became one of the most significant and repetitive threats to ships while sailing in the international or inland waterways or even inside the port. By analyzing collision accidents, it is apparent that 90% of these accidents were caused by human errors (EMSA, 2016). As a result, the international maritime organization (IMO) started to conduct thorough studies which aiming at analyzing human errors as a primary cause of collision accidents. This analysis has showed that there are many sub-factors that increase the probability of these errors like being unaware of the rules or misunderstanding it; which lead to the unsuccessful application of the collision regulation rules. Another sub-factor is the fatigue that affects decision makers inside the bridge during maneuvering (Saleh, 1998). As a result, a number of amendments were made in 2001 and 2007 to overcome these causes. However, these amendments were insufficient due to the frequent reoccurrence of collision accidents at sea during the last period. Thus, the aim of the present study is to prove and show those who work in the maritime transport, whether masters or marine officers or specialists in maritime arbitration, that there is still some failures and contradictions in the collision regulations, despite the amendments of 2001 and 2007. This has led to misunderstanding and wrong application of these rules; and consequently taking the wrong decisions during maneuvering those results in frequent collision accidents at sea.

Therefore, the study in hand aims at studying and analyzing marine accidents that took place in random places all over the world statistically. It also aims at studying some of the COLREGS' sections in order to propose some suggested modifications to these rules to reduce such kind of accidents.

KEYWORDS: Collision, Fatigue, Human Errors, International Regulations for Preventing Collisions at Sea (COLREG)

2.1 INTRODUCTION

Since middle ages, there were some rules that organizing the navigation at sea. However, the first set of rules in the modern age was drawn up by the British Board of Trade in 1863, in consultation with the French government. By the end of 1863, these regulations had been ratified and adopted by more than thirty countries (Saleh, 1998).

Intermittently, some modification were made and issued to the maritime countries all over the world. In 1948, The International Convention for the Safety of Life at Sea (SOLAS conference) at London (issued) several recommendations and new rules for preventing collision at sea. By 1960, the maritime countries found that there was a dire need to set out international regulations for preventing collision at sea due to the huge development in the maritime field, especially in the ships construction, speed and new kinds of ships. In the same year, these regulations were eventually ratified and adopted as the collision preventing regulations 1960 by the maritime countries.

However the 1960s had witnessed a dramatic increase in the number of faster, larger, vessels along with their tonnages, and speed, as well as the increased number of the developing countries that has entered the field whether from Africa or Asia. Thus, by the beginning of the 1970s there was an urgent need to set out new rules that would organize the marine traffic in the navigable waters.

Accordingly, in 1972, the international maritime organization (IMO) held an international conference for the purpose of revising the collision preventing regulations of 1960. On the 20th. Of October 1972, The International Regulations for Preventing Collisions at Sea were adopted and signed. This convention took into consideration the safety of sailing vessels especially the large ones that are limited in maneuvering due to its draft or working nature. The convention entered into force on the 15th. Of July 1977.

The conference has approved ratification of any further amendments that are done by the IMO Maritime Safety Committee (MSC). If two third of the members, who have the right to attend and vote, in the MSC approved these amendments, it becomes effective (unless the other third made any reservations).

2.2 THE FOLLOWING AMENDMENTS HAVE BEEN MADE OVER THE YEARS AFTER 15 JUL. 1977

- In 1981 amendments were made by the MSC and ratified by the members, particularly with regard to Rule 10. These amendments entered into force in 1983.
- In 1987, amendments were mad to several rules including crossing traffic lanes, and entered into force by the end of 1989.
- Further amendments were made in 1989 regarding the inshore traffic zone, and entered into force in 1993.
- By the end of 1993, amendments were made concerning the positioning of lights on vessels, and entered into force in 1995.
- In 2001, new rules were made regarding wing-in-ground-effect (WIG) craft, and entered into force in 2003.
- In 2007, amendments were made on annex IV (distress signals), and entered into force in 2009.

In spite of all these amendments, collision accidents at sea have increased lately.

In the next pages will explain some terminologies which are used in this paper then will present some statistics related to the resent maritime collisions.

