# Reporting Hazardous Occurrences at Sea from the Aspect of Maritime Professionals

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As near-misses are considered precursors to accidents and share the same root causes, reporting them to improve safety and reduce accidents is imperative. Near-miss reporting in shipping is a regulatory requirement under the International Safety Management Code (ISM Code), intended to improve maritime safety and pollution prevention. This objective is achieved by trustworthy reporting of hazardous occurrences on board ships. After reporting, serious near-miss events are investigated and analysed. The data obtained is used to implement corrective actions, such as more adequate and safer procedures. However, seafarers are not reporting all observed near-miss events due to various factors that act as barriers and thereby prevent reporting. Besides underreporting, which is recognised as the most significant problem in near-miss management systems implemented on board ships, fabricated near-miss reports are the second one. Therefore it is the aim of this research to investigate what types of near-miss seafarers report, if they fabricate them, and if so, why. To achieve the aim of the study, the authors have created a short questionnaire for active and experienced seafarers. The questionnaire was internationally distributed and, in the end, involved 102 participants. The responses have been analysed by descriptive statistics, and furthermore, the participants have been divided into groups (division by rank and by experience) to investigate if there are any statistically important differences between them. The analysis of variance (ANOVA) has been used to identify possible differences. The analysis of responses has pointed out that seafarers seem to frequently fabricate near-miss reports in order to comply with company requested near-miss report quotas. However, although they fabricate reports, most respondents believe that near-miss management systems improve safety at sea. In addition, no significant differences have been observed between the groups except for one. Although considered important for maritime safety, near-miss management systems are compromised with fabricated reports made to comply with requested reports "quotas", whereas the most experienced maritime professionals fabricate more than others. It can be concluded that learning from near-misses and incidents in the maritime industry relies on a significant number of fabricated reports and focuses on nonexistent events. Instead of leading to safer shipping, conclusions drawn from such reports create an unsafe atmosphere, where actual and serious events are kept hidden, thereby rendering learning impossible.

**KEYWORDS**
~ Near-miss
~ Maritime safety
~ Maritime industry
~ Accident prevention
~ Learning from incidents (LFI)

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doi: 10.7225/toms.v14.n02.s07

Received: 7 Jan 2025 / Revised: 19 Mar 2025 / Accepted: 22 Mar 2025 / Published: 20 Jul 2025

