Barriers to Near-miss Reporting in the Maritime Domain

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Abstract
The catastrophic accident of the ferry Herald of Free Enterprise made it clear that the development of accident prevention in the maritime domain must not only rely on negative events but rather on proactive measures.

Near-miss reporting is becoming widespread as a proactive tool for accident prevention in various domains. This thesis aims to examine and identify barriers to near-miss reporting through studying the national reporting system INSJÖ and local company specific systems in the Swedish maritime domain.

Interviews with representatives from Swedish shipping companies (designated persons responsible for safety work in each company and officers responsible for the reporting at sea) were conducted as a means of data collection. Based on the data two separate analyses were made; one in a naturalistic fashion and one using a framework of barriers and incentives derived from various social technical domains in which near-miss reporting has been institutionalized.

The results of the two analyses highlight differences regarding how and with whom information should be shared. The therapeutic factor, to teach and learn from others was emphasized as important by the majority of the interviewees. Further, potential external influences, issues concerning anonymity and the risk of rehearsed benefits of reporting are also made visible. Finally, critique against the accident-ratio models, that introduced the near-miss concept, is presented and it is argued that these models might be too simplistic to explain why accidents occur.

It is concluded that, in order to create effective reporting systems and to decrease the risk of creating a disparity between rehearsed benefits and how the system is used in reality, it is important to give the personnel ownership of their own reporting system and the knowledge of how and why to use it. Nevertheless, near-miss reporting might be used as a powerful tool and incentive for proactive work and accident prevention.
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<tr>
<td>CHIRP</td>
<td>The British Confidential Reporting Programme for Aviation and Maritime</td>
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<td>Classification Society</td>
<td>A non-governmental organization that establishes and maintains standards for the construction and classification of ships and offshore structures</td>
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<td>DP</td>
<td>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</td>
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<td>EMSA</td>
<td>The European Maritime Safety Agency, the maritime safety agency of the European Union</td>
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<td>IMO</td>
<td>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</td>
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<td>INSJÖ</td>
<td>A Swedish database for reporting accidents, incidents, near-misses and non-conformities</td>
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<td>ISM</td>
<td>The International Safety Management Code</td>
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<td>MARS</td>
<td>The Mariners' Alerting and Reporting Scheme</td>
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<tr>
<td>Port State Control</td>
<td>The inspection of foreign ships in national ports to verify that the ship comply with international requirements concerning equipment and operation.</td>
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<td>SAFIR</td>
<td>An ISM reporting tool for accidents, near accidents and non-conformities</td>
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<td>SMA</td>
<td>The Swedish Maritime Administration</td>
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<td>SMS</td>
<td>A Safety Management System</td>
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<tr>
<td>SOLAS</td>
<td>The International Convention for the Safety of Life at Sea</td>
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<td>SOS</td>
<td>The reporting system SjöOlycksSystemet, a Swedish database for accident reporting</td>
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<tr>
<td>SSA</td>
<td>The Swedish Shipowners’ Association</td>
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<td>STA</td>
<td>The Swedish Transport Agency</td>
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1 Introduction
On the 6th of March 1987 the passenger and freight ferry Herald of Free Enterprise sailed from Zeebrugge in Belgium to Dover. The Herald was manned by a crew of 80 and held numerous vehicles and approximately 459 passengers. The voyage to Dover was expected to be made without any complications in the prevailing good weather with light easterly breeze and very little sea or swell. At 18.24 the ship passed the outer mole and increased its speed with the result that water came over the bow sill and flooded into the lower car deck. Approximately four minutes later she capsized with the dread result of 150 passengers and 38 crew members dead and many injured (MAIB, 1987). The conclusions of the formal investigation were exceptional at the time, because not only were active errors identified as cause to the horrific accident, but the company management’s failure of giving proper and clear directions was also ascribed as a contributory cause to the catastrophe (Reason, 1990).

The maritime domain is one of the oldest domains that could be regarded as a socio technical system, where technology and people interact and are dependent of each other. It precedes such domains as aviation, the railway domain or chemical and medical industries (van der Schaaf & Kanse, 2004). Common for these domains are the importance of safety regulations concerning risk management and having to deal with and prevent unexpected events that result in negative loss (Barach & Small, 2000). These kinds of unexpected events can lead to dire consequences in form of accidents and incidents that might affect both human lives and valuable property (Jones, Kirchsteiger & Bjerke, 1999).

The formal investigation of the catastrophic accident befallen the Herald of Free Enterprise was one of the leading reasons for new guidelines on safe operation of ships and pollution prevention by 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.

The Herald of Free Enterprise accident made it painfully clear that lessons learned and the development of accident prevention must not solely rely on these kinds of utterly negative events. 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).

1.1 Outline of this thesis
This study highlights near-miss reporting and potential barriers to this kind of reporting in the maritime domain. Chapter two, the background chapter, is divided into four sections. The first section, 2.1, will include a short overview of the domain at hand and relevant organizations therein. Section two, 2.2, will present the key terms accident, incident and near-miss and how they are
defined in previous literature. Section three, 2.3, will include a literature overview of reporting systems and near-miss reporting in various socio technical systems. Chapter three presents the study’s aim and research question as well as the boundaries, in 3.2, and scope of the study, in 3.3.

Chapter four describes the methodological approach in section 4.1. This is followed by a presentation of the data collection in 4.2. The section concerning the data analysis, 4.3, is divided into two separate parts, one for each analysis. The chapter’s last section, 4.4 presents how validity, reliability and objectivity can be applied in qualitative research. The following analysis chapter, chapter five, presents and discusses the material found in the two analyses. Section 5.1 to 5.4 concern the first analysis and 5.5 to 5.6 concern the second analysis. Chapter six, the discussion chapter, is divided into four parts, a general discussion in 6.1, a discussion regarding the theoretical framework in 6.2, a discussion regarding methodology in 6.3, and the chapter will end with suggestions of further research in 6.4. Lastly, conclusions made are presented in chapter seven.


2 Background
This chapter introduces the background of this study. It is divided into four sections. The first section presents Swedish and international organizations within the maritime domain. The second introduces the key terms accident, incident and near-miss relevant for this study. The third section contains a cross-domain literature overview presenting barriers (and incentives) to reporting systems in general and near-miss reporting in specific.

2.1 The Maritime Domain
The focus on maritime safety, as defined by the IMO (2002), is visible on an international and national level. This section covers organizations that are deemed important in relation to reporting systems in the maritime domain - as a whole and to the Swedish domain in specific.

2.1.1 IMO and the role of the designated person
The International Maritime Organization was established in Geneva 1948. The main task of the organization is the maintenance of an international regulatory framework for safety, environmental concerns, legal matters, technical co-operation, maritime security and the efficiency of shipping (IMO, 2002).

As mentioned previously, the International Safety Management Code (ISM) code was adopted by the IMO in 1993, its purpose is to provide an international standard for the safe management and operation of ships as well as for pollution prevention. The main objectives of the ISM code are to ensure safety at sea, to prevent human injury or loss of life, and to avoid damage to the environment (both damage to the marine environment and to property) (ISM, 2002).

The ISM code (2002) furthermore states that every shipping company should designate a person or persons ashore that have direct access to the highest level of management. The responsibility and authority of the designated person or persons (DP) should include monitoring all aspects concerning the safety and pollution of the operation of each ship. The shipping company is responsible to ensure that adequate resources and shore-based support are provided to enable the DP to carry out his or her functions, e.g. assessing the effectiveness of Safety Management Systems (SMS), conducting audits and overseeing regulations (IMO, 2007).

2.1.2 EMSA
The European Maritime Safety Agency (EMSA) was created in the aftermath of the Erika disaster that occurred in 1999 - resulting in the release of thousands of tons of oil spill into the sea, polluting the shores of Brittany, France (IMO, 2002). EMSA aims to contribute to the enhancement of the overall maritime safety system in the European community (EMSA, 2010). EMSA’s (2010) goals are to reduce the risk of maritime accidents, decrease marine pollution from ships and to prevent the loss of human life at sea. In order to achieve this, important key tasks are: strengthening the Port State Control regime; conducting audits of the Community-recognized classification societies, e.g. Lloyd’s Register; developing common methodology for the investigation of maritime accidents; and establishing a community of vessel traffic monitoring and information systems (EMSA, 2010).

2.1.3 The maritime domain in Sweden
There are several organizations tied to and relevant for reporting systems in the maritime domain in Sweden. The three organizations that are deemed most relevant will be mentioned in this study: The
Swedish Maritime Administration (SMA), The Swedish Transport Agency (STA) and the Swedish Shipowners’ Association (SSA).

The Swedish Maritime Administration (SMA) is a public enterprise within the transport sector. SMA’s primary tasks (Sjöfartsverket, 2010) concern the responsibility to provide such infrastructural services as safe and accessible fairways that ensure the needs of shipping. These tasks include supervising and maintaining breadth and depth of fairways as well as supervising, operating and performing maintenance work on fairway facilities such as beacons, buoys and spar buoys (Sjöfartsverket, 2010).

The Maritime Department of the Swedish Transport Agency (STA) was created in 2008 and inherited many functions from the former Maritime Safety Inspectorate (Transportstyrelsen, 2010). The department formulates regulations as well as examines and grants permits. It also has a supervising role for the traffic in Swedish waters and works furthermore to improve safety as well as to prevent negative environmental influence at sea. One important part of the department’s safety work is to analyze maritime accidents and near-misses of merchant and fishing vessels (Transportstyrelsen, 2008).

The Swedish Shipowners’ Association (SSA) is a trade organization for the Swedish shipping companies. SSA aims to support the Swedish maritime profession and trade, as well as to make Swedish companies competitive and attractive on the international and national market both. SSA is actively working with its members to create fair and equal competition and to promote and enhance the work in such areas as maritime environment and maritime safety (Sveriges Redareförening, 2010). SSA’s work creates the possibility of sharing competence in various sectors of the maritime trade as is achieved with committee work and by meetings conducted among the organization’s members. SSA is also one of the initiators of the Swedish reporting system INSJÖ that will be introduced in more detail in 2.3.2.

2.2 Definitions of accident, incident and near-miss

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, see 3.3.

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 analyzed 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).
Figure 2. 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).

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) and do not use the term incident at all in their book *Industrial Accident Prevention*. Instead, 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).

Heinrich et al. (1980) acknowledge that the ratio might be problematic to use as a general model of how accidents, incidents and near-misses interrelate. Different situations, environments and types of accidents do not necessarily adhere to this model, as have been implied by statistic figures presented after the claims of the 1-29-300 ratio (Heinrich et al. (1980). The view that frequently occurring no-injury accidents or minor injuries lead to major injuries in a straightforward manner is thus being challenged. Heinrich et al. (1980) further describe the problems stemming from viewing the 1-29-300 ratio as applicable in a broad sense. The interrelation between each step of the triangle seems not to
be as direct as the figure itself implies and the circumstances that produce different types of injuries differ amongst each other; this leaves the authors with a new conclusion:

“(..)”We have typically believed a 1-29-300 ratio, believed it might apply to all kinds of accident types and causes, and then seen national figures. (..) that show that different things cause severe injuries than the things that cause minor injuries. Obviously then there are different ratios for different accident types, for different jobs, for different people, etc. (..) This very difference might lead us to a new conclusion. Perhaps circumstances which produce the severe accident are different from those that produce the minor accident.“ (1980, Heinrich et al., p. 64).

The authors themselves realize that separate ratios might apply to different jobs and that the circumstances that produce severe injuries possibly are not the same as those that produce minor injuries. This open up for further discussion regarding the usefulness of these types of ratio models and will therefore be discussed further in 6.2 of the discussion chapter.

Perrow (1999) introduces another perspective on accidents and incidents. He defines accidents and incidents from a systemic view, where the complexity and interactive features of a socio technical system as a whole are emphasized as important to be able to understand why accidents and incidents occur. He divides a system into four different levels: (1) the whole system - e.g. a nuclear plant, (2) a subsystem, e.g. a nuclear plant’s secondary cooling system, (3) a unit of parts, e.g. a collection of parts that make up a steam generator or (4) a single part, e.g. a lone valve. He defines these four levels and accidents versus incident as:

“An accident is a failure in a subsystem, or the system as a whole, that damages more than one unit and in doing so disrupts the ongoing or future output of the system. An incident involves damage that is limited to parts or a unit, whether the failure disrupts the system or not.” (1999, Perrow, p. 66).

The major difference between accidents and incidents is thus the scope of the damage done (Perrow, 1990). An accident should according to this definition damage more than one unit of parts within the system. As a result, the whole system or a large subsystem within it will fail. An incident is limited to damage to single parts or to a unit of parts, even though the potential disruption could befall the system as a whole.

Dekker (2010) presents a stance on accidents from a systemic point of view. An accident is an emergent property in a system and a result of the system’s components doing their ‘normal’ work. He describes system accidents as something that is possible even though each part of the system seems to function normally, e.g. everybody are following local rules, common solutions and habits. Dekker (2010) among many other proponents of a systemic view refutes the idea of simple, linear and causal explanations to complex situations (or negative events, such as accidents and incidents) where a multitude of relations and interconnections coexist within the system. Dekker (2010) underlines that this linear and casual view of accidents stems from an objectivistic point of view, where events and accidents can be broken down to simpler and more understandable parts. He furthermore warns that this creates the need to search for and to blame the ‘single’ part or parts that stand as the root cause of the accident.
2.3 Reporting systems

The use of reporting schemes is becoming widespread in domains such as the chemical process industry, transportation and health care (Schaaf & Kanse, 2003). There are several studies on incident reporting and near-misses in these domains (Jones et al., 1999; Lawton & Parker, 2002; Evans et al., 2004; Elder et al. 2006; Sanne, 2008; Cambraia et al., 2010; Barach & Small, 2000).

Johnson (2003) divides reporting systems into three main categories; open, confidential and anonymous. Open systems provide all details concerning the report, in confidential systems are identification only available to alleged responsible parties, whereas anonymous systems de-identify and often to some degree de-contextualize stored reports. Johnson (2003) furthermore ascribes levels, in terms of local, national or international usage, to reporting systems. These characteristics imply different strengths and weaknesses (Johnson, 2003). An open system risks being limited in its use if the users are afraid of punishment and unwelcome exposure in the media. A benefit with an open system is that an investigator has all collected information available. A confidential system builds on trust, in the sense that the ‘responsible parties’ that have access to all information do their job properly. Confidential computer-based online reporting systems might create new security issues and feel less trustful to people not used to computer-based systems. Anonymous systems might give the reporter more confidence in their submission, though an apparent problem might be the risk of decline in quality when the accountability of the submitted reports is removed. Johnson (2003) mentions the paradox of anonymity in reporting systems. He presents an example from the aviation domain where many people emphasize the importance of anonymity at the same time as they acknowledge that full anonymity requires de-contextualized reports. The vital information that could benefit an accident investigation might at the same time be part of the context and pose as identification. The removal of this information could render a report much less useful. Johnson (2003) also mentions that local reporting systems might tackle this problem better due to a smaller scope and more inherent local context to that can be used in an investigation.

Critique against anonymity in reporting systems is also presented by Barach and Small (2000), due to the potential threat to accountability and transparency. Barach and Small (2000) note that full anonymity risks being counterproductive in the sense of that you cannot contact reporters to get more and in some cases perhaps critical information. They also note that there is a risk that the reliability might be lower when accountability is withdrawn.

The following sections will present reporting systems in the maritime domain, studies showing barriers to reporting in general and studies acknowledging barriers that are found specifically in near-miss reporting. A cross-domain overview of near-miss reporting is of relevance to learn more about and perhaps find similarities and differences to near-miss reporting and its potential barriers within the maritime domain.

2.3.1 Reporting systems in the maritime domain

Reporting accidents and near-misses at sea is mandatory and bound by legislation for Swedish merchant and fishing vessels. This compulsoriness aims at supporting the authority when deciding whether legal action should be taken as well as to help the responsible authority to prevent further accidents (Transportstyrelsen, 2009). It is each ship’s master or ship owner that is responsible to report these events (Transportstyrelsen, 2009). Accidents and near-misses are reported on the form
“Report on Accidents at Sea” that is sent to the Maritime Department of the STA by mail (Transportstyrelsen, 2009). These types of reports are common in most professional industries (Zachau, 2008) and are often stored in computerized databases, such as the Swedish maritime database SjöolycksSystemet (SOS) - which will be presented later.

Reporting systems can be mandatory by law as well as non-mandatory to partake in (Barach & Small, 2000). Systems that are mandatory often have a larger ratio of accidents whereas non-mandatory systems often offer confidentiality and strive to stimulate near-miss reporting, generating reports of events that otherwise might get unnoticed during accident prevention work (Zachau, 2008).

