Symposium 2007

Seafarers International Research Centre, Cardiff University

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Table of Contents

FOREWORD

Helen Sampson

This year the Seafarers International Research Centre (SIRC) is twelve years old. For a UK University research centre this is a fairly healthy age. Nevertheless we are not planning on stopping the work we have begun just yet and I hope to be here with you in eight years time announcing that the centre has reached the grand old age of twenty!

The centre was set up in 1995, in order to conduct research into seafarers' health and safety. It is in essence a policy-related research centre, the success of which has been in working closely with the maritime sector. In terms of the centre's achievements I think it is fair to say that these have been built upon the support of key stakeholders in the maritime sector, who have commissioned projects, provided 'core-funding' for the centre, and importantly facilitated, and sometimes even encouraged, research access. Such on-going co-operation suggests a deep rooted desire within the sector to gain a deeper insight into some of the issues relating to the organisation and functioning of the shipping industry with particular attention to issues relating to safety and to seafarer health.

As I said, SIRC is twelve years old, and with the passage of time comes change, and with change there are often challenges. Our challenges are primarily challenges of funding and in the coming years we are going to need to find more support from the industry in the form of research sponsorship (the funding of research posts rather than research projects) if we are to survive. My hope is that the centre will continue for **another** twelve years and that we will continue to contribute to policy debates in the sector via the production of objective reports and papers documenting our various research findings. That is what this symposium is all about: feeding back our findings to those across the sector who may find the kinds of information we have gathered of use to them in forming policy, in reaching decisions about strategy, and in considering

operational matters, whatever kind of organisation they represent. Not everyone here will share the same priorities, some organisations are primarily focussed upon seafarer welfare, some upon safety, some upon the competitive operation of ships, some on the representation of seafarers, but whatever your reason for taking an interest in our research I would like to thank you for coming to Cardiff today and for sharing with us, and with others, your insights and your perspectives. I hope you will find the papers of use, and of interest, and that you enjoy the symposium.

Introduction to Day One

Helen Sampson

The first three papers presented today appear on the surface to be unconnected. In terms of current problems being experienced by shipping companies however these papers have a very close relationship.

Dr Kahveci is going to present the findings of a commissioned study of the provision of welfare services for seafarers. His paper discusses changes in the nature of seafarers' requirements for port-based welfare services. These are predicated upon the reduced time that seafarers have available for shore-leave, and their associated need to prioritise matters that can be dealt with promptly from port. In this, communication with families and friends features strongly. Dr Kahveci's paper also highlights the limited interpretation currently being applied to seafarers' welfare needs on board. Such understandings can be seen to emphasise a need for entertainment facilities such as DVD players, and communication facilities such as email, but give little, or no, consideration to the mitigation of social isolation on board or the alleviation of stress through group activities (games, barbecues, sports etc). The maximization of cargo space and the minimization of cost appear to be the paramount concerns of today's ship builders and the customers of new build vessels, and seafarers' welfare and living conditions (beyond the most basic provision of space for cabins and more frequently today than perhaps previously en-suite washing) are increasingly overlooked.

Mr Gekara, is one of three SIRC-Nippon Foundation fellows[1] presenting research at this year's symposium. His paper presents some of the findings from his PhD study of

[1] SIRC has been awarded a grant by the Nippon Foundation to support people with a social science or a maritime-related background (including former seafarers) through a programme of post-graduate level research which has the potential to culminate in the award of a PhD. The objective of the funding is to support the development of an international network of social scientists focussing on 'human-related' work in the maritime sector. There are currently thirteen SIRC-Nippon Foundation fellows based within the Seafarers International Research Centre. For further details of their backgrounds and research please visit the SIRC-Nippon Foundation Fellowships website at http://www.sirc.cf.ac.uk/Nippon%20Fellows/index.html

the effectiveness of the introduction of the training commitment as part of the UK tonnage tax regime. In considering this area Mr Gekara has explored the perspectives of those working for cadet training sponsors, and colleges, in order to try to gain an understanding of why it is that the number of junior officers has not risen dramatically with the introduction of the training commitment within the tonnage tax regime, despite the increase in the UK fleet in tonnage and numeric terms. Perhaps most importantly of all, Mr Gekara reports on the perspectives of UK former cadets who having initially committed themselves to training, have subsequently withdrawn and chosen to pursue other occupational pathways.

In contrast to both of these papers (Kahveci and Gekara), Mr Tang is not going to discuss the perspectives of seafarers themselves but of seafarers' partners. The importance of the family for seafarers' decisions to go to sea, and whether or not to remain at sea, has been demonstrated to a limited extent by previous research undertaken by SIRC. Seafarers' partners have been shown to accept the brunt of the responsibility for: child care and rearing; parental care; emotional labour in relation to the maintenance of seafarers' friendships and family relationships; household management; and so forth. Their willingness to shoulder the burdens of practical life is essential in enabling seafarers to continue to work at sea, and their support is often a central pillar for the emotional and psychological strength of seafarers when enduring the isolated and often stressful conditions they work in. By focusing on the young partners of Chinese seafarers many of whom have yet to commit to marriage Mr Tang gives us a unique insight into the pressures and privations which seafarers' partners experience. This, in turn, offers us an understanding of the issues which seafarers have to deal with in relation to their emotional relationships with partners. Sometimes these may be impossible to satisfactorily resolve and Mr Tang's paper offers us a very clear understanding of why it is that many younger seafarers may choose to leave the sea rather than sacrifice close emotional bonds with loved ones.

So what is it that links these three, rather different, papers? Today one of the major preoccupations of fleet personnel managers, whether they work in ship management companies or for 'owner operators', is the recruitment and retention of suitably qualified and experienced officers. The crisis in the supply of such personnel can be attributed to a concatenation of circumstances which include: an increase in demand

spurred by a boom in trade and a rapid expansion of the world fleet; a fall in the supply of seafarers from traditional maritime nations such as the UK; increasing numbers of seafarers leaving the industry for shore-based jobs at a relatively early age; and a decline in the provision of cadet berths. When we begin to unpick the problem in these terms we see the connection between the three papers mentioned. Dr Kahveci and Mr Tang's papers shed some light on why it is that many seafarers seek to leave 'the sea' at a relatively early stage in their career whilst Mr Gekara's focus is more directly on cadets and the supply of new young officers to the sector.

At the present time, in trying to deal with the problem of the limited availability of officers, the focus of many in the sector is wages and we have seen senior officers' wages increase dramatically in the last five years. However, what these three papers highlight when put together and considered in the light of an officer shortage, is why seafaring can be seen as an increasingly unattractive occupation and why paying higher wages cannot offer a long term solution to the challenges of recruitment. Higher wages mean that in the medium to longer term seafarers will be able to leave 'the sea' at an earlier and earlier stage in their careers. This will further reduce the numbers of available officers and put further pressure on wages, resulting in a wages spiral which will allow seafarers to leave the industry even faster, and so forth. Clearly such a situation is unsustainable and is likely to produce a major crisis in the sector with ships being tied up, more accidents resulting from the recruitment of lower quality personnel, etc.

Current research at SIRC, illustrated by the findings presented in the first three papers of this year's symposium, suggest that what is required is not just higher wages but a more systematic effort to improve the lives of seafarers at sea in order to retain them on board. This kind of effort was once evident in the Scandinavian and North European fleets when considerable consideration was given to thinking about life and work on board and the kinds of living and recreational facilities that seafarers would benefit from. Today it seems there is an assumption that seafarers from developing countries don't need such provision (I have heard people 'explain' this to others) but I think that the evidence speaks for itself. People wherever they are from are all capable of experiencing suffering as a result of: isolation; boredom; confinement; institutionalisation; fear; heat; cold; noise; vibration; fatigue; and stress. Seafarers are

no different. The need for the provision of a decent lifestyle on board a ship knows no ethnic or cultural boundaries. If it is not provided, then seafarers, wherever they are from, will constantly weigh up economic necessity and privation. As soon as their economic needs can be satisfactorily met, in their judgement, they are likely to leave an uncomfortable life aboard ship for a less-well paid but happier life ashore with their families and friends. A consideration of the findings from various SIRC studies strongly suggests that the key to keeping seafarers at sea is to make seafaring an attractive occupation where adequate compensation is provided on board for the privations associated with such remote and monotonous work.

The fourth paper of the day deals more **directly** with the current concerns of the industry via a focus on risk and risk management. Professor Walters has undertaken a great deal of land-based research on safety, and safety management, and in recent years has undertaken an extensive study of land-based chemical risk management. For the last six months he has drawn upon this expertise in undertaking a small-scale and preliminary investigation of chemical risk management at sea, with regard to both the transport of chemical cargoes and the use of chemicals in the course of daily work on board merchant vessels. In this paper he highlights the dearth of knowledge about practice in this area, the lessons that can be learned from land-based experiences of risk management, and the contribution that risk-management at sea could, potentially, make to the elucidation of best practice ashore.

Introduction to Day Two

Helen Sampson

Today sees the continuation of the theme of safety and risk management begun for us with the delivery of the last paper of yesterday's session given by Professor Walters. Professor Walters considered the very specific application of risk management to the use and transport of chemicals. However, today's papers consider risk and safety at a more general level.

We begin with an account by Mr Ellis of some research activity which we have initiated under the auspices of the 'Perceptions of Risk' study undertaken by the Lloyd's Register Educational Trust Research Unit (LRETRU) formerly known as the 'Lloyds Register Research Unit' or LRRU, here at SIRC. In the course of this research we have sought accident data from a variety of stakeholders. Our ambition was to compare data gathered on seafarers' perceptions of risk, and the perceptions of those involved in the shore-side management of vessels, with the 'reality' of risk. We have been limited in realising this ambition by the inadequacy of the available data relating to accidents/incidents at sea. Whilst various types of information are collected, collated, and sometimes analysed, by stakeholders in the sector such data are invariably limited in their coverage. This makes it impossible to aggregate data and thereby establish, with any degree of confidence: how risk prone the shipping industry is in general terms: where risk is concentrated (types of ships, types of trades, types of activities and so forth); and/or where risk management is being successfully achieved. However, not to be defeated, we have set out to document what kinds of data are available from three sources: Maritime Administrations; P&I clubs; and individual companies; and have sought to describe how these might best be utilised and what kinds of data could valuably be collected and collated in the future, in order to facilitate the development of far more robust information on accidents at sea. We are hoping that these preliminary efforts might be a catalyst for a concerted effort by key stakeholders to standardise data collection relating to accidents at sea to allow us

to develop, for the first time, a valid understanding of maritime accidents and incidents. We would be grateful for any assistance which can be volunteered by stakeholders in furthering this objective.

Following on from the account by Mr Ellis, Dr Bailey describes what we have been able to make of the available accident/incident data, in relation to the production of a comparison between the perceptions of risk held by seafarers/those involved in the shore-side management of vessels and the kinds of risks which appear to predominate in the industry. Here Dr Bailey draws heavily upon the outcome of a major survey of risk perception undertaken by LRETRU and data which we have been able to access from seven of the thirty largest maritime administrations in the world. This research is on-going and we hope to produce a full report of the findings in 2008. For the present, Dr Bailey offers a clear understanding of seafarers'/managers' perceptions of risk and draws some conclusions about the nature of risk in the industry and the different ways of seeing risk found across the industry workforce.

One of the very interesting findings which emerged in the course of the analysis of our extensive questionnaire on perceptions of risk (LRETRU), was that they are strongly influenced by nationality. Chinese respondents were found to see risk in the general domain of shipping as relatively low, whilst they ranked the risks which they perceived co-workers (employed by the same company as themselves) to be faced with as relatively high, when compared with other groups of respondents of different nationalities. Intrigued by these findings we developed a study within SIRC designed to explore with Chinese seafarers the issues which impacted upon their perceptions of risk. This study is still ongoing and to date Dr Wu has boarded two vessels wholly crewed by Chinese nationals in order to consider the issue further. His paper represents a preliminary analysis of his findings which currently point to structural factors (such as local labour market conditions, and management practices and policies) having a stronger influence over perceptions of risk than cultural factors.

Last but not least, Mr Bhattacharya, the third of our SIRC-Nippon Foundation fellows to present a paper at the symposium, will discuss his research into the implementation of the ISM code. His paper focuses on the importance of seafarer participation in relation to the effective management of safety on board and considers the factors

which block or impede such participation. It concludes that a number of issues confront the industry in its quest to develop an effective safety management system i.e. one that successfully achieves a reduction in accidents/incidents. Not least of these is a lack of awareness amongst many shore-side managers of the importance of seafarer participation in effective shipboard safety management. Other barriers relate to the hierarchical structure of shipboard relationships, the nature of the labour market (e.g. the widespread application of temporary contracts), and a lack of trust in aspirations, on the part of management, to foster 'no blame' or 'just' workplace cultures.

This collection of papers represents some of the current interests and concerns of the Seafarers International Research Centre. Inevitably, our research interests extend beyond those that we have been able to present here and incorporate work on: regulation; education and training; transnationality; the impact of globalisation on seafarers' living and working conditions; the under-reporting of personal accidents by seafarers; the long-term health consequences of working at sea; seafarers' nutrition; the mental health of seafarers; and a range of issues which have in common a broad conception of health and safety. By its nature this short symposium allows us to offer a flavour of just *some* of the work that we are undertaking, or planning, at the centre. Nevertheless we hope that this selection has been of interest and value and that you continue to take an interest in and, where possible, support the research undertaken at the Seafarers International Research Centre.

Please note that all the views offered here are those of the authors and do not necessarily constitute the views of the SIRC, or Cardiff University, management nor those of our sponsors and funders. Please include a full citation (reference) when quoting any parts of any of the papers contained herein.

WELFARE SERVICES FOR SEAFARERS

Erol Kahveci

Abstract

This paper assesses the adequacy of welfare provision for seafarers, in port and on board vessels, by analysing primary data obtained through extensive research undertaken with both seafarers and shipping company key informants. The research utilised questionnaires and semi-structured in-depth interviews. The paper identifies 'best practice' and areas where improvements are needed in relation to welfare provision at sea. It recommends a number of wider policies and practices for the consideration of regulators, policy makers, shipping companies and ship management company personnel.

Introduction

The ILO 2006 Maritime Labour Convention is currently in its ratification phase. However, there is a general consensus in the industry that if, and when, the convention is ratified by sufficient administrations the conditions set by the Convention will establish comprehensive minimum requirements for almost all aspects of working conditions of seafarers. As far as welfare issues are concerned the convention covers access to shore-based welfare facilities and services; also onboard recreational facilities including reasonable access to ship-to-shore telephone communications and e-mail facilities. However, there are two questions here, firstly, what do we actually know about seafarers' access to port based welfare services world-wide and secondly what do we know about the current state of recreational facilities and access to telecommunication facilities aboard merchant vessels? In this context the paper aims:

- To explore current seafarer access to shore based welfare facilities and services;
- To document the provision of recreational facilities and access to telecommunication facilities aboard merchant vessels;

- To critically assess the adequacy of welfare provision for seafarers from a seafarers' perspective.

In the following sections of this paper these main aims will be examined by the analysis of a recently completed SIRC research project funded by the ITF Seafarers' Trust which was started in April 2006 and finalised in March 2007 (see Kahveci 2007 for further details).

Research methods

The research was conducted in different locations combining various research methods (i.e. an extensive seafarers' questionnaire, semi-structured in-depth interviews with seafarers and key industry informants etc.) and these included:

- 86 questionnaires from shipowners and key ship management company informants.
- 52 semi-structured interviews with ship owners and ship management company informants in the UK, Cyprus, Germany, Greece, Norway, Hong Kong and Singapore.
- 3,792 questionnaires from seafarers (stratified sampling applied to the top 20 maritime labour supplying countries and the sample target is based on 1 per cent representation)
- 112 in-depth interviews with seafarers in their home societies in the Philippines, India, Russia, Ukraine, PRC, Turkey and the UK

Summary demographics

Table 1 below summarises the number and nationalities of the seafarer respondents to our survey. Of those included in the survey 53 per cent were employed on deck, 40 per cent in the engine room and seven per cent in the galley. Fifty-one per cent were

ratings. Of the rest 17 per cent were senior officers, 21 per cent junior officers, nine per cent petty officers and two per cent were cadets.

Table 1: The top 20 seafarer supplying countries and the number of seafarers who responded to the survey questionnaire

	Nationality	Frequency	Valid Percent	Proposed 1 per cent representation	Returned questionnaires
1	Philippines	132314	27.1	1323	1417
2	Russia	40871	8.4	409	379
3	Ukraine	40305	8.3	403	419
4	China	30855	6.3	309	164
5	India	23861	4.9	239	320
6	Indonesia	17761	3.6	178	147
7	Poland	17254	3.5	173	175
8	Turkey	15277	3.1	153	210
9	Greece	14216	2.9	142	101
10	Burma/ Myanmar	10830	2.2	108	62
11	Syria	10273	2.1	103	48
12	Romania	10081	2.1	101	80
13	Latvia	9552	2.0	96	49
14	Bulgaria	9502	1.9	95	70
15	Croatia	7893	1.6	79	21
16	Korea, South	5946	1.2	59	18
17	Egypt	5828	1.2	58	27
18	Netherlands	4387	0.9	44	33
19	Italy	4295	0.9	43	35
20	Taiwan	4265	0.9	43	17
	Total	**415,566**		**4,158**	**3,792**

Note: for frequency and valid per cent *SIRC Global Seafarer Labour Market Survey 2003*, used as a source.

Most seafarers were married (71 per cent), 28 per cent were single and only one per cent were divorced, separated or widowed. There were only 18 women respondents. The youngest seafarer was 18, the oldest 65 and the average age was 36. The years at sea varied from a couple of months to 49 years with an average of 14 years. The average lengths of contracts were five months for senior officers, seven months for junior officers and nine months for petty officers and ratings. When they responded to our survey questionnaire they were on average into their fiftieth month of current contracts at sea.

We estimated that seafarers responded to our survey from circa 400 ships. Twenty-eight per cent of seafarers worked aboard bulk carriers, 19 per cent on general cargo, 18 percent on tankers (including oil, chemical and gas), 11 percent on containers, four per cent on Ro-Ro (including car carriers) and the remaining 20 per cent aboard different type of vessels (including unknown). The voyage cycle of the vessels where the seafarer respondents sailed showed variations. Just over 28 per cent of the vessels were involved in short sea trades, 20 per cent were involved in deep sea crossings with intense port calls, 17 per cent were involved in deep sea crossing with few port calls; another 15 per cent were involved in regional trades (i.e. Mediterranean, Black Sea, Baltic Sea etc.), 11 per cent said the trade patterns of their ships were changeable. The remaining nine per cent said that their ships sailed world-wide without making any specific reference to the nature of their ships' voyage cycle.

The majority of the eighty-six shipping company survey respondents were ex-seafarers (n=75), having served as senior deck and engine room officers. Only 11 of them had no previous sea-based career. The biggest company in our survey owned/managed well over 200 ships and the smallest had only 3. Their position in the company also varied from senior managers (owner, president and vice-president, n=8) to managers (crewing, communication, operation etc., n=53) to lower line management (superintendent etc., n=25).

Access to shore-based welfare facilities and services – shore leave

It is a simple fact that in order to have access to shore-based welfare facilities and services seafarers need to have adequate shore-leave. Seafarers overwhelmingly acknowledged that having shore leave was important for their physical and mental well-being. They also made frequent reference to the importance of 'seeing different faces and places', having a break from the stressful shipboard environment and work pressure. They explained that it was time for them to contact their families as shore leave provided them opportunities to use cheaper telecommunication facilities. Here are some first person accounts to highlight this:

> "Shore leave is important because it is the only way for letting our stress out. We are like prisoners onboard. We need to interact with other people and see different faces and places."

> "For me it is important to have shore leave, even once in a while just for a few hours. This is the worry free time from all those traumas in the engine room and all those problems on the ship. And being relieved from home sickness or sea sickness."

> "It is very important because when we have a shore pass; it's the only time that we can forget our problems on the ship. Then it's also the time we can call our family. It is the time that no-one will tell you to do this or do that. No boss when you go out. It is my favourite time; my favourite part of seafaring."

> "When I have a shore leave I can release my boredom. It's another environment and I can refresh myself."

One seafarer said that his ship had just been in dry dock in China for 17 days and he had gone out every evening. However, his case was atypical. When seafarers were asked how many times they had shore leave during the last eight weeks, as can be seen from Table 2, 64 percent of the respondents said they had not had any shore leave during the last eight weeks. However, for some the lack of shore leave went well beyond the previous eight weeks:

> "My last five contracts, including the current one have been on LNG tankers. Our route is only between the Middle East – Qatar and Japan – Bay of Tokyo. It takes fifteen days between the two ports. We stay in port 18 hours in both ends. In Qatar, it is impossible to have shore leave. In Japan we are always busy with engine work or gangway watch. So over the last 50 months at sea I've never had shore leave. Once we had this emergency dry dock, for two days in Jabel Ali and even then we were within the port compound, we didn't go outside."

Some other seafarers provided more typical examples of shore leave:

> "I have not had any shore leave during my current contract at all. We are very busy in ports. Only port we stay over night is in Japan which is our main loading port, but at night we are like prisoners onboard. They close all the port gates. Although you are sometimes off duty at night you cannot go out. This happened to me twice already during my current contract."

> "Our ship trades between Korea and Europe. Ulsan is our loading port and we stay in port over night while loading cars. Every time we stop in Ulsan I have shore leave which is every other month. So I have one shore leave every eight weeks."

Thirty-six per cent who had been able to take shore leave during the same period said that their shore leave on average lasted around two hours. Voyage cycles of the ships that seafarers sailed aboard could be seen to have had an impact on their shore leave opportunities; as the majority of seafarers who had taken shore leave during the previous eight weeks worked aboard short-sea trade vessels.

Table 2: Number of shore leaves during the last 8 weeks

	Percentage
None (N=2160)	64
Once (N=270)	8
Twice (N=371)	11
Three times (N=169)	5
Four times (N=201)	6
Five Times and more (N=204)	6

N= 3375

There was a further question for seafarers who had taken shore leave asking whether they spent it within the port area or went beyond the port gates. In response, fifty-three per cent (N=604) of seafarers said that they spent their shore leave within the port area.

In-depth interviews with seafarers revealed that when they had an opportunity for shore leave their main priority was to make a phone call to their families and friends and their shore leave did not extend beyond a phone box either in the port area or seafarers' centre. Seafarers who got beyond the port gate stated that the main motivation for this was either to go shopping for their basic needs or again to use communication facilities which are not in the immediate port area.

The main reasons given for not having shore leave and for lack of access to shore-based welfare facilities were workload when ships were in port; fast turnarounds; lack of information about ports where ships called; lack of transport; and restrictions, imposed by port authorities, related to the ISPS Code. According to the 1996 MORI survey, 57 per cent of seafarers were satisfied with their shore-leave. Today, on the contrary, 64 per cent of the seafarers were not able to have shore-leave for a considerable length of time.

The limited access to shore based welfare facilities and services due to lack of adequate shore leave had an impact on the ranking of important port based welfare services for seafarers. In seafarers' opinions the importance of using traditional port based services such as organised sightseeing, video/book exchange and reading rooms have declined. The next section of the paper demonstrates this change over the last 10 years. The MORI 1996 *Seafarers' Living Conditions Survey* serves as a very useful comparison point to document these changes.

Important port based welfare services for seafarers and changes over 10 years

Seafarers were asked to rank the importance of 15 selected port based welfare services (as "important"; "neither/nor"; "not important"). In order to document changes over

the last 10 years this question was adopted from the MORI 1996 *Seafarers' Living Conditions Survey*. However, the 1996 Survey did not include port based welfare services such as transport to seafarers centres; availability of cheap phone cards which did not exist in 1996, and internet access which was in its infancy in 1996. These items were included in the 2006 Survey.

Table 3: How important each port based welfare service is for seafarers (Percentage of seafarers who said it was important)

Services	MORI 1996	SIRC 2006	Change over 10 years
Transport to shops/town	70	85	+15
International phone	79	81	+2
Transport to seafarers' centre	N/A	72	N/A
Cheap phone cards	N/A	70	N/A
Internet access	N/A	68	N/A
Personal counselling services	45	57	+12
Place of worship	48	53	+5
Port based medical clinic	70	44	-26
Reading room/library	50	17	-33
Video/book exchange	64	15	-49
Organised sightseeing	48	13	-35
Meeting local people	53	10	-43
Sports facilities	51	10	-41
Money exchange	66	9	-57
On shore accommodation	44	9	-35

As can be seen from the table, over the last 10 years the opinions of seafarers in relation to the most important port-based welfare services have changed. As in the 1996 MORI Survey, port-based welfare services such as transport to shops and town, and international telephone facilities are very important for seafarers. In fact over the 10 years the importance of these services for seafarers has increased slightly.

The other port based services which were not listed in the MORI survey, such as transport to a seafarers' centre; availability of cheap international phone cards; and internet access are also regarded by seafarers as being important.

Availability of services like a port based medical clinic and personal counselling services have been regarded as more important in comparison to the 1996 MORI survey.

The most important changes occurred, however, in relation to the need for a reading room/library; video/book exchange; organised sightseeing; meeting local people; sport facilities; money exchange; and on shore accommodation. In comparison with the 1996 survey, the importance of these services for seafarers has declined considerably.

This major shift reflects changes in the maritime industry and the basic priorities of seafarers faced with limited time in port. In fact, when seafarers were asked what would improve their lives at sea their emphasis focused on the shipboard welfare. They frequently mentioned a desire for people from shore based welfare agencies to visit their ships or for companies to expand their onboard welfare facilities and services. In other words in the context of seafarers having very limited opportunities to have access to shore based welfare facilities and services, the provision of adequate shipboard welfare facilities are very important for seafarers' physical and mental well-being. The next section of this paper focuses on the current state of the onboard welfare provisions for seafarers.

Onboard welfare provisions

As the respondents worked for circa 100 shipping and ship management companies their onboard welfare provisions such as sports and recreational facilities varied considerably according to the different companies they worked for. One of the most frequently reported company policies for welfare provision included a monthly provision of approximately $100-150 contributed to the welfare fund of each ship in the fleet. From this budget seafarers would decide what to buy (i.e. DVD's, sports equipment, musical instruments etc.). The worst cases of onboard welfare provision varied from very limited provision to 'pay for it yourself' - where seafarers contributed to shipboard welfare funds either from their overtime pay or extra earning

onboard (such as earnings from cargo handling or cleaning of cargo holds). Here are some first person accounts to demonstrate these alternative approaches:

> "Our facilities for entertainment are good. We have complete DVDs; it's pirated but better than nothing. Our yearly budget is for entertainment, exercise equipment and games etc. and it is $1,200 per annum."

> "We have so many facilities onboard. We have a whole basketball court, swimming pool, gymnasium; we have also table tennis, darts, chess and other table games and complete set of musical instruments and lots of movies, CDs and, DVDs. … Five dollars deduction from every crew member's salary monthly and the welfare committee decides how to spend it - if there is something to be bought or something to be paid. In addition once a year – every December the company allocates also $1,000 for the purchase of equipment. For example last December we have purchased a play station and a DVD player. The captain also cuts some funds from our overtime pay for the purchase of movies."

> "When we lash containers we get paid one dollar per container, every month 10 per cent of the lashing money goes to the ship's welfare fund."

> "My ship is a passenger luxury liner. We have a library equipped with all the CDs and DVDs but it's very hard to compare it with the passengers, because we rent them for one dollar a day. We can also borrow a book but need to put a $20 deposit."

It needs to be emphasised that as far as seafarers are concerned their financial contribution to 'ship welfare funds' is involuntary. "They never ask if we want to pay or not" said one seafarer and "we can't say no, this is a company rule" said another. The system that allows deductions from seafarers' payments for the purchase of on board entertainment equipment creates suspicion and disagreement. One seafarer said "we pay money for the ship's welfare fund but don't get anything back". A rating said "officers buy what they want not what we [ratings] want".

Seven out of 10 seafarers said that it was important for them to have access to e-mail at sea. However, only 16 per cent of the seafarers reported that they had access to onboard e-mail facilities. There are differences when senior officers and ratings are compared. Their access to on board e-mail facilities for private use was 40 and three per cent respectively. All the vessels that seafarers worked on had e-mail facilities. However, it was generally stated that this was mainly for official use. Where it was possible to use e-mail on board seafarers expressed dissatisfaction with the limitations placed on the number and length of messages they could send and also the lack of privacy associated with email communication. Some seafarers said that they not only had to pay for the messages they sent from their ships, but also for in coming e-mails too.

> "We have e-mail onboard the vessel but it is at the discretion of the master. Some times he lets the junior officer use it but some times not. Some times he lets the crew use it and some times that's also limited but there is no problem for senior officers."

> "Our captain is quite good. He allows us to send 4 e-mails a week."

> "Our first captain said we could only send 2 emails a week. However, the new captain said that we could send 3 emails a week, but only at weekends - Saturday or Sunday."

> "We can use e-mail onboard but you have to buy a 20 dollar internet card, it is very expensive. I pay minimum of $1 for each mail I send or receive. The price goes up by bytes. Each card cost $25 and I use 3 cards a month. I can send about 10 e-mails per card. I also receive some."

> "Only communication I use is via satellite phone which is very expensive. We have an e-mail onboard but it is for the ship's business only even as a Chief Officer I don't have an access to it for personal use."

> "We are not allowed to use the e-mail. It's only for the business communication."

As some of the seafarers' accounts illustrated above suggest the shipping companies that they worked for had no clear policies on shipboard e-mail access for them and captains' discretion played an important role. This policy has potential to create a further division amongst the crew members on board ships.

The main means of communication for seafarers with family and friends whilst at sea was the satellite phone. This was followed by personal mobile phones (mainly text messages) when they were in range of a signal. Only one in 10 seafarers mentioned writing letters. Although this is the cheapest option available, many said that the limited time they had, and the length of time it took for letters to be sent and received, made letter writing less attractive.

Company policies on seafarers' welfare

The questionnaire analysis and the in-depth interviews with ship owners and ship management company representatives revealed that onboard seafarers' welfare provisions were heavily influenced by company preferences and practices. This creates a very fragmented welfare provision for seafarers at sea with a big gap between the 'top' end of the industry and the 'bottom'.

> "In our fleet the onboard welfare facilities vary. Some clients are more concerned with crew welfare than others. We have to give them a free hand to some extent and we only step in when there are problems. We employ 3,000 seafarers and have had no welfare related complaints so far this year."

> "We have a vested interest in looking after seafarers' welfare because quite frankly, happy seafarers are far more productive. It's far nicer to manage happy people, so why not make them happy if you can and still be relatively competitive."

The analysis of company policies on seafarers' welfare shows parallels with seafarers' accounts of their experiences of onboard welfare provisions which were reported earlier. As we have also seen, some companies aim to provide welfare services for

seafarers which are directly or indirectly subsidised by seafarers themselves. Here are some examples to demonstrate this.

> "We have shipbased welfare funds. The money is collected in these funds through supernumeries onboard. For example, if a senior officer sails with his wife he contributes to the welfare fund US $3.50 every day that his wife stays onboard. We have no restrictions on ranks to sail with a family member and sometimes if the space permits a crew member could be joined by his wife and children together but they must contribute to the shipboard welfare fund. The money accumulated in this fund can only be used for the crew entertainment onboard. They could purchase sports equipment or DVD's and so on."

> "These days many crew members have their own laptops, DVD players and other equipment in their own cabins and they all have different taste. In some parts of the worlds where our ships trade our crew could buy music CDs or DVD movies very cheaply."

This "different taste" has also been emphasised by another manager:

> "Our company recruits crews from seven different countries through local crewing agencies. All these seafarers have different tastes. We have common understanding with the crewing agencies that they send DVDs in Tagalog or Hindi with a joining crew regularly. This is part of their service."

However, it must be emphasised that encouraging seafarers to subsidise their own recreational facilities on the basis of different tastes could create some problems for a cohesive social life on board vessels. Seafarers spending their time alone in their cabins watching DVDs on their computer monitor, or different nationalities arranging their recreation according to their "different taste" aboard the same vessels, could have some serious consequences for the safe running of the ship as well as physical and social well being of seafarers. These sort of company policies for seafarers' recreation limit social interaction between crew members and deepen the social isolation of seafarers.

As emphasised earlier, onboard recreation provision for seafarers differs enormously from one shipping or ship management company to another. This pattern persists when monthly crew welfare and recreation budget allowances are considered. As the table below demonstrates when company representatives were asked about their average monthly welfare budget per ship, over 50 per cent indicated that they do not have any regular monthly budget allowances. "We don't have a particular budget but we supply movies and entertainment systems and all that on board" said one manager and "we spend some months over a thousand dollars on stereo systems or TVs but not much in the next. It all depends on demand" said another. Similar points were echoed by other managers. Some ship management company representatives emphasised that although they have no particular welfare budget allowance as such their ship operating budget covers items related to crew welfare.

However, 26 per cent of company representatives said that their companies have a monthly on board welfare budget allowance per ship of between US$100 and $150, and another 18 per cent of under $100. Table 4 below, also demonstrates the extent of 'contributions' made by seafarers to shipboard recreational welfare funds. Altogether 28 per cent of our respondent group have practices in place to this end.

When the best budget allowance per ship is considered the amount of money per capita is fairly low and in real terms it is insufficient to maintain most facilities and/or equipment let alone improve the current low level of onboard provision.

Table 4: Monthly company budget for ship-board seafarer recreational facilities (per ship)

	Percentage
No regular budget but facilities are provided on demand (N=16)	20
No specific budget but provisions included in the ship operation budget (N=13)	16
No regular budget but company provisions coexist with (involuntary) contribution from seafarers (N=12)	15
Regular budget over $100 and provision on demand (N=12)	15
Regular budget between $100 and $150 and further (involuntary) contribution from seafarers (N=9)	11
Regular budget under $100 and further (involuntary) contribution from seafarers (N=7)	9
Regular budget under $100 (N=7)	9
Other (i.e. supernumeries contributing to onboard welfare fund) (N=3)	4

N= 79

One of the striking outcomes of the survey and interviews is that in general companies have a narrow sense of seafarers' welfare which mainly focuses on the provision of limited leisure and entertainment facilities, such as TV monitors, DVD players and DVDs, music systems and so on. During interviews and focus group discussions with seafarers, they emphasised that sometimes ships they sail on have recreation facilities such as gymnasium rooms, swimming pools, saunas, bars, reading rooms and libraries. However, increasing numbers of vessels are built without such facilities as emphasis is increasingly placed upon cost and cargo space, as opposed to crew welfare.