## 1. INTRODUCTION

Safety Management Systems (SMS) and procedures implemented in commercial shipping fleet have improved safety at sea and strongly influenced the reduction of fatal injuries (Pereira et al., 2018). The SMS prescribes the implementation of the requirement to report hazardous occurrences on board by the ship's crew. Hazardous occurrences include near-misses, while such a system is called a near-miss management system. Near-miss is defined by the International Maritime Organisation (IMO) as a chain of events and/or conditions that could have resulted in a negative outcome but was prevented coincidentally (IMO, 2008). Additionally, as the term is quite broad, there could be minor near-misses that, if not avoided, could result in a minor accident. At the same time, there are also major near-misses and procedure violations that have the potential for catastrophic events. The system relies on learning from incidents (LFI), where near-miss reports are used by shore management for analyses and corrective actions (Hasanspahić et al., 2024) (Haas et al., 2020) (Shneiderman, 2020). Besides regulatory obligation under the ISM Code, it is believed that near-miss reporting will have a strong influence on increasing safety (Winkler et al., 2019), which will have other positive effects, like economic benefits and a better company image. Near-misses and accidents share the same root causes, while the basic difference between them is the outcome (De Leo et al., 2023), (Hasanspahić et al., 2020). Knowing and analysing the near-misses, it is possible to proactively approach problems on the particular ship or fleet and avoid future accidents. However, near-misses are not adequately reported due to various barriers. Examples of the barriers to reporting are fear of being blamed or embarrassed, but also fear of being legally liable for some hazardous occurrences (IMO, 2008). Confidentiality of reports and a no-blame culture on board are some of the tools to achieve efficient near-miss reporting. According to the National Safety Council, management should promote a reporting culture and train the employees, but they should also provide some incentives for reporting (NSC, 2024). Unfortunately, research (Hasanspahić et al., 2021) indicates that incentives and a fixed number of near-miss requested by management could have a negative impact on the near-miss system, as crew members will sometimes try to report fabricated near-miss to achieve the target. Additionally, despite efforts to promote honest reporting, research (Storgård et al., 2012) found that seafarers primarily report technical faults to avoid reporting faults done by fellow colleagues or themselves. Another research (Hasanspahić et al., 2022), conducted among the crew of one tanker ship, found that most of the reported near-misses were related to technical faults, procedure violations, general housekeeping, and personal protective equipment usage. These findings are in contrast with the fact that human factors represent a significant and major cause of maritime accidents (Cao et al., 2023). In fact, if near-misses are precursors to accidents, there should be a strong relation between them, but, somehow, barriers in reporting are still affecting this relation. Hasanspahić et al. (2023), in a research targeting Masters and Safety Officers, revealed that a great number of respondents seem to think that not all observed near-misses are reported. Finally, it is concluded that a significant barrier to efficient near-miss management system is underreporting. Consequently, conclusions based on reports affected by barriers are not sound, and derived solutions will not solve the problem. The accident of Hoegh Osaka in 2015 highlights the problem of relying on incomplete or flawed data, where information entered in the loading computer was false, and the results were not related to reality (MAIB, 2016), leading to listing, flooding, and grounding of the vessel. In this paper the authors investigate if the near-miss reporting culture needs improvement and if it is possible to identify weaknesses in the system based on near-miss analysis. Active crew members have been approached to investigate their perspective on near-miss reporting. The focus is particularly on honest reporting of critical near-misses and opting to report minor near-misses to achieve companies' quota and avoid blame. Crew opinion about the near-miss system in improving safety at sea is also questioned, as this will indicate the willingness of crew members to work on safety issues and acceptance of the near-miss system.

## 2. METHODOLOGY

Research data has been collected using an online questionnaire prepared by the authors who are maritime experts, in accordance with the observed problems. The questionnaire was distributed internationally, targeting randomly selected maritime experts with different navigational background. The questionnaire was prepared using Google Forms, an online open-source survey tool, and questions were designed as closed-type questions. Research based on expert knowledge is sometimes problematic due to the broad definition of experts (Krueger et al., 2012) and objectivity (Essl et al., 2020). This problem in expert knowledge elicitation was solved by distributing the questionnaire to active seafarers, only excluding other maritime stakeholders. The questionnaire consisted of two parts:

- Personal profile questions—PPQs.
- Expert opinion questions—EOQs.

The first part of the questionnaire contains personal profile questions to which respondents answer by choosing only one option as a response (Table1).

| | Question | Possible answers | | | | | |
|---|---|---|---|---|---|---|---|
| **PPQ1** | What is your rank on board. | Master | Chief Officer | Officer of the watch | Chief Engineer | 2nd Engineer | Engineer of the watch |
| **PPQ2** | What is your total working experience | 0-5 | 5-10 | 10-15 | 15-20 | 20-25 | Over 25 |

Table 1.Personal profile questions

The second part of the questionnaire consists of four statements, to which respondents answer using a Likert scale (Table 2):

| | Question | Possible answers | | | | |
|---|---|---|---|---|---|---|
| **EOQ1** | I would always report serious near-miss, even if I know that shore management would never find out about that particular near-miss. | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
| **EOQ2** | I prefer to report benign near-miss just to avoid problems with shore management. | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
| **EOQ3** | I report near-miss that didn't happen at all just to comply with company requirement. | Never | Occasionally | Sometimes | Often | Always |
| **EOQ4** | I think that the near-miss system is improving safety at sea. | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |

Table 2. Expert opinion questions

While the first group of questions has been used to describe the personal profile of respondents, the second group aims at detecting problems in near-miss reporting at sea. A descriptive statistical analysis of the first group of questions has revealed the respondents' personal profiles, namely seafarers' ranks and experiences. Analysed groups of respondents have been used for inferential statistics on the second group of questions to investigate any differences in answers between groups. Analyses of the second group of questions could be divided into two parts: the first part, where by the method of descriptive statistics, general characteristics of analysed data would be presented, and the second part, where analysis of variance (ANOVA) has been utilised to find some possible differences between groups. ANOVA has been used to test the differences between the arithmetic means of several groups, and a conclusion has been drawn whether the samples (groups) belong to the same population (Arnerić and Protrka, 2019). The null hypotheses is that all the population means are equal, while alternative is that at least one of the population means is different. When using the ANOVA test, the total variability (SST) is separated into the variability between groups (SSR) and the variability within groups (SSE). Using these values, the F-ratio can be obtained:

$$SSR = \sum_{j=1}^{k} N_j \left(\overline{y_j} - \bar{y}\right)^2 \tag{1}$$

$$SSE = \sum_{j=1}^{k} \sum_{i=1}^{N_j} \left(y_{ij} - \overline{y_j}\right)^2 \tag{2}$$

$$SST = \sum_{i=1}^{k} \sum_{j=1}^{N_j} \left(y_{ij} - \overline{y}\right)^2 \tag{3}$$

$$F = \frac{\frac{SSR}{k-1}}{\frac{SSE}{N-k}} = \frac{MSR}{MSE} \tag{4}$$

Where $\overline{y_j}$ represents the arithmetic mean for each of the $k$ sample groups of size $N_j$, $j = 1,2,\dots,k$, $\bar{y}$ represents the arithmetic mean of all the groups combined, $y_{ij}$ is the i-th value of the variable in the j-th group, and $N = N_1 + N_2 + \cdots + N_k$.

The analysis of variance assumes that the variances are equal in groups or samples, so Levene's test can be used to check this assumption (Gastwirth et al., 2009). The null hypothesis that the population variances are equal is tested. Statistic of Levene test can be described as:

$$F = \frac{(N-k)}{(k-1)} \frac{\sum_{i=1}^{k} N_i \left(\overline{Z_{i.}} - \overline{Z_{..}}\right)^2}{\sum_{i=1}^{k} \sum_{j=1}^{N_i} \left(Z_{ij} - \overline{Z_{i.}}\right)^2} \tag{5}$$

where *k* is the number of groups we are comparing, *N* the total number of samples, $N_i$ represents the number of samples in group *i*, $y_{ij}$ the value of the variable in group *i* for case *j*, $\overline{Z_{i.}}$ is the arithmetic mean of the groups of $Z_{ij}$, while $\overline{Z_{..}}$ is the overall mean of $Z_{ij}$. If the resulting Levene's test p-value is less than 0.05, the null hypothesis of equal variances is rejected, and it is concluded that there is a difference between the population variances. In this case, it is possible to use the Kruskal-Wallis test (Ostertagova et al., 2014) as an alternative to the ANOVA test. Since ANOVA cannot provide data on the differences between individual groups, it is possible to examine the differences between them by Scheffee post-hoc tests (Midway et al., 2020):

$$F_s = \frac{\left(\overline{X}_i - \overline{X}_j\right)^2}{MSR\left(\frac{1}{N_i} + \frac{1}{N_j}\right)} \tag{6}$$

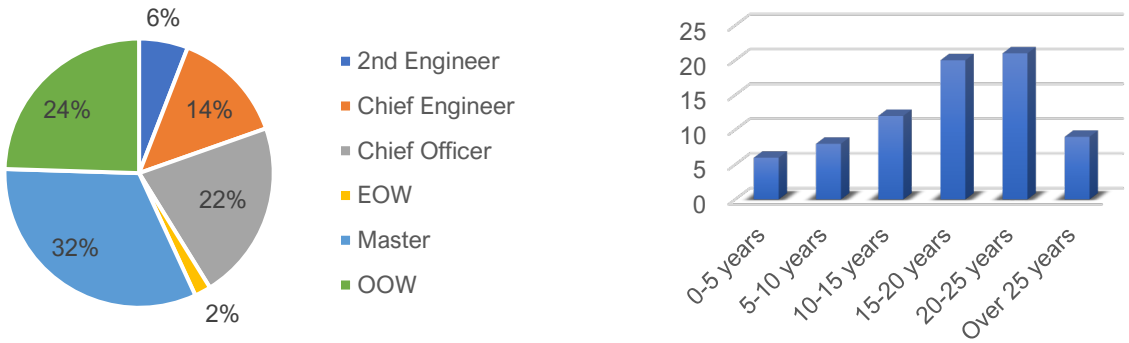
Where $\overline{X}_i$ is the arithmetic mean of the *i-th* sample, $\overline{X}_1$is the arithmetic mean of the *j-th* sample, $N_i$ is the number of measurements within the *i-th* sample, $N_j$ is the number of measurements within the *j-th* sample. With the Scheffee test, eventual differences between individual groups would be determined.