One of the arguments for near-miss reporting is the ‘iceberg’ shaped ratio (Jones, Kirchsteiger and Bjerke, 1999; Heinrich et al., 1980; Bird & Loftus, 1976) - see 2.2 for figures and further definitions - which implies that near-misses at the base stand in direct connection to the amount of incidents and accidents further up the iceberg. Other benefits of near-miss reporting include a more proactive approach to safety work (Barach & Small, 2000).

The IMO’s guidance on near-miss reporting (2008) states that every company should investigate near-misses as a regulatory requirement, as mentioned in the ISM code - and further define near-misses as a sequence of events and/or conditions that could have, but did not result in loss (such as human injury, environmental damage or negative business contact). The IMO (2008) further states that to gain full benefit of near-miss reporting both seafarers and onshore employees need to understand the definition of near-misses.

The IMO (2008) also mentions explicitly that companies must be clear about how reporters and the persons involved will be treated when a report is made and in which circumstances the reporter and those involved will be guaranteed a non-punitive outcome and confidentiality. Each company should strive to create a just culture that is built on both trust and responsibilities, and where sharing or reporting essential safety-related information is made without fear of retribution.

One example of a confidential reporting program is for aviation and the maritime in the United Kingdom (UK) the Confidential Hazardous / Human Factors Incident Reporting Programme (CHIRP). The reporting system’s maritime program has been operative since 2003 with the aim to contribute to the enhancement of maritime safety in the UK, by providing an independent and confidential, though not anonymous, reporting system for employees and associates within the maritime industries (CHIRP, 2007). Reporting to CHIRP can be done both online through the website or by sending an e-mail and through ordinary mail or by telephone / fax (CHIRP, 2007).

There are other maritime reporting systems, such as The Mariners’ Alerting and Reporting Scheme, MARS. MARS is a confidential reporting system, with the possibility to be anonymous, run by The Nautical Institute in London. The Nautical Institute functions as an international organization and forum for qualified seafarers and others with an interest in nautical matters (MARS, 2008). The objectives of the reporting system are to allow reporters to report accidents and near-misses without being afraid of litigation and to exchange information so that valuable lessons may be learnt by others; which might help to prevent similar accidents in the future (MARS, 2008). The reporter, often a member of the Nautical Institute is guaranteed anonymity for himself as well as for the ship. Reports are sent online through the website or printed and sent through ordinary mail. The reports are published on the Nautical Institute’s website as well as in their monthly journal (Zachau, 2008).
In Sweden, SjöOlycksSystemet (SOS) is a database for accidents and near-misses aimed at the Swedish merchant fleet. SOS was at the time of Zachau’s (2008) study operated by the Swedish Maritime Safety Inspectorate (Zachau, 2008). The reports are sent in by ship captains or companies as legislation demands (Zachau, 2008), though Zachau (2008) noted that only 7-8 percent of the total reports are categorized as near-misses. The information in the database is public. Even though it does not contain the names of any persons, other information like ship names, positions and date make identification possible (Zachau, 2008).

According to Zachau (2008), the above mentioned low numbers of reported near-misses led to an agreement among the Swedish Maritime Safety Inspectorate (Part of the Swedish Transport Agency since 2009) together with ship owners, employees and the maritime industry to create the autonomous, confidential and anonymous database INSJÖ, with the goal to remedy the inaccurate ratio between accidents and near-misses. Section 2.3.1 has introduced reporting systems in the maritime domain, both systems primarily at work in Sweden and systems that are used internationally. The presented reporting systems range from open to anonymous and are aimed for both accidents and near-misses. Section 2.3.2 will present the reporting system INSJÖ in more detail.

2.3.2 INSJÖ
INSJÖ is an autonomous, confidential and voluntary reporting system with web-based reporting forms. Reports stored in the database can be retrieved directly online. The database is not open to the public and you need to login to view the reports (Zachau, 2008). INSJÖ’s aim is to follow the ISM code, as adopted by the IMO, see 2.1.1.

Involved parties in the INSJÖ development are the Maritime Department of the Swedish Transport Agency (STA), the Swedish Shipowners’ Association (SSA) and the Swedish Maritime Agency (SMA). The Merchant Marine Officers’ Association, Swedish Ship Officers’ Association, Swedish Seamen’s Union and other concerned unions have also been involved in the project (INSJÖ, 2007).

INSJÖ contains roughly 2500 reports (INSJÖ, May 2010), with approximately 300 new reports added annually (Zachau, 2008). The essential content of the database are reports from companies, ships, safety committees and crews on board Swedish ships (INSJÖ, 2005).

The term near-accident is used in favor of the term near-miss in the INSJÖ database (INSJÖ, 2007), even though the properties of the first term coincide with the near-miss definitions in 2.2. For sake of coherence, the term near-miss will still be used in section.

The DPs for each shipping company have the possibility to forward the reports from their company to INSJÖ, and thus share knowledge of accidents, near-misses and non-conformities (non-conformities will not be presented further in this study) nationwide to all participants in the INSJÖ collaboration. It is not obligatory for shipping companies to do near-miss reporting through INSJÖ even though near-miss reporting in some form is strongly encouraged and closely tied to the DP role as it is assigned by legislature.

A report sent to INSJÖ is written by a reporter (in most cases the DP) on the basis of categorizations used in INSJÖ’s reporting form, e.g. type of ship, type of event (accident, near-miss or non-conformity), event description, the cause of the event, the consequences of the event and measures
taken afterwards. All information regarding the event itself is written down in a free-text format. The independent company in charge of the database categorizes these answers in order to make the report searchable in the database. The DP gets feedback on his or her reports (originally sent in from a reporter on one of the shipping company’s vessels), in the form of similar cases stored in the database. This feedback can be used to guide the DP when proper corrective actions are decided (INSJÖ, 2005).

This feedback process is shown in figure 1 below.

![Figure 1. The feedback process in INSJÖ. (Copyright ICC, IPSO Classification & Control AB ICC, IPSO Classification & Control AB, Retrieved November 2009.)](image)

Zachau (2008) did an analysis of INSJÖ and compared the voluntary INSJÖ database with the public, SOS database (SjöOlycksSystemet) that does not provide anonymity and that cannot guarantee that legal actions will be excluded. Voluntary and confidential databases like INSJÖ should, according to several studies mentioned by Zachau (2008), contain a higher ratio of reported near-misses compared to incidents. He found that INSJÖ did not contain the expected ratio of near-misses in the database. The ideal relation would be 1:100, which would give more power to conduct such tasks as proactive safety work, due to a large amount of analyzable near-miss events, whereas INSJÖ had only a 50:50 relation. This is still a step in the right direction, according to Zachau (2008), if compared to SOS that contains far less near-miss reports in relation to the number of accidents. This most likely stems from the fact that accidents, by definition (see 2.2), often are easier to recognize, harder to ignore, due to their negative outcome, and obligatory to report. It is in contrast harder to always correctly identify and make sure that near-misses are reported in the same manner.

2.3.3 Near-miss reporting
Barach & Small (2000) mention several advantages using near-misses in reporting systems. They note that near-misses occur 3-300 times more often than negative events, such as incidents, which makes a quantitative and statistical analysis possible, this might help identify patterns in the data (Johnson, 2003). Barach and Small (2000) also note that the study of strategies and mechanism for making recoveries - that might determine whether the outcome will be negative or not - enhances proactive
means to hinder accidents. They furthermore mention that the post accident / incident hindsight bias – the inclination to rate a phenomenon as more predictable than it actually is - can be reduced when studying the interrelation between accidents and near-misses.

Jones et al. (1999) mention the ‘iceberg’ relation between the numbers of near-misses, minor incidents and major accidents as has been demonstrated in earlier studies (Heinrich et al., 1980; Bird & Loftus, 1976) and depicted by Heinrich et al. (1980) and Bird and Loftus (1976), see 2.2. Reducing near-misses at the ‘bottom’ of the iceberg will supposedly affect and reduce the amount of incidents and accidents further up.

Jones et al. (1999) point out that the actual amount of reported near-misses is far from satisfactory in many domains, and most likely not even near the actual amount or level of near-misses that occur in reality. This suggests that an increase of near-misses in different kind of incident reporting systems can and should be seen as a positive indicator of safety performance in the sense of that the near-miss reporting gets stimulated and helps to unveil occurrences of near-miss events that are not reported at present. Jones et al. (1999) present Norsk Hydro and their focus on near-miss reporting as an example where it was evident that the number of accidents lowered when the near-miss reporting went up. They suggest that the rate of near-miss reports is an important numerical indicator of industries’ safety awareness. The term safety awareness is not further explained or defined by the authors and will therefore not be elaborated upon in this study.

2.3.4 Barriers to Reporting

A collaborative hospital study (Evans, Berry, Smith, Esteman, Selim, O'Shaughnessy, & DeWit, 2004) showed that self-perceived barriers to incident reporting - near-misses included - for both doctors and nurses were lack of feedback and organizational factors relating to structures and processes for reporting (e.g. inadequate feedback on actions taken, long forms and insufficient time to report). Almost two thirds of all respondents in the study believed that the above-mentioned lack of feedback was the greatest deterrent to reporting.

Van der Schaaf & Kanse (2004) highlighted differences in perceived reasons for not reporting incidents in the chemical process industry. The management and safety staff did to some extent anticipate fear and shame as potential barriers to operators. They also anticipated that operators would view often experienced and common risks as something negligible to report, in the sense that common occurring events would be viewed as ‘nothing new’, widely known by the personnel and without learning potential. Successful recoveries were also anticipated to be viewed as superfluous to report by the operators, because the situation would likely be seen as taken care of. To the surprise of management and safety staff the study showed a genuine difference between some of the anticipated barriers mentioned beforehand and the one brought up by participant operator. The operators de-emphasized fear and shame as barriers contrary to the beliefs of the management. The barriers mentioned the most concerned the fact that no remaining consequences were to be found, which made reporting non-valuable and insignificant. Other barriers were labeled as not applicable and referred to various reasons such as miscommunication and administration errors.

Elder, Graham, Brandth and Hickner (2007) studied barriers and motivators for what they present as error reporting (reporting of events that could lead to incidents or accidents) within the domain of
family medicine in the US. The term error reporting will not be further used or elaborated upon in this study. Common themes found during several focus groups were: 1) Burden of effort, 2) Clarity of request, 3) Perceived benefit and 4) Properties of the error.

The burden of effort in reporting referred mostly to lack of time to report and a risk of forgetting to file a report at all. The clarity of request referred to the difficulties to know what to report. Repetitive and frequent errors were found in this category as well as errors that were unlikely to recur. Other barriers in this category concerned what to write in the report and if it applied to a certain person’s job to report a particular event. The benefit of reporting was not acknowledged or seen as a job requirement by some of the participants. Certain properties of an error also related to barriers; errors that were deemed as not serious and errors that were self-made were less reported.

Motivators to reporting were in most cases found in inverse of the barriers though more scarcely mentioned by the participant groups. Other common motivators mentioned involved receiving some sort of perceived benefit such as feedback or knowledge that lessons were made known to colleagues. Anonymity was also seen as a motivating factor in making reports.

In his study of the Swedish railroad domain, Sanne (2008) highlights how different accident etiologies and discrepancies between official policies and local practices can conflict in ways that hinder the official incident reporting process. Sanne (2008) describes that the reason for non-reporting in the railroad domain is due to different accident etiologies. Occupational and informal storytelling is the occupational norm, while the official incident-reporting scheme is not. Telling stories to teach and learn from each other can function as a way to address risk, though from a more narrow and local perspective; stories are shaped by the shared values and norms within the social context in which they are told, and the value of storytelling risk to be too limited in a larger organizational perspective. Sanne (2008) mentions how an awareness of these limitations could create insights in how change to a better incident-reporting climate could be accomplished and what kind of obstacles that has to be overcome. One of the most important conclusions from Sanne’s (2008) fieldwork is that, in order to make incident-reporting work properly, employees must be given ownership of the incident reporting system, and know how and why to use it. Fear of disciplinary action must be addressed and a better focus on finding root causes, as often lacking in occupational storytelling, is important; as well as giving more feedback and education in the principles of incident-reporting systems within a more systemic perspective.

2.3.5 Barriers to near-miss reporting
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.

The just culture concept also includes supplying confidentiality to reporters when reporting near-misses, to ensure that enough resources are given to the investigation at hand and that near-miss reporting gets followed through with suggestions and recommendations for future conduct (IMO, 2008).

Barach and Small (2000) draw conclusions from domains (though not the maritime one) where reporting near-misses have been institutionalized to gain more insights to help to create similar schemes in health care, insights that might enhance the reporting and the prevention of medical mishaps. They list domains such as aviation, nuclear power technology, petrochemical processing, steel production and military operations to have these kinds of near miss reporting schemes. The authors list several barriers that were found in 12 non-medical incident reporting systems.

The authors divide different kinds of barriers (and incentives to those barriers) - found in the various studied domains - into three main categories: individual, organizational and societal; where each larger category could be further divided into four subcategories or aspects: Legal, cultural, regulatory and financial, see table 1 below.

Table 1. Barriers and incentives to reporting

<table>
<thead>
<tr>
<th>Legal</th>
<th>Individual</th>
<th>Organizational</th>
<th>Society</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrier</td>
<td>Fear of reprisals, lack of trust.</td>
<td>Fear of litigation, costs, sanctions, undermine trust, bad publicity</td>
<td>Legal impediments to peer review, confidentiality, and multi-institutional databases</td>
</tr>
<tr>
<td>Incentive</td>
<td>Provide confidentiality and immunity</td>
<td>Provide confidentiality and immunity</td>
<td>Ensure accountability, enforce reporting statuses</td>
</tr>
</tbody>
</table>
Table 1 presents barriers and incentives to reporting in 12 domains. Legal, cultural, regulatory and financial subcategories are viewed through their impact on the individual, the organization or the society.

Barach and Small (2000) found that disincentives to reporting were the extra work needed, skepticism, lack of trust, fear of reprisals and lack of effectiveness of present reporting systems. Incentives to report would be confidentiality, some degree of immunity, and that the reporting system should be philanthropic (that reporters identify with patients and other healthcare providers that benefit from the data), and therapeutic (in the sense that reporters learn from reporting about adverse events). Barach and Small (2000) mention several important factors that determine the quality and success of incident reporting systems. These include having an independent outsourcing of the report collection, analyzing reports with help of peer experts, having sustained leadership support, making it easy to report and supplying rapid meaningful feedback to reporters and all interested parties.
Barach and Small (2000) highlight several changes or conflicts that can occur when taking the near-miss perspective. If the focus changes from errors and adverse events, the near-miss perspective might move the focus to resilience, in the sense of that successful recoveries from accidents are emphasized. There might also be tradeoffs between large aggregate databases and more regional systems. A national system might help to capture more rare events where more regional ones instead provide more specific and local feedback more efficiently.
3 Aim
This study’s aim is to examine near-miss reporting and to identify barriers that might hinder or limit near-miss reporting in the Swedish maritime domain. The study focus on both near-miss reporting through the national INSJÖ database - that is used by several Swedish shipping companies to gather and share knowledge about incidents and near-misses - and through the obligatory and local near-miss reporting between ship and office. Near-misses are in this study defined as events that could but did not result in damage or injury but otherwise share aspects with an accident (Cambraia et al. 2010).

3.1 Research question
- What kind of barriers against reporting in general and near-miss reporting in particular can be found prevalent in the Swedish maritime domain?

3.2 Boundaries of the study
This study aims to examine and identify barriers prevalent in the Swedish maritime domain, and only shipping companies with ships flagged in Swedish waters participate in the study. Not all types of Swedish shipping companies are represented in this study.

Barriers highlighted in this study are the ones found when analyzing the interviews with selected representatives, seven DPs and four officers, from shipping companies in Sweden. The study does not focus on other parties' view of barriers, such as other company personnel or representatives from other organizations. Specific details concerning individuals, ships, companies or events are not brought up in this study.

