BARRIERS TO NEAR MISS REPORTING

AS PERCEIVED BY MARINE OFFICERS IN EFFECT TO

SAFETY ONBOARD SHIP

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The general problem of the study is: What are the barriers of near miss reporting as perceived by marine officers in effect to safety onboard ship?

Specifically, this study sought answers to the following questions:

1. Why do most seafarers don’t report any near misses that they observe?
2. How effective is near-miss reporting in the overall safety of the ship?
3. What are the things to be done to persuade fellow seafarers to report near-miss?

The following hypothesis will be tested in this study in order to give direction to the discussion:

1. There is no barrier against reporting general incidents and near-miss reports in particular can be found prevalent in the maritime domain.
2. There is less chance of changing the view of seafarers with regards to reporting near misses that they observe.
3. There is no significant change in reporting near misses with regard to improving overall safety onboard ship.

Theoretical/Conceptual Framework
This study was undertaken as a means of improving safety onboard through the reporting of near misses, this study is deemed significant to the following stakeholders:

Seafarers. This study will be beneficial for all seafarers to understand the importance of reporting near misses onboard ship.

Shipping Company. The result of this study will give an insight to the shipping companies on strict implementation of reporting near misses onboard that may reduce the loss time injuries which may happen onboard.

Ship’s Seaworthiness. This study will give an insight to how reporting and correcting near misses affect the seaworthiness of a ship.

Environment. This study will be beneficial for the environment because it will give an insight on how reporting near misses could have a direct effect on the environment.

In this research we gathered data from the 1st class about what they think about reporting near misses onboard ship. In this research we did not include the underclassmen in the statistics because they still don’t have any shipboard experience.

The following key terms were used operationally throughout the study

IMO The International Maritime Organization. IMO is the agency established by United Nations with the task to develop and
maintain a comprehensive regulatory framework for shipping worldwide.

ISM  The International Safety Management Code

SMS  Safety Management System.

Near Miss  Unplanned event that did not result in injury, illness, or damage but had the potential to do so.

Engine Department  Organizational unit aboard a ship that is responsible for the operation, maintenance, and repair of the propulsion systems and the support systems for crew, passengers, and cargo.

Deck Department  Organizational unit aboard a ship that is responsible for navigational and cargo handling of merchant ships.

Manning Agencies  A set of agencies offering sea based duties.

DP  The designated person. Each shipping company must designate a person in office with access to the highest level of management, responsible of monitoring the safety and pollution aspects of the operation of each ship.

LTI  Lost Time Injury
CHAPTER III:
REVIEW OF RELATED LITERATURE

A new guideline on safe operation of ships and pollution prevention was established on the 16th assembly of the International Maritime Organization (IMO) in 1989. The purpose of these guidelines was to give those responsible for the operation of ships a framework for appropriate development, implementation and assessment of safety and pollution prevention management (IMO, 2002). These guidelines transformed into the creation of the International Management Code for the Safe Operation of Ships and for Pollution Prevention (the ISM Code) that was adopted by the IMO (2002) in 1993. Accident prevention should rather be a continuous and by large proactive process; a process which in turn must depend on a large quantity of analysis material (Barach & Small, 2000). As means to gather enough quantities of data, that benefit proactive accident prevention, near-miss reporting systems are being used in several high-risk domains (Barach & Small, 2000).
Best Practices in near-miss reporting:

The role of near-miss reporting in creating and enhancing the safety culture

Ilknur Erdogan

Importance of feedback – Crash between shore management and shipboard personnel

The study carried out in 2006 in Norwegian controlled 83 liquid and dry bulk cargo vessels showed that feedback from the company is a positively influencing factor for reporting more frequently (Oltedal & McArthur, 2011).

The interview results from previous studies clearly show that, especially, experienced seafarers perceive some of the events not worth to report. They think that those events are somehow inevitable and do not compromise safety. When they are required to report even those minor ones, their perception is that this reporting scheme is being made more bureaucratic which is considered as a negative factor. Dekker (2005) investigated the ambiguity of being ‘normal’, not worth to report when it comes to near misses, however, same occurrences become the ‘cause’ or ‘contribution’ in the accident report when an accident occurs at the end. Bureaucracy and tendency to break it bring us to the matter of procedures and deviation from procedures which concerns safety at the same time. It was studied earlier by Dekker (2003) from the view of adaptation, developing skills to take initiatives in an unexpected situation where procedures are not the real guide and showing that how the process of deviating from procedures is a result of the imbalance between procedures and practice. His statement is, in fact, a self-explanatory to the components of how being off-track from the procedures is seen as normal;
“Empirical success is not proof of safety. Past success does not guarantee future safety. Borrowing more and more from safety may go well for a while, but you never know when you are going to hit.” (Dekker 2005).