2.3 COLLISION

The act of two vessels striking together or of one vessel running against another floating or still objects and results in a direct damage to one or more vessel, or the collided units. The term "collision" is inapplicable when a vessel strikes with rocks, platforms, or any fixed structure. The risk of such accidents increased due to traffic on the high seas and during restricted visibility (Saleh, 1998).

2.4 CONDITIONS OF SHIP COLLISION AT SEA

1. It should occur between two floating structures (unit)

2. One of the two structures should be a vessel
3. A direct physical impact should take place due to collision

2.5 DETERMINE COLLISION LIABILITY

1. If one vessel was solely to blame for the collision, a power-driven underway vessel collides with a vessel at berth; a vessel underway collides with another vessel not under command. In this case the faulted vessel, liability to make good the damages which has resulted from the collision.
2. If both-to-blame collision, i.e. collision caused by the fault of all vessels involved in the collision. In this case, liability will be allocated to the amount of blame accorded in each vessel.
3. If the degree of fault cannot be determined, each vessel shall follow the collision regulations and marine technical assets. In case the degree of liability cannot be allocated equally, each vessel bear the damages which it has suffered.
4. If the collision is caused by force majeure that cannot be controlled by the parties, such as, lightening, volcanoes, earthquakes, hurricanes, etc., each party bear its own losses.

In order to highlight the weakness points in the collision regulations, and their consequences, the present research study is going to show some of the marine accidents' statistics all over the world that are taken from some of the specialized centers and offices. These statistics have been categorized according to the type of accident.

3.0 MARINE ACCIDENTS OCCURRED FROM 2005 TO 2014 ACCORDING TO THE TRANSPORTATION SAFETY BOARD OF CANADA (TSB) STATISTICS

Table (1) shows the number of marine accidents that took place from 2005 to 2014 worldwide and has been categorized in accordance with the type of accident.

Table 1: Number of Marine Accidents Occurred From 2005 to 2014

	2005.	2006.	2007.	2008.	2009.	2010.	2011.	2012.	2013.	2014.
Accidents	451.00	426.00	456.00	427.00	3910	359.0	318.00	290.00	323.00	301.00
Capsize	10.00	18.00	11.00	15.00	8.00	8.00	2.00	6.00	8.00	3.00
Collision	110.00	94.00	84.00	95.00	81.00	65.00	87.00	77.00	79.00	88.00
Fire/Explosion	67.00	53.00	48.00	62.00	50.00	53.00	50.00	34.00	31.00	29.00
Grounding	87.00	114.00	95.00	73.00	110.00	102.00	73.00	69.00	62.00	61.00
Sank	78.00	69.00	69.00	74.00	54.00	41.00	33.00	33.00	38.00	26.00

Source (Statistical Summary – Marine Occurrences 2014 (TSB))

From this table, it is clear that collision is the highest percentage compared to the other accidents, as the number of collision accidents reached 860. Also normally noticeable percentage of the grounding accidents are resulted from the fact that collision regulations are either not understood or ignored. Fire and explosion came in the third place as the number of accidents has reached 477.

4.0 MARINE ACCIDENTS OCCURRED FROM 2007 TO APRIL 2016 ACCORDING TO JAPAN TRANSPORT SAFETY BOARD

Table (2) shows the number of marine accidents that took place from 2007 to April 2016 worldwide and has been categorized in accordance with the type of accident.

Table 2: Number of Marine Accidents Occurred From 2007 to April 2016

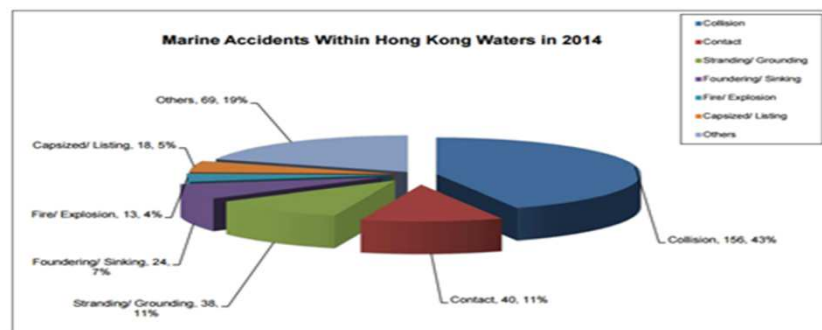
Year	Collision	Contact	Grounding	Sinking	Flooding	Capsizing	Fire	Explosion	Vessel Missing	Facility Damage	Casualty	Others	Total
2016	22	13	17	0	4	1	2	0	0	0	14	0	73
2015	238	95	194	5	10	58	38	3	0	19	119	0	779
2014	266	115	213	7	11	61	35	1	0	37	150	3	899
2013	265	144	210	10	25	49	33	2	0	38	163	2	941
2012	246	132	264	5	21	55	44	2	0	34	155	0	958
2011	282	145	244	12	18	57	32	1	0	23	142	1	977
2010	356	180	339	15	18	50	35	2	0	26	146	0	1197
2009	325	174	231	16	19	58	42	3	0	38	217	2	1325
2008	181	101	255	12	4	28	15	3	0	30	61	0	690
2007	0	1	2	0	0	0	0	0	0	0	0	0	3