Where they do remain it was reported that these spaces are often not utilised for the purposes they were built for. It emerged during interviews with seafarers that the spaces may be left empty, turned into store rooms or locked up permanently. One manager making reference to one of his multi purpose ships which was built in the early 1990s in Finland said "that ship has so much empty, unused spaces. Life onboard changed a lot since that ship was built". He implied that the ship was built originally by a Scandinavian company employing Scandinavian crew and his company employs seafarers from the Philippines, India and Indonesia and that crews from these countries do not 'need' a reading room, sauna or a gym. It was evident

from the findings of the research that assumptions are being made about what crew require on board and what they do not based upon stereotypes and seeming prejudice. Crews themselves are likely to feel unable to resist practices such as never filling up the swimming pool or turning over gymnasia for storage space given the precarious nature of their employment, and in any case a gymnasium full of obsolete un-maintained equipment may eventually fall into 'voluntary' disuse. If companies are not prepared to equip and properly maintain reading rooms, gyms, saunas, swimming pools and so forth, as a matter of priority, then inevitably seafarers will end up not making use of them.

In fact, newly built vessels are often based on the optimisation of available space for cargo and sometimes for daily work which results in smaller crew quarters. In general it seems that the provision of onboard welfare facilities for seafarers is going in the wrong direction. Given the shortage of qualified seafarers and problems with seafarer retention in the industry, this is not a good impression to give future recruits, and the industry needs to address the provision and maintenance of shipboard welfare facilities for seafarers. In fact, at a time where concerns are being expressed about seafarers' health onboard, recreational facilities such as swimming pools, gyms, separate recreation and mess rooms could improve social interaction on board contributing to an improvement in both physical and mental wellbeing. Similar views in relation to the importance of recreational facilities on board are also expressed elsewhere (Du Rietz and Ljunggren 2001; Sampson 2000: 2006).

To finalise the paper on a positive note, some companies have managed effectively to secure shore-leave for their crews despite their vessels having fast turnarounds and busy schedules and some others provide unlimited e-mail access to their seafarers:

> "With a very few exceptions we have free shuttle services for our seafarers in every port that our ships operate, even if there is only one seafarer who could have shore leave in that particular port. The service operates on demand and makes a couple of rounds if necessary to accommodate crew members who are on duty. Of course this costs money but we see this as an investment and we have very good return in our investment. We can see the outcome of this service

although it is difficult to measure it. We have a very high retention rate, our crew is loyal to us, they are happy and healthy."

"In our fleet every crew member onboard has a private e-mail account and unlimited access to send and receive e-mails."

Conclusions

It is widely accepted in the shipping industry that due to changes in relation to globalisation and competition and also in relation to fast turnarounds, reduced crew sizes, restriction of shore leave, and new port developments away from easy access to shore-based facilities, the welfare needs of seafarers are greater than they used to be. Prolonged isolation from families and friends and limited opportunities to communicate with them make this need even greater.

The comparison between the results of the ITF/MORI 1996 and the current survey shows that over the last 10 years, seafarers' lives have become increasingly confined to their vessels. As we have seen, port-based welfare services, access to which requires a longer period of time ashore (reading room/library; organised sightseeing; meeting local people; sport facilities and on shore accommodation) are not seen as important as they were 10 years ago. These changes reflect the basic priorities of seafarers with a limited time in port and are not because seafarers do not desire or require these services anymore. They simply do not have time to use them and prioritise their most pressing needs in the face of limited time.

As we have seen, some shipping and ship management companies provide better welfare services for their seafarers than others and there is a polarisation in the industry as far as company policies on welfare provisions for their seafarers are concerned. However, amongst our company respondents only a few could be considered as implementing 'best practice' in relation to crew welfare provision.

The ILO Maritime Labour Convention has the capacity to improve seafarers' welfare ashore and at sea. There is also optimism in the industry that by 2011 ratification by

30 countries will be achieved representing a total share of at least 33 per cent of world gross tonnage - the requirement in order to bring the convention into force.

Meanwhile a number of policies and practices could be successfully introduced or developed by international and national maritime employment regulators, policy makers and shipping and ship management companies. The following proposals could be adopted to improve the existing welfare services and facilities for seafarers.

Shipping and ship management companies should consider:

- Having policies in place making sure that their seafarers have shore leave on a regular basis.
- Exploring the provision of free shuttle bus facilities provided by the companies for their seafarers when their ships are in port.
- Instructing their agents to provide necessary information about welfare and other facilities (including communication and transport) for their crews in ports.
- Having clear policies in place which permit seafarers aboard their ships access to telecommunication facilities (not at the discretion of captains).
- Developing a holistic approach to seafarers' welfare beyond just addressing Limited entertainment facilities aboard their vessels.
- Allocating a sufficient budget for wide ranging onboard welfare provision.
- Exploring the availability of cheaper onboard telecommunication facilities for seafarers.

It needs to be emphasised that, as documented in this paper, some of these recommendations are already in practice; however it would be beneficial if they were more widespread across the industry.

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`INCREASING SHIPPING SKILLS IN THE UK: 'BURSTING' THE INDUSTRY 'MYTH' OF 'DIMINISHING INTEREST'

Victor Gekara

Abstract

In recent decades, the UK has experienced a significant decline in the numbers of qualified officers which poses a threat to the British shipping industry and the wider maritime sector. Efforts by the state to change this situation, primarily through the introduction of a tonnage tax regime incorporating a training commitment, have brought little success as cadet intake levels remain low and drop-out rates increase. This paper examines the apparent failure of state intervention in relation to stated objectives to increase officer numbers. It considers the perspectives of employers/ training sponsors, staff working at training colleges, and cadets themselves, in an effort to understand why the training commitment associated with the tonnage tax has failed to significantly increase the pool of UK officers.

Introduction

Over the past three years I have been writing a thesis on some of the issues related to globalisation and state strategy in shipping. My big question in this thesis is how the state responds to some of the negative aspects of economic globalisation. I have been particularly looking at the loss of fleet and merchant navy officers, especially junior officers, in the UK and considering what the state has done to mitigate the negative impact of globalisation on the industry and the wider maritime sector.

In recent decades, there has been a drastic decline in shipping skills in the UK due to reduced training levels and increased officer 'wastage' rates. This has left a shrunken and ageing pool of British officers working at sea (BIMCO/ISF, 2005). The impact of this decline has been extensively analysed and discussed by many people (Pettit et al, 2004; Selkou and Roe, 2002; Leggate, 2004; Brownrigg et al, 2001), who have argued that the reduction in the available pool of officers poses a threat to the future of the British maritime sector as a whole, because seafarers supply essential skills to the shore-side maritime 'cluster' of firms (Gardner and Pettit, 1996, 1999).

In response to these concerns the UK government introduced a range of measures associated with a 'tonnage tax' regime aimed at increasing the pool of UK seafarer

officers. The strategies introduced by the government in 2000 for the recovery of UK shipping have not been as successful as originally projected however, particularly with regard to increasing the training and output of qualified UK junior officers. It was projected that within five years of the introduction of the tonnage tax, intake levels would have increased to 1200 cadets per year (Gardner and Pettit, 1996), but by 2005 the annual intake stood at about 600 with a cadet cohort wastage rate of between eight and ten percent (UK Seafarers Analysis, 2005).

In this paper, I mainly want to focus on questions relating to the diagnosis of the problem and the adequacy of the tonnage tax as the main strategy for the recovery of shipping skills in the UK. There is a sharp difference in opinion between shipping companies on one hand, and the training establishment on the other, regarding the reason for the failure to increase the number of qualified British junior officers. I will assess the various claims on both sides with the aim of determining the actual cause of the problem of low training and output levels in British cadet training colleges.

Methods

Over a period of twelve months, between January and October of 2006, I collected a large amount of data through semi-structured interviews, policy document analysis, and secondary data analysis as part of my PhD project. I Interviewed the Human Resources and Operations Managers of UK based Shipping companies; training agency managers and administrators; cadet college administrators and training staff; and ex-cadets. I also interviewed industry commercial and policy representatives as well as policy officials in relevant government departments and seafarers' union officials. I gathered important information through an extensive analysis of relevant government policy documents and analysed existing statistical data from various sources including the Department for Transport, *World Fleet Statistics*, and the Seafarers International Research Centre.

The data I am using in this paper is mainly interview data collected as follows:

- 25 Human Resources or Operations Managers from 25 UK-based shipping Companies
- Training administrators from 2 cadet colleges
- 4 training company managers
- 15 ex-cadets

The UK Tonnage Tax

The shipping industry in the UK declined steadily between the 1970s and the late 1990s. The UK registered fleet fell from 33 million GT (3,822) in 1975 to 3.4 million GT (1,391 ships) in 1999 (*World Fleet Statistics*). The number of officers dropped from 28,000 in 1980 to 7,000 in 1998 as estimated by the UK Chamber of Shipping (CoS) and reproduced in *Charting a new course* (see also Brownrigg et al, 2001). Cadet intake levels also fell from around 4,500 in 1970 to less than 1000 in the late 90s.

By the mid 90s it was clear that this decline was threatening the entire maritime sector. The decline in the UK fleet combined with the decline in the number of qualified British officers threatened the shore-side maritime cluster of firms which rely on the flow of essential technical skills from the sea to the shore. Certain technical shore-side operations like ports and harbours, ship surveying and insurance, ship management and maritime law require people with seafaring skills and experience (Gardner and Pettit, 1996; 1999). The possibility that some of these firms would close down, and others shift their operations overseas, as a result of a skills shortage, was high hence urgent measures were needed.

The introduction of the UK tonnage tax was, therefore, a response to this general decline and was meant to represent a long-term recovery strategy for both UK registered tonnage and the seafarer skills base. It was designed to achieve three main objectives: To encourage the growth of the UK registered fleet; to encourage cadet training with the aim of increasing maritime skills; and to promote the growth of the shore-side cluster of maritime related industries.

In order to encourage the growth of the UK fleet the tonnage tax was offered as an alternative and more attractive method of calculating corporation tax based on a company's actual operating tonnage per day rather than the company's total profits and chargeable gains. In this way it was meant to attract ship-owners because they would end up paying much less tax, it would be more user-friendly; it would create an investment friendly atmosphere for ship-owners, and offered more predictability than the normal corporation tax.

To encourage cadet training and boost the maritime skills base, a unique minimum training commitment was included in the UK tonnage tax system whereby all participating companies are required to undertake to train at least one UK cadet for every fifteen officer positions on board each of their tonnage tax vessels every year. An 'opt-out' window was provided which allows companies to make a payment of £550 per un-provided cadet position per month instead of undertaking the actual training. This money goes into funding career promotional activities jointly sponsored by the government and industry. As a result of this commitment, it was projected that within the first five years of the introduction of the tonnage tax, annual cadet intake levels would have increased to 1200 which represents the minimum level required to maintain the maritime skills base (British Shipping: Charting a New Course, 1998).

A third element built into the tonnage tax and meant to boost growth in the shore-side maritime cluster was the requirement that all participating vessels be 'strategically and commercially' managed in the United Kingdom. This would mean that, with every company entering the regime, there would be some growth in the UK's shore-side maritime cluster of maritime related firms.

Performance evaluation of the strategy, by the Department of Transport and the Inland Revenue four years after its introduction, showed positive scores on all but one of the three main targets. With regard to increasing the fleet and the shore-side maritime cluster the strategy was shown to be successful. According to the Department of Transport (DfT) data, the number of vessels participating in the tonnage tax steadily increased from 134 in 2000 to 816 in 2005 and, because of the 'strategic and commercial management location' requirement, many British and foreign companies participating in the tonnage tax regime had relocated a significant amount of their ship management operations to the UK. It must however be remembered that until the 1st of April 2006, this increase in tonnage tax vessels did not necessarily mean an increase in UK flagged tonnage since the regime allowed companies the option of retaining vessels on foreign registers while operating under the tonnage tax. With the enactment of a law requiring that all new tonnage entering the scheme must be EU registered (EC, 2004; Leggate and McCoville, 2005), it is expected that the UK national register will grow quickly. Already, by June 2004, there had been a big positive response in this direction

with the UK registered fleet increasing from 5,531GT in 2000 to 11,122 GT in 2004 (*World Fleet Statistics*).

Unfortunately, with regard to increasing the number of qualified British junior officers, the strategy has not been as successful as initially expected. This is in spite of the fact that, according to my research data, all the tonnage tax participating companies are either directly recruiting and training UK cadets or making the required payment in lieu of training under the minimum training commitment. Cadet training levels are still far less that initially projected and the number of qualified British officers has continued to decline. According to the UK Seafarers Analysis (2005), the number of all UK officers rose from 15,190 in 2002 to 16,850 in 2003 but then declined to 16,150 by 2005 while future projections show that, at the current rate, by 2021, the number of officers will have dropped to 6,190. Furthermore, although annual cadet intake rose by about twenty percent, from 450 in 1997 to 540 in 2005, the general output for qualified junior officers remains low.

Low Officer Output Levels

One of the main objectives of my thesis is to determine why the government strategies have failed to increase the output of qualified British junior officers and, during my research, I came across a number of views from different interest groups including the corporate industry, largely made up of shipping companies and training agencies, the training establishment comprising mainly of training colleges and the cadet view.

(i) *The Corporate View*

Many of the managers in the corporate shipping industry presented the view that declining interest in seafaring careers among British youth was the reason for the low training output and the failure to increase the number of officers in the UK. The majority of shipping company Human Resource Managers and training agency personnel I interviewed strongly argued that British people no longer wanted to go to sea because seafaring no longer had anything to offer them, as a career, as the following interview extract reveals:

> I can't see very much to attract British people to go to sea; the wages are not that good, and that is not going to get any better any time in future because

> shipping companies can't afford it. I see nowadays that there are many, much better career options for British youth ashore…. What we want them to do is a very difficult job under difficult conditions… [Company Interview 6]

Some supported this argument with accounts of difficulties in attracting young people to their training programmes and argued that young British people preferred careers ashore. This, according to many was greatly frustrating their efforts to fulfil their training obligations under the tonnage tax system. One Manager explained:

> It is difficult, I tell you, and it is frustrating. Getting people who want to join the merchant navy is proving to be very difficult. It seems that most of our youth would prefer careers ashore rather than go to sea and maybe one can understand but it is hurting our efforts to recruit British cadets [Company Interview 17]

In addition to this problem of attracting the youth to cadetships, the shipping companies and training agencies explained that they were facing problems arising from, what they described as, a lack of physical and academic capacity in cadets. Many of the managers participating in the study said that "the people who apply for cadet training nowadays are both too young and lack the academic aptitude necessary to successfully complete officer training" [Company Interview 10]. This, they argued, presented two problems: first, it made the selection process difficult because, as one training agency manager explained, "there are not enough good quality applicants to pick and choose from" [Agency Interview 13] and, second, they lack both the physical and academic capacity to withstand the strenuous and demanding training. One training agency manager explained:

> The people we are taking now are very young and because there has been a gradual lowering of university entry points, we are forced to lower ours so that many of the candidates are hardly equipped physically and/or academically to manage the strain of the course [Agency Interview 9].

The general argument from the corporate industry, therefore, seems to be that the number of people interested in sea careers has decreased drastically so that it is not easy to recruit enough cadets to meet companies' minimum training obligations and, moreover, the few that are available are not of the right quality and are therefore likely to drop out of training before completion.

Not all shipping companies and training agencies, however, supported this argument. Some explained that they were able to get enough cadets through active advertisement

and promotion of their training schemes to the youth. One company manager, for example, dismissed the 'lack of interest' argument and explained that:

> Everything needs hard work, a lot of hard work. So, you can not sit and expect good cadets to come to you. We go out, work hard and get the cadets and we don't complain [Company Interview 5]

Also disagreeing with the argument, the Managing Director of one of UK's major training agencies pointed out that:

> There is no evidence to suggest that young people are not interested in these cadetships, I must say that each year we are inundated with applications; we are receiving an average of 3000 enquiries each year, I don't see that as a sign that young people are not interested [Training company manager]

This divergent corporate view seemed to support that of the training establishment described below.

(ii) *The training establishment view*

According to staff in training colleges, the problem is not in attracting people. My training college staff interviewees explained that, judging from intake levels in recent years, many people in the UK are still interested in sea careers: One college staff explained:

> There are many people in Britain still interested in seafaring careers….the traditional seafaring areas like Liverpool, Glasgow and Southampton still continue to generate a lot of interest in the profession….Numbers wise, in the last three to four years, we have had no problems, we have done very well [College Interview 28].

Another college administrator explained:

> We have not failed to bring people in, I don't think that is where the problem is; I think that there needs to be measures to ensure greater retention; to ensure that most of the cadets actually complete their training [College Interview 15].

Some of the other problems identified by college staff and administrators included declining awareness of seafaring careers, declining academic quality of applicants, and the age of most cadets, which they thought was too young. According to these interviewees, such issues have a considerable impact on overall cadet output because

they contribute to high rates of cadet wastage. With regard to academic aptitude one training administrator said:

> This is a big problem; many of the cadets simply do not have the academic capability for the course and it is something that has to be considered seriously because it inevitably affects output and the general quality of officers that come out of the system [College Interview 15]

Concerning age, the main problem as identified by employees of training colleges, seemed to be one of difficulty adjusting to the training environment on the part of cadets, but also difficulty with some of the training content, especially practical training at sea. In contrast to the corporate view where these issues were presented as indicative of a characteristic of society which makes it difficult to recruit and train cadets, training college staff viewed them as issues which could be easily overcome with the right amount of support from sponsoring companies and their training agents. One college cadet officer explained:

> Age becomes a problem when there is no proper support for the cadets. Some are clearly too young and it shows from their physical build and their behaviour… In college we can handle the discipline part but out there at sea some senior officers do not have the patience… These are the ones who cannot complete the course, it [age] is not such a big problem, I don't think [College Interview 15]

Declining awareness of shipping and seafaring among many people in Britain was one of the main issues raised by training staff and administrators in colleges. They argued that because of the many years of decline in shipping and cadet training in the UK, knowledge about seafaring had diminished so that the new generation was unaware of shipping or the careers it offers:

> Not many of our young people know anything about shipping of seafaring, we occasionally run quizzes on line and in schools to try and find out how much young people know and to increase their awareness, but it is amazing how little of what goes on in shipping that even adults know nowadays [College Interview 28]

With regard to whether young people did not want seafaring careers the college administrator wondered "how do you become uninterested in what you do not know?" [College Interview 28]

What I found was, therefore, a situation whereby shipping companies, who are both the training sponsors and potential employers of British junior officers, and some of the

training agencies argued strongly that British youth are no longer interested in sea careers and presented this argument as the explanation for the fact that the tonnage tax has not been successful in increasing the output of qualified British junior officers. The training colleges on the other hand identified high cadet wastage rates as the main problem rather than recruitment. Evidence from the data overwhelmingly supports the latter argument. Statistics show that there has been a significantly positive response with regard to intake levels since the introduction of the tonnage tax, but there is also overwhelming evidence from other studies, like BIMCO/ISF Manpower survey and the UK Seafarers Analysis, to support the claim by college staff that cadet dropout rates have been on the increase. The important question, therefore, is why dropout rates are high?

Data from industry managers suggest that because most of the people being admitted into cadet programmes in recent years are both too young and lack essential capacity, they are unable to withstand the strain of training and therefore end up dropping out. The college training administrators and staff, on the other hand, argue that cadets withdraw from the programme prematurely because their sponsoring companies fail to give them the necessary support; both material and emotional.

Cadet data becomes important here because the cadets are in the unique position of being able to explain why they may choose to terminate their training prematurely. In order to shed further light on my findings, I therefore specifically sought out, and interviewed, ex-cadets.

(iii) *The Cadet View*

In my interviews with cadets I explored the various factors influencing their decision to withdraw from training. In their accounts many highlighted poor support, (financial and emotional) when confronted with difficulties with course content and the tough life at sea, a lack of adequate facilities in colleges, inadequate on-board training, abusive and insensitive senior officers during sea-time, and inappropriate deployment of cadets while training at sea.

Experiences on board were described as particularly influential in decisions to drop out of training. Many of the cadet accounts indicated an unsupportive and insensitive atmosphere on-board their training ships. They described cases where their training

officers and other senior personnel on-board treated them with impatience and lacked tolerance in their approach. One such account came from a cadet who was experiencing difficulties with some of the tasks he was required to do by his training officer:

> I did not enjoy the training, especially at sea… it was hard work and I did my best but the chief officer kept threatening to send me away…that I was lazy. When I complained to the training company they just did nothing, not even respond [Cadet Interview 3]

Some of the interviewees suggested that their companies took advantage of their presence on-board to cut down crewing costs because they treated them as a supply of extra free labour. About the nature of work on-board, one cadet explained:

> I expected that I would be assigned to various officers in different sections at different times to work with, practice skills and be assessed accordingly, but no. … I realised that I was there just as part of the crew; cleaning and scraping most of the time. When I approached the training officer about it he got very cross saying that I was arrogant [Cadet Interview 6].

There are similarities between these two accounts but, perhaps, the most important common element is the lack of support and concern which, would, probably, have left the cadets feeling 'cornered' and helpless. In both cases the cadets tried to seek support within the training structure but received none.

Accounts of lack of support and subsequent frustration, on the part of the cadet, were not only offered in relation to the nature of the work. Many cadets narrated incidents whereby they had personal or family related problems but received no emotional support from the training management structure. In the following extract such a situation culminated in a decision to quit training:

> I had many problems after I started the training but it was clear to me that no one cared; my father died while I was away at sea the first time…the captain complained that I had overstayed when I rejoined the ship… I was really unfortunate because during the next sea phase I was told that my girlfriend had miscarried. This time I was told I could not go…when I complained to the training company they said if I left I should not come back… [Cadet Interview 9]

Another problem highlighted in the cadet interviews was the nature of the training ship on which the cadets are placed. In some of the interviews the cadets gave accounts of their experiences on-board what one described as "old run-down" vessels with neither decent nor adequate living facilities. Cadets who were placed on such ships found it

hard to adjust and cope with life at sea, especially if it was their first experience at sea. The following interview extract shows this:

> My first sea-phase was on-board an old, run-down, ship with the worst conditions, honestly, the accommodation cabins were few and horrible and we had to share; there were basically no decent facilities of any sort on board that ship, no entertainment, no communication, nothing!..... It was very hard for me [Cadet Interview 1]

Unfortunately it seems as if it is not always the case that a choice of training berths are available for cadets. One training agency manager explained that, in cases where sponsoring companies do not have any training berths available in their fleet, training agencies have to allocate cadets to any ships available and not all are always suitable.

However, not all the cadets who were interviewed found their training experience at sea unbearable; a few cadets described their sponsors as being very supportive and encouraging with the result that their training experiences were pleasant. One such cadet explained:

> My sponsoring company was good to me; I received a lot of support. It was three of us with the same company and we had direct telephone contact with a personnel person in the company itself and we were treated very well….I had to quit for personal reasons…. the other guys are still in training, going to the third year now. I might go back later; who knows... the company said they would consider continuing the sponsorship [Cadet Interview 6]

Once again a training agency staff provided an explanation for this. He said that some shipping companies had an established training structure which included an elaborate support mechanism for their cadets whereby the cadets could contact a training liaison officer with their problems. He also explained that such companies normally designated specific and suitable training berths on-board their ships and had an elaborate training structure on-board those ships.

Apart from factors directly related to the training arrangement and life at sea, the cadet interview data reveal yet another problem; one of career anxiety and uncertainty. The data reveal that many cadets are anxious about their future career prospects because they are aware of the diminished employment opportunities for British junior officers. Although this is not a problem that was cited as a major reason for quitting by many cadets, some of them said that it was something that they seriously thought about. A few

went so far as to say that it was one of the major reasons for their decision to quit as shown in the following extracts:

> I started hearing stories from other crews that the company was really bad and one senior officer….they said the company only employed foreigners, said I was wasting time if I expected a job with them, he said. I could not take the risk (Cadet Interview 10).
>
> People are talking about lack of jobs and, of course, it is discouraging…. I did not want to sit around and take chances [Cadet Interview 11]
>
> They say that there are no jobs for British officers, not anymore; everybody is talking about it and it is discouraging….. Companies are employing foreigners…..they claim that the British want too much money…. Too expensive….it is very discouraging….better to find something more promising [Cadet Interview 3]

In any case, it appears that, a decision to quit was influenced by a combination of factors and, from the data, it seems that all the cadets, apart from those who were given job guarantees by their sponsors, did consider their career opportunities with anxiety.

It seems, from the analysis of the various views above that the major issue behind high drop-out rates seems to be a lack of commitment by sponsoring companies and their training agents in relation to the active support and encouragement of cadets. In the words of one college administrator; "the companies simply don't care, as long as they have met their recruitment quota, they just don't care what happens to the cadets" [College Interview 15]. But the next question would be why companies are not providing the necessary support to cadets when they are committed, under the tonnage tax, to recruit and train cadets?

A Question of Demand

There is overwhelming evidence, in this study, that many UK-based shipping companies are not genuinely committed to train UK cadets and that this is linked to a lack of genuine interest in the employment of British officers; particularly *junior officers*. This lack of genuine commitment to train emerged in my interviews with many industry Managers. The general view was that British junior officers are much more costly than other available nationalities and that shipping companies were unable to afford their services. The following interview extract from one such manager sums-up

this argument and reveals the predominant company attitude towards cadet training among UK based shipping companies:

> We train alright but that does not mean very much… With or without British officers, ships will still sail and cargo will still move …I don't want you to get me wrong, I have nothing against training British officers but who is going to employ them? If we train then we should employ but we can't…it is just too expensive… I don't want to give young people false hopes… It is a sad situation, I agree, but that is the way of open markets…we must live with it [Company interview]

Another manager explained:

> The other nationalities are so much cheaper than the British and do the same job. We employ the Eastern Europeans because they are cheaper and can do the job. It is the only way we can make a profit and remain in business (Company Interview).

These extracts suggest that because companies consider British junior officers too expensive, they are not willing to employ them and, by extension, they see no great benefit associated with training British cadets. Employment is a key missing element in the design of the tonnage tax which, seemingly, triggers a 'chain reaction' which, ultimately, results in a discouraging training atmosphere for cadets and, consequently, high cadet wastage.

Many of the company managers I interviewed made it clear that they are in no position to guarantee employment to cadets in the face of constantly changing fortunes and growing costs and competition. The following extracts from an interview with a company manager echoed this wide-spread view. On the commitment to employ British junior officers he explained:

> That is a promise we cannot guarantee to keep and so we do not make the mistake of giving one. I honestly don't know of any industry in which companies promise and guarantee employment to trainees in …. The British are just too expensive to employ. (Company manager)

Perhaps the best illustration of the general company approach towards training and the underlying economic argument for this approach is given by this next extract from an interview with yet another company manager:

> I don't need to tell you that we are in business for profit and the competition is high… We cannot employ British officers, or any others for that matter, if it is not profitable for us…. If we begin with this position then, you see,

> there is really no need for the training because, what good is it…? [Company interview]

It therefore seems as if the shipping skills problem in the UK is primarily driven by forces of demand and supply. Because UK-based employers prefer employing foreign officers who are relatively cheap, the demand for British junior officers is low which also affects training since the employers are also training sponsors. Unfortunately, the tonnage tax strategy has only focused on the supply side, i.e. increasing cadet recruitment and training, without addressing the problem of demand. Unless UK seafarer employers begin to rely on British junior officers they will have no motivation to train and therefore will continue to show little commitment to support the training programme. The tonnage tax will therefore remain inadequate as a strategy for the increase in the pool of UK seafarers.

Conclusions

The discussion in this paper has shown that the idea that British youth do not want to work at sea is a 'myth' which serves to legitimise an unwillingness to train and employ British junior officers. There is overwhelming evidence in the data, especially the cadet interview accounts, to suggest that the problem facing cadets in training and resulting in poor officer output, is due to a general lack of support and attention for cadets from their sponsoring companies during training. This makes the training experience for many cadets unpleasant and leads to high dropout rates.

There is no evidence to indicate that people are not interested in the seafaring career instead, training college and agency staff interview data indicates growing interest in cadetships over the past five years and provide figures which dispute the mantra of 'diminished interest'.

The interview accounts of industry managers have, on the other hand, clearly shown that because operators are concerned with the cost of UK junior officers and have access to cheaper alternatives elsewhere, they are not taking the training commitment, associated with the tonnage tax, seriously. They, as the main training sponsors, are not actively and positively underwriting cadet training and have often failed to provide the necessary support and encouragement that cadets need during the programme.

The general conclusion therefore is that for the government to effectively address the problem of declining officers and increase training and output levels, they need to find ways of boosting demand for British junior officers on-board UK ships. This will not only restore society's confidence in the profession but also, and most importantly, give companies the commercial motivation to train UK cadets.

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THE 'PRESENCE' OF ABSENT SEAFARERS: PREDICAMENTS OF CHINESE SEAFARER-PARTNERS

Lijun Tang

Abstract

This paper examines the difficulties experienced by a group of relatively young seafarer-partners. Drawing upon online observation and interview data, it suggests that these seafarer-partners suffer emotional loneliness, stigmatization and social isolation associated with the relatively long-term absences of seafarers. These experiences may have implications for seafarers' morale at work and the retention of seafarers.

Introduction

Seafaring is a special career. It often causes predicaments for seafaring families, such as loneliness, isolation and role displacement (Thomas, 2003; Thomas and Bailey, 2006; Thomas, Sampson and Zhao, 2003), although it can also positively impact upon seafarer partners in terms of income and independence (Sampson, 2005; Thomas, 2003). Families, however, play an important role for male seafarers, since when at home they depend heavily on their wives for social networks and emotional warmth (Thomas, 2003; Thomas and Bailey, 2006). Thus, it is reasonable to assume that family stability has an influence on seafarers' morale at work. Additionally, the desire for a happy family may play a significant part in determining whether a seafarer remains at sea or not. Given that the shortage of officers has become a priority at the top of many companies' agendas in the shipping industry (BIMCO/ISF, 2005), the retention of qualified seafarers is arguably more important, today, than ever before.

This paper is based upon the experiences of young Chinese seafarer-partners, who are computer literate and participating in online discussions on a website called the *Home of Chinese Seafarers*. While the informants of past studies were seafarers' wives across the whole age range, most of the seafarer-partners in this study have not been married yet and can be considered to represent more closely the partners of future seafarers. With the largest population and relatively adequate Maritime Education and

Training facilities, China is regarded as an important seafarer supply country that has the potential to help bridge the officer shortage gap in the near future. In this context, young Chinese seafarer-partners' experiences are worthy of particular attention.

Methods

This research focuses on the *Home of Chinese Seafarers*, which was established on May 1st in 2003 by a fairly new seafarer. It is a Bulletin Board System (BBS) website containing a number of forums and covering the following discussion areas:

- Information exchange for seafarers and future seafarers
- Careers advice for future seafarers
- Job information for seafarers
- Experiences of seafarers and seafarer-partners

Besides postings, the *Home of Chinese Seafarers* also provides a diary space for its participants to record, and to open up to others, their everyday experiences. By October 15th 2005, some 19 months or so after its start, the website had 11,532 registered members, including Chinese seafarers, students of Chinese Maritime Education and Training institutes, partners of seafarers and seafaring students, Chinese shipping companies, crewing agencies, and others in the seafaring community. In the autumn of 2005, it was estimated that the number of participants online simultaneously was on average around fifty over any given 24-hour period. Besides registered members, non-members are allowed to visit this website and read postings as guests. As in many of other BBS websites, the number of registered members does not represent the participating population. It seems that only a few hundred members (including seafarer-partners, seafarers and others from the seafaring community) are active at a given time. The others remain inactive for long time periods or disappear completely after a few 'visits'.

One research method employed in this study was online observation. From August 2005, I started 'observing' seafarer-partners' activities online in the *Home of Chinese Seafarers* regularly. My attention was paid mainly to the open diary space and one forum called 'Communication between Seafarers and Seafarer-Partners' where

seafarer-partners were likely to make postings. Occasionally, I also browsed other forums. During the two-year observation period, the following kinds of writings were gathered:

- Revealing problems that seafarer-partners face due to the absence of seafarers
- Indicating relationships between seafarer-partner participants in this website
- Disclosing seafarer-partners' feelings towards participating in the website
- Reflecting how the website is managed
- Showing the reasons for coming to and leaving the website

This paper focuses on the first point.

Unlike interview transcripts, data from online observation is not obtained via the gathering of responses to the researchers' questions. Rather, in the case of this research, postings and open diaries in the *Home of Chinese Seafarers* were produced for their own sake. In this sense, these fieldnotes are more natural and spontaneous than interview data. If the range and scope of interview questions pose restrictions on what informants can answer, observation allows flexibility. The observed, of course, write what they want to reveal, and they have no intention to note down what the researcher needs. Some postings and diaries, however, are related to seafarer-partners' everyday lives and thus reveal some of their dilemmas caused by separation. A long period of observation (over one and half years for this project) of many seafarer-partner participants' writings arguably allows the researcher to draw a relatively detailed picture of their day to day concerns.

One may wonder whether the postings or diary entries in the website are authentic. The 30 interviewees also included in the study, however, believed that those postings reflected real experiences. Moreover, some informants stated that the anonymity in 'online space' encouraged them to reveal their innermost feelings and thoughts which they would not do in their 'offline' daily lives.

The other research method was interviewing. Between February and April 2006, I interviewed fifteen seafarer-partner participants of the *Home of Chinese Seafarers* in three places of China: Shanghai, Nanjing and Shandong province. Thirteen interviews were undertaken face-to-face, while the other two were by telephone. In addition to

these, another fifteen interviews were undertaken using email during 2005. Altogether thirty seafarer-partners from various parts of China took part in interviews. As mentioned earlier, the informants were relatively young, well educated, lived in cities, and had access to the internet. Twenty-nine of them had received, or were receiving, higher education; twenty five were below thirty in age; and only eleven were married at the time of interviewing.

Emotional loneliness

The painful experience that seafarer-partners are most likely to suffer certainly is emotional loneliness. The latter, according to Weiss (1973), is the subjective response to a long-term separation from, or loss of, the person to whom one is emotionally attached. Seafaring entails seafarers being away from home for long periods. For Chinese seafarers absence may be for around one year, since they are likely to sign one-year contracts. This inevitably involves the long-term separation of seafaring couples, which may cause, among others things, emotional isolation for seafarer-partners. The latter can present itself in several forms: longing, feeling of emptiness, complaining of seafarers' inability to provide emotional support, and worrying.