3.3 Scope of this thesis
Accidents in this study are defined as all safety related events that are accompanied by negative consequence, including incidents (Perrow, 1999), errors and other adverse events as mentioned by Barach & Small (2000); this is in contrast to near-misses that do not result in injury or property damage (Bird & Loftus, 1976).
4 Method

Ethnographic methods are about studying and getting insights of the daily lives of others (Emerson, Fretz & Shaw, 1995). The core activities in ethnographic field research are often participant observation, as the ethnographer participates in the daily routines of the studied setting, and an accumulation of written material of observations and experiences made (Emerson et al. 1995). This kind of traditional field research is often time consuming and extensive. When looking at socio technical systems, these potential drawbacks have led to tradeoff-methodologies or focused ethnographies (Knoblauch, 2005) that balance time limitation and knowledge gain. A focused ethnography, in contrast to conventional ethnographies, often means conducting shorter field visits and having a more extensive data collection during these visits, as might be appropriate when time is an important factor or when the setting under scrutiny is one under change (Knoblauch, 2005). To gain more knowledge on one or more specific aspects of daily work in the maritime domain, such as the view on reporting and potential barriers that might hinder reporting in near-miss events, qualitative methods can be used to capture ‘life as it is lived’ (Boeree, 2010). This can be done by studying results of past living, observing the present or eliciting data by the use of methods such as interviewing or conducting focus groups. These methods let the researcher ask questions and, in the case of focus groups, initiate tasks that encourage a group to discuss and labor on specific topics (Boeree, 2010).

The material analyzed in this ethnographically inspired study has been collected by conducting semi-structured interviews - which was deemed the best choice time and resource wise - with deck officers and DP personnel. This chapter will begin with a presentation of interviewing as a qualitative method in 4.1 and continue with a description of the data collection and data analysis in 4.2 and 4.3. Lastly, 4.4 describe how validity, reliability and objectivity concepts can be applied when using qualitative methods.

4.1 Interviews as method

Interviews are a common and versatile way to learn more about certain topics of interest and to capture and investigate participants' attitudes (Jordan, 1998). Interviewing ranges from highly structured interviews with all questions developed beforehand to completely unstructured ones (Benyon, Turner & Turner, 2005). Unstructured interviews contain open-ended questions that give the respondents the opportunity to steer the interview in preferred directions. This might be beneficial when explorative studies are conducted, when the background information is limited (as when the interviewer does not know what the issues of concern are) or when the interviewer lacks domain knowledge (Jordan, 1998). Structured interviews contain a pre-set collection of questions, which might be a good format if conducting a structured quantitative analysis where certain variables are studied (Jordan, 1998). This type of interview also requires a clear idea of the issues of interest (Jordan, 1998).

The semi-structured interview uses questions prepared beforehand without losing the opportunity to explore new topics as they are brought forth during the interview. The interviewer should have considered relevant topics and have expectations of what type of questions that might elicit relevant responses from the respondents beforehand (Jordan, 1998).
Jordan (1998) mentions that interviews have certain advantages to other means of collecting data such as questionnaires, as they share certain aspects with interviewing but often are more static. When interviewing, the contact with the respondent is direct and misinterpretations can be repaired, for example by rephrasing or providing more context. This in a way that ordinarily is not possible when reading text only and the respondent has to make an interpretation based solely on the information written down. Jordan (1998) also emphasizes that it is easier to compensate for potential deficiencies like ambiguity that risk creating confusion and misconception in written text, this due to the two-way communication during the interview session.

Interviewing as a qualitative method is not, as any method, without potential drawbacks. Problems might occur if the interview is conducted without preparation or if the interviewer biased. How a question is asked might affect how a respondent will answer that certain question (or how the interviewer chooses to interpret the answer given) (Boeree, 2010). Section 4.4 presents how concepts for judging quality of one’s findings, e.g. validity, reliability and objectivity can be applied in qualitative research.

4.2 Data collection
To collect material, on the near-miss reporting and its potential barriers in the Swedish domain, semi-structured interviews with seven shipping companies were held. A literary overview of near-miss reporting in other domains were conducted beforehand, this overview helped me formulate topics and questions (to be included in the interview template) deemed relevant for identifying barriers that might be prevalent in the maritime domain as well as in other domains.

To get perspectives from both the office and from onboard the ships I interviewed both DP personnel and deck officers at sea. The participating companies were also divided between companies that report to INSJÖ and companies that do not, this to make potential differences in perspective salient.

Before the interviews could be conducted, the DPs of several Swedish shipping companies were contacted by phone. The companies called where chosen based on convenience and location. They were given information regarding the study and were asked if they could participate, and if it was possible to interview someone who regularly made reports from one of the company’s ships; in those cases this was possible the DP supplied contact information to selected officers, in charge of the onboard reporting. All of the interviewees were men.

The interviews were semi-structured (Benyon et al., 2005). An interview template (See Appendix A) was used but not followed strictly Follow-up questions were given when unforeseen topics arose. This generated new questions and themes not thought of beforehand. The template was created to help cover all themes that were deemed interesting. There were four versions of the template with slightly different questions; the groups considered were INSJÖ-DP, INSJÖ-Officer, Non-INSJÖ-DP and Non-INSJÖ-Officer. The following broad themes were judged relevant to investigate further.

1) The view on near-misses
2) The view of reporting
3) The view of DP
4) The relation between crew and DP
5) Potential barriers to reporting
6) Feedback when reporting
7) The view on responsibility onboard

Theme 7 was specific to the template given to the officers, to learn more about the view on responsibility onboard from the reporting officer.

Not all the template questions (See Appendix A) were asked if I deemed them redundant or already answered by the interviewee. One interview could not be given in person or by phone due to constraints regarding time and resources. This participant answered similar questions by e-mail instead; this interview therefore lacked the semi-structure of the other interviews and was e-mailed as a version of the interview template, edited to suit the e-mail format better.

Each participant was given a short introduction regarding the aim of the interview and the study as a whole. Each interview in person or by phone was recorded after the respondent had given his consent to participate. All participants were briefed about being anonymous, about that they could abort the interview at any time and about that all material recorded is handled strictly confidential, in line with ethical principles when interviewing (Bryman, 2002). The participants were also informed that the gathered material would not be used for any commercial purposes. The final draft of the thesis will also be e-mailed to each participant before the study goes into print, this to let the respondents comment on the material and conclusions made.

The interviews were conducted with representatives of seven different shipping companies, four of them were tanker companies and the other handled other types of cargo. Five of seven companies report to INSJÖ. Interviews were conducted with seven people in the offices ashore - in all cases but one interviews were made with the person designated by regulation to have responsibility over safety management (this group will still be described as DPs) - as well as four nautical officers onboard ships belonging to four of the total seven selected companies. Five out of seven interviews with DP personnel were conducted in person while the other two were interviewed by phone. The one participant that did not work as DP was second in command of the company’s safety work and had good insight in the reporting matter.

Of the four interviews that were held with officers, only one interview was made onboard a ship (due to limited time and travel resources), two interviews were made by phone and one was answered by an officer through e-mail due to limited communication possibilities at sea. Three out of four officers belonged to shipping companies using INSJÖ to report near-misses.

4.3 Data Analysis
After the interviews were completed, the material was transcribed and color coded according to the different themes found during this same process. The transcriptions were verbatim, though not on a very detailed level and only focused on what the informants were saying. The transcriptions did not include overlaps, pauses or potential communicative non-verbal gestures such as laughs, nods or humming in agreement. The material was used in two separate analyses; the first analysis (analysis 1) is described in 4.3.1. This analysis was done in a naturalistic fashion, with highlighted categories deemed relevant chosen by me and without the use of any particular underlying method. The second analysis (analysis 2) is described in 4.3.2 and was done after the completion of the first analysis. It
uses the categories from by Barach and Small’s (2000) presentation of barriers and incentives to near-miss reporting in various domains, see table 1 in section 2.3.5.

4.3.1 Analysis 1
To make the material more manageable and lucid, the highlighted themes identified in the material were plotted in a mind map like manner. This mind map includes two parts, one part that illustrates the material from the interviewed DP personnel and another part that depicts the material from the interviewed officers. Each participant’s highlighted statements from the material were transformed into subcategories and organized according to each theme in the mind map, see figure 2 and 3. This categorization made it possible to group participants’ quotations together and make differences and similarities between the different participants visible; and to discern if there were differences among the four groups: 1) INSJÖ-DP, 2) INSJÖ-Officer, 3) Non-INSJÖ-DP and 4) Non-INSJÖ-Officer. The two visualizations can be seen in figure 2 and 3 below.

Fig. 2 Visualization of the eight themes, with subcategories, from the mind map generated from the four officer’s statements. Each subcategory shows how many of the respondents that mention a particular topic.

Figure 2 shows eight different themes that were used to categorize the subcategories that held quotations from the officers. These themes were:

1. Why report near-misses?
2. The role of the DP
3. Barriers
4. Means to increase reporting
5. Feedback
6. Anonymity
7. External parties that affect reporting
8. INSJÖ

Figure 3 shows eight different themes that were used to categorize the subcategories that held quotations from the DPs. These themes were:

1. Why report near-misses?
2. The role of the DP
3. Barriers
4. Means to increase reporting
5. Feedback
6. Anonymity
7. External parties that affect reporting
8. INSJÖ

Some changes in the presented themes were done during the course of analyzing the material, I deemed one theme (the role of the DP) irrelevant to be a theme of its own, in regards to the aim of the study. There were also other minor rearrangements and name changes to the themes. In some cases parts of the gathered material were deemed relevant to more than one theme and will thus be mentioned at more than one place in section 5.2 and 5.3 in the following analysis chapter. All
statements have been numbered to correspond to the representing DP or officer, this to make it possible to see whether a representative has more than one statement in a subcategory.

The highlighted material was paraphrased (Purdue Online Writing Lab, 2010) from direct quotation into my own words (Emerson et al. 1995) and then translated from Swedish to English. The paraphrasing was made to make the translation simpler to handle, this due to the potential problems of preserving the feel and accuracy of a direct translation from Swedish to English, for me as a non-native speaker of the English language.

4.3.2 Analysis 2
Different categorizations highlight and mould the interpretation in various ways, and might lead to new insights and conclusions from the same material. Table 2 in 5.5 divides the material into four dimensions:

1. What the DP mentions as barriers and incentives on the individual level
2. What the DP mentions as barriers and incentives on the organizational level
3. What officers onboard mention as barriers and incentives on the individual level
4. What officers onboard mention as barriers and incentives on the organizational level

I analyzed the transcribed material once again from the beginning. Statements were once more divided and categorized, though this time, the barriers and incentives listed by Barach and Small (2000) were used as a template. The gathered material does not concern the societal category, which was removed from the analysis. DPs and officers mention barriers on both the individual and organizational level, which made it necessary to use the four dimensions presented above. Respondents’ statements that I deemed to be of similar nature and meaning were grouped together and generalized to create categories that would make the similarities and differences between the two groups more salient, even though single statements of interest were highlighted as well.

4.4 Validity, reliability and objectivity
When assessing the quality of one’s research, you often judge the work by using the concepts of validity, reliability and objectivity. These kinds of tools for quality assessment are as important in qualitative field research as in experimental design (Lützhöft, 2004). The use of above concepts (and what they entail from experimental research and the natural sciences) might prove to be problematic and poorly reflect methods often used in qualitative research (Lützhöft, Nyce & Petersen, 2009). This section will present concepts used in the qualitative field that are of relevance when discussing methodology in 6.3.

When looking at the quality of one’s findings in qualitative research it is more appropriate to use the term credibility rather than applying such validity terms as internal validity (the causal relation between two variables) and construct validity (whether we actually measure what we think we measure). This shift of concepts is a way to evade experimental concepts and the search for truth or falsity of a proposition, a focus that ill befits qualitative research (Lützhöft et al. 2009). Credibility concerns the degree to which a phenomenon is interpreted correctly given the data at hand and to the soundness of the arguments given (Lützhöft et al. 2009). The goal of credibility is to show that the link between the reconstructed world of the qualitative researcher and the respondents are credible and phenomenological sound (Lützhöft, 2004). This could be accomplished through such
measures as a triangulation of methods, sources and investigators as well as with prolonged engagement and through persistent observation (Lützhöft et al. 2009).

It is in the same manner more favorable to use the concept of transferability instead of external validity in qualitative research. Transferability concerns whether it is possible to generalize, e.g. observations and findings, to other domains, contexts and populations. Transferability is said to be possible by providing such a rich or thick description that generalization can be derived from this description (Geertz, 1973). Lützhöft et al. (2009) mention though that it is hard to assess when and what kind of thickness that is sufficient in a given fieldwork situation.

The traditional definition of reliability (Heiman, 2001) is the extent to which a measured phenomenon is the same every time it is measured in the same way. Testing of reliability by this definition might make sense in a controlled experimental setting where randomness can be minimized by design (Lützhöft et al, 2009). In real world settings this definition poorly reflect the qualitative methodologies often used. Other definitions are therefore preferable (Lützhöft, 2009). Two types of qualitative reliability are quixotic reliability and synchronic reliability (Lützhöft, 2004). Quixotic reliability concerns the possibility that one single method misleadingly yields consistent results. In qualitative research this might be misleading in the sense of that the information given might be ‘rehearsed’. Synchronic reliability concern if observations are similar within the same time period. If this is not the case these observations might give birth to insights of interesting potential differences in different observer’s view of the world.

Objectivity, as traditionally viewed in the natural sciences, concerns knowledge’s independence from all external influence and opinion (Lützhöft et al. 2009). Dekker (2010) discusses this world-view in relation to its influence on human factors and the concept of human error (and to other fields in the social sciences). He explains how this ‘Cartesian-Newtonian’ view implies that there are real undeniable truths to discover about the world, bound to the laws of mechanics; and how complexity is seen as readily reducible to smaller and more understandable parts if needed. This objectivistic stance is problematic in qualitative methodology.

Objectivity in qualitative research is not so much about discovering the real undeniable truth, in the above sense (Lützhöft, 2009). If one should apply this ‘Cartesian-Newtonian’ view when conducting qualitative studies he or she would miss a crucial point of qualitative research entirely. Objectivity in qualitative research concerns getting reliable insights in someone’s world-view, their perspectives and the logic that goes with it (Lützhöft, 2004). This has nothing to do with finding the ‘truth’ in the objective sense, in the same sense of that the this study does not concern finding some absolute truth inherent in the respondents’ statements or a ‘true’ interpretation of this material. A certain truth does not ‘cancel’ out everything else in qualitative research; diversity among findings is not a negative thing but rather a source that gives you more insights of a phenomenon or let you gain a deeper look into someone’s world-view (Lützhöft, 2004). Dekker (2010) furthermore highlights the possible ethical complications that could arise when someone is an ‘adjudicator of truth’, the researcher is right while the subjects (and possible their world-view) is wrong. This point of view presented by Dekker (2010) goes against the qualitative research paradigm and would surely not give birth to fruitful insights and a better understanding of the life of others.
Lützhöft (2004) also mentions the insider bias and how preconceptions about the world or a particular domain shape the questions we do or do not ask and how we perceive the world around us. This could perhaps be seen as a kind of professional vision (Goodwin, 1994), which might unlock doors that would remain closed to a person lacking knowledge of the particular domain or trade – who might fail to unpack the practice and knowledge of the practitioners studied (Lützhöft et al. 2009). At same time might an insider overlook to ask or feel awkward about asking perhaps seemingly trivial questions; even though relevant information can be found (Lützhöft, 2004). Overall, it is important to be aware of the both the positive and negative aspects of being an outsider / insider and try utilize this knowledge the best possible way.
5 Analysis
The analysis chapter is divided into two main parts, each section presenting the analysis and discussion from the corresponding data analysis. 5.1 to 5.4 will cover the first and more naturalistic analysis 1 and 5.5 and 5.6 will present and discuss analysis 2 that use the barriers and incentives framework presented by Barach and Small (2000).

5.1 Analysis 1
The collected material was transcribed and is divided between designated persons and officers that managed reporting on board. Statements deemed relevant were highlighted and subcategorized into larger themes. The highlighted themes were:

- Near-miss reporting
  - Why is reporting important?
  - Perceived barriers
  - Means to increase reporting
- Feedback and communication
- Anonymity and confidentiality
- INSJÖ
- External parties that might affect reporting

Each theme has its own subthemes or subcategories that will be presented below.

5.2 Reporting officers onboard
The material gathered from the officers is presented within the subcategories used during the analysis described in 4.3.1. Each statement has been numbered to correspond to the representing officer. This makes it easier for the reader to get a sense of which representative that is connected to a specific statement without compromising the anonymity of the respondents. The numbering also makes it possible to know whether a representative has more than one statement in a subcategory.

5.2.1 Near-miss reporting - Why is near-miss reporting important?
Near-misses is a familiar notion for all interviewees and is regarded an integral component in the safety work on board. All ships have some type of goal regarding near-miss reporting. All officers mention near-miss goals dictated from the office, three of the respondents whom work on tanker ships also mention the similar goals from companies in the oil industry. The oil companies have their own demands and regulations regarding near-miss reporting and are able to deny certain ships work opportunities if these demands are not met properly.