His suggestion to managers is to observe the outcomes of the applicability of procedures from the people who apply them in the workplace and accept the fact that checklists and written procedures are not the job itself. Therefore, skills of people and the ability of using those skills in emergency situations to take the right decisions are important and they should be encouraged for improvement. Bourrier (2005), as well, studied the ‘procedures’ and ‘the way work is actually done’ and the interaction between them by means of the safety organizations in nuclear plants. However, safety is relevant for all industries, especially, the part dealing with the safety procedures, management side and human factor as the workers who are the real actors that carry out the work practically is worth to mention for all industries. Therefore, her results might also be beneficial for the maritime industry. She pointed out 3 items which was the outcome of a real event in an American nuclear plant as an example of how to make adjustments to existing procedures in the way of making them more practical but still safe. They were;

- Feedback from bottom to top about the applicability of the procedures
- The adjustment should be made by the proposal of the real workers who carry out the job.
- Time needed for the revision should be kept as short as possible. It shouldn’t take months to make a revision.

However, it stays unanswered in her study how to find the optimum level of mixing procedures and self-rules. After all, these 3 items are perfectly useful as a starting point to create a good communication between crew on board and the management side. Same study also points out that formality has an important effect on the people who really carry out the job. It is meant by
formality is the management takes the problem, which is the gap between procedures and the work practically done, really seriously and tries to solve it by using all its opportunities.

Court report of M/V Herald of Free Enterprise’s formal investigation (1988) shows those weak points that are explained in Bourrier’s (2005) study. Management’s failure to install some indicators on the bridge which show the position of bow and stern doors, was one of the reasons of the disaster at sea. It was required by the ship’s crew, however, perceived in a not very polite way on the company side. The suggestion from the ship side was based on their experience. What is dramatic is, after the accident, even within a very short time, subject indicators were installed on the remaining ships. Had the experience of the crew were taken seriously, feedback system functioned well, there would have been a high chance to avoid a disaster. Antonsen (2009) studied the safety with comparison from a point of culture and power by means of explosion of space shuttle Challenger. At one point it is stated how an organization start putting emphasize on commercial concerns and more surprisingly how this deviance can be perceived as normal by the powerful ones, so to say by the managers. Therefore, both culture and power should worth to be evaluated on the understanding of safety by the parties.

According to Antonsen et al. (2008) first step to match procedures and the way the work practically done is to simplify the procedures. That interview study, with the Norwegian oil industry, also proved that simple systems are more likely to be used when compared to complex systems. It is worth mentioning that while making the procedures simple it should be careful not to make them too general. They should be explanatory but not complex.

Same study supported the findings of Bourrier (2005) as well that the people who exactly carry out the job are satisfied with being included in the development process. Being involved in the decision
process is said to have a positive effect on people as they feel that their ideas are cared about by the company instead of by just being ordered to do what should be done.

Antonsen (2009) refers to worker’s involvement from the view of power and its effect on the organizational safety. The example used in that study was the explosion of the space shuttle Challenger in 1986 where the cause was attributed to a rubber O-ring and how their exposure to icy weather could compromise safety. Engineers made their warning by stating their concern and advised to delay the launch. However, NASA officials had the sufficient authority over the engineering company which could make them to change their wordings. During the investigation period, one of the engineers stated that their opinion and concern due to cold weather launching was not considered in the final decision process. Or else, even the engineers had pointed out their concerns in the process; the opinions of lower ranks usually would not appear in the final decision.

Blame culture – Human behavior

A diary study (Schaaf & Kanse, 2004) which was carried out with the workers of a chemical plant that requires them to write down the cases they have faced during their working shifts for 15 days, including day and night shifts, surprisingly showed that being ashamed/blamed has almost no influence on not reporting near misses. Instead, ‘perceived importance’ has a big effect which means, people see the happenings having no consequences, the case is recovered immediately, not applicable to report and no learning takes place from them.

However, there exist also the opposite results, for instance, according to Withington (2006) being blamed has a remarkable effect on people which leads them not to report to avoid being criticized.
Humans make mistakes. There are both individual and organizational influences on mistake-making. Individual influences can be stress, fatigue, insufficient training and experience, inadequate communication while the organizational influences can be inadequate time, poor design of equipment, inadequate manning and inadequate safety culture. *MCA Guide on Human Behaviour (2010)* explains the effect of a good safety culture as the serious approach of the senior management towards all these mentioned factors that have influences on mistake-making. Senior management is waited to invest on these factors. It emphasizes that people also attach a meaning to the absence of these investments. Then, the risk of making mistakes increase even more (MCA, 2010).

