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Optimising Watchkeeping to Prevent Collision Hazards on the MV Francisca

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ABSTRACT

Negligence during the navigational watch is a major contributor to collisions at sea, even though the International Regulations for Preventing Collisions at Sea (COLREG) 1972 and the STCW Convention, as amended in 2010, set clear requirements for lookout, assessment of collision risk, and watchkeeping arrangements. This study analyses efforts to prevent collision hazards caused by negligence during the navigational watch on the general cargo ship MV Francisca. It was carried out during the authors' sea practice from 5 August 2022 to 5 August 2023 using a descriptive qualitative design, with data collected through direct observation, interviews with watchkeeping officers and crew, and documents such as the logbook and standard operating procedures. The units of analysis were the officers of the watch and the navigation equipment used during the watch. A near-collision on 25 January 2023, during a voyage from Rotterdam to Reykjavik in Scottish waters in snow and waves of about 6 m, served as the case study. The Second Officer ignored repeated reports from the cadet that a fishing vessel on the starboard side was less than 1 nautical mile away with a decreasing closest point of approach, because he was completing a passage plan that should have been prepared before departure; a collision was avoided only by a late alteration of 75° to starboard and a reduction to dead slow ahead. The Chief Officer had also left his 16:00–20:00 watch to the Second Officer outside the latter's watch hours. The study concludes that watchkeeping on the MV Francisca did not fully comply with COLREG 1972 and STCW, particularly regarding continuous lookout, response to reports, handover, and avoidance of distracting tasks. Stricter watchkeeping discipline, better use of radar and ECDIS, effective communication within the bridge team, and training are recommended.

Keywords: Watchkeeping, Collision Hazard, COLREG 1972, STCW, MV Francisca

ABSTRAK

Kelalaian selama dinas jaga navigasi merupakan penyebab utama tubrukan di laut, meskipun International Regulations for Preventing Collisions at Sea (COLREG) 1972 dan Konvensi STCW Amandemen 2010 telah menetapkan ketentuan yang jelas mengenai pengamatan, penilaian risiko tubrukan, dan pengaturan dinas jaga. Penelitian ini menganalisis upaya pencegahan bahaya tubrukan yang disebabkan oleh kelalaian selama dinas jaga di kapal general cargo MV Francisca. Penelitian dilaksanakan selama praktik laut penulis sejak 5 Agustus 2022 hingga 5 Agustus 2023 dengan metode deskriptif kualitatif melalui observasi langsung, wawancara dengan perwira jaga dan awak kapal, serta dokumen seperti log book dan prosedur operasi standar. Unit analisis penelitian ini adalah perwira jaga dan peralatan navigasi yang digunakan selama dinas jaga. Kejadian hampir tubrukan pada 25 Januari 2023, saat pelayaran dari Rotterdam menuju Reykjavik di perairan Skotlandia dalam kondisi salju dan gelombang sekitar 6 m, dijadikan studi kasus. Mualim II mengabaikan laporan berulang dari kadet bahwa sebuah kapal nelayan di sisi kanan berada pada jarak kurang dari 1 mil laut dengan nilai CPA yang terus menurun, karena sedang menyelesaikan passage plan yang seharusnya telah disiapkan

sebelum keberangkatan; tubrukan baru dapat dihindari melalui perubahan haluan 75° ke kanan dan pengurangan kecepatan menjadi dead slow ahead yang terlambat. Mualim I juga meninggalkan jam jaga 16.00–20.00 dan menyerahkannya kepada Mualim II di luar jam jaganya. Penelitian ini menyimpulkan bahwa pelaksanaan dinas jaga di MV Francisca belum sepenuhnya sesuai dengan COLREG 1972 dan STCW, terutama terkait pengamatan terus-menerus, tanggapan terhadap laporan, serah terima jaga, dan menghindari pekerjaan yang mengganggu konsentrasi. Disarankan peningkatan disiplin dinas jaga, pemanfaatan radar dan ECDIS secara optimal, komunikasi yang efektif dalam tim anjungan, serta pelatihan.