A recurring notion from all four of the interviewed officers is that the reports, in particular near-misses, should contain some degree of relevance, be useful and not trivial.

1. I am sure incidents occur that are not experienced as such and don’t get reported properly for that reason. We have several sailors and deckhands that have worked onboard ships for like 25-30 years. There is working tasks that I think are a bit unsafe, working tasks these guys have encountered during their years at sea and therefore deem harmless. Of course they
won’t report this.

2. All reports must be relevant. You report all that’s relevant.

4. I mean, you don’t report if it’s not important. The report should be of serious matters and useful. You always have to draw a line around what’s interesting to report. We often discuss this onboard, especially when someone wants to make a report.

4. The written account should be useful. I mean, some sailors write about stuff that is nothing to write about. Some might write too little, what do I know.

3. The work at sea is risk taking all the time. Something might happen that’s a bit out of the ordinary, but you still feel it’s nothing to report.

Three out of four mention the learning aspect or lessons learned to be an important incentive to near-miss reporting and two specifically mention that knowledge about specific events must be spread to ‘sister boats’ with similar architecture.

2. There is an expression, “lessons to be learned” that emphasizes the importance of reporting. The more reports sent in the less near-misses, you learn from your mistakes.

4. The system is made to share and teach others of your own mistakes

3. It’s quite important that we report. If you encounter strange things onboard that you aren’t used to it’s a good thing to report. There might be others who need to know.

4. I mean, if you got a whole series of similar ships and there is something wrong with one of them or if a near-miss occurs, then it’s pretty important to report this to prevent the same on the other ships. It’s better to learn from each other.

3. If the other boats have similar systems and if you by happenstance discover “This has happened, this must be known” and you don’t report it, then the other boats can be endangered as well and you haven’t shared your experiences with others.

5.2.2 Near-miss reporting - Perceived Barriers
One barrier that all officers mention is related to the near-miss reporting and the perceived relevance and where to draw the line between a near-miss and ordinary events.

2. As I said before, near-miss reporting is pretty new in an ancient trade. I think it will take some time before all people have the ability to discern a near-miss.

2. All reports must be relevant. You report all that’s relevant.

3. The work at sea is risk taking all the time. Something might happen that’s a bit out of the ordinary, but you still feel it’s nothing to report. Often you feel, “Well, that worked alright”.

4. Well, people hesitate to report, it happens. But it’s not a big deal, generally everything works fine, it’s the ordinary life. If something happens, it’s often something that stands out, minor stuff happens every day right?
4. There are always dangers onboard, especially during winter. And if you do something wrong the risk for accidents is always there. It’s a special work place and really hard to know where to draw the line. Sailors have always been practical; we are not a writing people or office personnel.

1. You have to draw a line all the time. Sometime there is mooring and unmooring in strong wind where risks for incidents are heightened. But still, in this profession, where do you draw the line? It’s something no one has explained to me through the years, that line you have to draw for yourself.

Another issue that might affect reporting is differences in the background of personnel onboard. The educational and cultural background as well as age differs greatly between crew members according to three officers. This might entail barriers such as different perspectives on the importance of reporting, unfamiliarity with paperwork, feeling ashamed of reporting self-made errors or a reluctance to forward near-misses or deviances to officers onboard.

3. There might be barriers against reporting for some. I have had the feeling that some nationalities don’t want to admit when they done anything wrong. They’ll deny it.

4. Yeah, the crew members talk to the officers when they want to report something. There are many people from other nationalities in this crew, just one or two Swedes. They aren’t fond of writing, I don’t know why, it’s not like someone impedes them from reporting.

4. It’s very rare that someone in the crew wants to report something, I don’t know if they might be a bit lazy in themselves or if they are scared of reporting or what it is. It’s always we officers that have to report stuff, even if you try to encourage the crew. It happens really rarely, I don’t think a deckhand has come forward to me and said that he wants to do a report, ever. I don’t think it’s because we are officers, they aren’t used to writing or reporting.

4. Some people may feel that the report verifies that they are stupid, but you must not see it that way.

1. The case might be that the individual worker doesn’t experience certain events as incidents. He may have 25 years of service on the same boat and experienced these things many times over during this time. He may feel that these things aren’t big deals, but someone from outside may think this an obvious thing to report.

1. Well, the background might differ. It depends on the education you got with you from your career. There are people that start out just after finishing primary school, or those that not finished it before they started working onboard. They have little theoretical knowledge and might not see this safety work the same way as those that read about it before they went out to sea. Everyone has different qualifications. When talking about the merchant fleet the crew composition is very varied. You got deckhands that might have scarce theoretical knowledge, cooks, engineers and motormen. All with different educations or in some cases no education at all. We also got the officers that have to go through merchant marine academy before they even can start to sail. This mix might be one reason why not everything gets reported.
5.2.3 Near-miss reporting - Means to increase reporting
The interviewees mention that the changing focus on reporting as well as the improved (navigational) safety is attributed mainly to the external parties and legislation. Two interviewees mention that increasing demands from oil companies have helped moving the focus away from only accidents and incidents to an approach involving proactive safety work and near-miss reporting.

2. The oil companies and the Swedish Maritime Administration have high demands on safety and reporting.

1. The oil companies have their own inspections onboard that take place on a yearly basis. If I remember correctly, they have conducted office inspections as well these last two years. In relation to this I feel follow-ups, safety work and feedback have gotten much better.

1. Whatever your feelings towards the oil companies, one can conclude that the navigational safety is much better on tankers compared to other ships. So they have brought with them good changes to safety work.

5.2.4 Feedback and communication
According to all officers, the SMS meetings (meetings regarding safety onboard employed monthly in most cases) are an important opportunity where feedback is given to the whole ship crew and the members of the crew are able to voice issues and propose improvements that will be forwarded to the DP.

3. Yeah, we got these SMS meetings monthly. We follow an agenda and talk about the safety work. If something’s happened, you mention it. It’s the way things work, there’s no secrets and no hypocrisy.

2. We continuously work to improve safety. We got these reports and the meetings onboard to accomplish this.

1. We have a safety meeting once a month. On this meeting we talk about all SAFIR reports the ship has sent since the last time. And if we have gotten info about near-misses from the office regarding other ships the whole crew is informed during this meeting. Every crew member has an opportunity to share experiences if something has happened. If they bring something up, we have to report it.

4. We do a risk assessment each time there’s a safety meeting. Then you bring up everything you think is serious or risky.

One positive feature with the reporting system that was mentioned by three of four officers is that every report sent in must be processed by the DP or someone else in the office. The report keeps its ‘open’ status and remains in the system until someone deals with it. This keeps unsolved reports visible in the system with lesser risk of being forgotten or neglected.

1. The system that handles SAFIR reporting shows a report as an open case until DP or someone else at the office have made a decision. When we get a reply and everything is in order it’ll close. A SAFIR can’t be ignored without proper steps taken.
4. Yes, when we send in a report it is open until the reported matter is solved. The company and we onboard support each other. We do the required changes or propose improvements to be made. When our measures get approved DP writes some notes about this and then closes the case.

3. Each report gets a reply, if no reply comes back it’s an error in itself.

Two out of four officers mention that the DP role is most important when events that are more serious occur. Furthermore, three out of four sees DP as the overarching safety coordinator and the natural link between the ship and the company office.

3. DP is most important when bad things happen. When you report “the usual” you contact the office people that work with safety related stuff.

1. Well, if your report concerns more practical stuff it’ll go to the company. If something serious happens I’ll try to contact the DP personally or see to that he’ll be contacted directly.

3. DP should be available twenty four seven, seven days a week, if something happens. He should assist us onboard concerning reports, feedback and whatnot.

2. DP handles the communication and information flow between office and ship. He’s the link between the two.

5.2.5 Anonymity and confidentiality

Two out of four officers mention that anonymity is important to hinder pointing out individual crew members when reporting self-made errors or slips.

1. It’s important that anonymity is provided to prevent someone to feel indicated. The whole system would break down.

2. Fear of consequences shouldn’t prevent one sailor to write a relevant report.

In contrast to the two statements above, the other two officers do not feel that anonymity necessarily is that important when reporting. Both officers mention that a seafarer should be able to stand his or her ground and be responsible for his or her own reports without hiding his or her identity, even though anonymity could be convenient in some cases.

3. I don’t like the use of anonymity. If you got something to say, you should stand your ground and be honest. To say “this is what I think” instead of sneaking behind someone’s back. But I’m sure there’s times where it might come in handy as well, because of the situation onboard. There’ve always existed officers that are not fit for the job and idiots that made one mess after another. Then it might be good that someone that ordinarily wouldn’t dare report could give others a hint of the situation. There are both pros and cons.

4. I don’t think anonymity is necessary, if you want do a report or if you want improve something, then you should stand for it. I mean, it’s nothing you just make up. There are no lies and nothing unpleasant to sign your name for. So I don’t think it matters, I mean if I want to report a near-accident for example I do it openly, it’s not like to badmouth someone.
5.2.6 INSJÖ
The officers mention INSJÖ only sporadically when asked about external parties that affect near-miss reporting. The same officers talk about getting feedback from the database directly to the company’s ships and that events from other companies’ database entries sometimes are discussed during safety meetings.

5.2.7 External parties that might affect reporting
Only one officer emphasizes the issue of external influence. The interviewee brings up the two sides of oil companies being so influential on the trade, at the same time as they have boosted reporting they may also function as a brake when it comes to further improvement. The officer suggests some kind of central instance that would function as a link between the shipping company and the oil company. This central instance could also help change the focus to the learning aspects of reporting rather than the potential negative consequences that might come with full transparency.

1. The oil companies often have higher demands than IMO on tankers. The oil companies claims that it is voluntary to follow their instructions, they don’t have any legislation in their back.. (..)Yeah I think barriers exist, I think it’s primarily the company that hesitates to forward some things. The oil company inspectors are not very open, they are open to the reporting system, but if something happens on a ship they might take this very serious and not green light the ship. As they improve safety they also function as a braking block for reporting. I feel that they sit on two different chairs at the same time. I don’t know how things are in aviation now, but when I worked in the navy you had anonymity. The ones who investigated accidents didn’t need to know the specific ship to improve safety. This could the oil companies learn from, you could introduce legislation and recommendations that improve safety without them knowing what specific ship did what. Today they know the specific ship, which can be seen as something negative.

5.3 DP personnel
Each statement has been numbered to correspond to the representing officer. This makes it easier for the reader to get a sense of which representative that is connected to a specific statement without compromising the anonymity of the respondents. The numbering also makes it possible to know whether a representative has more than one statement in a subcategory.

5.3.1 Near-misses - Why is near-miss reporting important?
All seven interviewees stress that the learning aspect of near-miss reporting is of great importance to be able to work proactively with accident prevention. Five out of seven DP personnel also mention the ability to proactive work as the cornerstone of near-miss reporting.

7. Many near-misses will occur before the real event happens so to speak. If it’s possible to process this when it’s still an almost-event it’s also easier to avoid the accidents.

7. Most of our work is focused on what happens on the ships, that we’ll be able to avoid similar events or hinder that something happens at all. So yes, near-misses are really important.
7. Sure, that’s why you don’t want just incidents, you also want to know when it almost happened something so you can prevent incidents proactively. That’s why near-miss reporting is important.

4. I think that near-misses are the most important actually, that’s where you really can prevent bad things from happening.

4. Reporting near-misses are an important way to learn from each other.

6. Reporting near-misses is paramount to us, it’s then you can prevent real accidents so to speak.

6. The most important is to prevent things from happening again and to learn from past mistakes.

2. Events that other companies don’t learn anything from aren’t sent forward to INSJÖ. There has to exist a general interest.

5. The reporting is a really important way to spread information between our ships. Through the system you can share important safety related info among all company ships.

3. Near-miss reporting is great when the right things get reported. Then you can work proactively and prevent before something happens for real.

3. The important part of reporting is to learn from and teach others.

1. I want to emphasize how important this form of reporting is to proactive work.

1. The most important thing with reporting near-misses, incidents and accidents is to prevent that similar events happens on another ship and that you learn something from each accident, incident or near-miss.

Two out of seven stress that knowledge from near-misses are only distributed within their own shipping company and that knowledge from other shipping companies is not used, one mentions that it would be hard to manage information from the whole domain capacity-wise.

5. The reporting is a really important way to spread information between our ships. Through the system you can share important safety related info to all company ships. It’s also important to make all ships highlight the information being sent out. The safety info is only shared within the company.

1. External feedback isn’t that important. It’s much more important with feedback within our own company. I don’t like the idea of “the whole fleet of Sweden”. It would be too much to process other companies’ reports as in INSJÖ. I don’t think it would help making our safety culture better, it might be more important to larger shipping companies.

1. We use INSJÖ to report in but not as a tool to send out information to our own ships. We use our own database to that end.
Two other DPs emphasize information sharing between companies and the importance to pool information that relates to ships of the same type, sister boats, regardless of the company.

7. It all comes down to what has happened, if the event for example is about equipment that only exists on one or a few ships then it might not be as interesting to others. But if there’s something that’s common on all ships it must be shared with everyone. That’s a consideration you have to make. I don’t always use the feedback I get from INSJÖ and send it back to the ships, it depends on the matter at hand. It differs from case to case.

6. Mm, we also learn from each other within the company. Is there an incident on one ship and there’s a sister ship or a similar ship then we send out this information to everyone and says: “This has happened at ship number one and we want you to take a look on this to ensure that it doesn’t happen to you as well”.

One person stresses that near-miss reporting is a good indication of ‘safety awareness’, in the sense of that a large amount near-misses reported statistically proves that the company has a good and sound awareness of safety.

1. A year ago we had quite few near-misses. We ran a campaign that emphasized how important it is to report near-misses. Both as proactive measures but also to show that the crew have a safety awareness, then you can prove to your clients through good near-miss reporting that thoughts of safety exists.

5.3.2 Near-misses - Perceived Barriers
All DPs mention barriers to reporting. The most prevalent type of barrier, that all except for one respondent mention, is the noticeable variation in reporting among their own fleet. Certain ships or individuals on ships are noticeably better at near-miss reporting.

7. We have explained to the crew that it’s really important that they report. You can see a rise in reports for a while. However, it’s very individual what you define as: “This was nothing special”, or “This could have lead to something dangerous, I’ll report this”. Some are better than others at reporting, it’s very individual.

4. Yes, there’re differences in reporting, but not between ships but rather between different persons.

6. Some ships are very good at writing reports and do this frequently, they are good at coming up with solutions as well. This is the way you want it in a perfect system, something’s happened, you acknowledge it, you write a report and then solve the situation before you send in the report and adds the solution in the report itself. It doesn’t work that way, there only a few ships that’s on this level.

2. There are large differences between different ships. One ship has reported almost one hundred near-misses this year, whereas the others are close to the yearly goal. There’s some over-representation of near-misses on deck. Deck officers report a bit more often than chief engineers and engineers, this might have to do with a better habit of reporting on deck.

5. There are better and there are worse ships when it comes to reporting.
3. Some individuals contribute to a better rate of reporting on some ships.

Four out of seven DPs also highlight the crew members’ background differences as a potential barrier. Differences in age, culture and education are mentioned as factors that affect near-miss reporting as well as trust between the office and the boat.

2. Deck officers report a bit more often than chief engineers and engineers; this might have to do with a better habit of reporting on deck.

1. Some cultural differences exist between for example Swedes and crews with other nationalities, there you could do a little extra work to enhance reporting.

7. I want to believe that reporting are easier for the newly educated officers. I hope the importance of near-miss reporting is included in the education. I know that the schools have access to INSJÖ and I hope that the ones that study now have this with them in their backpack. The older officers may not see it the same way; they haven’t seen the profit that comes with reporting.

7. I think that newly graduated officers are more prepared to do things like risk assessments and reporting of near-misses. But there might be two sides, this new generation has learnt new ways, but they lack experience. The experience onboard is worth a lot as well, and is something that takes many years to build up. You can’t say that one generation is better than another, but you have to acknowledge the differences.

6. You mentioned education, I should say that education is really important. You gain a broader insight which I think lead to better reporting.

Four out of seven mention that understanding the motivation behind reporting can be improved whereas three mention specifically that unfamiliarity with paper work, or in extension lack of computer skills, might be an obstacle.

3. The near-miss reporting is going well, but you can always become better. You could try to make the crew more aware of near-miss reporting, by setting monthly goals on reporting for example.

1. I feel content with the quantity of reported events. Nevertheless, to increase reporting even further people must understand why it’s important to report, you could for example arrange events to brace the crew.