Longing was the most visible theme in the postings and diary entries on the website. 'It is not lonely to be one person alone; it is lonely to be longing for a person.' This poignant remark was one seafarer-partner's signature in the *Home of Chinese Seafarers* website. It reveals the major cause of loneliness – longing, which seafarer-partners have to face when seafarers are absent. Due to the nature of seafaring careers, seafarer-partners are alone most of the time. Thus though they are in relationships they are also rendered effectively single by their partners' absences. A seafarer-partner described this ambivalent situation as such:

> A single person can live as others and lead a beautiful life. But I am in a predicament: behind the appearance of being single, you [the partner away at sea] are in my mind. Therefore, I cannot live as a single person. But the reality is that nor can I enjoy the shared life of a couple. I fall in between. [Fieldnote, 18/12/05]

When seafarers leave home for ships, seafarer-partners lose their intimate companions. This loss makes seafarer-partners feel that their lives suddenly become empty. For some new seafarer-partners this emptiness seems to be felt strongly. Two interviewees who were 'new' seafarer-partners reported:

> [M]y boyfriend had been with me for a while and then he suddenly went onboard. I suddenly felt that my life had become empty. [Tulip]
>
> My husband went onboard the ship shortly after we established our relationship. I suddenly felt empty. [Rebecca]

Many seafarer-partners also complained on the website of seafarers' inability to provide emotional support. Modern heterosexual relationships have been regarded to be the most important source for emotional intimacy (Beck, 1992; Giddens, 1992). Seafarers' long-term intermittent absence, however, renders this problematic. Two seafarer-partners complained:

> When I feel bad and want to talk to you, your mobile has no signal; when I know from news that accidents happened at sea, it is an ordeal to hear nothing from you; when something happens home and needs your opinions, you are not here…[Fieldnote, 30/11/2005]
>
> I feel so bad these days that I hope that you can give me some consolation. But what I face is always silence … [Fieldnote, 10/01/2006]

Being attached to seafarers, seafarer-partners are concerned about their safety. Working and living on ships, seafarers are at the mercy of the sea. The sea, however, is perceived as mysterious, volatile and dangerous. Thus, seafaring careers are regarded as inherently risky. No matter whether this perception is correct or not, it can fill seafarer-partners with concerns for their partners' safety. One seafarer-partner wrote:

> It is true that modern technology and safety standards enable ships to outride storms at sea. However, out on the vast ocean and being left high and dry, who can guarantee 100% safety of ships? [I am] worrying and fearing for his safety everyday. [I am] checking the situation of his ship everyday. Without exaggeration, this is an unbearable ordeal! [Fieldnote, 26/11/2005]

For the partners of new seafarers, worrying manifested itself even more strongly, because they had not previously experienced separations and were thus ill-prepared for their fears. Further, seafaring is a 'secluded' career in the sense that it takes place on the oceans and in enclosed ports, which are invisible to the wider population. Inexperienced seafarer-partners thus may know very little about seafaring. The sudden 'disappearance' of seafarers for the first time into an unknown and unreachable world makes their young partners worried. Two seafarer-partners recounted their experiences:

> [H]e went to the sea for the first time. I could not get any of his information and was worried. [Dianna]
>
> After he left, I did not get any of his information for two months. I was very anxious. [Snow]

The feeling of loneliness makes seafarer-partners treasure every trace of information they receive about their beloved seafarers. In the diary space, some seafarer-partners expressed their excitement after receiving a long-distance phone-call or a letter or an email. For example, one wrote after she had received a phone-call from her boyfriend:

> He phoned me a moment ago, really! … …Oh, I cannot believe it. It was him. It's really beyond my dream. How excited I was. [Fieldnote, 11-08-2005]

It has been noted, however, that there is no convenient and cheap communication means between ships and home (Thomas, et al., 2003). More often than not, therefore, seafarer-partners were complaining that they had not received any phone-calls for a long time. The following example illustrates the worries of seafarer-partners when they fail to make contact with seafarers:

> One seafarer-partner: Why has my partner not made a phone-call? … Having waited for dozens of days, I am worried.
>
> Another seafarer-partner: Me too! I have not received a call for more than forty days. [Fieldnote, 12/12/2005]

As a result, a phone-call from the seafarers is important and being looked forward to; and seafarer-partners take every possible measure to make sure that they do not miss any contact from their partners. Many seafarer-partners disclosed that they dared not switch off their mobiles or to forget to take mobiles with them. One wrote:

> Actually I know that the radiation from the mobile is not good for health. But when he is away, I am afraid of missing his phone-calls and therefore I keep it close to me around the clock. [Fieldnote, 19/03/2006]

Stigmatized by others

Of course, seafarer-partners do not live in a one- or two-person world. In every day lives, they interact with people around them. Sometimes, such interactions make seafarer-partners feel stigmatized.

The most common occasion when seafarer-partners felt victimized was when others gossiped about seafarers' infidelity. Most people know that seafarers leave home for a long time for the job; and that during this time, seafarers have no sexual contact with their partners and that they may go to foreign ports. This knowledge leads to a common perception about seafarers – seafarers are promiscuous and they have girls in every port. The presence of a seafarer-partner may invoke other people's discussion of or even joking about this. One seafarer-partner complained in one of her diary entries:

> At lunch time, my colleagues talked about relationships. They said that the relationship would meet problems if two persons are separated for a long time. I knew that they were insinuating me and my seafarer boyfriend… They said that seafarers were not reliable. I have not seen him [her boyfriend] for eleven months and have been feeling bad for that. Their words made me feel worse… [Fieldnote, 06/01/2006]

It seemed that another seafarer-partner had encountered similar problems quite often. She was furious about this and wrote:

> There are lots of curious people around. [They keep asking:] what is your husband job? I told them: a seafarer. Then they would look at me in a strange way. I do not mind how they think of me since they do not know much of seafaring …But one thing makes me angry. I have been working in this company for three years … and said good-bye to many colleagues. But the fact that my partner is a seafarer has never failed to evoke their curiosity and discussions about seafarers' infidelity… [Fieldnote 28/04/2006]

Though people do not know much about seafarers, they tend to associate seafarers with high incomes. When seafarer-partners told others that their partners were seafarers, the common response from others was said to be that seafarers earn lots of money. For example, one interviewee said:

> For many people, once they know that we are married to seafarers, their first response would be saying that seafarers earn lots of money. [Forever]

From this common response, some seafarer-partners perceived a connotation: marry for money. One seafarer-partner complained:

> When others ask me about my partner's career, I say that he is a seafarer. They would immediately respond that you are rich … If our aim were really their money, why would we suffer the agony of separation, after all there are lot of rich men ashore. [Fieldnote, 19/05/2006]

This seafarer-partner clearly felt very bad at others' responses. The latter, in her view, insulted her and her sacrifice for love. She accepted that she could not, however, change others' perceptions.

Further, some seafarer-partners felt that others pitied them. Being alone most of the time, seafarer-partners had to cope with many tasks single-handedly, while other women had their husbands' or boyfriends' help. This sometimes attracted others' sympathetic eyes and such sympathy was not always welcome.. One seafarer-partner explained:

> It is the end of the year. Our company provides each of us lots of things to celebrate the New Year[1]. My colleagues rang their husbands to come to give them a hand, while I could not. They looked at me with pity when I was loading and lashing these things on my bike alone and with great difficulties… This was hard to bear. I do not want others to pity me! [Fieldnote, 25/01/2006]

Finally, people around were said to occasionally misinterpret seafarer-partners' motivations when communicating with the opposite sex. One seafarer's wife complained:

> I am a seafarer's wife. Because my husband is not home most of the time, many people think that I cannot bear the loneliness. This brings me lots of pressure in

[1] It is a common practice in China for companies to buy for and distribute to their employees some goods, such as food and drinks, to celebrate New Year.

> the work. As a leader, I have to talk to and discuss with colleagues quite often. This makes others suspicious of my motivation, which is awkward for me... [Fieldnote, 01/10/2006]

These words suggest that this seafarer-partner felt humiliated by others' inaccurate perceptions of her motivation when talking with colleagues. Thomas' (2003) study shows that the temporarily 'single status' of British seafarer-partners had double effects on them. On the one hand, they might fear unwanted attention from men who perceived them as single; on the other, they felt they were being regarded as a 'sexual predator' by coupled women. Similarly, it appears that the above seafarer-partner's discussions with colleagues were interpreted by others to be out of loneliness. Lotus, who had been married for twelve years, gave another account:

> There are more things that I need to pay attention to, especially interactions with the other sex. Once they know that you are a seafarer's wife, they would … they would be more likely to think in that way. In order to maintain a seafarer's partner's reputation, I have to be more careful. [Lotus]

Again, it seems that seafarer-partners' behaviours towards the opposite sex can easily be misinterpreted by others. For this, seafarer-partners felt stigmatized but helpless.

The four elements discussed so far can combine together. Separation, loneliness, money and promiscuous partners, may stir up people's imagination and curiosity when there is a seafarer-partner around. Others may not enquire or discuss seafarer-partners' lifestyle directly in front of a seafarer-partner. They can, however, do it indirectly. Another married seafarer-partner seems to have experienced various kinds of attention from others:

> As a special group, we always live a different life-style. Around us, people are observing and guessing our lives with various eyes and attitudes: envy, sympathy, suspicion, and even pity! [Breeze]

The seafarer-partner identity thus seems likely to attract others' intrusive attention. Some envy seafarer-partners' having money; some sympathize and feel sorry for seafarer-partners' sufferings; and some suspect seafarer-partners' motivation for entering relationships with seafarers.

The above seafarer-partner's words also suggest that some of them become sensitive towards their surroundings. On the one hand, seafarer-partners may be aware that they

are different; and that as a result their different private lives are likely to attract others' attentions and speculations. On the other hand, knowing this makes seafarer-partners sensitive towards others' attitudes and behaviours towards them. The sensitivity leads some seafarer-partners to feel that the 'small talk' of familiar people about seafarers is intrusive. For example, one seafarer-partner wrote:

> I used to be a very social person and liked to join in group activities. Now, I do not like going out after my husband left. No matter where I go, there are always people asking: how long has your husband been away and when will he come back? If I say that he has just left, others would show sympathy: your husband is good in all other respects but too far away from you… Some familiar colleagues and neighbours have never been tired of making such inquiries… [Fieldnote, 08/01/2006]

It appears that others' common questions and 'concerns' made this seafarer-partner feel stigmatized. To avoid the awkwardness, she chose self-seclusion. Similarly, another seafarer-partner wished to go to a new place in order to avoid others' intrusive talk:

> The women in my office are the kind of people who gloat over others' misfortunes. They make jokes about me, as if my loneliness can remind them of their happiness… I want to go to a new place where people pay attention to their job instead of others' private lives. [Fieldnote, 31/12/2005]

Social loneliness

Apart from emotional loneliness, Weiss (1973) identifies another kind of loneliness – social isolation, which is due to an inadequacy of social networks. Though not uprooted from their everyday social grounds, some seafarer-partners may withdraw from the wider social network into a self-confined world to avoid others' intrusive prying, as I have shown in the last section.

Further, the longing for their absent partners causes seafarer-partners to become sensitive to other couples' togetherness. Seeing others being together or even hearing talk about husbands can easily remind seafarer-partners of their lonely situation. For example, one seafarer-partner wrote:

> One day, it was snowing, some couples were sharing an umbrella, clinging together and talking to each other intimately. The feeling of loneliness suddenly rose from deep in my heart. [Fieldnote, 18/01/2006]

This sensitivity equally forces some seafarer-partners to withdraw from social activities. Two seafarer-partners complained in the *Home of Chinese Seafarers*:

> In those days when you are away, I do not even want to go out. I fear of going to busy places, where the hurly-burly makes my loneliness and sadness prominent… [Fieldnote, 31/12/2005]
>
> When I go out with other women, their talk always revolves around their husbands … … I don't have a husband at home. Being with them makes me feel the pain of my loneliness more sharply. So, normally, I do not go out. Instead, I stay home cooking and surfing the Internet… [Fieldnote, 08/01/2006]

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Being in an 'in-between' situation, many seafarer-partners tend to set themselves apart from others who are together with their husbands or boyfriends. One seafarer-partner wrote in her diary:

> A colleague just invited me to her house for dinner, but I declined. All others are in pairs … I do not want to join them. [Since] my boyfriend is not around, I do not want to go anywhere but stay home to watch telly. [Fieldnote, 15.01/06]

These words indicate that when alone she did not want to be involved in situations for couples. Besides being reminded of the lonely state, seafarer-partners may feel awkward to have to mix with seemingly happy couples.

While some seafarer-partners have bosom friends, with whom they can share their ups and downs, many seafarer-partners reported feeling that their non-seafaring friends could not empathise with their feelings and situations. Seafarers' long absences created different experiences for seafarer partners compared with those whose partners worked ashore. Many informants in this study reported that conversations with non-seafaring friends could not 'go deep' and 'get close to the heart'. As one seafarer-partner explained:

> [T]hey [non-seafarer-partner friends] have little idea about seafarers; they cannot empathize with seafarer-wives' feelings! Even though we talk, the conversations can never go as deep as I wish. Moreover, there are many things

> that they do not understand. I have to explain to them over and over again. It is tiresome. I cannot find resonance. [Rose]

Another interviewee, who was a student, was afraid that revealing too much grievance might be regarded as 'making a fuss over an imaginary illness' by her friends and therefore make them impatient. She therefore 'edited' her expressions and showing of feelings:

> My boyfriend is a seafarer and I may feel lonely everyday. But I cannot complain everyday about this. Otherwise, I feel that my friends would feel impatient…Too much grievance gives people the feeling that I am making a fuss over an imaginary illness. [Lily]

In a similar vein, British seafarers' wives in Thomas' (2003) research and Australian seafarers' wives in Foster and Cacioppe's (1986) study believed that only people with similar experiences could understand their feelings and therefore expressed their desire to meet and socialize with other seafarer-partners. They were, however, geographically separated and could hardly have any contact with each other (Thomas, 2003). In China, there are seafaring families living in 'Seafaring Villages' constructed in major port cities by shipping companies. There are also 'seafarer wife committees' and 'seafarer wife stations' to organize mutual support for China Ocean Shipping Company's (COSCO) seafaring families (Thomas et al., 2003). These services are diminishing however. The privatization of housing at the end of last century replaced the companies' house providing function; 'stations' and 'committees', which are relics of planned economy, are being eroded because a more market orientated economy is prevailing (Thomas et al., 2003). Moreover, these services only target married seafarer-partners and are not for the new generation of Chinese seafarer-partners. It is not surprising then, that among the thirty interviewees only one (who has been married for sixteen years) lives in a 'Seafaring Village'. It is a tradition for Chinese seafarer-partners to visit ships while they are in Chinese ports. On these occasions, seafarer-partners from different places were able to meet and establish contact with each other, for example, Lotus said:

> Normally, I would meet them [other seafarer-partners] on the way visiting the same ship. Then I know that she is the wife of Captain and she is the wife of the Chief. After several times, we would be familiar with each other. Then we

> would chat what happened to them on the ship and what she takes with her. [Lotus]

Geographical separation, nevertheless, constituted a barrier for developing close relationships. Lotus continued:

> [But], we do not have time to develop relationship. We only meet on the way to visit the ship and have a little chat. [Lotus]

Another informant who also had opportunities to visit ships and to meet other seafarer-partners expressed the same view. Thus, it seems difficult for the young generation of Chinese seafarer-partners to communicate with each other and to share their experiences.

Conclusion

We have examined the dilemmas that Chinese seafarer-partners have to face in their everyday lives. Seafarers are absent; yet in their absence their presence is strongly felt as a strong shadow cast over a relationship. In the shadow of each seafarer-partner's dilemma, there is the presence of seafarers. Arguably, it is seafarers' absence that makes their presence even more prominent in seafarer-partners' consciousness. Only in the seafarers' long absence, do seafarer-partners experience longing, worrying, and feelings of emptiness. The longer the absence and the longer there is no communication, the more seafarer-partners long for their beloved and become worried. It is the seafarers' absence that makes other people 'concerned' about seafarer-partners, which in turn leads seafarer-partners to feel stigmatized. Moreover, seafarer-partners may become sensitive to others' attention and conscious of their lonely situation. Even others' togetherness and seemingly happy companionship remind seafarer-partners of their absent seafarers. The social interactions and even non-interaction encounters, then, bring to the fore for seafarer-partners the presence of absent seafarers. For this reason, some of them tend to withdraw into their own world, which inevitably causes social isolation. Even worse, seafarer-partners' close non-seafaring friends may not be able to share their ups and downs. On the other hand, although they may wish to communicate with other seafarer-partners, geographic separation nevertheless constitutes a huge barrier.

These experiences are certainly painful. During the interview, several seafarer-partners complained that one year at sea is too long to be humane. Behind the complaint, the practical implications loom. One wrote in the website:

> If he does not move ashore, we will not marry. If [the fact that he is a seafarer] cannot be changed, we will have to break up. Before we started the relationship, I have said explicitly that I had no intention to marry a seafarer. That kind of life is not complete. Moreover, it will be sneered and laughed at by others. [Fieldnote, 14/08/2006]

Such a view may not be popular among participants on the website, for many seafarer-partners expressed that they would respect their boyfriends/husbands' choices and decisions. Nevertheless, they kept an eye on information about leaving sea and moving to other careers. Communication is another problem. While some seafarer-partners complained in their diary entries in the *Home of Chinese Seafarers* that they had not received phone-calls from their boyfriends/husbands for a long time, many others wrote postings asking for cheap and reliable means to keep contact with seafarers at sea.

Separation is certainly unavoidable for seafaring couples. This does not mean, however, that nothing can be done to alleviate seafarer-partners' problems. If the duration of separation becomes shorter and if there is more frequent communication, they may experience less emotional loneliness. In line with unavoidable separations, seafarer-partners have to live a different lifestyle and thus attract extra attention. However, if seafarer-partners are able to reunite with their partners more often, they may become less sensitive and more able to ignore others' talk. There are also possibilities for seafarer-partners to communicate with similar others. The *Home of Chinese Seafarers* is a good example. Through it, seafarer-partners are able to overcome geographical barriers and 'meet' others online. In a sense, the *Home of Chinese Seafarers* networks seafarer-partners, and the latter are able to share their experiences with each other and become less socially isolated.

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CHEMICAL RISK MANAGEMENT

David Walters

Abstract

Chemicals are both transported in large quantities by sea and also used in the everyday operation of ships. This paper is an exploratory discussion of the extent of the risks involved in such transport, and use, and its implications for approaches to health and safety management on board vessels. It asks whether sufficient is known concerning the reality of chemical exposures and their control at sea, what the implications of this are, and whether further research is warranted to evaluate the effectiveness of risk management at sea. It presents some consideration of the broad strategies to manage and reduce chemical risks that have been the subject of previous work across a range of economic sectors. Based on recent literature and interviews with key informants representing interests in the supply, transport and use of chemicals in the maritime sector, the paper makes a preliminary attempt to establish what might be some of the issues for managing chemical risks to seafarers, while at the same time considering the extent of common ground between them and those addressed in land-based situations.

Introduction

During the 20th century the global production of chemicals increased from 1 million tonnes in 1930, to 400 million tonnes by the beginning of the 21st century. Much of this material requires transportation from producer to user. When raw materials such as the mineral ores and hydrocarbons involved in chemical production are included, the scale of global transportation of chemical substances and products is enormous. A substantial proportion of this transportation takes place at sea. In addition, on ships as in many other workplaces, chemical substances are used routinely in operational and maintenance work and may also be present in the shipboard environment as by-products of other ship operations. In all these cases there is a degree of risk of harmful exposure. This presentation is an exploratory discussion of the extent of this risk and its implications for strategic approaches to health and safety management on board vessels. It asks whether sufficient is known concerning the reality of chemical exposures and their control at sea, what are the implications of this and whether

further research is warranted to evaluate the effectiveness of risk management and its supports at sea.

The paper begins with a review of recent literature on the toxic risks involved in working with chemical substances in maritime transport. It notes the presence of many 'known unknowns'. This, it suggests, is in common with the findings of land-based research on working with chemical substances and demonstrated need for a wider search for understandings of the nature and extent of chemical risks and how they can be most effectively addressed, embracing both land-based and maritime experience. At the same time it recognises that the maritime industry presents a unique working environment, which needs to be taken into account in discussing approaches to control risks of working with chemicals at sea.

This leads to some consideration of the broad strategies to manage and reduce chemical risks that have been the subject of previous work across a range of economic sectors. Based on recent literature and interviews with key informants representing interests in the supply, transport and use of chemicals in the maritime sector, the paper makes a preliminary attempt to establish what might be some of the issues for managing chemical risks to seafarers, while at the same time considering the extent of common ground between them and those addressed in land-based situations. It discusses factors that support or constrain sustainability and transferability of good practices. It identifies some challenges and asks what it would be useful to know in order to address them.

Chemicals and the nature of the risks they pose to seafarers

Accidents with hazardous chemicals at work may cause injury, acute ill-health or even death. The extent to which this is documented largely depends upon the coverage and accuracy of reporting systems for work-related incidents, which for a host of reasons are known to under-report such events. There are predictable variations by sector in the importance of chemicals as a cause of injury, and while they are not the main cause, they feature prominently across most sectors, especially associated with burns, being overcome by fumes, poisonings as well as commonly involved in major

incidents such as fires and explosions. Lack of standardisation of reporting systems in the shipping industry make quantitative assessment difficult but the qualitative details of incidents involving chemical substances suggest similar patterns, with accidental spillages, leaks, entry into confined spaces, fumes and handling chemical products in routine maintenance and cleaning, frequently occurring in shipboard incident reports.

However, such reporting only tells a small part of the story, because most of the consequences of working with chemical substances are chronic health effects, for many of which there is also a long latency between exposure and subsequent ill-health. In employment generally, by far the most prevalent health effects associated with exposure to chemical substances are diseases of the respiratory system and the skin, of which, asthma and chronic obstructive pulmonary disease (COPD) in the case of the respiratory system and contact dermatitis in the case of the skin, are the most common. Diseases of the central nervous system are linked to such exposures, as are allergies and reproductive, developmental and endocrine disorders. Cancer is also associated with exposure to chemicals at work.

In all cases, there are no reliable data concerning the full extent of occurrence. In Europe for example it has been estimated that nearly one third of all occupational diseases recognised annually in the EU are related to exposure to chemical substances. Occupational cancer is estimated to account for between 4 to 16 per cent of all cancer mortality and most occupational cancer is related to exposure to chemical substances of one sort or another. But it is also acknowledged that these are only partial measures and probably serious underestimations. Two major problems confound measurement of the extent of the health effects of working with chemicals. One occurs because neither the hazards of many chemical substances nor the extent of exposure to them are adequately researched, therefore understandings of risks to health and their quantification are based on limited data. The second occurs because the long latency between exposure and disease for many conditions associated with hazardous substances means it is often difficult to establish a causal relationship.

There is no reason to suppose that the pattern of chemically related ill-health or the problems in documenting its extent in seafaring are likely to be any different from those found elsewhere. Seafarers are potentially exposed to a range of hazardous

chemicals in their routine work and, as already noted, in addition, a substantial proportion of global chemical production is transported by sea, from producers to users, including many substances that are known to be hazardous to health. Seafarers regularly employed in such transport may be particularly at risk as a result of exposures during loading and unloading operations, as well as in routine maintenance and as a result of leakage. There is some evidence of this in the mortality data for seafarers generally (Bloor *et al* 2000) and for particular seafaring occupations. For example elevated cancer incidence has been demonstrated amongst merchant seamen (Greenberg, 1991), in Danish engine room crew (Brandt *et al* 1994); for mates on Norwegian tankers (Moen *et al* 1994) as well as for Danish seafarers employed on tankers generally (Kaerlev *et al* 2005). For Finnish seafarers, it has been noted that occupational exposure of both deck and engine room crews on tankers add to their risk of various forms of cancer (Pukkala and Saarni, 1996; Saarni et *al* 2002). Elevated risks of lung and bladder cancer have also been found amongst Icelandic seamen (Rafnsson and Gunnarstoditter, 1995). As well as historical exposure to asbestos in engine rooms, exposure to polycyclic aromatic hydrocarbons (PAH) and to benzene are commonly reported in studies of seafarers. Exposures to carcinogenic agents in tanker operations and in engine rooms has been noted (for example, Verma *et al* 2001, Nilsson *et al* 2004, Moen et al 1995a and 1995b) and in relation to the inspection of commercial tank barges (Davenport *et al* 2000). Other than carcinogens, chemical substances such as organic solvents for example, have been associated with neurotoxic effects amongst seafarers (Riise and Moen 1990; Nilsson *et al* 1997). There is also some limited evidence that subgroups of seafarers with a higher risk of hospitalisation as a consequence of lifestyle related conditions also have increased risk of hospitalisation due to injury and poisonings, the latter caused by chemical substances (Hansen *et al* 2005).

However, overall, the extent to which the health effects of working with chemicals at sea are reported and analysed in the international scientific literature on the subject, is comparatively limited in comparison with studies on the effects of occupational exposures in land-based industry. There are good reasons for this. Problems of monitoring such ill-health are particularly challenging in seafaring, where many individuals are employed on short-tem contracts across a range of employers and agencies, and where the large part of the labour supply is from countries in which

disease reporting systems are poorly developed.[1] As Thebaud-Mony (2007) has shown in relation to the incidence of work-related cancers amongst contract workers in the nuclear and chemical industries in France, such employment arrangements are major factors promoting the low visibility of ill-health in routine reporting systems even in Western countries with robust reporting systems. Combined with poor public health data reporting systems in most major maritime labour supply countries, this means that complete information on the long term health consequences of seafarers' exposures to chemicals is unlikely to be available. As a result, there are no reliable data on the proportion of the morbidity and mortality that can be attributed to work involving the transportation of chemical substances by sea.

Nor is exposure to chemical substances that occurs during sea transportation systematically documented. While some ships are fitted with automatic devices that are designed to warn workers about toxic chemical contamination and are equipped with hand-held simple detection devices for checking for contamination in confined spaces, such devices cannot be used to monitor workers' exposure during work. Some chemical tanker companies also require more frequent than average routine medical examinations for seafarers employed on their tankers, however, here again, such medical monitoring is unlikely to detect effects of more than a very limited number of the range of hazardous substances to which seafarers may be exposed in their work. Moreover, such examples represent exceptional cases in which the dangers of the chemical substances involved are to a large extent known and precautionary measures are implemented. In many other cases, arguably the majority, the hazards and the exposures concerned as well as their consequences for seafarers are simply unknown.

In land-based workplaces there is also little systematic information on exposures. Exposure data-bases exist in some industries in a few countries — for example, the DOK-MEGA database in Germany — but they are exceptional. In the UK, the Health and Safety Executive (HSE) has maintained measurements of exposure to hazardous substances on the National Exposure Database since 1986. But research carried out by the Institute of Occupational Medicine (Cherrie, *et al* 1999) noted that its coverage is only partial and that it has proved difficult to persuade industry and others to

[1] All the epidemiological studies cited, are concerned with Western European or North American subjects, reflecting the relative availability of data from such sources.

contribute towards this database. In Europe more widely, self-assessment based surveys conducted for example by the European Foundation for the Improvement of Living and Working Conditions found that 22 per cent of respondents throughout the EU considered themselves to be exposed to dangerous substances for at least a quarter of their working time, while 16 percent thought they handled dangerous substances daily (European Foundation 2001). It has been estimated that some 22-24 million workers in EU countries are exposed to occupational carcinogens (Kauppinen et al 2000). National surveys support this thesis, for example, analysis of the French 2003 SUMER survey indicated that 14 per cent of the French workforce were exposed to one or more of 28 carcinogenic substances at their place of work (DARES 2005). No such information on the exposure of seafarers has ever been gathered systematically. But snapshot small scale surveys suggest substantial exposures, for example Jensen *et al* (2005) indicate that 55 per cent of a sample of over 6000 seafarers thought themselves to be exposed to chemicals with the highest exposures experienced, not surprisingly, on tankers.

All this suggests that the current level of knowledge of the full extent of the health effects of transporting and working with chemical substances at sea, does not provide a reliable basis on which to implement or evaluate control strategies. Although seafaring may represent a cause for concern in this respect, it is clear that it is not unique. In recent years there has been a growing recognition of the extent of 'known unknowns' in relation to workplace chemical exposures and their effects across a wide range of work situations and a variety of sectors. This prompts the question of what is to be done to minimise exposure and manage risks.

The development of current occupational chemical risk management strategies

Conventional approaches towards health and safety at work involve imposing regulatory duties on those that create risks, requiring them to take reasonable steps to protect those that may be exposed to them. This is also true as far as the risks of using and working with chemical substances are concerned. In addition, in the case of chemicals there are a host of further requirements imposing duties on manufacturers and suppliers of chemical products to provide information on their hazards and how

they may be transported, used and disposed safely and without risks to health or the environment. This makes for a complex regulatory framework for managing the risks of hazardous substances. Nowhere is this more evident than in the shipping industry, where sections of international regulations, codes and conventions such as MARPOL, SOLAS, STCW and so on, as well as a host of national measures and industry requirements, provide for an exceedingly complex regulatory framework addressed to the supply, transport, use and disposal of chemical products at sea, providing general standards and detailed requirements specific to particular trade sectors and ships.

Despite this complexity there are some relatively simple conceptualisations about risk management that can be distilled from both land-based and maritime requirements. To appreciate their significance requires first understanding a little of their background.

The 1970s and 1980s were decades when the modern approach to regulating the management of health and safety took hold.[2] Regulatory approaches to achieving systematic risk management were increasingly advocated, both in relation to health and safety generally and for specific hazards such as chemical exposures. While it could be argued that the maritime industry was somewhat slow to follow suit, with its adoption of the ISM Code in the 1990s, it too implemented a more systematic approach to general safety management on board ships. On land, requirements began to emerge at EU and national levels in which good occupational hygiene practices were emphasised in the regulation of systematic chemical risk management. Where safer substances or processes could not be introduced, concepts of controlling exposure at source were advocated, standards were required against which exposures could be monitored and the risks to workers controlled. Today as result, although there are some differences of detail, most countries in the EU have broadly similar regulatory requirements for general chemical risk management, derived from, or harmonised by, EU provisions. They are outlined in Table1. In addition there are special requirements that apply to sites and substances that are deemed to be especially hazardous.

[2] Regulating health and safety management (process regulation), as opposed to setting prescriptive regulatory standards with which duty holders are required to comply (prescriptive regulation) was a feature of national legislation such as the Health and Safety at Work Act (HSW) Act in the UK, the various Work Environment Acts of Scandinavian countries and the Netherlands, all of which date from this period. They influenced the content of the EU framework Directive 89/391, which extended such process-based regulation to all member states from the early 1990s onwards. They also influenced similar developments in Australia, Canada and New Zealand.

Table 1: Requirements on chemical risk management

Substitution, obligatory for some substances in some countries but also in most countries there is an obligation on duty holders to consider whether there may be safer products available
Risk assessment — this requires appropriate suppliers' information, i.e. on labels and in material safety data sheets (SDS), but also the capacity to understand it and to consider the tasks for which chemical products are required. It also requires inventories of substances used. More technically, it requires exposure assessment.
Information and training for workers about risks to health and safety and risk prevention/control measures, often interpreted as written working instructions
Implementing control measures according to the established hierarchy of good practice for control
Health surveillance where necessary

Similar requirements can be found amongst the regulatory details that cover the shipping industry, applying generally to chemical risk management in the industry as well as more specific requirements on ship design, substance and plant safety that apply to situations such as chemical and oil tanker transport, and are analogous to those on land addressed to hazardous installations and very toxic chemicals.

Despite the plethora of regulatory and other measures aimed at the control of the risks to health of working with chemicals, as the preceding section suggests, both on land and at sea there is reason to be concerned that reduction or control of these risks to acceptable levels remains to be achieved. On land such concern is not new — indeed the measures outlined above were a response to earlier worries in this respect. In the past decade however attention has shifted from the systematisation of process regulation of chemical risk, to the practicability of the achievement of control in workplaces in which resources to operationalise such ends are limited.

It became increasingly apparent, for example, that the effective implementation of systematic approaches to chemical risks management was dependent on several preconditions. They included, not least, good quality information concerning the hazards of substances, clear criteria on which exposure standards could be set, good systems for communicating this information to duty holders, sufficient technical capacity to monitor, evaluate and control risks and monitor workers' health in workplace scenarios, sufficient grasp of what was required and how it should be

achieved by duty-holders, as well as adequate inspection and control. Yet the reality was that information on the hazards of the vast majority of substances used in European workplaces was far from complete, exposure standards were set for comparatively few substances and the criteria used subject to variation and debate. The quality of communication on hazard information to duty holders as well as that between duty-holders and their employees was poor. Technical capacity was limited to large enterprises or external services and there was growing evidence that a substantial proportion of duty–holders neither understood what was required of them, nor possessed the capacity to deliver the systematic approaches framed by regulation (Walters and Grodzki 2006).

Numerous studies across the range of northern European countries demonstrated that owners/managers especially in small enterprises did not understand suppliers' information or use it appropriately, they frequently did not understand the application exposure assessment/control, nor were they willing or able to employ expertise to do so (see for example Research International 1997). At the same time, many studies pointed to the inadequacies of information, both with regard to labelling and SDS – considerably more so in the case of the latter — identifying severe limitations in the quality of information and of its accessibility for small enterprises. (See for example, Samways 1988, Geyer et al 1999 and more recently CLEEN, 2004). It was also becoming evident that regulatory inspectorates lacked the capacity to check compliance adequately across the range of duty-holders subject to the regulation and it was, in short, a situation in which there was mounting evidence of regulatory failure.

It would seem to be important to ask to what extent this land-based experience is repeated at sea. Unlike the situation on land, there has been little independent evaluation of the effectiveness of arrangements to manage chemical risks to seafarers. However, there are several points of comparison. For example there would appear to be some degree of parallel between land-based experiences in the chemical and oil industries, and that on board chemical and oil tankers, where industry experience, regulatory scrutiny and the presence of large and well resourced companies, combine to influence good practice in controlling chemical risks both in terms of the safety technology of plant/ship design, and in the systematic management of operations to

ensure delivery of best occupational hygiene and safety practices. As well as requirements on design and operation in relation to the carriage of hazardous cargo, in the oil and chemical tanker sectors of shipping there are especially pronounced requirements on the training of seafarers that are also in place.