Source (Japan Transport safety board 2016)

From this table, it is clear that collision got the highest number compared to the other accidents as it reached 2181, while contact reached 1100, fire 276, and grounding 1969. A huge percentage of grounding accidents are resulted from lack of knowledge or the wrong application to collision regulations.

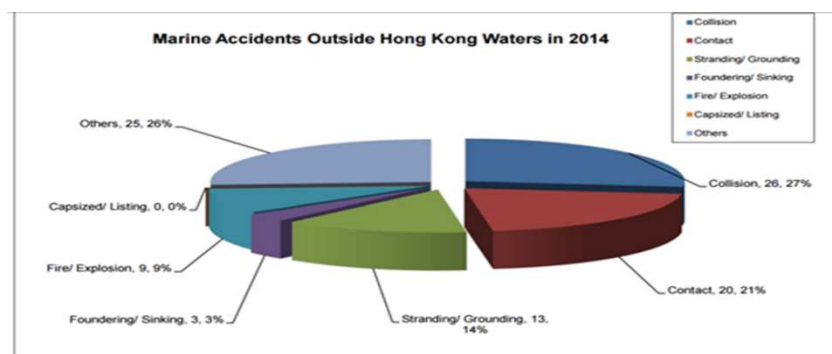
5.0 MARINE ACCIDENTS WITHIN AND OUTSIDE HONG KONG WATERS IN 2014

Figure (1) shows marine accidents in 2014 and their types within Hong Kong waters as a regional area.



Source MAI Statistics 2014

Figure 1: Marine Accidents in 2014 within Hong Kong Waters



Source MAI Statistics 2014

Figure 2: Shows Marine Accidents in 2014 and Their Types outside Hong Kong Waters

By analyzing figure (1), it is observed that collision is one of the most frequent accidents within Hong Kong waters in 2014 as it represents about 43% of the total number of accidents. By analyzing figure (2) as well, it is noted that both collision and contact are the most common and frequent accidents that took place in 2014 outside Hong Kong waters, as they both representing 46.4%.

6. ANALYSIS

By analyzing the above statistics of accidents, it is found that collision represents the highest and the most common type of accident in the maritime field. Hence, this remarkable increase in the number of collision at sea should be considered along with their causes.

It is also found that the major cause for collision at sea is the human errors that has led to the wrong application and misunderstanding of COLREG rules. The first cause can be due to paradoxes in meaning and the misunderstanding of some rules; which lead to wrong decision and hence, increase in the number of collision at sea. This shows that there is still some failure in the international regulations for preventing collisions at sea (EMSA, 2016). Although some amendments have been made lately to the rules, it could not cope with the fast and modern development that happened lately in the maritime field like increasing in number of larger, faster, and even new types of vessels.

The second cause can be due to ignoring and margining some of the International Regulations for Preventing Collisions at Sea. and neglecting what has been mentioned in STCW manila convention (table A-11/1 & A-11/2) which is related to training seamen on modern simulators. In the next section, the study is going to tackle in details the failure parts and weaknesses in these regulations and the way it should be amended to decrease this type of accidents.

7. PARADOXES AND WEAKNESSES IN THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA

7.1 RULE 3

7.1.1 Article (c)

The term “sailing vessel” means any vessel under sail provided that propelling machinery, if fitted, is not being used.