4. Reporting is relatively new thing that people aren’t used to. It takes time before the crew understands the need and use of reporting. But you more you inform about reporting the better they become.

6. You mentioned education, I should say that education is really important. You gain a broader insight which I think lead to better reporting.

1. The crew sometimes thinks it’s tiresome to write down stuff in the report form.

5. We would not manage to process sent in reports that are not correctly written.
3. There are still some people onboard, older people, that never have used a computer. There’ll not be as many reports from these people.

Another issue mentioned by three of the DPs as being problematic when reporting, is how and when one should draw a line between ordinary work conditions and near-misses; questions arise regarding relevance, usefulness and non-triviality.

7. It depends on what you define as a near-miss when something happens onboard. Many events could be seen as ordinary ones. You have to take a step further and think: "Could this lead to something?" I think it is very individual what you acknowledge as a near-miss.

6. You have to draw a line for what you send in. I usually think: "What’s the value to know that this has happened at another company’s ship?"

3. Near-miss reporting is great when the right things get reported.

Three DPs also mention that some crew members might feel that they ridicule themselves when reporting certain events.

5. It might be hard for some people to write down near-misses, you get the feeling that you ridicule yourself.

4. You don’t want to be ridiculed by your colleagues, that won’t do. That’s the way it works in society.

7. I think it’s hardest when the near-miss is self made, you don’t want to shout out to everyone that you’ve done something stupid.

5.3.3 Near-Misses - Means to increase reporting

The single most prevalent measure to increase reporting is mentioned by five out of seven interviewees. They emphasize that the crew members have to be aware of the importance of near-miss reporting; or in two cases more specifically the importance of a (no blame) culture for safety. This DP describes the creation of a good safety culture as a continual process that stretches over many years. Two mention that the topic of near-misses are one of the focuses during SMS-meeting and that the near-miss awareness could be improved by education.

1. We ran a campaign that emphasized how important it is to report near-misses.

3. You have to get everybody to know that near-misses are important. We measure statistics on reporting for example. We set monthly goals to get people to be more aware of the importance of reporting.

7. We have a no blame culture, no one gets blamed if you do something the wrong way, if it’s not criminal of course. But you don’t blame someone that makes an ordinary mistake. This indicates that people really speak up when something’s happened. We don’t get mad if something happens, it’s always better to let us know. We continuously bring this issue to the officers when we meet them. You have to explain what is done with the information that’s
sent in and make them understand that the more reported near-misses the less risk of really large events.

6. Well, as safety culture is made from several measures in the daily work process. It’ll take many years to build a good safety culture, and there are a lot of aspects and parameters that you have take account of. It’s nothing you can build in a year. But there’s always room for improvement. You mentioned education, I should say that education is really important. You gain a broader insight which I think lead to better reporting. INSJÖ or this kind of reporting as a whole is a continuous process to make more and more people aware of the purpose of the system. This view is far from obvious for the crew onboard.

4. Reporting is a relatively new thing that people aren’t used to. It takes time before the crew understands the need and use of reporting. But you more you inform about reporting the better they become.

Two interviewees, as mentioned in 5.3.2 above, note that newly educated master mariners probably have more knowledge regarding maritime safety in ‘their backpacks’ and are therefore probably more naturally inclined to reporting near-misses.

5.3.4 Feedback and communication
Most DPs assert that firsthand feedback regarding reports from the DP goes to the reporting officer onboard the ship, even though several DPs also mention that information deemed important such as specific near-misses goes out to internally by e-mail to the whole company fleet. One DP mentions that feedback from INSJÖ is included in the DP’s reply to specific ships if the report from these ships were forwarded to INSJÖ in the first place.

4. Yes, if there is a case that’s of general interest I’ll forward this feedback from INSJÖ

7. I don’t always use the feedback I get from INSJÖ and send it back to the ships, it depends on the matters at hand. It differs from case to case.

6. The feedback is included in the report that’s e-mailed back to the ship. It’s not only my feedback but the information from INSJÖ as well. I don’t think you always go through the attached feedback from INSJÖ onboard. Primarily you look at the feedback directed to your reported case specifically. You make sure that the preventive measures are taken care of, that’s what you prioritize. But I’m sure they look and ponder the INSJÖ feedback as well. I don’t work actively with that feedback that is sent from INSJÖ centrally, it’s the specific ship’s job.

The two DPs that represent companies outside the INSJÖ collaboration describe more of a closed loop of reporting. Near-misses regarded as relevant to notify about are only sent to the company fleet. In one case, information is actually sent in to INSJÖ, even though the feedback from INSJÖ never reaches back to the company’s own ships.

5. The reporting is a really important way to spread information between our ships. Through the system you can share important safety related info to all company ships. It’s also important to make all ships highlight the information being sent out. The safety info is only
shared within the company.

1. I use INSJÖ to report in but not as a tool to send out information the company ships.

Two DPs mention that the feedback that goes from the DP directly to crew members (and back), is mostly given through SMS-meetings. Three of seven DPs mention that the crew and officers are encouraged to send in suggestions of improvement and not only report near-misses.

Three DPs mention that the DP functions as a direct line between the crew and the management, though two of three have never encountered a crew member that use this method to contact management instead of contacting the officer onboard.

1. It’s almost always the officer in charge that report. Crew members can contact me directly, even though I can’t recall this ever to happen.

6. (..)If you look at the rest of the crew you don’t see that kind of contact with me actively, most of the time I talk to the officers onboard.

7. Yes, it’s happened. It has been nothing serious, but sure, I’ve been contacted by crew members directly.

5.3.5 Anonymity and confidentiality

Four out of Seven DPs claim that their company has a no blame culture.

4. I think it’s important not to create scapegoats. It’s not what you’re after.

7. We got a no blame culture, no one’s get blamed if you do something the wrong way, if it’s not criminal of course

1. We often talk with the crew about the importance of a no blame culture, but it’s hard to know how every man on deck views the matter.

6. If you want anonymity you should have it. We have a no blame culture here in the company. If you find that you or a colleague doing something wrong, no one should be blamed for notifying this, we are just grateful that you bring it up. Then fix the situation instead, that’s the way we work.

Four of seven DPs mention that anonymity is important on an individual level, though one mentions that a low number of anonymous reports are a good indication of a good and transparent safety culture.

6. I think it’s important with anonymity, on the other hand there’s not a great many anonymous reports that get written. It’s just a few on a yearly basis. I feel this is a sign of transparency in the company. You can talk about safety, regardless. This could be a sign of a good safety culture. I believe that a good safety culture is more of importance than anonymity itself. If we didn’t have a good safety culture there would be more people who wanted anonymity, for sure.
One person mentions that anonymity and confidentiality is more important on a ship level than on an individual level, and the fact that INSJÖ is closed to the public prevent denigration of shipping companies in the press. Another DP, that do not use INSJÖ, comments that the maritime domain in Sweden as a whole is rather small; which makes anonymous events in INSJÖ less anonymous at second glance.

7. Anonymity is very important. Else I think we would lose reports. When you have a reporting system the size of INSJÖ, there are many that can go in and have access to this information. You don’t want to reveal yourself and say: “this has happened on my ship and this has happened on my ship”. There’s a risk that this kind of statistics is used to list all the problems one company has had, statistics that would be printed in a newspaper.

1. The trade is not very large and you can sometimes deduce which company what despite anonymity in systems like INSJÖ.

5.3.6 INSJÖ

All five DPs that report to INSJÖ mention that not every report is sent to the database. Four of these DPs mention that reports they deem to have no value to others are not sent in to INSJÖ; whereas the remaining DP mentions that he reports all of the incoming near-misses regardless. One DP only sends ‘good’ near-misses to the database.

7. All that’s of value to others, things that could have ended really badly. That kind of things I report to INSJÖ.

4. There’s events of a more private nature, that’s not for all eyes to see, not even within the company. These kinds of reports we don’t send forward to INSJÖ.

6. I don’t send in all reports to INSJÖ. I decode like seven out of ten reports that I send to INSJÖ. And if you ask: “why not ten out of ten?” Sometime the report has no value for others, neither INSJÖ nor the reporter; in these cases I choose not to send the report forward.

3. All reports don’t get sent to INSJÖ. There are superfluous reports that just bring up things like spelling errors. But all accidents and near-misses are sent to INSJÖ.

2. I choose to report to INSJÖ if there’s a good near-miss. If it’s too specific to one ship, to the company or if there’s no general interest, I don’t forward to INSJÖ

Three out of five interviewees mention that they use or would like to use the feedback from INSJÖ for risk assessment purposes in the future.

3. We haven’t directly used the feedback from INSJÖ, it’s mostly been used to show others what can happen. No “aha” experiences. The statistics can be good for risk assessment purposes, to know if it’s happened earlier and so on.

Two interviewees mention that there exists a wide gap in quality between reports sent in to INSJÖ. One of the DPs sees this as a crippling factor that limits the use of the database, whereas the other DP sees a potential to learn something from every report.
3. One problem with INSJÖ are large differences in quality among the reports, some of them tells you nothing of value.

4. The reports from INSJÖ come in varied quality, but it’s still interesting to go through them. You learn from everything.

5.3.7 External parties that might affect reporting
Two DPs mention the demands of certain quantities of near-misses reported each month to reach the demands of the oil companies and of the inspections from the same companies on yearly basis. The first participant also brings up an example of a near-miss case that he depicts as debatable.

5. We work with the oil companies, they want three to five near-misses a month.

3. The oil companies want at least one near-miss a month to show that the company has the correct thinking

5. I’ve seen that it’s not clean enough onboard. I reported this as a near-miss. You might view this as: "ok, this might not really be a near-miss", but we feel that it is.

One DP mentions the double-edged role of the oil business. Another DP mentions that oil companies are not allowed to use a report against a company even though problems of this nature have occurred in the past.

5. Oil companies aren’t allowed to use the reports against the company, this rule is better followed nowadays, but it hasn’t always been so. Earlier the shipping companies didn't dare bring some things up because of the risk of "decapitation".

3. All parties want the shipping companies to be proactive. The clients are always positive to reporting until the report is sent in, you get the feeling that mostly negative critique come back when it's sent in. It would be good with more support.

5.4 Discussion - analysis 1
I will here discuss material from analysis 1 that is mentioned by several respondents or notions that are emphasized by one or very few respondents but deemed relevant on their own. The common denominator is that I see these notions as relevant for this study. A discussion of analysis 2 will follow in 5.6.

5.4.1 Benefits and barriers to near-miss reporting
DPs and Officers almost unanimously highlight the proactive power of near-miss reporting and that lessons to learn from this kind of events are of importance. There are some notable differences between DPs and officers that belong to the INSJÖ cooperation and those who do not. Companies that are part of the INSJÖ cooperation mention advantages of having access to a nationwide database for incidents and near-misses to a large extent whereas the companies that are not a part of INSJÖ seem more content to spread the lessons learned within the boundaries of their own company. This is relevant in regards to the tradeoffs mentioned by Barach and Small (2000), a nationwide database might contain less relevant reports that lack in detail. However, rare occurrences and ‘unique’ events, that might transpire due to a certain setup of factors, are more
likely to be found in a larger accumulation of reports. A local database might therefore seem more efficient in the day-to-day work, as a company’s own reports probably make more sense to use in a local context. Still, using a local reporting system (the company’s own reporting system) only might be less effective as a proactive measure to learn about, and in a worst-case scenario hinder, rare but maybe more disastrous accidents.

There might also be a division of philanthropic values (Barach & Small, 2000). Some companies emphasize the value of sharing information (and learn lessons from other companies) within the whole maritime domain whereas others find it more valuable to inform and spread knowledge among sister ships and their own company ships. The importance of reporting being therapeutic (having learning value) seems common among all companies and respondents, the learning factor is held high by practically all the respondents.

Evans et al. (2004) discuss the lack of organizational feedback that was identified as a major barrier for doctors and nurses. Lack of feedback is not mentioned as a particular barrier to near-miss reporting in the maritime domain by the respondents. The regulative function of the DP and the nature of the reporting system create a stable feedback stream between DP and officers onboard, as reporting matters must be dealt with and closed through the SAFIR system. The present study does not however answer the question whether crew members in general feel that they get adequate feedback from officers or the DP. Some officers mention that crew members of certain nationalities report less or not at all or that differences in crew members’ background might cloud the larger safety picture for some.

Van der Schaaf & Kanse (2004) emphasize differences in perceived reasons for not reporting between management and operators. When presented with the results in van der Schaaf and Kanse’s (2004) study most management and safety personnel were surprised that the major reasons for not reporting did not involve fear of reporting or avoiding shame. There are some differences in perceived barriers between DPs and officers in this study, but also an agreement of factors that affect reporting in the maritime domain negatively. Three out of seven DPs mention that uneasiness and fear of shame might be a barrier, whereas only one officer out of four mentions very briefly that this might be a problem. A noticeable difference in this study compared to van der Schaaf & Kanse’s (2004) is that the respondent groups, DPs and officers, might be perceived as authority figures or management, from other crew members point of view. Differences in opinions perceived in this study are between the two respondent groups, DPs and officers. The view of the rest of the crew remains unknown. The IMO guidelines on near-miss reporting (2008) also mention fear of shame as a barrier for near-miss reporting and as one major reason for the need of a just culture. With lack of input from the crew members, it is difficult to know how prevalent this barrier is within the companies in this study.

Other noticeable potential differences are presented in the anonymity paragraph below. One very prevalent notion that is mentioned by all DPs and several officers is that reported events must be relevant and not trivial. At the same time, where do you draw the line between ordinary working condition seafarers are used to and near-misses? One of the dangers mentioned with near-misses is their ‘trivial’ nature. Triviality might create resonance in a system’s stability and become hazardous in orchestra with other factors. The problem of judging the seriousness of an event is noticeable in the
literature and something seemingly common in various domains such as family medicine (Elder et al. 2007), the chemical process industry (van der Schaaf & Kanse, 2004). Barach & Small (2000) list skepticism of near-miss reporting as one cultural barrier that is prevalent in aviation, petrochemical processing, NASA and the nuclear power industry.

Several DPs mention that a good way to achieve an increased near-miss reporting is to enhance the awareness of reporting near-misses. This might seem simple, but could be complicated in reality, and should be addressed and treated seriously. To alter one’s view both an understanding of the matter at hand and effective means to bring about change is needed. One danger is that the ‘importance of near-miss reporting’ is rehearsed but the view of the matter remains the same and reporting is regarded mostly as extra paper work. As Sanne (2008) concludes, to make reporting systems work effectively, a focus should be to give employees ownership of their own reporting system and the knowledge how and why to use it. Sanne (2008) mentions the storytelling scheme as the occupational norm in the railroad domain. While storytelling is a way to address risk- and surely a possible tool to unravel knowledge that might disappear in a more formal reporting scheme - this perspective focuses on risk in a way that favors a more narrow and local perspective rather than a wider one.

Another aspect that both DPs and officers mentioned during the interviews is the difference in reporting between ships and that some officers are more used to reporting than others. This might not come as a surprise in a domain with many generations of officers working onboard ships. There is a large age span among members of the maritime domain and this could mean a variation of skills, experience and knowledge. Both DPs and officers mention differences in background, such as difference in crew education, as a factor and potential barrier that influence how safety is viewed onboard.

5.4.2 Feedback and communication
The communication in reporting matters between ship and office mainly between the DP and the officer in charge of reporting matters. Three DPs assert that the crew can contact them directly without notifying either officers or office, though only one DP claims that use of this privilege has occurred during his time in office.

The feedback process between DP and officer within the reporting system SAFIR seems to function well according to most officers. According to all four officers and two DP feedback to other crew members stems primary from safety meetings onboard.

SAFIR reporting is described as a built-in measure to get feedback on all reports sent in. Most near-miss reports are forwarded by a DP to INSJÖ in the cases where the company is a participant in the INSJÖ cooperation. One DP mentions that all near-miss reports are sent in whereas another only sends in the ‘good ones’. This might lead to the same problems with triviality and where to draw a line between what events are valuable to share with the whole community and which ones are not. The feedback stream from INSJÖ back to the actual crew seems to differ between companies and ships. One DP mentions that an e-mail with INSJÖ recommendations is automatically sent to the ship where in other cases it is up to the DP in charge to choose whether to inform certain ships or not. Johnson (2003) mentions the risk of bias towards certain groups in national systems, something that can be perceived in this domain as well. Not every Swedish shipping company is part of the INSJÖ
cooperation and there is quite a difference in quantity of how many reports that are sent to INSJÖ as well as how actively companies use the retrieved information in their daily work. A risk with national systems that are difficult to examine further in this study is the possible discrepancies in mentioned and actual use of national reporting systems as a tool for accident prevention. Johnson (2003) mentions similar risks when he describes how national reporting systems might develop into ‘grandiose initiatives’ that fulfill the ambition of its proponents rather than addressing safety issues.

