

A FIELD STUDY IN SHIPPING: NEAR-MISS, A MANTRA WITH DUBIOUS EFFECT ON SAFETY

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**A FIELD STUDY IN SHIPPING: NEAR-MISS, A MANTRA WITH DUBIOUS
EFFECT ON SAFETY**

Thesis/Project work submitted in partial fulfillment of
the requirements for the MSc in Human Factors and System
Safety

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Under supervision of Anthony Smoker, PhD.

Lund 2018

ABSTRACT

Safety is intertwined with learning, without learning safety would be a static construct. To advance, safety concepts and theories all rely on the art of processing knowledge and through learning attaining a contributing effect. In shipping, the abstract of a near-miss is promoted as ‘good business and economic sense because it can improve crew performance and reduce costs’.

Studies have shown the challenges of what constitute safety learning and what can be learned from incidents (Drupsteen & Guldenmund, 2014), but less attention has been on the perception of how near-miss contribute to maritime safety.

This research was conducted to explore the perception and experiences with maritime safety personnel, of how and why near-misses contribute to safety.

Inspired by phenomenology, the lived experience was captured through ten semi-structured qualitative interviews of Captains, Owners representatives Recognised bodies and Maritime Administration.

Explicating the data shows, that since the implementation of the ISM code in 2002, the responsibility and the power is perceived to have drifted from ship to shore - today safety is shared. What constitutes a near-miss is not absolute, but uniformed categories e.g. unsafe act and conditions, for managing the reports are recognized across the respondents.

In the Tanker fleet segment, a ritual to fulfil KPI's for reporting near-misses' is imposed by Oil majors, but the purpose are opaque. In the hierarchies of Authority, Owner and Captain, the ritual is questioned, but for unknown reasons safety managers has not entered a dialogue with Oil Majors. The trade-off, not entering the dialogue, creates distrust and bureaucracy, and visualize the influence the Oil Majors' have been given and how safety manifests itself. The ritual is perceived to increased ‘awareness’ that drives and secure the development of the SMS systems and highlights ‘unsafe’ behaviour. Whereas, Accident Pyramids, linear and latent failure models are the underpinning practice and understanding behind near-miss and classic safety improvements, lived experiences across the

hierarchies tells another tale – it is not that simple, why a new understanding and view of safety is requested – a new language.

Compared to safety, the language of learning is less advanced in shipping. How and if we learn are uncharted waters and the effect of near-miss - the outcome, is dominant by single-loop learning. Comprehending, that organizational learning is an essential complement to Safety, is a potential. A potential that is depended on the integration of an organizations capabilities to collect new knowledge and insight from events and pick-up the tacit knowledge to be shared in a framework of a learning organization. In other words, shipping needs to 'learn how to learn'. To gain the benefits of learning, Organizational capabilities needs to progress beyond the classic linear thinking and embrace systemic thinking when exploring events and collecting knowledge, while considering how knowledge is to be shared to facilitate control and compliance, adaptive capacity or in combination.

The effect of the knowledge collected and processed from near-miss events is perceived dubious, but in the hierarchy of Owners, a sign of an awakening – defying the ritual, indicates a change and a wish to view and master safety and learning through a new lens.

Supporting organizational safety, future research should explore how safe work and organizational learning are interlinked. Further, the power mechanisms between Owners and Oil Majors should be made transparent to determine who has the power to progress safe operation.

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LIST OF ABBREVIATION

Accident pyramid	Heinrich Iceberg model
Administration	Flag state Administration
Authority	Flag state Administration and Classification
Code	International Safety Management Code
Guideline	Guidelines for implementing by companies
HSQE	Health-Safety-Quality and Environment
IAEA	International Atomic Energy Agency
ICS	International Chamber of Shipping
IHS_fairplay	Information Handling Services fairplay
IMO	International Maritime organization
KPI	key performance indicators
MSC	Maritime Safety Committee
NM	Near-miss
NMR	Near-miss report
NMRS	Near-miss reporting system
OCIMF	The Oil Companies International Marine Forum
OVID	Offshore Vessel Inspection Database
PPE	Personal protective equipment
Recognized bodies	Classification societies
SCM	Swiss cheese model
SIRE	Ship Inspection Report Programme
SMS	Safety Management System
TMSA	Tanker Management and Self-Assessment

1. INTRODUCTION

1.1. Motivation for research

My professional job as an assessor includes visiting ship managers to assess the operation and organisation, and to obtain knowledge and an understanding of the managers perception of risks. Last year one such assessment made me curious off how near-miss are perceived and argued to support safety.

At the meeting, the entire management team were gathered in the boardroom to answer my open-ended questions in the presence of their Owner, insurance broker and insurer. During my questioning of the work and responsibilities of the Health-Safety-Quality and Environment team (HSQE), we discussed near-miss reporting. Within the team, a firm belief was that, the more near-miss reporting the safe the operation of vessels. Managers proudly presented fleet statistics in the annual Management Review and the quarterly Company magazine. Managers claimed a clear correlation (perceived as a causation) existed between near-miss reporting and a safe operation. In other words, the more near-miss reports the safer the vessel - that was what their numbers told them. The following question I then raised was: “if you increase the required number of near-miss reports per vessel by a factor two – will this make your vessels twice as safe and if so, what is preventing you to require more near-miss reporting?”

The following 10 seconds of absolute silence in the boardroom felt like an eternity, thus I decided to continue my questioning to understand their perception of Lost Time Injury....

On the flight back to Copenhagen, the silence at the meeting haunted me. I wondered if well paid safety managers ever questioned the purpose of near-miss reporting and it's value. Furthermore, I got curious to understand how near-miss and its alleged effect was perceived in the hierarchies above and below the ship managers.

The meeting made me realize an important question had to be explored - how is near-miss reporting perceived in shipping?

1.2. Assumption

The concept of Near-miss Reporting and its assumed effect on safety in shipping is unchallenged and unknown, as my literature review has shown. The risk of a myth or mantra, that is based on a safety view from the 1930's, may distract seafarers and owners believing Near-miss reporting is an obvious and self-evident way to improve safety.

This research is inspired to contribute to safety discussions of how and why the Near-miss reporting contributes to safety in shipping by capturing and illuminating the perceptions and experiences of safety professional in the maritime industry.

To capture the truths of everyday near-miss activities, I have chosen the methods of qualitative semi-structured 'face-to-face' interviews for data gathering for presentations. The respondent bodies Governmental and Recognised bodies as well as HSQE personnel and ship Masters, are subject to an assertive epistemic interview style - a dialogue to get beyond the surface. Inspired by phenomenological explication of the data, I expected the narratives on what safety and a near-miss is and what can be learned from near-miss events.

I expected to discover a mutual perception of an 'obvious' and 'unquestioned' Truth in the accident pyramid - causality, perceived justifying the near-miss regime.

Previous research has not brought forth the experiences and perceptions of individuals from their own perspective. My research will try to provide such views, and hopefully add to a richer and more coherent knowledge for safety application and highlight aspects concerning education and training in safety.

2. THE LITERATURE

2.1. Previous research

In the maritime industry Safety magazines, not many articles question the concept of near-miss reporting. However, some magazines have published interesting articles questioning and criticising different aspects e.g. definitions, proximity of a near-miss. Near-miss as a measuring tool (“Why near-miss reporting fails”, 2017). Mutual, for these are, they are not based on qualitative research, but on personal opinions.

In the safety science literature, Dutch authors have made interesting contributions to the research question, illuminating; gaps, myths and misconceptions of how accidents happen and can be prevented (Hale, 2002; Drupsteen et.al 2013 & 2015).

One Ph.d. study (Anderson, 2003) addresses the initial challenges, post 1998, of implementation the ISM code in shipping. Among the findings were; “an attitude of us and them”, “national / cultural issues” (p.173) and a recognition of Heinrich's accident pyramid.

Another Ph.d. study (Bhattacharya, 2009) addresses the impact of the ISM Code by looking at the effect of risk assessment, incident/ near-miss reporting and audit of the Code and SMS. The study briefly reflects and present different stands on the pyramid theory (e.g. Heinrich, 1931; Bird, 1966, Schaaf, 1991).

Neither research provide a deeper understanding of the common understanding of causality between near-miss and accidents. It seems Henrich’s accident pyramid is encircled with a shield, that over years has strengthened and become difficult to penetrate. The reasons are many, but a few appear eminent;

- The accident pyramid is logical and visual to perceive, like the Reason’s ‘Swiss Cheese Model’ (Reason, 2008)
- It is promoted by many actors - authorities, managers, crew agencies, insurance and customers e.g. The Oil Companies International Marine Forum (OCIMF) etc.
- It’s lucidity of how accidents happens provide us with a trust in effective loss prevention based on a linear understanding (Hale, 2002; Hollnagel, 2014).

- It is tangible and conceived as an effective source of learning potential supporting the concept of safety management (MEPC 56/WP.8, 2007; MSC84/15/4, 2008).

The shield appears strengthened by a classic safety view¹ – old view, and Taylorism - scientific management, which is well illustrated in the studies on the effect of the ISM Code (Anderson, 2003; Bhattacharya, 2009). For years the classic view has brought forth safety and with results, but in a rapid changing world with shipping being defined as a sociotechnical environment (Schroder-Heinrichs et al., 2013), where hidden interdependences emerging surprising our classic safety regime – barriers of control, procedures and compliance, can it continue or last? I do not argue that the classic view is obsolete and to be terminated, as in future it may continue to have effect, but the perceived effect or contribution to safety needs to be understood and made transparent e.g. is it about delegating safety responsibilities - responsabilisation, increasing safety awareness, creating an information pool for handling the lapses (Wharton, 2000) or other. Rather, I believe a complement to the classic view is the answer, thus a new safety language is required.

The language to penetrate the shield, I think, partly flourishes in the progressive safety view² - non-linear events (Rasmussen, 1981 & 1997; Dekker, 2011; Hollnagel, 2014, Woods et al., 2010).

¹ Classic safety is 'defined' as few things as possible go wrong, and governed by a

Management principle of a reactive respond when something happens or if categorised as an unacceptable risk. Work processes/functions – systems, are inherently safe and to succeed there is one norm, why performance variability is harmful and should be prevented as far as possible. Humans are seen as unreliable and predominant liability or a hazard to be controlled, which the SMS is an important tool. The SMS ensure safe operations and quality, if followed, and also serve the purpose of control and documenting compliance with procedures. Success is considered to flow from adherence to processes because the process as designed faithfully represents the task as it is actually carried out. Failure is considered to flow from a deviation from the process. Thus, when things go wrong this is caused by failures and malfunctions and the reactive management response is an investigation with the purpose to understand what went wrong, identify root causes and identify and implement barriers that preventive recurrence. Investigations are driven by an understanding of a linear safety model - a cause effect relationship (causality credo; symmetry) in which Humans, being unreliable, become the focus of attentions and the stopping point of the investigation. The safety model applied prescribe a vision of zero accidents and remedies a to implement barriers – defence in depth.

This safety view is an inhering deeply rooted in our understanding how safety is managed.

² The progressive safety view is a contrast to the cherished classic view. Safety is about making sure as many things as possible go right supported by a management principle of being proactive, continuously trying to anticipate development and events. The system is believed inherently unsafe (intractable and complex in nature) and goal conflicted. Human are seen as a variability and a necessary asset to harness and a resource necessary for system flexibility and resilience, requirements to succeed. With progressive safety the construct of 'human error' do not exist – only a local rationality exist. Things basically happens in the same way, regardless of the outcome. Investigations is about understanding how things usually goes right as a basic understanding how things occasionally goes wrong. In this context, accidents are seen as a social/cultural phenomena which require an understanding of the insiders perspective. When labelling an accident, a fragment of behaviour as an error we neglect symptom or problems deeper in the system/organization. Human error categories are thus measures of ignorance, rather than contributing to managing risk.

Comprehending the emergence of complexity in systems, the progressive view provides another reasoning than the classic understanding of the alleged correlation, perceived as a causation, in the accident pyramid.

The progressive safety language, with all its good intentions promoting new perceptions and models of safety, we must not forget to calibrate our understanding of the existing world. Capturing and describing, through interviews, the perceptions and experiences of safety professionals as of how and why near-miss reporting contribute and effect safety, our understanding of the lived world in shipping may advance - e.g. do safety professionals perceive and experience;

- a linear world - supporting the accident pyramid
- near-miss reporting makes sense to prevent accidents or e.g. do they experience behaviour control or social control?
- how and what can we learn from near-misses?

Advancing our understanding of the lived world, I think is a precondition when trying to map and shape hypothesis³ and theories that supports future safety. Inspired by phenomenology, I hope my research will illuminate the lived experiences with near-miss reporting that may add to a richer and more coherent knowledge for safety application and highlight aspects concerning; theories of accident & causation, education and training in safety.

³ Inspired by phenomenology my research is not aimed at testing a hypothesis, but if one had to be presented, I would predict the following: “It is believed that Near-miss reporting and analysing is part of the Code as it prevents accidents - harm and loss, regardless that no unified definition of a near-miss is applied. Further, near-miss is recognized as a valid measure/indicator of how safe an organisation operates. Because training, required by IMO, about near miss reporting, safety culture and investigations is implicit, the myth of the accident pyramid – causality, is not questioned and remain alive³.”

2.2. The aetiology of the ISM code and Near-miss in IMO

The countless search through documents in the IMO data base⁴ revealed the root of the Code⁵ to the mid-eighties with the capsizing of the RORO ferry “MS Herald of Free Enterprise” killing 192 passengers and crew loss of another UK registered vessel MV “Grainville”. Investigations identified “human errors” and a lack of instructions on-board to secure safe passages and in March 1987 the UK Merchant Shipping Regulation 1988 (operation book) were laid before Parliament. Concurrently, the IMO Assembly (1985) stipulated the agreement to create guidelines to improve the way – safety, in which vessels/shipping operate⁶.

The first trace of near-miss reporting found in the documents relating to human element in the IMO database⁷ is at the Maritime Safety Conference 69 in 1999. With the information document no. 16 the member state Japan⁸ brings forth near-miss reporting in shipping “an investigation into near-miss”. The investigation covered navigational near-miss and the findings are initial presented and discussed at the Maritime Safety Committee (MSC) 69/inf.16 and further discussed in MSC 71/inf.8. Supporting the ability for self-improvement, near-miss reporting is added in Chapter 9 of the Code, thereby supplementing learning from incidents and accidents.

Subsequent implementing near-miss in shipping, IMO identify challenges in way of “a disturbingly low number of near-miss reported” and that “persons reporting near-misses are penalized” (MSC74 24, 2001). Subsequent, IMO identifies several barriers and most important culture is seen as an obstacle for near-miss reporting. The existing blame culture needs to be replaced with a no-blame culture, thus trust

⁴ <https://webaccounts.imo.org/Common/WebLogin.aspx?ReturnUrl=%2f>

⁵ Historically, Total Quality Management and Management Systems preceded the SMS. A SMS is a formal (certified) risk management framework for enhancing safety, and should contain systems for: hazard identification and risk management; safety targets and reporting processes; procedures for audit; investigations; remedial actions to improve performance; and safety promotion and training (Loannou et al.,2017).

⁶ Near Miss Reporting was not included.

⁷ <https://webaccounts.imo.org/Common/WebLogin.aspx?ReturnUrl=%2f>

⁸ Ministry of Transport of Japan (1998). Report of the investigation into near misses. The first report. IMO MSC 69/INF.16 Ministry of Transport of Japan (1999a). Report on the investigation into near misses. The second report. IMO MSC 71/INF.8 Ministry of Transport of Japan (1999a)

among parties are required (MSC/circ.1015, 2001). To support trust, it is believed that and near-miss reporting must by-pass line management. Consequently, the “Designated Person” is introduced in the Code, who reports directly to the CEO.

In the IMO documents of 2002 covering the Code and near-miss reporting, the belief in the value of reporting and investigating events is dominant. The following passages, I find of interest as they over a period of years, accentuate the potential in near-miss reporting.

In 2002, the Nederland presents a paper addressing the complexities of causation:

There is a recognition that marine accidents are far more complex than earlier assumed, with a close link between management ashore and performance afloat. There are obvious requirements to learn more from accidents and their underlying causes, to see accident investigation information and data better promulgated, the greater use of "near-miss"-reporting without penalties to those involved, better identifying of the potentially dangerous or incompetent (MSC75/inf.12, 2002)

A seldom used terminology in the IMO documents “complexities of causation” stands alone, with no reflection on what complexity means or the effect of complexity!

In 2005, the Safety Committee (MSC81/17/1) presents the result of an assessment of the effect of the Code, including the effect of ability to self-improving near-miss reporting. The Group responsible for the review concludes that, where the Code is embraced as a positive step toward efficiency through a safety culture, tangible positive benefits are evident. The reader is not enlightened of the nature of the benefits nor the postulated evidence. Perhaps that explains why the Committee Group recommends further study should be undertaken: “to examine cause and effect between ISM implementation and flag State safety record, the relationship between Port State Control and ISM compliance” (MSC81/17/1, 2005).

It is noted that the respondents experience the Code; as a bureaucracy, why “streaming-lining” and reducing the paper work that supports ISM compliance, particularly the SMS as well as a greater use of technology and IT to reduce paperwork and identifying common areas in the Code and for example the ISPS Code and integrating documentary, should be pursued. It seems the impact of the Code is not easy to assess, a view recognized by the research of Størkensen (2016).

At MSC 82 in 2006 – the member state UK presents an information paper in which James Reason and Chris Johnson⁹ are mentioned. The document emphasizes a trust in the work of Heinrich - the accident pyramid, and the Swiss Cheese Model (SCM). I shall discuss the models later and introduce a contrasting view - on the urban myth of the iceberg by Andrew Hale (2002).

However, at various IMO safety committee meetings¹⁰ the accident pyramid is reconfirmed and argued as to why near-miss is a good idea. These meetings are held within the Marine Environmental Protection Committee (MEPC) joint/or the Maritime Safety Committee domain with the ISM code and/or the Human Element as topic. In the following, I have captured some of the most common used phrases:

Why investigate near-misses? Near-misses share the same causal factors and underlying causes as accidents. By investigating near-misses and addressing the underlying causes of accidents and near-misses, the precipitating conditions can be influenced so as to be avoided in the future.

Near-miss reporting is necessary if continuous improvement in an organizations safety performance is to be achieved (MEPC 56/WP.8, 2007).

Notably, the word “lessons” is not elaborated leaving the reader with the perception that the investigation is all it takes to create a lesson - learning. There is no acknowledgement of challenges in respect of feedforward and feedback learning processes (Crossan et al., 1999). In 2008, we find more evidence of why near-miss reporting are important to investigate;

⁹ Johnson, Chris W. (2003). Failure in safety-critical systems: A handbook of incident and accident reporting. Glasgow: Glasgow University Press. Notable, it is the first and only time in the IMO HE documents author's of safety science has been referred.

¹⁰ E.g. workgroup

Why investigate near-misses? Companies must investigate near-misses as a regulatory requirement under the “Hazardous Occurrences” part of the ISM code. Aside from the fact that near-miss reporting is a requirement, it also makes good business and economic sense because it can improve vessel and crew performance and, in many cases, reduce costs. In many high hazard industries, prevention of a 300th near-miss is estimated to save 1 life (US\$3m), or to prevent a major spill (US\$60,000 per tonne), or to avoid major damage to ship equipment or cargo (with associated costs). Additionally, investigating near-misses is an integral component of continuous improvement in quality management systems. Learning the lessons from near-misses should help to improve safety performance since near-misses share the same underlying causes as losses.

(MSC84/15/4, 2008)

The wording shows how near-miss reporting as a statutory requirement is promoted with an economical incitement – cost savings, before safety. Further, it reveals a perception that the investigation of near-miss reporting itself will result in prevention of future near-miss, thus avoiding the major casualty or accident. In summary; a correlation and causation exists between a near-miss and Major incidents - rare events.

Returning to MSC 82 in 2006, and the information letter by the member state U.K;

Estimating the frequency of less severe accidents from fatalities data and estimating the *likelihood* of fatalities from near-miss data can be done using accident pyramids. However, the size and shape of the pyramids are sensitive to the accuracy and relevance of, and definitions used in, the historical data used to design them, and therefore this approach should be employed with caution¹¹ A good example is provided in [5] where the near-miss to fatality ratio in general aviation is 25:1, but in commercial aviation it is 1,024:1. However, recent work on Metro safety by the Centre for

¹¹ Great Britain. Health and Safety Executive. (1997). The costs of accidents at work. Sudbury: HSE Books.

Great Britain. Health and Safety Executive. (2002). Marine risk assessment. Sudbury: HSE Books.

⁵Johnson, Chris W. (2003). Failure in safety-critical systems: A handbook of incident and accident reporting. Glasgow: Glasgow University Press. p37.

Transport Studies at Imperial College has shown that deaths conform less well to the ‘pyramid’ hypothesis than had been thought previously.

Conclusions and recommendations

The UK concludes that there are many circumstances, especially where accident information is unavailable or represents very small data sets, when near-miss information is useful to help risk assessment. The degree to which near-miss data can be used depends on its validity and reliability, and the extent to which its data can be shown to predict safety outcomes. Accordingly, the decision to use such data is normally made on a case-by-case basis” (MSC 82/INF.8, 2006).

As we have read, various IMO documents post 2006 are pro the interpretation of the pyramid hypothesis – ratio/correlations and causality regardless U.K. warning, referring to a study by the Imperial College¹² and questions the validity and reliability of near-miss reporting. It is difficult to know if the UK paper had an impact on the latest revision of the IMO.

In the Guidance on near-miss reporting dated 2008, one specific wording has changed. “Learning the lessons from near-misses should help to improve safety performance since near-misses can share the same underlying causes as losses” (MSC-MEPC.7/Circ.7 T5-MEPC).

From a near-miss that “*share* the same underlying causes as losses” MEPC 56/WP.8, 2007 to the above wording “can share the underlying losses”. It is recognized by practitioners in shipping that time does not allow to search and scrutinize the many documents by IMO¹³. However, when new resolutions are to be implemented, IMO publishes a field guide - the book “ISM code” with guidelines. The book captures the outcome of the negotiations among the IMO members and parties, thus not the process. The shift in wording is not highlighted nor argued in the latest edition (2014), thus safety work may continue

¹² http://www.imperial.ac.uk/people/a.majumdar/publications.html?respub-action=search.html&id=00172947&limit=30&keywords=Heinrich&iminyear=1996&imaxyear=2017&itypes=BOOK%2CBOOK+CHAPTER%2CCONFERENCE+PAPER%2CJOURNAL+ARTICLE%2COTHER%2CPATENT%2CPOSTER%2CREPORT%2CSCHOLARLY+EDITION%2CSOFTWARE%2CTHESIS+DISSERTATION%2CWORKING+PAPER&_type=on&type=BOOK&type=BOOK+CHAPTER&type=CONFERENCE+PAPER&type=JOURNAL+ARTICLE&type=OTHER&type=PATENT&type=POSTER&type=REPORT&type=SC H O L A R L Y + E D I T I O N & t y p e = S O F T W A R E & t y p e = T H E S I S + D I S S E R T A T I O N & t y p e = W O R K I N G + P A P E R & m i n y e a r = 1 9 9 6 & m a x y e a r = 2 0 1 7 & p a g e = 1 & p e r s o n = t r u e

¹³ E.g. Facilitation Committee, Legal committee, Marine environment protection committee, Maritime Safety Committee and sub committees

undisturbed. A reasonable question to raise is why have they changed the wording and what consequences will it have, if any?

Advocating Heinrich's accident pyramid is the International Chamber of Shipping (ICS)¹⁴. In the brochure "Implementing an effective safety culture - Basic Advice for Shipping Companies and Seafarers"¹⁵ the following is observed;

More strikingly, research has also shown that for approximately every 330 unsafe acts or non-conformities, 30 are likely to result in minor injury. Of these 30 injuries one is statistically likely to be an LTI. Thus the prevention of 330 unsafe acts is likely to prevent a significant injury. Statistics also suggest that the prevention of 30 LTIs is likely to result with the saving of a life! (www.ics-shipping.org, 2017)

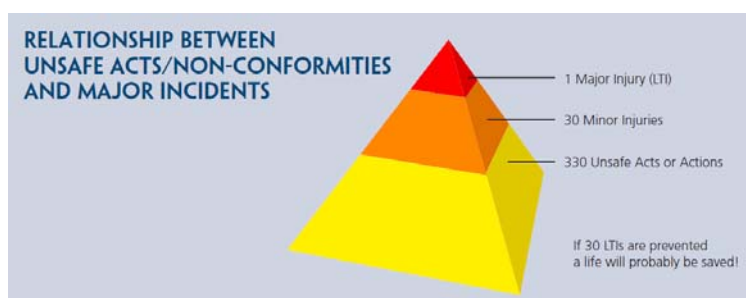


Figure 1:Source International chamber of Shipping¹⁶

I have accounted for the aetiology of near-miss reporting in Shipping by scrutinizing IMO documents, and revealed a perception of a correlation and causality between different type of events. In

¹⁴ ICS is the principal international trade association for shipowners and operators. ICS is concerned with all technical, legal, employment affairs and trade policy issues that impact on international ship operations. ICS membership comprises the world's national shipowners' associations, representing all sectors and trades and over 80% of the world merchant fleet. ICS represents shipowners with the various intergovernmental bodies that regulate shipping, especially the UN International Maritime Organization (IMO), where ICS was the first shipping industry association to be granted consultative status in 1961. ICS's overriding concern is the maintenance of a global regulatory framework for international shipping. A truly global industry requires global rules.

¹⁵ <http://www.ics-shipping.org/docs/default-source/resources/safety-security-and-operations/implementing-an-effective-safety-culture.pdf>

¹⁶ <http://www.ics-shipping.org/docs/default-source/resources/safety-security-and-operations/implementing-an-effective-safety-culture.pdf>

the following, I will examine the definition of a near-miss and the impact of possible misinterpret of Heinrich's work – accident pyramid.

2.3. Defining a near-miss

Scrutinizing the book “Near-miss Reporting as a safety tool” (Schaaf et al., 1991) we find Van Schaaf's definition of a near-miss to include the (human/system) human intervention by a purposeful action (recovery) planned or executed on an intuitive basis at the type of event, stopping incidents, thus perceiving the human or systems as a responding or preventing factor. In the closing chapter the editors agree to a pragmatic definition of a near-miss as “a deviation which has clearly significant potential consequences” (Schaaf et al., 1991) and that accidents are by definition near-miss, which failed to be recovered in time and near-miss are clear precursors of accidents to serve as reasonable predictors not only of the qualitative type, but also of the quantitative risk of accidents.

In shipping the definition of a near-miss when implemented in 2008 is written in similar terms:

A sequence of events and/or conditions that could have resulted in loss. This loss was prevented only by a fortuitous break in the chain of events and/or conditions. The potential loss could be human injury, environmental damage, or negative business impact (e.g., repair or replacement costs, scheduling delays, contract violations, loss of reputation) (IMO, 2014).

Examples of fortuitous breaks are listed in the Guideline and do involve intervention from the system or humans. Though IMO recommend a definition (IMO, 2014) it does not mean the organizations or the sharp-end, responsible for the reporting, share this perception and use it.

The context and experience affects the interpretation of events on-board. What may be regarded as a dangerous situation – risk of collision for a graduated deck officer is not necessary the perception of a senior officer, the Master or a HSQE manager at the blunt end. Difference through distance is likely.

Moreover, what if the seafarer does not distinguish a near-miss from normal work¹⁷? Can it be our construct of a near-miss is hidden in the variation of life, thus undermining the alleged value? Near-miss reporting as applied today would give a misleading view of ship operations, be a learning decoy - not meaningful. Learning on the wrong track without recognizing it - nobody is immune, would be critical and force operations towards safety boundaries.