Kata Kunci: Dinas Jaga, Bahaya Tubrukan, COLREG 1972, STCW, MV Francisca

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1. INTRODUCTION

The International Regulations for Preventing Collisions at Sea (COLREG) 1972 require every vessel to maintain a proper lookout, to assess whether risk of collision exists, and to take the necessary action to avoid collision (International Maritime Organization [IMO], 2018; Supriyono & Subandrijo, 2017). Rule 8(a) states that any action taken to avoid collision shall be taken in accordance with the Rules 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 (IMO, 2018). The STCW Convention, as amended in 2010, complements these rules with requirements for fitness for duty, watch arrangements, and the principles to be observed in keeping a navigational watch (IMO, 2011).

Despite continuous improvements in safety standards, shipping still carries risks, and collisions remain one of the main types of marine accidents, together with sinking, fire or explosion, and grounding. Human error is a dominant factor in these accidents (Sanchez-Beaskoetxea et al., 2021; Kasyk et al., 2023), and inadequate lookout, poor situational awareness, and fatigue are recurring causes of navigational

incidents (Youn et al., 2019; Fan & Yang, 2024). National studies have likewise emphasised the importance of watch handover procedures (Fahrisani et al., 2022; Nuryaman & Denisyanti, 2022), the radar skills of watchkeeping officers (Sidauruk et al., 2023), and the role of navigation equipment in safety (Syibli & Nuryaman, 2021).

During the authors' sea practice on the general cargo ship MV Francisca, a near-collision occurred on 25 January 2023 while the ship was sailing from Rotterdam to Reykjavik in Scottish waters. The ship came dangerously close to a fishing vessel because of negligence by the officer of the watch. Few studies have documented how such negligence develops on board in actual operations. This study therefore aims to analyse how the navigational watch on the MV Francisca was carried out, to identify the forms of negligence that led to the collision hazard, and to formulate measures to prevent similar incidents.

1.1. Navigational Watchkeeping

The navigational watch is the period during which an officer, assisted by ratings, is responsible for the safe navigation of the ship, including lookout, monitoring of the ship's position and the traffic, and compliance with COLREG. Its purpose is to eliminate or reduce the risk of collision, grounding, and other hazards so that a safe and controlled situation is maintained. In practice, however, accidents and groundings still occur because watches are not kept in accordance with the required procedures (Supriyono & Subandrijo, 2017). Work on board is organised into day work, covering administration, maintenance, and ship operations according to each crew member's duties, and watchkeeping, covering sea watches, port watches, and radio watches throughout the 24-hour day.

1.2. Fitness for Duty and Watch Arrangements under STCW

Section A-VIII/1 of the STCW Code requires all persons assigned duty as officer in charge of a watch or as a rating forming part of a watch to be provided with a minimum of 10 hours of rest in any 24-hour period and 77 hours in any 7-day period. The hours of rest may be divided into no more than two periods, one of which must be at least 6 hours long, and the interval between consecutive periods of rest must not exceed 14 hours. These requirements need not be maintained in an emergency or in other overriding operational conditions, and watch schedules must

be posted where they are easily accessible (IMO, 2011). Fatigue resulting from inadequate rest is a significant contributor to marine accidents (Fan & Yang, 2024).

1.3. Watch Handover

Section A-VIII/2 of the STCW Code sets out the principles to be observed when handing over the navigational watch (IMO, 2011). The relieving officer must not take over the watch if the officer being relieved has reason to believe that the relieving officer is unfit to carry out the watch duties, for example because of illness or the influence of alcohol, in which case the master must be informed. The relieving officer must ensure that the members of the watch are fully capable of performing their duties, particularly with regard to adjustment to night vision, and must be satisfied about the ship's actual or estimated position, the intended track, course and speed, engine controls, and navigational hazards before taking over. If a manoeuvre or other action to avoid a hazard is in progress at the moment of handover, the handover must be deferred until the action has been completed. The officer in charge of the navigational watch must also not undertake duties that would interfere with the safe navigation of the ship (IMO, 2011). Proper handover procedures have been shown to support safe watchkeeping on Indonesian ships (Fahrisani et al., 2022; Nuryaman & Denisyanti, 2022).