Turning to the other sectors of the shipping industry, practices in the carriage of hazardous substances are considerably more varied, most probably reflecting the diversity of ships, companies and clients involved. This is therefore a further parallel with land-based situations in which it is well established that outside of large companies, the chemicals industry and high-risk hazardous installations, there is similar variety of practice in terms of chemical risk management across a wide range of workplaces and sectors. What is also known to be the case on land however is that it is in these situations that previous regulatory strategies to control chemical risks failed because they did not address the conditions of risk communication and control commonly experienced in these workplaces.

Tackling the challenge

Acknowledgement of this failure led to recent strategies to improve chemical risk management by addressing them towards the limitations of risk communication (Russell *et al* 1998, Topping 2001. For example in the UK, the production of *COSHH Essentials*, the recasting of requirements on exposure limits, and the recent reorientation of the COSHH Regulations have all occurred within a policy debate at national level in which the weaknesses referred to above have been aired. Similar debates have taken place more recently in Germany, explicitly addressing the need to make the legal framework for regulating chemical risk management 'more small enterprise friendly' and have influenced Hazardous Substances Ordinance 2005. Within the recently re-established Committee on Hazardous Substances, (*Ausschuss für Gefahrstoffe – AGS*) for example, there is a working group to develop proposals to improve the accessibility of support tools directed at SMEs. In Sweden, the *KemiGuiden* (Chemical Guide) is a complete tool that allows employers to identify regulatory requirements on chemical risk management and implement appropriate responses. It was developed with support and financing from trade unions' and

employers' organisations and is delivered with their active institutional support as well as that of the Work Environment Authority.

Other countries have adopted comparable approaches, embedding them in wider strategic initiatives to engage employers and their workers. For example, in the Netherlands the *VASt* programme, requires employers to engage with preparation of sectoral level action plans for chemical risk management that identify specific improvement activities in high-risk sectors. Alongside another major Dutch strategy that promotes the adoption of covenants (*Arboconvenanten*) between employers and trade unions at sectoral level, setting achievable targets for improvement of health and safety issues, this provides a framework for institutional support in which tools for chemical risk management can be deployed.

In Austria, the AUVASafe system (*AUVAsicher)* provided by the AUVA (the major insurance organisation for occupational risks) is a free preventive support service for smaller worksites. Employers can call upon the services of health and safety expertise from prevention centres run by the AUVA. Chemical risk management is not the only part of its programme, but it is nevertheless a central one (Friedl 2000; Pfoser and Peer 2004).

Such approaches are increasingly international. At the level of the European Union, for example, the rhetoric behind the recently introduced Regulation on Registration, Evaluation and Authorisation of Chemicals (REACH) places considerable emphasis on risk communication in the supply chain and its requirements are intended to promote two way exchange between suppliers and users concerning exposure scenarios at the workplace.

None of this seems to be taking place at sea where there has been no parallel acknowledgement of limitations in the application and operation of requirements for safety in the transport and use of chemicals, as was the case on land. Of course it is possible that this is because, unlike in the majority of land-based scenarios, requirements for managing chemical risks on board ships work effectively. If so, it would seem important to know what are the supports for effectiveness in this respect on board ships and the extent to which lessons learned here can be transferred to land-

based situations. Alternatively, it may be that similar failings to those perceived to occur on land are in fact commonplace in chemical risk management on board ships, but neither they nor their consequences have been properly investigated or documented. If this were the case, again it would seem important to learn more about the reasons for such failings in order to better understand ways in which they may be overcome.

A focus for further study?

A great deal is already known about the technology of preventing harmful exposures to chemical substances. Yet, if the indications of the evidence of exposure and its consequences referred to previously are to be believed, harmful exposure to chemical risks continues to be a commonplace experience at work and a cause of substantial work-related mortality and morbidity. Furthermore, although we cannot document it in detail, it seems likely that such exposure will be no less an issue in the shipping industry than it is in other sectors of the economy.

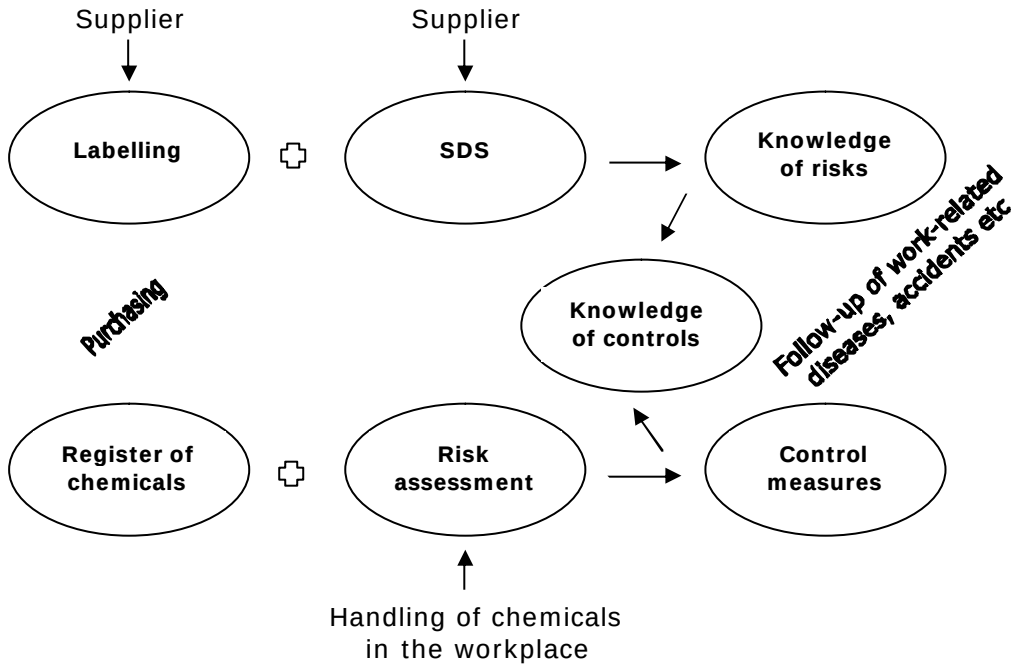
While it is relatively straightforward to show that the technical means exist to prevent harmful exposures, to use chemical substances safely and to monitor workers' exposure and health, as preceding sections illustrate, it is equally easy to demonstrate that they are seldom applied across all the situations in which chemicals are used and it is far from simple to find practicable and economically feasible solutions to this problem.

From a social science research perspective, an interesting set of questions arise concerning the socio-economic factors that act as supports or barriers to desired improvement in chemical risk management of which the following are some examples.

Communicating risk: Figure 1 illustrates the flow of information from supplier to user in chemical risk communication and how it drives the operation of risk management at the workplace. Many of the known weaknesses in present practice take place at points in this diagram. For example, as we have seen, land-based study suggests that

the content of SDSs are frequently inadequate. Preliminary interviews in the present study suggest that there are similar concerns about chemicals both in use and carried as cargo on ships. Further study of the extent and nature of such inadequacy would seem to be warranted since good suppliers' information is both fundamental to downstream safe use of chemical products as well as being one of the cornerstones of regulatory strategies. This does not only concern requirements on the generic design of SDS but also monitoring the extent to which they are observed in practice.

Figure 1: **Aspects of chemical risk management**



(after Walters 2007)

Several other aspects of the role of suppliers are important. In land-based studies, they are shown often to be the major source of specialist and trusted advice on chemical safety, especially for many users in smaller establishments who do not have the resources or knowledge to use alternative sources of advice. It is largely based upon this understanding that modern European regulation such as REACH advocates a greater role for the chemical supply chain and for risk communication between suppliers and users. In shipping the role of economic relations between shipping companies and their clients in the transport of goods can sometimes be major factors that influence the management of safety on board ships, including that of chemical safety. Equally, some of the chemical products used on board ships are often sourced

from relatively few suppliers for whom shipping companies are a major source of business. In these situations the supply chain may be an important influence on safety and the leverage for improvements that may be possible in such relationships. Yet, it is equally clear that there is much variation in the quality of help available from suppliers and that supply chains are not simple relationships (Walters 2007; James *et al* 2007). Their role in improving chemical risk management at sea would therefore benefit from further detailed study to identify both their supporting and constraining features.

Purchasing and registering: Figure 1 also shows the importance of purchasing strategies in chemical risk management. Here too there are several aspects of land-based experience that may be worthy of further study. Fundamental to the control of chemicals hazardous to health is the notion of the substitution of dangerous products with those less dangerous. As researchers have pointed out, such substitution extends beyond substances and can also include plant or processes (Ahrens *et al* 2006). Substitution certainly occurs in the purchase of chemical substances in shipping, but its extent of significance is not clear and a better understanding of these matters and their effects would be useful.

Of course purchasing decisions also take account of a variety of other factors. For example, there is some evidence to suggest that in land-based scenarios as well as maritime ones, some organisational strategies have quite explicitly taken into account environmental issues in the purchase of chemicals and with beneficial effects (Gorton 2001). It would seem to be important to explore how widespread this practice is in shipping companies and how far it is possible to create links between the purchase of substances for use on board ships and already present environment policies in many shipping companies.

A consequence of purchasing that is often a legal requirement is the creation of an inventory of substances used at the workplace. Some firms use this requirement as an opportunity to keep purchasing policies under review to ensure only necessary substances are acquired and in necessary amounts. An example of a similar approach used at sea is found on Wallenius Lines (Gorton 2001). Again, it would be useful to

know how widespread such approaches are and what are their effects in relation to the use of chemicals across the industry as whole.

Risk assessment and control: Reasons for a register of chemicals, and good quality suppliers' information are in a large part to enable adequate assessment of the risks involved in the handling and storage of substances at the workplace. Risk assessment on board ships is required not only by specialised rules and regulations on chemical safety but also more generally as part of the shipboard safety management systems called for under the ISM Code. Elsewhere, risk assessment has been fundamental to regulatory strategies on chemical risk management at the workplace for several decades, and has been seen as an important stage in the development of appropriate control strategies in the professional practice of occupational hygiene for a lot longer. Despite this history, it is a process that is much misunderstood, and often inappropriately and incompletely applied. Research on the practice of managing chemical risks suggests that employers in workplaces other than those that are large and well resourced are poorly equipped to undertake risk assessment and even when they are supplied with appropriate information there remain major problems with their understanding and capacity to carry out the task adequately (Walters 2007). Since the primary purpose of assessing risks is to ensure that adequate and appropriate measures are taken to control them, it follows that failure to discharge this task properly will lead to further problems in implementing appropriate controls.

It was the acknowledgement of this failure that has led the development of the latest national strategies, to improve chemical risk management in land-based industries, some examples of which were outlined previously, and in which generic control solutions and greater engagement with support infrastructures and suppliers are advocated. Properly conducted study of the effectiveness of these approaches has been shown to be limited. However, some indications of supports and constraints to these approaches are evident.

It seems clear for example that simplified and generic control solutions are not a complete answer. Their application requires engagement and support from actors in the economic infrastructures of the sectors and trades in which they are applied. These may include trade unions and employers organisations, trade bodies such as economic

chambers, insurance organisations, inspectorates and occupational health and safety services as well as the suppliers of substances and equipment themselves, and client companies and other intermediaries that are in positions of leverage (Walters 2006 and 2007). The exact nature of such constellations of influence is shown to vary according to firm size, economic position, country, and sector. What is possible by way of support for chemical risk management is very different in, for example, the German printing industry, where there is active, insurance-based, technical support for health and safety, well established co-operation between small firm users of chemicals, the insurance organisation, the trade bodies, the suppliers of chemicals and the regional health and safety inspectorates and say, the British construction industry where many substances are in unsupervised use on a daily basis by non-union employees of small subcontractors with no direct link to suppliers, often at temporary building sites for short periods and with no more than the remotest of connections with the health and safety management arrangements of principal contractors on such sites (Walters 2007).

In contrast to the situation on land, the extent of the success or failure of traditional approaches to risk assessment and control of chemical substances has not really been tested in the shipping industry. Based on the available literature and the preliminary findings from interviews in the present study however, the picture that emerges suggests at least some commonality with land-based experience. For example, most of the work that has been done on exposures to hazardous substances at sea has been undertaken in the chemical and oil tanker trade, paralleling the similar situation in the chemical and oil industries on land. It is in these sectors that the most developed strategies for managing chemical risks exist and again this is the case on land. However, the extent of the research evaluating the effectiveness of these strategies at sea is limited in comparison with that in the same sectors on land. Importantly, there appears to be no documentation of the range and extent of demonstrable good practice on chemical risk management in these trades or of the extent to which such practice might be transferable to other parts of the shipping industry, or of the likely barriers or supports for such transfer. Nor does there appear to be any sign of an emerging research literature paralleling that on land that considers the role of leverage in the economic and social relations of the supply of chemical products, or, in the case of their transportation, of these relations between suppliers, shippers, ship- operators and

users. Yet anecdotal accounts suggest that such relations provide opportunities for leverage in the supply chain and in the relations between shipping companies and their clients that may be important influences on practice.

If all of this could be explored further in the tanker trade, it certainly would warrant investigation in other sectors of shipping where the transport and use of chemicals are commonplace but where the situations and contexts of control are considerably more varied. Here too anecdotal accounts in interviews for the present study suggest that supply chain leverage could be an important support for the introduction of more accessible approaches to risk assessment and control and for sustainable good practice in their operation. Such activities as the storage and use of paints, engine room materials and substances used in general cleaning and maintenance are to some extent comparable with those in land-based activities where the role of suppliers in improving and sustaining good practice have been described further. For example in the motor vehicle trade in Germany large manufacturers are able to influence the management of chemical products both in relation to their contracted dealers and repairers, as well as in some cases, the suppliers of components and there are many other examples in the same vein in other trades (Walters 2007).

Conclusions: Learning from experience

Working with chemical substances is a widespread feature of modern life at sea as well as on land. Some chemical substances are hazardous and exposure to them at work may cause serious ill-health and may even prove fatal. The problem is a significant one but its dimensions are not known, especially not in seafaring, where both exposure and its consequences are difficult to monitor. Nevertheless, sufficient is understood of the means to prevent harm in working with chemical substances to suggest that applying a precautionary principle would be good management practice. Unfortunately, research shows that regulatory approaches to achieving such good practice across anything like the full range of workplaces in which chemicals are used in land-based situations has until now met with only limited success. There are several reasons underlying this limited achievement but research further suggests that important amongst them is the failure of risk communication and support for the

implementation of chemical risk management in enterprises that lack the resources to gain specialist knowledge in this field. The absence of similar study of the situation at sea means that it is unclear to what extent approaches have been successful here, but it would appear that there is sufficient similarity with many land-based situations to warrant caution in assuming such success.

In land-based situations, acknowledgement of regulatory failure in chemical risk management has meant that the orientation of current research and policy has increasingly focused on discovering ways of supporting and sustaining the effectiveness of interventions by exploring the socio-economic contexts in which they occur. It is suggested that there would be something to be gained from the exploration of these contexts in shipping too.

At the same time on land, a general crisis in the resourcing of regulatory inspectorates combined with neo-liberal economic policies has promoted a desire for more self-regulatory approaches towards health and safety management generally on the part of industry. As a result there has been a growing interest in the role of economic drivers, in leverage in the relations of supply, and in the role of actors in social and economic infrastructures that support business relations in achieving improved and largely self-regulatory approaches to health and safety management. These approaches are already the norm in shipping, where in a globalised industry self-regulation has been a well-developed feature for a considerable time. It is therefore quite possible that by investigating the role of economic drivers in determining best practice in chemical risk management at sea, by documenting what works and why it works in these situations, significant lessons may be learned that could have a wider application in other economic sectors.

While it is important to understand and utilise the possibilities for support and leverage to improve chemical risk management in the shipping industry, it also needs to be acknowledged that there are likely to be some limits to the extent to which economic relations can be utilised to drive self-regulated approaches, since there are always those companies that fail to see the commercial advantages of improved quality and are unresponsive to economic pressures to achieve it, opting instead to compete for business by cutting costs. Here again there would seem to be some room

for further study, this time concerning 'best fit' in the relationship between economic drivers and international regulation and its enforcement in achieving improved working practices on board ships.

Particularly interesting at the macro-level for example, would be some consideration of what might be the extent of the possible increased supply chain focus of international regulatory intervention, and to what extent it might be possible to explore linkage between improving workplace health and safety in the use and transport of chemicals at sea, with that of measures aimed at environmental and consumer protection. Such has been the character of the new European approach to chemical regulation typified by REACH. Here, a refocusing of the chemical suppliers' duty of care has occurred so that it is industry rather than the state that is responsible for ensuring the safety of chemical products, and the extent of this responsibility extends beyond use at work to embrace consumer and environmental protection also. In so doing, the role of risk communication in the supply chain has become a prominent issue for regulatory attention.

It is far too early to see what the effect of these measures will be, but for our purposes, it is important to note the already existing parallels in some of the requirements of MARPOL, in the voluntary practices of larger oil and chemical suppliers, shippers and shipping companies and to suggest that their effects could be the subject of fruitful future inquiry.

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ACCIDENT AND INCIDENT DATA

Neil Ellis

Abstract

Although it is often suggested that accidents at sea have reduced over the last decade, there is no doubt that they still occur, both to vessels and those that work on them. One potential contribution to the reduction of such accidents is the collection of accurate data on accident and incidents as this may be used to suggest improvements to safety systems, and to inform changes in practice and policy. Although there are a number of sources from which such data may be obtained, when these are examined they are generally found to be localised, poor in coverage, and/or to contain only very basic data. Therefore, this paper outlines an attempt to collect and combine available sources of accident and incident data, both for vessels and personnel, discusses the format, nature and limitations of this data, and considers whether there is any common core of available information in the public domain. Information from a number of sources will be examined, including maritime administrations, P&I clubs, and shipping companies. Finally, recommendations are made to consider what information could valuably be recorded, and how it could helpfully be classified, so that these sources are more comparable and compatible for research purposes.

Introduction

Although the number of shipping accidents occurring at sea has been said to have reduced over the last decade (Transport Safety Board of Canada, 2001) accidents and incidents still occur, both to vessels and those who work on them. The impact of these accidents can be far reaching. Not only can they entail physical damage to, or loss of, a vessel with considerable financial losses, all too frequently they also involve loss of life or disabling injury. For shipping in general, such accidents cause a loss of confidence about the safety of the industry (Iarossi, 2003), and may produce strong demands for tougher regulation and control over the sector.

One way to try and reduce accidents and suggest ways in which safety may be improved, is to collect accurate information about the accidents and incidents that occur (McCafferty and Baker, 2006; Nielsen, 2001; European Transport Safety Council, 2001). The benefits of such information are well recognised. The European

Transport Safety Council (2001) in a report on road, air, rail, and water transport suggested that 'accident and casualty databases are an indispensable tool to allow for objective assessment of transport safety problems, the identification of priority areas for action and for monitoring the effectiveness of countermeasures' (p1).

There are also a number of benefits of such information which are specific to the maritime industry. For example, classification societies could use such information to guide and support their planning of rule making (Baker and McCafferty, 2005). Shipping companies may also use this data to develop better informed and targeted policies for their safety management systems, whereas Port State Control could use it to identify ship types that are more at risk of incidents in order to better target vessels for inspection. More generally such data may help to facilitate research into health and safety within the industry (Baker and McCafferty, 2005), which at present is very limited.

Ashore, information about accidents and incidents in most transport sectors is well recorded and is readily available. For example, a European wide database of road transport accidents was set up in 1993, and all member states provide data to feed into this on a yearly basis. Similar schemes have also been set up in the aviation industry (European Transport Safety Council, 2001). However, in the maritime industry, although administrations are legally required to collect data on accidents and incidents occurring to their flagged vessels, or to vessels in their waters under SOLAS regulation I/21 and MARPOL 73/78, articles 8 and 12 (see MSC/Circ.953-MEPC/Circ.372 for more detail), this data is sometimes poorly kept, and often not always publicly available. This makes it of limited use.

In an attempt to try and examine the types of accidents and incidents that are occurring at sea, some researchers have simply looked at single datasets (Philips and Daltry, 2006, Roberts, 2006). However, due to their nature such studies are generally very limited, as the data even when collected from several sources is often related to a single geographical location (e.g. Hansen *et al.,* 2007), or focuses on specific vessel types. Thus, robust generalised statements about the type of accidents and incidents that are occurring worldwide cannot confidently be made from such studies.

Other researchers have attempted to collect data from multiple sources and aggregate this data (Baker and McCafferty, 2005). However, in practice these have only used data from a small number of sources which the researcher has access to, and thus cannot be seen as global in their coverage, suffering from many of the limitations similar to those of the single source studies. A similar conclusion is drawn by the European Transport Safety Council (2001) report on accidents and casualties occurring in waterborne transport.

A major recognised source of accident and incident information is maritime administrations. Administrations are not only obliged to conduct accident investigations and record their outcomes, but they must also supply the International Maritime Organization (IMO) with information regarding their findings[1]. However, they are only legally required to provide these when 'it [the maritime administration concerned] judges that such an investigation may assist in determining what changes in the present regulations may be desirable' (Graveson, 2006), and thus a large majority of the accidents and incidents that occur are not reported. This is supported by our own analysis of the IMO database and corresponding data from a sample of maritime administrations which indicated that only a very few of the incidents recorded on national databases are reported to the IMO[2]. A similar conclusion is drawn by Graveson (2006).

Many other sources of accident and incident data are also available. For example, the World Casualty Statistics is published yearly by Lloyd's Register Fairplay, and lists losses and disposals of sea-going merchant ships. Confidential reporting schemes such as the Marine Accident Reporting Scheme (MARS), and the Confidential Hazardous Incident Reporting Programme (CHIRP) collect and publish accident information reported confidentially by seafarers. However, these sources generally provide limited data with very partial coverage, and cannot be used to determine robust calculations of numbers of accidents and incidents globally.

[1] Under the SOLAS regulation I/21 and MARPOL 73/78, articles 8 and 12 legislation (see MSC/Circ.953-MEPC/Circ.372 for more detail).

[2] It should be noted that administrations are only legally required to report ship casualties which are considered to be 'serious' and 'very serious'.

Thus, whilst there are a number of available sources of information about maritime accidents and incidents internationally, these are either very localised, or those which are more global contain very limited data. The European Transport Safety Council (2001) suggested that where such situations arise 'a co-ordinated approach offers the best means to gain maximum value out of each separate system' (p7). However, to date in the maritime industry such a combined approach has not been undertaken on a large scale.

This paper describes the progress made to date with a project dedicated to the identification and collation of accident and incident data kept by different sources worldwide, such as maritime administrations, Protection & Indemnity (P&I) clubs, and shipping companies, as well as other available sources of information. The format and nature of these data will be documented, as well as whether there is a common core of information that is collected across sources. The public availability of relevant data will be also discussed.

Within the study we have looked at two levels of accident and incident data: vessel level incidents and personal injuries/fatalities and in describing these have approached and collated data from maritime administrations, P&I clubs, and shipping companies.

Vessel Level Incidents

In order to collect vessel level incident data, maritime administrations were contacted and asked for their co-operation. Maritime administrations are legally obliged to collect accident and incident data, so between them they should be in a position to supply comprehensive data on numbers of accidents/incidents worldwide, all things being equal.

However, shipping is a major global industry, and worldwide there are over 180 maritime administrations. Contacting all of these would be very time consuming. Therefore using the Lloyd's Register Fairplay World Fleet Statistics 2005 report, we identified the top 30 countries of registration by gross tonnage and contacted them for

further information and details. This was seen as acceptable as the top 30 represented 87.5% of the world gross tonnage.

Contact details for these maritime administrations were obtained from three sources. Firstly, the Marine Accident Investigators International Forum (MAIIF) (http://www.maiif.net/Contacts.htm) which is an organisation that aims to provide a forum to promote and improve marine accident investigation, and to foster co-operation and communication between marine accident investigators. Secondly, the International Maritime Organization (IMO) website (http://www.imo.org/includes/blastDataOnly.asp/data_id%3D17408/6-circ.2Annex1NationalcontactpointsJan07.pdf), and thirdly, if no contact details were listed for a particular maritime administration, internet search engines or personal contacts were used to try and identify relevant personnel[3].

Using these contact details a combination of faxes and emails were sent to the listed contact persons/organisations explaining the aims of the project, and asking them to identify the most appropriate person to contact in their administration about accident and incident records and their potential access. To make it easier and quicker to respond a pre-designed pro-forma was provided (see Appendix 1) asking for the following information: organisation, name, the person's position within the organisation, their address, email, telephone number, and fax number. The sheet could be either sent back by email or by fax. If no response was received to this after approximately 2-3 weeks, a follow up fax or email was sent, again asking for the same information. If no responses were received after the two attempts, the maritime administrations were contacted by telephone (where listed), and the contact details of the appropriate person were asked for.

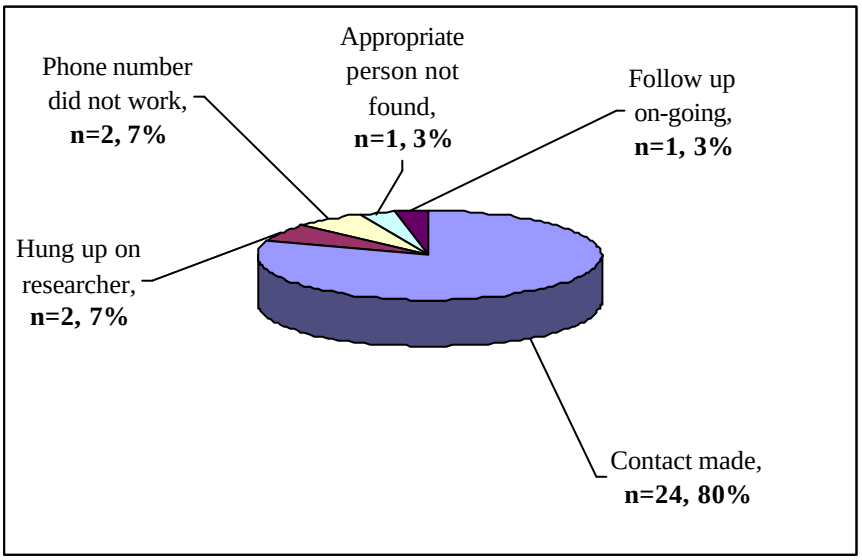
Although for many of the contacts the same organisation and individuals were listed on both the IMO and MAIIF list, in some instances different people/organisations were provided. In these cases, if no response was received from the initial and follow

[3] In some cases no contacts details could be found for some maritime administrations either on the lists or the internet, and thus, where possible personal contacts of staff in SIRC were used to either directly contact the maritime administration, or to identify contacts.

up requests, an alternative contact person was identified from the list, and was contacted.

Following this lengthy process we managed to get a response from 80.0% (24 of the 30) of the maritime administrations initially contacted. Of the 6 maritime administrations we could not contact at all despite numerous efforts, two put the phone down on the researcher, which was mainly attributed to language difficulties, and the phone number listed in two other cases did not work. For one maritime administration, the contact details were for an inappropriate person in the administration, and despite being passed from department to department, the appropriate person was never found, and in one further case the follow-up process remains incomplete.

Figure 1: Pie chart showing contact made, and reasons for contact not being made

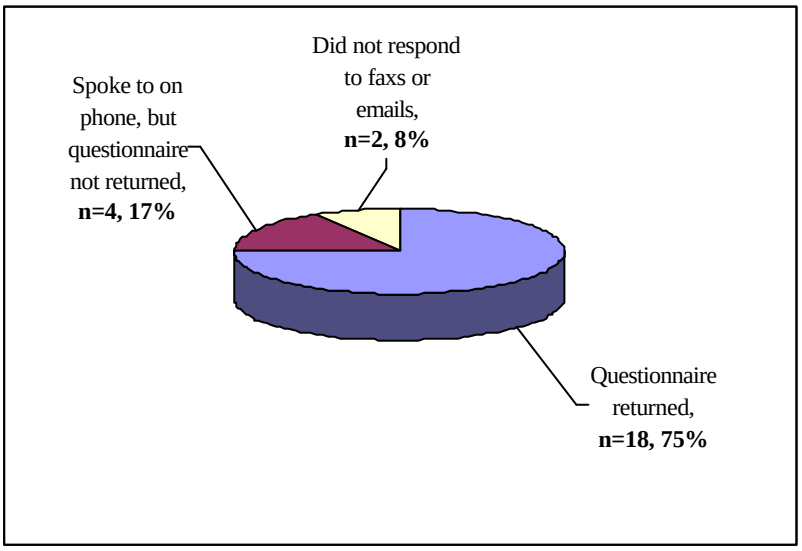


Once we had established the appropriate individuals with whom to further liaise, we sent a short questionnaire (see Appendix 2) to them by fax or email. The questionnaire asked about the sort of information that was maintained by the maritime administration (e.g. written accident reports, statistics on accidents, tabulated data, etc), the format (i.e. electronic or paper), whether it was publicly available, whether it could be accessed online, and importantly if they would be willing to share this data for academic research purposes.

If no response was obtained a second follow up fax/email was sent after a period of 2-3 weeks. After a further 2-3 weeks, if we still hadn't received a response, the identified person was contacted by phone, and asked if they would be willing to complete and return the questionnaire.

As a result of this concerted effort, 18 completed questionnaires (75.0%) were returned from the 24 administrations for which we had contact details. In four of the six cases where questionnaires were not returned, this was despite discussions with individuals on the phone and agreement with regard to the re-sending and return of the questionnaire. Two contacts, simply did not respond to any fax or emails sent to them.

Figure 2: Pie chart showing the number and frequency accident database questions returned, and reasons for no - responses



Looking at the 18 questionnaires that were completed and returned, 94.4% (n=17) of the maritime administrations indicated that they kept basic records of accidents and incidents that occurred on their national flagged vessels and in their national waters, with only one maritime administration indicating that it did not keep any records at all. However, when asked more specifically about the types of records kept, all 18 maritime administrations indicated keeping records of accidents/incident reports, with 88.8% (n=16) keeping paper records, and 72.2% (n=13) keeping electronic records. Similarly, all 18 maritime administrations kept records of accidents/incident

investigations, with 94.4% (n=17) keeping paper records, and 66.7% (n=12) keeping electronic records. However, not all maritime administrations kept statistics on accidents, with one indicating that it did not keep records in either a paper and electronic format. Of the remaining 17 that did, 76.6% (n=13) kept paper records, and 70.6% (n=12) kept electronic records. Four (22.2%) of the maritime administrations indicated that they kept other sorts of records, including website data, faxes and the International Maritime Organization Global Integrated Shipping Information System (IMO GISIS). The frequency and type of records kept can be seen in Table 1.

Table 1: The frequency and percentage of record types kept

Records kept			**Type of record**		
	Frequency	*Percent*		*Frequency*	*Percent*
Accident/incident reports	18	100.0%	*Paper*	16	88.8%
			Electronic	13	72.2%
Accident/incident investigations	18	100.0%	*Paper*	17	94.4%
			Electronic	12	66.7%
Statistics on accidents	17	94.4%	*Paper*	13	76.6%
			Electronic	12	70.6%
Other	4	22.2%	n/a		

For the accident and incident records that were kept, just under half the maritime administrations (44.4%, n=8) indicated that these were publicly available, and in 87.5% of cases (n=7) these were available online. In 6 of the 7 cases (85.7%) web addresses were listed. However, for one of these the website was maintained in the national language, and thus the researcher could do no further analysis of its content. Of the remaining 5 websites, two gave access to accident reports only, one offered tables of accident statistics, and the remaining two websites maintained both sources of data.

When asked if they investigated all accidents that occur on their national flagged vessels or in their national waters 66.6% (n=12) of the maritime administrations indicated that they investigated all accidents. The majority of these investigations were done by the maritime administration itself with only 33.3% (n=6) suggesting that the investigations were done by another agency.

Twelve maritime administrations (66.7% of those who returned the questionnaire) indicated that they might be willing to share the information that they maintained on accidents and incidents for academic purposes. These maritime administrations were contacted by email and asked if they could provide us with access to/or copies of the accident and incident databases/records (ideally in an electronic format) for the period of 2000-2005. The email emphasised that the information would only be used for research, and that we were interested in general trends, and not individual cases. It was also made clear that all data would be treated as strictly confidential and that any reporting of it would not identify any sources of data, vessels or seafarers.

If no response was obtained, a follow-up email was sent after a period of 2-3 weeks. If there was still no response after an additional 2-3 weeks, the maritime administrations were contacted by phone, and asked if they would be willing to let SIRC have access to the data for academic research purposes. In a number of cases the person contacted had to seek further permission to share the data which took additional time.

In addition to those that agreed to share data when they completed a questionnaire, a further maritime administration subsequently agreed, via email correspondence, to share accident and incident data with us for the study, making a total of 13 maritime administrations that agreed to share their data with us.

However, after extensive follow-up, of these 13 maritime administrations only 7 (53.8%) actually provided data. Even though they indicated that they were willing to share data, two of the maritime administrations simply did not respond to requests to provide this. A further two despite repeated emails and phone conversations have yet to actually provide the data, although they still seem willing to do so. Reasons for not providing data ranged from difficulties with extraction, to needing to seek permission from a higher authority. In one case, although the maritime administration had data, it could not provide it as it had only recently been computerised, and said it needed to check the system before it could extract such data, saying this would take around 12 months. In another case, a database was actually sent, although this was blank. Despite follow-ups about this no complete database was received. In three cases, data was obtained (in some cases additional data to that sent) from the maritime administrations' websites, as this was publicly available online.

Table 2 summaries the data that was sent to us by maritime administrations. The actual source of the data has been excluded to protect confidentiality and the alphabetical letters labelling datasets were assigned randomly. In most cases the datasets cover a period from 2000-2005, although in one case, only a single year of data (2004) is given, and in two other cases, data is available from 1984 and 1982, respectively.