2.4. The urban myth –Accident pyramid

Hale's publication "Conditions of occurrence of major and minor accidents Urban myths, deviations and accident scenario's" (2002), provides a contrast to the appearance of a unanimous support to Heinrich's accident pyramid within IMO and Shipping. Hale expresses a critical view to the perception that near-miss will prevent major adverse events – and discard it as a myth.

Any model may be misleading if the user does not understand its preconditions and in the worst case obstruct safety efforts. This is the point Hale (2003) makes when dissecting; Henrich's work – pyramid model, and years of misinterpretations by industries and safety practitioners.

Providing an account to explain the misperception lets scrutinize the graphical representation(s) of the pyramid over time.

The first graphical rendering from 1931 illustrates a square at the top underneath horizontal bars are positioned. In the Fourth edition of his book the "Industrial Accident Prevention", the graphical rendering – the square and bars, are superimposed looking like a path to an event. The relationships shown and implied by the pyramid are tempting, simple and dubious. The bars have transformed from different

¹⁷ While learning from deviations and near misses are argued more effective than from accidents, normal work pose an even greater potential. Hollnagel's (2012) three preconditions for effective learning ; 1) reasonable opportunities, 2) must be comparable and 3) we must have opportunities to verify the learning potential are fulfilled in normal work. However, does this justify reporting everything we do to share and increase adaptive capacity and how would the sharp-end distinct what is important? Perhaps observations and experience from normal work should not be reported but nurtured in the existing informal storytelling.

kinds of injuries i.e. outcomes (not different kinds of accidents), to a visualization of type of events e.g. deviation, near-miss unsafe act, incident and accidents – the Accident pyramid.

With the number of events in the categories seems to display a fixed relation (correlation) the accepted assumption is that common causes of accidents exist across levels – thus the logical linear relationship is perceived. With this mindset an industry may conclude dealing with frequent events will prevent the rare – serious events (Hale, 2002; Hollnagel, 2014).

In the 5th edition of “Industrial accidents prevention: a safety management approach” written post mortem (Heinrich et al.; 1980) it was found necessary to emphasize a confusion about the ratio and causality in industrial prevention work.

it does not mean, as we too often interpreted it to mean, that the causes of frequency are the same as the causes of severe injury.....Statistic show that we have been only partial successful in reducing severity by attacking frequency” (Heinrich et al., 1980).

While there may be a limited overlap between near-miss, minor and major events, it is not necessary the case, and research is definitely not definite in favour of this view, thus we cannot claim a correlation.

We have seen examples on the challenges to define and recognize a near-miss. Further the argument for introducing near-miss reporting – the correlation and linear causality consequently leading to opportunities to prevent accidents, are not founded in research, but through misconstrued drawings of a pyramid (misinterpreted), and old accident models (Hollnagel, 2014).

With a high frequency of near-miss occurring compared to accidents, what will future safety practice and effort be? Would the existing near-miss reporting system continue to manage the isolated consequences of a near-miss, and would a progressive safety view be adopted acknowledging the consequences of non-linear causality?

I have accounted for the aetiology of near-miss in the institution of IMO and discovered how definitions and perceptions have changed. The Guideline from 2008, the wording seems to slowly assimilate towards the writing of Hale and Hollnagel (2002, 2014), which warns against the perception and misinterpretation of correlations between types of events.

Yet, I have to account for the learning, which is defined as a key element in the IMO near-miss reporting guideline, however not elaborated on. In the following, I shall explore the literature and synthesise learning but refrain from examining the barriers of learning.

2.5. Learning, how is it perceived?

The ultimate objective of near-miss reporting, and investigating is to identify areas of concern and implement corrective actions to avoid future losses. In other word; learning the lessons from near-misses should help to improve safety (IMO, 2014). There is little direction in the IMO documents as or what constitutes learning from events besides reports are to be; generated, shared, read, and acted¹⁸ upon, and this is, allegedly, most effectively done if a Just culture is implemented¹⁹.

Learning from incidents and events is by various authors captured as a process divided in steps and/or sub-processes (Jacobsson, 2012; Drupsteen et al., 2014 & 2015; Schaaf et al., 1991, Serge, 1990). Generally, the processes can be divided into two main categories - Learning lessons process and Follow-up process (detect and reflect). Numerous presentations of such processes exist (Jacobsson, 2012; Drupsteen et al., 2014 & 2015; Schaaf et al., 1991). In shipping, a simple process is practiced as can be illustrated by Jacobsen, with the first loop²⁰ learning being dominant.

¹⁸ Gathering near-miss information, Analysing information, Identifying causal factors, Developing and implementing recommendations, Completing the investigation

¹⁹ I will not cover the cultural aspect nor question the dubious perception that a culture is something you can implement – like procedures

²⁰ Single loop learning by Argys and Schon(1996)

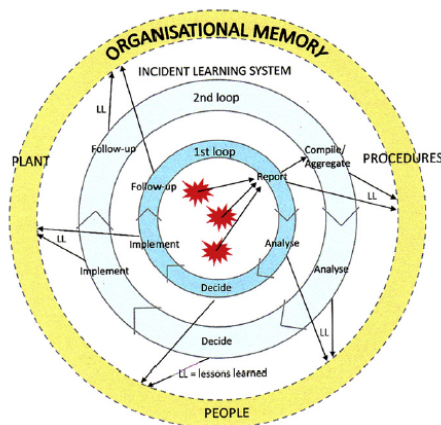


Fig. 1. The learning cycle for incidents.

Figure 2: The learning cycle for incidents (Jacobsson & Akselsson, 2012)

The model(s) visualize a difficult process that requires resources and skills to master, and the learning outcome is very dependent on the investigation and analytic skills available. Why learning is complicated, I will illustrate next by reviewing different aspects of shipping and layers of learning.

Today the world merchant fleet covers +100,000 vessels, that are operated by thousands of ship managers in which layers of technical complication hide the significance of subtle human performance factors and provides a picture of the socio-technical system, where causalities are not linear, where their effects can be by nature unpredictable and counter intuitive. The nature of this unpredictability is found in the high number of interrelated, self-organised entities that are always affected by changes in the system, through interactions and feedbacks, and thus leading to unexpected and emergent patterns (Le Coze, 2008). Truly, from modern shipping (system) complexity emerges (Schoder-Heinrichs et al., 2013; Perrow, 1999).

Secondly, the obstacle learning from events are as complicated and subtle as the circumstances that surrounds a failure or near-miss involve multiple contributors, the decision to focus on one or another of the set, and therefore what will be learned, is largely socially determined (Woods et al., 2010, Le Coze, 2013; Drupsten et al., 2014).

Argyris and Schon (1996) further articulate factors that impact the learning process; capturing information – acquisition²¹ followed by processing and storing;

- history and context
- the assumption about why things happen
- scope of the investigation/exploration - individual/teams at the operational level - micro, collective and organization - meso, environment, societal level - macro.
- choice of model; normative – data fits the model (structured root cause analysis) or descriptive – model fits the data (Le Coze, 2008).

The Guideline (IMO, 2014) writes; “The Company shall provide training and information about its approach to “just culture, near-misses reporting and investigation for all persons involved”. Continuing, the criteria and ambitions to achieve learning from events is based on the investigation and;

A ‘just culture’²² features an atmosphere of responsible behaviour and trust whereby people are encouraged to provide essential safety-related information without fear of retribution...It is a crucial requirement that the company clearly define the circumstances in which it will guarantee a non-punitive outcome and confidentiality (IMO, 2014, p.67).

Notably, the Guideline does not address the above factors nor complexity or notions of learning - individual, groups and organizations.

Individual, groups and organizations can all learn, but the mechanisms for each differs. The term learning has traditionally been used about individuals who change their behaviour in the light of experience (Sanne, 2007; Schaaf et al.,1999), or in viewpoint of an organizations as by Senge “...where people continually expand their capacity to create the results they truly desire, where new and expansive patterns

²¹ Generating, collecting, detecting, reporting

²² Should you be interesting in barriers against NMR, the science litterateur will provide such research e.g. lack of just culture, (Bhattacharya, 2009 ; Drupsteen & Guldenmund, 2014), thus this will not be a part of my thesis.

of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together.” (1990b, p. 3).

Even though Nonaka and Takeuchi (Crossan et al., 1999) focus on product innovation I rather like the view that creating knowledge is not a mechanic process, rather it depends on “tapping” the tacit²³ and often highly subjective insights, intuitions, and hunches of individual employees and making those insights available for testing and use by the company as a whole.

However, ingrained in the IMO and traditions of Western management²⁴, is a view of the organization as a machine for "information processing." According to this view, the only useful knowledge is quantifiable data and codified procedures. This is dominant in shipping partly self-inflicted partly enforced by clients e.g. oil majors, all claiming risks are well managed by showing performance statistics - ISM Code -observations, non-conformities, LTI and KPI systems²⁵

Though research exists on organizational learning (Argyris et al., 1996; Crossan et al,1999) and the learning organization (Senge 1990), no clear systematic review of what learning from events and incidents is, and why learning from incidents²⁶ (LFI) is often ineffective has not been published yet (Drupsteen et al., 2014).

Senge notes, the basic rationale for learning organizations, is that in situations of rapid change only those that are flexible, adaptive, and productive will excel. For this to happen, Senge argues five fundamental disciplines are required put into practice for becoming a learning organization:

- systems thinking,
- personal mastery- discipline of personal growth and learning,

²³ Tacit knowledge is highly personal. It is hard to formalize and, therefore, difficult to communicate to others. Tacit knowledge is also deeply rooted in action and in an individual's commitment to a specific context -- a craft or profession, a particular technology or product market, or the activities of a work group or team.

²⁴ From Frederick Taylor to Herbert Simon

²⁵ Intermanager KPI system <https://www.shipping-kpi.org/>

²⁶ Including near misses

- mental models- Mental models are images, hypotheses, and histories that we are maintaining in our minds regarding ourselves, other people, institutions, and each aspect of the world in which we are living (Senge et al., 1994),
- shared vision - shared images of the future,
- team learning - discussion is the necessary counterpart of dialogue. In discussion decisions are taken while, in a dialogue, complex questions are explored (Senge, 1990b). In brief, the power of these two essential practices to team learning lives in their synergy.

Without a systemic orientation, there is no motivation to look at how the disciplines interrelate. By enhancing each of the other disciplines, it continually reminds us that the whole can exceed the sum of its parts.” (Senge, 1990b, p. 12). According to Senge, the essence of the systems thinking discipline is related to a shift of mindset which consists of seeing interrelations instead of linear cause/effect chains and processes of change instead of snapshots. Progressing Senge’s five disciplines, Nonaka et al. argues that organizations need to “discover how to tap people’s commitment and capacity to learn at all levels (1995). This principle and disciplines recognized in progressive safety e.g. resilience (Hollnagel et al., 2012).

Mary Crossan et al. writes that “Organizational learning is a dynamic social process” (1999) – a network and informal relations among employees that can be expressed in notions like ‘explore’ and ‘exploit’ to describe the processes. Not only does learning occur over time and across levels, but it also creates a tension between assimilating new learning (feed forward) and exploiting or using what has already been learned (feedback). Through feed-forward processes, new ideas and actions flow from the individual to the group to the organization levels. At the same time, what has already been learned feeds back from the organization to group and individual levels, affecting how people act and think.

The concurrent nature of the feed-forward and feedback processes creates a tension, which can be understood by arraying the levels against one another. Doing so illustrates that, in addition to the processes that feed forward learning from the individual and groups to the organization, learning that has

been institutionalized feeds back and impacts individual and group learning. The importance of these interactions can be highlighted by two relationships that are especially problematic: interpreting-integrating (feed forward) and institutionalizing-intuiting (feedback) (Crossan et al., 1999). Feed forward relates to exploration. It is the transference of learning from individuals and groups through to the learning that becomes embedded—or institutionalized—in the form of systems, structures, strategies, and procedures (Crossan et al.,1999 p.524).

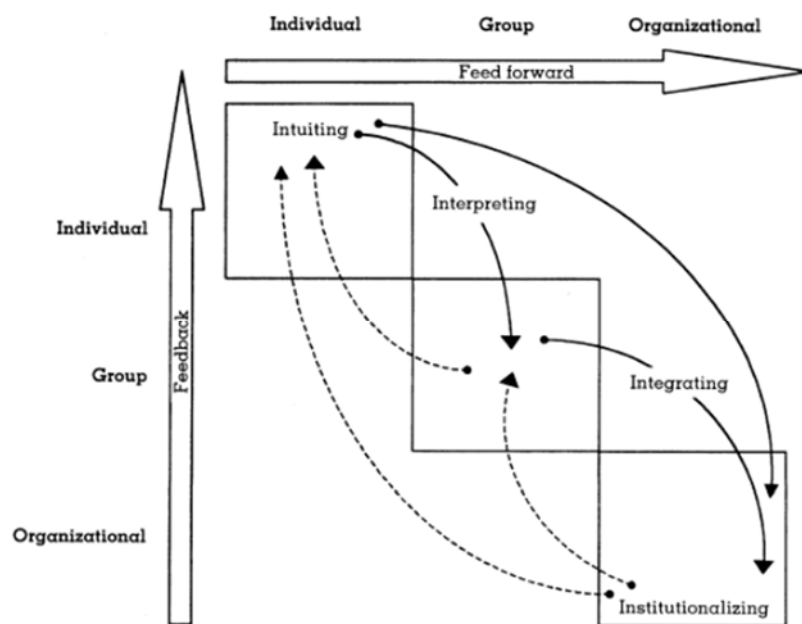


Figure 3: Learning as a dynamic process (Crossan et al., 1999, p.532)

A dynamic theory of organizational learning recognizes that there may be bottlenecks in the ability of the organization to absorb the feed forward of learning from the individual to the group and organization (p.533). The bottleneck has many names as this review illustrates; models applied, stop rules²⁷

²⁷ Often the analysis of causes is a weak point. Hale (2008) claims that accident investigations often stop at events close to the accident, which usually concern only the behaviour of the hardware and of the operators/workforce directly concerned with carrying out the activity. Hale, A. R. (2008). The goals of event analysis. From accidents to organizational learning. In A. R. Hale, et al. (Eds.), After the event. Bingley: Emerald Group Publishing.

understanding sociotechnical systems, fear, blame and retribution, normal work vs. near-miss captured in various deliberate or unconscious trade-offs.

The review of learning shows there is more to learning than; an investigation, a just culture and a Company defining circumstances in which it will guarantee a non-punitive outcome and confidentiality. It raises the question of the industries perceptions on what is required to secure learning. Is the IMO guideline and a near-miss reporting system regarded sufficient to overcome the obstacles or does a more nuanced view exist in the industry?

Summary

My introduction synthesizes arguments and debates on learning in general and from near-miss in particular. My position is that the learning potential of near-miss reporting is questionable and may be deceiving in the endeavour to support safety in the maritime environment. In contrast to the IMO, this is supported by safety science (Drupsteen et al., 2014). All stakeholders wish the safest work environment, but the rationality differ. I argue that the attention of IMO – arear of focus, is misguided because of superseded knowledge – perception of various factors; a simple learning process, linear models and a correlation and causation in Heinrich Accident Pyramid. Further, I advocate for the problematic in trying to learn from a near-miss, a construct depended on the context and experiences of the seafarer, that is subject to a potential transformation when managers investigate.

Is near-miss reporting about doing something we trust that makes life safer, that creates a feeling of being safe or is it perceived as a bureaucratic tool for scientific management that measure²⁸safety? While barriers preventing near-miss reporting has been studied e.g. blame-culture, and is ongoing (Anderson, 2003), I have not found any research addressing my thesis question “to explore the perception in the maritime domain of the learning potential from near-miss reporting”. The maritime domain consists of

²⁸ lagging indicators

various levels; Flag state - Company - Seafarers. Inspired by Rasmussen (1997) abstract presentation “Levels of decision making in a dynamic sociotechnical system” my research may capture transformations of the perception(s) of near-miss reporting. Perception(s) reveals knowledge, thus the research may provide a narrative about the condition of the learning dynamic between an industry and safety science – is the explored being exploited. This forms the aim for my research:

“to explore the perception in the maritime domain; of how and why near-misses contributes to safety “

3. METHODOLOGY

3.1. Methodology and methods

The methodology is driven by the ontological and epistemology though it is more specified and practical. The methodology is often explained as the strategy, whereas methods are the techniques or procedures used to gather and analyse data related to a research question or hypothesis. Methodology is according to Blaxter, Hughes, & Tight described as the “paradigm that underpins the research” and method is the “tools of data collection or analysis” (2010, p. 59).

The paradigm or positions underpinning social science research are frequently described as either ‘Positivism’ or ‘Interpretivism’. With Positivism, social science often inclines towards quantitative approaches testing hypotheses. This research paradigm is in favour of information and data in ways of large numbers, increased control, surveys, questionnaires and statistics. An example of a quantitative approach for data collection was identified in my literature review - the IMO study “the impact of the Code” (IMO, 2005). The study is characterized by applying hard data²⁹ and questionnaires for shipboard personnel, shore-based personnel, shipping companies and Administration’s . Scrutinising the study and the conclusions e.g.:

Everyone agreed that, where the ISM Code is embraced as a positive step toward efficiency through a safety culture, tangible positive benefits are evident”, and recommendations...

further study should be undertaken, at a later date, specifically to examine:

- cause and effect between ISM implementation and flag State safety record;
- the relationship between Port State Control and ISM compliance.

²⁹ through Port State Control data and results, defects and detentions are registered.

A paradigm of realism with the objective approach of understanding knowledge and gathering information - questionnaires and creating statistics, becomes apparent. While such paradigm may be effective to create some awareness and 'confirm' an universal Truth – the questions posed do not reveal the many perspectives – contexts and multiple truth's of every day working with the Code and its effect.

In contrast, to positivism, the interpretivist approach believes that to understand social phenomena – the human, their world their everyday activities, qualitative research is required.

Whereas, the study by IMO tries to capture and identify the effect of the Code - on efficiency and safety, my thesis can be regarded as a qualitative supplement that explores, the why and how part of the code i.e. Near-miss reporting, is perceived and experienced contributing to safety. With the approach of Relativism and Subjectivity guiding my research, I will in the following describe why my research will draw from the phenomenology methodology.

3.2. Choosing a method

Phenomenology is concerned with the lived experience – the perspective of the individual. Moustakas (1994) describes how the aim of phenomenology is about determining what an experience means for an individual who is able to provide a comprehensive description of it; from this description relevant meanings are derived, which are the essences of the experience. The grandfathers of phenomenology, Husserl and Heidegger are often quoted by “return to the concrete”, “Back to things themselves”, “Dasein – Being there” (Groenewald, 2004, p.43), emphasizing a key feature in phenomenology that support my research paradigm and endeavour. Free from hypotheses and preconceptions it essentially tries to describe rather than explain (Husserl, 1970). Interpretation of phenomenology research may be used to form a hypothesis or practical theory to support and/or challenge conventional wisdom³⁰ (Lester, 1999).

Essentially, I believe that drawing from the phenomenological approach/methodology will enlarge and deepen the understanding of the range of experiences with near-miss reporting.

A definitive research technique for phenomenological studies does not exist. That said, various authors have presented guidelines for analysis of interviewed data e.g. Moustakas (1994) presenting each a series of seven steps and Hycner’s (1985) fifteen step analysis of interviewed data. Said guidelines have been my primary inspiration for this research – the framework (methodology).

3.3. Designing the research – the framework

Inspired by the phenomenological research to derive scientific evidence, a series of methods and procedures that satisfy the requirements of an organized, disciplined and systematic study needs to be followed (Moustakas, 1994). Generally, the research process can be divided into three phases ; 1. Preparation, 2. Collecting and 3. Organizing and explication of data (Moustakas, 1994, p. 103).

³⁰ Accident Pyramid

3.3.1. Preparation

First, the researcher is surprised, encounters a problem or experience in understanding of some phenomenon (Brinkman, 2014). Through my professional job as an assessor, I experienced insurance clients claiming that the amount of near-miss reported, meant a higher safety on-board.

Reviewing the literature, I identified no qualitative research addressing why and how near-miss contributed to safety. In other words, how does near-miss affect safety and what is the effect?

To identify potential group of respondents, I was inspired by Rasmussen's (1997) abstract presentation "Levels of decision making in a dynamic sociotechnical system", and found it worth pursuing if the experiences and perceptions at different levels of the hierarchy were a like or significant differences existed and in case what this meant for safety. The IMO at the top of the hierarchy, I identified four sub levels which likely were accessible and could, could form the data for the research:

1. Flag state, Regulators Authority
2. Recognised body – Classification Societies
3. Owner or Ship manager
4. Vessels Captains

Next was to identify personnel with knowledge and working with the ISM code - near-miss within the levels of the hierarchy. Identifying personnel at Regulators Authority and Recognized body - Classification societies were not difficult, but finding a shipping company where no string attached – my profession being marine insurance, required more effort. Having access to the largest maritime databases in the world - IHS Fairplay³¹, a number of Scandinavian based ship managers was identified of which two were pre-selected. One of the managers was capable of granting access to two Captains. Further, a NGO actively working with health and safety at sea and hosting a national near-miss database, was invited.

³¹ Fairplay by IHS Markit holds the largest maritime databases in the world, evolved from the Lloyd's Register of Ships books, which have been continuously published since 1764. <https://ihsmarkit.com/industry/maritime.html>

The invitation to participate in the research was initially by phone and followed up with a formal introduction and letter of consent describing the purpose and the respondent role. All of the respondents confirmed their interest and interview date(s) agreed.

3.3.2. Collecting of data

Two pre-interviews were conducted to test; the chosen interview form - semi structured, the open-ended questions and my own abilities and biases – Epoché. As it turned out, this investment of time became very useful for two reasons. First, it confirmed which questions needed to be adjusted to better revealed “what” the respondent experienced with the phenomenon as well as “how” the experience happened. Second, listening to the two audio recordings repeatedly, I became more conscious about my style – it was to assertive, and the difficulties of “bracketing” - freedom from suppositions.

Subsequent, an introductory letter was sent to the ten participants by e-mail to inform them about the research, with a follow-up telephone call before the commencement of data collection. They were informed that the objective of the study was to explore how Near-miss reporting was perceived to contribute to safety. Participants were asked to participate in a semi structured interview session. The in-depth semi structured interview contained 8 questions to bring forth perceptions of what safety means, what is near-miss, the purpose of near-miss and why and how we learn. The questions are listed in Appendix B

The data collection was performed in the period July to September 2017, and the interviews of each 1-2 hr each were audio recorded.

3.3.3. Organizing and explication of data

The third and final phase is explication of the data gathered, inferring “an investigation of the constituents of a phenomenon while keeping the context of the whole” (Hycner, 1999, p. 161).

The explication, or what we find, is not a product of the data nor the analysis itself. The data is produced in the interaction of the interview and the interviewee, and the findings emerges from the

relationship between; the data, the method chosen and the theory. My explication is inspired by Moustakas (1994) and the guideline by Hycner (1985) - a way of transforming the data through interpretations, simplified into five subcategories (Groenewald, 2004).

1. Bracketing and phenomenological reduction.
2. Delineating units of meaning.
3. Clustering of units of meaning to form themes.
4. Summarising each interview, validating it and where necessary modifying it.
5. Extracting general and unique themes from all the interviews and making a composite summary.

To resonate with the reader, the explicating of the data is supported by descriptive visualization aiming to make the process applied as explicable and transparent a possible (Appendix I).

- First, a verbatim transcript was created based on the audio recordings and a colour coding applied for the eight sub questions. Units of general meanings were identified in the complete transcript and coded. After identifying the relevant units of meaning, clusters of relevant meaning were created and pre-coded.
- Working forwards and backwards in the data, clustering of units of relevant meaning took shape. An average of 15 clusters were identified per respondent.
- Working with the clusters of meaning (and related units of relevance), images of theme(s) emerges – the Gestalt. Revisiting the sub questions and answers, the clusters were confirmed, and the themes finalized with a certain confidence. A list of the 24 themes that emerged is presented in Appendix E.
- For each respondent, a summary of the interview incorporating the unique and general themes - elicited from the data, was created.

3.4. Validating the data³²

The themes were summarized and subsequent forwarded to the respondent for a "validity check". This to confirm whether the participant agrees that the essence of the first interview has been accurately and fully "captured". (Hycner, 1985). Overall, my initial explication of the data was well received by the respondents, and I only received two comments addressing; an elaboration of noted experiences and a perception. Subsequent, the relevant meanings where reflected upon and amended – clusters of themes and summaries revised.

3.5. Ethical considerations³³

I conceive ethics as an aspect that requires continuous attention (monitoring, anticipation) throughout my research, and another precondition for quality. Consulting the Swedish Ethical Review act (www.lunduniversity.lu.se, 2017), I found no requirement to obtain an ethical permission for my research.

Nevertheless, my attention was focused on; informed consent, confidentiality, consequences and my responsibility as a researcher. As a result, I created an 'Information letter' and 'Informed Consent', which was forwarded to the respondents (Appendix D. Information letter and consent form). The letter describe general information of the study and include the recommended paragraphs of a consent letter in compliance with the ethical guidelines by Lund University. This meant the Informed consent form was explained to respondents at the beginning of each interview and any questions were clarified e.g. the information collected during the interview would be kept strictly confidential and available only to the undersigned researcher and for the purpose of the research.

³² are further sited in the appendices

³³ ³³ are further sited in the appendices

3.6. Number of respondents³⁴

How do you know the right number of respondents required to reach saturation and does it make sense to talk about a minimum number of respondents – saturation, when conducting a phenomenological study? While the question is quite valid, I will simply state that my groups - ten respondents was guided by the work of Boyd and Creswell (Groenewald, 2004), both recommending up to ten participants.

An anonymous list of respondents can be found in Appendix A and the list of the semi structured questions, consent forms and letter of introductions are in appendix D.

³⁴ are further sited in the appendices

4. EXPLICATION OF DATA AND FINDINGS

4.1. Illuminations from ten summarise across respondents

In this Chapter, I will present five narratives that represents unique as well as general meanings from the ten summaries, aiming to illuminate perceptions and create an understanding of the ‘how’ and ‘why’ near-miss contribute to safety. The context of the narratives are associated to the initial questions given to the respondents during the interviews:

- How safety is perceived?
- How is a near-miss defined?
- The purpose of the near-miss in the code – the why?
- How can we learn from near-miss ?
- What do we learn from near-miss ?

Prior to each discussion of and around the narrative, the data from the themes is presented classified in terms of the Code and Guidelines. This is complemented by data visualisation in the form of Chevron lists and Venn diagrams. The Chevron list display the four hierarchies³⁵with relevant meanings and explores the data across the hierarchies, and a Venn diagram illustrates the unique and general meanings.

4.1.1. Narrative: How safety is perceived?

Code & Guideline

In the Code and Guidelines safety is used in different contexts, which will be listed in the following.

³⁵ Color codes are consistent with Venn diagrams

First. In the Code the Objective is: “To ensure safety at sea, prevention of human injury or loss of life.....” (p.14).

Second. The definition of a safety management system means; “a structured and documented system enabling company personnel to implement effectively the company safety and environmental protection policy”(p.13).

Third. In the functional requirements to the safety system; “instructions and procedures to ensure safe operations” (p.15).

Fourth. In the Guideline (MSC_MEPC.7/Circ.8), safety is applied in the context of culture; “The application of the Code should support the development of a safety culture in shipping...” (p.57).

Finally, I will highlight the context of statistical safety – measuring safety. In the IMO guide line (IMO, 2014) the notion of safety trends is noted: “It may take years for safety trends to be discerned, and so reporting must be archived and revisited on a timely basis....” (p.71).

Notable is the many context in which safety is used in IMO documents – “Trends, culture, management systems, injury, loss of life and operations”. An important notion is the distinction between safety and safe operations. Safety being difficult to define and agree upon, the safe operation can be specific related to a work process/function - thus tangible and easy to discuss.