The term "is not being used" creates a kind of confusion and misinterpretation as the vessel may sail using both, propelling machinery and sail. In this case the vessel is treated as sailing vessel provided that it uses the two ways together. Because the sail is the source of power, it can be also a source of hindrance if there is a change whether in the wind direction or in the traffic line. In such cases, dealing with the vessel as a sailing vessel or not is very critical due to the huge difference between them that would make any action dangerous; especially the difference between the two cases would be a small cone, that can only be observed from a near distance. Consequently, a lot of confusion and contradictions may occur in making the right decision; and **so, it is suggested to amend this article to read as follows:**

The term “sailing vessel” means any vessel under sail even if provided with propelling machinery.

7.1.2. Article (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.

The abbreviation NUC (vessel Not under Command) is not mentioned in the definition. However, it is widespread and is practically used. Therefore, the abbreviation is known for some people and unknown for the others; who creates a kind of misunderstanding and failure to detect the situation that would lead to miscommunication among all parties during maneuvering. In such cases, there is a high probability of collision. Thus, it has been suggested to add this abbreviation to the article so that it becomes familiar to everyone like WIG which has been added to Rule 3 article m in the 2003 amendments.

So, it is suggested to amend this article to read as follow:

The term “vessel not under command” (NUC) 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.

7.1.3 Article (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...etc.

The abbreviation RAM (vessel restricted in her ability to maneuver) is not mentioned in the definition. However, it is widespread and is practically used. Therefore, the abbreviation is known for some people and unknown for the others; who creates a kind of misunderstanding and failure to detect the situation that would lead to miscommunication among all parties during maneuvering. In such cases, there is a high probability of collision. Thus, it has been suggested to add this abbreviation to the article so that it becomes familiar to everyone like WIG which has been added to Rule 3 article m in the 2003 amendments.

So, it is suggested to amend this article to read as follow:

The term “vessel restricted in her ability to maneuver” (RAM) 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. ...etc.

7.1.4 Article i

The word “underway” means that a vessel is not at anchor, or made fast to the shore, or aground.

The term "underway" here is vague and not specific. It could be understood in two ways: the vessel is underway making way or the vessel is underway not making way. Therefore, it should be determined whether the vessel is underway making way or it is underway not making way (drifting vessel). This has been stated in Rule 27:

(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 this, it is understood that vessel is underway making way through water, which means that there is another case where the vessel is underway not making way through water.

So, it is suggested to amend this article to read as follow:

- i. The word “underway not making way” means that a vessel is not at anchor, or made fast to the shore, or aground, and is not propelled by its machinery, and is unable to maneuver in case of (drifting vessel).
- ii. The term "underway making way" means that a vessel is not at anchor, or made fast to the shore, or aground, and is propelled by its machinery, and is able to maneuver.

It is concluded that there is no definition of drifting vessel in the COLREGs and there is no reference to the lights and shapes that drifting vessel shall exhibit. Therefore, it should be determined whether the vessel is underway-making way or underway not making way (drifting vessel). As the term "underway" has more than one meaning. Usually most of the drifting vessels make this mistake, as there are no specific lights to exhibit in their case; thus, they exhibit the several lights for the same case; which consequently create a big confusion and contradictions that would lead to collision.

7.2 RULE 4 Application

Rules in this Section apply to any condition of visibility.

It is not necessary to number this rule and it would be adequate to write it part B/ section 1 (Conduct of Vessels in Any Condition of Visibility). In this case, Rule 5 would 4 instead.

7.3 RULE 11 Application

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

It is not necessary to give this rule a number and it would be adequate if it becomes (Part B/ Section 2 Conduct of Vessels in Sight of One Another). In this case rule 12 would become 11 and so on.

7.4 RULE 19

Conduct of Vessels in Restricted Visibility

Article (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.

It is found that Rule 19 d (i) *in section 3 which applies to vessels not in sight of one another in restricted visibility* mentions the case in which an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken. Whereas *Rule 13 in section 2 that is concerned with overtaking applies to vessels in sight of one another* whether or not the visibility is restricted.

These two rules, although they occur in two contradictory sections (section 2 and 3), they agree in the same action. Therefore, Rule 19. d (i) should be rephrased in order to avoid any confusion that would lead to misunderstanding

the rule.