When it is clear that it is normal for people to make mistakes, it is also clear at the same extent that organizational factors has a considerable effect on helping to create the human behaviour which includes mistakes as well. This leads us to shift from the 'blame culture' to a 'just culture' (MCA, 2010). Same issue is emphasized by *IMO Guidance on Near-miss reporting* that company should adopt a 'just culture' to encourage reporting (IMO MSC-MEPC.7/Circ.7, 2008).

The first principle to create a 'just culture' is to accept that the human error is inevitable, therefore, policies, processes and interfaces in an organization must be monitored and improved all the time. This requires a reporting system which is not sufficient itself and should be together with developing trust that allows people to reveal mistakes (MCA, 2010). In the same guidance open communication, discussion and team management issues are also addressed which are believed to have effect on a 'just culture'.

Safety culture and near-miss reporting

Creating a safety culture, in the most effective way, has always been an issue for the maritime industry. Not only the duty of ship is to create safety culture on board and maintain it but
also so many other organizations such as port states, owners, operators, national and international organizations among many others are included in the creation, review and feedback process (Ek & Akselsson, 2005). The ISM Code was the attempt to form the safety culture in the maritime industry. After ISM Code was introduced, studies have been carried out to see how much successfully it has been implemented and what criticisms it has gained. Near miss reporting has seen as the failing part of ISM code’s implementation and received resistance from the users (Lappalainen, 2011).

Safety culture is a complex issue to define with only one sentence however, the definition of IMO Maritime Safety Committee is that “it is a culture in which there is considerable informed endeavour to reduce risks to the individual, ships and the marine environment to a level that is as low as is reasonably practicable” (IMO MSC-MEPC.7/Circ.7, 2008).

Dekker (2005) introduces a concept called ‘drift into failure’. Accident is at the end of the drift which is caused by a chain of events. It is claim in the study that none of the accident happens as a result of an immediate action. This term is clearly illustrated with an example of Alaska Airlines 261 accident where the root cause is found to be, simply and at first place, the poor maintenance. Actually it was about only one single unit, jackscrew-nut assembly, which makes it more dramatic. However, when it is digged more inside the chains that led to the failure of one single unit, it is found that greasing that jackscrew assembly is crucial and recommended to be carried out every 300 to 350 flight hours which at the same time means that doing that every few weeks. The accident happened in 2000, this maintenance recommendation goes back to mid 1960s when the aircraft first launched. Over this time period, the interval of maintenance had started to increase due to several reasons such as commercial concerns, adaptation of technological developments decided by local decision makers, are some of those. Consequently, the maintenance interval went up to 2550 hrs at the time of accident. Yet, when the screw was investigated after the accident, the guess was that probably it had been exposed to a proper maintenance more than 5000 hrs ago. These are all the drifts that lead to
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failure at the end. Same logic can be adapted to the Herald of Free Enterprise accident where the conclusion was basically human error, however, in deep inside, it reaches along the chains to the management failure to install a equipment on board and also unstable design of the vessel (Grech & Horberry & Koester, 2008).

Under the light of all these approaches near miss reporting gains more importance in catching the weak chains before drifting into failure. The main points of reporting near misses are learning from others’ experiences and avoid accidents. It can be said, in other words, that it is big resource for the companies especially for the small ones to have a bigger pool of occurrences on board and their corrective as well as preventive actions. Then, it becomes easier to manage safety related issues on board, such as technical failures among many others. It was realized, for instance, by Norsk Hydro in the late 1980s and they tried a new system to start near miss reporting which led them at the end to the decreased number of accidents as a result of learning from small happenings (Lindberg & Hansson & Rollenhagen, 2010). Near-miss and accident reporting systems are the ways of sharing experiences. Reporting as many near-misses as possible is the factor that can lead to better safety level as a result of learning from small mistakes and avoiding them to turn into accidents.

Reporting practices

Three out of four companies use IRIS system on board vessels to report near misses. One uses the AMOS for 4 years. These softwares serve to same purpose with differences in appearance, usage and ownership of the softwares. One of the companies which has been using IRIS system uses it for 7 years, while the other two have been using it for around 1.5-2 years. In all the systems in use, everybody onboard has the access to make reports. No interviews on board the ships that the AMOS
system is in use could be made. Therefore, there are no reflections of people on board about that system.

In one company, superintendent is the responsible person to take care of reporting. In the other companies, DPAs are the responsible persons. All of them believe that the number of reports have been increased when they changed to existing computer system, from a paper system or another computer system which is not easy to use. In one company DPAs say that number of deficiencies written by port state controls have been decreased in the recent year and they believe that it is due to having a better follow up with this system. They all state that making report in the existing system is very easy. DPA of the company which uses AMOS believe that even though the system is easy to use when someone is used to it, it is still not very user friendly. Therefore, they are changing to a new version of the same system which is more simple. It is expected to be implemented fully to all ships by the year 2013.