My data

The question “how safety is perceived” may seem trivial, nevertheless safety as a construct needs to be explored in order to describe and understand what it is near-miss contributes to. The majority of respondents seemed surprised by the question, seems like it was too obvious or actually difficult if not in a context. This showed in their facial expression – lifted eye browse, stunned expression or a petit laugh. While some took time for reflection before answering, others articulated concisely. In the Chevron diagram, the essence of safety within the hierarchies is shown. Conjoint for all the respondent, is a classic perception of safety – “*as not getting hurt*”, nevertheless various perspectives of safety surfaced.

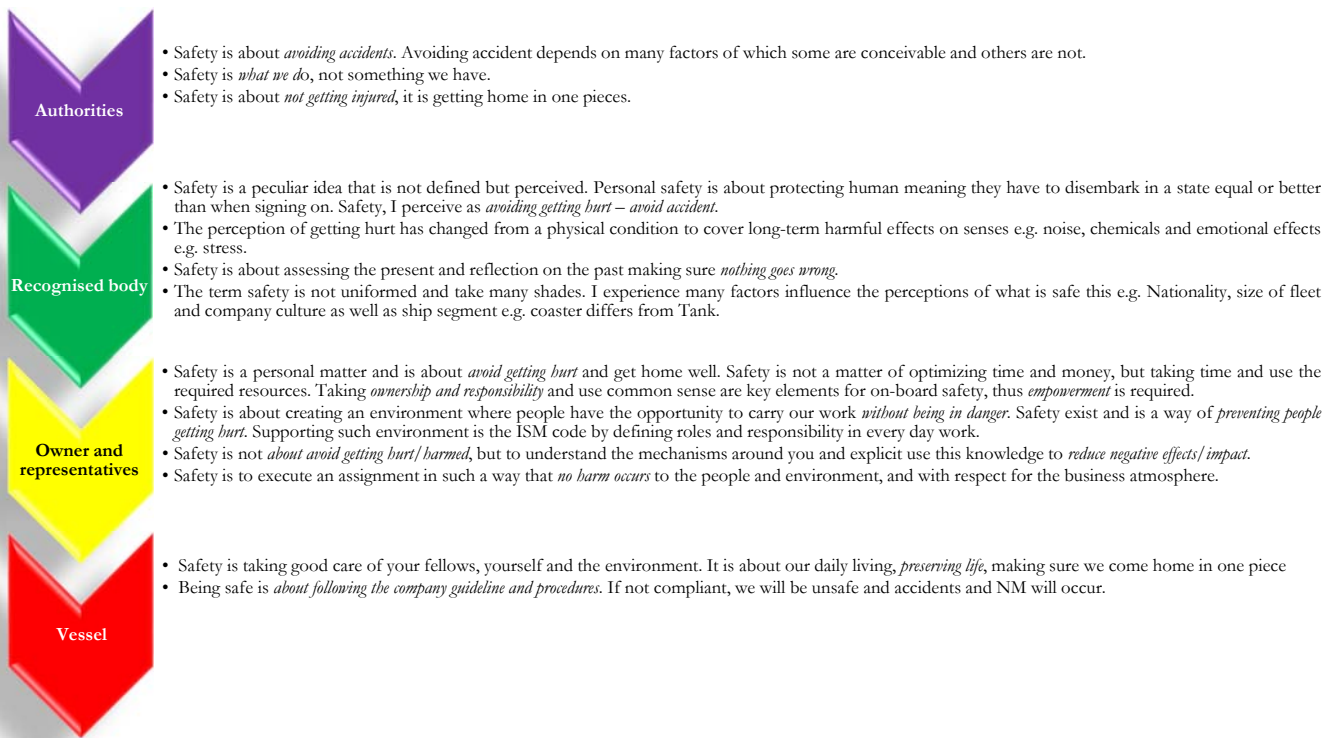


Figure 4: Chevron list by hierarchies - how safety is perceived?

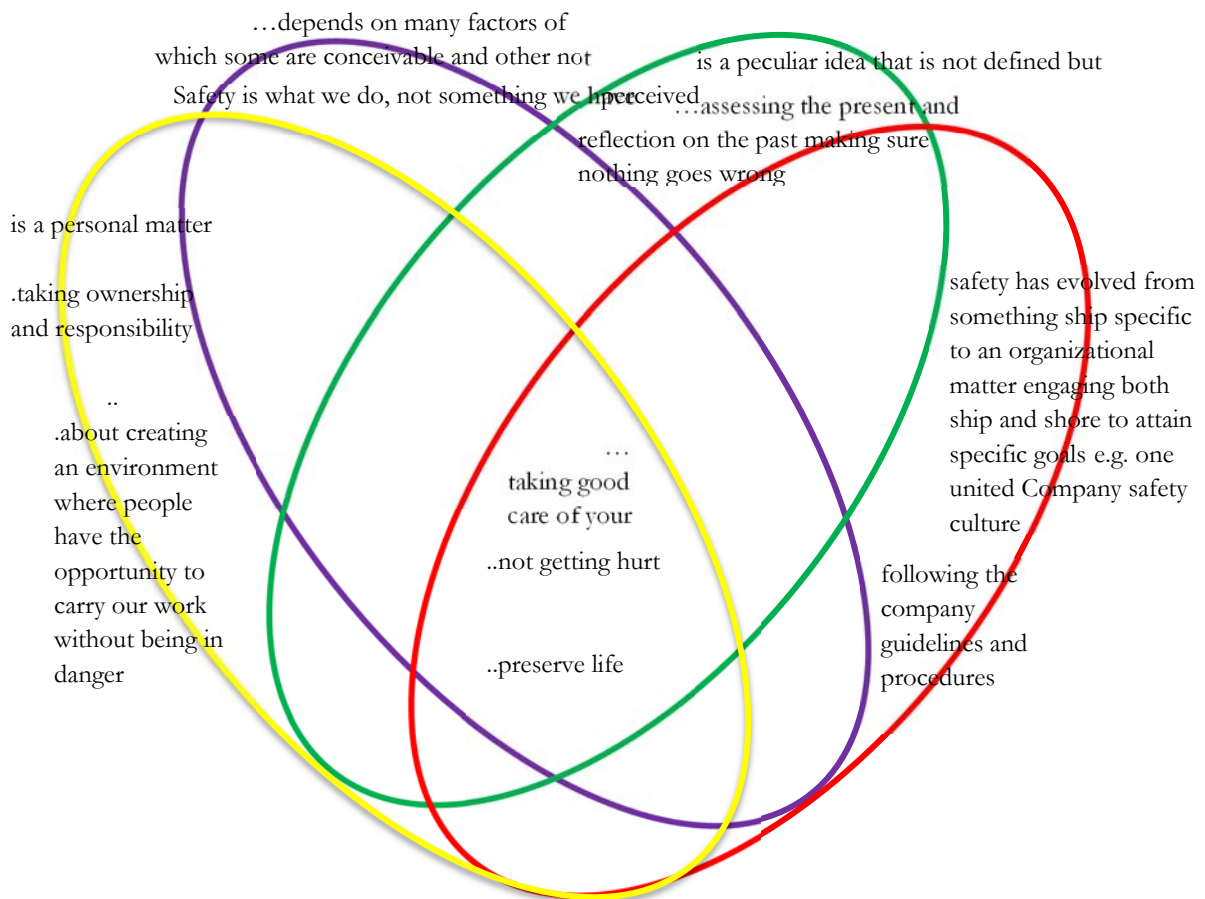


Figure 5: Venn Diagram by hierarchies- how safety is perceived – the general and unique?

In the centre of the Venn diagram, general meanings are illustrated and in the surrounding intersections partly shared and unique meanings and phrases are displayed.

Administration

At the top of the hierarchy – within the respondents from the Administration, safety was defined as “avoiding accidents” and “not getting injured”.

The two respondents elaborated on safety in the context of the SMS as “a tangible and dynamic tool that requires an active engagement and reflection from the seafarers” (Respondent E, J) and as “a tool assisting the seafarer to succeed and complete work process in a safe manner – not getting injured”. The common perception here is that if the seafarer uses the SMS system in which “responsibilities, work descriptions and processes can be managed and documented” and is reflective, safety can be achieved.

That leaves the question - when somebody gets injured or harmed, is this due to lack of reflectiveness, an imperfect system or a seafarer not using the system at prescribed?

However, this classic definition and understanding of safety was supplemented with more nuanced views.

One perception (Respondent J) was that safety is; “what we do and not something you have”, indicating safety is not a system characteristic but about behaviour.

Continuing. To be safe i.e. your actions in order to prevent injuries and harm, the respondent emphasized that an “understanding of the complexity behind why things goes wrong (Respondent E) – the many factors making it difficult to understand”, is required.

Two respondents (Respondent E & B) link safety with an understanding as of why things happens and use the word ‘complexity’. Unfortunately, complexity was not elaborated on thus we do not know if it is perceived as something a system has or emerge.

Recognized Body

The recognized bodies share the definition of safety with the Administration. It is perceived “as avoiding getting hurt – avoid accident”(Respondent C) and “making sure nothing goes wrong”. Significant for the former respondent is the elaboration of the effect of getting hurt. Not only physical condition but also long-term harmful effects on senses e.g. noise, chemicals and emotional effects - stress (Respondent C). Both respondents, as ISM auditors, associate safety with the notion of ‘assessments’, which is a well-recognised axiom from the ISM code e.g. “to identify hazards by risk assessment and safeguards, not only for humans but also for the environment e.g. against pollution and loss of property (Respondent C).

The ISM code is a general frame-work with a huge impact promoting safety in various ways. Improving the work environment and work process are significant for the ISM Code, thus the capability to assess, reflect and adjust are of paramount important (Respondent D).

The perception is that safety today is interlinked with the SMS system and the ability, not only to assess, but reflect and adjust are key abilities.

Whereas these abilities historical have been treasured in the maritime world – known as part of good seamanship, they are now formulated and formalized in a SMS context.

The Administration and Recognized bodies experience that ‘no two companies are alike’, thus the implemented SMS systems are different, a noteworthy statement also found in the Preamble to the Code (p.11). Notable, they perceive an association that is dependent on vessel type and size or organization. Larger vessels and organizations, with resources, attain the crews with the “right mind-set” and a generative system is created, whereas smaller vessels operate ‘in compliance’. In this context compliance is understood as; SMS systems not evolving and not reflecting the life lived - it is kept alive [but the ‘pulse’ is critically low].

Owner

Among the Owners, two of three perceived safety is about “avoid getting hurt/harmed” (Respondent H,A). The other view was more progressive as “safety is about creating an environment for the individual in which empowerment to take ownership and responsibility is required” (Respondent B). At this level, safety is about setting and creating a framework for seafarers to work in. While the frame is controlled by the SMS system in which a degree of freedom to work is defined, it is perceived to help keeping the seafarers’ safe. Though not expressed by the respondents implicit the SMS system provides a frame in which responsabilisation is defined (Code).

From the data two perspectives [strands] of safety appears. First, one which embraces the governance of the ISM code “in which roles and responsibilities are defined, and where reporting and documentation requirements for auditing promotes a safer environment”. This statement could have been taken out of the ISM code and especially the perception that reporting and documentation requirements for auditing promotes a safer environment, I find interesting. The idea of being able to document what you have done on-board is perceived to promote safety is just another lagging indicator.

The second strand is about the difficulties modern shipping faces, where “the ownership and responsibility have drifted into the shore organisation, leaving the crew with the feeling of disempowerment” (Respondent A).

The drift is experienced as an effect of the ISM code that “supports a centralized control”, meaning the expertise is located ashore and not on-board”. In this paradigm, the ISM code has been perceived and interpreted as “the company is to create and develop perspective procedures and rules for the crew to followed” (Respondent H), thereby transforming SMS from an ‘advice’ into an ‘encyclopaedia’ which turns out difficult to understand and apply. Consequently, a disadvantage of the SMS perceived is, “when Companies try to capture expertise on paper, thereby refraining the crews professional pride and opportunity to navigate within their field of expertise, ownership and authority fade” (Respondent H).

While the intention of the ISM code was perceived as shared responsibility, between vessel and ship manager in which, the ship manager could be held accountable, it is experienced that “the majority of companies has not only taken the lead, but the control and today dictate the operation of the vessel” (Respondent I).

In the name of safety, noble intentions to develop a system – framework for the seafarers to practically work within and understand, is difficult to master and at the risk of disempowerment and ownership. Above tells a story of the difficulties and implications when introducing a system (SMS) that affect century’s of self-understanding of what a seafarer is and does.

Master

At the sharp-end, both Master’s perceived safety in the classic view; “preserving life, making sure we come home in one piece” (Respondent F) and “Being safe is about following the company guideline and procedures. If not compliant, we will be unsafe, and accidents and near-miss will occur” (Respondent G).

Whereas the latter statement expresses a Master’s belief of safety on-board being dependent on strict compliance with safety systems, the other Master acknowledged some compliance, but perceived safety as a joint effort:

Considering the implementation of the ISM code, safety has evolved from something ship specific to an organizational matter engaging both ship and shore to attain specific goals e.g. one united Company safety culture (Respondent F).

The evolution of safety as a shared responsibility between manager and crew is perceived as an intended consequence of the Code. What makes this statement interesting is the acknowledgement of not being sole responsible for safety, but that this has changed into a joint responsibility. Continuing. The Master perceive the joint effort as interconnected with a culture:

A culture that respect the actual hazards faced by the crew and benefit from reflections of lived experiences e.g. incidents reports and near-miss, increase crew consciousness and provides a learning experience, thus support the Safety Culture (Respondent F).

Across the hierarchies one general definition of safety as ‘not being hurt or injured’ has emerged. However, as shown safety has many shades and is perceived as ‘a compliance approach’, ‘SMS as a framework’, ‘as assessment’, ‘as what we do’, and to the notion of ‘safe operation/work’ surfaces. The variation can be explained and understood as a function of proximity to life at the sharp-end, as well as the experience with the SMS system as a supportive tool or as a control function. A control function that provide the leverage for internal/external auditors, and investigators³⁶ after an event, to address non-compliance and corrective actions. Ultimately, as a maritime law, the Code and SMS can justify legal judgment and accountability.

4.1.2. Narrative: How is a near-miss defined?

Code & Guideline

The definition of a near-miss, according to the Guideline (IMO, 2014), has previously been addressed as:

A sequence of events and/or conditions that could have resulted in loss. This loss was prevented only by a fortuitous break in the chain of events and/or conditions. The potential loss could be human injury, environmental damage, or negative business impact (e.g. repair or replacements costs, scheduling delays, contract violation, loss of reputation) (p.68)

³⁶ Including national investigation branches

My data

A precondition for the quality of my research is to be able to describe how a near-miss is perceived – what is it. Even though the IMO guideline presents a definition of a near-miss, and what constitutes a near-miss, the interviews revealed different practices. In the Chevron diagram the essence of the definition of a near-miss within each hierarchy is presented.

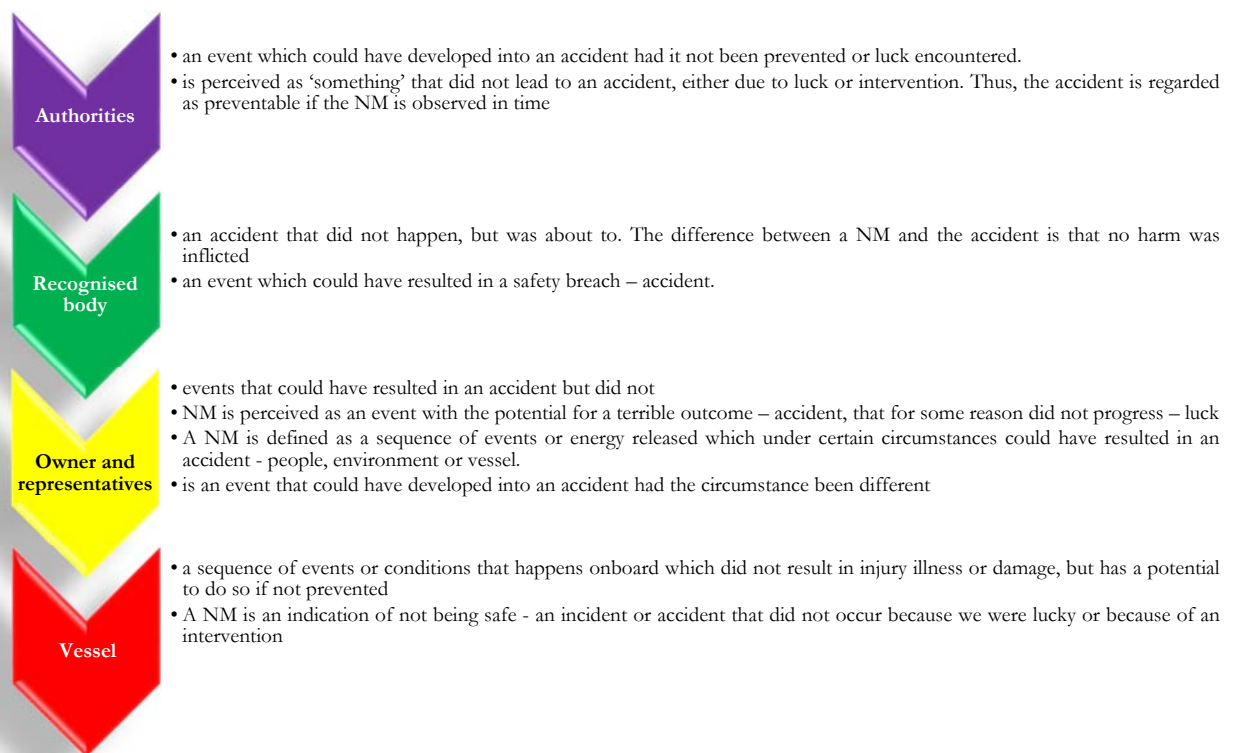


Figure 6: Chevron list by hierarchies - how is a near-miss perceived?

Across the respondents’ a uniform perception on a definition of a near-miss appears. “An accident or something that could have happened but did not, because of intervention or luck”. However, like the perceptions of Safety showed other layers, likewise the notion of a near-miss unfolds.

Administration

Within the Maritime Administration the understanding is that a near-miss is an; “individual perception” (Respondent J) and that “no unified definition can account for the many experiences at sea” (Respondent E).

Recognized body

These sub-categories or notions are acknowledged by the Recognized bodies as “unsafe acts and unsafe conditions” (Respondent C, D).

The categories are perceived of practical reasons – manage and measure, where ‘unsafe acts’ are related to behaviour, ‘condition’ to design and equipment and the ‘pure’ near-miss is about luck – act of God. Latter is not perceived to be related to safety but can best be illustrated as a window of how life can evolve and be risky.

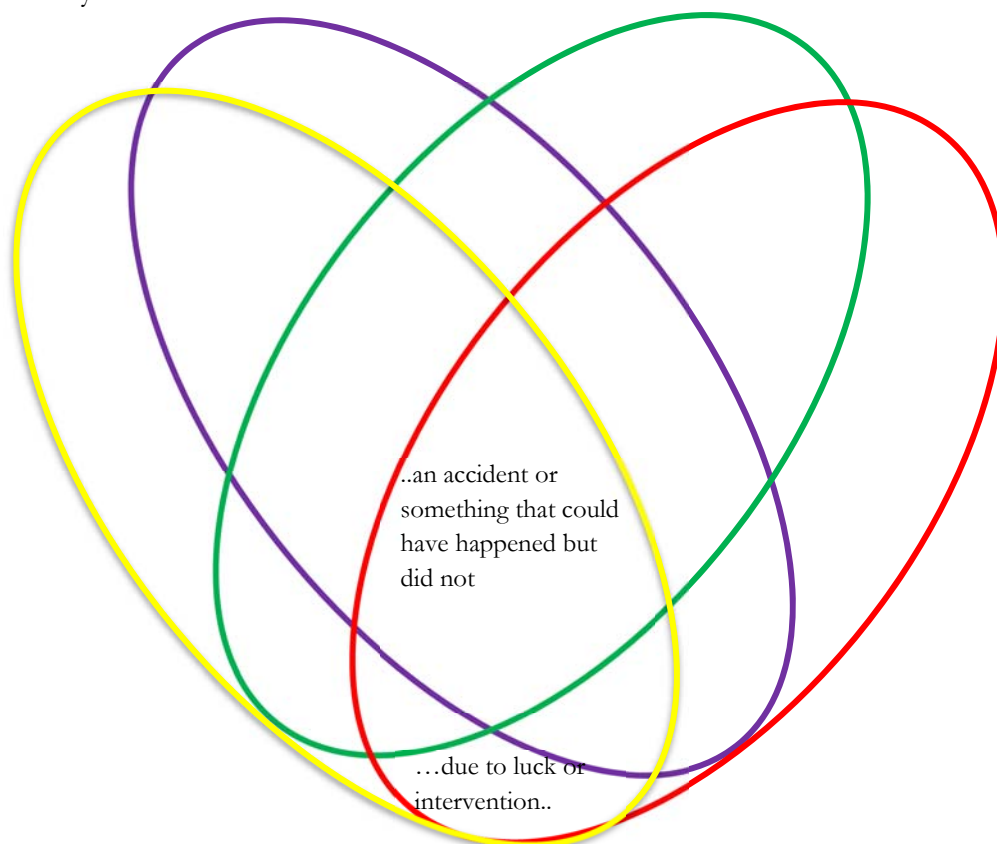


Figure 7: Venn diagram by hierarchies- how near-miss is perceived, the general and unique?

Owner

Within the hierarchy of the Owner another elaboration of a near-miss follows:

A near-miss is not to be understood as an image or a snapshot, but as a sequence of images - a film. Within this frame, the interpretations of what can be characterized as a near-miss are endless, and previous attempts for consensus among ship managers ends in disputes (Respondent B).

Of interest is it that a general definition of the near-miss exists, but when it comes to what characterize a near-miss, consensus among Owners is not possible. Why consensus is not possible was not elaborated, but the notion of a near-miss as something personal and context depended, provide an idea why it is difficult to capture. Consequently, it become difficult to (justify) compare and count near-miss events as they can represent different experiences on-board. Not acknowledging this, near-miss by the number may be mistakenly applied as a function for measuring safety.

Today, various categories of a near-miss exist of which the most common has been mentioned – ‘unsafe conditions’, ‘unsafe behaviour’, the origin of the categories are not clear, but the definition of causal factors as prescribed in the Code is a potential source (p.70).

Notable it is that one of the interviewed managers has discarded the commonly practiced subcategories of near-miss, arguing ‘it became too difficult to manage’ (Respondent H). Regardless of this initiative the manager expressed the difficulty for the crew to determine if an event is a near-miss, and accident or a remote danger. This emphasizes the problematic in consensus of what constitute a near-miss.

The data tells a story of how near-miss is perceived and managed. A general perception of the definition of a near-miss exist “an accident or something that could have happened but did not. If an event constitute or is qualified as a near-miss depends on the (local) interpretation and rationale and is therefore not absolute. Nevertheless, managing near-misses through pre-defined categories e.g. “Human

error”, and implementing KPIs that is used to document and as evidence, human error is what we see and likely to fix.

4.1.3. Narrative: The purpose of near-miss reporting in the code - the why Code & Guideline

Having described how the definition of a near-miss is perceived, the purpose of the near-miss is next. Revisiting the IMO guideline (IMO ,2014) the objectives of the near-miss reporting is clear:

Investigating near-misses is an integral component of continuous improvement in safety management systems” (1.1)

The ultimate objective of near-miss reporting and investigating is to identify areas of concern and implement appropriate corrective actions to avoid future losses.” (5.2)

Scrutinizing the Guidelines for implementing by companies, the awareness is highlighted as follow:
“The Company should encourage the reporting of near-misses to maintain and improve safety awareness (6.4)

Depending on your safety view above opens up to multiple interpretations of the purpose of the near-miss, in which conflicting goals can be argued. For instance, does the strive to - continuous improvement of a system - its effectiveness, intertwined with ideas of good business and economic sense [reduce costs], conflict with the notion of safety? Does the objective acknowledge a trade-off between safety and effectiveness?

My data

In the Chevron diagram, selected statements from the hierarchies’ shows an association with the wording in the IMO guidelines.

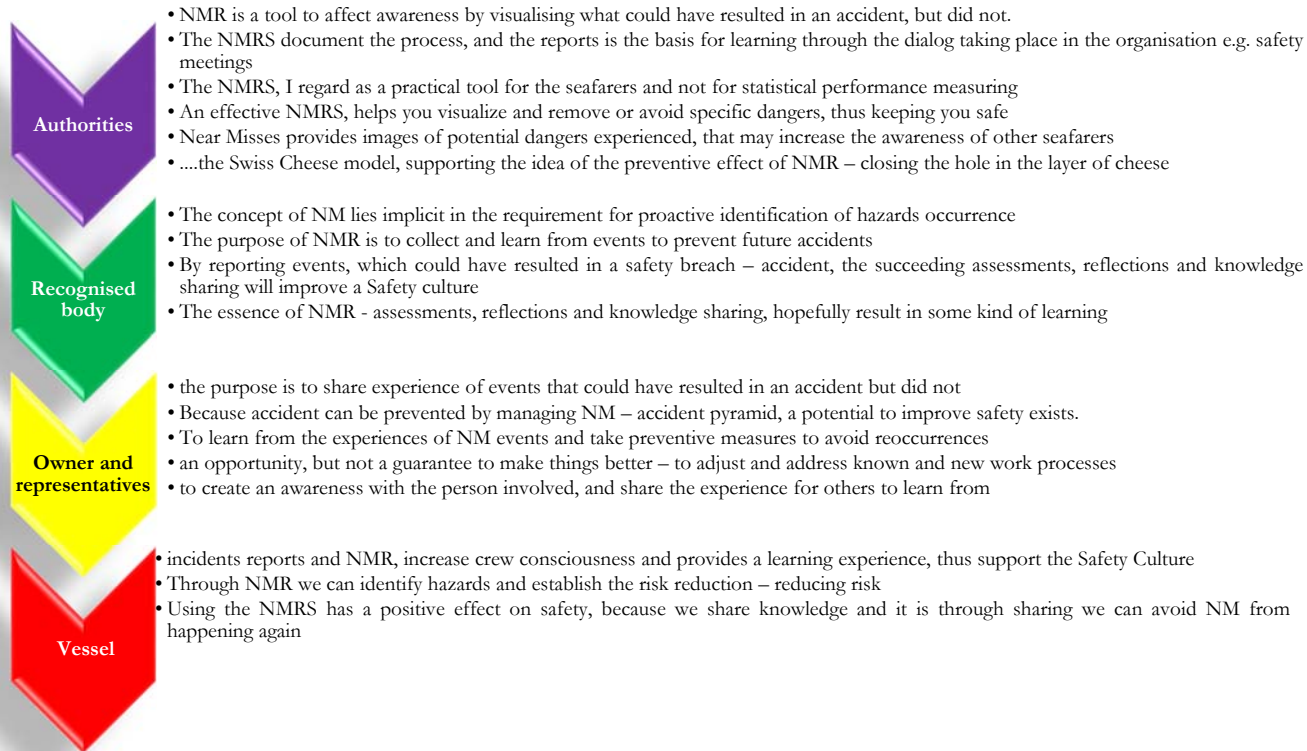


Figure 8: Chevron list by hierarchies - Why is near-miss in the code?