5.4.3 Anonymity and external parties

When talking about anonymity and confidentiality there are some differences in perspectives between DPs and officers. Most DPs talk about anonymity and confidentiality in positive terms and as means to decrease blame and improve reporting at large, though one DP mentions that he is feeling a bit divided regarding anonymity. He explains that he feels a bit of skepticism against anonymity. He mention that it is important in the sense of providing anonymity. Still, the crew should at the same time not feel the need of reporting anonymously if there is indeed a no blame culture installed and a sound safety culture prevalent in the company. In contrast to this, two officers oppose anonymity with rather strong words and emphasize that one should stand his ground and take responsibility for what has happened without a layer of anonymity. The mentioned issues with anonymity seem to concern responsibility rather than the paradox of anonymity (Johnson, 2003) mentioned in 2.3.

When anonymity is highlighted as a topic during the interview, the respondents seem to focus on anonymity on two levels, the crew level and the company level. The focus of anonymity mostly concerns the crew level where it is mentioned as a necessary component in the reporting system. One officer mentions anonymity as important on a company level as he is talking about external parties, in this case the oil companies. He mentions that the oil industry affects the reporting in both positive and negative ways, this due to their power to demand changes regarding safety and the authority to deny companies working possibilities if certain standards are not met. This officer suggests that there should be another layer of anonymity added towards these companies in a central autonomous manner, a model not wholly unlike the INSJÖ system. This would regain the lessons learned effects but dampen the negative focus on specific ships that might come from full transparency towards the oil business. Two DPs mention monthly near-miss demands specifically, whereas one further comment that reports have been used against companies earlier to ‘decapitate’ the company. This potential negative external effect combined with a certain vagueness of the nature of near-misses might create a problem of relevancy. Does strict demands of monthly near-miss reports equal safety or sound safety awareness? Is there a risk of ‘finding’ debatable near-misses out of necessity due to these requirements but still dismiss others, especially when personnel might not share the safety view of the DP or certain officers, due to their perceived triviality?

The use of INSJÖ seems to vary from company to company. Three out of five DPs use the feedback to INSJÖ for risk assessment purposes though two out of five officers also mention that there are significant differences in quality between different reports in the INSJÖ database. This creates a problem of not only getting people to report near-misses, but also how to present the reports in a manner that is useful for the Swedish maritime domain.
5.5 Analysis 2 – Barriers and incentives to reporting

The second analysis applies Barach and Small’s (2000) framework of barriers and incentives to near-miss reporting, presented in table 1 in 2.3.5, on the gathered material. This analysis intends to highlight the barriers and incentives identified in this study in comparison to barriers and incentives found prevalent in other domains.

The four main categories used in this analysis concern barriers and incentives within the legal, cultural, regulatory and financial area. Each main category contains subcategories – marked in bold - that in turn includes notions related to the collected material from the study’s informants. The presented companies are de-identified and referred to as numbers. Company number one and five do not use the INSJÖ system in their accident prevention work. Each respondent group has statements regarding barriers and incentives on the individual and the organizational level as can be seen in each group’s two separate columns. Subcategories within brackets are categories used in the study of Barach and Small (2000) even though they have not been mentioned by the informants or have been identified in this study. To get a better overview of each main category table 2 below has been divided and is presented in four parts.
Table 2.1. The legal category of table 2 with both barriers and incentives to near-miss reporting

<table>
<thead>
<tr>
<th></th>
<th>DPs: (1), (2, 3, 4, 5), 6, 7</th>
<th>Officers onboard: (1), 2, 3, 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individual</td>
<td>Organizational</td>
</tr>
<tr>
<td><strong>Legal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Barrier</strong></td>
<td>Fear of reprisals:</td>
<td>Sanctions:</td>
</tr>
<tr>
<td></td>
<td>Fear of negative consequence when reporting (1, 4, 5, 7)</td>
<td>Risk of negative consequences from oil companies when reporting (3, 5)</td>
</tr>
<tr>
<td></td>
<td>Lack of trust:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Supervision when reporting (6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tension between office and crew (7)</td>
<td>The layer of anonymity in INSJÖ might not be enough to de-identify companies due to the small domain (1)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Undermine trust) (Fear of litigation) (Costs)</td>
</tr>
<tr>
<td><strong>Incentive</strong></td>
<td>Provide confidentiality and immunity:</td>
<td>Provide confidentiality and immunity:</td>
</tr>
<tr>
<td></td>
<td>Must not create scapegoats: (4, 5, 6),</td>
<td>INSJÖ prevent negative media coverage when reporting (7)</td>
</tr>
</tbody>
</table>

The statements of the DPs and officers are categorized based on the mention of individual or organizational barriers / incentives respectively, which create four dimensions of barriers / incentives

Barriers on the individual level found in the legal category mainly concern fear of reprisals and lack of trust. The only incentive mentioned in answer to these barriers is to provide confidentiality and immunity. Barriers on the organizational level are only identified in the DP group and concern sanctions and bad publicity.
### Table 2.2. The cultural category of table 2 with both barriers and incentives to near-miss reporting

<table>
<thead>
<tr>
<th>Cultural (values, attitudes, beliefs)</th>
<th>DP: (1), 2, 3, 4, (5), 6, 7</th>
<th>Officers onboard: (1), 2, 3, 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual</td>
<td>Organizational</td>
<td>Individual</td>
</tr>
<tr>
<td>Organizational</td>
<td></td>
<td>Organizational</td>
</tr>
<tr>
<td><strong>Barrier</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dependent on profession:</td>
<td>Dependent on organization:</td>
<td>Dependent on profession:</td>
</tr>
<tr>
<td>Where do you draw the line during</td>
<td>Feedback from INSJÖ</td>
<td>Where do you draw the line</td>
</tr>
<tr>
<td>ordinary working conditions:</td>
<td>differs greatly in quality:</td>
<td>during ordinary working</td>
</tr>
<tr>
<td>(1, 3, 7)</td>
<td>(3)</td>
<td>conditions:</td>
</tr>
<tr>
<td>Different cultural backgrounds:</td>
<td>Bureaucratic:</td>
<td>(1, 2, 3, 4)</td>
</tr>
<tr>
<td>(1)</td>
<td>Can not handle reports</td>
<td>Differences in background:</td>
</tr>
<tr>
<td>Different educational backgrounds:</td>
<td>that are not correctly</td>
<td>(1)</td>
</tr>
<tr>
<td>(1, 3, 6, 7)</td>
<td>written: (5)</td>
<td>Everyone does not understand</td>
</tr>
<tr>
<td>Some crew members Lack knowledge</td>
<td>(Pathological)</td>
<td>or value near-miss reporting:</td>
</tr>
<tr>
<td>about DP role:</td>
<td>(Generative cultures)</td>
<td>(1, 2, 3)</td>
</tr>
<tr>
<td>(3, 6), Computer inexperience:</td>
<td>(Don’t want to know)</td>
<td>Not used to paper work:</td>
</tr>
<tr>
<td>(3), Crew (or officers) not</td>
<td></td>
<td>(4)</td>
</tr>
<tr>
<td>used to reporting: (4, 5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skepticism:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Where do you draw the line during</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ordinary working conditions:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1, 3, 7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Only reports “good enough”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>near-misses: (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The report must be useful: (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra work:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>extra workload: (2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Code of silence)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Fear of colleagues in Trouble)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Dependent or organization)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Pathological)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Bureaucratic)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Generative cultures)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Don’t want to know)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extra work:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not used to paper work / not a</td>
<td></td>
<td></td>
</tr>
<tr>
<td>writing people: (4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Code of silence)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Fear of colleagues in Trouble)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Incentive

<table>
<thead>
<tr>
<th>Professional values: philanthropic:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share within the company: (1, 4, 5, 6)</td>
</tr>
<tr>
<td>Share with similar ship types: (6, 7)</td>
</tr>
<tr>
<td>Knowledge of general interest must be shared (and learned from others): (2, 3, 4, 6, 7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Integrity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>An understanding that official reporting leads to guaranteed feedback from the DP (4)</td>
</tr>
<tr>
<td>Openness regarding reporting regardless: (6)</td>
</tr>
<tr>
<td>Direct line to the DP: (7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Near-miss awareness / emphasis: (1, 3, 4, 5, 6, 7)</td>
</tr>
<tr>
<td>Emphasis on near-miss reporting on SMS meetings and Officers’ conferences: (3, 7)</td>
</tr>
<tr>
<td>Using cases from INSJÖ and other scenarios in educational purposes: (4, 6, 7)</td>
</tr>
<tr>
<td>Create a good safety culture: (6)</td>
</tr>
<tr>
<td>Everyone should know the role of the DP: (7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Become a leader in safety and quality; good for business:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety has the highest priority (6)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Professional values: Philanthropic:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Efficient feedback to company ship from office (1, 2)</td>
</tr>
<tr>
<td>Knowledge of general interest must be shared (and learned from others): (3, 4)</td>
</tr>
<tr>
<td>Share with similar ship types: (4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Integrity:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting guarantee feedback (1, 3, 4), Straight forwardness and honesty (is more important than anonymity): (1, 2, 3, 4), SMS meetings are a way for crew members to voice their opinion and ‘clear the air’: (1)</td>
</tr>
<tr>
<td>Open dialogue with the crew: (3)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Educational:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newly educated officers have more theoretical knowledge: (4)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cathartic:</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMS meetings are a way for crew members to voice their opinion and ‘clear the air’: (1, 3, 4)</td>
</tr>
<tr>
<td>Lessons learned: (2)</td>
</tr>
</tbody>
</table>

The statements of the DPs and officers are categorized based on the mention of individual or organizational barriers / incentives respectively, which create four dimensions of barriers / incentives

Barriers found in the cultural category concern several subcategories. On the individual level, both DPs and officers mention barriers dependent on profession, and in relation to skepticism and the extra work needed to report. Both groups mention incentives relating to philanthropic values and the importance of integrity and educational resources. Organizational barriers are few and are only mentioned by the DPs.
Table 2.3. The regulatory category of table 2 with both barriers and incentives to near-miss reporting

<table>
<thead>
<tr>
<th>Regulatory</th>
<th>Barrier</th>
<th>Incentive</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Exposure to malpractice:</td>
<td>Prophylactic:</td>
</tr>
<tr>
<td></td>
<td>Fear of negative consequence when reporting (1, 4, 5, 7)</td>
<td>Strive for a No-blame culture: (1, 7)</td>
</tr>
<tr>
<td></td>
<td>Potential censure:</td>
<td>Anonymity important on an individual level: (2)</td>
</tr>
<tr>
<td></td>
<td>Supervision when reporting: (6)</td>
<td>Must not create scapegoats: (4, 5, 6)</td>
</tr>
<tr>
<td></td>
<td>(Premiums will go up)</td>
<td>Follow the rules:</td>
</tr>
<tr>
<td></td>
<td>(Investigation and license suspension and subsequent loss of income)</td>
<td>An understanding that official reporting leads to guaranteed feedback from the DP: (4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emphasis on the ISM-code: (4, 7)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Set goals in near-miss reporting: (3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Every near-miss is sent to INSJÖ: (3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Report as near-miss when applicable: (5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>It doesn’t apply to us, we do our own internal analysis process:</td>
<td>Prophylactic:</td>
</tr>
<tr>
<td></td>
<td>Using company’s own databases reporting systems only, not INSJÖ: (1)</td>
<td>Anonymity is important on the crew level, names not mentioned (1, 2)</td>
</tr>
<tr>
<td></td>
<td>Not enough resources to handle reports from the whole Swedish maritime</td>
<td>It is human to err: (3)</td>
</tr>
<tr>
<td></td>
<td>domain: (1), (They can’t understand our problems anyway)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follow the rules:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SMS meetings is a way for crew members to voice their opinion and ‘clear the air’: (1, 3, 4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reporting guarantee feedback (1, 3, 4)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The SMS manual is integral to reporting: (3)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>The officers onboard emphasize reporting: (3)</td>
</tr>
</tbody>
</table>

The statements of the DPs and officers are categorized based on the mention of individual or organizational barriers / incentives respectively, which create four dimensions of barriers / incentives.
Both groups highlight exposure to malpractice as a barrier on the individual level. Fear of censure as a barrier is found in the DP group only whereas the risk of license suspension as a barrier is identified solely in the officer group. Prophylactic no-blame directives as well as rule following are identified as incentives on the individual level in both groups. The only barrier on the organizational level is mentioned by a DP and is related to the view that the use INSJÖ is not important in his company.

Table 2.4. The regulatory category of table 2 with both barriers and incentives to near-miss reporting

<table>
<thead>
<tr>
<th></th>
<th>Individual</th>
<th>Organizational</th>
<th>Individual</th>
<th>Organizational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>(Loss of reputation) (Loss of job) (Extra work)</td>
<td>Potential loss of revenue: Risk of losing job opportunities if demands from oil companies are not met (5) (Wasted resources) (Patient care contracts) (Not cost effective)</td>
<td>(Loss of reputation) (Loss of job) (Extra work)</td>
<td>Potential loss of revenue: Risk of losing job opportunities if demands from oil companies are not met (1) (Patient care contracts) (Not cost effective) (Wasted resources)</td>
</tr>
<tr>
<td>Incentive</td>
<td>(Safety saves money)</td>
<td>Improve reputation of quality and safety: Near-miss statistic / Oil company inspection: (1, 2, 3, 5) (Publicity relations)</td>
<td>(Safety saves money)</td>
<td>Publicity relations: The DP functions as a link between company, organizations and the media: (1) Improve reputation of quality and safety: The DP functions as a link between company, organizations and the media: (1) Near-miss statistic / Oil company inspections: (1) External organizations and clients demands safety focus: (2,4)</td>
</tr>
</tbody>
</table>

The statements of the DPs and officers are categorized based on the mention of individual or organizational barriers / incentives respectively, which create four dimensions of barriers / incentives

The financial category only concern barriers and incentives on the organizational level. The risk of losing revenue is identified as an barrier in both groups whereas found incentives are the improvement of the company’s reputation of quality and safety publicity relations with the media and other organizations.

Categories in this material that seemingly relate to each other using the general categorization from Barach and Small (2000) are integrity and rule following. The best channels for the crew members to

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be heard and voice concern without being ignored are through proper channels integrated in the system. Following the rules by reporting through proper channels guarantee that feedback will be received. The notions of straightforwardness and honesty are mentioned as incentives to reporting by all the officers though the DP personnel do not mention this particular motivator at all. Questions about where to draw the line between ordinary working conditions and near-miss events are mentioned by both groups as a common barrier in the maritime domain. This barrier also seems to relate to the notion of skepticism of reporting events that is regarded as trivial.

According to the Barach and Small’s (2000) categorization, anonymity, confidentiality and immunity can be contemplated from various perspectives; this categorization highlights the legal point of view as well as the regulatory and perhaps more local company perspective. The notion of no-blame cultures seems to reside within each company, being prophylactic and not something that could be said to necessary be a part of a larger legal category, it rather fits with the notion that ‘some degree of immunity’ (Barach & Small, 2000) is provided. Both officers and DP personnel mention barriers related to this regulatory category. These barriers are mainly related to the fear of exposure of malpractice from the crew. There is a seemingly small but relevant distinction between this barrier and the related barrier of fear of reprisals that can be found in the legal category. The data suggests that fear of shame and ridicule is more prevalent than fear of legal consequences in this case. It can be hard to distinguish the two categories. Both groups mention ‘where to draw the line?’ as a possible professional barrier to near-miss reporting. This suggest that many near-miss occurrences are not viewed as something that lead to legal consequences to the same extent as they are viewed as something trivial or ordinary. To omit reporting certain near-miss occurrences might relate more to fear of embarrassment or not feeling the need to report than fear of legal consequence. The legal category also include the subcategory ‘lack of trust’, a category that should, with above mentioned relation between legal and regulatory fit well within the regulatory category as well; lack of trust should be related to fear of exposure as much as fear of legal consequence.

The only other potential barrier found in the regulatory category is one of potential censure related to a notion that crew members’ reports should be reviewed by an officer before forwarded to the office. This notion might also be relevant in ‘lack of trust’ in the legal category.