## 3. RESULTS

The results of the study are presented as descriptive statistics for the first part of the research, containing the respondents' profiles. The second part consists of descriptive statistics of maritime experts' opinions, while in the third part inferential statistics has been used to test data on differences between groups of respondents.

### 3.1. Personal profile questions

A total of 102 active seafarers, different in rank and experience, have participated in this research (Figure 1). The answers to the question PPQ1 are given within the previously given categories as follows: Master, Chief Officer, Officers of Watch (OOW), Chief Engineer, 2nd Engineer, Engineers of Watch (EOW). It contains answers from 33 Masters, 22 Chief Officers, 25 OOW, 14 Chief Engineers, 6 2nd Engineers and 2 EOW. The largest group of respondents is Masters, with a share of 32,4%, followed by OOW (24,5%). The responses to question PPQ2 are limited to the following categories: 0-5 years, 10-15 years, 15-20 years, 20-25 years, and over 25 years. The participants with total working experience between 20 and 25 years make up the largest group, with a share of 28%, followed by a group of respondents with experience between 15 and 20 years (26%).



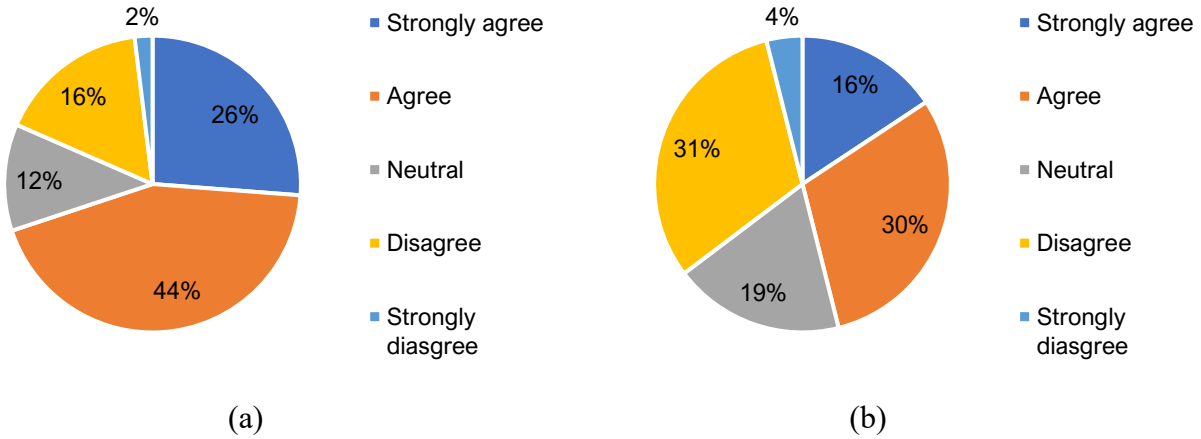

(a) (b)

Figure 1. Participants in the questionnaire (a) by navigational rank and (b) by their total experience at sea.

The smallest group of participants in terms of rank is EOW, while the smallest group in terms of experience is the group containing respondents from the least experienced seafarers, with experience from 0 to 5 years.