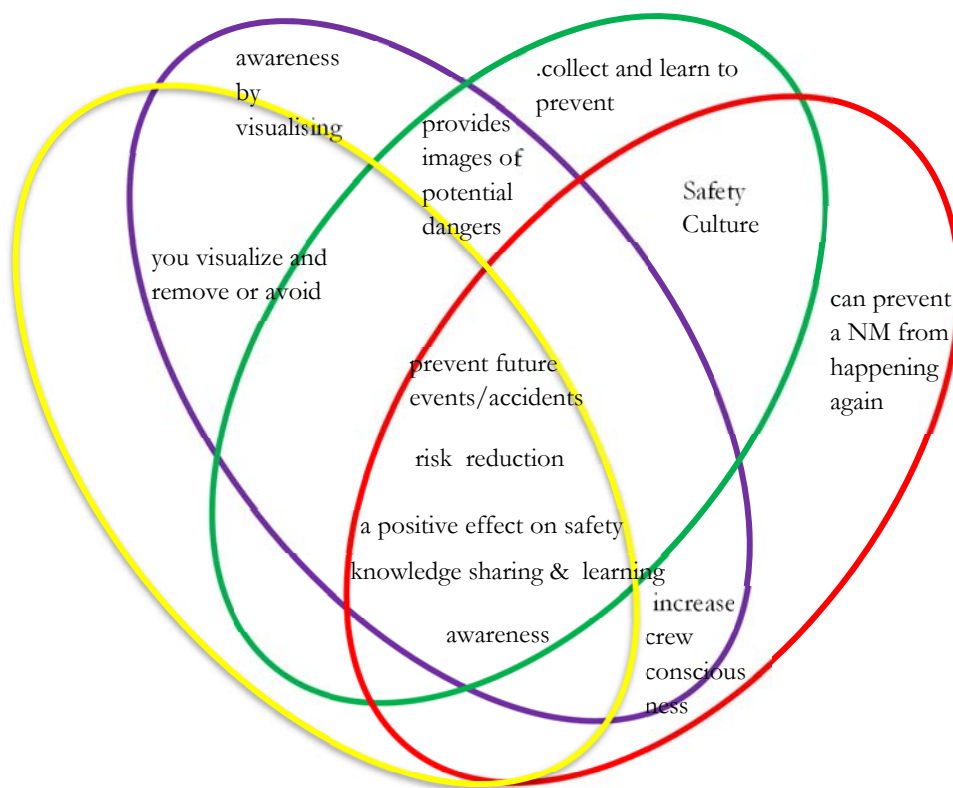


Figure 9: Venn Diagram by hierarchies – why near-miss is in the ISM, the general and unique?

Administration

Interviewing the Maritime Administration several notions of why near-miss is part of the Code surface.

The word ‘awareness’ was recurrent, emphasizing the effect of near-miss reporting. The perception that a near-miss provides a ‘visualization’ (Respondent G) of dangers, which increases the awareness of the seafarers is shared within the hierarchy of Recognized bodies and Owners. The importance of awareness is noted in another interviews with a Master whom state “near-miss reporting increases the consciousness of crew”.

Recognized Body

In the hierarchy of Recognized bodies, the purpose of near-miss is perceived as “a source of learning and to support proactive identification of hazards occurrences which may prevent accidents” (Respondent C).

Nevertheless, the effect of the learning was expressed as ‘dubious’ as it was recognized, that an accident is caused by many factors and that current investigation and analysis were not always sufficient to reveal these. It is noted that the Recognized bodies and the Owners representatives both perceive the purpose of near-miss “is to improve or support a Safety Culture”. Culture, which for one respondent (Respondent B) has become a buzz word in shipping and not really understood – “just and safety culture seems to be the answer to everything”. The statement indicates the notion of culture is everywhere and used to explain how we fail and succeed, similar to the Chernobyl Investigation report by International Atomic Energy Agency. The safety culture is not further elaborated but observed as a frequent applied terminology in most of the interviews.

Owner

Representing the Owner hierarchy, the accident pyramid was introduced by all four respondents as an argument as why near-miss exists. In favour of the near-miss one respondent stated “because accident can be prevented by managing near-miss – accident pyramid, a *potential* to improve safety exists (Respondent A). The handling of a near-miss was expressed a precondition for future success, in which the identification of the ones with the greatest potential – consequence was prioritized. This interview revealed a belief in the pyramid and that the identification of near-miss with the highest potential was applied practice to promote safety. In the Guideline (IMO,2014), we find a similarity in which: “potential ‘severity and likelihood’ of a near-miss event is to be identified and in-depth investigation is to be conducted of those near-miss which are likely to recur and/or which could have severe consequences” (4.2).

Another Owner articulated for the classic safety belief “from the accident pyramid a correlation and causation exist between near-miss and accidents and by focusing and removing the unsafe conditions/acts and near-miss, can affect the risk of an accident – but this I cannot prove” (Respondent B). Notable with this respondent was an interest and knowledge in accident models – sequence event, epidemiological and systemic models, which create a conflict in what to believe and how to explain the purpose of near-miss.

A third Owner was more determined and critical towards the argument that near-miss ‘prevents’. The *possibility* of preventions was perceived as follow “A near-miss event is unpredictable and infinite, why the near-miss provide an opportunity to gain a better understanding of factors that can affect our processes. However, managing near-miss events by the number, I do not believe will prevent an accident as the Accident Pyramid indicate, but I can’t prove this (Respondent H). Axioms like ‘potential’, ‘possible’, ‘can’, ‘may’ and ‘not always’ used by the respondents claim no certainty of the effect of near-miss - of a causality between near-miss and accidents.

Another perception was very concise. The intended purpose of near-miss is “to create an awareness with the person involved and share the experience for others to learn from” (Respondent I). The respondent was very reflective and critical, and did not believe the current near-miss reporting system would further promote safety, wherefore an alternative was required - a fine tuning safety as a counter force to the existing practice emerges when introducing ‘positive reporting’ and ‘best practices reporting’ and discarding KPI’s for near-miss reporting.

Master

The Masters perceptions support the view that through near-miss, prevention of accidents are possible because of causality between a near-miss and an accident;

“through near-miss reporting hazards can be identified and measures taken to reduce risk”

“we have near-miss reporting in order for us to avoid near-miss from happening again”

“we share knowledge and it is through sharing we can avoid near-miss from happening again”

(Respondent F/G)

Thus, avoiding or reducing the risk of near-miss events from recurring summarize the view that near-miss reporting system has a positive effect on safety.

The Master, who perceived being safe is about following the company procedures and guidelines elaborated on the purpose of the near-miss as “an indication of not being safe” (Respondent G). This view, quantifying safety is in contrast to the other Master whom perceived the purpose as “not about compliance (Respondent F) but about the quality of the near-miss events reported.

Revisiting the Venn diagram three general understandings across the hierarchies appears.

- First. The near-miss events are perceived as a “risk reduction measures which can prevent future accidents”. From the answers we note the respondent’s choice of wording i.e. can, that acknowledge an uncertainty in the effect of near-miss - there is no guarantee for prevention.

- Second. The risk reduction measures are believed supported through the sharing of near-miss experiences. It is the sharing of the knowledge attained in the reports, that includes investigation and/or analysis, which may have an [positive] effect on safety.
- Finally, a secondary effect on safety is perceived through an improved awareness.

It is noted how these understandings overlap and reflect the objectives and intentions stipulated in the ISM code. However, neither the respondents nor the ISM code describes the nature of (safety) awareness – what is it (- foresight or hindsight)?

4.1.4. Narrative: How can we learn from near-misses

Code & Guideline

The Guidance on near-miss reporting (IMO, 2014) elaborates how the reporting and the near-miss investigation provides an opportunity to improve the safety management system “learning the lessons from the near-misses should help to improve safety performance since near-misses can share the same underlying causes as losses” (p.67)

Further, identifying the likelihood of a recurrence of the chain of events and/or the conditions that led to the near-miss, supports this endeavour. Learning is achieved through the investigation that identifies; concerns, recommendations and corrective actions. In other words, both understanding, and action are required. Continuing. How we learn and reach the ultimate objective of near-miss - avoiding future losses requires, the Code summarize; “that reports are to be generated, shared, read, and acted upon. Companies are encouraged to consider whether their report should be disseminated to a wider audience” (p.69-71).

The [learning] process above is partly recognized in the first loop in the learning cycle for incidents by Jacobsson and Akselsson (2012) as well as Drupsteen et.al (2014) ‘review of process steps on learning from incidents’, which have been conveyed previously in this research.

My data

In the Venn diagram, in the intersection of Administration, Owner and Masters we find a shared perception how we learn from near-miss. Learning is the outcome of reflection, dialogue and discussion facilitated by the Master on-board e.g. safety meetings. This understanding emphasises and favours the importance of a process on-board – the dialogue preceding ahead of the outcome of an event – the product in form of a report.

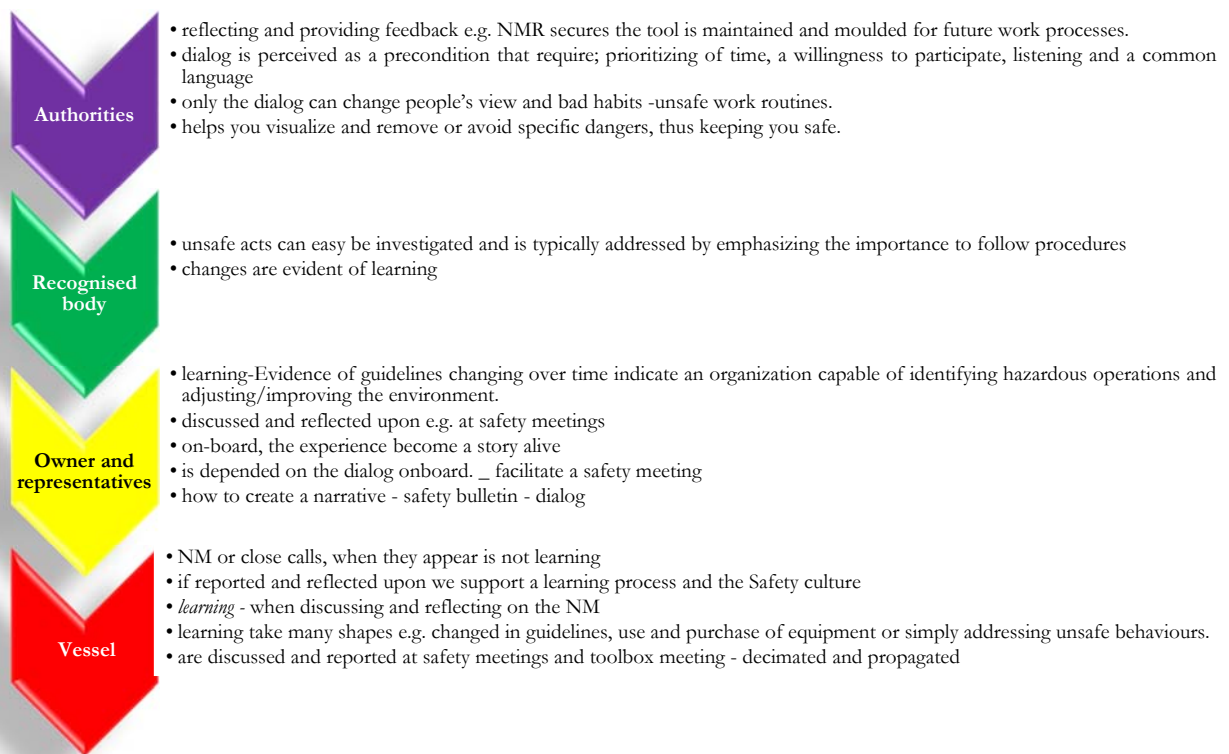


Figure 10:Chevron list by hierarchies - how can we learn from near-miss?

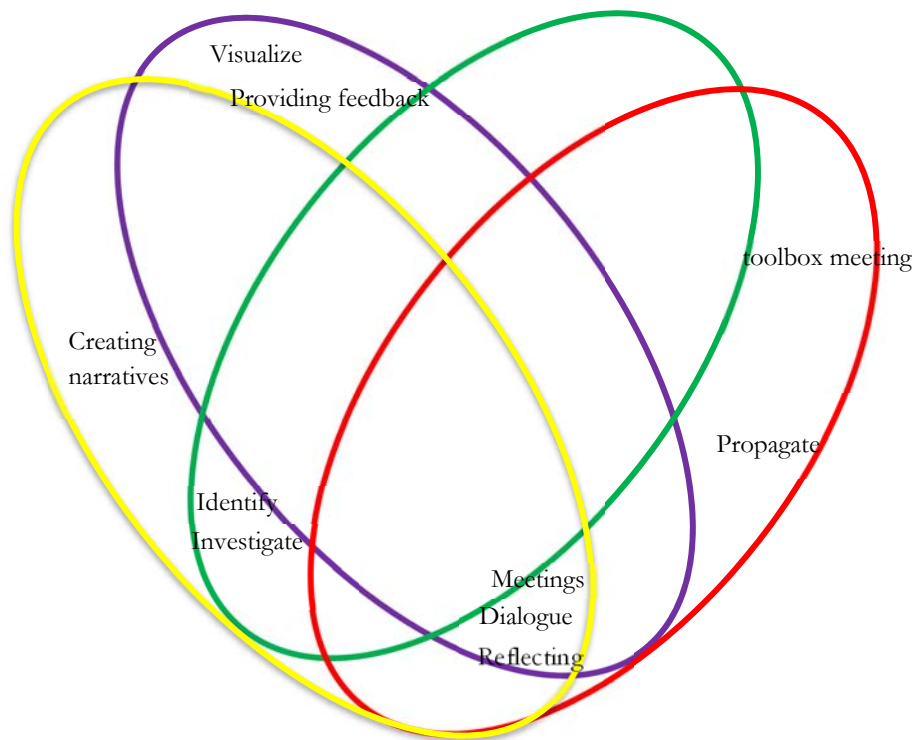


Figure 11: Venn diagram by hierarchies- how do we learn from near-miss the general and unique?

Administration

With the Administration, learning is thought by visualization³⁷ of the near-miss in which “the lived experiences (knowledge) can be shared for others to adjust or increase their awareness for the unforeseen” (Respondent J). Based on the investigation and analytic of the event, the distributed report(s) support such a visualization when discussed on-board. For the learning to succeed a number of preconditions are mentioned; “quality of the near-miss, prioritizing of time, a willingness to participate, listening and a

³⁷ Visualization meaning; being able to recognize an event in an context and create a mental picture.

common language” (Respondent J). These [four] preconditions can be viewed in two perspectives. First. The individual’s abilities – willingness, listening and lingual skills. Second. Company resources made available – time to investigate and reflect and discuss.

Recognized body

The Recognized bodies perceived the near-miss investigation process – the ability to identify root causes as important for learning. Not mention the on-board processes – meetings and dialogue does not mean the dialogue at the safety meetings are not recognized, just not perceived that important.

Owner

Within the Owners, there is a general understanding of learning taking place on-board when near-miss are discussed during safety meetings. However, the effect of the learning from near-miss events is dependent on understanding the context in which the near-miss was observed.

The real potential of successful learning is, however within the crew having the lived experience of the near-miss as only they understand the whole - context, which typically is omitted in near-miss reporting system. On-board, the experience become a story alive (Respondent A).

The respondent, perceived the SMS as “intended to support safety in way of organisational learning” (Respondent A). Meaning, the reporting and propagation of near-miss events increased the learning in the entire organisation – ship and shore.

Master

The Captains perceptions on how we learn is similar to the other hierarchies it is about the discussion on-board; “On-board, near-miss events are observed and discussed....discuss the importance of being aware” (Respondent G), and “learning takes place on-board when discussion and reflecting near-miss reports” (Respondent F).

One of the objectives of the Code is to support continuous improvement which require learning. The Code promotes the notion that learning from near-miss events is possible if reports are generate,

shared, read and acted upon, nonetheless what constitute learning is opaque. My respondents perceive the dialogue on-board as essential and with the Authorities, four preconditions for learning are mentioned.

Reflection on my literature review (p. 24) about learning in which fundamental principles and the notion of individual, groups and organizations are addressed, the data explicated in this sub chapter suggest a less advanced understanding of learning in shipping, which may be jeopardizing the objective of improvements.

4.1.5. Narrative: What do we learn from near-miss?

Code & Guideline

The IMO Guideline (IMO, 2014) describes the near-miss investigation process and what can be learned as follow:

At this point the who, what, where, why, and when of the near-miss is understood, and *the human errors, structural/machinery/equipment/outfitting problems, and external factors* that led to the near-miss, have been identified. (p.70)

What is perceived as the learning, [though this word is not used in the guidelines, except as lessons learned], is the developed and implemented recommendations:

Any recommendations made needs to address all of the identified causal factors to improve organizational and shipboard polices, practices and procedures. Implementing appropriate recommendations is the key to eliminating or reducing the potential for reoccurrences of similar near-misses or more serious losses. (p.70)

Above supports the goal in the functional requirements' for the safety management system, to continuous develop, implement and maintain the system, as stipulated in the Code (p.15) and Guideline MSC-PEPC.7/Circ.8 (Ch. 6.2).

The potential learning [the output] can be captured by the notion of behaviour, material and external factors, all of which to be governed by the safety management system. The behaviour addresses the errors identified and includes unsafe practices. The material relates to physical design – structures,

machinery and artefacts incl. software. Finally. External factors, which are not tangible or out of control, reach or power of the organisation responsible for the system e.g. a freak wave.

My data

Assuming we can learn from or about near-miss events, the question is how it contribute to safety – what do we learn? In the Chevron diagram relevant statement in the four hierarchies are displayed and in the Venn diagram an overview of the unique and general meanings is shown.

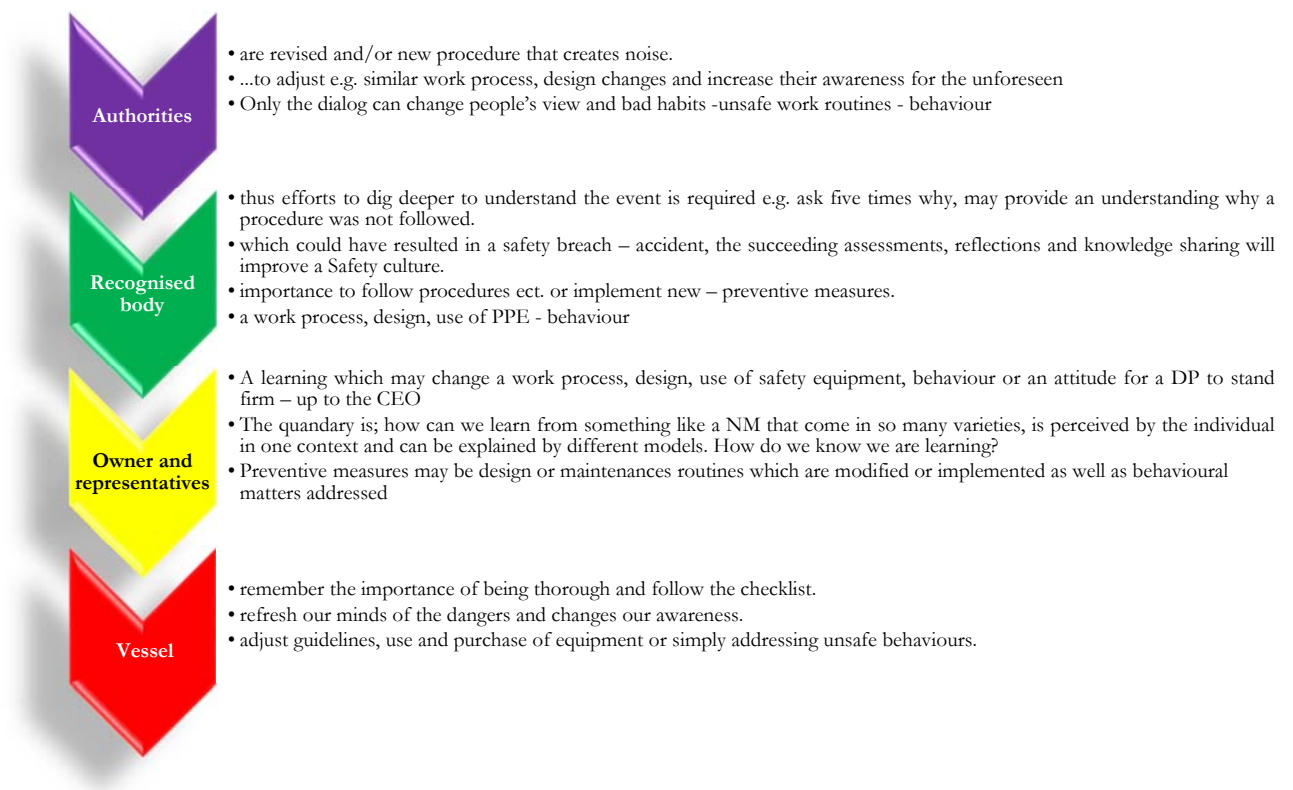


Figure 12: Chevron list by hierarchies - what can we learn from near-miss?

Within the four hierarchies, a number of general perceptions on what can be learned appears - Venn diagram.

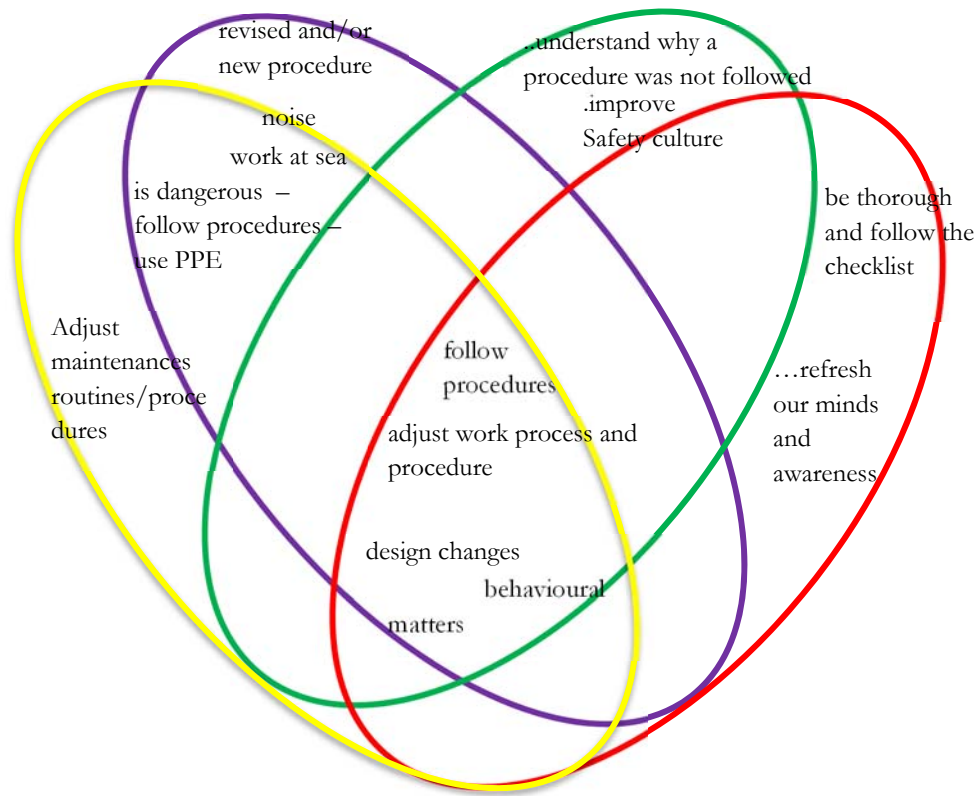


Figure 13: Venn diagram by hierarchies-perceptions of what is learned - general and unique?

Administration

Within the Administration what can be learned is perceived as adjustments of the management system - guidelines procedure and design or unsafe behaviour. “...to adjust e.g. similar work process, design changes and increase their awareness for the unforeseen” (Respondent J).

While this is in line with the objective of ISM code, the same Administration is somehow critical for some practices and the effect of the proclaimed learning. A perception that some near-miss systems are counterproductive and [instead] creates noise. “The outcome of many near-miss, are revised and/or new procedure that creates noise” (Respondent E). The critique – noise, is to be understood in the context of communiques, related work processes, which changes to rapidly, are becoming too described and controlling thereby restricting the seafarer.

Predominant are the near-miss reporting concluding on ‘unacceptable’ or ‘dangerous behavioural’ patterns which are typically labelled as “bad habits and unsafe work routines” (Respondent E). While none of the respondents in this research could account for the origin of the notion bad habits and being unsafe, we find a possible genesis in the introduction to this narrative (Code); “At this point the who, what, where, why, and when of the near-miss is understood, and the *human errors*.....have been identified.” (p.70)

These events [human errors] are registered by numbers which is in line with the Code that recommends safety trends to be discerned and acted upon, and campaigns and culture programs are initiated trying to affect these behaviours - human error.

Recognized body

A shared perception of what can be learned e.g. work process, design and behaviour, exists among Authorities and Recognized bodies; “assessments, reflections and knowledge sharing, hopefully result in some kind of learning. A learning which may *change*; a work process, design, use of safety equipment, behaviour” (Respondent D), “by emphasizing the importance to follow procedures etc. or *implement new*-preventive measures” (Respondent C).

An example of a near-miss that had reveal a design solution endangering the seafarer was *told* - ‘how an automatic closure of fire damper to the engine room could kill a person if standing to close’³⁸. Consequently, a redesign or reconfiguration was implemented.

The shared perception is not surprising as both hierarchies conduct ISM audits and assess the effectiveness – through objective evidence, of the implemented systems (Guideline on implementation by administration A1071(28) p.48). In other words, the audit *fulfil* the purpose of verifying the existence of a process (not the quality), supporting continuous improvement for which a SMS certificate is issued.

³⁸ Quote from the interview of respondent © – from a NMR that made an impression on the respondent

Continuing one respondent (Respondent D) perceived the near-miss reporting to “improve the safety culture” (Respondent D). What constitutes a safety culture was not elaborated and within the Guideline to near-miss reporting the notion of safety culture is not mentioned. However, as the near-miss is a part of the ISM code and the very application of the Code is by IMO perceived to support and encourage the development of a safety culture the origin of this statement seems plausible.

Notable is the following quote that illustrates a concern of near-miss events analysis being superficial:

Today most analysis are superficial – they simply point at the seafarer. Efforts to dig deeper to understand the event is required e.g. ask five times why. This may provide an understanding why a procedure was not followed (Respondent C).

The perceived concern is that sharp-end practitioners remains the centre of attention – to be blamed, and yet we do not understand the reason for the non-compliance or violation of procedures – the SMS. Recalling the Objective in the Code, ‘to improve the system’, this statement indicate that the current ability to attain knowledge and implement corrective measures is not effective.

Owner

Within the Owners hierarchy the perception of what can be learned is similar to what has previously been mentioned – improve the understanding of work processes and adjust or implement procedures accordingly:

“Preventive measures may be design or maintenances routines which are *modified or implemented* as well as behavioural matters addressed” (B).

“to *adjust and address* known and new work processes which for some reason had not been accounted for” (Respondent B).

“a near-miss event may lead to adjustments of control measures i.e. the SMS’s checklists, descriptions or procedures” (Respondent I).

“can *affect* the behaviour and awareness, and improve the understanding of the work process” (Respondent H).

“near-miss reporting *provide* an opportunity to gain a *better understanding* of factors that can affect our processes.” (Respondent H).

In addition, to the adjustments of the SMS as described above, near-miss reporting are also perceived as a system to identify behaviour ‘not compliant’ e.g. “PPE not used by ratings on-boards” or “work permit systems not applied in work processes” (Respondent H). As previously noted the guideline do not mention categorise of near-miss e.g. human error, this is endorsed by managers, thereby enforcing a classic perception of safety in which near-miss can affect behaviour towards compliance. This practice and understanding of what contribute to the ‘continuous improvement’ is eventually the process that the statutory auditors verify.

Master

With the Masters, the perceived learning potential is in line with the other *hierarchies*; “The learning take many shapes e.g. changed in guidelines, use and purchase of equipment or simply addressing unsafe behaviours” (Respondent F) and “Most near-miss concern equipment e.g. technical issues or personal protection equipment, thus help us to remember the importance of being thorough and follow the checklist (Respondent G).

On-board, where most implementations and adjustments are direct towards, one Master highlight the importance of being able to change your behaviour else you have not learned anything: “The near-miss reporting it-self make no different, it is how we respond” (Respondent F).