The best statistics from these companies is approximately one report per ship per month. In one company this number is a bit under this average. All of them believe that this number doesn't show the reality and they should be better at reporting. The content of the reports is mostly technical issues about equipment failures. One DPA compared the content as 60% technical errors, 40% human mistakes. Many agree on that it is easier to report technical failures.
The number of reports collected in the reporting system has not been investigated systematically, since the aim of the study is more qualitative based. However, below table shows a brief statistics from the companies regarding the number of near-misses reported, together with the number of ships they have and for how long time they use the reporting system: It should be stated regarding the Company 3 that they operate in a business area with different type of ships, other than Ro-Ro vessels which are the focus of this study. In that area, the reported near-misses are 3 times more than the number showed in the above table. They say that they aim to bring all the business areas to the same level.

Three out of four companies advise their crew that they should report everything. The DPA of the fourth company believes that if they are advised to report every small detail, reporting losses its importance and reality. He thinks that crew can make that judgment what to report and not to report. He say that the way to achieve making crew capable of deciding themselves is communication. They
put near miss reporting in the agenda for all the safety meetings and encourage them discuss near
misses there. After discussion, he says that probably 9 out of 10 happenings end up with formal
reporting. Half of the participants believe that getting more reports should be the first goal, while the
rest think that there is more need in good quality reports.

They all think that number of near misses is not an indication of safety level on board. The
Superintendent says that number of accident can be an indication because they can not be hidden,
must be reported. Since not all the near misses are reported, there are hidden ones, they can not be an
indication of anything. Two DPAs give an example of two masters that one reports many while the
other report 1 or 2 or not during their contract on board. They add that the safety level on board these
two ships are the same. The master who doesn't report many thinks that they have already discussed
and took the action on board and there is no need to share it with the others, whereas the other master
thinks in the opposite way. Therefore, they say that it is not an indication of safety level on board.

Feedback and follow-up

Feedback process works quite similar in all the companies with small differences. In three
companies reports come to the responsible person for the reporting system, DPA or Superintendent,
then distributed to technical or marine superintendents depending on the nature of the near miss. In
one company it is distributed to all superintendents. In one company reports are handled by the
superintendents first. After all, DPA gets the report and add his ideas and forward it to the ship. In
the same company, DPA makes a self-criticism that they are not very good at providing a fluent and
quick feedback. He says that it is due to operation department of the company. The Superintendent
are not very good at checking the reports frequently and taking actions as quick as possible. He says
that they see reporting as the duty of the ISM Department only. Therefore, he reminds them all the
time to take care of the reports which is a time consumption. In the other company an approval from
the ship that they acknowledge the receipt of the reports is received. Otherwise there is no follow-up system in any of the companies to check whether the preventive actions have been implemented on board or not. The Superintendent says that even though they receive an acknowledgement they never know if even the lowest rank has received the information. In one company completed reports are shared with all fleet. In the others, it is shared with all fleet or only with sister ships depending on the subject of the near miss. In one company there are time limits to handle a report which comes from the ship, such as 3 days to take care of it; forward it to responsible technical or marine superintendents and 3 months to take the complete action and close the report. Others try to make the feedback process as fluent as possible. In the IRIS system there is a 'lessons learnt' section where safety alerts and all the near misses from other ships of the company are listed. Masters have access to that section. The company using AMOS system prepare a quarterly report including all near misses and non-conformities and share it with all fleet.

Anonymous reporting - Blame culture

There is also a possibility to make anonymous reports. Even though 2 out of 4 companies has never experienced any anonymous reports they all agree that it is good to have the possibility. In one company an anonymous letter was received by Filipino crew which was a complaint about the master on board. DPAs say that they took it very seriously because they see it as an improvement on the rating side that they start to complain with the happenings that they are not happy with. In another company one anonymous report was experienced as well. DPA says that it was a serious case and they did further investigation to correct it.

All the companies believe that they have achieved no blame culture and everybody on board is aware of it. In one company DPAs say that they have made a remarkable improvement on that in the recent year and they should still continue on the same way. The Superintendent of the other
company thinks that achieving no blame culture doesn't have a big effect on reporting, that they already achieved it and many of the crew members have been working in the company for many year, however, they are not at the desired level so far. Another DPA says that company side should repeat the importance of reporting all the time and show the crew members that reporting is not exposing their inability. It shows, on the contrary, that they are clever enough to bring up problematic issues to correct and prevent them happening again. All agree on it is a matter of time to create and increase the safety culture on board continuously. They say that no miracle happens in the maritime industry from one year to another.