### 3.2. Expert opinion questions

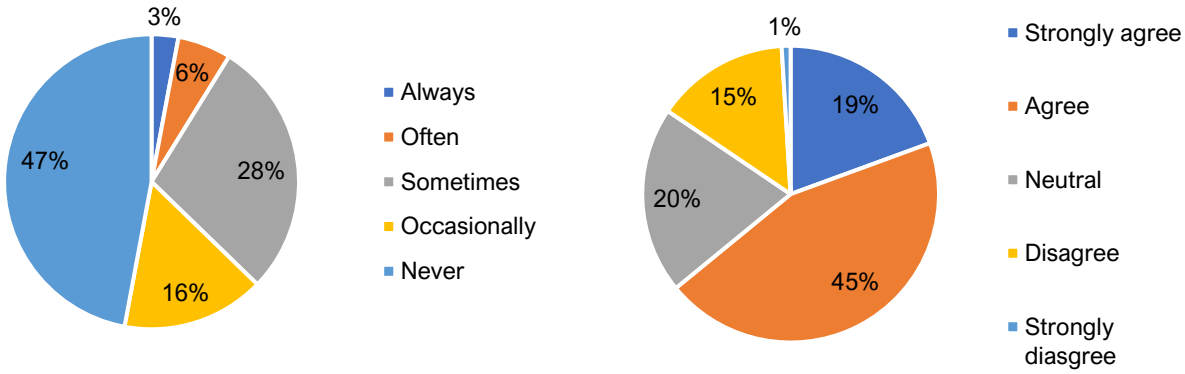
The general shares of answers to the questions EOQ1 and EOQ2 are shown in Figure 2. Results of the first question (EOQ1), aiming to find out how many seafarers will report serious near-miss, even in cases when they do not feel to be bound to do so by the shore management, reveals that the largest group of respondents (43%) agree with the proposed question, while the smallest group of only 2% strongly disagree with the proposition. Still, a significant share of respondents disagrees with reporting serious near-miss (17%) if they are sure that the shore management will never find out. Results of the second question (EOQ2) indicate that a significant share of respondents (16%) strongly agree with reporting benign near-miss just to avoid problems with shore management, while 30% of respondents agree with the statement. Only 4% of experts strongly disagree with EOQ2.




(a) (b)

Figure 2. General shares of responses (a) EOQ1 and (b) EOQ2.

Expert opinions to the questions EOQ3 and EOQ4 are shown in Figure 3. The largest group of experts have never reported near-misses that didn't happen at all (47%), but 53% of respondents have at least occasionally reported fabricated near-misses. Only 3% of respondents always report near-misses that didn't happen at all. Finally, the question EOQ4 targets experts' opinions on the efficiency of near-miss systems on board ships. The largest group of respondents agree with the statement that near-miss reporting is improving safety at sea (44%), while 20% of experts agree with the statement. Only 1% of respondents strongly disagree that the near-miss system is effective in improving safety at sea.




(a) (b)

Figure 3. General shares of responses (a) EOQ3 and (b) EOQ4.

### 3.3. Testing differences between groups

Prior to testing of differences between groups of respondents, it is required to create statistically significant groups from the observed data. With respect to rank, three groups will be created: Engine by merging ranks Chief Engineer, Second Engineer and EOW, Deck consisting of Chief Officers and OOW, and the third group Masters (Figure 4.).

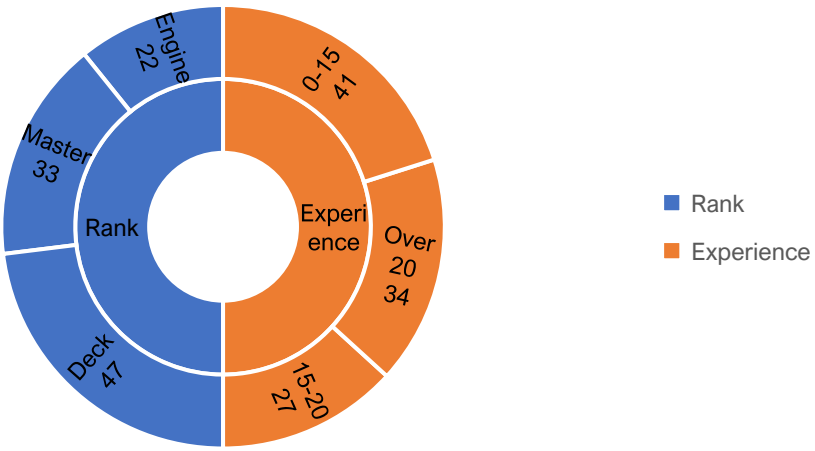



Figure 4. General shares of respondents after merging of categories.