This statement addresses an important notion of what learning is and discard the idea of quantity of near-miss and pleasing third parties. The tools for gathering information and analysing the what, how, and why of near-miss events and the dialogue following are but means to the desired ends - learning. If no one behaves differently, learning has not occurred.

Summarizing. What is perceived to be the learning outcome of the near-miss can be captured to.

First. Humans do not comply with safety prescription and rules e.g. “PPE not used by ratings on-boards” or “work permit systems not applied in work processes”. Most frequent the subsequent analysis concluded “that existing procedures were not followed”. The likely outcome of the analysis – learning, would be a reference to ‘existing procedures and guidelines’, and emphasizing the importance to comply with the SMS

Second. Work processes included (described) in the SMS do not account for the context in which life is lived and experience by the sharp-end operator (IMO, 2014). New knowledge and insight would be amended in the SMS system, thereby enrichen and support safer work processes.

Third. A near-miss can reveal a design solution endangering the seafarer e.g. how an automatic closure of fire damper to the engine room could kill a person if standing to close (Respondent C). Consequently, a redesign or reconfiguration is implemented.

Finally, from the near-miss, unacceptable or dangerous behavioural patterns or characteristics emerges, known as “bad habits and unsafe work routines”. These events are typically registered by numbers, and campaigns and culture programs are initiated trying to affect these behaviours.

Succeeding, the respondents were given a subsidiary ‘killer’ question “how do we know we have learnt”? This question surprised the respondents and only a few perceptions were shared.

One perception was related to the adjustments of the SMS system: “Evidence of guidelines changing over time indicate an organization capable of identifying hazardous operations and adjusting/improving the environment” (Respondent B).

The argument that the number of changes [revisions] in a SMS system expressed a ‘de facto’ learning, says nothing about the effect – quality or the dialogue on-board and if behaviour has changed.

Another perception was that the decrease in accidents was a clear evident of learning taking place – “how else would we explain it?” (Respondent G).

Both perceptions support the notion of objective evidence³⁹ which is a tool for auditors to assess as to the effective implementation of the SMS.

4.2. Emerging themes from the interviews

From the data - the themes as presented in the appendices, two notions re-emerged. In the following, I will present the following narratives;

- Owning and being responsible for safety
- KPI for near-miss events
- The value rationale on the near-miss concept - phronetic

4.2.1. Narrative: Owning and being responsible for safety?

Code & Guideline

Revisiting the Code Part A, the responsibility and authority are addressed for both the Company and the Master:

the Company means the owner of the ship or any other organization....., who has assumed the responsibility for the operation of the ship from the Owner and who, on assuming such responsibility, has agreed to take over all duties and responsibilities imposed by the Code (p. 13).

The Code imposes upon the Company to define responsibility, authority and interrelations of all personnel involved with the SMS and basically for the development and maintenance of the SMS among other things e.g. resources and personnel. In other words, the SMS is the responsibility of the Company and within they define the Master's responsibility and authority (p.16) as well as various tasks assigned to qualified personnel (p.18).

³⁹ The ISM Code definition of Objective evidence is "quantitative or qualitative information, records or statements of fact pertaining to safety or to the existence and implementation of an SMS element, which is based on observation, measurement and tests and which can be verified" (Code, p.13)

My data

Ship Owners

A notable perception of “ownership and empowerment” emerged from the hierarchy of Owners – ship managers. Pre the ISM code, the Master was entrusted to conduct a safe passage, and company requirements, descriptions and procedures were limited. The following statements illustrates a perceived ‘reality’, where the traditionally understanding of the Captain being highest authority and empowered seems to be an illusion:

“the ownership and responsibility have drifted into the shore organisation, leaving the crew with the feeling of disempowerment”. (Respondent A).

“as the code supports a centralized control meaning the expertise is located ashore and not on-board” (Respondent H).

“companies has not only taken the lead, but the control and dictate the operation of the vessel”. (Respondent I).

“When Companies try to capture expertise on paper, thereby refraining the crews professional pride and opportunity to navigate within their field of expertise, ownership and authority fade” (Respondent H).

“a seafarer is today perceived as a commodity, which easily can be replaced as long as you have a good SMS” (Respondent H).

“Today, the shore dictate the operation of the vessel” (Respondent I).

“Shipping is in a position, where the Company is regarded as the overall responsible and accountable, and a culture and attitude of CYA exist” (Respondent H).

What makes these perceptions of interest, is the expressed concern in how the safety management system has affected the operation of ships. By centralizing, disempowering, replaceable, dictating, commending work and a CYA attitude, a cage of bureaucracy surface.

Post the ISM code, the Master is guided (controlled) by a SMS system and by law still has the overriding authority, though this is perceived less enforced:

Ship managers are constantly consulted by the Masters for; instruction, guidance or approval, on matters in which the Master is supposed to be the professional e.g. route deviating due to low pressures (Respondent E).

Making this practically possible is the “use of technology - communication channels” (Respondent A). Like a ‘mirror’, the technology provides a way; to reflect life as lived and affect the life on-board by monitoring, controlling and advising. We may think and claim that the true experts are on-board, nevertheless the ‘mirror’ “live and feed the SMS with work descriptions, rules and view of compliance, which lead to disempowerment” (Respondent I). The very disempowerment is perceived as a concern that require attention; “we are left with the huge challenge of empowering the fleet again, or at least creating an equilibrium of power, which I believe was the intention in the Code (Respondent I).

Authorities

In relation to the near-miss the concern of dis-empowerment of seafarers are shared by the Administration, stating “today, the near-miss, as a process, is owned by the shore management, distant from the experts on-board. The future should host a shared ownership and responsibilities of the process in which seafarers are empowered not only to report, but to deal with the experience” (Respondent J).

The experiences and perceptions listed, reach far further than the research question. Nevertheless, we should ask if the drift or shared ownership and responsibility are something we should embrace rather than fear? Embrace, as technology changes our; work processes, monitoring and adjusting possibilities

(semi-autonomous vessels) making transport by sea safer than ever, or fear because what for centuries have proven right and represent the industry practice we have experienced is about to fall.

4.2.2. Narrative: KPI for near-miss events

ISM

Scrutinizing the ISM code and guidelines the notion of effectiveness is recurrent in various contexts e.g. effective in way of implementation, enhancing the effectiveness of operations and procedures.

The continuous strive to improve the system is verified during internal and external audits in which the system is assessed based on objective evidence as to its effective implementation. Within the notion of objective evidence is qualitative and quantitative information that is based on observations, measurement or test which can be verified. (IMO, 2014, p.13) As such measuring parameters of a system that is intended to promote safety is a core feedback function in the Code. And as previously mentioned the registration of near-miss and analysis trends represents this.

My data

In all the interviews the quantity of near-miss as a “KPI” emerged with criticism. The argument that “a KPI for near-miss indicate a safety level on-board” is perceived as an illusion or a deception, which the statements in the Chevron and Venn diagram displays. Owner’s and Captain’s argue that a KPI do not promote Safety because “it does not reveal the learning from the near-miss nor how the seafarer responded”, or as the Administration elaborated “The outcome of many near-miss, are revised or new procedure that creates noise”.

Common for this view is a perception that safety cannot be predicted or prevented by a defined monthly KPI for near-miss. Alternatively, without KPI’s would any near-miss events be reported and what effect would it have on learning?

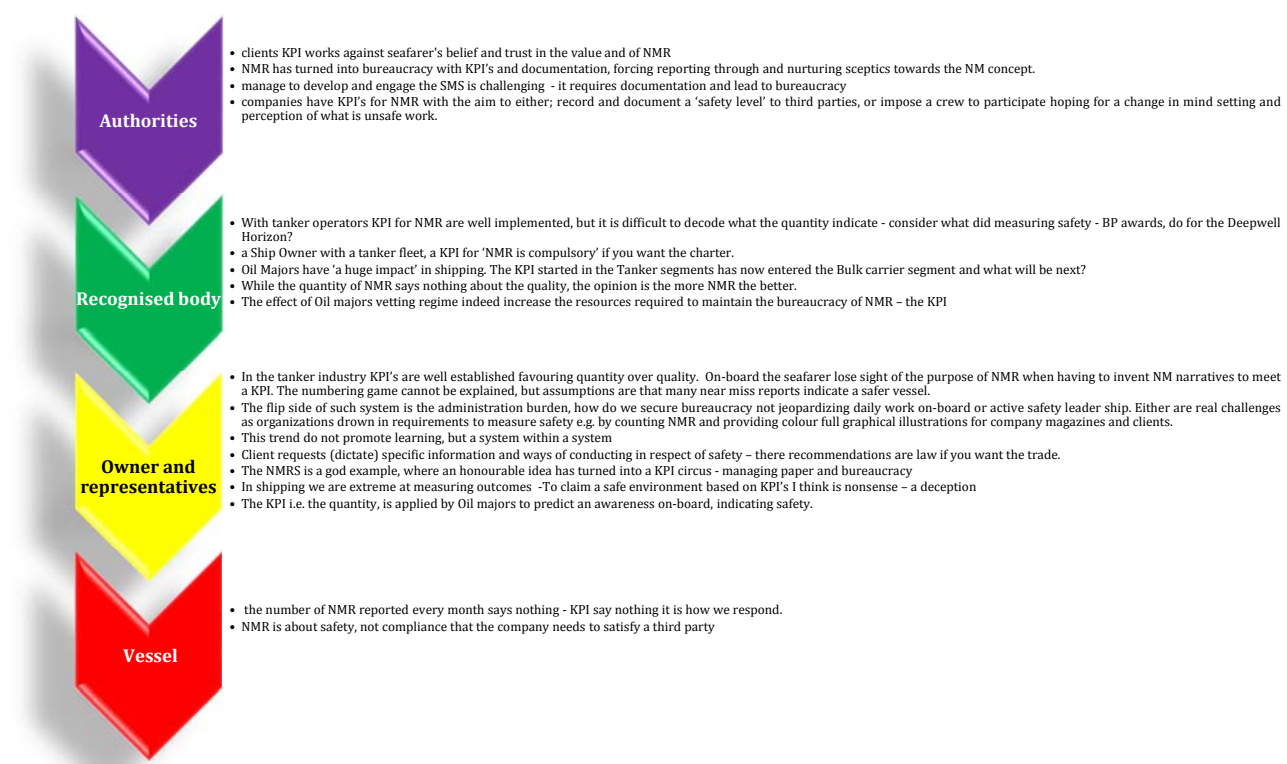


Figure 14: Chevron list by hierarchies - KPI for near-miss

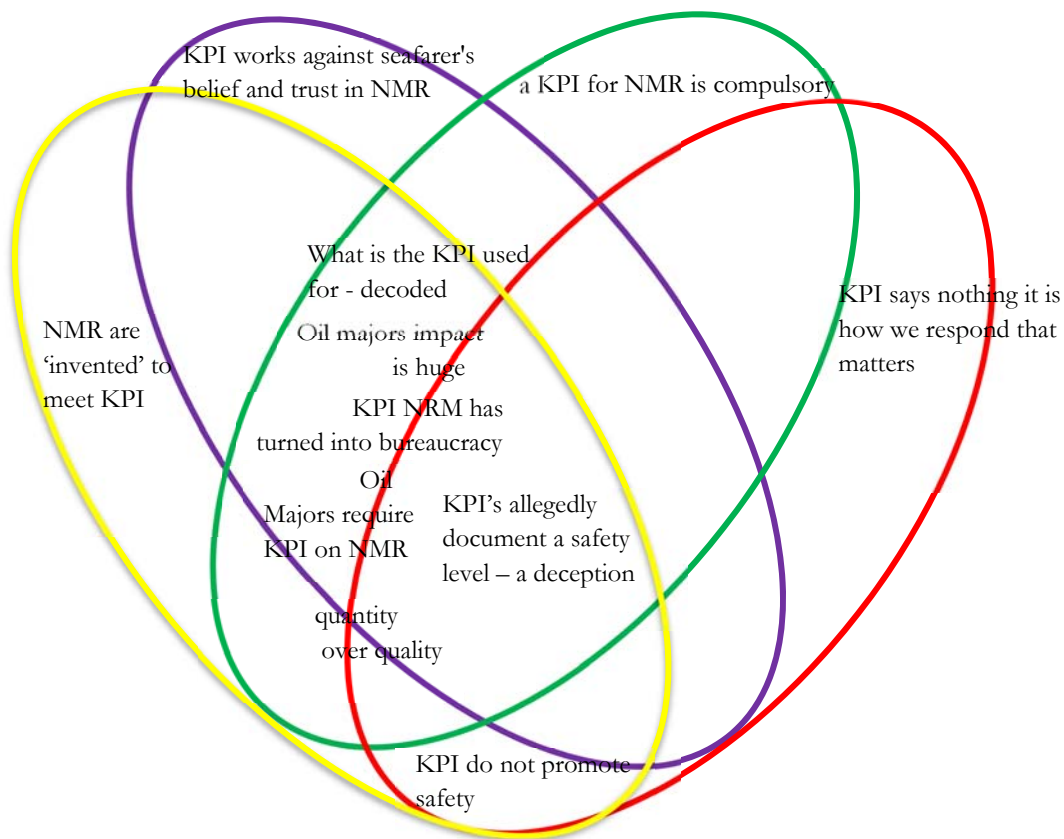


Figure 15: Venn diagram by hierarchies- Rituals and KPI's, the general and unique?

Mutual for the Owner, Recognized body and Administration, was a scepticism towards; the effect of KPI – bureaucracy. How KPI's were used and the impact oil majors had on safety in shipping, which is illustrated below;

Documenting compliance with oil major's requirements is overwhelming, but if you want the charter you have to. The near-miss is a god example, where an honourable idea has turned into a KPI circus - managing paper and bureaucracy (Respondent A).

From the shore, clients' monitor ship managers and vessels performances and require 'data' documenting safety. The KPI is applied by Oil majors to predict an awareness on-board, indicating safety (Respondent I).

In the tanker segment you are under the governance of oil majors vetting regime. The client request and 'dictate' specific information and ways of conducting in respect of safety – there recommendations are law if you want the trade (Respondent A).

The oil majors are keen to get every bit on paper – the descriptions, almost like they are trying to capture common sense with the pen and expect experience can be read. In this turmoil of a trade, constant requirements are imposed and suddenly Oil majors dictate safety" (Respondent A).

The data express respondents who perceive the KPI of significant importance and a pre-condition for oil majors to accept Owners tonnage. In a previous narrative, we noted the difficulties in recognizing a Near-miss and how sub categories of near-miss had developed, but the origin could not be account for.

As oil majors have not been part of this research we do not know; if Owners tonnage actually has been turned down in the past due to 'deviations' in KPIs, what the KPI express and if the subcategorize are recognised by oil majors.

Nevertheless, the managers interviewed maintain critical about managing safety, i.e. near-miss KPI and subsequent reporting and documentation in administration systems – bureaucracy. Regardless a trade-

off is recognized by Managers, whom seems to have given-in “we do not believe the current near-miss will further promote safety, unfortunately, terminating it would be a commercial suicide” (Respondent I).

Disempowerment of crew and drift of ownership towards the ship manager have previously been noted, but is it further progressing towards the clients – oil majors and is future safety being shared by the many? What is the forecast for owning safety and what mechanisms acts below the surface – how has the power to dictate safety and safe operation?

4.2.3. Narrative: The value rationale on the near-miss concept

The closing session with the respondent were conducted in a pure epistemic assertive style in which the value rationale on the near-miss concept was questioned and reflected⁴⁰ on. Meaning; Where are we going, Why is this desirable, What should be done?

In the Chevron list, selected statements are listed and in the Venn diagram the variation across the hierarchies are shown.

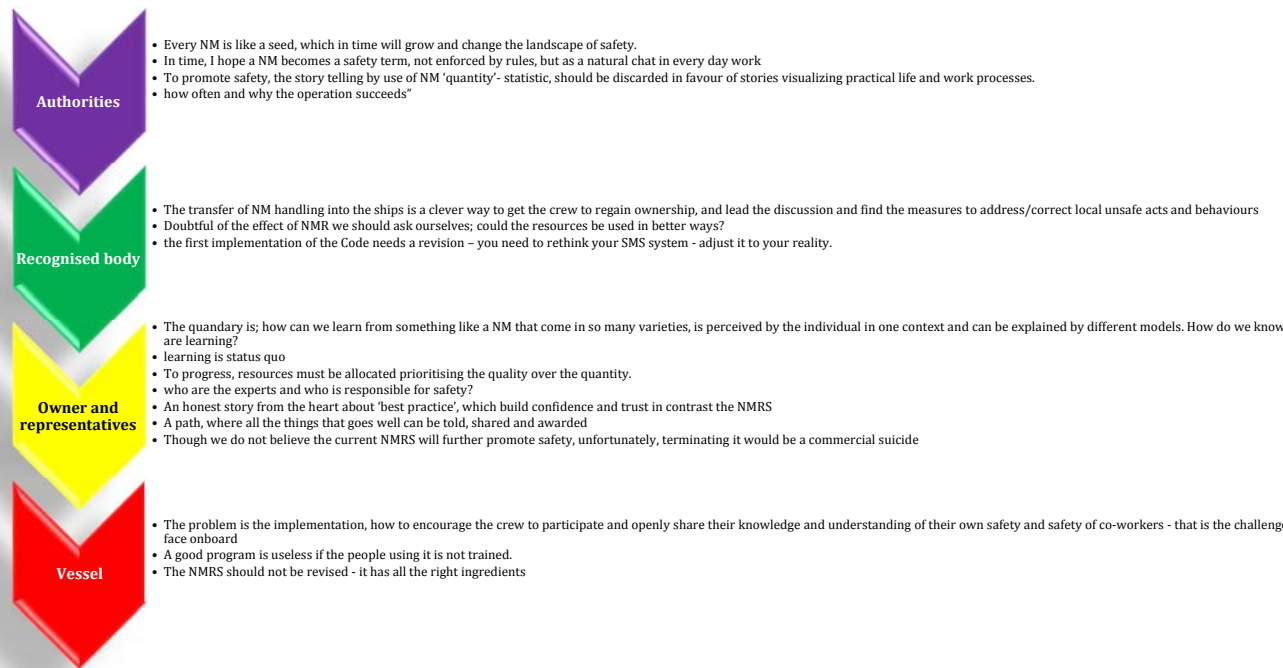


Figure 16:Chevron list by hierarchies - Reflections on the near-miss – value rationale?

⁴⁰ Presenting the value rationale question at the end of the interview in which respondents have found it challenging accounting for the purpose and logic behind the preventive effect of NM reports, is at the risk of a predisposition -a bias against the existing.

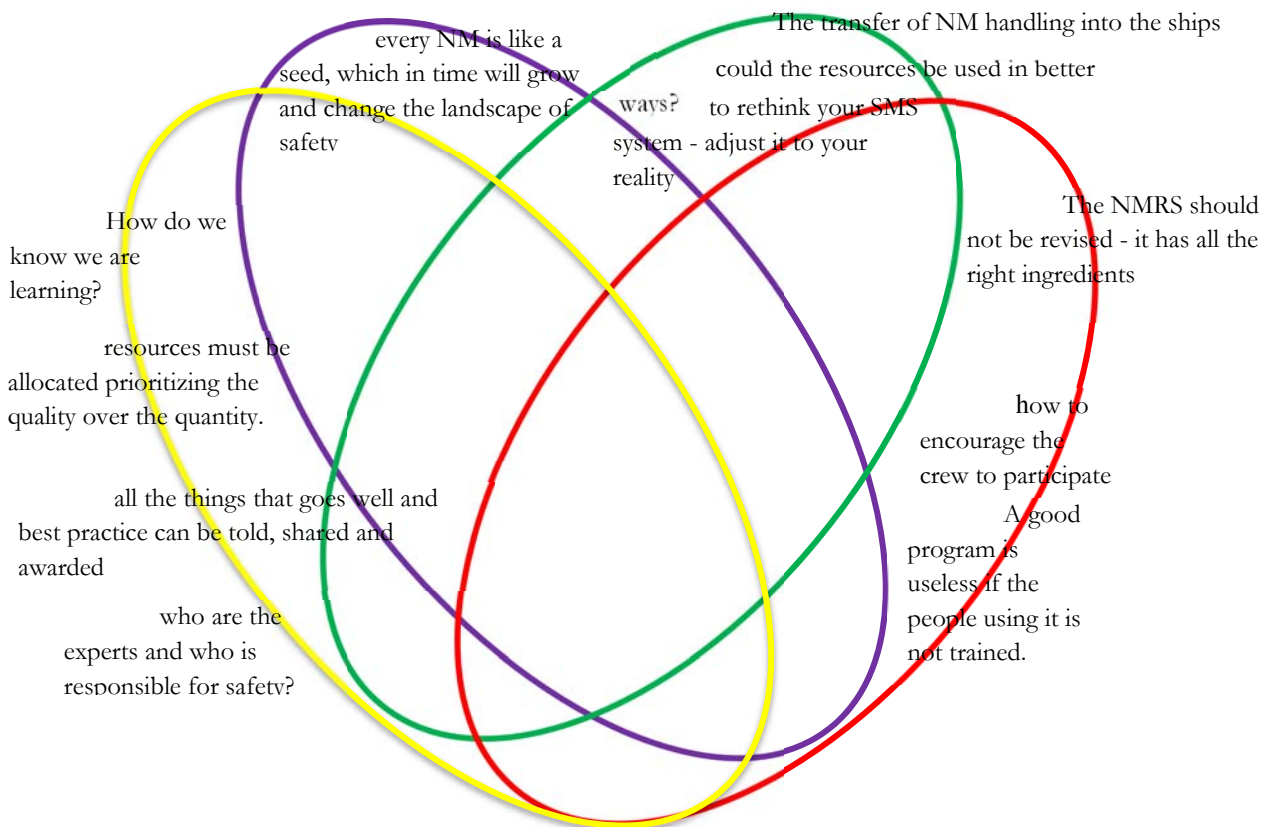


Figure 17: Venn diagram by hierarchies- Reflection Value rational on the near-miss- general and unique?

Administration

The reflection of the Administration finds the future of Near-miss as desirable as it supports “awareness”, though minor adjustments as needed. It is believed that the quality of the near-miss investigation needs to be more thorough – quality by depth of investigations and empowerment of crew required.

First. The notion of quality by depth of investigation remains somehow opaque. Nevertheless, a key to promote safety, narrative of by numbers – statistic should be discarded in favour of stories visualizing practical life and work processes. In contrast to how safety is perceived by all respondents – nothing goes wrong, one auditor requested that the investigations of near-miss events should include a more nuanced view – “how often and why the operation succeeds” (Respondent J). Whereas the Code support the classic safety view of control and managing humans and their behaviour, this reflection

indicates a more progressive approach to safety that in safety science is known as e.g. ‘Safety II’ and ‘Resilience’ by authors like Hollnagel, Woods, Dekker.

Second. Both respondents emphasise the need to involve and empower the crew in the handling of the near-miss events:

The current arrangement, where seafarers only report, but are not empowered to process the near-miss event is not desirable, wherefore the future should host a shared ownership and responsibilities in which the quality of near-miss should favoured work as done (Respondent E).

The respondent perceives experience that the near-miss, as a process, is owned by the shore management, distant from the experts on-board and that the future should host a shared ownership and responsibilities of the process in which seafarers are empowered not only to report, but to deal with the experience (Respondent J).

These perceptions not only address reflections on the near-miss concept, but reaches much further into uncharted waters of how ownership and responsibility is divided and/or observed to have drifted, as a consequence of the implementation of the management system itself. In the lens of progressive safety an argument is that the phenomena of drifting ownership and responsibilities is a result of interactions evolving relationships within the system – a feature of the system.

Recognized body

The Recognized bodies, whom certify the SMS, recognize that not all what is implemented as a part of the Code support safety. It is experienced that many of the initial SMS systems that was created with the assistance of consultants has not developed. Early SMS systems implemented do not match the lived experience of a vessel operation today, wherefore adjustments are needed. As one respondent phrased it “.. you need to rethink your system, adjust it to your reality” (Respondent D). Whereas the ship managers in the tanker ship segments adjust their SMS systems, partly to accommodate Oil majors, in other ship segments the SMS system is merely kept alive – to comply.

Within the SMS system, a negative perception surrounding a near-miss events lead one auditor in doubt and question the effect of near-miss on safety “if it is worth it - could resources be used in better ways?” (Respondent C). He perceived that the near-miss concept had turned into a buzzword in shipping, that everybody talks about it, and where quantity out weight quality and that the life of the near-miss is dictated by the oil majors. Within the tanker segment the respondent perceived this at the risk of ‘seafarers losing sight and sinks into a ‘bureaucracy’ only they experience” (Respondent C).

An interesting observation shared, was that some ship managers had tried to change the process in which the many near-miss events categorized as ‘unsafe act’ where handled. From being analysed or investigated ashore by the ship manager, these events were now transferred for handling by the ship. It is not known if the Captains embraced this adjustment of the system and perceived being either; empowered taken ownership and lead the discussion and find the measures to address/correct local unsafe acts and behaviours, or loaded with more work - layer of bureaucracy. What has initiated the change - thoroughness or effectiveness, remains unanswered, but would be of interest to pursue and understand how it affect safety.

Owner

With the Owners, some fundamental questions about the effect of the near-miss concept emerged. First. How can you learn from something like a near-miss?

An event that come in so many varieties, is perceived by the individual in one context, and can be explained by different models. How do we know we are learning? (Respondent B).

The respondent, with insight in safety science, is really in doubt, nevertheless he perceives that learning is possible, but not advancing – “learning is status quo”. Another perception is that insufficient resources are allocated “prioritising the quantity of near-miss over quality”.

If we doubt learning from near-miss events are possible why should Owner allocate more resources to the process? The [goal] conflict(s) of quality vs. quantity, efficiency vs thoroughness are recurrent, and the Oil Majors, requesting the KPI’s, are perceived not as a partner, but as an authority

having powers directly affecting the revenue in a shipping company. Four statements illustrate different perceptive of concern:

In this turmoil of a trade, constant requirements are imposed and suddenly Oil majors dictate safety. This leaves the questions – who are the experts and who is responsible for safety? (Respondent A):

We have ended up in a gridlock we cannot escape – bounded by law and clients demands. Safety and risk are measured and controlled by numbers and statistics and left behind is the seafarers – their abilities and seamanship fading. Only through a de-bureaucracy process can we adjust for the deviation, but who dares to give that order (Respondent A).

Somehow we do not raise the question ‘for what the KPI is used or perceived (Respondent H).

Though we do not believe the current near-miss reporting system will further promote safety, unfortunately, terminating it would be a *commercial suicide* (Respondent I).

the near-miss concept has been exhausted by the history; the analogy of telling a bad story, blame and a lost belief in its value – creating safety (Respondent H).

Previously, the respondents have argued that dialogue is a key element for learning. Not entering in a dialogue with the Oil Majors thereby preventing an understanding of the rationality behind enforcing the KPI regime is peculiar. In the midst, another way of promoting safety illuminates:

To counter for the negative perceptions reporting of near-miss events, one Owner has promoted a supplement – positive reporting or best practice. As expressed; “An honest story from the heart about ‘best practice’, which build confidence and trust in contrast the near-miss (Respondent H)

The Owner had experienced positive feedback from the fleet with this approach where the seafarers awareness around the process and the knowledge applied in succeeding the goal to work safe, can be acknowledged.

This manager still has near-miss as part of the SMS system, but has discarded both the ‘sub categories for near-miss events and the KPI’s. Time will show how the Oil Majors respond to the “tuning of the SMS system” and if the KPI ritual is at its end.

Another interesting reflection surfaced - ‘ship to ship’ communication. It is acknowledged that Captains and chief engineers communicate [ad-hoc] across the fleet, though a practice not transparent and expressed as ‘under the Radar’. From the “value rational” discussion the respondent (I) suggested that promoting and supporting the inter-ship communication was an opportunity to further support knowledge sharing though the current extent and subjects of communication was opaque. It was further elaborated that such network should be autonomous: “perhaps we should have trust and encourage a self-developing knowledge sharing network not monitored by the Company” (Respondent I). Supporting an autonomous knowledge sharing network would likely promote (hidden) personal narratives between the seafarers – sharing the tacit knowledge, but would be a contrast to the SMS where documentation, monitoring and verification are central processes.