Rule (19-d) it is suggested to amend this Article to Read as Follows:

(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
- ii. An alteration of course towards a vessel abeam or abaft the beam.

7.5 RULE 20

- (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.

It is observed that there is no reference, whether in Rule 20 or in any rules in the COLREGs, to the fact that the light should be exhibited 24 hours, although is widely used practically as it is safer to avoid any human error like forgetting to exhibit the lights in sunset. Thus, it has been suggested to mention this point in the rule,

So, it is suggested to amend rule no. 20. To read as follows:

- (a) Rules in this Part shall be complied with in all weathers.
- (b) The Rules concerning lights shall be complied 24 hours during sailing, 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 Rules concerning shapes shall be complied with by day.
- (d) The lights and shapes specified in these Rules shall comply with the provisions of Annex I to these Regulations.

7.6 RULE 27 Adding a New Article

It is suggested to add an article after (b) that would be **Rule 27 c**

C-"Not under command" light. (Two all-round red lights) can be used from "the restricted in her ability to maneuver" light (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), where an electrical system is arranged to join the two red lights of the vessel not under command together in one bottom called NUC, which shall exhibit the light of NUC. An electrical system

is also arranged to join the two red light with the middle white light in a bottom called RAM which shall exhibit the three lights as "red white red" provided the vertical and horizontal distances required as prescribed in Annex 1.(IACS. interpretation to COLREG)

7.7 RULE 38

The whole rule should be amended as most of the exemptions are disregarded for more than 35 years.

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 4 years after the date of entry into force of these Regulations. **This rule was entered into force from 1977 to 1981, thus there is no need for this exemption and must be disregarded as more than 35 years have passed.**
- (b) The installation of lights with color specifications as prescribed in Section 7 of Annex I to these Regulations, until 4 years after the date of entry into force of these Regulations. **This rule was entered into force from 1977 to 1981, thus there is no need for this exemption and must be disregarded as more than 35 years have passed.**
- (c) The repositioning of lights as a result of conversion from Imperial to metric units and rounding off measurement figures, permanent exemption. **Nowadays, ships do not use Imperial to metric units; thus, it should be disregarded.**
- (d) The repositioning of masthead lights on vessels of less than 150 meters in length, resulting from the prescriptions of Section 3(a) of Annex I to these Regulations, permanent exemption. **This exemption 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. This exemption is disregarded once these vessels reach the end of their life service; thus, this should be clearly mentioned, and the whole article should be rephrased.**
 - (ii) The repositioning of masthead lights on vessels of 150 meter or more in length, resulting from the prescriptions of Section 3(a) of Annex I to these Regulations, until 9 years after the date of entry into force of these Regulations. **This rule was entered into force from 1977 to 1986, thus there is no need for this exemption now and must be disregarded as more than 29 years have passed.**

Ships that are built now of 150 meter length or more should be exempted from the rules of section 3(a) of Annex I due to their large size and length. If this rule was applied on a vessel of 300 meter, the after masthead would fall in the middle of the vessel in front of the bridge; which hinders visibility, and cargo handling. Thus, we suggest rephrasing the whole rule to serve the maritime industry's development.

- (e) The repositioning of masthead lights resulting from the prescriptions of Section 2(b) of Annex I to these

Regulations, until 9 years after the date of entry into force of these Regulations. **This rule was entered into force from 1977 to 1986, thus there is no need for this exemption now and must be disregarded as more than 29 years have passed.**

- (f) The repositioning of sidelights resulting from the prescriptions of Sections 2(g) and 3(b) of Annex I to these Regulations, until 9 years after the date of entry into force of these Regulations. **This rule was entered into force from 1977 to 1986, thus there is no need for this exemption now and must be disregarded as more than 29 years have passed.**
- (g) The requirements for sound signal appliances prescribed in Annex III to these Regulations, until 9 years after the date of entry into force of these Regulations. **This rule was entered into force from 1977 to 1986, thus there is no need for this exemption now and must be disregarded as more than 29 years have passed.**
- (h) The repositioning of all-round lights resulting from the prescription of Section 9(b) of Annex I to these Regulations, permanent exemption.

It is observed that this rule has been set specifically for vessels provided that they comply 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, 1972.