Campaigns to increase reporting frequency

Three out of four companies don't have any kind of rewarding or performance system to encourage increasing the number of reports. One of these companies believe that it is worth to try and it can help to increase reporting practices. One DPA says that they discussed that idea in the company and decided that it is not a good idea to connect safety with some money. He says that they support innovations, but safety is something that should be built as a culture. He adds that they care about safety more than anything and try to show it to the crew. For instance, they provide an extra fire training for the crew which is not required by the Administration. He adds that it is actually a big cost for them. However, when it comes to emergency preparedness and people's readiness to it, that is worth to spend. Another two DPAs don't support the idea either. One of those say that it is better to include safety issues more during the education process of young seafarers. In one company there is a performance system in place for almost a year. Near miss reporting has 10% influence in the matrix. DPA says that they are planing to increase the percentage to 15% - 20% in the coming year. He says that there is a little increase in the number of near misses compared to last year although they have 2 ships less this year and he believes that it is because of the performance system. When it comes to the
quality of the reports, he says that it is dependent on the individuals; some are good at writing, reporting happenings whereas some are not. In the same company there are remarkable differences in the number of reports among the ships. According to DPA it is due to the management in the ship. Some are more sensitive to safety issues while some are not. In the other two companies there is not a big difference in number of reports among the ship. In the fourth company there is a difference between the industrial shipping section, where there are Ro-Ro, bulk carriers, and off-shore section. They think that it is due to having more strict regulations and demands from oil companies on the off-shore side.

The usage of an external reporting system

Companies using IRIS system contribute to Insjö as well, as the system has automatically connected to it with a button. Company using AMOS has no connection with Insjö, or ForeSea, therefore, they haven't sent any report there. No interviews on board the ships that the AMOS system is in use could be made. Therefore, there are no reflections of people on board about that system. IRIS system is connected to Insjö reporting with a button, which means that by just pressing the button the report which comes from the ship can be sent to Insjö. Afterwards, a similar report from the Insjö database is received as an e-mail, to be shared with the ships. In all the companies that contribute to the Insjö, not all the reports are sent. Responsible person in the company selects the reports that are thought to be helpful for the other companies and ships. The Superintendent criticizes the external systems that they are not well presented. Some small companies need them more as they don't have enough resources inside the company, however, they are not very familiar with the benefits of an external system.

The company using AMOS system has no connection with an external system. DPA says that he has the log-in to the ForeSea system, however, he hasn't entered any report there. He says that it is time
Barriers to near miss reporting

All of them agree on the idea of having a more international external sharing system. They insist on that the only way it can work is to make it as simple as possible to use. A DPA says that even though they are happy with Insjö, a more international external system means more reports which may have a disadvantage for the people on board and their time to put on reading those reports. He says that he has asked the people on board and the answer is that they don't have time for it. He thinks that it is not good but it is the reality we have. However, he emphasizes on the importance of learning from each other.

Barriers to reporting

All the companies complain that there are not many reports coming from the rating side. The company using the reporting system for longer year than others say that they believe the reporting system is implemented completely on board the ships, however, including the rating side actively in the reporting process should be their next goal. According to companies some barriers to reporting are;

- Natural human behavior; hiding mistakes, being ashamed,
- Human tend to obey the rules. Near miss reporting is not perceived as mandatory by many seafarers yet. The Superintendent gives an example of high ranked officer in their ships who consistently resists to report. He says that whatever company procedures tell about near miss reporting and its role in the ISM Code, he still thinks it is voluntary and he refuses to do it.
- Cultural differences; in one company DPA says that when they first started to work with Polish crew in one of their ships, it was the worst ship in number of report, however, they...
were very good at taking actions and keeping the vessel in good condition. He says that it was the feeling of shame that restricted them to report. Therefore, they decide to go on board and tell the crew that it is about their own safety. He says that when people are convinced that it is beyond being a 'must' or a 'procedure', they are more successful at reporting.

- Non-user friendly system; DPA of the company which uses AMOS system thinks that it might be the reason for specifically the rating side not to contribute reporting. He says that the system

The role of near-miss reporting in creating and enhancing the safety culture

All the company people say that near-miss reporting is the vital part of ISM Code and it is the way to create and enhance safety culture on board. The superintendent says that learning from mistakes, sharing experiences create resources for the company. He says that everybody on board and in the company has a high workload of carrying out many duties. If near misses are shared more, workload becomes less by learning from each other and making use of them, instead of being surprised and losing time to correct them when they are suddenly experienced. A DPA adds that it is the company's duty to make the system as simple and practical as possible for the people on board. He says that the idea of safety culture should be implemented in the company's top management at first in order to be successful at adapting the same culture on board.