The statement [‘perhaps we should have trust’] provides an interesting take on the perception of (dis)trust and power relation between ship and shore. Power and authority to judge what safety interventions should be implemented, manager perceive his domain.

Master

On-board, the Captain’s statements indicate an acceptance of the frame work within they must operate.

Whereas one Captains perceptions was the system was well designed and had “all the ingredients” (Respondent G), thus not to be changed, the other Captain reflected on the implementation and the effect of the near-miss reporting system. From the interview, the challenges on-board getting to participate and making a difference becomes evident:

The problem is...is the implementation...how can we get...and encourage the crew to participate and openly share their knowledge and understanding of their own safety and safety of co-workers - that is the challenge I face on-board (Respondent F).

What seems an honest shared experience illustrates barriers in life as lived. Notable, is the preferred word “encourage” instead of “must”, which indicate a Captain favouring a mentor/guiding role on-board. Continuing. This Captain acknowledge, it uselessness if people are not trained “..sorry but it is useless” (Respondent F). Scrutinizing the interviews and observational notes from the Captains, two unlike characters appears – one satisfied with the existing and governing by compliance and another wondering and questioning the existing. The age span between the Captains - 58 vs 35 years, and their experience at sea and years in Command can explain the different views.

Notable, none of the respondents questioned the classic safety view or abandon the thinking that near-miss increase awareness and can prevent losses.

Instead critique and frustrations dominated this part of the interviews related to the effect of the SMS - Ownership, KPI, quality of investigation and crew disempowerment. However, it is a paradox that of the ten respondents one Captain was content with the existing SMS and one Manager had revised the near-miss reporting system by terminating the KPI and subcategories and implementing the ‘good story.

5. DISCUSSION CONTRASTS AND MULTIPLE READINGS

In the preceding chapter, the explication of my data provided many narratives to support the research question - how near-miss reporting is perceived contributing to safety.

In the introduction, I predicted to find a mutual perception of an 'obvious' and 'unquestioned' Truth in the accident pyramid - causality, justifying the near-miss concept among the respondents, and that the learning from near-miss reporting questionable – in worst case an unintended distraction.

In the following, I will reiterate, explain and relate to the notion of safety and near-miss, followed by a discussion on the purpose of the near-miss in conjunction with how and what can be learned.

5.1. How safety is perceived

In this study, a general perceived understanding of safety as ‘not getting hurt’ and ‘avoid accident’ was eminent. This classical understanding of safety is not unique and has been applied/known for centuries in the sense of effort to prevent harm to people – safety is personalised. Notable, only one respondent related safety to environment.

Respondents may see safety as an image – snapshot, and agree it looks like ‘not getting hurt’, but the understanding of what constitute safety is context related - thus not absolute. In the context of the ISM Code the respondents perceive safety as: ‘compliance approach’, ‘framework’, ‘assessment’, “what we do”, and the notion of ‘safe operation/work’. This matches the Code, previously accounted for in the illumination of data, in which safety embrace - *Trends, culture, management systems, injury, loss of life and operations (effectiveness)* (IMO, 2014, p.13- 15, 71)

The variation across the hierarchies can be explained and understood as a function of the context and proximity to work carried out, as well as the experience with the SMS system as a supportive tool as respondents elaborated (respondents J;E;I).

The notion of ‘safety’ and ‘safe operations/work’ is applied in the IMO publications and used by the respondent, however the distinction between them has not been addressed.

A safe operation/work is more tangible and possible to define as it is associated to a process or function that is observable and thereby in a context. ‘Safety’ as avoiding the injury is more difficult to work with, and is in a classic view argued not to be present when an unintended event has occurred – accident/incident (Hollnagel, 2014). This raises a fundamental question if it makes sense to talk about safety or it is a dead-end, and should focus be on the more tangible notions like ‘quality’ and ‘productivity’ of the work functions/operations?

With the hypothesis of increased technology to complete various functions and fewer humans on-board, the future of safety is more about monitoring systems than people. Perhaps it is time that the controversial (anti-safety) terminology of ‘quality and productivity’, as implicit mentioned in the Code (IMO,2014), is applied actively in discussion of safe operations and not concealed by safety.

My study aims not to define safety, but it has confirmed a perception of safety in line with the classic view. The paradox of (trying) capturing what safety is or means, safety science has attempted to address. Hollnagel (2014) elegantly summarize the paradox of the classic safety view that try to manage and learn about safety by studying and investigating events where safety apparently did/do not exist.

5.2. The (unintended) effect of the Code - Owning and responsible for safety?

For centuries the notion of being in Command of a ship has been associated with; ownership, responsibility, power and influence to protect the crew, environment and ship, not to share, but to execute.

The implementation of the ISM Code has disturbed the notion and since 2002, it has been the Ship manager who is overall responsible for the implementation and continuous improvement of the SMS system by means of centralization, control and documentation (IMO, 2014, p.13, 19-20).

Explication of the data, shows a concern among Owners and Authorities in respect of ownership of safety having drifted ashore and left a dis-empowerment crew on-board (Respondents A,E,H,I)

My study finds that the manager is perceived as a Custodian of the SMS system, and centralizing and prescribing/dictating work, the power relations between ship and shore is disturbed and crew become disempowered. Research by Almklov et al, (2014) finds too disempowerment and ownership is drifting in which the seafarers are marginalized. The perceptions of ‘disempowerment of crew’ and ‘ownership of safety has drifted’ confirms the research of Almklov et al, (2014). The effect of a marginalized crew is today well known to my respondents and not believed desirable wherefore ‘re-empowerment’ is called upon, but no suggestion as of how this can be achieved.

The perceived side effects of the Code - disempowerment of crew and absence of ownership of safety, reach far further than the research question. Nevertheless, in future research, we should ask if the drift or shared ownership and responsibility are something we should embrace rather than fear? Embrace, as technology changes our; work processes, monitoring and adjusting possibilities (semi-autonomous vessels) making transport by sea safer than ever, or fear because what for centuries have proven right and represent the industry practice is about to fall.

Further, we should consider if the (side) effect of implementing a management system like the SMS ends here, or could it be that the power to influence what safe operations are, already has surpassed Managers and rest with the oil majors. Indeed, the initiative of Oil majors via OCIMF certainly indicate this.

5.3. How is a near-miss defined?

Across the hierarchies a general perception shows the definition of a near-miss as ‘an accident that could have happened but did not due to luck or human intervention’. This is in line with the recommended definition in the Code and the proposed working definition of Van Schaaf et al. (1991).

Regardless of a common definition, there is no universal understanding of what constitutes a near-miss.

The experienced near-miss is highly subjective phenomena that depends upon various factors, not limited to; the context as a proximity to a perceived danger⁴¹, the distance physical and in time, together with the bounded rationality that is affected by ones goal (trade-off), knowledge and experience and awareness (Respondents B,J,E).

An example, a HSQE manager may perceive an event to be a near-miss with significant potential impact and learning potential, whereas a seafarer experiences every day normal work. An example of such could be a mooring operation. Mooring operations provides a good example of such an event offering multiple interpretations – a near-miss or normal work. Further, the study showed that across hierarchies a common understanding of categorizing near-miss exist.

The applied categories; ‘unsafe-behaviour; -acts and –conditions identified, has in safety literature been visually illustrated by expanding the accident pyramid downward, thus enforcing the perception of not only an association between the various categories but causality, as illustrated by Schaaf et al, (1991) and Bird (Bird et al, 1996).

⁴¹ E.g. Imagine onboard a bulk carrier en-route through the Malacca strait and anchorage of Singapore how different the notion of an acceptable safe closest point of approach (CPA) can be perceived by a Master and a new 3.Officer and a HSQE manager who never have sailed in the Far East.

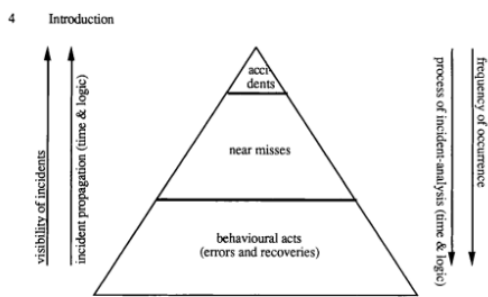


Figure 1. A qualitative iceberg model of the relationships between accidents, near misses, and behavioural acts.

Figure 18: Qualitative iceberg model by Schaaf et al. (1991)



Figure 1. Safety Pyramid (the lowest strata, unsafe conditions, is not shown by Bird and Germain, 1996).

Figure 19: Accident pyramid by Bird and Germain (1996)

How and why the categories were introduced in shipping - by Owners or if it was a consequence of changing market conditions and commercial pressure (Rasmussen,1997), e.g. Oil majors require KPI in shipping, is opaque. That said, the ‘causal factors’ that are mentioned in the Code are potential sources as they are equivalent to the applied categories either as unsafe conditions – structural/machinery/equipment/outfitting and unsafe act – human error (IMO, 2014, p.70).

Consequently, it is alluring to associate a near-miss with a cause e.g. human error and thereby reinforcing the classical safety view of humans being unreliable. This is supported by one respondent (J), responsible for the national near-miss database, who uttered “the human error today out-scale the ‘fortuitous’ events 90-10”. My study cannot explain the ratio, but future research should address the few recollection and if seafarers and managers predisposed to find and manage human error.

The idea of and effect of capturing such an individual and intangible phenomena tells a story of how shipping simplifies work and make the world fit the data or model –pyramid, in the endeavour to control and reduce risk. For sure we are doing something in the name of safety, when maintaining a near-miss regime but what it is, is less obvious. In the succeeding, I will discuss the purpose of the near-miss.

5.4. Why do we have near-miss reporting - the purpose?

The study shows, across the respondents, a general view of why near-miss reporting exists, it’s about awareness and risk reduction. Both notions are recognised in the Code, but whereas the risk

reduction is explicated as logic– ‘it makes sense’ (IMO, 2014, p.67) and promoted by a sequence of steps including investigation, the notion of awareness is not.

Risk reduction

All respondents argue that near-miss is a means to reduce risk and prevent accidents. A common understanding of how this can be achieved is based on Heinrich’s (1929) Accident pyramids which is perceived to illustrate an association and/or causality between the near-miss and the accident exists.

Heinrich (illustration of a) pyramid is recognized^{42 43} and/or used as an argument for the ‘possible’ prevention. The notion of recognition is of interest as it became challenging for the respondents (e.g. A, B, C) to account for the pyramid itself – association and causality. This indicate that the arguments for risk reduction/prevention are cited and not really reflected on or understood.

The sub-questions in the interview relating to training (IMO, 2014), made it clear that training as prescribed in the Code is interpreted and limited to using the SMS and artefacts on-board, and not about providing an understanding of the promoted causality credo and pyramid (Respondent G).

There is a wish to believe accidents can be prevented but a doubt exists as it cannot be proven (Respondents B, E, H)

While arguing risk reduction through near-miss reporting is possible, in the beginning of the interviews, the quandary surfaces when entering the interview phase of reflection. Here, most of the respondents doubt peaked. Their experience told them, that prevention of accidents is not as simple as dealing with a near-miss – the current model does not reflect life, why alternative explanations and understandings of why things happens is requested. In other words, an alternative to the classic safety view.

⁴² Other research studies in shipping has shown a similar understanding (Anderson, 2003; Bhattacharya, 2009; Storkersen et al., 2106).

⁴³ Elaborated in IMO and International Chamber of Shipping

Reflecting on my initial expectations of the study was to find an 'obvious' and 'unquestioned' Truth in the accident pyramid and causality among the respondents, perceived justifying the near-miss regime.

Instead, I found an unease with the classic understanding of how events happen – sceptical of the perceived accident pyramid (model), but no language to progress.

What has been promoted as obvious - that the pyramid as an abstract linear accident model denote life experienced and has an effect on safety⁴⁴, is perceived dubious.

Awareness

According to the Guideline the 'focus' on reporting near-miss improves safety awareness. Whereas the notion of awareness is unknown – a construct which none of the respondents could account for, it is in the Code written in the context of risk assessments “when accident information is limited it provides new insight” (IMO, 2014, p.61). A similar understanding is found in the work by Schaaf et al. (1991) who argues that the purpose of near-miss reporting is to maintain a certain level of alertness of danger, especially when rates of actual injuries and other accidents are already low within an organization.

Assuming awareness is stimulated through the near-miss reporting, thereby preventing the seafarer from a mental 'drift' and stay alert, logic reasoning pronounces more near-miss reports more awareness – more insight, unless there is a tipping point, where negative side effects appears.

However, my data nor safety science have provided evidence of how many near-miss should be processed for optimal awareness nor if the individual can become over aware, and finally we have to question prior the implementing of near-miss reporting in the code 2008, were seafarers not aware and what was the consequence?

⁴⁴ Int. Chamber of shipping and the Code and cited by respondnetbs

In the context of (proclaimed) fewer accident information available the ‘classical’ magician has pulled the near accident up of the hat – a trick that reinforces a belief in the value of learning from what can go wrong – classic safety instead of focusing on why we succeed.

Alertness, attention, focus and awareness, all may constitute the construct in question. In the lens of classic safety – the human needs to be controlled and stimulated, as without awareness will drift or evaporate and accidents will occur. Drawing our attention to what could go wrong sharpens our senses. In a progressive safety lens – e.g. HRO or resilience the notion would be about success and the ability to monitor, anticipate and learn (Hollnagel et al., 2006, 2012, 2014) or a constant sense of unease (2008, p.294).

We can argue that either view is about recalling, recreating or probing an imagination (recognise risk, patterns, pictures) but the willingness to embrace and decode the knowledge for understanding and turn it into meaningful learning can be perceived differently depending on the safety view you know and live by.

The discussion of the purpose of the near-miss reporting tells the tales of ‘the obvious made dubious’ and ‘the hidden made obvious’.

The obvious tale of the effect of the accident pyramid able to prevent accidents is dubious among the respondents, as the model does not match the lived experiences. If so our effort may be useless and in worst case have a negative effect on our safety objective.

The hidden tale in which awareness is stimulated through the near-miss, thereby preventing the seafarer from a mental ‘drift’ and stay alert, is supporting the belief and the value in learning from something that almost became an accident. An inherent paradox it is, that in the absence of accidents, we construct the notion of a pre-accident that is highly subjective, and in the absence of said events reported we impose a KPI to secure the feed-back loop of knowledge and insight to learn from.

But how is learning perceived possible from the near-miss?

5.5. How do we learn from a near-miss?

Why do we strive to learn? One argument is that knowledge and the ability to learn is one sure source of lasting competitive advantage and without learning an organization will be limited to a given set of responses and will similarly always monitor the same values and conditions (Hollnagel, 2017). In the Code, self-improvement is a key theme in which acquiring knowledge, processing and sharing, provides the foundation for continue development. In the following, I will account for the perceived notion of how and what we learn and discuss if theories on organizational learning present a hidden potential for future safety work

The respondents perceive, that sharing of knowledge through dialogue constitutes learning, which ultimately promotes safety, can be justified congruent with the Code (IMO, 2014, p.69-71). Learning is perceived possible in two stages. Initially, the dialogue takes place between ship and shore when the event is reported and investigated. Finally, when the knowledge has been processed and a report generated, it is circulated in the fleet, and on-board another dialogue takes place among sharp-end operators., typically during the safety meetings. This corresponds to the findings by Huber, Wijgerden, Witt, and Dekker (2009) whom conclude in their research that ‘person to person safety meetings are needed to learn from other people within the organization.

Notable, only one respondent addressed pre-conditions for a dialogue and learning - quality of the near-miss, prioritizing of time, a willingness to participate, listening and a common language.

I will not speculate on the many other local barriers e.g. group think and the desire for harmony, authority gradient, that may affect the dialogue, but emphasize that there is no feedback or following up on this important part of the learning process.⁴⁵

Spencer argues that the purpose of learning is not knowledge but actions (1911). It is about how we act the next time out. Notably, only one of the respondents (J) associates learning with ‘change in

⁴⁵ in Dutch flagged vessels the Captain is not allowed to participate in safety meetings, this prevent the effect of the authority gradient.

behaviour' in light of experience (Sanne, 2008; Schaaf et al.,1999), which make me doubt the quality of this part of my interviews, and if the question is fully understood. The Guideline does not mention 'dialogue but encourage the learning process in way of; generate, disseminate, read and act on, which implies a response and some form of dialogue. Revisiting the literature review, this process corresponds well with the two categorizes' "Learning lessons process" and "Follow-up process" (Drupsteen et al., 2014).

While attention to the coding - subcategories and encoding of near-miss reports are important, for the management of near-miss reporting, we know most learning decays over time and ends up being a waste because it's not designed to effectively create long-term knowledge.

Questioning the respondents on a near-miss they had read or been involved in, which they perceived of significant, notable only three respondents were able to describe a near-miss. Further, all where 'fortuitous' – no human intervention. Only three near-miss stories recollected and perceived of significance across ten respondents representing plus 100 years of experience with the SMS system, is of interest. We may speculate about the reason(s); is there no memory to recall, did they not want to disclose, was it result of a poor learning environment – no dialogue or story telling or is it perhaps not that many significant near-miss events exist?

Nevertheless, the observation is of significance and worthy of future research if we are to understand what it takes for a seafarer to change behaviour or simply 'recall' knowledge post an event (the experienced).

The ethnographic fieldwork with Railway technicians by Sanne (2008) provides an interesting take on the impact of storytelling as an attractive practice for transferring knowledge from incidents into learning, compared to standard reporting, which may explain the few recollections among my respondents.

Our world view affect what we learn

Our perception of the learning potential appears affected by assumptions about why things happen and our comprehension (choice) of theoretical constructs of causation and investigation method and

analysis. This leaves learning itself as a construct. We may think learning is about doing things better and that continuous improvement in safety management systems, is a process of adaptation to prevailing circumstances or implementing another barrier – a checklist or procedure, not knowing the impact of ‘doing better’. The quandary is that no one owns the truth of what constitute the right learning and how it is realized or is capable of providing evidence of what specific contribute to safety. All we are equipped with is our understanding and believe. Fundamentally we need to ask the question; to secure work processes, what are we trying to learn?

Referring the Code and my Respondents the answer is ‘to prevent accidents’, in which the-classic safety view is dominant and enforced by rigid SMS systems that are forged in the flames of scientific management – where managers knows better and the expert is allegedly no longer at the sharp-end (Respondents C, H, G) makes dialogue difficult. It is well recognized, that in the Tanker segment, the SMS systems⁴⁶ have become extremely comprehensive as a result of the Tanker Management Self-Assessment and vetting regime, restricting the experienced degree of freedom on-board. In addition to the tensions in relation to responsibilities, disempowerment and ownership of safety, my study shows that bureaucracy is exhaustive.

The (learning) environment described is classic (view) where the dialogue is based on the propagated event reports that in hindsight blame deviations from the prescribed system - the unsafe act, unsafe conditions, non-compliant and the lack of awareness (Respondent B). The effect of the near-miss reporting system as a feedback loop to the manager today reinforces the classic safety in which learning is controlled and predefined through (the truths articulated in) the reports by the HSQE managers (experts), but need it to?

If our world view is affected by systemic thinking, learning theories (Argyris et al., 1996; Crossan et al., 1999; Senge, 1990; Drupsteen et al., 2014) provide much inspiration and insight.

⁴⁶ Safety management system for operating Tankers are often in exceeding 1000 pages

With a progressive safety view, the seafarers' adaptive capacity is believed to be a key to succeed in work processes, how and what we learn differs.

To expand the capacity and imagination of the seafarer, the dialogue should perhaps involve dissonance. Only through a dissonance can we push the operator to questioning the existing premises and make sense of their experience in a new way. Often, metaphoric images or phrases have multiple meanings and appears logically contradicting or even irrational. This may be the strength which creates a dialogue which is rewarding and remembered (Nonaka et al., 1995).

Tapping the tacit from the seafarers is not easy through a centralized reporting administrated by managers that do not recognize or see the value of tacit. An alternative approach is if crew autonomously explore and exploit the near-miss event observed and by-passed the (proclaimed) expert ashore. Hereby, the focus could be on the individuals on-board, sharing tacit knowledge to a greater extend. The approach could promote re-empowerment, where crew again are shown trust that stimulate taking ownership and responsibility.

Spontaneous learning happens in everyday life at the sharp end. This can be explained by the individual, who constantly faces new and unpredicted tasks and challenges, wherefore adjustment takes place to account for the many (conflicting) goals. While this is recognized in progressive safety, it is unnoticed in the classic safety view.

This learning is used to explain the theories of 'drift' e.g. ETTO model by Hollnagel (2009), practical-drift by Snook (2000) and Rasmussen's 'Migration model' (1997). For any 'drift' to possibly be noted the learning as a dynamic organisational process must be transparent and prioritised. Apparently, a model to detect such drift is not developed.

Resilience addresses that for effective learning to take place there must be sufficient opportunities to learn from, events must have some kind of similarities – to allow generalisation and it must be possible to confirm/verify learning has taken place. This makes learning from accidents difficult, but as near-miss and normal work are more common, here the potential to learn is greater

(Hollnagel et al., 2011). However, as the study has shown, the near-miss events are captured in a unique context, the effect of generalization (approximation) should be questioned especially as it serves the purpose of constructing the ‘conditions’ for effective learning.

Safety science and industries acknowledge the importance of learning – but learning from near-miss in shipping in it’s current state is not guaranteed and perhaps an illusion. The study shows a simple understanding of what learning is – dialogue, compared to the more comprehensive views of the learning organisation.

What the near-miss offers shipping is a knowledge feed-back loop. Knowledge created but highly dependent on an assumption of how things happens. Whether the knowledge transforms into (easy or meaningful) learning and affecting a potential response from a seafarer we do not know, but as the following will address, it affects prescribed systems –SMS

5.6. What is learned –the outcome of the process?

The purpose of the near-miss reporting has been identified to maintain or promote awareness and to reduce risk, but what is the outcome of the near-miss process?

The study uncovers three strands of the outcome that relates to; Behaviour, System (SMS) or Design. Basically, they represent a notion of cause(s) that need to be fixed – corrected.

Behaviour

Behaviour addresses unsafe act(s) and non-compliant observed at the sharp-end and argued to account for the majority of all near-miss reported (Respondent B). This reinforces the perception that humans are predominantly seen as an unreliable and a liability to be managed. Narratives analyzed by the HSQE experts are through the classic safety lens; “dominated by a hindsight bias and findings written in a counterfactual language are often decoded with blame” (Respondent B).

The most common context in these near-miss reports is ‘work’ carried out without the required personal protective equipment, which could have resulted in an injury or loss, had it not been corrected or due to a fortuitous break in the chain of events. The reporting that ‘the use of personal protective

equipment is a requirement' is not news, and to some people allegedly noise (e.g. Respondent J). Nevertheless, it tells a story of how safety is conceived in which the majority of near-miss reported each year relates to 'behaviour', contribute to safety. Is it about behaviourism.

From a classic safety perspective, the outcome is an explanation of the True story (constructed) and remedies that are believed to narrow or close the gap between WAI and WAD, by affecting behaviour.

Creating categories like 'unsafe act/behaviour' reinforce what you are looking for – What You Are Looking For Is What You Find (Hollnagel, 2008). Consequently, identifying the human error is at the risk of seafarers not disclosing the full narrative.

From the interviews, quality of the reports is a recurrent topic. The knowledge gained from the events are often limited as investigations are superficial – not thorough enough (Respondent C).

Elaborating on what quality is desired and what is missing revealed little. One suggestion was to apply the “5 x why”⁴⁷. Whether the quality is affected by the many near-miss reports to be processed - resources available or the ability to investigate or in-combination remains unanswered, nevertheless quality is a concern.

Design and system

The last strands, are about Systems and Design. Systems are characterized by management systems i.e. the SMS, and knowledge feedback results in amendments, corrections or clarifications.

Design covers; equipment, structural properties (vessel) as well as software. Correcting this environment may be due to deterioration over time e.g. system failure of a crane or equipment found unsafe to use, and system feedback may lead to new work processes.

The learning from both strands are compensation. To compensate and regain control for what was not predicable or comprehensible previously – outside the design envelope (Rasmussen et al.,1990,

⁴⁷ IEC/FDIS 31010:2009(E) Root cause analysis (RCA)

1986; Rasmussen & Svedung, 2000). In a classic view, a system is perceived inherently safe and reliable, a paradox the compensation (feedback loop) clearly contradicts.

In a progressive view the system is inherently unsafe (and goal conflicted) and the feedback are explained by our limitation to anticipate, wherefore adjusting for the variability in life is required to succeed.

The ability to anticipate has become evident in the proclaimed second (human) and third age (management) of safety (Hale & Hovden, 1998; Hollnagel, 2014) in which socio technical systems evolves, and new understandings and models are constructed to explain emerging phenomena's e.g. how complexity emerges from systems.

How near-miss contribute to safety depends on how we understand events^{1 2} and how learning is mastered at the individual and organisational level. That require mastering of multiple disciplines complementing each other like languages of learning to cover organizational learning and the ability to see the (safety) world in a 'wider-angle' and not in a narrow lens vision. My study shows that within the four hierarchies of respondents, the insight in various thought of safety (views) and learning models are limited, and the fact that training (and education) within these fields are not practiced or prioritised leaves the maritime industry behind the drag curve.

Ultimately, what the current near-miss system contribute, is knowledge used to adjust the prescribed SMS, and narratives about how human behave and adjust to the environment where conflicting goals needs to be managed.

5.7. The value rationale - is the near-miss concept desirable?

At first glance, the effect of near-miss, as stipulated in the ISM code – risk reduction and awareness, seems obvious. The closing question during the interviews - value rationale questions⁴⁸, provide different

⁴⁸ 'why is it desirable – where are we going – what should we do?

images of disbelief in the effect of the near-miss. Criticism (vague) pointing to part of the near-miss process especially the (lack of) quality of investigation – (in-depth), and the known barriers of distrust, blame, bureaucracy and resources and disempowerment and ownership of safety.

In the turmoil of disbelief, what I found unique and of special interest; is how KPI for near-miss seems to have become a ritual in shipping and one Owner's initiative to discard the same KPI.

5.7.1. KPI, a ritual

Images of environmental pollution – shores and wild life covered in oil have for decades hit the press followed by public condemnation of the carriers and affecting the stock prices of oil companies. Regardless of IMO rules being enforced e.g. Double hull tankers, Oil majors have been forced to respond and take responsibility and ownership of safe shipping, and the initiatives by OCIMF is evident of just that. In the last decades OCIMF has implemented various programs e.g. the SIRE vetting regime, TMSA, and OVID with the aim to improve safety (operations), and Owners – Ship Managers have created rigid SMS systems and reduced the degree of freedom on-board with the same aim.

Today, it is practice that a tanker vessel has a KPI to report a minimum of four near-miss events per month as a part of Oil Majors - client, requirement. None of the respondents were confident about the specific target of four reports and neither had the Oil majors rational been questioned but assumed to reflect a way to measure safety and improve safety awareness. Frustration among Owners exists, because of the increased work load and bureaucracy because of the KPI, which they question the logic and the contribution to safety.

Let's view the KPI in a broader perspective. Consider an organization, with say 20 vessels, the KPI of four vessels per month result in all most 1000 reports to be managed annually. To manage this a trade-off is made in which the sub-categories and coding of the reports are central thereby streamlining the handling process, which have the advantage of easy pulling numbers out for clients and management review reports. Regardless of the efficiency of technology, it is this workload – managing reports, that

respondents' question the value of and experience as 'bureaucracy'. In perspective of the world fleet of tankers (nos. 17.000 in 2017) and the assumption that 90% operates⁴⁹ for Oil Majors subject to KPI's - over 734.000 near-miss reports needs to be processed each year. Knowing the volume to be processed how much time is actually invested for; the reporting on-board, the analysis/investigation, the identification of corrective action, the implementation and the follow-up?