The barriers connected to the subcategories dependent on profession and skepticism within the larger cultural category are mentioned by both groups on several occasions; whereas the categories professional values and educational in the same main category contain many incentives to near-miss reporting. DP personnel focus more on educational incentives whereas both groups mention the importance of philanthropic values. All DPs emphasize that knowledge of general interest to all companies must be shared. The exception are the two representatives that do not use INSJÖ as part of their safety work. They stress instead that it is critical to share relevant information within the own company.

Two of the DPs mention that crew members or officers might not be used to report and two other ones state that some members lack knowledge of the DP role. The latter might suggest that knowledge about the DP is interwoven with the knowledge of using reporting systems. Three out of four officers refer to a similar barrier where crew members do not fully understand or value near-miss reporting.
That feedback is an incentive to near-miss reporting is apparent even though feedback do not claim its own category. Still, it is hard to tell whether feedback should pose as its own category or if it is more of a philanthropic and regulative function.

5.6 Discussion - analysis 2
Analysis 2, presented in table 2 in section 5.5 examines the gathered material through the lens of Barach and Small’s (2000) general categorization of barriers and incentives to near-miss reporting. This is done to compare findings in this study with identified categories from other domains that use near-miss reporting.

The second analysis suggests that barriers related to categories concerning the fear of exposure are more prevalent than the fear of legal consequences when reporting. This indicates that measures to create trust and no-blame within the company and among the crew members are at least as important as providing confidentiality and immunity by legislation.

The category ‘dependent on profession’, not surprisingly, is tightly connected to the domain or profession under scrutiny. This category could be used to highlight and compare values, attitudes and beliefs in other domains and organizational settings with those found in the Swedish maritime domain, or specific parts of it. The categories ‘code of silence’ and ‘fear of other colleagues in trouble’ are not mentioned directly by any of the respondents. They might still be linked to lack of trust and the mentioned lack of reports from certain nationalities, as mentioned by the informants. The fear of exposing colleagues is indirectly connected to the fear of one’s own exposure. Differences in crew members’ background are highlighted as a barrier in both analyses. Even though this, for most part, is mentioned in regard to the background of crew members and to some lesser extent to officers. Education and an increased awareness of near-misses and proactive accident prevention are presented as a remedy. This is hard to argue against. Questions relevant are how and what this education should consist of. Are measures that aim to uniform background knowledge as well as to ‘educate’ certain crew members, so they will be able to distinguish what kind of events that are important to report, the best way to go? Or is there a risk of losing knowledge if there is less diversity in the ‘correct’ point of view? If the reporting system should be ‘owned’ by the crew members themselves, which measures should then be used to pool together and highlight experience and knowledge from different points of view without losing focus on how to use this information?

The financial and legal categories are not mentioned as much as the cultural category. There is no doubt that there are more barriers that relate to these two categories, even though these barriers and incentives for most part concern the companies’ relation to outside parties that might influence reporting by making demands and affecting the company financially. It is the informants of tanker companies, which work closely with the oil business mention this aspect to the greatest extent. The only other statement in this category concerns how exposure to the media might pose a sensitive barrier.

As in the first analysis, differences in philanthropic values (with whom the company shares their reports and near-miss information with) between the DPs in INSJÖ and Non-INSJÖ become visible, and seem to be the most relevant differences between these groups found in the collected data.
The division of individual and organizational barriers and incentives highlight the need to oversee the entire reporting process; from steps to encourage the crew members to report, to explore the process taking place within the office, as well as an examine the forwarding of selected near-misses to the INSJÖ database. Categories that seem to relate to each other would also be harder to identify if not for the categories used in this analysis; as the subcategories of ‘integrity’ and ‘rule following’, in the sense that reports sent through the reporting system cannot go unanswered and must be given proper feedback by the DP.
6 Discussion

The discussion chapter is divided into four main parts. The chapter begins with a general discussion in section 6.1 followed by a discussion in 6.2 that concerns the theoretical framework and the discussion of concepts used in this thesis. The methodology section, 6.3, discusses the method used and how the study was conducted. Section 6.4 suggests topics for future research.

6.1 General discussion

The aim of this thesis was to study near-miss reporting and to identify barriers that might hinder or limit near-miss reporting in the Swedish maritime domain. The statements from DPs and officers in this study suggest that similar barriers to near-miss reporting can be found in the maritime domain as in other domains, which use near-miss reporting systems, presented in the study.

Barriers in this study have been identified either by direct answers from respondents or deemed to be found implicitly in what the respondents say. Two seemingly important threads that can be found in both analyses are that of integrity and anonymity / confidentiality. These two threads are not necessarily incompatible but might clash in some ways. A misuse of anonymity could stand in direct opposition to integrity whereas integrity might not be enough if the fear of reprisal or exposure are big enough (e.g. you risk being affected economically, risk being seen in a bad light or expose yourself in some other negative way). On a local level, especially in smaller companies, this anonymity or confidentiality risks being breached, by purpose or not, due to a small number of crew members and vessels. The best way to remedy this problem might be hard to identify, but creating a genuine trust in the company management and between crew members might play a key role.

Another barrier made salient in both analyses is the view on relevance and significance of near-misses. All respondents have not mentioned the view of certain near-miss events as trivial as barriers per se; but these statements have rather been interpreted as barriers by me. Literature from other domains presents similar barriers, but does this type of skepticism need to be a barrier to reporting by default? There might exist different types of ‘triviality’, on one hand there might be diffuse near-misses that are hard to assess properly in a risk spectrum and on the other hand there might be near-misses that really are trivial, that might be reported as a result of the growing focus on near-miss statistics. This skepticism could perhaps also work as a professional vision filtering out certain trivial events that actually are known within the profession as well as to rule out truly harmless events; this all depends on how near-misses and their inherent nature is viewed. This will be discussed more thoroughly in section 6.2.

The second analysis focuses more systematically on both barriers and incentives compared to the first analysis and made it possible to compare DPs and officers. Legal and economic barriers/incentives though, are scarcer than barriers/incentives in the cultural and regulatory categories that hold more focus. Still the legal and economic aspects were not highlighted much in the first analysis either, and is thus absent in both analyses.

One thing to have in mind is that the boundaries of this study are within Swedish maritime domain and statements from other parts of the domain are not presented. This does not mean that the creation of efficient accident prevention is an isolated national problem and not important for the maritime domain everywhere. The use of reporting systems is local (within the company only) and
national (using INSJÖ), as can be seen in this study. The use of the third category, international reporting systems, is not mentioned to a large degree in this study but may still be one important component that should be available when learning from each other through reporting systems. The task of creating efficient international reporting systems are not without complications, Johnson (2003) describe common problems such as the difficulty of collating data efficiently when the parties included use different terms, definitions and so forth; information that may be tailored in certain ways to suit specific needs of each party. This might create a barrier, of transferring and sharing vital information in-between cooperating parties that are difficult to bring down.

Potential problems with uniting all Swedish shipping companies under one voluntary reporting system are apparent in this material. How should one undertake the measures to efficiently cooperate on an international level when there are apparent obstacles to tackle on the national and local level?

Is the issue of barriers to near-miss reporting in the maritime domain then an issue to handle through legislation and recommendations on an international level, on a national level or primarily on the company level? This study's focus has been on the respondents statements and not on the organizations presented in 2.1, even though the interrelation between organizations working for safety of course is of great importance in order to attain an effective and functional reporting culture.

6.2 Theoretical Framework

The concepts of near-miss, incident and accident are common within a large number of socio technical domains, as have been presented in the literature overview in 2.2. Several of the DPs interviewed mentioned 'Bird's triangle' when discussing near-misses, and the accident-ratio model seems to be an accepted motivator for why near-miss reporting is important. The proactive work is also described as way to remove near-misses at the bottom of the triangle to prevent accidents further up.

This stands somewhat in contrast to potential critique of the ratio triangles themselves, both the one made by Bird and Loftus (1976) and the similar one depicted by Heinrich et al. (1980). Heinrich et al. (1980) presents reasonable critique against the suggested generality and causal explanations of their own accident-ratio model and the implications that causes of frequent incidents are the same as the causes of severe injuries. Johnson (2003) further brings up potential problems of interpreting ratios found in various domains; it is hard to know what the ratios actually tell, without proper context. If you cannot generalize these ratios between domains or jobs, and the authors themselves refute their own previous statements, it is difficult to know what kind of assumptions you could draw, at least from the ratios alone. The data supporting Heinrich et al. (1980) was collected during the thirties if not earlier; the first edition of their book was published in 1932 and has since then gone through four more revisions. This fact could make it difficult to validate this data today. One can wonder if the data behind the ratio of Heinrich et al (1980) is even meaningful to interpret in our constant changing world where socio technical systems and views of human rights and lives have changed tremendously since the time when the data was collected. Bird and Loftus’s (1976) accident-ratio is based on 1 753 498 accidents reported from 21 industries, this overwhelming amount of reports
might give power to statistical analysis, but also create questions regarding reporting format, reporting standards and reporting quality, that goes unanswered in this study.

When looking at systemic views of socio technical systems such as Perrow (1999) it might be hard to maintain the underlying accident-ratio model of Heinrich et al. (1980) and Bird and Loftus (1970) as a plausible explanation for the occurrence of accidents. Most proponents of a systemic viewpoint of socio technical systems probably regard the model as too simplistic a model of ‘reality’. This does not mean that the accident-ratio model are ‘wrong’ but rather that the complexity of socio technical systems, their interactions and couplings, are factors that are left out from the model. If the focus moves to a more complex model explaining why accidents happen, there should be careful considerations of what this shift in focus means in regard to concepts such as accidents, incidents and near-misses as well. Many proponents of a systemic viewpoint describe accidents and other events as resonance within the system, as well as something that ‘emerge’ and consequently might be hard to predict based on the state of every single component in the system (Dekker, 2010). This systemic stance makes one integral key component of the accident-ratio model problematic - that of ‘cause and effect’, as no parts need necessarily to be broken for the system to brake (Dekker, 2010). Still, is the ‘accuracy’ of an underlying model necessarily in symmetry with the practical efficiency of the methods it has spawned? The notion of near-misses and the use of near-miss reporting might despite the shortcomings of the underlying model prove to be useful in accident prevention work. It might for example be an effective way to monitor the resonance of normal work and a possibility to learn more about working conditions and ordinary behavior within a domain or organization.

The accident-ratio models presented in 2.2 have proven to be powerful motivators for near-miss reporting and proactive work in many domains (Jones et al., 1999). Even though these types of models probably do not reflect reality but rather simplify it, concepts as that of near-misses do stem from these models; a concept that has shown to be a helpful aid in reducing accidents in various domains. The concept of near-misses is therefore a powerful tool that should not be neglected, and reversely, a concept that should not be taken for granted either. For example, going all the way and labeling the amount of found near-misses a numerical indicator of industries’ safety awareness sounds great, but risk being more of a show of statistics than indicative of awareness of something as broad, complex and rather hard to define as safety.

Accidents and incidents can be understood (or at least feel self-explanatory) without an accident-ratio model, these concepts still feel like ‘common sense’ to use when assessing the severity of the outcome or output. The near-miss concept might inherit more of a ‘cause and effect’ point of view, due to the direct connection to the research of Heinrich et al. (1980) and Bird and Loftus (1976). Still, the near-miss concept might still be valid and usable from a systemic perspective, it is rather what kind of factors you ‘collect’ or highlight from an event labeled near-miss; should a near-miss be regarded as an accident with the last link in the casual chain removed or as an relevant insight of ordinary situations that you could learn from? A ‘stereotypical’ near-miss might be an event where the accident is very close at hand, e.g. similar to the event of the train that almost collides with a vehicle on the tracks described in 2.2. This type of event makes sense in a cause and effect view of near-misses; where one or a few factors remove the last link in the casual chain and thus prevent the accident. On the other side of the spectrum are seemingly trivial or diffuse near-misses where this ‘casual chain’ are hard to spot. Does this argue for different categories of near-misses or is the first
example with the near-miss on the railroads an illusion of causality (in the sense that the view of a casual chain of events is too simple an explanation)? To accept the above-mentioned train related near-miss as causal might cloud the identification of further relevant factors that will not be regarded as important when analyzing the event through a sequential accident model. Near-misses of a (seemingly) trivial or diffuse character might feel more natural to regard as resonance in a system even though both stereotypical and diffuse near-misses perhaps should be analyzed from a systemic perspective.

At the same time as near-miss reporting makes it possible to conduct quantitative analysis to find patterns and estimate accident prevention costs, the same potential large quantitative of data could visualize resonance in a system. The proactive power of near-miss reporting might be as present in a systemic perspective as in predominant causal perspectives on accident prevention. The usefulness might then correspond to what factors a report of a near-miss event include and how to efficiently use this information during analysis. Near-miss reporting in this sense might be a tool to interpret interconnections (in a broad and not causal sense) between different parts in a system.

6.3 Methodology

To gain knowledge of a domain or a specific phenomenon therein through qualitative methods time is an important factor. This study had limited resources time wise, which made interviews, combined with a small literature overview to delve deeper into near-misses concept, a suitable choice to find out more about near-miss reporting. The versatility and the low resource cost of interviewing as method made it possible to interview both DPs and officers within a relatively short time span.

Meeting people who talk about near-miss reporting is a more time friendly task than actually being onboard observing people encounter these events in their ordinary work. Furthermore, in the context of the study’s aim, to make barriers that might hinder or prevent near-miss reporting salient, the choice of semi-structured interviews felt like an appropriate option. The semi-structure of the interviews made it possible for me to cover certain issues that I deemed relevant but at the same time giving room for new questions and interesting directions that I did not think of beforehand. The literary overview gave me some insight of what could be interesting to ask, even though the possibility to adapt to the respondent was very important due to my limited knowledge of (and outsider status in) the maritime domain.

Participant observations onboard might have generated more and deeper insights on crew member’s view on reporting given that time and resources were sufficient. This combined with extended interviews with more persons onboard, rather than only the deck officer, would have been interesting as well if the study indeed had been a full ethnography, with a far longer time span. Near-misses are not reported on daily basis, or even weekly, as described by several companies which limited observation as a suiting choice for this study. Focus groups could have been an interesting option and dynamic and interactive investigative tool if crew members had participated in the study. Focus groups could potentially trigger a more thorough discussions regarding near-miss reporting, though there could be potential problems to have focus groups consisting of DPs from different companies due to competition and uneasiness to share sensitive information among companies in the trade. There might also be other reasons that speak against focus groups in certain cases, e.g. there might be hard to get the necessary participants, or the nature of the questions asked might fit better in an interview format with a single individual. Beoree (2010) also mentions that strong
individuals might affect the focus group and prod others members in directions they would not have taken otherwise.

The limited amount of time and resources to visit ships that were stationed far from my location made it necessary to conduct interviews by e-mail in one occasion and interview by telephone in several occasions. The same restrictions made focus groups a less attractive choice. The e-mail questions differed from the ordinary interview template in some ways, even though the essence of the interview was preserved. There were some evident differences in the reply from the e-mailing officer. The written answers were both shorter and more structured. The e-mail format also limited any form of further interaction such as follow-up questions on potential relevant threads and made repairs of misunderstandings impossible. In one occasion a written statement felt a bit ambiguous, which made the statement hard to interpret given that the intentions and interpretations of the respondents does not communicate through the media. However, as a mean to discover how near-misses are viewed by the officers I still deemed that the written account did not differ too much from spoken ones.

The semi-structure of the interviews - with some questions chosen beforehand that might have guided the respondents’ train of thought - have most likely affected the answers and also my expectations of the respondents’ answers in some ways due to the inseparability of methods and findings (Emerson et al., 1995). In some occasions, interesting notions brought up by the respondents might also have shaped my follow-up questions, giving them more characteristics of leading questions than I first intended. It is therefore important to have this in mind when reading the results, regardless in what form the interviews were conducted, they influence what is seen, experienced and learned.

Cited source material might change or lose its original meaning when put in different context (Emerson et al., 1995), as seen in various media coverage and ‘yellow journalism’. The statements I present in analysis 1 in sections 5.2 and 5.3 has been transcribed, paraphrased and translated. This makes the transformed material stray from its source, and risks regarding the participants meaning must be made salient. This kind of transformation might pose a threat to the credibility of the material, due to the risk that I might influence the material unknowingly when I choose how to paraphrase and translate the material.

The transferability of this study is difficult to determine. It is hard to label the description of the material as thick when the gathered data stems from interviews only, and not from other types of qualitative methods as observations and the like. This even though the aim and research question easily could be generalized and used within another domain and in other socio technical systems. Due to the nature of work in complex environments, the concepts used in this study are both taken from and could be applicable to various domains. The conclusions drawn from this material could be of gain to other domains in the same way findings in other domains are of use in this study.