Table 2: Content of the datasets provided by the maritime administrations

	Country										**% keeping Information**	
	Datasets							***Offline***				
Information Kept	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**A**	**D**	**H**	***Datasets***	***Offline***
VESSEL LEVEL												
Reference number			✓	✓	✓						42.9%	-------
Occurrence date/date incident occurred	✓	✓	✓	✓	✓	✓	✓				100.0%	-------
Location		✓		✓	✓	✓					57.1%	-------
Incident type	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	100.0%	100.0%
Vessel name			✓	✓		✓	✓				57.1%	-------
Flag		✓		✓		✓	✓				57.1%	-------
Ship type	✓	✓	✓	✓		✓	✓				85.7%	-------
Damage to vessel				✓	✓						28.6%	-------
Gross tonnage		✓		✓		✓	✓				57.1%	-------
Age of vessel when accident occurred				✓			✓				28.6%	-------
Was there any pollution						✓	✓				28.6%	-------
Remark	✓	✓	✓		✓						57.1%	-------
Cause		✓		✓							28.6%	-------
CREW LEVEL												
Total crew number							✓				14.3%	-------
Number of seafarers dead	✓	✓	✓	✓	✓	✓	✓	✓			100.0%	-------
Number of seafarers rescued							✓				14.3%	-------
Number of seafarers injured	✓	✓	✓	✓[4]	✓	✓	✓	✓			100.0%	-------
Number of seafarers missing	✓	✓		✓			✓	✓			57.1%	-------
Crew injury level					✓						14.3%	-------
Details of crew injury	✓				✓						28.6%	-------

[4] Injuries are actually broken down into serious and minor injuries.

From Table 2 it can be seen that there is considerable variation in what information is recorded about accidents and incidents. Some countries, such as country 'D', store detailed information, whereas others store much less, for example countries 'A' and 'C'. All keep information on the type of incident, the dates of incidents, and the number of seafarer deaths or injuries. The majority (85.7%) also keep information on ship type. However, important information about the vessels and the incident seem not to be recorded in many cases, with less than half (28.6%) of maritime administrations recording information about the age of the vessel, damage occurring, and surprisingly the cause of the incident. Information about the nature of injuries to personnel is also often not recorded, with only one of the current datasets including such data.

Although Table 2 includes information about what accident and incident data and statistics are available online, it is difficult to draw conclusions about such data, as they often only represent a small amount of the information held by the maritime administrations, i.e. what they chose to publish. Therefore these online data sources will not be discussed any further. However, it should be noted that only 3 maritime administrations actually published such data.

Looking at the format of the data, a number of problems can be seen when making comparisons between the different sources. Firstly, as discussed above, different information is recorded by each of the maritime administrations. Although there is a basic core of information, in reality only a very limited number of variables can be compared, such as incident type, ship type, and the number of seafarers deaths or injuries. Thus only a very basic picture of the type and nature of accidents and incidents occurring worldwide can be obtained.

How the data is recorded is also an issue. For example, some maritime administrations code fire and explosion as separate events, whereas others group them together. In fact, even within maritime administrations classification may change year by year as databases grow and develop. Such inconsistencies, make it very difficult to compare datasets, and often result in the loss of detailed data as incidents have to be grouped together in order to compare them meaningfully. This standardisation not only applies to factors such as accident types, but also to others such as recording of

personal accidents. For example some maritime administrations simply record numbers of seafarers injured, whereas others record more detailed information such as whether these injuries were minor, serious, or fatal.

There is also large variation in respect to the years for which data is available. Some maritime administrations keep data as far back as 1982, whereas others have only recently begun to collect data. For example, country 'E' only has accident and incident data from 2000. It is important to note that it is not only tabulated data that is not kept in some cases prior to these dates, but that accident and incident data per se is not available at all before this. However, it must be noted that in some cases we were only provided with data for a certain range of years (usually 2000-2005), even if accident and incident information was available for years prior to this.

In this paper we have only discussed tabulated data, and this ignores the vast number of accident reports that the maritime administrations maintain, which take the form of narrative reports, many of which are published online. In fact all maritime administrations indicated they kept such records. However, this type of data is very problematic from an analytic point of view as data needs to be extracted, classified, and standardised which, as a process, is very open to error, such as variability in coding and difference in interpretation of the data, even if it is done by one researcher. Therefore, although narrative accounts may be a rich source of information about what happened during accidents and incidents, they present a number of challenges in terms of the extraction of reliable statistical data.

Despite these difficulties, we were able to create a limited accident and incident database using combined data from the maritime administrations, containing the following factors: ship type, incident type, flag, the number of fatalities and injuries. It is these data that will be presented by Dr Bailey in the next paper in a comparison of perceptions of risk and 'reality' as far as we can ascertain it.[5] . Table 3 gives a flavour of the sort of information which is contained in the database, showing the percentage of incident types occurring.

[5] See Bailey, N., Ellis, N., Sampson, H., 2006 '*Perceptions of Risk in the Maritime Industry: Ship Casualty*', SIRC: Cardiff University for more information about the perceptions data which this comparison is based on.

Table 3: The percentage of incidents that occurred - all maritime administration databases

Incident type	Percent
Collision with Another Ship	34.9%
Damage to Vessel	12.8%
Personal Injury/Death	9.4%
Grounding	8.5%
Sinking	8.3%
Fire	5.4%
Natural Death	4.4%
Damage to Equipment/mechanical failure	2.8%
Regulation Infringement	2.2%
Missing Data	1.8%
Contact with a fixed structure	1.8%
Fire/explosion	1.5%
Explosion	0.2%
Other	6.1%

Personal Injuries

Although maritime administrations keep fairly detailed information about accidents and incidents that occur to their vessels, records of accidents and incidents occurring to crew are much less detailed, especially if these did not involve the vessel at all in terms of damage (see Table 2).

Looking at the data which is kept, in all cases maritime administrations retained information about the number of seafarers who were injured and fatalities that occurred in any recorded incident. In one case these injuries were further broken down into 'serious' or 'minor' injuries. Nearly two thirds (57.1%) kept information about the number of seafarers missing. However, only a small number kept more detailed information about injuries, with just 2 (28.6%) recording the activity that was being undertaken when the incident occurred.

This lack of detailed information has a number of drawbacks. Firstly, it does not allow a reliable picture of the most frequent accidents occurring to be obtained, and thus little can be said about the risk of certain accidents and incidents occurring. This lack

of information, such as the task being undertaken, means that no conclusions about casual factors can be drawn from aggregated data, or recommendations as to how procedures can be improved in order to try and reduce the risk of accidents.

Even when information is available about the type of accidents occurring, as with the vessel level data, there is often little consistency across sources as to how this is classified, again reflecting the differing nature of what is recorded by the maritime administrations. Thus it is difficult to make robust comparisons across the datasets.

There may also be under-reporting of injuries that occur to personnel, as these often only seem to be recorded when they are linked to accidents associated with the vessel. The severity of an injury may also influence whether it is reported, and Philips and Daltry (2006) suggest that only a fraction of the incidents that occur are reported if they do not involve a fatality or serious injury. Thus the level of accidents and incidents occurring to personnel is likely to be dramatically under-represented as a result of considerable under-reporting.

Given these limitations, we decided to see if more robust information could be collected from other sources. Two possible alternative sources of data relating to personal injuries were identified: P&I club claims data, and company 'in-house' data.

P& I Club Claims Databases

Given the sensitive nature of this data, the previous approach - obtaining access through 'cold calling' - was seen as inappropriate, and therefore a face to face method of negotiating access was employed. Using established personal contacts within SIRC, we approached a number of P&I clubs within the UK, one within Scandinavia and in addition a claims handler based in a major labour supply country with whom we had worked in the past[6].

[6] We are very grateful to all these individuals for their kind assistance and time consuming efforts to help us.

We managed to obtain the cooperation of 3 P&I clubs and one claims handler, who agreed to provide us with data. To date information has been provided by 2 of the P&I clubs, and the overseas claims handler. With respect to the final P&I club, researchers have visited the office and looked at the data maintained, and it is hoped that in the near future they will return with a strategy for collation and collection.

The type of data obtained from the P&I clubs was for the most part in the form of aggregate statistics presented as frequencies and percentages in relation to the different types of claims received (most of the clubs did not feel they could allow us to have full access to the raw claim reports due to their sensitive nature and potential legal repercussions). Having examined the data, we concluded that there is little congruence in claims classification across clubs. Indeed it was only in relation to burns that incidents appeared to be classified in the same way. This makes it difficult to compare data from one club with data from another, as there is no standard format to the stored information. Table 4 shows the injury claims for two of the P&I clubs, and illustrates the different nature and format of the data kept by the two clubs, with only 'burn' being similar across the sources.

Table 4: The types of injury claims received by each P&I club

Club A		**Club B**	
Injury type	*Percentage*	*Injury type*	*Percentage*
Burn	2.7%	Burn	8.4%
Strain	7.4%	Dental	0.6%
Suffocation	0.8%	Fracture	46.0%
Drowning	0.8%	Wound	26.6%
Cause of injury	47.3%	---------	---------
Under investigation	34.2%	---------	---------
Other	6.8%	Other	18.4%
Total	100.0%	*Total*	100.0%

Another limitation on the use of P&I claims data in establishing levels of incidents/accidents to vessels and to seafarers is that they may only be collected when claims are sufficiently large to justify recording/documentation. For example, some clubs only collate data relating to claims over 100,000 US dollars, which means that many accidents and incidents where costs have been relatively minor are not included.

For larger claims, records are generally kept, but this is often only in a very basic form. It seems that only in the cases of very large claims, amounting to several hundreds of thousands of US dollars, are detailed records kept.

The format of the records maintained by the P&I clubs is also problematic from a research perspective. Claims generally take the form of a file (or files) of information about the claim, which include accident and investigation reports, port state control reports, witness testimonials, solicitors' letters, invoices, emails and other correspondence. Within these files there may be little organisation and order, and what is included often varies greatly from claim to claim, depending on the nature of the individual case. From a researcher's point of view this is very difficult to analyse, as it may be necessary to trawl through hundreds of documents in order to arrive at standardised data which can be aggregated into accident/incident statistics. This process has its own problems as, during such coding of cases, researchers are necessarily required to exercise a degree of judgement as to what injuries to record, how to classify accidents (for example, where multiple injuries may be present) and so forth. However, notwithstanding this difficulty, it is simply the case that in many claims files the residing documents simply do not include enough detail about the incident to allow for such classification into usable standardised data[7].

Even when P&I clubs do aggregate their data, due to the changing nature of how claims are classified, groupings are often inconsistent from year to year making comparisons over time highly problematic. It is also the case that many claims records have also only been recently computerised, and thus the analysis and classification of earlier, paper-based records requires considerable effort and time.

Some clubs publicly report some of their findings from their claims databases. However, caution must be taken when examining these, as they may reflect the particular club priorities - for example, which claims are the most costly, rather than which incidents are the most frequent. When looking at such reports, it is therefore

[7] Through examining the records at the P&I club it is estimated that only 1 in 10 of the claims have sufficient information to be aggregated effectively into an accident and incident database format.

crucial to remember that these represent claims, and not accidents and incidents, which are very different in nature.

Due to the many limitations of the claims data, and the vastly differing nature of the information kept by different clubs, it was not possible to attempt to combine them together into one dataset, and thus only very limited conclusions can be drawn from each comparison made. No meaningful aggregated statistics for the P&I clubs can be presented.

Company Injury Data

The introduction of the International Safety Management Code in 2002 made it a legal requirement for shipping companies to set in place and follow documented Safety Management Systems (SMS). As part of this process, companies are also required to record and maintain accident and incident data for their fleet, and this information is usually very detailed. However, it is generally not publicly available and kept within the company due to its sensitive nature.

Therefore, in order to try and address the limitations of the data kept by the P&I clubs we decided to approach a number of shipping companies which had helped us with the Lloyd's Register Educational Trust Research Unit (LRETRU)[8] *Safety and Perceptions of Risk* study, and asked if we could have access to their injury records. Five companies were approached and of these three provided accident and incident information and two are still in discussion with us. Of the three that did provide data, one simply provided their raw accident and incident data, one provided a internal report which consisted of brief summaries of each incident that had occurred within the company between 1999-2005, and the final company provided its 'in house' software package which was used to produce accident/incident reports, as well as examining more detailed information about specific incidents and reporting new incidents. Each of these sources of information will now be examined in order to see

[8] Formerly known as the Lloyd's Register Research Unit (LRRU)

the format of the data, what it can be used for, and its compatibility to other sources of data.

Company A

Company A provided its accident and incident data in a raw electronic format for a period of 2003-2005, which included just over 1,600 reports. These datasets included information such as the date of the incident, reference number, a description, information about the cause, and classification of the incident type.

When comparing this data to that of the maritime administration and P&I clubs a number of differences can be seen, relating to the classification of accidents and incidents. For example, Company A classifies accidents in terms of major and minor injurious, near misses, pollution incidents, and mechanical incidents, where as maritime administrations classifications included fire, explosions and collisions, etc. Therefore this makes comparisons between the different sources very difficult.

However, the description field in the data does give fairly detailed information (in the form of a narrative) about what happened, and this was available for approximately two thirds of the accidents and incidents that occurred. Analysis of this showed however that many of the incidents refer to mechanical and electrical failures, dealing with functionality problems of machinery and equipment rather than the types of occurrences traditionally termed as accidents and incidents.

However an important factor listed on company A's data is cause. This was listed at multiple levels, and is classified in terms of the main cause, and then broken down into three subsequent causes. No other data sources provide such important information, and this may be very useful in the development of subsequent interventions or attempts to develop safety measures.

Company B

Access to Company B's accident data took the form of access to a software package which could be used to produce customisable accident/incident reports, as well as to

examine more detailed information about specific incidents. Data could be manipulated and queries run according, for example, to particular years, incident types, locations of work, etc. Outputs could take a variety of forms such as tabulated data, bar graphs and pie charts.

However, there were a number of difficulties with the software package. For example, although the software package could produce varied outputs, many of which use similar categorisation to those used by the maritime administrations, data could not be re-coded or re-classified and therefore it was not possible to produce a single output to match the maritime administrations data. Raw data was not available and this considerably reduced the capacity for the data to be used comparatively.

As a single data source, Company B's data provided a good model for the collation of personal injury data, providing breakdowns of the types of injury, the area of the body where injury occurred, the severity of injury, treatment received, and the location of the incident which resulted in the injury. However these details are provided as separate outputs, and information cannot be matched across individual cases limiting the conclusions which can be drawn from the study of the information. For example, conclusions about the most frequent types of accidents in certain locations onboard vessels cannot be made.

The personal injury data is however detailed enough and similar enough to that maintained by other companies, such as Company C, to compare for example the types of injury and the location of injury on the body, with some standardisation of coding between the two. This analysis is ongoing.

Company C

Company C's accident and incident data takes the form of a report which includes brief summaries of each incident, which are further grouped into basic incident types, as well as graphs summarising these data, for example, bar graphs and pie charts showing the number of incidents by month. The reports cover accidents and incidents over the period 1999 to 2005.

The data is fairly comprehensive giving a brief overview of the accidents and incidents that occurred, and containing more detail than in many of the maritime administrations accident and incident reports referring to personnel. The nature of this data is different from that contained in maritime administrations datasets, including more detail about the incident, not just the number of seafarers injured or fatalities. Its more detailed nature would make it easily adaptable to be comparable to other available data.

Although this report was printed it was fairly easy to transfer the brief summaries to a database in order to aggregate them, using categories of injury causes similar to those used on the LRETRU's 'Study of Safety and Perceptions of risk' Questionnaire Survey. This allowed us not only to examine the frequencies of injury types occurring, but also to compare these to the perceptions of risk for each (as defined by the questionnaire survey results). This analysis is currently ongoing.

Other Data Sources

Although we have looked at three sources of data within this paper, there are many other sources of accident and incident data that are publicly available, such as reports, papers, and annual publications. These stem from a range of institutions and organisations within the maritime industry, as well as governments and academia. Therefore this section will consider a select few of these data sources, looking at the format of these, as well as their compatibility to other sources of data.

Lloyd's Register Fairplay - World Casualty Statistics

The *World Casualty Statistics* are published yearly by Lloyd's Register Fairplay, and list frequencies of total losses[9] and disposals[10] of sea-going merchant ships. These figures are additionally further broken down by nationality of registration, nationality

[9] The term total 'losses' refers to 'propelled merchant ships of not less than 100 GT which, as a result of being a marine causality, have ceased to exist, either by the virtue of the fact the ships are irrecoverable, or have been subsequently broken up'. Ships that have been declared as total losses, but which have, or are in the process of being repaired are not included.

[10] The term 'disposals' refers to ships which are broken up for reasons other than casualty. These will not be considered within this paper.

of owner, incident type, ship type, GT and DW ranges, as well as many combinations of these. The most up to date report is for 2005, although data is available back to 1994. The *World Casualty Statistics* mainly deals with losses and disposals for cargo carrying ships, although data for other types of vessels are included, but generally only for serious incidents. The data does however exclude pleasure crafts, naval vessels, and ships restricted to harbour services, or river/canal services. This information is compiled from a variety of sources, including data from insurance claims handlers, classification societies, registration authorities, reports form the web, owners, and government departments. This is usually collected in a raw format, and then coded, with new sources constantly being added.

The information which is presented by the *World Causality Statistics* is very similar in many instances to the format of the data recorded by maritime administrations and some of the companies. This makes it easy to compare basic information, such as, accident types, and vessel types to other sources. More in depth analysis is also possible, for example, such as the number of losses by flag and ship type, due to the extensive breakdown table provided, although this would take in some cases extensive manual manipulation.

However, there are a number of problems, from the point of view of this type of research, with the use of the *World Casualty Statistics*. Crucially data is limited to cases involving total loss of vessels excluding the many cases where vessels are repaired or relatively undamaged after accidents and incidents. The data also focuses on cargo vessels over 100 GT excluding many other smaller vessels, for example those that work within harbours. Therefore although the *World Casualty Statistics* may be based upon information received from a wide range of sources, its scope in terms of the provision of a comprehensive dataset relating to marine accidents and incidents is very limited.

To illustrate the under-reporting inherent in the database a comparison was made between the frequency of incident types as listed in the *World Casualty Statistics* publication for a period of 2005-2000 to data provided to LRETRU by five maritime administrations for the same period (Table 5).

Table 5: The frequency of different type of incidents for the period of 2000-2005 reported in the World Casualty Statistics, and from 5 maritime administrations

Incident Type	World Casualty Statistics	Maritime administrations combined datasets	Percentage differences
Collision	112	2631	2249.1%
Contact	20	135	575.0%
Fire/Explosion	126	539	327.8%
Foundering	423	623	47.3%
Hull/Machinery	9	Not included in dataset	n/a
Missing	4	Not included in dataset	n/a
Other	20	Not included in dataset	n/a
Wrecked/Stranded	208	638	206.7%
Total	922	4566	395.2%

From this comparison it can be seen that even when accident types from the *World Casualty Statistics* are compared to those from only five maritime administrations, there is a massive difference between the numbers of incidents recorded. In general, despite only coming from five maritime administrations, there is much more data recorded in this combined database. For example, in the case of collision the maritime administrations show a 2249.1% increase in the number of cases recorded. For other incident types the difference is less extreme, for example, foundering (taken as sinking) only showed a 47.3% increase. For our purposes such under-reporting makes the dataset unsuitable for use in analysis.

The Australian Transport Safety Bureau (ATSB) - Online Database

Although this source is in essence the Australian Maritime Administration's accident and incident database, Australia was not included in the top 30 maritime administrations, and thus given the accessibility of its data it will be discussed briefly here.

The Australian Transport Safety Bureau (ATSB) is an operationally independent body within the Australian Government Department of Transport and Regional Services and is Australia's prime agency for transport safety investigations. Its aim is to

maintain and improve transport safety and public confidence through independent accident investigation, safety data analysis recording and research, and through raising awareness and knowledge. The ATSB investigates accidents in the aviation, marine, rail and road sectors and keeps records on all of these.

In reference to marine accidents, it investigates all accidents and serious incidents involving Australian registered ships anywhere in the world, as well as foreign flag ships within Australian waters. These reports are then published in a tabulated format on the ATSB website which is publicly available (http://www.atsb.gov.au/publications/investigation_reports/index.aspx?mode=mar).

The data includes information relating to occurrence date, location, basic categorisation, and brief descriptive accounts. Some personal injury data is also presented, although this is very limited being classified and presented as either 'none', 'minor', 'serious', or 'fatal'. With some recoding this could be compared to the information stored by other maritime administrations.

Confidential Reporting Schemes

Confidential Reporting Schemes, unlike many schemes linked to maritime organisations and shipping companies are voluntary and confidential, and allow seafarers to report accidents or near misses without fear of reprisal or blame. The aim of these schemes is to 'create an environment where human element incident reporting is facilitated, resolution promoted and information disseminated without risk of negative personal consequences' (Powell, 2006). There is strong support for such schemes, as many suggest that they encourage seafarers to submit reports where they would not necessarily do so in other ways (Beedle, 2006).

One such scheme is the Marine Accident Reporting Scheme (MARS) run by the Nautical Institute, which was started in 1992. Accident reports are received from seafarers worldwide who can report accidents (and near misses) without fear or prosecution. The sole purpose of MARS is to pass on lessons learned to other seafarers through making public these anonymous reports. To date over 700 reports have been received and published by MARS (Beedle, 2006). Other schemes also

exist, such as the Confidential Hazardous Incident Reporting Programme (CHIRP), originally introduced in 1982 within the aviation industry, but extended to the maritime industry in July 2003 to allow seafarers to report potentially hazardous incidents confidentially. Both of these schemes are based online, and have searchable databases of reports, in which specific years can be examined or keywords searched for. The reports take the form of a narrative about the incident written by the seafarer.

However such confidential reporting schemes cannot be used to provide statistical data on seafarers' accidents and injuries as their coverage is so limited and partial. Few seafarers report to such schemes lacking either the requisite interest, motivation, means, or information to do so.

Some Ways Forward

In this paper a number of sources of data have been examined relating to vessel accidents and personal accidents and injuries in the merchant shipping sector. At the current time none of these sources of data can be easily combined to allow for the production of a robust analysis of accidents and injuries across the sector which is a major deficiency giving rise to problems in relation to planning and policy making for ship operators, regulators, insurers, classification societies and so forth. The sector is in urgent need of robust data relating to marine accidents and injuries and it would be possible for such data to be produced given greater consistency in recording practices.

Maritime Administrations

Although the majority of maritime administrations store accident and incident data, the nature of this varies widely from administration to administration. Therefore there is a need to standardise the data collected so that a 'core' of comparable information can be recorded by all. This should include information on incident type, ship name, location of vessel, flag, vessel age, reference number, ship type, ship size. Core information about personal injury/mortality also needs to be recorded, for example, the number of fatalities and injuries, location of incident (e.g. whole ship/engine room, bridge, etc) type of injuries, area of injury, level of injury, age of those injured,

nationality of those injured, rank of those injured. Standardising this information would allow it to be compared and compiled much more easily. However this is not to say that maritime administrations should not be encouraged to collect additional data, as they may wish to record information specific to their administration.

Not only does the type of information that is collected need to be standardised, so too does the method of accident/incident classification. For example, as discussed previously, it is not uncommon, even within single maritime administrations, for fire and explosion to be grouped together in some cases, but not in others. Therefore standard classification systems for the data that is collected need to be outlined so that all maritime administrations may use this to guide their classification.

Although the majority of maritime administrations maintain computerised records, this research has shown that there are still some that do not. Therefore it is recommended that all should be encouraged to record accidents and incidents electronically, as this has a number of benefits. For example, the format of what and how this is recorded could be easily standardised, especially if a universal software package was developed for use by all maritime administrations and an electronic format would also make it much easier to analyse and compare the data.

However, in order for such data to be of any wider use, it is of course necessary for maritime administrations to be willing to make data available for research purposes. At present it remains rather difficult to secure access and this hampers efforts to effectively assess accident and injury data in meaningful ways to the benefit of the sector.

P&I Clubs

P&I clubs could play an important role in the collation and analysis of injury and accident data and indeed some already provide partial data which is of benefit to the industry. To take such efforts forward and allow for more robust conclusions to be arrived at, there is a need for the standardisation of information that is collated by P&I clubs for statistical purposes. The recording of 'core' data about claims, similar to the core information outlined in relation to maritime administrations would be beneficial.

This would allow for comparative analyses which would provide the basis for more robust conclusions.

One way to facilitate the standardisation of data collected by the P&I clubs is through the design and use of pro formas (either electronic or paper), which could be used by all clubs, for all types of claims, regardless of their financial value. This may go some way to addressing the current situation in which lower value claims are not being recorded.

Companies

Although companies are generally good at keeping accident and incident data within their fleet, this information is usually kept solely within the company, and is recorded using their own methods of classification, making it very difficult to compare to that of other companies. Therefore it is suggested that, as with the maritime administrations and the P&I clubs there is a need to standardise how data is recorded and its format, perhaps through the development of a universal scheme which companies could voluntarily adhere to.

It would also be a benefit if companies encouraged seafarers to report accidents and incidents, as at present practices such as including targets for the reduction of lost time incidents (LTIs) in Key Performance Indicators (which may be linked to bonuses) serve to encourage non-reporting of more minor incidents. This masks the real levels of accidents and injuries that may be occurring and casts considerable doubt on available data. It may also give the impression to seafarers that companies are not genuinely interested in their safety, only in the *appearance of safety,* which may cause not only low morale, but also produce poor adherence by seafarers to company policies and practices reflecting a two-way lack of commitment.

As with the maritime administrations and the P&I Clubs, it would also be helpful if companies could be persuaded to make their data available on a confidential basis to researchers. Sharing this information could promote the development of more effective safety procedures as a more comprehensive and thorough understanding of accidents and injuries is achieved.

Conclusion

Within the maritime industry there are many different agencies that keep information about accidents and incidents, such as maritime administrations, shipping companies, P&I clubs, and regulatory organisations. However, when the type and nature of these data are compared, it can be seen that what is recorded varies greatly, even within the same types of organisation. For example, the levels of detail recorded about the incidents and the definitions used for accident type classifications. Such findings are not new nor are they industry specific; The European Transport Safety Council drew a similar conclusion in its review of road traffic accident databases in 2001. However, they do suggest that although the problem is recognised within industries, currently little has been done to address it.

The consequence of this is that it is currently impossible to present comprehensive and robust globalised accident and incident data, making it very hard to identify trends in accidents and incidents and suggest measures in order to address these. Therefore, there is an urgent need to standardise what is recorded, and how data is stored, in order to facilitate research, analysis, and subsequent decision making, across the sector.

It is our intention in the future to attempt to develop a recommended pro forma for the categorisation, recording, and storage of data for use across the industry. We will be looking to key stakeholders within the sector for assistance and support in this endeavour. We thank them in advance for their assistance.

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Appendix 1

Contact Person Details for the Maritime Accident and Incidents Review Project

Organisation: _____

Name: _____

Position within the organisation: _____

Address:

_____

_____

_____

_____

_____

_____

Email: _____

Telephone number: _____

Fax number: _____

Thank you for your cooperation. Please return this completed page by email to EllisN@cf.ac.uk or by fax to +44(0)29 2087 4619.

All contact details will be held in the strictest confidence and in compliance with the Data Protection Act.

Appendix 2

Accident Database Questionnaire

1. Do you maintain records of accidents/ incidents that occur on/ to your national flagged vessels, or in your national waters?

   Yes ☐ No ☐

2. What sort of accident/ incident records are kept? (please tick as many boxes as necessary)

   Records of accident/ incident/ reports

   Paper ……. ☐
   Electronic (if so please state software utilised e.g. Excel) …… ☐

   _____

   Records of accident incident investigations

   Paper ……. ☐
   Electronic (if so please state software utilised e.g. Excel) …… ☐

   _____

   Records of statistics on accidents (i.e. the number/ type of incidents)

   Paper ……. ☐
   Electronic (if so please state software utilised e.g. Excel) …… ☐

   _____

   Other (please specify below) ……. ☐

   _____
   _____
   _____

3. Are these record's publicly available? (If no, please go to question 5)

   Yes ☐ No ☐

4. Can these records be accessed on line? (If yes, please go to question 6)

   Yes ☐ No ☐

   If so. please give the web address:

   http://_____

Accident Database Questionnaire

5. Would you be willing to make your data available for academic research purposes (subject to normal protocols about confidentiality etc)?

   Yes ☐ No ☐

6. Do you investigate all accidents that occur on/ to your national flagged vessels or in your national waters?

   Yes ☐ No ☐

7. Is this done by yourself?, or by some other agency? (if this is done by another agency, please give contact details)

   Name _____

   Address _____

   _____

   _____

   Telephone number _____

   Fax number _____

Thank you for your cooperation. Please return this completed page by email to EllisN@cf.ac.uk or by fax to +44(0)29 2087 4619.

All contact details will be held in the strictest confidence and in compliance with the Data Protection Act.

MARITIME INCIDENTS: WAYS OF SEEING

Nicholas Bailey

Abstract

This paper attempts to relate the perceptions of workers across the maritime industry to the available data on actual **ship level** incidents. In so doing, reference is made to the findings of a Seafarers International Research Centre (SIRC) and Lloyd's Register Educational Trust Research Unit (LRETRU) questionnaire survey into perceptions of risk, and of an investigation into available datasets.

Introduction

Shipping is widely perceived as a dangerous industry. Ships sink, run aground, collide and catch fire, and consequently individuals are frequently injured or killed and coastlines, livelihoods and marine life damaged or destroyed. A fact brought home by high profile shipping incidents such as the capsizing of the ferry *'Herald of Free Enterprise'*, the sinking of the tanker *'Prestige'*, and the more recent grounding of the containership *'MSC Napoli'*.

Media response to such events informs the opinion of the general public and consequently how the industry is perceived (Furedi, 2002). Other industries have experienced significant consequences due to the coverage of such incidents (Garland, 2001; Kasperson, 2000). For example, current debates in the United Kingdom (UK) and other countries as to whether to build nuclear power plants tend to centre on public concerns about the risk of incidents like Chernobyl and Three Mile Island. In the same way, a few years ago the perceived risk associated with eating British beef led to a loss of consumer confidence and the boycotting of British beef by several European countries.

We may ask, however, whether these perceptions are a reliable indication of actual levels of risk. In general individuals are fairly good at perceiving risk and acting appropriately (Waring & Glendon, 1998). For instance, every day thousands of people safely assess the risk of getting running down by a moving car and manage to safely

cross busy roads, or drive their car to work and back without incident. However amongst those thousands of crossings some may get it wrong. Moreover it has been shown that while individuals are generally good at perceiving the risk in these specific contexts they are poor at estimating risk at a more general level, i.e. estimating the overall likelihood that they will be run down while crossing the road, or the extent to which eating beef poses a genuine risk to their health (Adams, 1995; Lupton 1999). By investigating large numbers of actual incidents, it is possible to detect patterns or trends in the data which may indicate which groups tend to suffer incidents and how often, and thereby to provide a numerical value for the level of risk they face. In the case of crossing the road, a current UK government campaign suggests that it is, perhaps surprisingly, teenagers who are most at risk due to their lack of awareness while listening to personal music systems. For those concerned with the management of health and safety such information can make a substantial contribution to understanding the extent of the risk faced by individuals, be they members of a society, organisation or workplace.

The collection and analysis of incident data is widely accepted and common practice in many sectors. Governments, in particular, tend to be concerned to keep records and to statistically analyse the impact of particular activities. Road traffic accidents represent one area that is closely monitored. Such information is then used to inform safety interventions, such as introducing road calming measures. On this basis, legislation was introduced requiring car drivers to wear seat-belts, for example. While this legislation initially met resistance from drivers who did not perceive the risk, today drivers are much more conscious of the need to belt-up and indeed are more inclined to feel 'exposed' to unnecessary risk if they are not able to do so (Adams, 1995). Likewise there are high profile road safety campaigns presently being aired on UK television and radio presenting various road safety messages relating to: the use of mobile phones when driving, the effect of speeding, and of drinking and driving. Each of these campaigns relies on the presentation of statistics highlighting the likelihood of experiencing an incident, accompanied by images which graphically portray the possible consequences. The aim of such campaigns is thus to modify perceptions and consequently behaviour.

To an extent Protection & Indemnity (P&I) clubs and some companies make use of these sorts of statistics to inform their policy and practice. However, as Mr Ellis has already illustrated, such information in the maritime sector tends to be hard to come by, despite its potential value in the management of occupational health and safety at sea. Awareness of trends in shipping incidents either at the ship level or in terms of personal injury would allow for a greater appreciation of the situation in relation to occupational health and safety (OHS) and thereby a better informed and more focused response. Although the introduction of the International Safety Management (ISM) Code in 2002 placed the onus for managing occupational health and safety on the operating companies, many safety interventions still originate at the international level (e.g. the requirement for tankers to be double-hulled). In a global industry some interventions need to be enacted industry wide and thus require a global perspective based on a global dataset. As previously noted the data available is at best limited and fragmentary. There is no global dataset capable of providing insight into the state of OHS on an industry wide basis.

Workers in the industry, whether in shore-based management positions or actually at the frontline working onboard ship, similarly form perceptions of the risk associated with the occurrence of ship and shipboard incidents. Likewise their perceptions are shaped by factors such as: media coverage, personal experience, training courses, statistical data or anecdotal stories. This diversity of inputs may however present conflicting pictures. Where individuals are working with partial information and a lack of informed guidance there is clearly scope for differing understandings and risk behaviours.

Lack of appropriate information is not the only factor that may affect individuals' perceptions. Differences may also result from the way they make sense of such information, which may be influenced by considerations such as: the relevance an issue has for them, their education, experience and even gender (Slovic, 1999). The fact is that different individuals, groups or even organisations may have their own unique concerns, objectives and ways of seeing things (Clarke, 1999; Hofstede, 1991; Harvey, et al. 2002). This may include their perception of what is important in relation to safety. A failure to appreciate such differences when introducing a safety

initiative can potentially lead to problems of miscommunication, poor co-operation, and even antipathy (Clarke, 1999; Harvey *et al.*, 2002; Rundmo, 2000).

For example, during recent fieldwork aboard two ships of the same company it was observed that the policy on whether to wear or carry one's inflatable lifejacket when boarding the free-fall lifeboat was different on both ships. When queried, it was reported that this was due to the senior officers on each of the two ships having different perceptions of the associated risk, combined with lack of clear information giving advice one way or the other. Eventually the company concerned simply stipulated that lifejackets should be worn. On the ship where this was not the normal practice, this decision was seen as a failure by the company to appropriately understand the risk and so the instruction was ignored.

Access to appropriate information is essential to rational decision-making and to allow resources to be focused on the appropriate issues, be it at the international, national, organisational or even individual level. Similarly an awareness of differences between group perceptions is necessary for safety initiatives to be introduced in ways that are sensitive to the perspectives of those groups, thereby producing better safety management (Clarke, 1999; Harvey *et al.*, 2000).