Further, how many near-misses reported events are investigated, not simply processed, and do they bring forth new knowledge or lead to learning?

We are not certain as to why the near-miss KPI exists – what it means, but the inductive analysis of the purpose of near-miss in my research provides a general understanding with a high probability. It promotes knowledge sharing and awareness which may lead to risk reduction having a positive effect on safety. Assuming this is a general premise, more events reported should lead to a safer environment. This deductive reasoning leads to the question – is there a tipping point in which the KPI for near-miss reporting become counterproductive?

The study shown that the near-miss KPI is an institutionalized activity embedded with the Managers that requires; identifying, measuring and recording of events, and finally, communicating information to oil majors in a systematic and repeated way, denote a ritual. A ritual fulfilled by Managers which none of the respondents could account the origin of – it had always, ultimately satisfying the oil majors, but why we do not know.

Are Owners afraid that the question of 'why having near-miss KPI' is self-explanatory and that everybody else knows the answer, or does the silence reflect; tensions in an industry where the power to dictate safety is in a transition,

Amalberti (2013, p. 119) provides a view on contradictory tensions, that may be hidden in the core of a company. From a commercial standpoint, not winning the contract due to inability to control the

⁴⁹ Tankers transport products owned by oil majors and/or tankers load or discharge at Oil Majors terminals.

safety of a vessel – having no saleable product due to poor vetting and not meeting the KPI, is not acceptable. Consequently, we can imagine the outcome of an internal trade off between the Safety and the Commercial department to respond to the threat – do not question the KPI, just comply. From my data the fear of the consequences not complying are clear “terminating KPI would be a commercial suicide” (Respondent I).

Owners and ship managers operating tanker fleets are under constant assessment, and never has so many ship inspections been carried out nor office assessment with the purpose to assess safety management and compliance. Documenting safety, e.g. near-miss KPI is a key element and the endeavour to improve systems are never ending and increase bureaucracy. Considering the many actors in shipping an Owner need to please – Client, Flag state, Port State Regime, Classification, insurance HM & PI, each with ideas of ‘best practice’ to be implemented, it is no surprise the ship managers feel an accelerated bureaucratization of safety - safety as measurable bureaucratic. (Dekker, 2014).

The Code and Guideline produce a perception of the effect of the near-miss reporting when stipulating; “it improves awareness and reducing risk, cost saving”(2014). With some applied preconceptions about the effect of near-miss we thereby enforce and legitimize the concept of near-miss. A selection bias appears in which we use the near-miss stories we already believe and convince (convey/communicate) ourselves that these messages are strong and valuable. They do not necessary provide new insight or learning. We think we are learning but perhaps we are actually reinforcing a belief in the classic perception of what constitutes safety without knowing it. Accordingly, it could be argued, that the use of KPI fulfil the task of reinforcing the perceived value of the near-miss which keeps us trapped and blinded - restricting evolving.

My study did not uncover the rationale behind Oil Majors requirement for a near-miss KPI, but future study should address the influence of Oil majors on safe shipping, and the objective of the KPI ritual and if a tipping point can be observed.

5.7.2. Discarding the KPI for near-miss reporting

For years having questioned the near-miss concept and fighting the negative perception of a near-miss – blame, and not seeing any effect, a voluntary reporting of ‘positive stories and best practices’ was introduced in the respondent fleet (Respondent I). In dialogue with selected Captains and with the assumption, that all people appreciate recognition, the initiative was a co-operative one. Concurrently, the manager terminated existing KPI’s for near-miss reports and communicated this internally and to oil majors, apparently without sanctions or black-listing imposed.

The initiative is about promoting the good story from daily work on-board – ‘what works well’. This is not about measuring work processes, but about creating an environment where the seafarer feels appreciated and want to participate and share knowledge. With the initiative, the quantity of near-miss reporting is expected to drop significantly, thereby releasing resources which will be allocated to support the circulation of the good story. In the years to come, it will be interesting to see if other managers will follow and if an effect is experienced.

What makes this story of significance is that regardless of other ship managers’ warnings of the commercial effect, this manager stood his ground convinced that a tuning or termination of the existing ritual was required. Without doubt the company will have had internal discussions between the commercial and safety department, and if (safety) thoroughness out weighted efficiency (Hollnagel, 2014) or if safety exist as a capillary in the entire Company, is not known.

The termination of the KPI, tells a story about one manager questioning the effect of the existing near-miss practice and consequently, critical reflections lead to another view of how a safe environment can be supported. Further it is an example of ‘double loop’ learning, where the improvement is not limited to a specific situation e.g. a procedure for mooring operation, but ‘fundamentally’ changes assumptions and polices (Argyris & Schon, 1996; Drupsteen & Guldenmund, 2014).

Summary of discussion

My research was inspired by Phenomenology with the aim to enlarge and deepen my understanding of the range of experiences with near-miss reporting in shipping. Reflecting on the data collected, the explication and discussion, this is accomplished.

On the surface, the ISM code and near-miss are pervasive tools promoted and perceived to improve safety.

Scratching the surface, the effect of near-miss are dubious of various reasons and fundamental questions about the consequences of the Code surfaced.

The study aimed not to define safety but has confirmed a perception of safety in line with the classic view - avoid getting hurt, which the SMS and near-miss promote. Nevertheless. Safety is an intangible construct perceived in multiple perspectives e.g. trends, culture, management systems and work functions, thus not absolute. This raises a fundamental question if it makes sense to talk about safety or it is obsolete? Should focus be on the more tangible notions like 'quality' and 'productivity' of the work functions/operations?

A near-miss is perceived as an accident or something that could have happened but did not, because of intervention or luck. The perception of a near-miss depends upon various factors, not limited to; the context as a proximity to a perceived danger⁵⁰, the distance physical and in time, together with the bounded rationality that is affected by one's goal (trade-off), knowledge and experience and awareness. The very idea that the effect of capturing such an individual and intangible phenomena to improve safety may be overrated, but tells one story of how shipping simplifies work by making the world fit the model – accident pyramid, in the endeavour to control and reduce risk.

⁵⁰ Imagine on-board a bulk carrier en-route through the Malacca strait and anchorage of Singapore how different the notion of an acceptable safe closest point of approach (CPA) can be perceived by a Master and a 3.Officer and a HSQE manager who never have sailed in the Far East.

A predicament follows. We have created an understanding that the studying and investigating of an intangible phenomena – i.e. pre-accident events, in which safety, according to the belief of classic safety thinking, is absent, can improve safety.

Reflecting on my initial expectations of the study was to find among the respondents an 'obvious' and 'unquestioned' belief in the accident pyramid justifying the near-miss regime.

Instead, I found a doubt with the classic understanding of how events happens and that the pyramid as an abstract linear accident model denote life experienced, but no safety language to progress.

The hidden tale in which awareness is stimulated through the near-miss, thereby preventing the seafarer from a mental 'drift' and stay alert, supports a belief in the value of learning from something that almost became an accident. An inherent paradox is, that in the absence of accidents, we construct the notion of a pre-accident that is highly subjective, and in the absence of said events reported we impose a KPI to secure the feed-back loop of knowledge and insight to learn from.

Regardless of scepticism towards the accident pyramid and the notion of awareness that cannot be explained, still the mantra of prevention echoes without knowing if it makes us safer or makes us feel safer.

The outcome of the near-miss process (learning) is an 'increase' in awareness, which is attained through the dialogue and discussion, or as a side effect of the events reported, which lead to adjustment (compensation) of the SMS system, re-design, configuration or safety campaign. In a classic view, a system is perceived inherently safe and reliable, which the adjustment clearly contradicts but appears not to be recognised.

What the near-miss as a process offers shipping is a knowledge feed-back loop. Knowledge created that is highly dependent on the assumption of how things happens. Whether the knowledge transforms into (easy or meaningful) learning and affecting a potential response from a seafarer we do not know.

Compared to the ideas from the learning organisation, the study shows a simple understanding of learning that is reduced to the investigation process of the event, and on-board learning emerges from the

dialogue facilitated around the near-miss reports circulated. A potential in understanding the mechanisms behind individual and the organisation learning and mastering classic and progressive safety views awaits to be explored and exploited in shipping.

For centuries the notion of being in Command of a ship has been associated with; ownership, responsibility, power and influence to protect the crew, environment and ship, not to share, but to execute.

The Code introduce shared responsibility, nevertheless it is the manager who is overall responsible for the implementation and continuously improvement of the SMS system by means of centralization, control and documentation (IMO, 2014, p.13, 19-20). This appears to disturb the power relations between ship and shore, leading to crew disempowerment and absence of ownership of safety on-board. This reach far further than the research question. Nevertheless, in future research, we should ask if the drift or shared ownership and responsibility are something we should embrace rather than fear? Embrace, as technology changes our; work processes, monitoring and adjusting possibilities (semi-autonomous vessels) making transport by sea safer than ever, or fear because what for centuries have proven right and represent the industry practice is about to fall.

Across the hierarchies the lived experience related to near-miss are interconnected with Oil majors requirement for KPI that accelerated bureaucratization. The study is not able to disclose Oil majors rationale for the KPI, meanwhile the ritual of reporting continues and (blindfold us) reinforce a perceived value of the near-miss. Future study should also address the objective of the KPI ritual and if the power disturbance is isolated to Manager and Vessel or has progressed to include the Oil majors, who seem to have a huge influence through the OCIMF initiatives, on what safe operation is and how to execute.

As argued the Code is a framework based on general principles and objectives to accommodate the variety of shipping. The framework promotes processes, but the quality is for the manager to determine. As such, it is not the system in itself, but how we apply our understanding of safety and learning that determines the perception of its value. That brings forth new research questions of how the SMS certificate is interpreted, what is the function and what does it contribute with?

I have scratched the surface of near-miss and revealed new questions to be answered in future research.

Concerning the near-miss process, I cannot say that it is without effect, but my doubt remains. My concern is not in way of the near-miss process, but on the fact that the (obsolete) accident model created in 1930 used to justify the near-miss concept since 2008, none of the respondents could account. Further, I see no mechanisms in the shipping industry that advance the language of safety and learning, and without we are not going to escape the old ideas and remain lost in translation.

6. FINAL REFLECTION

The aim of my research is to explore the perception in the maritime domain; of how and why near-miss reporting contributes to safety.

My work shows safety is generally perceived as to avoid getting hurt, but the notion of safety is not absolute - across the hierarchies in the domain, multiple perspectives exist. A general perception exists that a near-miss, is an event that could have led to an accident but did not. What constitutes safety and a near-miss is highly subjective and context dependent.

The purpose of the near-miss is about increasing awareness and preventing losses. To compensate for the absence of accidents, that is believed to be the ultimate source of learning, the construct of near-misses is alleged to increase awareness of what can go wrong, and with the belief of the causality between a near-miss and an accident, prevention is possible. My research shows the difficulties for the respondents to account for the Heinrich Accident pyramid and the notion of awareness. Further, some respondents could not recognise the alleged effect of preventing losses by the near-miss concept. This raises the questions of; the level and accessibility of knowledge of accident models in shipping and fundamentally the value of the near-miss concept – it's dubious.

Unexpectedly, my research revealed that a KPI for near-miss is implemented - a ritual no one can account for, creating tension and increasing bureaucracy, and demonstrates how a negative side effect of (safety) management system implementation has disturbed power relations and affected the ownership of safety and result in dis-empowerment of the crew, which corresponds with existing research (Almklov et al, 2014).

My research shows how the classic safety language and view - including obsolete ideas from the 1930', dominates the frame work of the ISM Code in shipping. However, the classic fairy tale of why things happen and the accident pyramid, are questioned by respondents as they are not able to explain or understand their lived experienced in the linear thinking that these approaches use.

“The limit of my language is the limit of my world. All I know is what I have words for”

(Wittgenstein, 1953)

Suddenly the (specific) aim of the research: how and why near-miss reporting contributes to safety, is no longer interesting, but the language reflecting our understanding and our belief of what constitutes safety and learning in shipping, become essential.

In a progressive safety view, our goal is to support and sustain operation for acceptable outcomes but in an understanding that success and failure springs from the same source and that the notion of zero accident is not achievable. Our knowledge and language have evolved beyond the classic view of safety, but it is not absolute, and it must be accepted that the classic approach is making a difference and is not to be discarded.

In the evolution of safety views, the narrow lenses become a wide-angle lens providing us with more nuances – seeing a wider spectrum and providing new ways of explaining life – not one truth but multiple truths.

Through this optic, a near-miss is multi-dimensional. Embracing the thought of a near-miss also perceives descriptions of ‘normal work’ and that the focus of the learning, is not concerned with how can a near-miss and accident be prevented, but why did the operation succeed and how can we make sure it will again.

Shipping is evolving and introducing advanced artefacts (technology) to improve productivity, so our language and understanding of safety must too, wherefore we should ask a more fundamental question; how the language of safety can and learning in shipping be developed to advance the (safety) management system.

7. ACKNOWLEDGMENTS

First, I want to thank my respondents for sharing their thoughts and perceptions without my research would not have been possible. My sincere thanks go to my supervisor Anthony Smoker for the many discussions and his continuous support especially in the darkest hours.

I also want to thank the University of Lund for prioritizing the Master program and the team behind making my journey into safety science possible.

Finally, I like to thank my wife for her understanding and giving me the opportunity to dive into and explore the abyss of safety and human factors.

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APPENDICES

Appendix A. Informants

Names, nationalities and employers are excluded from the list, in order to assure the confidentiality and anonymity of the informants; the ten informants have 3 different nationalities and are employed by 6 different organizations.

Informant A

Male

Educational background: Master Mariner

Work experience: AB and Deck officer 17 years, new building inspector 11 years, HSQE and Nautical inspector 8 years.

Employed by Ship Manager as HSSQE manager and working with the ISM Code.

Informant B

Male

Technical and pilot education

Employed by civil ANSP

Previous experience in state aviation sector

21 years of experience in working with regulatory issues.

Informant C

Male

Educational background: Master Mariner

Work experience: Deck officer 18 years, HSQE manager at various ship managers 7 years.

Employed by recognized body with 9 years of experience in working with regulatory issues – ISM Code.

Informant D

Male

Educational background: Marine engineer

Work experience: on-board engineer, project manager at various ship yards, new building surveyor.

Employed by recognized body with 7 years of experience in working with regulatory issues – ISM Code.

Informant E

Female

Educational background: Dual Officer

Work experience: With various Danish shipping companies

Employed with Maritime Administration as a senior inspector -5 years of experience in working with regulatory issues _ ISM Code.

Informant F

Male

Age:35

Educational background: Master Mariner

Work experience: Deck officer with various Ship Managers.

Employed as a Captain since 2014 and working with ISM Code every day.

Informant G

Male

Age:58

Educational background: Master Mariner

Work experience: Deck officer in various Companies.

Employed as a Captain for the past 17 years and working with ISM Code every day.

Informant H

Male

Age:38

Educational background: 2004 Dual Officer (Capt. 2008 &CE2010)

Work experience: Officer in various shipping companies.

Employed as a HSQE engineer since 2015. Working with ISM Code every day.

Informant I

Male

Age:50

Educational background: Master mariner 1990

Work experience: Deck Officer (8 years) and HSQE manager (+15 years) in various shipping companies.

Employed as a HSQE Manager and working with ISM Code every day.

Informant J

Male

Age:46

Educational background: Dual officer

Work experience: Deck Officer in different companies and as auditor in Maritime administration.

Employed as a HSQE Manager and working with ISM Code every day.

Appendix B. Semi-Structured Interview Questions

The aim is to explore the perception of how and why near-misses contributes to safety in the maritime domain.

- What is safety perceived as and what explicit contributes to safety?
- What knowledge is behind the perceptions in way learning from events e.g. mystery of causality

To capture the perceptions at the different levels of the hierarchy, I have been inspired by Rasmussen (1997) abstract presentation “Levels of decision making in a dynamic sociotechnical system”. The presentation will help me trace any transformation in the perception of the concept of near-miss and it’s impact - the learning potential as synthesized in the literature review.

- Information of the respondent
- Experience of the respondents
- Career history
- Age and gender

Guiding questions

1. Tell me what safety mean to you – how do you define safety?

Justification

The IMO convention Safety of Life at Sea (SOLAS) promotes safety in various ways. From structural design and FSA and LSA, the implementation of the ISM code in Chapter IX of SOLAS,1998, the Code provide an international standard for the safe management and operation of ships and for pollution prevention safety was introduced as management tool.

The very foundation of the code is safety wherefore it is relevant to capture the respondents perception. Is safety perceived as a system property – something an organization has? Is it perceived through an artifact -near-miss reporting system or through checklist and procedures. We may find that some respondents regard safety as an emergence of people’s actions in an organization. We may be able to categorize perceptions in the following, which may support our understanding of events models and why and how near-miss reports contributes to safety and if learning is evident.

- i. Safety is the prevention of harm or loss. There is a presence of failures (things that go wrong) due to risks and hazards. The number of harmful events can be counted.
- ii. Safety is a dynamic non-event (ref. can be found in SI-II). There is an absence of failures (things that go wrong), but as a result of active engagement. If safety is a non-event, it can neither be observed, nor measured
- iii. Safety is a dynamic event. Safety is the presence of acceptable outcomes. The more there are, the safer the system is. Is Near-miss regarded as acceptable outcomes?

2. Tell me what does a near-miss, mean to you - how do you define a near-miss?
 - a. is a near-miss perceived as something positive or negative?

My literature study identified the difficulties capturing near-miss in one definition. The value of this exploration depends on many factors but knowing how it is perceived is without doubt of paramount importance. It will let me analyze if the perception is deviating from the definition of the ISM code.

Further, alternative definition may provide arguments and an understanding as of why and how near-miss contribute to safety (management)

3. Why do you think near-miss reporting is included in the ISM code (purpose)?

Answering why Near-miss reporting is a part of the Code provides valuable information in my exploration. First. Training /knowledge

Second. how, why it contributes to safety:

- a. Improve safety (*improvement in an organizations safety performance* -management system)
- b. Make shipping more efficient (Ref. guideline)
- c. Measuring and confirming safety (commercial)
- d. Prevent losses (cause effect relation, correlation in Heinrich Pyramid)
- e. Knowledge sharing (meaningful learning, organizational 1990 learning)
- f. Controlling behaviour
- g. Safety awareness

“The Company should encourage the reporting of near-misses to maintain and improve safety awareness. The reporting and analysis of such incidents are essential for an effective risk assessment by the Company, especially where accident information is not available” MSC-MEPC.7/Circ.8

4. Tell me what can we learn from near-misses -how do you experience learning?

- a. What are the alleged lessons to be learned?
- b. Any barriers?
- c. Why
- d. How do we know if we have learned?
- e. How - reporting or reading reports
- f. What
- g. Discussion reports and/or statistics
- h. Single vs. double loop

5. Tell me about the most important Near-miss you have read or reported?

- a. Why was it important
- b. What made it important
- c. What was the consequences

6. The company shall provide training and information about its approach to “just culture” near-misses reporting and investigation. Tell me about the training you received - what do you recall?

7. Have you seen any of these drawings/illustrations before?

- a. What do you make out of them



8. Reflection on the near-miss concept?
 - a. Where are we going?
 - b. Why is this desirable?
 - c. What should be done?

Appendix C. Sketch for Observational Notes



Figure 20: Interview sketch for observational notes

Appendix D. Information letter and consent form

Information Letter

Dear Sir/Madam,

My name is Mikkel Andersen and I am completing a MSc in Human Factors and System Safety at Lund University.

I am a master mariner and naval architect, with 27 years experience in the maritime domain. Today, I am employed as a risk assessor with CODAN Marine insurance in Scandinavia.

When the implementation of the ISM code, near-miss reporting was introduced in shipping. No studies have yet been undertaken that explore the perceptions and the experiences of the experts – safety professionals working with the ISM codes provisions for *near-misses*.

Therefore, the research topic that I have chosen for the Lund Masters is “*to explore perceptions and experiences of how and what can be learned from near-miss reporting*”.

For this purpose, I have designed a qualitative research study aimed at collecting experiences and perceptions through interviews. That is to gather the experiences and views and opinions of professionals who use and have a part to play in the way that the ISM code in relation to near-miss reporting is undertaken.

Your participation is invaluable to the research, which hopefully will contribute to an understanding and will lead to discussions being initiated of what near-miss do and contribute to safety.

Ultimately, I must obtain your consent before I can include any of the information in my thesis.

I look forward to hearing from you soon.

Sincerely,

Mikkel Andersen

Informed Consent Form

Research Question: to explore the perception and experience of how and why near-misses contribute to safety in the maritime domain.

Researcher

Mikkel Gardner Andersen, MSc Human Factors & System Safety (candidate), Lund University

Sponsors

Lund University

Supervisor

Dr. Anthony Smoker, Lund University, Sweden

Assessor

Dr. Johan Bergström, Lund University, Sweden

Background and Purpose of the Research:

The ISM code prescribes that hazardous and near-miss events are reported and investigated with the aim to support self-improvement and safety.

An IMO review supports the contribution to safety, but no research has verified the contribution to safety nor captured the perceptions and experience of near-misses in shipping.

The purpose of my research project is to explore various stakeholders perception and experience of the contribution of near-miss reporting to safety - how and what can be learned. It is hoped, that the research will contribute to our understanding of how work is done, and to the safety discussions in the maritime and safety science world.

The research is for safety and academic purposes and also forms part of the fulfillment of the requirements to complete a Masters of Sciences in Human Factors and System Safety with Lund University in Sweden.

Who will be invited to participate in the study?

The many stakeholders vary from legislators to the seafarer's on-board - some controlling/verifying compliance, others executing work functions. The aim of the research is to capture as many perceptions and experience as possible to approach the hierarchy of stakeholders in shipping from; Seafarers, Shipping Companies Safety professionals – HSQE personnel, Recognized bodies – auditors at Classification and at Maritime authorities.

The body of the research will be based on the interviews. Achieving a sample size of 15 participants who are experienced with the ISM Code on a daily basis is the ideal size of participants.

What will be asked of you during the research:

I am seeking your voluntary participation for one interview that will take 60-90 minutes.

The interview will be a face-to-face dialogue guided by semi-structured questions. The questions will relate to the ISM code and near-miss reporting, but your perceptions and experiences are the target. The interview will be conducted in a language of your preference – Danish or English.

For the purpose of quality, as all details are important when transcribing the interview for further analysis, I would ask your permission to record the interview.

Additionally, it may be desirable to follow up after the transcription of interviews for points of clarification.

Risks and Discomforts:

As all interviews will remain anonymous, thus I do not see any risks or discomforts from your participation in the research.

Benefits of the Research and Benefits to You:

Participating in the research provide an opportunity for practitioner’s to express and share experience and perceptions related to the impact of Near-miss on safety.

By participating, your knowledge and experience as an expert, will contribute to a broader understanding and discussion on what safety means in shipping and how it’s sustained.

Voluntary Participation/Withdrawal from the Study:

Your participation in this study is voluntary and you may chose to withdraw from participating at any time, if you so decide.

Confidentiality:

The information collected during the interview will be kept strictly confidential and available only to the undersigned researcher and for the purpose of the research.

The audio recording will be erased upon completing the transcript, latest one month after the interview. On completion of the research all notes be erased.

Who can I contact to obtain additional information about the study?

If you have any questions or concerns and would like to discuss the study, please contact me:

Mikkel Andersen
Nordic Risk Manager
Codan Marine Insurance
Gl.Kongevej 60, 1790 Copenhagen, Denmark

Email: mi2828ans@student.lu.se
Phone +45 2025xxxx

Consent:

Your signature below confirms that you have read the participant’s package in its entirety, and that you agree to voluntarily participate in this study.

1. My signature is my acknowledgement that I have agreed to take part in the above research.
2. I have received background information about this research. I understand its contents and agree to participate in the intervention program.
3. I understand that I can refuse to participate in the research study by not taking part in the intervention program. I understand that I can withdraw from the study at any time.
4. I will not receive any financial benefits from participating.

5. I agree to the audio-recording of my participation in this research.

6. Participant email address should you wish to receive a copy of the final results:

Name and Signature (Participant) Date

Name and Signature (Consent Taker) Date

Appendix E - List of Themes per respondent

Themes by Respondents A to J	Hierarchy
AT01 Safety is about taken ownership and responsibility, it's personal	Owner
AT02 The influence of Oil majors	Owner
BT01 Capturing safety in the ISM - documentation bureaucracy	Owner
BT02 The dark side of definitions and categories	Owner
BT03 Learning is possible, but we don't / how blame obstruct learning	Owner
CT01 Safety, a perception	Recognized Body
CT02 Deciphering events and understanding the potential of NM	Recognized Body
CT03 The need for NMR	Recognized Body
DT01 Safety is lived and promoted in many colours – variation of life	Recognized Body
DT02 Living Safety in the shadow of the past	Recognized Body
ET01 NM, a safety term	Maritime Administration
ET02 Overcoming learning obstacles and noise	Maritime Administration
FT01 Preserving and harvesting safety	Captain
FT02 The key to the future-unlock the potential	Captain
GT01 Safety - implemented and complied	Captain
GT02 The effect – awareness	Captain
HT01 How the ISM endanger the seafarer	Owner
HT02 Understanding the mechanisms	Owner
HT03 Escaping the "iron cage" – showdown of bureaucracy	Owner
HT04 A second story to be told.	Owner
IT01 Safety, a process to be protected	Owner
IT02 Fine tuning safety	Owner
JT01 Safety - NMR, images of potential dangers	Maritime Administration
JT02 Preconditions - quality and a learning environment	Maritime Administration

Appendix F - Quality and validity

Qualitative inquiry

When taking an interest in how people obtain knowledge about their everyday lives, we are beginning to address the qualitative inquiry. Qualitative research is primarily exploratory research. It is used to gain an understanding of underlying reasons and opinions, using open-ended, unstructured or semi-structured techniques e.g. what is the effect of Near-miss reporting?, and compared with quantitative research, the sample size is typically small (Brinkmann, 2014).

Qualitative research is a situated activity that locates the observer in the world – to capture the perspective of the insider whom we approach as human agents i.e. a naturalistic approach.

In qualitative inquiry, we are not trying to pinpoint a specific causal factor that may have brought about a certain action, but we are rather trying to understand how a certain action makes sense to the people involved – local rationality (e.g. why do we report Near-misses), the context and hidden interdependences. This means that qualitative researchers study things in their natural settings, attempting to make sense of/or interpret phenomena in terms of the meanings people bring to them. (Denzin & Lincoln, 1994)

The outcome of the interpretive, naturalistic approach to the world, is a set of interpretive, material practices that make the world visible to the researcher – representations in way of field notes, interviews, conversations, recordings, and memos (Brinkmann, 2014). Creating - collecting representations may appear simple but is not. In the following, I will present a number of features of the qualitative inquire that influence the quality.

The interview

At this time of a study, it is expected to argue or select a way of inquiry e.g. open-ended, unstructured or semi-structured techniques. Initially, I was determined to follow a semi-structured approach, however reflecting on the process – creating the research questions, planning the interview and the actual execution, a trade-off emerged. How can I explore, if I have a rigid plan and an inflexible mindset? I have concluded, that it is not important to choose a technique – structured or not, but to acknowledge the important question – “how much control do I want to have during the interviews”. Consequently, the questions⁵¹ I have defined will be used as a guideline to facilitate my interview, but the paradigm remain open.