1.4. Use of Navigation Equipment to Assess Risk of Collision

Rule 7 of COLREG requires every vessel to use all available means appropriate to the prevailing circumstances and conditions to determine whether risk of collision exists; if there is any doubt, such risk shall be deemed to exist. Proper use must be made of radar equipment, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects, and assumptions must not be made on the basis of scanty information, especially scanty radar information. Risk of collision shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change, and 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 (IMO, 2018; Supriyono & Subandrijo, 2017). Radar, ARPA, AIS, and ECDIS support this assessment (Syibli & Nuryaman, 2021; Sidauruk et al., 2023), although the introduction of ECDIS has

changed watchkeeping practices and created new forms of reliance on electronic systems (Car et al., 2020; Kayisoglu et al., 2022).

2. METHOD

This study used a descriptive qualitative method to obtain an in-depth understanding of negligence in the navigational watch and of efforts to prevent collision hazards on board. A qualitative approach was chosen because the study focused on the behaviour, perceptions, and actions of individuals in the natural setting of shipboard life (Moleong, 2011). The study was carried out on board the MV Francisca during the authors' sea practice from 5 August 2022 to 5 August 2023.

The subjects of the study were the persons involved in navigational watchkeeping, particularly the officers of the watch. The units of analysis were (a) people, namely the officers of the watch and the crew involved in navigation, and (b) navigation aids, such as radar, ARPA, AIS, ECDIS, the compass, and other observation equipment. Data were collected through direct observation of the navigational watch, in-depth interviews with officers of the watch and crew involved in navigation, and documentation including the logbook, standard operating procedures, and the relevant regulations, namely COLREG 1972 and STCW 1978 as amended in 2010. The persons involved are identified only by their rank. Data were analysed interactively and continuously through data reduction, data display in narrative and tabular form, and conclusion drawing and verification by comparing the findings with the requirements of COLREG and STCW (Miles et al., 2014).

3. RESULTS AND DISCUSSION

3.1. Near-Collision Incident

The incident used as the case study occurred on 25 January 2023 while the MV Francisca was sailing from Rotterdam to Reykjavik in Scottish waters. The weather was bad, with snow and waves of about 6 m. The sequence of events is summarised in Table 1.

Table 1. Sequence of the Near-Collision Incident on the MV Francisca

Stage	Event
1	The cadet on watch with the Second Officer observed another vessel on the starboard side on the ECDIS.
2	The cadet reported that the vessel was less than 1 nautical mile (NM) away according to the radar. The Second Officer ignored the report because he was busy completing a passage plan that should have been prepared before the ship's departure.

Stage	Event
3	The cadet reported again that the closest point of approach (CPA) of the vessel was decreasing, indicating an increasing risk of collision. The report was again ignored.
4	The Second Officer realised that the fishing vessel on the starboard side was at a critical distance and immediately ordered an alteration of course of 75° to starboard and a reduction of speed to dead slow ahead.
5	The collision was avoided.

In addition to the negligence of the Second Officer, another violation was identified: the Chief Officer had left his 16:00–20:00 watch and handed his responsibility to the Second Officer outside the latter's watch hours.

3.2. Watchkeeping Deficiencies

The observations and interviews showed that watchkeeping on the MV Francisca did not fully comply with COLREG 1972 and STCW 1978 as amended in 2010, particularly regarding vigilance, observation of the ship's surroundings, and the responsibilities of the officer of the watch. The deficiencies and the corresponding requirements are summarised in Table 2.