Considering experience, there will be three groups: the first group of respondents with experience from zero to 15 years, the second group with 15 to 20 years of experience, and the third group with more than 20 years of experience. When newly merged groups have been created, proceeding with the Levene test is possible. The Levene test is performed on expert opinion questions to confirm the homogeneity of variance. All observed data p-values are higher than significance level 0,05, so the data is suitable for ANOVA testing. The ANOVA test is performed with the resulting p-value for all expert opinion responses, as shown in Table 3.

| | **Levene** | | **Anova** | |
|---|---|---|---|---|
| | **p-value** | | **p-value** | |
| | **Rank** | **Experience** | **Rank** | **Experience** |
| EOQ1 | 0.7828 | 0.7587 | 0.9183 | 0.5892 |
| EOQ2 | 0.8275 | 0.8293 | 0.2851 | 0.8413 |
| EOQ3 | 0.3371 | 0.2146 | 0.5651 | **0.0079** |
| EOQ4 | 0.3058 | 0.0767 | 0.806 | 0.2402 |

Table 3. Results of Levene test and ANOVA test.

The results hereby obtained results indicate no significant differences between groups, except a difference between groups of respondents on statement EOQ3 in terms of experience, where the p-value is 0.0079. As it is not possible to define which groups are significantly different, the sample must be tested using the Sheffee test (Figure 5).

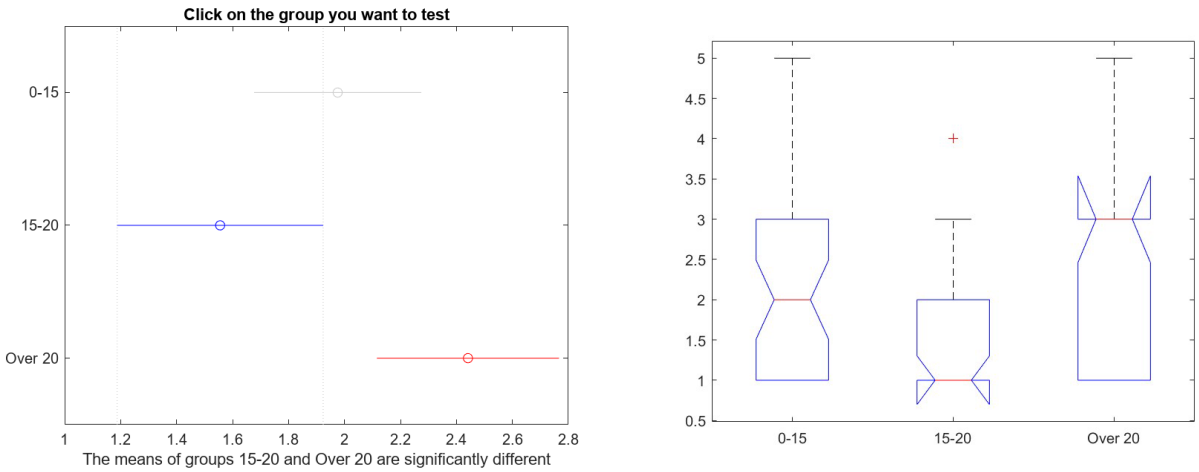



Figure 5. Results of Scheffee test on EOQ3.

The test indicates that there is a significant difference between the group of experts with experience of over 20 years and the one with experience ranging from 15 to 20 years.