Other issues that might come from an interviewing method only, concerns the quixotic reliability (Lützhöft, 2004), and the risk that some answers are rehearsed, knowingly or unknowingly. Might the respondents feel uneasy giving their view, presenting issues and seemingly sensitive data to an interviewer who is not well grounded in the domain? One possible advantage that might limit rehearsed answers is my neutral status. A neutral status in the sense of that the study is not affiliated
with any shipping company in the maritime trade, neither to media nor to other external businesses that affect the respondents directly.

One way to test the synchronic reliability as mentioned by Lützhöft (2004) would perhaps been to assign more than one interviewer when interviewing shipping companies or to use more than one form of interviewing technique on different respondents. It would still be problematic to test for synchronic reliability when using interviews only and not observations. Two observers can take note of the same event simultaneously whereas the same thing is not possible when interviewing a respondent.

I made the question template that was used during the semi-structured interviews as an outsider to the maritime domain. A risk to consider is that an outsider might not be trusted enough to get the answers that corresponds the most to the respondents point of view but rather be presented with ‘rehearsed’ or official answers that would strengthen the quixotic reliability and give an misleading conception of the matter at hand. Still, the reverse could possibly be true as well. A person unfamiliar with the domain at hand could be given more thoroughly answers to certain questions, due to the respondent’s belief that a more exhaustive answer is needed.

In retrospect some questions in the question template might have been rephrased, some questions were latter deemed unnecessary and some threads could have been followed more thoroughly to gain an even clearer picture and a better understanding of near-miss reporting. The time lapse between the conducted interviews led to a knowledge gain for me as an interviewer during the course of interviewing all respondents. Some threads, that I found relevant during this process, were explored more in the latter interviews, due to my lack of domain knowledge beforehand. However, there are not necessarily only drawbacks having the outsider status, due to potential insider bias some questions in the template (see Appendix A), might have been viewed as self-explanatory for insiders and might have been left out had I known more about the domain beforehand.

Analysis 1 was made in a naturalistic fashion where found themes are connected to the answers given by the respondents. It is hard to know whether the themes presented in this study are the most representative ones for barriers to near-miss reporting in the maritime domain. The themes in themselves, they are affected by the structure of my interview template and by my limited knowledge in the domain; in a sense of what I ask is what I get. Another question template could possibly create other themes. In the same sense are the generalization and categorization of statements into Barach and Small’s framework in analysis 2 my own choice. Many of Barach and Small’s (2000) subcategories were not found in this material and one main category, the societal category, was not used at all as the collected data was not deemed broad enough to enable an analysis from the societal point of view. This does not necessarily indicate that these categories are unimportant but rather that the question templates used for interviewing were not tailored to make visible barriers and incentives in all given areas. None of Barach and Small’s categories were defined in their study which made it difficult to know the authors intent in regard to some of the categories, this led to my own interpretation of these categories instead.

There is also a question of whether the material gathered is representative of the view of the respondents. The use of interviews is fast and effective but does not give more information than the respondents knowingly or unknowingly choose to share with the interviewer. This create a situation
where the point of view constructed by me is judged against the view of the respondent, do I correctly present a sound description of the respondents mentioned views on reporting? Perceived and highlighted barriers in the material are not only those that are mentioned directly by the respondents, some of the perceived barriers stem from my own interpretation of the respondents answers. Without the use of other methods and triangulation, it is hard to reach the next layer; even if I do a sound and well described analysis of statements and overarching themes, this presentation has not been juxtaposed against findings derived from other methods and it is difficult to know whether the respondents are presenting the ‘correct view’. The respondents, knowingly or unknowingly, might have left out parts of their views, perhaps integral parts of their worldview that cannot be made salient with interviews only. The interviews do although show differences in views between DPs and officers and similarities within the respondent groups, this might be seen as an indicator of objectiveness in the sense of potentially reliable insights in their point of view.

Do I, as an outsider, view, analyze and present the gathered material as would a person with more domain knowledge and professional vision do? One way to investigate this could be to let a insider re-analyze the raw material, but It could at the same time exist individual and cultural differences within the domain that would make it hard to draw conclusions regarding my ‘correctness’ from such an investigation. If my own analysis differ from the analysis of the insider, this would not necessarily imply that my view is ‘wrong’.

6.4 Further research
The parallels between the maritime domain and other socio technical systems found in this study could be further explored, perhaps by more extensive use of qualitative methods such as observations or a full ethnography. Cross-domain studies are of course of importance to detect both similarities and potential domain specific factors. Maintaining safety in aviation or in the maritime domain might differ from, for example, patient safety in the medical domain. The process of safely transporting a vehicle or vessel from one point to another differs from treating people medically, whereas a more fitting resemblance might be mechanical work. Is it possible to discern differences in different domains looking at them functionally?

The discussion of the first analysis suggests that analyzing of the reporting process in INSJÖ could be of relevance, both to assess the design of this reporting system, and the means to report. It would further be of relevance to explore what type of accident etiology that is the occupational norm in the maritime domain. If a storytelling scheme, as described by Sanne (2007), were present in this domain would it be possible to harvest the positive sides of this norm and incorporate those aspects in a broader reporting scheme?

The present study does not focus on the view of the rest of the crew beside the reporting officer onboard; it is unclear whether the crew members onboard feel that they get adequate feedback from officers and the DP. Some officers mention that crew members of certain nationalities report less or not at all or that differences in crew members’ background might cloud the larger safety picture. These threads might be interesting to follow up if conducting interviews with crew members in future studies.

This report does not scrutinize the term safety culture, even though several participants mention the importance of good safety culture and how a no-blame view is prevalent in one's company. How
important a brick near-miss reporting is in achieving a sound safety culture remains unanswered in this study.
7 Conclusions

The last chapter presents the conclusions of the study, with the aim of identifying and examining near-miss reporting and its potential barriers within the Swedish maritime domain. The following highlighted conclusions are derived from the analyses and discussions of the collected data.

- There are tendencies of different philanthropic values among shipping companies. Some companies value information sharing beneficial to the maritime domain as a whole, in contrast to sharing information only locally within their own company or ships with similar setup. This might create repercussions regarding the efficiency of near-miss reporting as proactive accident prevention.

- The therapeutic factor, to teach and learn from others is held high by a majority of the respondents.

- The perceived views of near-miss reporting in this study and the potential differences are between DPs and officers. The other crew members’ view remains unknown.

- To make reporting effective, and decrease the risk of unbalance between rehearsed benefits of reporting and reality, it is important to give personnel ownership of their own reporting system and the knowledge how and why to use it.

- An interesting view of anonymity and no blame culture is made salient. It is deemed important to provide anonymity but the need among the crew should not be strong if indeed a no blame culture and a sound safety culture exist in the company.

- Do external influences, such as Oil companies, add a potential risk of urging the company in finding debatable near-misses out of necessity due to strict requirements?

- To present reports in manner that is deemed useful for people in the maritime trade might be important to minimize the risk of crippling proactive safety work.

- Further studies of the reporting process and if there is a difference in accident etiologies, such as storytelling and a more organizational incident scheme could be of importance, to learn more regarding reporting in the maritime domain.

- The accident-ratio models depicted by Bird and Loftus (1976) and Heinrich et al. (1980) might be too simplistic models to explain why accidents occur, but might nevertheless be used as powerful tools and incentives for near-miss reporting.
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Appendix A - Interview template

Frågor till rederier som rapporterar till INSJÖ

**Frågor till DP:**

**Synen på near-misses**

- Hur ofta eller i vilken utsträckning brukar fartygen rapportera in händelser som kunde ha lett till en incident eller olycka? Är denna typ av händelser eller tillbud något du känner igen från säkerhetsarbetet på rederiet?
- Är denna typ av rapportering något du tycker ska utökas eller förbättras? Hur?
- Hur viktig anser du att denna typ av rapporter är? Varför?

**Synen på och syftet med incidentrapportering**

- Beskriv hur säkerhetsarbetet ser ut för ert rederi.
- Hur stor vikt ligger på rapportering av olyckor, incidenter och tillbud i säkerhetsarbetet?
- Varför är det viktigt att rapportera olyckor, incidenter och tillbud?
- Hur viktig är denna form av rapportering i ditt arbete som DP? Varför?
- Får du någon form av feedback på inrapporterade händelser, till exempelvis genom INSJÖ? Hur använder du i så fall denna feedback i ditt säkerhetsarbete?
- Hur viktig anser du att anonymitet och möjligheten till att vara konfidentiell vid inrapportering är? Varför?
- Är dessa faktorer något som påverkar detta din inrapportering (till INSJÖ) på något sätt? Hur?

**Synen på DP:s roll**

- Beskriv hur säkerhetsarbetet ser ut för dig som DP.
- Vilka är dina viktigaste uppgifter gällande säkerheten?
- Hur sker kommunikationen med rederiets fartyg?
- Hur skulle kommunikationen kunna förbättras med rederiets olika fartyg?

**Trust mellan DP och besättning?**

- Känner du att det råder ett öppet klimat inom rederiet gällande säkerhetsarbetet?
- Känner du att besättningen rederiets fartyg förstår din roll som DP? Varför?
- Känner du att besättningen rederiets fartyg värderar din roll som DP?
- Varför?

- Beskriv kommunikationen mellan fartygen och dig som DP. Vad för typ av information förmedlas oftast till dig från fartygen?

Vad beror eventuellt motstånd till rapportering på?

- Känner du dig nöjd med mängden inrapporterade händelser från fartygen?
- Vad tror du detta beror på?
- Hur skulle man kunna öka inrapporterandet av händelser från fartygen tror du?
- Vilka faktorer eller barriärer tror du kan hindra eller påverka antalet inrapporterade händelser från fartygen?
  - Varför?

- Finns det händelser inrapporterade från fartygen som du anser är onödiga att föra vidare in till INSJÖ?
  - Varför?
  - Vilka typer av händelser rör det sig om?

Synen på och möjligheten till Feedback på rapportering.

- Hur används den feedback som fås från INSJÖ?
- Tycker du att det är något som saknas i den feedback du får från INSJÖ?
  - I så fall vad?
Frågor till rederier som rapporterar till INSJÖ.

Frågor till besättning:

Synen på near-misses

- Vad anser du vara en olycka?
- Vad anser du vara en incident?
- Vad anser du vara ett tillbud?
- Hur ofta eller i vilken utsträckning brukar ni rapportera händelser som kunde ha lett till en incident eller olycka?
- Hur viktig anser du att det är att rapportera denna typ av rapporter?
  - Varför?

Synen på och syftet med incidentrapportering

- Beskriv hur säkerhetsarbetet ser ut för ert rederi.
- Hur stor vikt ligger på rapportering av olyckor, incidenter och tillbud i säkerhetsarbetet?
- Varför är det viktigt att rapportera olyckor, incidenter och tillbud?
- Hur viktig anser du att anonymitet och möjligheten att vara konfidentiell vid inrapportering är?
  - Varför?
- Är dessa faktorer något som påverkar detta din inrapportering på något sätt.
  - Hur?

Synen på DP:s roll

- Beskriv säkerhetsarbetet ombord på fartyget.
- Genom vilka kanaler sker säkerhetsarbetet ombord?
- Vilken är DP:s funktion inom rederiet?
- Hur viktig är DP:s roll för fartygets säkerhet?
- Vilken form av feedback får du på inrapporterade händelser och hur används denna feedback?
- Beskriv kommunikationen med DP.
- Hur skulle kommunikationen kunna förbättras med DP?

Trust mellan DP och besättning?

- Känner du att det råder ett öppet klimat inom rederiet gällande säkerhetsarbetet?
- Vem vänder du dig till om du upptäcker brister i säkerheten?

Synen på ansvar (Loss of face?)

- Finns det händelser eller tillfällen när du tvekar att rapportera vissa händelser ombord?
- Vad skulle detta kunna bero detta på?
- Vad kan konsekvenserna (i värsta fall) bli att rapportera känsliga händelser?
- Vad kan konsekvenserna (i värsta fall) bli att inte rapportera känsliga händelser?
Synen på och möjligheten till Feedback på rapportering (både från besättningens och DP:s sida).

- Hur viktig anser du att anonymiteten och konfidentialiteten vid inrapportering är?
- Är dessa faktorer något som påverkar detta din inrapportering på något sätt.
  - Hur?

- Känner du dig delaktig i det övergripande säkerhetsarbetet inom rederiet?
- Ger du själv – eller har du möjlighet att ge - förslag på förbättringar till rederiet / DP?
- Känner du att du får tillräcklig feedback från DP på inrapporterade händelser och annat som rör säkerhetsarbetet inom rederiet?
Frågor till rederier som inte rapporterar till INSJÖ

Frågor till DP:

Synen på near-misses

- Vad anser du vara en olycka?
- Vad anser du vara en incident?
- Vad anser du vara ett tillbud?
- Hur ofta eller i vilken utsträckning brukar fartygen rapportera in händelser som kunde ha lett till en incident eller olycka? Är denna typ av händelser eller tillbud något du känner igen från säkerhetsarbetet på rederiet?
- Är denna typ av rapportering något du tycker ska utökas eller förbättras? Hur?
- Hur viktig anser du att denna typ av rapporter är? Varför?

Synen på och syftet med incidentrapportering

- Beskriv hur säkerhetsarbetet ser ut för ert rederi.
- Hur stor vikt ligger på rapportering av olyckor, incidenter och tillbud i säkerhetsarbetet?
- Varför är det viktigt att rapportera olyckor, incidenter och tillbud?
- Hur viktig är denna form av rapportering i ditt arbete som DP? Varför?
- Hur används de rapporter som kommer in från fartygen?
- Skickas vissa rapporter vidare till en annan part?
- Hur viktig anser du att anonymitet och möjligheten till att vara konfidentiell vid inrapportering är? Varför?

Synen på DP:s roll

- Beskriv hur säkerhetsarbetet ser ut för dig som DP.
- Vilka är dina viktigaste uppgifter gällande säkerheten?
- Hur sker kommunikationen med rederiets fartyg?
- Hur skulle kommunikationen kunna förbättras med rederiets olika fartyg?

Trust mellan DP och besättning?

- Känner du att det råder ett öppet klimat inom rederiet gällande säkerhetsarbetet?
- Känner du att besättningen rederiets fartyg förstår din roll som DP? Varför?
- Känner du att besättningen rederiets fartyg värderar din roll som DP? Varför?
- Beskriv kommunikationen mellan fartygen och dig som DP. Vad för typ av information förmedlas oftast till dig från fartygen?
Vad beror motvilja till rapportering på?

- Känner du dig nöjd med mängden inrapporterade händelser från fartygen?
- Vad tror du detta beror på?
- Hur skulle man kunna öka inrapporterandet av händelser från fartygen tror du?
- Vilka faktorer eller barriärer tror du kan hindra eller påverka antalet inrapporterade händelser från fartygen? 
  - Varför?

Synen på och möjligheten till Feedback på rapportering.

- Vad för slags feedback får du på ditt säkerhetsarbete?
- Är denna feedback tillräcklig?
Frågor till rederier som inte rapporterar till INSJÖ

Frågor till Besättning:

Synen på near-misses

- Hur ofta eller i vilken utsträckning brukar ni rapportera händelser som kunde ha lett till en incident eller olycka?
- Hur viktig anser du att det är att rapportera denna typ av rapporter? - Varför?

Synen på och syftet med incidentrapportering

- Beskriv hur säkerhetsarbetet ser ut för ert rederi.
- Hur stor vikt ligger på rapportering av olyckor, incidenter och tillbud i säkerhetsarbetet?
- Varför är det viktigt att rapportera olyckor, incidenter och tillbud?
- Hur viktig anser du att anonymitet och möjligheten till att vara konfidentiell vid inrapportering är? - Varför?
- Är dessa faktorer något som påverkar detta din inrapportering på något sätt. - Hur?

Synen på DP:s roll

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Trust mellan DP och besättning?

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Synen på ansvar (Loss of face?)

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Synen på och möjligheten till Feedback på rapportering (både från besättningens och DP:s sida).
• Hur viktig anser du att anonymiteten och konfidentialiteten vid inrapportering är?
• År dessa faktorer något som påverkar detta din inrapportering på något sätt.
  - Hur?

• Känner du dig delaktig i det övergripande säkerhetsarbetet inom rederiet?
• Ger du själv – eller har du möjlighet att ge - förslag på förbättringar till rederiet / DP?
• Känner du att du får tillräcklig feedback från DP på inrapporterade händelser och annat som rör säkerhetsarbetet inom rederiet?