Reporting practices

When people on board were asked to compare the system they use now with the system they used before, in most cases it is a paper system to make reports, different ideas has come up. Most of the participants think that computer system is easy to use and most agreed that it has created more and easier follow up. Besides, there is an idea of that it also included more people into reporting.
Many masters state that it has provided the possibility to see the reports from the other ships of the company which they can also benefit from. Some state also that number of reports has increased after changing to computer system from the paper version. However, many don't connected the number of reports to the system change. All are agree on that safety thinking has been increased when compared to 10 years ago, but the number of near miss reports hasn't shown the same level of increase. One master stated that he prefers paper system which is more tidy and they can store them in the files. He feels that in the computer system the reports disappear somewhere. Another master and a chief officer stated that paper system feels a bit more usable while adding that computer system should be much easier and better, however, it is only technically implemented. Therefore, their minds are still on the paper reporting version.

Many of the participants agree on that number of reports is not a direct indication of safety level on board. Most of them say that they often discuss the happenings and take the actions immediately, however, they don't make any report. They believe that their ships have high level of awareness even though it is not reflected by the number of reports. Another idea is that in some ships everything could really be in order and there exists not so many to report. Therefore, comparing the vessels by looking at the number of reports that they produce doesn't give an idea of safety level on board that ship. Two masters and an AB think on the opposite side. They believe that a ship reporting more than others would have a higher awareness on the safety issues.

Feedback and follow-up

When it comes to the feedback from company, everybody agrees on that it is important to get feedback, especially fluent and practical feedback is desired by the officer side. In one company, a master states that he is not happy with the feedback from the company due to it is being very late. He gives an example to prove that the reports are not read frequently by the DPA when they had a
problem with thrusters they sent many reports about it but couldn't get any proper solutions. Then, they decided to solve it via telephone or mail communication. In the same ship chief engineer evaluated the feedback from the company is being in the middle. He says that they should visit the ships more rather than writing down the regulations from the book. Chief officer of the same ship also states the similar idea that he is not happy with the feedback at the moment, because the company has recently faced an organizational change, it is a bit on the worse side now. He believes that it will soon be improved.

One master and two chief engineers say that the quickness of feedback is dependent on the nature of the near miss. Some of those require more time to take actions. For the others, the action is usually taken already. A chief officer state that he is happy with the feedback but its distribution to all people on board is strongly dependent on the master, because he is the one who reads the reports from the system first. Therefore, he says that if the master is not interested in safety issues enough, it is possible that the information flow stops there. In the company where the reporting system is in use for longer years, officer side is quite happy with the feedback. A master criticizes the evaluation process afterwards. He prefers more active follow up with the company and together with sister ships when necessary. Rating side get the feedback during the safety meetings, or some reports, safety alerts are posted on a board that they can read. It should be mentioned that only in one of these companies, all crew are included in the safety meetings. In the others, the highest rank from each department takes part in those meetings. ABs who don't participate in the safety meetings generally happy with the system. They wouldn't like to participate in other words. Same Abs say that they get a kind of feedback a couple of times in a year and they are also happy with this.
The role of near-miss reporting in creating and enhancing the safety culture

When it comes to the effect of near miss reporting in creating and enhancing safety culture on board, majority of the participants think that it is important with many of those say that it is almost the most important improvement which was brought by the ISM Code. According to them, it has an effect from different aspects, such as;

- Sharing experiences and avoiding possible serious accidents,
- Some near misses happen very seldom. Therefore, it is good to share them,
- It is also an indication that the safety culture has been created on board and that there is a free atmosphere to report openly. They are all connected to each other.

One chief engineer says that since they don't report many near misses, they don't have an effect on the culture on board as today. However, it will in the future. Only one master states that near miss reporting is a workload. Safety meetings, discussions are enough to share and take actions; therefore, we can live without near misses. He adds that communication, team work, open culture and discussing the happenings are the ways to keep the safety level up all the time

Review of related studies

There are several definitions of accidents, incidents and near-misses. The definitions introduced below function as an underlying framework for how these three concepts are defined in this study.

Bird and Loftus (1976) define incidents as undesired events that could (or do) result in loss (or downgrade the efficiency of the business operation). Accidents are defined as undesired events that results in physical harm to a person or damage to property. The authors also assert
that accidents usually are the result of contact with a source of energy above the threshold limit of the body or structure.

Bird and Loftus (1976) present an accident-ratio study that analysed 1 753 498 accidents reported by 297 cooperating companies. The triangle, as shown in figure 2, represents accidents and incidents reported, not the total number of accidents or incidents that actually occurred. According to this point of view near-miss is not a category of its own but rather a type of incident that is frequently referred to as near-miss accidents (Bird & Loftus, 1976).