## 4. DISCUSSION

The results of the research reveal several interesting facts. According to the results, it is evident that barriers to honest reporting in the maritime field are still very active, and seafarers tend to avoid potential problems with shore management about near-miss systems. Responses to the first statement indicate that most seafarers, when coping with serious near-miss, will report such a hazardous occurrence. However, a significant number, 17%, still do not agree with the statement, meaning they will try to avoid reporting. A considerable number of respondents, 12%, are neutral about this important question. These results show that some important and serious near-miss will never be brought to the attention of the shore management. From this study it is not clear what the barriers to reporting a serious near-miss are, but it is evident that when serious near-misses are hidden, the system is not functional. This question can easily be compared to earlier research by Hasanspahić et al. (2023), where almost 80% of senior rank respondents were neutral or disagree with the statement that crew members report all near-misses they observe. While the targeted group was different than in this study, targeting only Masters and Safety Officers, obviously a great number of near-misses are never reported. Unfortunately, it seems that most important, critical near-misses, are also underreported. The next question targets if seafarers prefer to report some benign near-misses, like not wearing a helmet or slippery floors. The results confirm that almost half (46%) of seafarers either agree or strongly agree to report something that has minor consequences to safety. This again confirms barriers in the system. The next question regarding fully fabricated reports, near-misses that did not happen at all, raises more questions. Why do seafarers report something that did not happen? To comply with the company's quota system, to avoid problems, or is this poor shipboard management? While 47% of respondents would never report imaginary near-miss events, a larger share of 53% would still, on some occasions, report something that did not happen, just to comply with company requirements. Differences between responses of groups of respondents to this question indicate that the most experienced group of respondents tends to report more frequently near-misses that did not happen. Finally, with regard to an opinion about improving safety at sea by near-miss system, answers indicate that seafarers still think that near-miss system is improving safety, where 64% of respondents agree or strongly agree with the statement, and 21% are neutral. Only 16% disagree or strongly disagree. It is interesting to see that, despite obvious barriers in reporting and difficulties in implementing honest and efficient systems on board, seafarers still believe the near-miss system has the capability to improve safety at sea. This is a great impulse to work on a more efficient system that considers various factors preventing seafarers from reporting hazardous situations.

## 5. CONCLUSION

Near-misses occur daily on ships worldwide, indicating flaws and weaknesses in the system that could lead to accidents. Reporting of near-misses as a part of an effective near-miss system represents a crucial segment of maritime safety. However, it was noted in previous research that the ship's crew avoided reporting near-misses that had happened as a result of human error. Consequently, it strongly affects the learning from incidents (LFI) process, as it will be affected by unreliable data. The study reveals several important findings. A significant number of ship crew will still try to avoid reporting major or significant hazardous situations. It is important to note that the inherent nature of maritime navigation,

where ships are hundreds or thousands nautical miles away from the shore management, allows them to sometimes hide or underreport some near-misses. The study confirmed previous research by the fact that seamen report minor or benign near-misses due to various barriers. Most importantly, a significant number of near-misses are, in fact, imaginary reports that did not happen at all, created just to fulfil company quota requirements. Conclusions based on flawed reporting will inevitably be wrong, leading companies to focus on issues that are not important and, at the same time, not recognising the pattern of accidents. However, an encouraging finding is that seafarers believe that near-miss systems are improving safety at sea. Naturally, safety at sea is of paramount importance to seafarers, and they are undoubtedly interested in improving safety. They are ready to collaborate; only the barriers have to be removed.

## CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

## REFERENCES


Arnerić, J. and Protrka, K., 2019. Modeli analize varijance (ANOVA). Matematičko fizički list, 25-32. Available at: https://hrcak.srce.hr/239446

Cao, Y., Wang, X., Yang, Z., Wang, J., Wang, H. and Liu, Z., 2023. Research in marine accidents: A bibliometric analysis, systematic review and future directions. Ocean Engineering, 284. Available at: https://doi.org/10.1016/j.oceaneng.2023.115048.

De Leo, F., Elia, V., Gnoni, M.G. and Tornese, F., 2023. Integrating safety-I and safety-II approaches in near miss management: A critical analysis. Sustainability, 3(15). Available at: https://doi.org/10.3390/su15032130

Essl, F., Lenzner, B., Bacher, S., Bailey, S., Capinha, C., Daehler, C., . . . Liebhold, A., 2020. Drivers of future alien species impacts: An expert-based assessment. Global Change Biology (26), pp. 4880-4893. Available at: https://doi.org/10.1111/gcb.15199

Gastwirth, J.L., Gel, Y.R. and Miao, W., 2009. The Impact of Levene's Test of Equality of Variances on Statistical Theory and Practice. Statistical Science, 24 (3), pp. 343–360. Available at: https://doi.org/10.1214/09-STS301

Haas, E.J., Demich, B. and McGuire, J., 2020. Learning from workers' near-miss reports to improve organizational management. Mining, metallurgy & exploration, 37, pp. 873-885. Available at: doi:https://doi.org/10.1007/s42461-020-00206-9

Hasanspahić, N., Frančić, V., Biočić, T. and Kristić, M., 2024. Utilizing the Bayesian network in near-miss reporting at sea. In Proceedings of the International Association of Maritime Universities Conference 2024 (pp. 65-70). Boston, Massachusetts Maritime Academy.