Table 2. Watchkeeping Deficiencies on the MV Francisca and the Corresponding Requirements

Deficiency observed	Requirement
No continuous lookout supported by the navigation equipment	COLREG Rule 5 (lookout) and Rule 7 (use of all available means, including radar plotting, to assess risk of collision)
Visual and radar reports from the cadet assisting the watch were ignored	COLREG Rule 7 (if in doubt, risk of collision shall be deemed to exist)
Avoiding action was taken late, only when the target was at a critical distance	COLREG Rule 8 (action to be positive, made in ample time, and with due regard to good seamanship)
Inadequate handover and unscheduled transfer of the watch from the Chief Officer to the Second Officer	STCW Code Section A-VIII/2 (watch arrangements and handover) and Section A-VIII/1 (fitness for duty and hours of rest)
Preparation of documents during the watch that distracted the officer	STCW Code Section A-VIII/2 (the officer of the watch shall not undertake duties that interfere with safe navigation)

3.3. Discussion

The near-collision on the MV Francisca was caused primarily by a failure of vigilance by the officer of the watch rather than by a lack of equipment: the radar and ECDIS had detected the fishing vessel, and the cadet had correctly reported its range and decreasing CPA. This pattern is consistent with studies showing that inadequate lookout and the failure to act on available information are among the most frequent human errors in navigational accidents (Youn et al., 2019; Weng et al., 2019; Kasyk et al., 2023), and that responsibility for accidents often extends beyond the individual crew member to the organisation of work on board (Sanchez-

Beaskoetxea et al., 2021). Because the fishing vessel was on the starboard side, the MV Francisca would normally have been the give-way vessel in a crossing situation, and a power-driven vessel must also keep out of the way of a vessel engaged in fishing (IMO, 2018); early and substantial action was therefore required. The snow and heavy seas also called for a safe speed and heightened lookout. Research on collision avoidance highlights the importance of applying COLREG consistently and of timely alerts for both give-way and stand-on vessels (Du et al., 2020; García Maza & Poo Argüelles, 2022), while collision risk indices and decision support systems can assist the officer of the watch but do not replace the officer's judgement (Hu et al., 2020; Aylward et al., 2022).

The distraction caused by preparing the passage plan during the watch, and the unscheduled transfer of the watch by the Chief Officer, indicate weaknesses in voyage planning, watch arrangements, and bridge discipline. Such organisational failures increase workload and fatigue, which are known to degrade watchkeeping performance (Fan et al., 2018; Fan & Yang, 2024), and human error assessment frameworks show that both individual and management factors must be addressed to prevent accidents (Bowo & Furusho, 2019). The growing reliance on ECDIS and other electronic systems also requires officers to verify information critically and to maintain their traditional lookout skills (Car et al., 2020; Kayisoglu et al., 2022), and raises questions of responsibility when technology is not used properly (Tsimplis & Papadas, 2019). The accuracy limits of navigation data in real close-quarters situations further emphasise the need for timely action (Engler et al., 2021). Deck officers' understanding of COLREG remains central to safe navigation, including in the context of increasing automation (Hannaford et al., 2022).

Based on these findings, the following measures are recommended: (1) strict discipline and full responsibility in keeping the navigational watch, including continuous vigilance; (2) improved visual and technical lookout skills and optimal use of radar, ARPA, and ECDIS; (3) effective communication and coordination within the bridge team, including a culture in which reports from cadets and ratings are acted upon, and proper handover at the change of watch; and (4) strict application of standard procedures, including completing the passage plan before departure and avoiding administrative tasks that distract the officer of the watch.

This study is limited to a single incident on one ship, and the information was obtained from the perspective of a cadet on board.

4. CONCLUSION

Based on the study conducted on board the MV Francisca, the following conclusions can be drawn.

1. Negligence in keeping the navigational watch was the main factor that nearly caused a collision with a fishing vessel in Scottish waters on 25 January 2023. The officer of the watch (Second Officer) ignored the cadet's reports of a vessel on the starboard side even though the radar data and the decreasing CPA showed an increasing danger, and he took avoiding action only at a critical distance.
2. The Second Officer's prioritisation of completing the passage plan over keeping the watch, and the transfer of responsibility by the Chief Officer outside the scheduled watch, violated the basic principles of watchkeeping set out in COLREG 1972 and STCW 1978 as amended in 2010.
3. A comprehensive evaluation of the watchkeeping system on board is needed, together with stricter watch discipline, optimal use of navigation aids, effective communication within the bridge team, and training to raise officers' awareness that safe navigation depends on their vigilance and professionalism.

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