The figure shows the 1-10-30-600 ratio presented by Bird and Loftus (1976). For every 600 near-miss accidents, there will be 30 property damage accidents, ten minor injuries and one serious or disabling injury

Cambraia, Saurin & Formoso (2010) adopt the concept of near-miss as an event separated from the incident notion. The incident term is rather used as an umbrella term referring to any situation where there is lack of safety - including accidents, near-misses and unsafe acts and conditions (definitions of unsafe acts and conditions are not within the scope of this study and will therefore not be further elaborated on). They define near-misses as instantaneous events involving the sudden release of energy that has the potential to generate an accident, even though the consequences in that case do not result in personal injuries or material damage, but usually in
the loss of time. Near-misses thus differ from accidents in the sense of not having any negative outcomes, such as damage or injury. A near-miss could be the unfortunate event of a vehicle with engine failure stuck in a railway crossing. A situation like this could lead to a dire outcome, but in this example due to some fortunate turn of events, the train driver had enough time to brake and halt the train before impact. This helped to prevent an otherwise inevitable collision. The event as it played out would most likely have resulted in loss of time and a train schedule running late but hopefully not in personal injury or material damage, thus making it a near-miss rather than an accident. This description of near-misses is similar to the notion of incidents and the downgrade of the efficiency of the business operation as described by Bird & Loftus (1976).

Barriers relating to near-miss reporting are described in the IMO’s *guidance of near-miss reporting* (2008). Common barriers mentioned are fear of being blamed, disciplined, embarrassed or found legally liable. Organizational barriers are also mentioned, such as unsupportive company management attitudes, insincerity about addressing safety issues and discouragement of the reporting of near-misses by demanding that seafarers conduct time consuming investigations in their own time.

The IMO (2008) states that these barriers can be overcome by initiatives from the management. This can be achieved by encouragement of a just culture approach which covers near-miss reporting (IMO, 2008). The culture should be just in the sense of that the company gives people responsibility, earn their trust and promote that sharing sensitive information in most cases do not bring negative consequence to the people involved. The IMO (2008) describes the just culture as featuring an atmosphere of responsible behavior and trust where people get encouraged to report important safety-related information without fear of reprisals. Even though a just culture is present in a company, the IMO (2008) emphasizes that a distinction between
acceptable and unacceptable behavior must be upheld. They furthermore state that unacceptable behavior will not go unnoticed or be without the risk of facing consequences.

Heinrich, Petersen & Roos (1980) define accidents in another manner. They assert that it is unnecessary and misleading to talk about accidents in terms of severity (e.g. a minor or major accident). The potential effect or injury that stems from the accident should be graded in terms of severity; as major injuries, minor injuries and no-injury accidents. Heinrich et al. (1980) define these three types of injury as:

1. A **major injury is any case that is reported to insurance carriers or to the state compensation commissioner.**

2. A **minor injury is a scratch, bruise or laceration such as is commonly termed a first-aid case.**

3. A **no-injury accident is an unplanned event involving the movement of a person or an object, ray or substance, having the probability of causing personal injury or property damage.** (1980, Heinrich et al., p. 63).

Even though the concept of injury is in the focus, a division into the three injury types above does not seem to be fundamentally different from a division into the accident, incident and near-miss category in terms of severity. No-injury accidents still share the fundamental features with the incident notion as defined by Bird and Loftus (1976) and the near-miss concept as defined by Cambraia et al. (2010). Heinrich et al. (1980) estimate that in a unit group of 330 accidents of the same kind and involving the same person 300 accidents result in no-injury accidents, 29 accidents result in minor injuries and one accident result in a major injury.
Figure 3: The 1-29-300 ratio, the foundation of a major injury (Heinrich, Petersen & Roos, 1980)

This pyramid like ratio has often been interpreted as much like the triangle ratio of Bird and Loftus (1976) depicted in figure 2 - to imply that the causes of frequency are the same as the causes of severe injuries. In the fifth edition (the first edition was published 1931) of Industrial Accident Prevention the authors (Heinrich et al., 1980) refute those previous notions and comment on what has been written in earlier editions of the book when they state:

“Our original data of 1-29-300 were based on ‘accidents of the same kind and involving the same person.’ The Figures are averages of masses of people and all kinds of different accident causes and types. It does not mean that these ratios apply to all situations. It does not mean, for instance, that there would be the same ratio for an office worker and for a steel erector. (...)It also does not mean, as we have too often interpreted it to mean, that the causes of frequency are the same as the causes of severe injuries.“ (1980, Heinrich et al., p. 64).
Studies have been carried out since the ISM Code came into force. The focus has been the implementation of the ISM Code at first. While searching on that many issues came to surface, such as it has been perceived as a huge paper work and time consumption instead of focusing on the practical issues (Knudsen, 2009).