Next how to master the interview – Doxa and Episteme in conversations⁵²

⁵¹ The questions are included later in this proposal

⁵² An interview is literally an *interview*, an interchange of views between two persons, conversing about a theme of mutual interest. *Con-versation*, in its Latin root, means ‘dwelling with someone’ or ‘wandering together with’, and the root sense of *dia-logue* is that of talk (*logos*) that goes back and forth (*dia-*) between persons. (Brinkmann, 2014)

Being able to navigate and apply different paradigms requires knowledge in how to set the scene for an n interview. The style(s) of interviewing is a tool to explore, and may require adjustment(s) during an interview. In figure 1, four different concepts are illustrated (Brinkmann, 2014)

Whereas the typically style is the interviewer does not object to or contradict the interviewee; he more or less acts as a neutral mirror of whatever emerges in the narrative of the interviewee, simply facilitating the process of telling the story of this experience – (receptive and doxastic),



Figure 21: Different conceptions of interviewing Figure 5.1 (Brinkmann,2014)

Brinkmann advocate for the epistemic assertive interviewing – Socrates interviewing, where conversations are used as a tool to move away from mere opinion to arrive at something more trustworthy that may illuminate the way for better understandings. Here the interviewer is allowed to question and challenge what the interviewee said (2014). As an example of challenging questions, I find Flyvbjergs “value–rational”, to bring the research deeper into the context being studied (2006). The questions that underpin his phronetic research are; Where are we going? Is this desirable? What should be done?

Then considering the context. With relativism, everything is to be understood in a context. However, can I define a context, when does it stop/end – is it infinite, or is it implicit?

Context is applied as an elastic term without saying much and can be fuzzy and opaque. Latour conclude “context stinks”, and that it is a trade-off by researchers, when not thoroughly or able to describe the particulars that make something happen in a specific way (Brinkman, 2016, p. 528). If context is boundless, should we leave it behind or is this the argument for paying special attention as it may hold a vital key for our search of a meaning?

R. Dillely describes context as the researcher’s articulation for a specific purpose.

“we must never lose sight of the fact that a claim about context is precisely that – an articulation concerning a set of connections and disconnections thought to be relevant to a specific agent that is socially and historically situated, and to a particular purpose” (p. 528).

If this is so, context does not exist – nothing happens because of a context, but a meaning is created in a context. When I pose my first interview question, I ask the respondent “what safety means in the context of the ISM Code”. Hereby, I create a “container” within safety is to be considered and articulated, and isolating any other thought of safety as e.g. feeling safe.

The context can be viewed through different lenses; the position of the Interviewer, the Interviewee, and the Material arrangement of the situation (Brinkmann, 2016). The position of the interviewer is defined by three types; 1)The Pollster⁵³- the classic approach seeking the opinion and attitudes receptive/doxa style, 2)the Prober⁵⁴ – getting beyond the surface and asking questions strangers would not answer and the 3)the Participant, whom actively engage in a conversation in an assertive style.

As the position of the Interviewer may vary so can the Interviewees. Three arche types have been presented by L.J. Foley. First, she considered the respondent as a Reporter based on the idea “there is a truth to be told”. The respondent may be viewed as “honest and helpful; lying, uncooperative, or forgetful; or unable to comprehend the questions” (Brinkmann, 2016). The second type is the Teacher, where the interviewee is given a degree of freedom - more control over the interview process promoting a conversation alike an in depth interview. Last, is the interviewee seen as an Informant. An Informant, because of the knowledge level being an expert in the field, leading to an interview more factual than descriptive.

Finally, the scene – the context of Material arrangement, not an easy discipline, should be considered. Imagine the impact of; gender, race, body language, dressing, smell, noise, time available, disruptions e.g. phone/SMS and voices for a start. Next, consider, the room and the arrangement in which the interview is held and the impact of a voice recorded on camera. Then, do colleagues, supervisor and managers know about the interview and are they nearby – can they see the interviewee will they prompt them?

As presented the qualitative interview is not simply about people coming together to talk, it requires mediation and non-human aspects are likely, not to interfere, but to contribute. Being aware of these mechanisms, I think is a precondition for quality in my research.

Maintaining a critical position

To remain critical, I will now want to elaborate on “pragmatic pluralism” in thinking ontological about the social world.

Enforcing a rigid position or single bounded ontology/paradigm provides the classic approach. Brinkmann argues to maintain flexible, in different theoretical perspectives as this will provide different answers to the questions – multiple answers. Such an approach acknowledge that each tradition/view may have value in a greater social science context, and keeping an open mind may lead to “unexpected” exploration. With the ontological triangle, Brinkmann introduce a framework to incorporate and apply a multiple approach to inquiry. The legs in the triangle represents different aspects; 1) experience – phenomenological aspect, 2) discourse aspect and 3) objects aspects (2014).

First. The Phenomenologists aspect, the study of human experience, i.e., how the world appears to human beings, and the ‘how’ of experience is often so implicit in a life processes that we fail to recognise it. This stance seeks to describe human experience by making the ‘obvious obvious’. Consider, Heinrich’s

⁵³ can be compared to the previous illustrated concepts the receptive/doxa style, seeking the opinion and attitudes.

⁵⁴ Method of friendship

Accident pyramid argued by IMO “not only with a correlation, but with causality between layers”. How this is experienced by the respondent and is it implicit - hardly thought of or discussed? What is safety and how does Near-miss reporting contribute?

Second. The Critical Stance - making the ‘hidden obvious’ the researcher need to go beyond appearance or the surface to critically uncover a truer reality. This stance is about uncovering the hidden power structures that regulate human behaviour and influence human experience. Making the hidden discursive mechanisms obvious. Is near-miss a social control, behaviour control? Questioning why Near-miss reporting is part of the code and how and why near-miss reporting contributes to safety may contribute making the hidden obvious. Third. Making the ‘obvious dubious’ is deconstructive. This stance implies an attempt to question what we take for granted, not necessarily to uncover hidden mechanisms, but rather to show that meanings and understandings are unstable and endlessly ambiguous.

This require a distortion of the traditionally semi-structured interview in favour of a more conversational confronting approach – Socratic interviewing. To prompt such dialogue, I will to let the respondents account for their understanding of the accident pyramid – what is a correlation, what does a ratio mean, what is causality (between the layers - if so how do we know)? Continuing, what is the impact if we are uncertain about these – why then report a Near-miss?

In the qualitative research, I have identified and acknowledged many parameters affecting the research which are interwoven or partly hidden. We cannot predict the process nor the outcome of interviews, but an understanding of the potential mechanisms, I trust will add to the quality.

Lost in translation

The choice of language for the interviews were at the discretion of the respondent’s. Of the ten interview, eight were in Danish and two in English. For the explication, a verbatim transcript was created based on the audio recordings and observational notes. Exploring the data, summaries of the theme(s) capturing the essence, was translated to English with the purpose of the respondent validating the truthfulness and to be part of this thesis. English, being the maritime language, many of the phrases and words used by the respondents were in English. Thus, the potential loss in translation is regarded as minimal.

Reflections on the interviews’

During the period of interviews, which stretched from June to October and while creating the ten summaries, I reflected on the interviews as carried out. Supported by the audio recordings, I created a representation for each of the ten interviews as I perceived them. With minor deviations, I found the below schematic to represent how the interviews progressed.

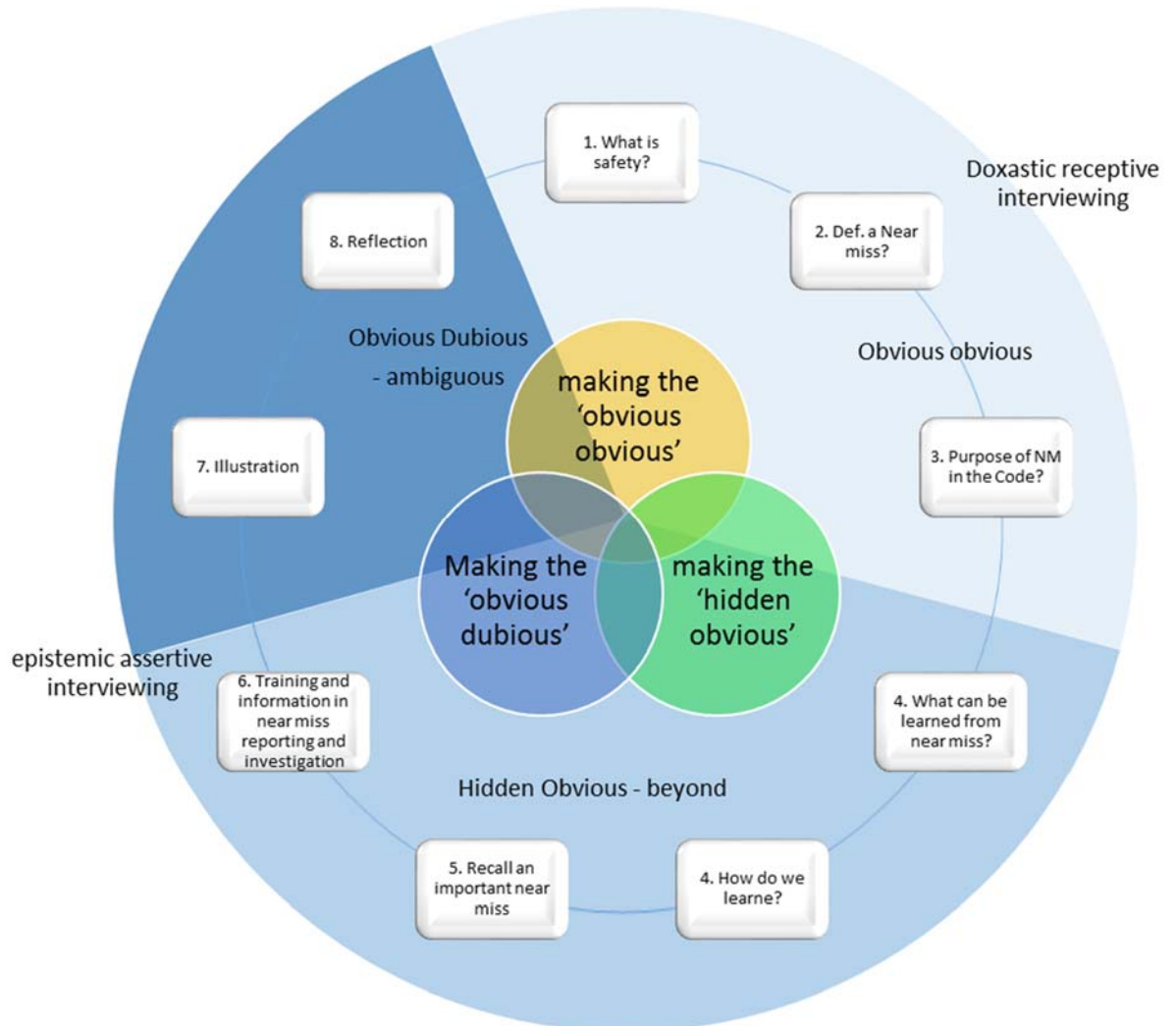


Figure 22: an illustration of how the interviews progressed from a receptive style to an assertive style.

Starting with the obvious questions of; how safety is perceived, how a near-miss is defined and the purpose of the near-miss in the ISM code, the respondent started opening up and sharing experiences and perceptions, while was in a doxastic/receptive role.

Continuing to ‘what can be leaned and how we learn’, all the respondents took more time before answering. Compared to the first three questions, it was evident that the interview had entered a new phase requiring the respondent to reflect before answering. Progressing, the respondents tried to recall important near-miss that had made an impression. For half of the respondents this was difficult and no significant NM could be recalled. In this phase of the interview, I was both assertive and receptive, which was required as ‘self-contradictions’ in the respondent’s answers surfaced. The more epistemic role in the interview created a room in which it was possible to better ‘capture’ the meaning of the respondent.

Entering the final phase, first an illustration of an accident pyramid was presented to determine familiarization and any perceptions and experience using it in relation to near-miss . This was followed by posing ‘value rationale’ questions towards the near-miss concept to create reflection and a dialogue, in which my position was epistemic dominated.

Validating the summaries and themes

Staying true to the experience of the respondent is of paramount importance when doing phenomenological research. Having completed a summary of the interview incorporating the themes found, a "validity check" was completed by returning to the respondents. This to confirm whether the participant agrees that the essence of the first interview has been accurately and fully "captured". (Hycner, 1985).

Overall, my initial explication of the data was well received by the respondents, and I only received a two comments that was an elaboration of noted experiences and perceptions. Subsequent, the relevant meanings where reflected upon and amended – clusters of themes and summaries revised.

Appendix G - Ethical considerations

Until now, I have not mentioned ethics as a mark of quality. When engaged with people e.g. talk to people, analyze what they do and say, and communicating research interpretations, we are engaged in a process with inescapable ethical aspects. Research is supported by theories and guidance of ethic, as I perceive as inspiration or aid to heal moral dilemma's, a researcher may experience. Inspirational, ethical dilemmas can't always be foreseen and may emerge in different shapes over time. What was ruled out in the planning phases of my research may appear at any stage of the research process - during an interview⁵⁵, while analysing or writing the thesis.

One may argue that a set of ethical rules must always be applied as long as it does not reduce our ethical. Contrasting Dewey articulates;

“a man's duty is never to obey certain rules; his duty is always to respond to the nature of the actual demands which he finds made upon him – demands which do not proceed from abstract rules, nor from ideals, however awe-inspiring and exalted, but from the concrete relations to men and things in which he finds himself” (Brinkmann , 2014).

, emphasizing that in the field of social science it is virtues and abilities of the researcher that makes the difference. I conceive ethic as an aspect that requires continuous attention (monitoring, anticipation) throughout my research, and another precondition for quality.

Consulting the Swedish Ethical Review act (www.lunduniversity.lu.se, 2017), I found no requirement to obtain an ethical permission for my research.

Nevertheless, my attention was focused on; informed consent, confidentiality, consequences and my responsibility as a researcher. As a result I created an ‘Information letter’ and ‘Informed Consent’, which was forwarded to the respondents (Appendix D. Information letter and consent form). The letter describe general information of the study and include the recommended paragraphs of a consent letter in compliance with the ethical guidelines by Lund University. This meant the Informed consent form was explained to respondents at the beginning of each interview and any questions were clarified e.g. the information collected during the interview would be kept strictly confidential and available only to the undersigned researcher and for the purpose of the research.

Epoche, seeing things as they appear (testing own bias – bracketing)

An essential key to successfully conduct a phenomenological study, is the ability to stay away from or abstain. This mean being free from suppositions and see things as they appear.

This ability is called “bracketing” or the Epoche, meaning only if “entering a pure internal place, as an open self, ready to embrace life in what it truly offers” and being true to the respondent, can we understand the essence of real life experiences (Hycner, 1985; Moustakas, 2014). Therefore what we are asked, is to enter the Epoche, where you are absolute/unconditional ‘present’ and ‘devoted’ to the experience of your respondent. Even though we cannot determine to what degree we have entered

⁵⁵ In contexts not predictable at this stage

Epoche, our knowledge, attention and energy mobilized, are precondition to reduce the influence of preconceived thoughts, judgments, and biases.

In some cases it may not be possible, or very difficult to “bracketing” as a result of life experiences or fundamentally beliefs. My ability to “bracketing” was challenged and affected as a result of various factors.

First. During my literature review and thesis proposal, my hypothesis was accentuated, thus I was looking for evidence that would support my quest⁵⁶. A quest triggered by personal experiences from assessing various ship managers operation. When determining an approach inspired by phenomenology, first then I became aware that in order to stay as true as possible to the phenomenon – the lived experience, it is advisable not to create or pursue a hypotheses. So, in advance without knowing I had made the process of the explication more difficult as a goal was in sight – an outcome in way of a hypothesis.

Second. Another significant bias, I have identified is the actual participation in the Master program. How do one cope with the significant change in mindset and the effect of the last two years critical thinking and studying with ‘new’ ideas introduced by authors such as Jens Rasmussen, D. Woods, E. Hollnagel, R. Cooks. Prior the Master program, I knew and practiced the old safety view, but today safety is much more nuanced. To me this is a constant challenge. Third. By conducting two pre-interviews ‘quick and dirty’ valuable insight emerged. The main purpose of the pre-interviews was to see if; the semi structured approach would work, if my style of interview was applicable and if the respondents would be able to share their experience for me to extract. Evaluating the interview - my notes and the audio recordings, lead me to the conclusion that my style was to assertive, not putting aside my insight gained in the past years, and, trying to lead and affect the responded to a specific statement without respecting their lived experiences. The effect of the pre-interview was an awareness and adjustment of my style of interview. Fourth. Having sailed as an officer on-board tankers, employed in Classification societies and a superintended with ship managers, a significant insight and experiences within the group of respondents, I needed to “bracket”.

⁵⁶ What Your Look For Is What You Find –WYLF IWYF (Hollnagel, 2008)

Appendix H - Selection of informants

How do I identify a respondent? Assume knowing is conceived as understanding, and understanding is an interpretative affair that constantly takes place on a background of human activity - experience, logic calls for the ideal respondent working with the ISM Code. Considering the hierarchy surrounding any statutory requirement - implementation, enforcement and application, Rasmussen (1997) abstract presentation “Levels of decision making in a dynamic sociotechnical system” provide an interesting frame. Rasmussen’s abstraction inspired me not to limit my focus on the experiences and perceptions of seafarers, but on the different levels of hierarchy likely to represent different views and experience with the Code – near-miss.

I have identified four groups for my qualitative interviews, which I believe have had experiences relating to the phenomenon to be researched.

The four groups are:

1. **Regulators Authorities** - Auditor from Maritime Authority

Justification: Frequently conducting ISM audits for vessels and managers under Danish flag. Also, assessing ISM systems on-board foreign flag vessels as part of the Port State Control regime.

2. **Recognised body** - Auditors from Classification societies

Justification: Conducting ISM audits on behalf of various flag states. Known for comprehensive internal training programs as well as provider of external ISM courses incl. mandatory Program for Designated Persons.

3. **Owner and representatives**

Shipping Company - Designated person and HSQE manager

Justification: Managing the company SMS system e.g. handling and analysis near-miss reports, conducting internal audits and investigations, as well as responsible for training employees in the system.

NGO representing Danish shipping Owners.

Justification: Visiting various vessel types. Promoting and hosting a volunteer NEAR-MISSR data base for Danish shipping.

4. **Vessel**

Captains (crews)

Justification: Experiencing the life at the sharp end working with the SMS. Crews are the expert in normal work and by system requirement required to report near-misses as per ISM code.

An anonymous list of participants can be found in appendices (Appendix A. Informants)

Number of respondents

How do you know the right number of respondents required to reach saturation and does it make sense to talk about a minimum number of respondents – saturation, when conducting a phenomenological study? While the question is quite valid, I will simply state that my groups - ten respondents was guided by the work of Boyd and Creswell (Groenewald, 2004), both recommending up to ten participants.

Having respondents representing four groups (levels of hierarchy), I avoid a narrow perspective and attain a form of triangulation „data triangulation“, which contrast the data and „validate“ the data if it produces similar findings. Designing for multiple perceptions enhances; confidence in the data, unique findings and support a clearer understanding to reveal a phenomenon.

Appendix I - Organizing and explicating my data

My approach 'explicating the data', is inspired by Hycner (1985) and Moustakas (1994), but first a word on explication. The explication, or what we find, is not a product of the data nor the analysis itself. The data is produced in the interaction of the interview and the interviewee, and the findings emerges from the relationship between; the data, the method chosen and the theory.

To resonate with the reader, the explicating of the data is supported by descriptive visualization aiming to make the process applied as explicable and transparent a possible.

The illustration below is a simplification of Hycners 15-step guideline which have inspired the approach and coding.

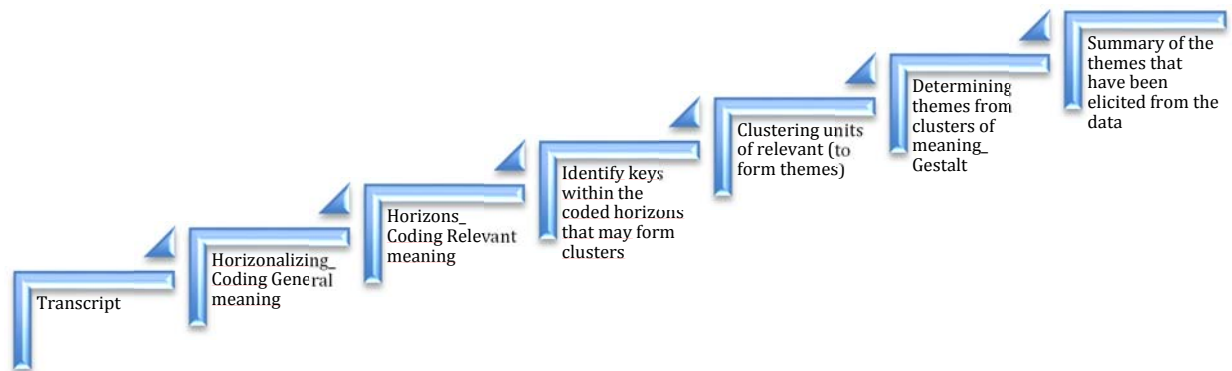


Figure 23: A simplification' of Hycner's 15-step guideline for the phenomenological explication of data

First, a verbatim transcript was created⁵⁷ based on the audio recordings and a colour coding⁵⁸ applied for the eight sub questions, both questions and answers. Units of general meanings were identified in the complete transcript and coded as follow:

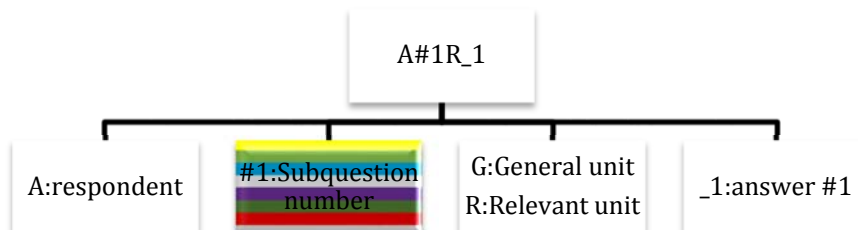


Figure 24: Coding by id and colour

⁵⁷ but with any uniquely identifying information removed or altered to maintain anonymity of the residents discussed

⁵⁸ Using an uniformed type color coding for each sub question in all ten transcripts, provided a quick and easy overview e.g. all text coded in 'red' was related to sub question # 7. This coding was maintained throughout the explication, thus the clusters consisted of relevant units in various colors

First character: Respondent ID, next: sub-question(s), Next: category G or R, Next: sub question answer(s). After identifying the relevant units of meaning, clusters of relevant meaning were created and pre-coded.

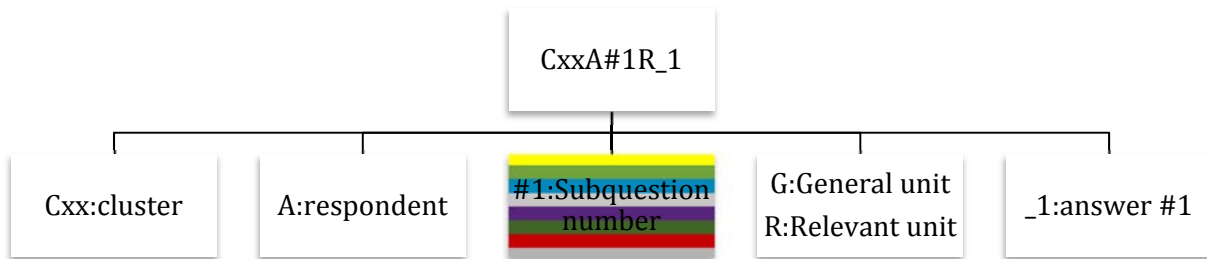
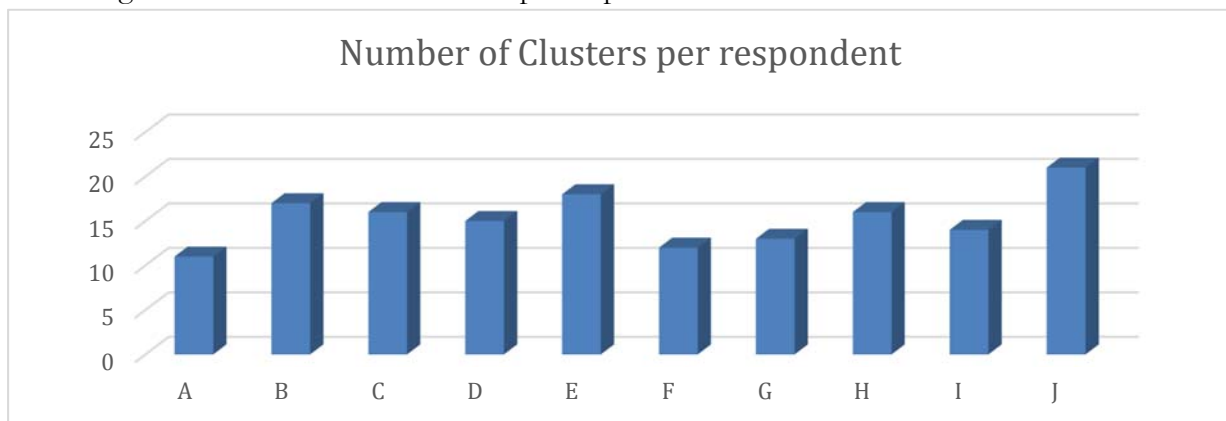


Figure 25: Coding of clusters

Working forwards and backwards in the data, clustering of units of relevant meaning took shape. An average of 15 clusters were identified per respondent.



Tabel 1: Number of clusters identified per Respondents.

Working with the clusters of meaning (and related units of relevance), images of theme(s) emerges – the Gestalt. Revisiting the sub questions and answers, the clusters were confirmed and the themes finalized with a certain confidence. A list of the 24 themes that emerged is presented in Appendix E. For each respondent, a summary of the interview incorporating the unique and general themes - elicited from the data, was created. The summaries describes the experiences and perceptions – it represents a reconstruction of the inner world of experience of the subject (Groenewald, 2004).

Appendix J - Elaboration of Classic and progressive safety

Safety is not absolute, but in the study the notion of classic and progressive safety will be referred to wherefore a short elaboration is justified.

Classic safety

Classic safety is 'defined' as few things as possible go wrong, and governed by a

Management principle of a reactive respond when something happens or if categorised as an unacceptable risk. Work processes/functions – systems, are inherently safe and to succeed there is one norm, why performance variability is harmful and should be prevented as far as possible. Humans are seen as unreliable and predominant liability or a hazard to be controlled, which the SMS is an important tool. The SMS ensure safe operations and quality, if followed, and also serve the purpose of control and documenting compliance with procedures. Success is considered to flow from adherence to processes because the process as designed faithfully represents the task as it is actually carried out. Failure is considered to flow from a deviation from the process. Thus, when things go wrong this is caused by failures and malfunctions and the reactive management response is an investigation with the purpose to understand what went wrong, identify root causes and identify and implement barriers that preventive recurrence. Investigations are driven by an understanding of a linear safety model - a cause effect relationship (causality credo; symmetry) in which Humans, being unreliable, become the focus of attentions and the stopping point of the investigation. The safety model applied prescribe a vision of zero accidents and remedies a to implement barriers – defence in depth.

This safety view is an inhering deeply rooted in our understanding how safety is managed.

Progressive safety

The progressive safety view is a contrast to the cherished classic view. Safety is about making sure as many things as possible go right supported by a management principle of being proactive, continuously trying to anticipate development and events. The system is believed inherently unsafe (intractable and complex in nature) and goal conflicted. Human are seen as a variability and a necessary asset to harness and a resource necessary for system flexibility and resilience, requirements to succeed. With progressive safety the construct of 'human error' do not exist – only a local rationality exist. Things basically happens in the same way, regardless of the outcome. Investigations is about **understanding** how things usually goes right as a basic understanding how things occasionally goes wrong. In this context, accidents are seen as a social/cultural phenomena which require an understanding of the insiders perspective. When labelling an accident, a fragment of behaviour as an error we neglect symptom or problems deeper in the system/organization. Human error categories are thus measures of ignorance, rather than contributing to managing risk.



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