There has, however, been little research of this type within the maritime industry. The Lloyd's Register Educational Trust Research Unit (LRETRU) has attempted to address this deficit by undertaking two pieces of research to discern how risk is perceived in the industry and to determine the actual extent of maritime incidents.

In the following pages we draw on the findings of these investigations to determine what lessons can be gleaned from the data and how they may inform health and safety policy and practice. Specifically we attempt to address the following questions:

> **1**. How do those in the industry perceive the likelihood of a ship level incident?
>
> **2.** Are there differences between different groups of respondents as to how they perceive the likelihood of a ship level incident?

3. What do the numbers of actual incidents per year tell us about safety levels in the industry?

4. What can we learn from comparing perceived levels of risk with the actual levels of incidents?

In so doing, we further draw attention to certain methodological issues that need to be addressed by the industry before full benefit can be made of such data.

The discussion is based on data derived from two sources. The first draws on a wide ranging questionnaire survey conducted by the LRETRU into perceptions of risk within the industry in relation to the likelihood of experiencing a ship level incident, e.g. fire, sinking, grounding, collision with another ship, contact with a fixed structure, or explosion. Investigation of this dataset provides insight into how those in the industry perceive risk. The second data source provides insight into the actual situation with relation to ship incidents and consists of collated incident data from maritime authorities, as previously reported by Mr Ellis. While there are other data sources available that may similarly serve this function they are in general fragmentary or limited as pointed out in the previous paper. For example, the *Lloyd's Register Casualty Statistics*, while useful, only report total losses and so consist of around 150 cases per year. By contrast, the LRETRU dataset comprises around 1,000 cases per annum and includes a far wider range of cases. Ideally we would piece together each of these various datasets to produce an overall, if kaleidoscopic, picture of what is actually going on in the industry, against which to compare perceived risk. However within the limited scope of a paper, it is clearly an advantage to have as large and systematic dataset as possible in order to make meaningful claims. Thus for the present discussion we shall confine our attention to the LRETRU collated datasets.

Methods

Incident Databases. This has been fully discussed in the preceding paper, however, to briefly recap: a systematic survey was undertaken of the available data relating to ship level incidents and included contacting thirty maritime authorities, of which eight supplied data in various forms. In the following discussion we utilise the data from

seven[1] different maritime administrations, these will be referred to by the following codes [2], [3], [4], [10], [15], [22] and [24]. The seven datasets used represent a range of flag types and include both national flags and those operating open registers. Together these registers constitute 18.7% of the world's fleet by gross tonnage and 16.3% by number[2]. While not claiming to be representative of the global fleet; we can for the purposes of argument take these databases to be indicative.

Perceptions Survey.[3] A worldwide questionnaire survey was conducted during 2006 and included a section on perceptions of risk with regard to ship casualty. Completed questionnaires were received from 2,372 respondents, giving a response rate of approximately 36%. Questionnaires were completed by a diverse range of individuals in terms of their position in the occupational hierarchy (i.e. rank), work department and nationality as follows:

1. Rank: - (managers (n=104, 4.6%), senior officers (n=709, 31.1%), junior officers (n=704, 30.9%) and ratings (n=763, 33.5%)).

2. Work department: - (deck department (n=1220, 51.4%), engineering (n=779, 32.8%), catering (n=115, 4.8%) and those based 'shore-side' (n=104, 4.4%), i.e. managers / superintendents, etc), unspecified (other n=154, 6.5%).

3. Nationality: - completed questionnaires were received from individuals from 50 different countries. However the majority (84.5%) of respondents came from just five countries: Philippines (n=909, 39.0%), United Kingdom (n=402, 17.2%), China (n=391, 16.8%), India (n=180, 7.7%) and Netherlands (n=89, 3.8%). To enable tests of statistical significance, the analysis of nationality was limited to these five groups.

Within the questionnaire we asked the following question:

> *Just thinking in general terms, how likely do you think it is that someone working for your company will experience the following (Fire, Explosion, Collision with another ship, Sinking, Grounding, Contact with a fixed structure) during their sea-going career?*

Seafarers and company managers were asked to indicate their answer on a scale of 1-5, where (1 = not at all likely) and (5 = extremely likely). For the purpose of description, '1' and '2' on the scale were understood as indicating that respondents

[1] At the time of writing the paper the data from the eighth administration had not yet been fully analysed.
[2] Based on figures derived from Lloyd's Register Fairplay 'World Fleet Statistics 2005'.
[3] For full details see Bailey *et al*. (2006)

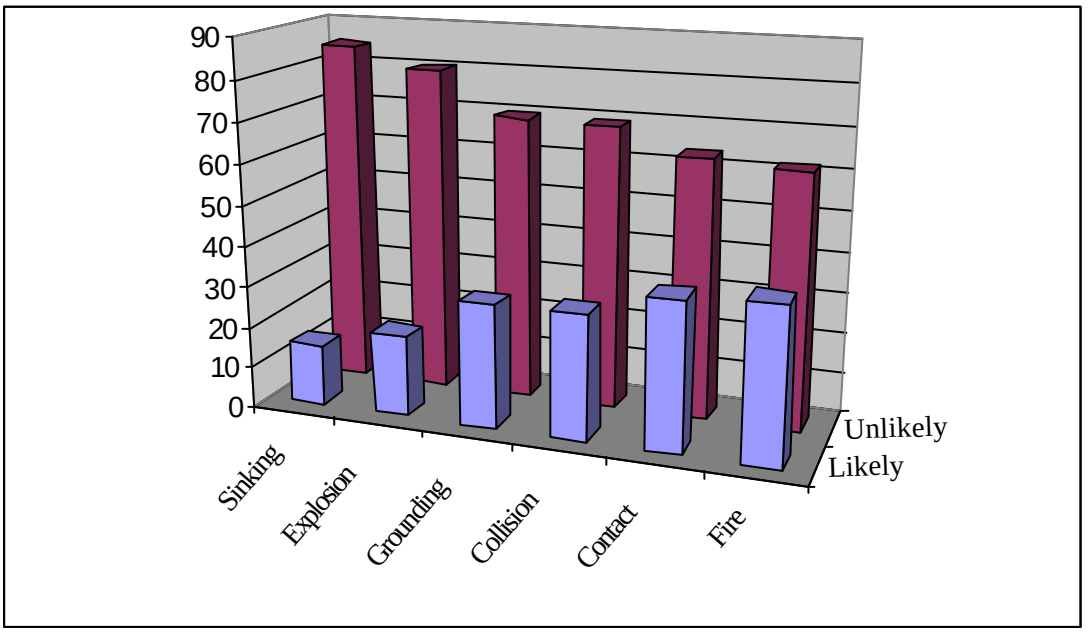
saw the particular incident as unlikely to occur**.** By contrast '3' '4' and '5' on the scale were understood as indicating that the particular incident was perceived as likely to occur.

The responses were analysed using the statistical package SPSS to determine whether different groups within the industry perceived matters differently. Factors examined included rank, department, nationality, age, and length and nature of experience of ship type.

Findings

The majority of seafarers and managers who completed the questionnaire generally perceived it to be 'unlikely' that someone working for their company would experience a ship level casualty. However, they perceived the likelihood of experiencing the various types of incident differently, and this was reflected in their answers. For example, 84.8% of respondents saw the risk of sinking as unlikely, while a smaller group 61.9% saw fire as such. Responses to the other listed incidents fell between these two extremes (Figure 1).

Figure 1*: Percentage of individuals perceiving each type of incident as likely / unlikely*



Looked at from the other direction, only 15.2% of respondents thought that it was likely that someone in their company would be on a ship that sank during their seagoing career, but 38.1% were of the opinion that someone in their company would be on a ship that had a fire. The likelihood of experiencing the following types of incident: contact with a fixed structure, collision, and grounding were similarly seen to be 'likely' by about a third of individuals who completed the questionnaire (Table 1).

Table 1: Relative percentages of overall group perceiving likelihood of experiencing an incident as likely/ unlikely

Type of Incident	Percentage perceiving risk to be *unlikely*	Percentage perceiving risk to be *likely*
Fire	61.9	38.1
Contact	63.5	36.5
Collision	69.1	30.9
Grounding	69.9	30.3
Explosion	80.1	19.9
Sinking	84.8	15.2

How, then, should we understand the perceptions of those in the maritime industry in relation to ship level incidents? Should we, for instance, be surprised that over a third of individuals considered the occurrence of a major incident in the workplace as likely? Alternatively could we expect this figure to be higher? In addressing these questions, we shall investigate the available data in relation to the actual level of incidents recorded between the years 2000 and 2005.

Before assessing the incident data, it can be seen from a brief inspection of Table 2 below, that different Administrations code their data differently. For instance it can be seen that, of the listed registers, [24] and [10] combined the data for 'fire' and 'explosion', whereas the other flags recorded them as separate categories. Indeed the way in which data is collected and coded is a significant issue and raises questions about the comparability of data from different flags. A full discussion of these issues is beyond the scope of this paper, but would need to address such central questions as: the choice of categories reported, the need for a set of globally consistent reporting requirements and the criteria underpinning their application. Consideration would also

need to be given to issues of interpretation, e.g. what constitutes material damage, and how to ensure compliance with reporting requirements. For the sake of this discussion, however, we will simply take the data at face value.

It can be seen that for the period 2000 to 2005 there was significant variation in the percentage of incidents recorded by the different flags (Table 2).

Table 2: Relative percentage of incidents per number of ships by flag for the years 2000 and 2005[4]

	Maritime Administrations						
Type of Incident	**Flag [2]**	**Flag [4]**	**Flag [10]**	**Flag [15]**	**Flag [22]**	**Flag [24]**	**Flag [3]**
Collision	4.22	0.58	13.86	0.98	0.54	2.28	26.86
Contact	2.52	0.90	0.48	0.21	0.07	0.63	5.85
Grounding	4.61	0.51	2.43	0.82	0.72	1.56	4.39
Fire	0.06	0.90	2.43	0.31	0.13	…	…
Explosion	0.01	0.19	0.08	0.05	0.00	…	…
Fire/Explosion	…	…	…	…	…	1.14	3.54
Sinking	0.19	0.00	2.46	0.07	0.09	0.00	3.72

In particular it can be seen that Administration [3] recorded between two and fifty times more collisions than the other registers. Similarly the data from flags [2] and [3] display notably higher levels of incidence for most types of ship casualty as compared with the other flags. For example, the incidence of grounding recorded by [2] is between three and twenty-six times higher than that recorded by the other registers.

It is important to realise that such differences in the recorded levels of incidents may simply be a function of different levels of regulatory capacity (Winchester, 2003) or recording procedures rather than a real difference in the level of incidents. Equally, such variation could reflect genuine differences but be an artefact of the types of ships on these registers or the waters they are trading in, for example. However given that most research into incident reporting suggests that, in general, incidents tend to be

[4] Data for register [2] is only for the period 2002-2004, while the data for register [4] covers the period 2001-2005. Percentages have been calculated accordingly.

under-reported (Nichols, 1997; Walters, 2001), we can reasonably expect that these figures, if anything, under-represent the real number of incidents that have occurred.

Leaving local variations aside, in order to get an overall picture of the level of ship casualties across the industry, it is necessary to calculate overall percentages of incidents for the period under consideration. To this end, we combined the total numbers of each type of incident for the given period, i.e. the years 2000-2005[5] (Table 3) and divided by the total number of ships on the five registers over the same time period (Table 4).

Table 3: Total number of incidents recorded by the seven registers between 2000 and 2005 by incident type

Type of Incident	Combined number of incidents for the seven registers within the years 2000- 2005
Collision	4,723
Contact	1,000
Grounding	1,834
Fire	435
Explosion	22
Fire/Explosion	269
Sinking	622
Total	**8,905**

Table 4: Total number of ships on the seven registers by year

Year	Total number of ships for the seven registers
2000	6,985
2001	7,212
2002	14,859
2003	14,566
2004	14,542
2005	7,777
Combined total	**65,941**

[5] Data for one of the administrations was only for 2001-2005, while for another it covered the years 2002-2004. These differences were allowed for in the calculations.

Thus by calculation we arrived at the following table of percentages per type of incident for the five year period (Table 5).

Table 5: Percentage of incidents over period 2000-2005

Type of Incident	Percentage of incidents over period 2000-5	Rate per 1000 ships
Collision	7.16	71.6
Grounding	2.78	27.8
Contact	1.52	15.2
Sinking	0.94 [LR [6] sinking's = 0.075]	9.4 [LR = 0.75]
Fire[7]	0.82	8.2
Explosion	0.04	0.4

On the basis of the available data, during the period 2000 and 2005 the type of incident that a seafarer was most likely to experience (of those listed) was that of a ship collision, with the prospect that 7.16% of all ships over the five year period would be involved in such an incident[8]. If we were to extrapolate this figure and apply it to the average size of the entire global fleet over this period[9], the average rate of vessel collisions over the last five years would be approximately eighteen vessels per day involved in such an incident. Likewise, if we extrapolate instances of sinking, we calculate a figure of slightly more than two incidents per day. Notably the figure for sinking is approximately 12.5 times higher than the numbers of total losses due to sinking recorded in Lloyd's Register Casualty Statistics. This may be explained by the fact that the Lloyd's Register figures only relate to vessels of 100gt or above, whereas we have captured vessels smaller than this. It is also likely to reflect the fact that the Lloyd's Register Casualty Statistics only record total losses although we are unclear why this would rule out the recording of most sinkings as we would anticipate that they generally constitute total losses. Alternatively, it may be the case that the flags included in our sample have some of the highest recorded numbers of sinkings in the

[6] *Lloyd's Register World Casualty Statistics* for 2005
[7] The data for fire/ explosion coded as a single category were excluded from the calculation
[8] We acknowledge that in practice a single vessel may be involved in several incidents.
[9] Based on figures from *Lloyd's Register World Fleet Statistics* and vessels over 100gt = 536,459. We need, however, to be extremely cautious when extrapolating in this way, as our sample probably includes vessels less than 100gt; hence the difference between these figures and those based on Lloyd's Register World Casualty Statistics and the IMUI REPORT 2006.

world fleet and as such, we would expect other registers (not represented by our data) to have considerably smaller numbers of recorded sinkings. Whilst this latter explanation seems unlikely, what we can't say at this stage is whether our data offer a 'true reflection' of the real situation.

To better help us to understand these figures; we can compare them to the number of serious incidents[10] involving Heavy Goods Vehicles (HGVs) in Great Britain in 2005. In 2005 there were 441,000 HGVs with current licenses in Great Britain and 1,648 serious accidents involving these vehicles (DfT 2005). By calculation 0.37% of the licensed HGVs were thus involved in a serious incident. In comparison the overall incident rate for shipping[11] for 2005 was 13.7%. That is, there were **37 times** more ship level incidents than there were serious incidents involving an HGV on British roads. There are obviously significant differences between these two modes of transport. However, there are sufficient similarities to make this difference in incident rates highly poignant, especially given that the fall-out from a shipping incident is liable to be significantly greater than that for a road transport vehicle. Furthermore, it could be argued that with the density of traffic on British roads and the high frequency of interaction between vehicles, there is a greater potential for a road traffic accident than an incident at sea.

Against this background it can reasonably be argued that the occurrence of ship level incidents appears to be relatively high. Given that, it may seem surprising that more seafarers and managers did not perceive it to be likely that someone in their company would experience such an event. A closer look at the responses to the questionnaire, however, in terms of how those in different positions within the industry saw the likelihood of experiencing such an incident, reveals significant variation in perception between different groups.

[10] A serious incident is defined as one in which at least one person is seriously injured, but no one is killed.
[11] Based on our seven datasets and taken over the period 2000-2005.

Differences in perception

A comparison of responses to the questionnaire survey revealed that there were statistically significant differences between the ways in which managers perceived the likelihood of an incident as compared to those who worked onboard ship. It can be seen (Table 6) that a greater percentage of shore-based managers tended to see the occurrence of a ship level incident as 'likely' than did shipboard staff. It can also be seen that senior officers tended to be most closely aligned with managers. This may be due to the fact that they have the closest direct links with shore-side management and tend to be the ones most centrally involved in shipboard risk assessment. Indeed it is not uncommon for shore-side managers to have previously worked at sea[12], often in a senior shipboard position. By contrast shipboard ratings were least inclined to perceive the occurrence of the listed types of incident as likely. Moreover they did not significantly differentiate between the different types of incident. Thus the further a group was from direct contact with shore-side management the greater the difference in perception appeared to be.

Table 6: Percentage by rank perceiving the occurrence of an incident as 'likely'

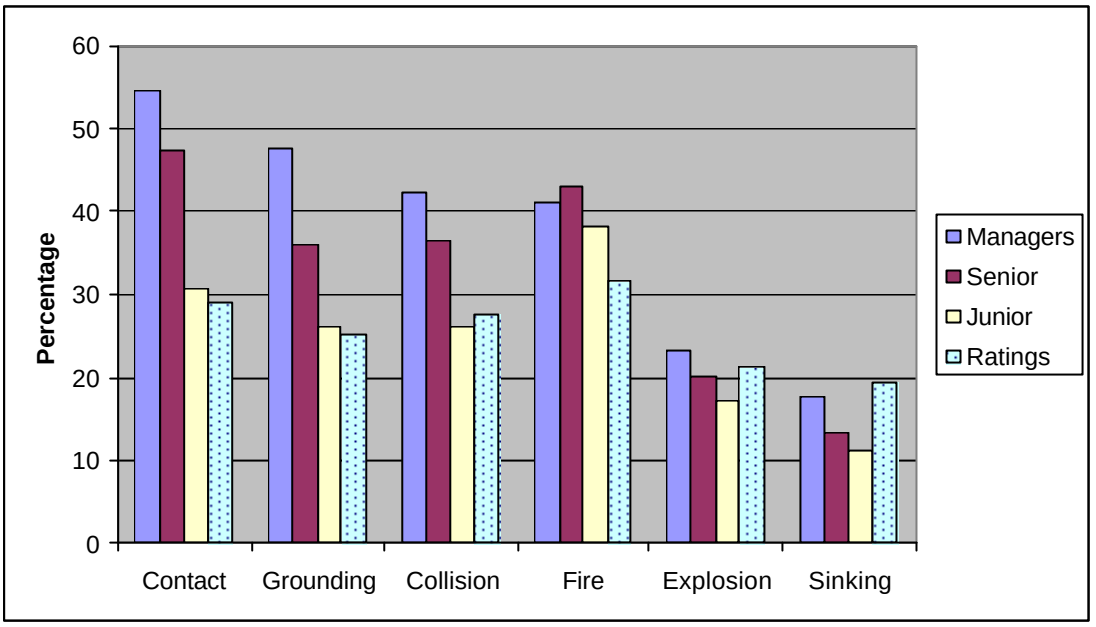
	Managers	Senior	Junior	Ratings
Contact	54.4	47.3	30.6	29.1
Grounding	47.6	36.0	26.1	25.2
Collision	42.3	36.3	26.0	27.8
Fire	41.3	43.0	38.2	31.6
Explosion	23.4	20.1	17.1	21.4
Sinking	17.6	13.2	11.3	19.5

When considering the above table, what is perhaps most striking is that over half of managers thought it likely that someone working in their company would be on a ship that experienced contact with a fixed structure, and almost half thought that this would be the case for grounding. By contrast, less than a third of ratings perceived contact with a fixed structure as likely and only a quarter saw grounding as a likely occurrence. The exception to this trend was in relation to the perceived likelihood of sinking. Here more ratings (19.5%) thought sinking was likely than did managers (17.6%), or indeed ship's officers. The different ranks seemed to be most closely in

[12] 74% of the managers in our sample had sea-going experience.

accord when they reflected on the likelihood of experiencing an explosion; approximately 20% of all ranks thought this was likely (Figure 2).

Figure 2: Percentage by rank perceiving each type of incident as likely



An explanation for this general difference in perception between managers and shipboard staff, could be that managers were better informed as to the actual level of incidents. This could be as a result of having access to actual statistics or a more global perspective deriving from greater awareness of the company fleet as a whole and a greater acquaintance with the wider industry in general. By contrast, those who work onboard ship may have been more or less prone to form perceptions based on an insular understanding derived from their actual experience of serving on ships and, specifically, the ship they were on at the time.

Having identified the extent of actual incidents from the national datasets, we produced a rank-ordering based on percentage of incidents recorded (Table 7). The higher the recorded percentage of incidents, the higher is the position in the ordering.

Table 7: Rank ordering of incidents

Rank Order	Type of Incident	Percentage of incidents over period 2000-5
1	Collision	7.16
2	Grounding	2.78
3	Contact	1.52
4	Sinking	0.94
5	Fire[13]	0.82
6	Explosion	0.04

On the basis that the greater the number of incidents (i.e. the higher in the rank-ordering) the more likely it is that someone will experience such an incident, we compared these with the *perceived* likely occurrence of an incident (Table 8). From the comparison, we saw that managers' perceptions again coincided most closely with the actual datasets. This could be taken to support the idea that they are better attuned to the actual situation with regard to the level of ship casualty.

Table 8: Comparison of rank orderings based on incident datasets with rank orderings based on perceptions of different ranks, as a percentage, who perceived the occurrence of an incident as likely

Rank-order based on incident data sets		Rank-orderings by Hierarchy							
		Managers		**Senior**		**Junior**		**Ratings**	
Collision	1	Contact	-2	Contact	-2	Fire	-4	Fire	-4
Grounding	2	Grounding	0	Fire	-3	Contact	-1	Contact	-1
Contact	3	***Collision***	-2	***Collision***	-2	Grounding	-1	***Collision***	-2
Sinking	4	Fire	-1	Grounding	-2	***Collision***	-3	Grounding	-2
Fire	5	Explosion	-1	Explosion	-1	Explosion	-1	Explosion	-1
Explosion	6	Sinking	-2	Sinking	-2	Sinking	-2	Sinking	-2
Total distance from dataset			**-8**		**-12**		**-12**		**-12**

[13] The data for fire/ explosion coded as a single category were excluded from the calculation

From Table 8 it can be seen that, based on the actual number of reported incidents recorded, an individual is most likely to experience a collision of the incident types listed. However, based on the perceptions of those who worked onboard, fire appears at the top of the rank-orderings; appearing in first place for junior officers and ratings and in second place for senior officers. By contrast, fire appeared fourth in the rankings based on managers' perceptions and in only fifth place based on the actual datasets.

It could be argued that the discrepancy between perceptions and the actual incident data, in relation to the occurrence of incidents of fire, is due to the fact that maritime administrations only record serious fires, but individuals' perceptions are informed by all fires minor and serious. The thought would be that there are many fires onboard ship that are dealt with in their early stages (e.g. scavenge fires) and so never escalate to the extent of causing significant material damage. Consequently such incidents do not get reported back to the maritime administration. Nonetheless this type of incident may well contribute to an individual's perception of the likely occurrence of a fire. The same argument could be applied to incidents involving contact with a fixed structure. Many heavy landings against a quayside for example may not be reported back to the maritime administration. By contrast a collision between two ships, for instance, is presumably going to have more significant financial consequences, involving P&I clubs and classification societies, and as such is more likely to be reported.

There is, however, evidence to suggest that the way in which a question is framed can influence responses (Bickert, 1992; Johnson et al., 1998; Schuman, 1992). In terms of our questionnaire survey, individuals were asked to rate the perceived likelihood of fire as one of several types of incident. These included collision, sinking and grounding, which by their nature tend to be significant events. As such the aim was to provoke thoughts of serious ship fires rather than perhaps a minor chip pan fire. The claim would then be that while the statistics perhaps appear counterintuitive, this is precisely the point about the unreliability of perception. The aim is to explain the heightened sensitivity or awareness of the particular risk.

As discussed previously, significant events like, for example, the sinking of the tanker *'Prestige'* with the attendant publicity may heighten awareness of certain forms of risk. This may particularly be the case if individuals strongly relate to the situation, e.g. they work on a similar type of ship. As Lupton writes, it has been found that individuals "tend to overestimate risk related to circumstances where it can easily be imagined happening to oneself" (1999, p.20). Thus, for example, it was widely reported after 9/11 that many office workers in tall buildings were anxious about the risk of fire.

It has further been argued that organisational factors such as company or group attitudes and behaviours, i.e. ways of doing things, shape individual ways of understanding. For instance, organisational factors like training and education, the extent to which workers are provided with information and allowed to participate in decisions or have direct control of the work process are liable to influence perceptions and risk awareness. Likewise, familiarity with a type of action or form of behaviour and the perceived benefit or potential harm associated with it, all influence the way in which risk is perceived. Thus the risk of fire may be perceived as likely by higher numbers of seafarers, than say collision, due to a complex mix of individual and social factors.

Seafarers may, for instance, have a keen appreciation of the risk of shipboard fire due to the regulatory emphasis placed on the prevention and management of such incidents, with normal practice including the carrying out of routine fire-rounds, the use of hot work permits, the testing of alarms and regular shipboard fire drills. Equally, fire is liable to be experienced as something that can affect everyone onboard and yet the outbreak of fire may not be within anyone's direct control. Furthermore given the small size of many crews and the large and often hazardous areas that may be affected by fire, including engine rooms, there may be a heightened sense of vulnerability due to the potential injuries or fatalities that could easily result and the difficulty in trying to cope with such a situation. Awareness of such factors can influence the perceived likelihood of an incident. We could thus point to the effectiveness of training, onboard organisational arrangements, and the ability to easily imagine such a possibility as factors contributing to seafarers' fear of the

potential effects of a fire, and hence a heightened sense of fire as a risk.[14] Indeed there is a long tradition of seafarers perceiving fire as a likely risk, as illustrated by the following quote from the famous 16th century Commander Sir John Hawkins: "Serve God only, preserve your victuals, *beware of fire*, and keep good company." (cited in Bridges 1927, p80).

From the incident datasets, we have seen that collision is actually the incident most likely to be experienced[15] and as such appeared in first place in the rank-order. By contrast, collision only appeared in third place in the rankings based on the perceptions of managers, senior officers and ratings – a difference of minus two places. Junior officers were even less inclined to view collision as 'likely', i.e. based on their perceptions collision was ranked fourth – a difference of minus three places from the ranking based on the incident data (Table 8). This could perhaps be due to their lack of experience. When we separated junior officers out, we found that 25.6% of junior deck officers and 25.1% of junior engineering officers saw the likelihood of experiencing a collision as likely. That is the two groups saw in the same way, which may further suggest that the issue is related to their experience rather than specific job.

Given that junior deck officers (i.e. second and third mates) tend to make up the largest number of bridge watch keeping officers (i.e. individuals whose actions could lead to a collision) and they appear to be underestimating the occurrence of collisions, relative to other types of incident, this is clearly a matter of interest. From a regulatory point of view, this may suggest the need for greater emphasis on collision avoidance and the appreciation of risk of collision during their training. Indeed, in a separate research project undertaken by the LRETRU into the use of VHF radio in collision avoidance situations, it was found that there was a high level of negotiation taking place, often resulting in action contrary to the collision regulations (Bailey, 2005).

[14] While the questionnaire was designed to encourage individual respondents to think of the likelihood of a serious incident of fire, we cannot rule out that their perceptions were nonetheless informed by an awareness of minor incidents involving fire. It would thus be wrong to ignore the fact that there are clearly methodological issues relating to the interpretation of questionnaire data that need to be taken account of when attempting to make such comparison.

[15] Based on recorded incidents.

At a more general level, the explanation for this disparity between perceptions and the data may be that the risk of experiencing a collision was perceived to be more directly under the control of a small group of individuals trained to avoid such incidents. Thus confidence or trust in colleagues may have ameliorated the perceived likelihood of such an incident happening. In this respect the hierarchical nature of shipboard life may have further influenced such perceptions by providing reassurance that the captain, a person of experience and authority, was ultimately in control.

Such an account may, however, appear to beg the question of why the likelihood of contact with a fixed structure is perceived to be so high; appearing in first or second rank position for all groups. Normally when manoeuvring in close proximity to any fixed structure, be it a supply boat next to an oil or gas platform or a vessel alongside a jetty or quay, the master is usually conning the vessel or close at hand. Thus, given the previous argument, it should be expected that there would be high levels of confidence in the captains' abilities and so a perception that there is little likelihood of an incident. The fact that perceptions of such incidents appear high in the rankings, suggests that there are other influential factors.

It has been demonstrated in other contexts, particularly medical settings (Zerubavel, 1985), that the existence of clear temporal markers identifying an event (i.e. a clear beginning and end point) is significant in influencing perceptions and behaviour, by possibly making it easier to imagine such an occurrence. When thinking about the occurrence of incidents of contact with a fixed structure, there tends to be a natural temporal framing within which such events occur, e.g., going on to 'stand-by' and being secured alongside. As such these events are liable to be easier to envisage. Moreover such periods tend to impact upon all personnel. For instance, deck crew will be at mooring stations (or engaged in deck operations in the case of supply vessels), engineers are liable to be on stand-by and catering staff will need to know when to arrange meals. Additionally, not only are most personnel liable to be involved, but each group tends to face their own particular risks associated with the operation. For instance, at such times there tends to be a high demand upon the engines and so the potential for mechanical failure, while on deck there is the danger associated with working ropes and wire and in the galley the problems associated with failing to have meals ready at the right time. Furthermore, all crew will be aware of the difficulty of

the operations involved, the contingent effect of weather, and the performance of engines and mooring operations upon the captains' performance and consequent successful manoeuvre. Thus what we see is that the two risks of fire and contact with a fixed structure, which were perceived to be likely by the greatest number of respondents from each of the different shipboard groups, are those incidents in which potentially all would actively play a part (sinking will be discussed below) - either before or after the event. As such those onboard may find it easier to imagine such an event occurring and to more easily envisage the possible consequences, thereby contributing to a heightened awareness of the likely occurrence of an incident.

Finally, when we looked at the relative rankings of sinking, we found that it appeared lower in the rankings for all groups than that based on the actual occurrence of such incidents. Although interestingly, the ranking based on the perceptions of those in the catering department corresponded most closely to that based on the actual datasets (Table 9). Indeed a significantly higher number (27.1%) of those in catering perceived sinking to be likely than did those who worked in other departments. By contrast, a significantly lower number of shore-side managers (7%) than shipboard staff perceived it to be likely.

Table 9: Comparison of rank orderings based on incident data sets with rank orderings based on perceptions of different work departments, as a percentage, who perceived the occurrence of an incident as likely

Rank-order based on incident data sets		**Rank-orderings by Work Department**							
		Deck	*%*	*Catering*	*%*	*Engineering*	*%*	*Ashore*	*%*
Collision	1	Fire	36.9	Fire	35.8	Contact	37.9	Contact	54.4
Grounding	2	Contact	34.3	Contact	32.4	Fire	37.4	Grounding	47.6
Contact	3	Collision	28.5	Collision	29.9	Collision	31.8	Collision	42.3
Sinking	4	Grounding	27.9	Grounding	27.4	Grounding	30.6	Fire	41.3
Fire	5	Explosion	17.9	***Sinking***	27.1	Explosion	21.7	Explosion	15.7
Explosion	6	***Sinking***	13.3	Explosion	26.9	***Sinking***	15.4	***Sinking***	7.6

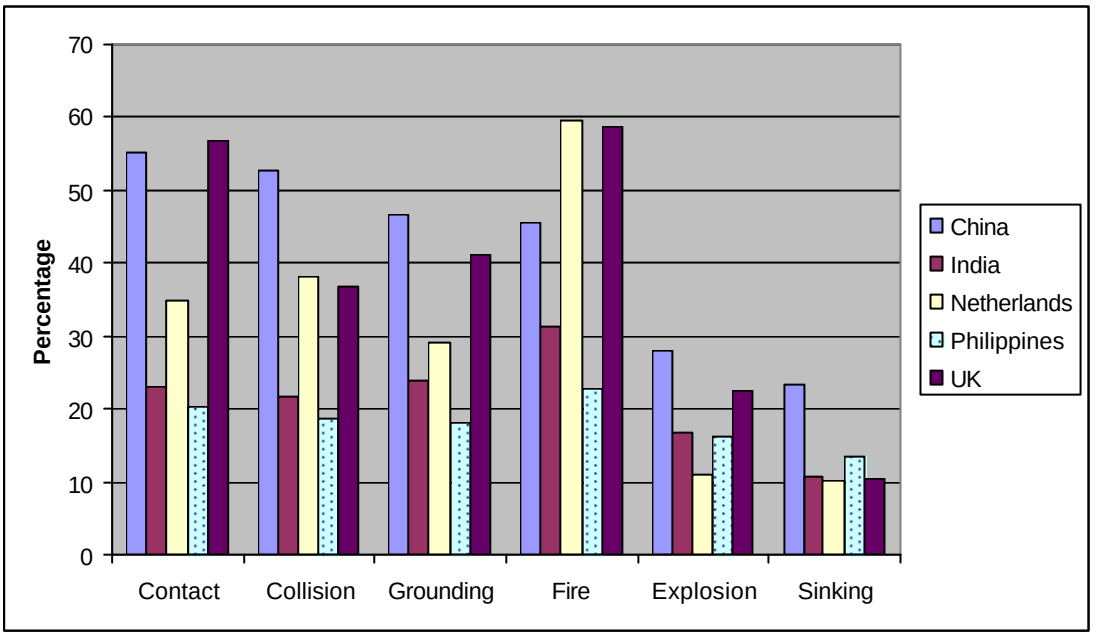
We have suggested that a sense of control over a given situation may serve to diminish perceived risk. With respect to the occurrence of incidents of sinking, managers and seafarers appeared to share confidence in their vessels. Despite the fact that there may be factors beyond the control of those onboard, including unexpected adverse weather, fire or unforeseeable structural failures, etc. These may be mostly ameliorated by the skill and dedication of those in the shore-side office and onboard who are responsible for ensuring the vessel is seaworthy, properly maintained, loaded and navigated. Interestingly it is those in the catering department who in general have no direct role in ensuring the vessel does not sink who were most inclined to perceive the occurrence of sinking as likely. Moreover, unlike the occurrence of fire, where all onboard are liable to be actively involved in dealing with an outbreak, in the case of sinking the response tends to be more passive - a retreat to the sanctuary of lifeboat or other survival craft. Thus the eventuality of sinking is perhaps best seen as the end of action, a point at which no more can be done, a point from which there is no recovery. To contemplate its occurrence would be like going to work in an office building which one believed was likely to collapse during the course of the working day. Acceptance of such a situation would make going to work each day unbearable, if not untenable. As such we can perhaps understand why the perceived likelihood of such an occurrence is relatively low for all groups.