Later, the studies focused on more detailed issues which might be the reasons for the ISM Code to gain some resistance from seafarers. Near-miss reporting has been concluded as being the failing part of the ISM Code's implementation (Lappalainen, 2011). In many ships it is reported on a paper format which is again perceived as another extra paper work. As the company has a big role on creating its own safety management system, criticisms started on that side, especially about the communication between ship and company, feedback process and differences in the understanding of safety between seafarers and company responsible people. Generally speaking, company has represented the ‘written procedures’ while the seafarers has represented 'the way that the work actually done on board' which are believed not to match each other (Dekker, 2003; Bourrier, 2005). Recommendations and/or practical applications from other industries, such as nuclear, chemical, have been proposed in the same studies. Then, the last but not least, the issue of 'blame culture' has appeared to be considerable effect on the reluctance of near miss reporting. Opposite results have appeared from different studies. While a diary study (Schaaf & Kanse, 2004) showed that people on board doesn't really care about being blamed or ashamed if they report, Withington (2006) has seen the blame culture having a remarkable effect on poor reporting. Blame culture leads us to the matter of being anonymous in reporting and human behaviour against all these.
All these mentioned are mostly investigated separately, however, they all led us at the end to think about creating safety as a 'culture' both in the company, including all management levels, and on board the ships, in the minds of seafarers. Although 'culture' itself is a complex issue, the aim with the ISM Code is identifying hazardous occurrences including the risks to individuals, ships and marine environment, then reporting them regularly to the company and continue with proposing corrective and preventive actions with an end to apply them to reduce those identified risks (IMO MSC-MEPC.7/Circ.7, 2008). Under the light of this approach, a previous study has tried to be found about the connection between creating a safety culture and near-miss reporting.
CHAPTER IV:

METHODOLOGY

This report uses the Descriptive-Survey Type of research. This report uses the weighted arithmetic mean of the 1st class midshipmen and selected MAAP senior officers/engineers of what they think about near miss reporting.

This report uses the Scientific Sampling Design namely Unrestricted Random Sampling.

The subjects of the survey are some of the 1st class midshipmen.

This study uses a questionnaire survey form which will get the weighted arithmetic mean of the 1st class midshipmen and selected MAAP senior officers/engineers of what they think about near miss reporting. This study also uses an interview of selected MAAP senior officers/engineers to further gather data about the topic.

After the researchers revised the questionnaire, the researchers’ adviser validated being found that it was valid and reliable. The questionnaire was given to the 114 1st class midshipmen because they already board an international vessel.

Immediately after the retrieval of the questionnaires, the researchers tabulated the data gathered. The data gathered was organized. The frequency of each answer was taken and the responses was analyzed.

The statistical treatment used in the interpretation of data only includes weighted arithmetic mean. Weighted mean was used to determine the frequency of the main reason why seafarers don’t report near miss.
CHAPTER V:

RESULTS AND DISCUSSION

Table 5.1 shows the Result of Reasons Why Seafarers’ Don’t Report Near Miss

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>57</td>
<td>52</td>
</tr>
<tr>
<td>B</td>
<td>33</td>
<td>30</td>
</tr>
<tr>
<td>C</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Total:</td>
<td>109</td>
<td>100</td>
</tr>
</tbody>
</table>

As shown from the table above, majority or 52% of the cadets thought that seafarers don’t report any near misses that they observe because they are afraid of giving a bad record to a fellow crew member and/or officer, 30% of them reasoned out that they are afraid of having a confrontation against a fellow crew member and/or officer and the remaining 18% thought that near-miss reporting is just a waste of time.

Table 5.2 shows the Results of the Effectiveness of Near Miss Reporting in the Overall Safety of the Ship

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Frequency</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>79</td>
<td>69</td>
</tr>
<tr>
<td>B</td>
<td>35</td>
<td>31</td>
</tr>
<tr>
<td>C</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total:</td>
<td>114</td>
<td>100</td>
</tr>
</tbody>
</table>

The table 5.2 shows that majority or 69% of the respondents think that near-miss reporting is very effective with regards to improving the overall safety of the ship and the remaining 31% thinks it is only somewhat effective.
This study sought to determine the barriers in near miss reporting as perceived by marine officers in effect in safety onboard ship. Results of the study show that seafarers have their different reason on why they don’t report near misses. Particularly, one of the main reason is because they are afraid to give bad record to their fellow crew member/or officer. In addition, study shows it will be very effective if seafarers report near misses.

Results of the analysis show the different point of views of seafarers why they report and don’t report near misses they observed.
CHAPTER VII:

SCHEDULE OF ACTIVITIES

- 1st – 2nd week – Gathering of data from surveys & interview of MAAP senior officers.
- 3rd week – Tallying of survey results & finalizing conclusions.
- 4th – 5th week – Furnishing of the research paper.
- 6th week – Deadline of submission
REFERENCES

Kohler, Fredrik (2010). Barriers to Near-Miss Reporting

Erdogan, Ilknur (2011). Best Practices in near-miss reporting: The role of near-miss reporting in creating and enhancing the safety culture


Heinrich, Petersen & Roos (1980) *Industrial Accident Prevention*


http://www.imo.org/

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