Hasanspahić, N., Frančić, V., Vujičić, S. and Maglić, L., 2020. Reporting as a Key Element of an Effective Near-Miss Management System in Shipping. Safety, 6(4). Available at: https://doi.org/10.3390/safety6040053

Hasanspahić, N., Frančić, V., Vujičić, S. and Maglić, L., 2021. Near-miss Reporting as Seen from Seafarers' Perspective. Transnav - The International Journal on Marine Navigation and Safety of Sea Transportation, 15(4), pp. 825-831. DOI: 10.12716/1001.15.04.15

Hasanspahić, N., Vujičić, S., Kristić, M. and Mandušić, M., 2022. Improving Safety Management through Analysis of Near-Miss Reports—A Tanker Ship Case Study, Sustainability, 14(3). Available at: https://doi.org/10.3390/su14031094

Hasanspahić, N., Vujičić, S. and Mandušić, M. 2023. Ship Safety Officers' Perceptions and Attitudes Toward Near-Miss Management Systems. Transactions on maritime science, 12(1). Available at: https://doi.org/10.7225/toms.v12.n01.w07

International Maritime Organizationa (IMO). 2008. MSC-MEPC.7/Circ.7, Guidance on Near Miss Reporting.

Krueger, T., Page, T., Hubacek, K., Smith, L. and Hiscock, K. 2012. The role of expert opinion in environmental modelling. Environmental Modelling & Software, 36, pp. 4–18. Available at: https://doi.org/10.1016/j.envsoft.2012.01.011

Marine Accident Investigation Branch (MAIB), 2016. Hoegh Osaka: Listing, flooding and grounding on 3 January 2015. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/508444/HoeghOsaka_Flyer.pdf

Midway, S., Robertson, M., Flinn, S. and Kaller, M., 2020. Comparing multiple comparisons: practical guidance for choosing the best multiple comparisons test. PeerJ, 8. Available at: https://doi.org/10.7717/peerj.10387

National Security Council (NSC), 2024. What is a Near Miss Really Telling You? Available at: https://www.nsc.org/workplace/resources/near-miss-reporting.

Ostertagova, E., Ostertag, O. and Kovač, J., 2014. Methodology and Application of the Kruskal-Wallis Test. Applied mechanics and materials, 611, pp. 115-120. Available at: https://doi.org/10.4028/www.scientific.net/AMM.611.115

Pereira, E., Ahn, S., Han, S. and Abourizk, S., 2018. Identification and association of high-priority safety management system factors and accident precursors for proactive safety assessment and control. Journal of Management in Engineering, 34(1). Available at: https://doi.org/10.1061/(ASCE)ME.1943-5479.0000562

Shneiderman, B., 2020. Bridging the gap between ethics and practice: guidelines for reliable, safe, and trustworthy human-centered AI systems. ACM Transactions on Interactive Intelligent Systems (TiiS), 10(4), pp. 1-31. Available at: https://doi.org/10.1145/3419764

Storgård, J., Erdogan, I., Lappalainen, J. and Tapaninen, U., 2012. Developing incident and near miss reporting in the maritime industry–a case study on the Baltic Sea. Procedia-Social and Behavioral Science, 48, pp. 1010-1021. Available at: https://doi.org/10.1016/j.sbspro.2012.06.1078

Winkler, M., Perlman, Y. and Westreich, S., 2019. Reporting near-miss safety events: Impacts and decision-making analysis. Safety science, 117, pp. 365-374. Available at: https://doi.org/10.1016/j.ssci.2019.04.029