The factors discussed, such as informed awareness, sense of control and fear of the consequences, which could be influencing perceptions tend to relate to the organisational setting and culture. It is further argued however, that individual conceptions of the world tend to be more or less deeply entrenched. In addition to the influence of organisational factors, it is claimed that individuals' perceptions are influenced by their deeper personal core-values and beliefs. These it is claimed are shaped by broader societal values and institutions. As such, individuals from different countries may well see things differently (Hofstede, 1991; Slovic, 1999; Karahanna et al., 2005).

When the various factors of hierarchy, work department, experience, etc., were entered into a statistical model and compared, nationality was found to be the strongest predictor of how individuals perceived the likelihood of an incident occurring. Of the five main national groups in the study, Chinese respondents were

significantly more inclined to see the occurrence of a ship level incident as likely, than the other national groups (Figure 3). The notable exception to this trend was the perception of fire. Fewer Chinese respondents (45.6%) perceived fire as likely as compared to those from the Netherlands (59.6) and the UK (58.2%). By contrast, Filipinos were overall significantly less inclined to see the various types of incident as likely in comparison to the other national groups.

Figure 3: Percentages by nationality that saw each type of incident as likely



When we produced rank orderings based on the different national perceptions, those from China again appeared differently to those from other nations (Table 10).

Table 10: Comparison of rank orderings based on incident data sets with rank orderings based on perceptions of different national groups, as a percentage, who perceived the occurrence of an incident as likely

Rank-order based on incident datasets		**Rank-orderings by Nationality**									
		China		**Netherlands**		**Philippines**		**India**		**UK**	
Collision	1	Contact	-2	Fire	-4	Fire	-4	Fire	-4	Fire	-4
Grounding	2	***Collision***	-1	***Collision***	-1	Contact	-1	Grounding	0	Contact	-1
Contact	3	Grounding	-1	Contact	0	***Collision***	-2	Contact	0	Grounding	-1
Sinking	4	Fire	-1	Grounding	-2	Grounding	-2	***Collision***	-3	***Collision***	-3
Fire	5	Explosion	-1	Explosion	-1	Explosion	-1	Explosion	-1	Explosion	-1
Explosion	6	Sinking	-2	Sinking	-2	Sinking	-2	Sinking	-2	Sinking	-2
Total distance from dataset			**-8**		**-10**		**-12**		**-10**		**-12**

A comparison of rank-orderings revealed that the rankings based on the perceptions of Chinese respondents corresponded most closely to those based on the actual incident data. Interestingly while Chinese respondents perceived more in accord with the actual statistics in terms of the ranking of fire and collision, they appeared to be the furthest-out in relation to their perceptions of the likely occurrence of incidents of contact with a fixed structure.

By contrast, the rankings based on the perceptions of those from the UK and the Philippines overall differed most from those based on the available data, particularly in relation to the risk of experiencing collision and fire. These two national groups appeared to over-estimate the likely occurrence of fire, as compared to other types of incident (as did those from the Netherlands and India), but they also appeared to underestimate the incidence of collision.

It could be suggested that an explanation for these national differences in perception actually reflect genuine differences in the risk faced. However given that our sample is drawn from a wide range of companies, it is open to question as to whether this would be the whole explanation. Rather, it may be suggested that a full account is liable to make reference to a range of factors relating to group, organisational and national influences. While our research has identified that there clearly is an issue to be addressed, a full exploration of this topic is obviously beyond the scope of this paper and requires substantive further investigation.

To summarise, we have seen that the number of ship level incidents appeared to be relatively high. We have also seen that different groups of workers within the maritime sector perceived the likelihood of experiencing such an incident differently. In particular shore-based managers and Chinese respondents were most inclined to perceive the occurrence of a ship level incident as likely. Moreover these two groups appeared to align most closely with the actual incident data, in terms of the relative ordering of types of incident based on their likely occurrence. In general shipboard workers were more inclined to perceive the occurrence of fire, relative to other types of incident, as more likely than the data suggested and to perceive the risk of collision as less likely than indicated by the statistics. Junior officers especially, appeared to under-estimate the relative likelihood of collision.

Perhaps most significantly, those in shore-side management tended to have different perspectives to those onboard ships. As it tends to be the managers who initiate safety interventions it is clearly important that they should be aware that those onboard may not see things the same way. Thus if shore-side managers have the 'most accurate' perceptions of risk, as the they would appear to do, then the evidence suggests that they are currently failing to effectively communicate the information shaping their perceptions to seafarers in their companies. Perhaps via seminars directed at seniors, senior officers are put more in touch with the viewpoint of shore-side management, but our data suggest that this view fails to be communicated or to effectively 'trickle' down to junior officers and ratings. This could have a variety of potential consequences including the failure to take risk assessments, instructions or company procedures, etc., sufficiently seriously.

Thus to emphasise, it is important that the industry move to establishing a coherent and robust set of statistics which can be utilised in the formulation of OHS strategy. Moreover, for the effective implementation of such strategies, it is also necessary to appreciate that different groups within an organisation may perceive things differently and to introduce safety initiatives in a manner sensitive to such difference. The aim is to develop appropriate risk communication strategies and practices to have all parties seeing the same way with regard to safety.

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THOUGHTS ON SAFETY: THE VIEWS OF CHINESE SEAFARERS

Helen Sampson and Bin Wu[1]

Abstract

Following the findings from the LRETRU/SIRC study of perceptions of risk, which identified nationality as a key influence on risk perception, research has been undertaken with Chinese seafarers to try to explore the factors which influence risk perception amongst a single national group. This paper reports on the preliminary findings of this study and discusses the main factors which are identified by Chinese seafarers as mitigating, or increasing, risk on board a vessel. These include: the practices and policies of employers; the impact of colleagues and their on board relationships; the effect of local labour market conditions; and the relevance of previous experience in determining risk perception.

Introduction

In recent reports (Bailey, Ellis, Sampson 2006, and Bailey, Ellis, Sampson forthcoming) on seafarers' perceptions of risk, nationality has been identified as a major influence on seafarers' views. In relation to vessel level incidents Chinese seafarers have been found to be almost twice as likely as other nationalities to perceive there to be a risk of an accident (fire, explosion, collision, sinking, grounding or contact with a fixed structure) occurring in their company (Bailey, Ellis, Sampson 2006). Whilst, in relation to personal injury, a complex picture of risk perception emerges. Chinese seafarers, it seems, are more likely than seafarers of other nationalities to identify a risk of injury pertaining to seafarers working for their own employers. However, and intriguingly, seafarers from China do not seem to perceive the risks associated with shipping in general as greater than other national groups (Bailey, Ellis, Sampson forthcoming).

[1] We would like to thank David Walters for his helpful comments and advice in relation to the development of this paper. We would also like to thank all the seafarers who took part in the reported study and the two shipping companies who kindly agreed to allow Dr Wu to sail on their vessels.

Such interesting findings warrant further investigation. To this end, this paper represents a very preliminary report on some research conducted by Wu aboard wholly Chinese crewed vessels. The aim of the study, which is on-going, is to arrive at a better understanding of the ways in which Chinese seafarers understand risk and the matters and ideas which may influence their perceptions. Further research is due to take place and as such this paper reports on the preliminary findings from the first two vessels to be included in this study.

Methods

In 2006 and 2007 Wu undertook research voyages aboard one tanker and one bulk carrier. He spent a total of 73 days aboard these two ships and formally interviewed 49 seafarers. Informal interviews and observations also took place, and detailed fieldnotes were maintained in the course of the data collection on board. This paper draws upon materials collected in the course of the research, including transcribed confidential interviews and field notes.

Perceptions of the safety of shipping

In relation to general perceptions of the safety of shipping, participants were divided. Some expressed a view that seafaring was relatively safe and cited: modern technological developments and improvements (e.g. in navigation systems and marine machinery); international regulation (e.g. SOLAS, ISM, ISPS); and more effective enforcement of regulation via port-state inspections; as reasons for safety improvements. Such seafarers often contrasted shipping favourably with shore-side industry and transportation in China, regarding the mainland as having a poor safety record. Other seafarers saw things rather differently, however, and highlighted the contemporary relevance of 'human error' in shipping accidents, referring also to the dangers of piracy which pose a significant threat to modern vessels particularly those trading in the Far East and in areas off the coast of some African states (e.g. Somalia). At the forefront of the minds of many of these seafarers was an awareness of the remoteness of deep-sea going vessels and the associated problems with rescuing or

helping seafarers in difficulty once they were underway. For these seafarers shipping was a high risk occupation and as one senior officer put it: *'You can never be relaxed until you stand up ashore after the completion of your contract'.*

Thus it seemed that there was no universal view about the risks associated with shipping in general amongst the seafarers included in this study. Some were convinced that the modern shipping industry was generally a comparatively safe one in which to work, others regarded its inherent nature (remote from shore-side assistance and facilities) as risky and were conscious of some of the very specific risks attached to shipping (such as piracy). What subsequently emerged in the accounts of most of the seafarers, however, was the importance of companies in terms of management policies and practices in mitigating or exacerbating risk in the exercise of their practices and the implementation of their policies.

The importance of 'the company'

It emerged in the course of interviews with seafarers that their companies' policies and practices strongly influenced perceptions of risk. It was widely understood that risk could be mitigated by seafarers and companies working together and acting in accordance with safety protocols. The following interview extract is illustrative of the ways in which seafarers believed that shipping could be rendered relatively safe where all parties acted properly and promptly:

> Interviewer: *…Is this a relatively safe occupation or a high risk occupation?*
> Interviewee: If the company has a good management system and working manuals and crew members implement the company manuals strictly, seafaring is not a risky occupation.
> Interviewer: *What do you think about the impact of occasional or natural factors?*
> Interviewee: I don't think those factors are important compared with human factors. Sometimes, deficiencies of the ship's hull or key equipment may be vital for the safety of ship and crew. Even so, it depends upon whether crew are able to identify the deficiencies at the earliest, and then whether the company can take necessary measures to deal with it once the company

> received the report from the crew. Should both crew and company take serious steps on safety management, the seafarer's occupation won't be as dangerous as normally expected. So shipping safety requires both the earliest findings of crew and also prompt response of the ship company. (Senior officer)

Reinforcing this view another interviewee emphasised that new vessels could be rendered unsafe by poor company practices whilst old vessels which were well run and managed could operate relatively safely. He explained that:

> Many small companies own new vessels but are poor in safety management. In that case, their ships are not safe at all. By contrast, some companies like my current servicing one have had comprehensive and strict safety management systems for a long time, in which the safety of even old ships can be secured. I believe that the safety of a ship is dependent upon management - both safety management by the company and by the crew. Without safety management, new equipment can easily be broken, leading to accidents…. Ten years ago, I would have placed an emphasis on ship conditions and I would have thought that a new ship would be safer than an old one. Today, I would give more weight to human factors and company safety management systems. (Senior officer)

Another seafarer of much lower rank reinforced this view arguing:

> A 30 year old ship may not be necessarily poorer than a 10 year old ship in terms of the safety because the strict management is more important. (Rating)

However not all seafarers were sanguine about the reliability and safety of their vessels and some suggested that there were some ships that were inherently unsafe creating danger that was beyond the 'control' of serving seafarers. One engineer for example reflected on a vessel he had previously served on. He described how he felt that:

Interviewee: It was our luck that no incident, like, related to the stopping of the main engine, happened during the period of poor navigation conditions. I was always worried and could not be relaxed throughout my service.

Interviewer: *Do you mean that without the reliability of marine machines and equipment, the safety of ship and crew cannot be secured?*

Interviewee: Certainly, this is particularly true for the main engine, which was my responsibility as 2nd engineer. In that period, I was a bit nervous.

Interviewer: *What factors caused you to be so nervous*?

Interviewee: That was the deficiency of the ship design and building. The designer focused on the economic profit only. Cargo space, deck equipment and machinery are excellent, leaving the engine room too small to do maintenance work. Average temperature in the Engine Room was over 46 ^{0}C. A key issue was the unreliability of the main engine. As all Chinese crew in this company knew her, it was difficult for crew agency to send us to this ship even US$100 more for a 3rd engineer's wage. Safety was a major consideration. (Senior engineer)

Thus seafarers recognised that there were limits to the problems that could be overcome by on-board, or on-shore, human endeavour alone. Nevertheless the 'company' approach was often key to their perception of safety.

Research in other sectors such as railway operation has identified an association between distrust and poor safety performance (Clarke 1998) and in reviewing some of these findings Conchie and Donald (2006) conclude that:

> In explaining this relationship most safety professionals agree that negative attitudes are the cause and not the consequence of accidents (e.g. Lee and Harrison 2000). For example, workers who express negative attitudes toward safety are more likely to experience an accident than workers with positive attitudes. **Research into risk draws similar conclusions**. (Conchie and Donald 2006:1154. Our emphasis)

Trust has often been discussed in relation to leadership and management (Clarke 1998, Fleming and Lardner 2001, Cox et al 2006). Where trust breaks down, be it in relation to the implementation of a 'just' or 'no blame' culture or in relation to

management commitment to safety, negative consequences accrue in relation to safe working practices and the development of a safety culture. In Clarke's research on British railways, for example, she demonstrated that rail workers failed to report minor incidents to management where they felt that 'management take no notice' (Clarke 1998:287). Such under-reporting undermines safety management and increases risk. Confidence in management is therefore key to the proper implementation of safety management systems. This was understood by the participants in this research who identified the company approach as a vital element in relation to the degree of risk they experienced at work. In relation to seafaring there is necessarily a distance between vessels and shore-side management. This distance is clearly a physical one but seems equally to be inter-relational. Shore-side management are seen by many seafarers to be the 'company' and the 'management' whereas shipboard senior officers seem to be more akin to 'supervisors' in land-based industries. Thus the 'company' can be equated with 'management' and trust in the company directly impacted upon the participating seafarers' sense of safety on-board. They saw the company as playing an essential role in determining the implementation of safe working practice on board. Similarly, however, in this research, relationships with colleagues particularly, but not exclusively senior officers (supervisors), featured strongly in relation to perceptions of risk.

The importance of colleagues on board in relation to perceptions of risk

Participants identified fellow seafarers as having a critical role in mitigating risk. In this, senior members of the crew were seen as vital in preventing accidents via the promotion of trust, team spirit, and error free work. Trust was again identified as a key component of safety management. As one rating explained:

> Management is key. I mean that the personalities, leadership styles, and charisma of ship leaders (including the Captain and the Chief Engineer) will determine whether they can bring a crew together as a close and united team. If so, error chains can be identified and disrupted at an early stage. If not, say that a leader does not take care of personal matters amongst the crew and is very rude in delivering his commands to subordinates, they would distrust

> and be disappointed in him. As a result, they wouldn't report anything [requiring attention]. In this case, the ship will be unsafe even if it is a new one. (Rating).

Senior officers were also considered to be a necessary, and an important, mediator of shore-side commercial pressure by seafarers. Some suggested that it was the role of senior officers to soak up such pressures and prevent them from impacting upon, and influencing, the remainder of the on board team. One explained that:

> All pressures should be the pressures of the captain and C/E because the crew do not have direct contact with external information. It is important how the captain and C/E approach work pressure and how they communicate with outsiders? External pressure should not be directly transferred to the crew. (Senior officer)

Where senior on-board managers were regarded as weak, seafarers perceived that safety was compromised. One seafarer offered the following description of events aboard a ship he had served upon. In his account the Captain was deemed to have failed to resist shore-side commercial pressures which had ultimately caused him to insist on a mistaken course of action that could have had serious health and safety implications. In the seafarer's account the Captain failed to resist the pressure applied by shore-side managers who required him to press for a faster voyage time than was sensible given the engine capacity of the ship. The Chief Engineer was deemed to have similarly failed to resist pressure exerted by the Captain causing him to operate the engines at a faster rph than was safe in the seafarer's eyes. This impacted negatively on the seafarer's perception of safety on board. He explained that:

> In the last ship, the maximum revolutionary rate of the main engine was 180 rph due to the constraint of the engine conditions. In order to reduce the voyage duration, the captain asked the engine department to increase the revolutionary rate. The C/E passed the captain's request to us. After a discussion amongst the engineers, we concluded that we cannot increase the speed beyond the limit of the ship condition. Having seen no response from us, the captain rang to an on-duty engineer directly and repeated his request. I told

> the C/E that we had never taken such high speed which may have serious consequences. The C/E did not accept my advice and he came down to the engine room to implement the captain's command. After one day run at the higher speed, unsurprisingly, two cylinders began to leak oil seriously. We had to stop the engine and spend two days making emergency repairs, making the voyage much longer than the original speed. It was our luck that the weather was not too bad at all during the period of the main engine stopping. Otherwise, we might have had a big problem.

Thus leadership and management were seen to impact significantly on seafarers' general sense of safety on board and their perception of the risk associated with their work. On-board seniors were emphasised in the accounts of most seafarers. Their role in leadership, promoting team work, and exercising authority in relation to team working rather than command and control tyrannies, was regarded as important to the safe operation of ships. Lee and Harrison (2000) argue that their research in the nuclear sector indicates that management style can have a strong impact upon safety-related attitudes. Their findings echo the perceptions of seafarers in this study who equated less authoritarian styles of management with less risk. Lee and Harrison suggest that:

> The categorization of management style is shown moving broadly from 'laissez faire' through 'authoritarian' to 'democratic' in general accord with the literature on leadership and safety culture[…] This progression is associated with increasingly favourable attitudes towards safety on the part of 'followers'. (Lee and Harrison 2000:88)

However, for Chinese seafarers it seemed that another element, which impacted strongly upon the ability to promote effective teamwork, was essential to safety on board and their confidence in risk mitigation strategies and practices. This element is termed 'guanxi' in Chinese.

Guanxi, is a term with complex meaning but for our purposes relates to a feeling of collective harmony, which underpins the understanding of many Chinese seafarers reflecting upon the importance of on board relationships and their perception of safety. 'Good' guanxi was deemed by many to be a vital component of effective team

work which was widely understood to improve safety on board. As one seafarer explained:

> Interviewer: W*hich factors influence the safety of a ship?*
>
> Interviewee: Guanxi is certainly an important factor.
>
> Interviewer: *How can guanxi influence safety?*
>
> Interviewee: Suppose that I had just argued, shouted at, or fought with, a crew member, how could I concentrate on my work? As you know, some jobs in the engine room are very labour intensive and mentally demanding whilst others are not. If you are in a good mood, you won't feel tired even if a job is really hard. Should you be in a bad mood, you will feel very tired even if the job is not difficult and you are very familiar with it….. Being in a bad mood is counter to the safety of yourself and others because you are unable to concentrate on your work.
>
> Interviewer: *You have raised an important point that safety is closely related to the psychological state of crew members.*
>
> Interviewee: Yes, bad moods cannot secure the safety of yourself and others because you cannot concentrate on work and make responses properly as usual. It is easy to lead to an accident because alongside working, you may be still concerned about what you heard, some bad words, or forged reports against you. In particular, you would find it very difficult to work with those with whom you had argued. (Rating)

Where guanxi was good it positively impacted upon the risk perceptions of crew members. Where guanxi was poor it seemed that seafarers perceived their ship as less safe and their lives and health to be at greater risk.

It seems that guanxi requires careful fostering and maintenance and that Chinese seafarers identify a number of responsibilities and 'rights' associated with guanxi. Guanxi is shared across a group who are deemed to share a collective responsibility for one and others' welfare. Thus guanxi could be negatively affected by the failure of particular individuals to act in the collective interest or to protect the interests of one of their member associates. Guanxi clearly related to seafarers who for the duration of the voyage were regarded by many as sharing a collective responsibility on board.

This is an extension perhaps of the fairly usual sense of comradeship (a term originally emanating from the sixteenth century Spanish fleet see Perez-Mallaina, 1998 and Bloor, 2005) experienced on board by seafarers who find themselves 'all in the same boat' (or specifically in the case of the sixteenth century Spaniards 'all in the same bedchamber') and therefore sharing common interests. However guanxi in China operates strongly ashore and the intersection of interests and responsibilities involved could produce conflicts between the maintenance of shore-side and shipboard guanxi.

On board guanxi could thus be affected by the distribution of the network of agencies supplying crew to vessels. Where crew agencies were dispersed, and thus on board crew were recruited from different parts of China, conflicts could emerge. Regional affiliations, prejudices and discrimination could disrupt on board harmony in ways which are very similar to those reported by Filipino crew who often express a preference for multinational vessels as a result of a desire to mitigate regionalism (Sampson 2003). For some Chinese crew the proposed solution was rather different however and they advocated that crews be made as homogenous as possible and be supplied by single agencies. The following account of the perceived problem and a proposed solution are illustrative:

Interviewer: *Does guanxi influence the performance of Chinese crew?*

Interviewee: Yes. Some region's crew are particularly inclined to establish their own grouping. Small groupings are more likely to exist when crew are supplied by different crew agencies, like a "United Nations". In my company, all officers are free seamen from different crew agencies while all ratings come from the same crew agency. This has made it very difficult for senior officers to manage and control the ratings.

Interviewer: *Why?*

Interviewee: Because the crew manager finds excuses to block their decisions or impede crew replacement. This will lead to either an accident or a near miss. Such consequences are actually inevitable.

(Rating)

On board strife, rifts, and power struggles were discussed a great deal by the seafarers in this study. It seemed that the capacity for personnel to access the support of the wider crew, to mobilise guanxi as it were, had the potential to fundamentally undermine the authority of even senior figures on board, illustrating how crucial on board relationships were to safe operations and to perceptions of safety. The following account offers an example of a captain being undermined by one of his officers which ultimately, in the view of the seafarer recollecting the story, resulted in an accident. The seafarer explains:

> Holding a captain's certificate in his hand, the C/O tried to weaken the authority of the captain and replace the latter through developing his own guanxi on board. In order to maintain his position, the captain had to agree with him to promote an unqualified OS to AB in order to take duty on the bridge. In the Suez Canal, the unqualified AB was unable to follow the pilot's command, and the ship grounded, resulting in a damaged hull. (Junior officer)

It was not only poor guanxi that was regarded as having the potential to undermine safety on board however. It seemed that in some cases seafarers did not feel confident about the experience and 'know-how' of their peers. Researchers considering safety culture and the role of trust in the promotion of such cultures have commented that the operation of a "good' safety culture can be characterised by a mutual trust that key stakeholders have in each other" and that furthermore workers feel secure when they know 'that individuals have the necessary skills to carry out specific work tasks' (Cox et al 2006:1124) In the course of this research it emerged that such faith in the competence of fellow seafarers was not always present. It was suggested by some participants that Chinese seafarers had, in some cases, acquired poor working practices and habits from their experience in the national fleet and that such deficiencies could be rectified if foreign companies provided good on-board guidance as to how to maintain or operate pieces of equipment and machinery. For example a senior officer suggested that:

> We would like to learn more from strict management and highly professional standards from foreign companies……We must admit that few [Chinese] crew/engineers/officers have good experience on maintenance work, and some

> may have the wrong experience, resulting in frequent breakage of the equipment and machinery … So a good company SMS and operating manuals are important, partly because we can learn a lot from reading company documents and improve their knowledge, partly because the manuals indicate what are the correct ways to carry out maintenance work. A good manual not only reminds us what to do, but also tells us how to do it. (Senior Officer)

However there was also a feeling that seafarers might not wish to learn but that by utilising 'guanxi' ashore to secure work on board, and by moving from company to company to avoid the consequences of their incompetence, some very poor, or in the terms of one seafarer 'rubbish', seafarers survive in the modern Chinese seafarer labour market placing their fellow workers at risk. As one seafarer put it:

> There are many 'rubbish' seafarers amongst Chinese senior officers aboard foreign ships. They are poor in professional standards but strong in abusing guanxi for personal purposes. Without a credit system in the global labour market, unfortunately, they can move easily from one company to another. This has not only negative impacts on the professional development of junior officers and cadets, but also makes it difficult to establish a safety culture amongst Chinese seafarers due to the variety of professional approaches and standards. Such phenomenon should be attributed to the impacts from the traditional management system and culture within China's state-owned shipping companies and crew agencies, which have yet transformed to a new system and culture. Such impacts can be summarised as the lack of professional concentration, poor professional standards, short term perspective, and favour to personal guanxi. (Senior officer)

This lack of confidence in colleagues' knowledge, competence, and experience, may well contribute to the heightened perceptions of risk identified amongst Chinese seafarers in relation to working in their current company (Bailey, Ellis, Sampson, forthcoming). A perception that other seafarers working for other companies may be better skilled and more knowledgeable could account, in part, for the perception amongst Chinese respondents identified in the same research (see Bailey Ellis Sampson forthcoming) that shipping in general was not as risky as respondents from other countries felt it to be.

The influence of the structure of the labour market

A particular feature of the Chinese seafarer labour market appeared to compound this lack of confidence in the ability of colleagues. It seemed that seafarers had concerns about the influence of shore-side agency staff upon relationships on board wholly Chinese crewed vessels. Suggestions of nepotism were made by crew members who raised the safety implications of such practices and relations. One explained that senior officers, fearful for their jobs, could be made to feel that they were unable to exert influence over junior crew members in relation to safe working practices. He suggested that:

> In the face of market competition, for instance, some captains and C/Es may be concerned about how to secure their jobs in this company. When they pay serious attention to the safety management, it may offend some crew who have a special background with the crew agency. This may make it difficult for those senior officers to perform their duties. In order to maintain harmonic work and personal relationships, they may give up their effort in safety education, training and strict management. (Senior officer)

Some seafarers could cite direct experience of crew agency intervention of a nature which they felt compromised the safe operation of a vessel. One, for example, described how aboard one ship the crew effectively ended up operating with one person too few in the engine room because the crew agency insisted that an incompetent seafarer remain on board rather than be fired and replaced. He described how:

> A 3rd engineer could do nothing but clean the oil filter. It threatened the safety of ship if he continued to occupy his post. At that time, the crew agency rang the ship and suggested to the C/E to take any measure except send the crewman home. To avoid offending the agency, the C/E made a decision that the 3rd engineer was not allowed to enter the engine room but stay on the deck until his contract completed. (Officer)

Here again guanxi appears to come into play as nepotism, an element of guanxi, could fuel the promotion of seafarers who might be regarded by others as not yet fit for advancement. The following account was illustrative of the kinds of practices that were reported and the ways in which they impacted upon on board seafarer relationships, guanxi and perceptions of risk and safety:

Interviewee: The impact of guanxi on Chinese seafarers cannot be underestimated whatever they board, Chinese or foreign-owned ships. For a rating, if you are good at communication with senior officers, it is certain that you have more chances to be promoted as AB, Bosun or Pumpman. On the other hand, some crew managers may ask the ship to promote their relatives although the latter may not be qualified or not strong enough for the new post.

Interviewer: *Does it influence safety?*

Interviewee: Yes, this is a case of a pumpman who was promoted just because he was a relative of the crew manager. He knew nothing about the deck work because he was an oiler. Soon after his promotion, he got a minute injury caused by the leakage of hot steam because he did not follow the operation procedure properly. Without learning the lesson from this accident, he had a bigger accident later. This was caused by his carelessness: he did not shut down the door in the forecastle tightly, resulting in a flood there later due to bad weather. To ensure navigation, a group of deck crew was sent to the forecastle for an emergency operation. Unfortunately, all crew members were hit down by a big wave, and one was seriously injured as he was thrown up in the air and fell down the deck with a serious break of his pelvis.

Interviewer: *The case you mentioned indicated an improper intervention from the crew agency.*

Interviewee: Yes, the ship is very vulnerable once the intervention from the crew agency took place which influenced the crew's guanxi. We fear such intervention.

Interviewer: *Is this still an issue for Chinese crew boarding foreign ships?*

Interviewee: Yes, it is a common issue. In the case I mentioned earlier, it was due to his special background that many crewmembers liked to show special respect to him, leading to a small grouping beyond the normal working relationship. This was a constraint from the strict safety management on board.

In this case favouritism, fostered by a concern with guanxi, appeared to have facilitated the promotion of the individual concerned and also to have influenced the on board behaviour of some other seafarers who appeared to cut him some slack in relation to his careless work practices ultimately resulting in a serious accident. There is a sense in the account of the issue dividing the crew and disrupting the harmony on board, something which most seafarers described as highly undesirable and as a problem in terms of safe operations on board.

The competitive nature of the labour market also seemed to influence on board behaviour in others ways which could impact on safety. Seafarers recognised the need for others to share their knowledge and understanding with them in order to assist them in learning. A cadet for example explained that:

> Interviewee: The most effective way for onboard learning is that they instruct you to do some crucial operations completely. Just recently for instance, an engineer offered a comprehensive explanation of the procedure for preparing the main engine for navigation.
>
> Interviewer: *How often do you have such opportunity?*
>
> Interviewee: It is dependent upon your own attitudes and efforts. If you are arrogant and lazy, nobody likes to help you. If you work hard and take every job seriously, you will gain reward from experienced crew who would be willing to pass their experience and skills to you. You would benefit a lot, in particular, if they show and explain a complete process in equipment repair or maintenance, which gives you an overall picture and also key techniques/know-how instead of general information. (Cadet)

However, a number of seafarers talked of the 'protection' of skills and knowledge by some colleagues unwilling to teach others for fear of future competition from them for their job. The phrase of 'taking over their rice bowl' was used by an engineer to evocatively describe the fears and attitudes of some seafarers conscious of the temporary status of their contracts and the competitive nature of the labour market:

> In the Engine Room, it is normal that people join together to fix machinery or equipment. This is an opportunity for us to learn from each other, and in

> particular for those who are preparing themselves to take charge of the machinery and equipment once they are promoted. Whilst many people like to teach you without reservation, some are not open to do so because they fear that you may take over their "rice-bowl" [job]. …I have experienced working with such kind of persons.
> (Engineer)

The account of a Bosun echoed this when he responded to a question relating to sharing of knowledge:

> Interviewer: *Do all experienced crew share a similar approach with you in terms of sharing knowledge and experience?*
> Interviewee: I don't think so. In fact, many people try to avoid doing it. It is a slogan: "once an apprentice has got all skills from his master, the master would end his business". Taking into account the labour market competition, skill development and promotion of ABs may mean the decline of employment opportunities for the current Bosun. This is the reason why many Bosuns are reluctant to transfer all their knowledge and skills to their subordinates. (Bosun)

There was also a suggestion that labour market conditions discouraged seafarers from seeking knowledge from others for fear of exposing their own ignorance. An older seafarer recognised this as a generational difference but it seems likely that the change in behaviour which he identified as relating to time also reflects changes in the nature of employment and a clear awareness amongst all seafarers of the precarious nature of their employment status. The seafarer reflected that:

> I gained such feeling from the first, my master, an experienced fitter who taught me a lot when I was cadet. It is rare for young seafarers today to talk about their mistakes. Rather, they would like to show that they are perfect even if they had actually made mistakes. This is certainly different from old ones. (Engineer)

The influence of previous experience in the domestic fleet

Many Chinese seafarers have entered the global labour market having been initially trained by, and within, state owned shipping enterprises (see Wu 2006; Wu *et al*, 2006). Previous experiences are likely to impact upon perceptions of risk as seafarers contrast the practices of their current companies with the practices they have previously been familiar with. Such contrasts may impact favourably, or unfavourably, on seafarers' risk perceptions. In the main seafarers in this exploratory study seemed to feel relatively 'safe' on board their current vessels as a consequence of the comparisons they made with what they considered to be the relatively unsafe ships aboard which they had previously served. In the main they appeared to regard the practices of their former employers as more risk prone than those which they experienced aboard their current vessels. The following example of an account given by a senior officer is illustrative:

> You may not know that "the segmentation of the three powers" was popularly practiced in the Chinese fleet in the past. That means that the Captain concentrates on the bridge, the Chief Officer on the deck and the Chief Engineer on the Engine Room. If all leaders focus on departmental interests without close cooperation, you might as well divide the ship into three pieces! In our company, it is different. (Senior officer)

Whilst this finding is likely to reflect the nature of the two ships aboard which the researcher sailed (both of which were operated by what might be termed companies at the 'top end' of the labour market vis a vis safe working practices and safe vessel management) it is also illustrative of the ways in which perceptions of risk are relative and, as such, require contextualisation if they are to be properly explored and understood. The example serves to highlight the fact that to understand risk perception as simply *culturally* mediated (i.e. pertaining to specific ethnically rooted group values, traditions, beliefs) is inadequate in itself and the understanding of structural issues relating to labour markets, management practices, shore-side industry safety records, education and training, and so forth is essential to any successful attempt to explain national variations in risk perception.

Conclusions

Consideration of the extended example of Chinese seafarers aboard fully Chinese-crewed ships offers us an insight into the influences on seafarers' perceptions of risks aboard. It is apparent in the discussions amongst seafarers, and between seafarers and the researcher, that a variety of issues impact upon safety perceptions at sea. These include what might be regarded as 'general knowledge' about shipping such as an awareness of technological advances, consideration of shipping specific risks such as piracy, and an understanding that ships are remote and isolated work places where help and assistance are not easily accessed when things go wrong. Crucially however it seems that what might be termed 'local context' is very important in shaping seafarers' perceptions. 'Local' considerations are wide ranging and include the policies and practices of individual employers, the behaviour and attitudes of shipboard colleagues, and the impact of local labour market conditions.

The form and content of localised relationships needs to be carefully considered in any effort to understand perceptions of risk whether a greater understanding is sought in relation to national differences or other variations such as those between seafarers of different rank or department. What this small scale preliminary study begins to reveal is the ways in which risks are understood, by seafarers, to be mitigated or exacerbated by organisations, or individuals; the importance of past experiences in gauging risks which are perceived in a relative manner; and the impact of structural conditions on safety behaviour and perceptions of danger.

The research therefore indicates that the specific context of seafarers' experiences, which can be conceived of within national frameworks, impacts significantly upon their perceptions of risk. Thus national differences in risk perception may be understood in relation to national economic conditions, national shore-based safety practices and regulations, national labour market conditions etc. What the research has yet to clearly indicate is any significant impact of national *cultural* understandings (i.e. national beliefs, values etc) on perceptions of risk and by extension on safety–related behaviours. Guanxi is understood by Chinese seafarers to be specific to Chinese culture but it nevertheless resonates with aspects of other national cultures and cannot be seen to be wholly unique. The role of guanxi on-board merits further

exploration however. It is hoped that further research in this area will assist us in developing our understanding of the risk perceptions of seafarers more generally, of Chinese seafarers in particular, and of overall national differences in risk perception.