Thus, in both rules 38 article (a) and (b), there are 4 years exemption after the date of entry into force of these Regulations, or even after 1986. There is no need for this exemption as more than 29 years have passed. Thus, it should be disregarded. In rules 38 article (d) 2, (e), (f), (g), and (h), there are 9 years are exemption after the date of entry into force of these Regulations, or even after 1986. There is no need for this exemption as more than 29 years have passed. Thus, it should be disregarded. In article (d) 1, d (2), and (h), there is a permanent exemption. This means that this rule should be amended and nothing should be mentioned except for the exemptions in (d) 1, (d) 2, and (h) after rephrasing and arranging.

RULE 38 after the Suggested Amendment

Part one: 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 repositioning of all-round lights resulting from the prescription of Section 9 (b) in Annex I, to these Regulations, permanent exemption. This exemption shall be disregarded when the vessel reaches the end of her service life.

Part two: the vessels that have been built after the International Regulations for Preventing Collisions at Sea entered into force shall be exempted from the following:

- (b) The repositioning of masthead lights on vessels of 150 meter or more in length, resulting from the prescriptions of Section 3(a) of Annex I from these Regulations, permanent exemption, provided the horizontal distances between the masthead lights.

7.8 Annex

7.8.1 Annex Me section 3(b)

On a power-driven vessel of 20 meters 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.

The distance between the sides of the vessel is not specified whether to be 1 or 2 or 5 meters, as this distance should be near the side in wide-beam vessels. It is important to determine the real dimensions of the vessel during the maneuver because if the lights are placed at the side of the vessel at a distance of 5 meters, the lookout would see the vessel 10 meters narrower and smaller than reality; which would create some confusion, and would affect the decision makers in the bridge during the maneuver. Therefore, it is suggested to amend this rule.

Annex I section 3(b) after the suggested amendment can read as follow:

On a power-driven vessel of 20 meters 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 of a distance not more than 10% of the breadth of the vessel inboard from the side, up to maximum of 1 meter. (IACS Interpretations to COLREG 2015)

7.8.2 Annex Me Section 3 Adding a New Section

There is no reference in the COLREG to the fact that there should be duplicated the navigational lambs, one is basic and one is auxiliary, though they exist in practical life. This is a legal- binding norm, although it does not exist in the COLREG. Thus, the following new part should be added to Annex I section 3: navigational lights shall be duplicated lambs, where are is basic and one is auxiliary, where the application is impractical. (IACS Interpretation to COLREG 2015)

8. CONCLUSIONS & RECOMMENDATIONS

The last period has witnessed a significant increase in the marine accidents especially the collision occurred due to the huge increase in the world trade that has led to increasing the number of larger and faster vessels. This, consequently, has increased the interaction between vessels, and their joint maneuvers whether in the international or inland waterways; which has resulted in a frequent concurrence of collision at sea.

By analyzing these accidents, it was found that the main cause for these accidents is human errors, whether due to lack of knowledge of the rules or misunderstanding of it; which leads to the unsuccessful application that ends up with collision accidents (European maritime safety agency). This confusion or misunderstanding is resulted from the inability of the COLREG to cope with the vast and new developments in the maritime industry since it was issued in 1972.

Although several amendments have been made, the last ones were in 2007; there are still some failures and weakness that have been previously mentioned. In order for these regulations to cope with the vast developments in the maritime industry, it is recommended to:

- Consider these suggested amendments, and rephrase the rules and points that have been previously mentioned to clear up any confusion or misunderstanding that could lead to wrong application by the decision makers and would eventually result in a collision.

- Create new scenarios for those who study on modern simulators to simulate failure situations in order to make the right decisions to avoid any case of confusion or misunderstanding that can lead to collision. This should be done in accordance with what has been mentioned in (table A-II/1 and table A-II/2) STCW. Manila 2010.
- Validate the amendments of (table A-II/1 and table A-II/2) concerning the simulator's trainings to and to obligate maritime educational institutes to comply with, to merge between the practical and the theoretical life, and to train the officers for making the right decision, and as a result, the rate of collision accidents will be reduced.
- Consider these rules by revising its teaching methodology, the required timeframe, assessment methods and instruments, to raise the minimum COLREGs exam passing grade to 90%, and to keep the English as the main teaching language.

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