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SEAFARERS' PARTICIPATION IN SAFETY MANAGEMENT ON BOARD CARGO SHIPS

Syamantak Bhattacharya

Abstract

The paper considers the importance of *seafarers' participation* in the management of self-regulated Occupational Health and Safety (OHS) in the shipping industry. It points to the ways in which the concept of participation is understood differently within the industry and highlights the potential contribution that full employee participation makes to effective safety management at sea. Using qualitative research, including document analysis, interviews, and observations, both with shore based management and seafarers in the course of research voyages aboard cargo ships, the paper demonstrates what happens in practice when participation is attempted in the shipping industry. Seafarers' employment patterns, fear of accountability, and shipboard hierarchy are identified as hindrances to participation. The paper concludes that the effects of these hindrances are compounded by a deeper and underlying problem of a lack of appreciation of the principles of self-regulated OHS management system in the shipping industry.

Locating seafarers in the ISM Code

The introduction of the ISM Code represents one of the major changes to have occurred in the shipping industry in recent times. This piece of legislation was brought in between 1998 and 2002 to provide a framework for the self-management of seafarers' Occupational Health and Safety (OHS) and vessel pollution prevention. In the process it highlighted the importance of effective ship management and identified ship operators[1] as independent and accountable entities.

The ISM Code for the first time provides a framework for ship operators to "self-regulate" with regard to the protection of health and safety for their employees. Given the marginal involvement of regulatory authorities (i.e. flag states) the onus for providing an appropriate measure for the regulation of health and safety at sea was transferred, via the introduction of

[1] Ship Operator: The ISM Code (3.1) requires that if the entity, who is responsible for the operation of the ship is other than the owner, the owner must report full name and details of such entity to the administration (Flag State) (IMO, 2002: 8).

the Code, almost entirely, to ship operators. This necessitated ship operators' active engagement with the development of Safety Management System (SMS) policies and procedures for their ships (Bailey, 2006). The ISM Code unequivocally demands direct and close involvement in SMS implementation and monitoring in its preamble where it states 'the cornerstone of good management is commitment from the top' (IMO, 2002: 5).

Similar forms of self-regulated Occupational Health and Safety (OHS) management systems are also widely found in shore-based industries. Along with the importance of the commitment from the top management, shore-based research into such systems has, among other influences, identified the benefit of employee participation in contributing to the development of safe and healthy workplaces. Statistics as well as academic research demonstrate that in self-regulated OHS management systems a top-down approach alone has limitations. However, when combined with effective employee participation OHS management systems bring overall tangible benefits, such as less employee turnover, fewer incidents and an increased level of communication from employees (Dawson et al., 1988; Bohle and Quinlan, 2000; Gallagher et al., 2003).

It is important to note however that the ISM Code nowhere contains an explicit provision concerning the requirement for seafarers' participation. It does, however, state a number of important operational elements that imply seafarers' participation in the development, maintenance and continuous improvement of the SMS. For instance, risk assessment, incident reporting and review of the SMS are all mentioned in the ISM Code (IMO, 2002: 10).

The purpose of this paper, then, is to explore how the shipping industry has risen to the challenges of the ISM Code and, in particular, if and how seafarers' participation has become an integral part of the implementation of safety management.

PhD Research design

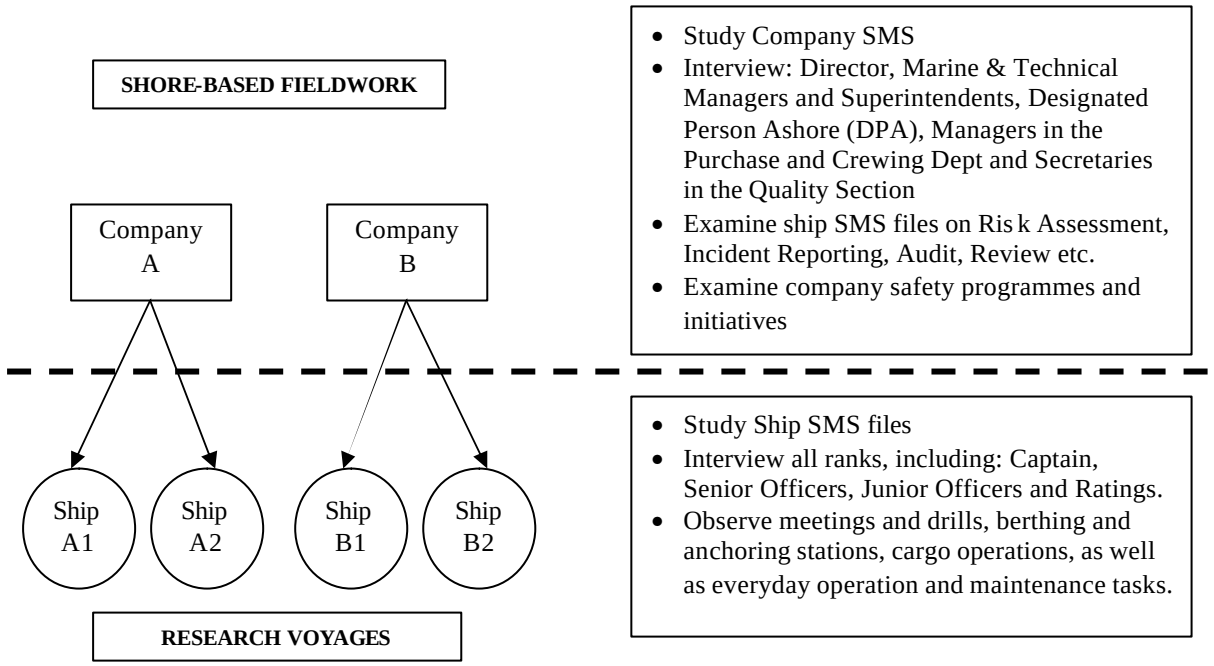
Earlier studies into the effectiveness of the ISM Code exposed serious limitations concerning the use of widely varying statistical data on accidents and incidents on board ships on a

global scale. The need for in-depth, qualitative research into the ISM related performance of ships and company offices was also a major recommendation of the IMO group of independent experts that conducted a quantitative survey into the benefits of the ISM Code in 2005 (IMO, 2005; Anderson et al., 2003).

The PhD research project, which underpins this paper, uses qualitative means to study some of the influences affecting the practice of the Code. It examines, among other things, the extent and quality of seafarers' participation and management involvement, and the consequences of the withdrawal of regulatory bodies against the backdrop of the changing nature of the industry. It also explores the interplay between these different influences and how this complex interaction impacts on the practice of OHS. This paper however focuses specifically on seafarers' participation and the impact of such participation on the practice of OHS in the shipping industry.

Two companies were carefully selected for the empirical study based on their size, business focus and trading interest. The research was conducted in the companies' shore-based technical management offices as well as on board their ships. The company SMS and associated written procedures, SMS files and other relevant documentation were studied, all ranks of seafarers and management staff interviewed, and routine activities on board ship closely observed. The research was designed to investigate a range of issues related to five specific procedures in the SMS: (1) Ship safety meetings, (2) Accident and incident reporting, (3), Risk assessments for onboard tasks, (4) SMS Reviews and (5) SMS Audits.

Figure 1: Research locations and data collection sources



The shore-based research took four days for each of the two companies, while a total of four ship voyages (two from each company) lasted for a period of one to two weeks each and included international routes (India-Persian Gulf and USA) as well as coastal trades (Western Europe). The data collection took place in the second half of 2006.

Onboard ships seafarers from all ranks and departments were interviewed producing over 100 hours of recorded interview data from around 75 interviewees. In addition, copious notes were kept from documentary analysis and onboard observations. The views and experiences of employees at all levels in the hierarchy onboard and those of the managers in the shore-based office with different responsibilities were instrumental in gaining an in-depth picture of the practice of OHS.

The four ships were tankers, a ship type that is widely regarded as the safer type of cargo ship (Lloyd's List, 2005). Furthermore, the companies that offered access for the research held good safety and pollution prevention records judging from Port State Control (PSC)[2]

[2] PSC data: Port State Control (PSC) is a government body which has statutory rights and responsibilities to carry out inspections of foreign flagged ships when such ships call at ports. PSC produces statistical data on operational deficiencies relating to ships' safety, prevention and control of pollution, crew proficiencies and

data (Equasis, 2007; Paris MoU, 2004). Thus, any findings here which suggest that there may be scope for improvement may be even more pertinent for the wider industry. Aside from this stated bias there was nothing untypical about the individuals or company settings compared to the industry in general. While the study doesn't intend to be representative of the industry as a whole, it presents in-depth discussion of a number of issues related to seafarers' participation which gives it a wider relevance.

What kind of participation?

There may be a number of different ways of understanding the concept of *participation* in the context of OHS management. Different managers may interpret its significance differently. To understand what kind of participation contributes to the successful management of OHS, it is important to differentiate the levels of seafarers' participation that might exist in the industry.

On one level such participation may be restricted to adherence to managements' directives and procedures as laid down in the SMS. This form of participation may include seafarers donning adequate Personal Protective Equipment (PPE) or meticulously complying with SMS procedures by filling in forms and checklists prescribed by the management. It may also include seafarers successfully playing their parts by simply being the recipients of new OHS information and decisions that are already taken by the management. Such a symbolic involvement may be located in examples where seafarers' participation is only limited to their presence in a safety meeting or their attendance in safety training programme.

A different level of participation might involve seafarers being consulted and contributing to management decisions on the practice of OHS. Such consultation may include genuine discussion between seafarers and management with regard to risk assessment where seafarers can share their concerns with the managers (Walters and Frick, 2000).

welfare and compliance to navigational rules. The industry, for regulatory compliance as well as commercial purposes, considers PSC-generated data, which is available in the public domain, as a valuable indicator for measuring the OHS performance of individual ships, and their owning, managing and/or operating company.

In the shipping industry this research demonstrated that seafarers' participation remains a highly variable element in the management of OHS. Although there seems to be a universal approval of seafarers' participation, there also seems to be a lack of true comprehension with regards to its potential and scope. Among managers alone there seems to be a wide variation in interpretation. While some managers remain oblivious to the potential for seafarers to play a role beyond their specific compliance with SMS, others see seafarers' participation in the running of SMS as an important step towards the improvement of shipboard OHS.

One shore-based manager, for example, remarked:

> *The sea-staff don't understand much, they are naive and as a result they should be told what to do – every step of it. I am happy with my crew as they are following our procedures and they are doing as per our requirements. In fact, our procedures are so good and so detailed that no one needs to butt in. And, of course, they send in their reports and pass the inspections. To run a ship safely you cannot ask for too much democracy... Democracy sometimes has the danger to lead to anarchy.*
> Quote: 1 (Ref: A-0-D)

On the other hand, one of his colleagues having similar responsibility had a completely different understanding of the benefits of participation. He was not content with the fact that some seafarers behaved passively within the system. The second manager thus said:

> *Some of the Masters and Senior Officers are very good, we learn a lot from them. I like to receive interesting suggestions and improvement notes. I hate when some of them write 'no comments' (in the Review) – it shows that we have failed somewhere... I would say that the downside of this company is the Ratings... the system fails there. If there is one weakest link in the whole system it's the Ratings, we get minimal participation from them. All they say is 'yes sir' and 'thank you sir'.*
> Quote: 2 (Ref: B-0-A)

Research shows that this second interpretation of employee participation (or certain variations of this interpretation) has the greatest potential to promote OHS in all types of workplace. By following such values employees and management jointly become responsible

for a common goal of a safer and healthier workplace. Such teamwork necessitates that management not only determine policies and procedures and provide channels for communication, but also decentralise decision-making on OHS matters in such a manner that employees' needs and concerns are incorporated in the running of the system (Walters, 2004; Harrisson and Legendre, 2003).

The following section focuses on a range of concerns that seafarers have with regard to participation and in particular when attempting to operate at this higher level of participation.

Obstacles to Seafarers' Participation

The research highlighted a number of barriers to seafarers' participation in OHS management at sea. Three major concerns: *Job Insecurity*, *Fear of Accountability* and *Shipboard Hierarchy* are discussed below.

Job Insecurity

The most common theme identified when analysing seafarers' interviews was of the fear of job loss. Seafarers were concerned about job security as a result of the temporary and short-term nature of their employment. Ratings[3] and Junior Officers[4] were aware of the large pool of seafarers available from certain labour supplying countries and felt especially threatened that their jobs would be taken up by their compatriots who were waiting "in the wings" to be employed. Captains and other Senior Officers[5], on the other hand, were concerned about changes in company employment programmes. Generally, this group of seafarers feared that, as a result of cost-cutting strategies, they would be replaced by seafarers from other nations drawing comparatively lower wages (Alderton et al., 2004).

[3] Ratings: Seafarers who carry out more menial types of task and have limited independent responsibility. Generally they comprise the Bosun, all deck hands, such as Able Bodied Seaman (AB), Ordinary Seaman (OS), all Engine hands, such as the Fitter and Motorman, as well as Saloon staff, such as the Cook and the Messman.
[4] Junior Officers: Seafarers who have certain independent responsibilities, such as watch keeping. They generally are 2nd Officer, 3rd Officer, 3rd Engineer, 4th Engineer and Electrical Officer.
[5] Senior Officers: The group of seafarers who have the greatest responsibility in terms of the onboard management of the ships. They generally are the Captain, Chief Officer, Chief Engineer and 2nd Engineer.

Against the backdrop of job insecurity the implementation of a performance appraisal system became highly sensitive and undermined the willingness of ratings, in particular, to actively participate in the SMS. In both companies crew were appraised by seniors or the captain at regular intervals and reports were forwarded to crewing offices located in seafarers' home countries. As these ratings were employed on short-term and temporary contracts, their future re-employment heavily relied on appraisal reports making them acutely aware of the importance of maintaining a 'clean record' in their reports. In the course of the research it became apparent that the ratings feared that senior officers might use the appraisal system as a tool to report not only work performance but also behaviour, which, in their understanding, depended on how respectful they were towards the captain or senior officers. This deterred ratings from participating freely in the SMS or from engaging in a meaningful discussion with the senior officers or captains, particularly if such discussions had the potential to be construed as arguments or dissent.

For example one AB pointed out why he felt that engaging in a discussion with the captain might affect his re-employment chances. He said:

> *I don't talk during lifeboat drills, may be it becoming argument.*
> Q. *So why is it not right to argue?*
> *Some captain don't like argument, may be not good for report, may be (he will put) bad remark in confidential appraisal...*
>
> *Q. So what happens if you get one bad appraisal?*
> *Very difficult to get new job... There are a lot of people waiting for AB job... Before changing company one manager (of new company) talking to other manager (of previous company) on the phone asking details ... 'What about this man, how was he on your ship, did he make any trouble?' So, very important for me to get good report.*
> Quote: 3 (Ref: A-2-D)

Some senior officers, fearful of losing jobs to other nationalities, were similarly reticent. The declining number of compatriots onboard along with a steady influx of officers from comparatively new seafarer supply nations was a constant source of anxiety for them. This impacted upon senior officers' willingness to make suggestions relating to shipboard

operations or to put forward any creative or confident proposals. Thus their interaction with management was noticeably muted. For example, one captain told me:

> *Q. Can you ask for more hands?*
> *Can we ask the management? No we can't. If I make hullabaloo may be tomorrow I will be replaced by two or three (cheap) masters, so I should rather keep quiet (he laughed).*
> Quote: 4 (Ref: B-2-A)

Another Chief Engineer articulated the same worry slightly differently. On asking him about his fears to retain employment, he said:

> *Yes, it's a worry for all of us. We are constantly worried as we keep seeing more and more Chief Engineers (from another nation) taking over. They will call it redundancy, although we have been promised that they (the management) would not kick us out or replace us with (other nationalities), but who knows...*
>
> *Q. But aren't you employed on a permanent basis?*
> *On paper we are permanent employees but every time we go home we become temporary again... They (the management) are the boss and we have to abide by their moves. But yes with regard to the first question, I guess I am always worried and thus psychologically it matters... I don't feel the urge in making an Improvement Note[6]. It's pointless you know – now the time has come for me to be safe and stay quietly and of course not draw any attention by having an accident or something.*
> Quote: 5 (Ref: B-1-E)

Fear of Accountability

Reporting near misses and different types of incident to the management can only be achieved through the active participation of seafarers and is considered a key element of OHS management. Procedures for these types of reporting are clearly identified in the ISM

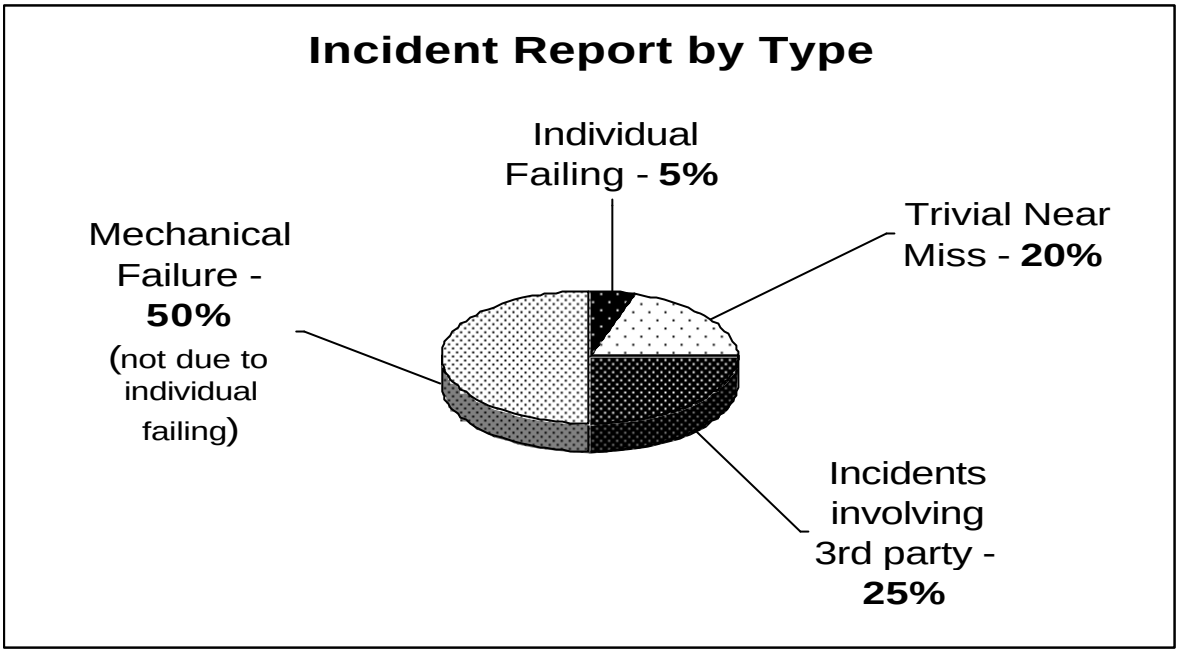
[6] Improvement Note: It is a mechanism used in the two companies for employees including the seafarers to comment on or suggest changes to the SMS as a means for continuous improvement to the SMS.

Code and feature in the SMS of the two companies. However, the research showed that, in practice, the seafarers were reluctant to use these systems because of the additional paperwork involved and importantly because they were concerned about the possible consequences of complying with such procedures. They feared that such reporting could damage their own and/or their colleagues' reputations in the company.

One of the two companies encouraged an anonymous incident reporting system, but the report form required so much detailed information that the identity of the seafarers involved could barely be obscured. Given the limited number of officers and ratings on board, such identification was even more straightforward. This prompted seafarers to report only serious incidents, such as personal injury, requiring considerable medical assistance, obvious mechanical or structural damage and incidents involving third-parties (e.g. cargo receivers and port personnel). Alongside these, there were a considerable number of reports of near-miss cases that were conspicuously trivial. These included instances of an OS not wearing a hard hat on deck, a Chief Cook who twisted his ankle in the galley and a Fitter observed wearing an inappropriate pair of gloves during gas-cutting. Although these types of reporting are indeed important, it appeared that a substantial number of cases of intermediate seriousness were omitted as a result of reporting practice. After checking the records in the incident reporting file on one ship I wrote in my field notes:

> *In the last five years this ship reported forty incidents... what interests me is the content of the reports. Almost 50% of the cases were mechanical failure (such as main engine breakdown and not due to individual failing) while 25% of the cases consisted of a serious personal injury (such as one that required hospitalisation), ship's structural damage (on contacting the jetty) and all such events involving third parties (including oil pollutions in port while loading, which were reported to authorities)... Almost all of the remaining cases reported uncomplicated near-miss incidents (such as not wearing proper Personal Protective Equipment (PPE))... There were only two cases that showed operational misjudgements or individual failings (close quarter in a Traffic Separation Scheme).*
>
> Quote: 6 (Ref: B-1-C)

Figure 2: Nature of incident reports on one research ship over a 5 year period



From the interviews with seafarers who served on the same ship for a considerable period of time over the last five years, it was apparent that significant errors which did not result in a major incident, such as minor oil pollution due to spray through PV valve[7], ship dragging anchor as a result of using insufficient scope of chain, and experiencing minor irritation after handling chemicals without wearing appropriate gloves, did occur, but from the Incident Report File on the ship they appeared to be absent. It seemed that these 'intermediate' cases were regarded as having the potential to 'get people into trouble'. There seemed to be a concern that reporting such incidents would allow for the identification of the people involved and that the reports of such incidents might be interpreted by management as a lack of professional ability. This impression was further substantiated during an interview with one captain who explained to me why he did not report an obvious case of a near miss incident to the management. He said:

> *I did not report, I was furious with the engineers. But you see I did not report (to the management).*

[7] (PV) Pressure Vacuum valve: It is a safety device commonly found in tankers which allows excess pressure from the cargo tanks to be released and also air to be drawn in when excess vacuum develops inside the cargo tanks.

Q. Why?

I think it's mostly because by making such report I will end up talking about a colleague of mine... the 2nd (engineer) probably will get a bad name in the office or may even lose job

Quote: 7 (Ref: A-2-F)

Seafarers' fear of being identified through reporting was further aggravated by the possible consequences of the analysis of incident reports. From the research it was apparent that they remained in doubt regarding the apportioning of blame for each of the reported incidents. Despite a number of campaigns, such as encouraging anonymous reporting systems and advocating a no-blame culture, it seemed that in practice the apportioning of blame was not entirely eradicated. As a result, seafarers were sceptical about initiating any such reporting. They feared spoiling their own as well as their colleagues' reputation within the company. They also did not want to risk getting into legal complications as they feared criminalisation. For example, one engineer explained why he would rather avoid reporting. He said:

There is always a tendency to find out who is guilty and that is always there with this office. On this ship I had a problem, I had a near accident and near death but this was not my fault. But they (management) are asking for the guilty person, they ask for many explanations. If I have an accident they keep asking why this, why that, why like that. I find there is a tendency to find who is guilty through this accident reports. There is neither any comforting e-mail nor any room in the incident report for entering the circumstances of the work. In their report they are only blaming us and gunning for our heads for our faults in relation to their 'lovely' management procedures... given a chance I wouldn't report the next time.

Quote: 8 (Ref: B-2-C)

Shipboard Hierarchy

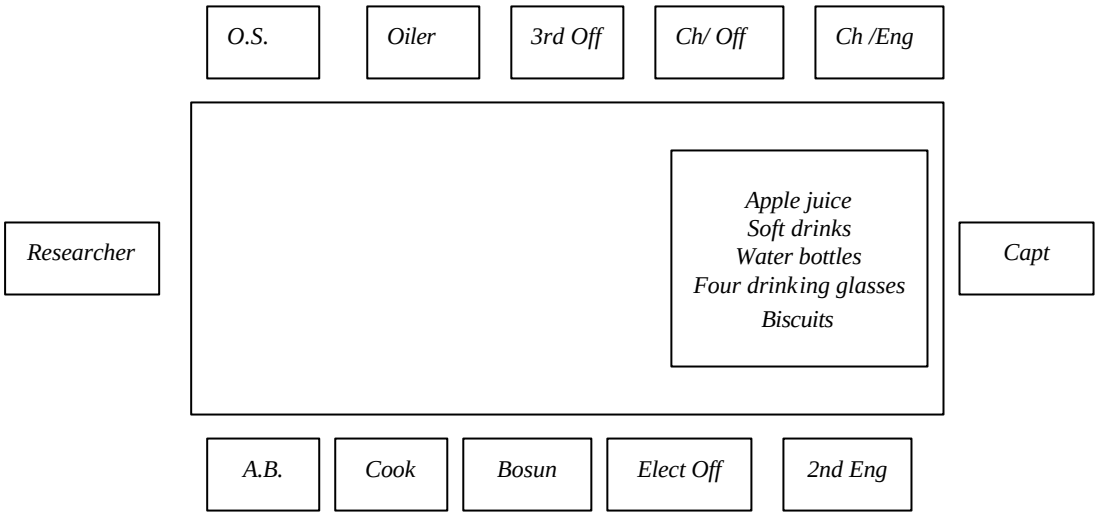
During the shipboard research a sense of a formal and regimented atmosphere surfaced on a number of occasions and was tangible during interviews as well as observations. It was shaped by a rigid hierarchical structure where a command and control model of operation prevailed over a teamwork-based working environment. The level of crew eagerness to

participate in OHS matters was visibly inadequate, not because of any procedural lapses but because the atmosphere for eliciting meaningful communication was absent.

Meetings and other occasions involving seafarers from across the shipboard hierarchy took a very formal route where management's decisions as well as the captain's and senior officer's interpretations of such decisions were merely distributed to the remainder of the crew. The communication seemed unidirectional leaving very little room for any forum type of discussion. Although these meetings may also be construed as one level of participation, the outcome of such meetings did not contribute to any decision-making or provide any input into the running of the OHS management system. On one ship, for example, I recorded the following seating arrangement during a safety meeting in my diary:

> *The seating arrangement during the meeting was as per the hierarchy on the ship (see the sketch). The Captain and the Senior Officers sat at one end with the Captain at the head of the table. Towards the middle of the table sat the Junior Officers and Senior Ratings, like the Cook and the Bosun leaving the most junior crew members, such as the OS to sit at the far end. There were insufficient chairs in the room to accommodate all 12 of us, so the crew had to get their own chairs from the adjacent smoking room and the cargo control room. Other than the Captain, who had the last month's safety meeting minutes and the 3rd Officer, who had a diary, no other crew members carried even any pen, pencil, paper or notebook. Refreshments were organised by the Cook before the meeting started and were provided only for the Captain and the Senior Officers.*

Figure 3: Safety meeting seating arrangement



> *The safety committee meeting was a formal occasion, which was convened in the ship's office. It was chaired by the Captain, who controlled the entire proceedings under the strict rules of 'speak when spoken to'. At the start of the meeting the Captain asked the 3rd Officer to note down the minutes. The meeting lasted for15 minutes, out of which the Captain spoke for over 13 minutes. While the Chief Officer and the Chief Engineer contributed for a minute or two, the others, particularly the Ratings, did not speak at all.*
>
> Quote: 9 (Ref: A-1-C)

Examples of this hierarchical atmosphere were not just exhibited in meetings and drills but also in everyday activities. The control of the health and safety of the workplace appeared to be firmly in the hands of very few senior officers. Even in cases when ratings carried out actual hands-on tasks it appeared that they did not openly express any concerns about safety for fear of breaching the shipboard hierarchical order. Although this lack of openness did not necessarily mean that seafarers were any less safe, it did restrict the opportunity for a wider participation from ratings who could have usefully shared their concerns backed up with their knowledge and experience of risk posed in the workplace. This was exemplified in the following interview with an AB regarding entry into an enclosed space[8]:

[8] Enclosed Space is a potentially oxygen-deficient compartment which is not entered regularly and the one which does not have a fixed means of suitable ventilation. On board ships it typically includes water ballast tanks, cargo tanks, void spaces, cofferdams etc.

> *I can't check meter (oxygen analyser)... if you follow the Chief Mate (Officer) you are OK. If chief mate say its OK then how can you argue... it is his responsibility to our safety. Mostly chief mate is the one who is doing it, but sometime he also send the cadet. If cadet is checking we can then going checking with him.*
>
> *Q. So can you check the oxygen reading if you are not sure, can you request the chief mate?*
> *No, because (on this ship) only the Chief is the one who is checking the meter. But if we smell gas we can go up (from the cargo tank) and then tell chief. I don't know if I can check, sometime he (Chief Officer) may agree, depend on the man, but I will not ask this chief, may be he get annoyed with me.*
> Quote: 10 (Ref: A-2-E)

However, the research also demonstrated that despite being in a hierarchical environment some individuals were able to make a significant difference in eliciting wider participation through their own efforts. Some senior officers were not prepared to accept ratings' silence and skilfully devised innovative ways to encourage them to speak up. These officers appeared to be sensitive to the range of reasons underpinning the lack of communication, were innovative in their ways to motivate their juniors, and created an approachable atmosphere that brought them comparative success. Not surprisingly, they were also the officers who were most popular on the ships. One Chief Officer, for example, said:

> *You need to know what works for them and what does not work for them. Sometimes it is better to play karaoke with them than trying safety meeting... well, that is only if you are that type. Otherwise you may set up 25 safety meetings and I wish you luck.*
> Quote: 11 (Ref: B-2-B)

These Senior Officers developed their own ways of encouraging other officers and Ratings to share opinions and ideas. In another example, on another ship, I noted how the 2nd Engineer successfully intervened through an informal discussion. My field notes taken onboard read:

> *During this morning's coffee break at 10 o'clock I saw the 2nd Engineer coming to the crew smoke room to talk to the deck and the engine room crew before the work on the*

> *hydraulic motor of the crane began. He made it a point to chat with them about the work schedule, safety precautions as well as the time scale of the work. He spent 20 minutes with the crew drinking coffee and clarifying a number of issues raised by them. The Fitter, Bosun and the OS raised a lot of questions, including the sequence of dismantling and reconnecting the hydraulic pipes and wearing PPE. Interestingly, the 'permit-to-work' checklist for this job was (already) filled in and signed by the Chief Officer and the Captain at quarter-to-eight this morning. I felt that these 20 minutes in the smoke room were much more valuable than the company's 'permit to work' form filled in earlier in the day... In this occasion the formal checklist seemed to have served the official purpose whereas the initiative taken by the 2nd Engineer proved to be effective for the OHS of the seafarers.*
>
> Quote: 12 (Ref: A-1-C)

Such informal procedures clearly ran in parallel with the more formalised and bureaucratic procedures embodied in the SMS. At the very least they complemented the SMS-based procedures but at times they also stood alone in contributing to the real work of day-to-day safety. In other words, these extra efforts from the senior officers yielded tangible and significant benefits to the management of the SMS which, at many times, were not achieved by literal application of the SMS based policies and procedures.

Summary and Conclusion

The research findings suggest that the extent and quality of seafarers' participation in the safety management system on board was affected by three main factors. These were: Nature of Employment, Fear of Accountability, and issues related to Shipboard Hierarchy.

With increasing globalisation across the shipping sector, and associated changes in the terms and conditions of labour, seafarers face changing employment patterns, such as the increased use of short- term, temporary, contracts. The research found that this type of employment contract promotes an unorganised and vulnerable labour force. The globalised nature of the industry also allows employers to choose and switch nationalities of seafarers with relative ease (Kahveci and Nichols, 2006). As a result, it generates fear in the minds of seafarers, and

in particular senior officers, about losing jobs to other nationals. Such labour market conditions cause seafarers to feel disempowered. Consequently, they hold back from actively volunteering their opinions, ideas and observations in relation to OHS issues for fear of losing their jobs. This feeling was very bluntly expressed by an OS:

> *First we need job and then we think safety... but if no job then where is safety?*
> Quote: 13 (Ref: A-1-F)

The research also shows that a vast majority of seafarers remain apprehensive about complying with SMS feedback mechanisms. Before reporting incidents to management they worry about the consequences in terms of their own accountability. Furthermore, they are aware that any written communication and especially written incident reports invariably go on record, which is bound to make it easier for the administrative or legal authorities to "point a finger at them" (Jeffcoat et al., 2006). With the increase in seafarers' criminalisation such fear runs very deep in their minds. As a result of all these pressures seafarers engage in selective reporting, leaving a substantial number of important incidents undiscussed when they might otherwise have made a positive contribution to the management of the company's OHS.

The research further demonstrates that a rigid onboard hierarchical setup merely limits seafarers' input to the management of onboard OHS and facilitates seafarers' adherence to OHS-related procedures and decisions that are taken by management. Such a setup fosters a lower level of participation and fails to promote the philosophy of involving seafarers in the decision-making process of OHS management. For a higher level participation to succeed, seafarers require a favourable and non-threatening atmosphere in which they may exchange ideas and experiences without fear of being reprimanded. However, the research also shows that the hierarchical setup varies from ship to ship and largely depends on senior officers who may resort to different and more informal means to enable the ratings to share their work experience and voice their concerns more freely.

Recommendations

From the data presented in this paper serious concerns emerge with respect to both the extent and quality of seafarers' participation in the management of their own OHS. Although it is true that seafarers themselves can deal with some of the issues that influence their participation, a substantial share of the responsibility lies in the hands of management. If ship-operators wish to utilise their SMS genuinely to improve safety, as opposed to simply operating a system as a bureaucratic exercise, then the extent and quality of seafarers' participation needs to be pondered. The very concept of OHS management is associated with giving employees legitimate and systematic opportunities to address their own health and safety concerns as well as taking the responsibility which underpins the philosophy of self-regulation. Although it is imperative that management addresses each of the concerns raised in this paper, there is a deeper issue that we must attend to first.

This deeper issue concerns the fact that seafarers' *participation* in SMS continues to remain a contested concept. While some expect seafarers to be creative and forthcoming and to do more than just follow management-led procedures, others remain contented as long as seafarers follow the prescribed SMS onboard and adhere to new OHS information and decisions that are already taken by management.

The evident need, therefore, is to bring about a common understanding of the term *seafarers' participation*, within the industry, and ship-operators in particular, who hold the prime responsibility for the development, maintenance and continuous improvements of the SMS. It is proposed that operators involved in the running of SMS undergo training that addresses the underlying principles of self-regulated OHS management system of which seafarers' participation is one of the key components. Particular concerns identified in this paper, i.e. employment patterns, alienation of the workforce, seafarers' fear of accountability and shipboard hierarchical problems, may be easier to deal with once this deeper issue is addressed first.

Further research is essential in order to understand this important subject within an industry which continues to be widely recognised as having one of the most dangerous workplaces.

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