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‘Walking the Talk’: How Companies Succeed in Managing Risk at Sea

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Abstract

This paper draws upon research about risk and risk management conducted with the support of The Lloyd’s Register Educational Trust¹. The wider research was large in scale comprising the analysis of over 2,300 questionnaires and a range of data relating to maritime incidents. In addition the study incorporated a detailed analysis of five case study companies. It is this latter element of the research which forms the basis for this paper which considers the differences in perceptions between shore-based, and ship-based, staff working for ship operators in relation to risk management.

The paper explores the means of communication utilised for the transmission of data and ideas about safety and risk management both to, and from, management. It then goes on to consider why it is that despite considerable efforts to write and to talk about safety and risk management, many companies are unsuccessful in encouraging their sea-staff to believe that safety is a genuine company priority and therefore to adhere closely to company policy in relation to safety management.

Background

This paper reports on research carried out as part of a programme of work conducted under the auspices of The Lloyd’s Register Educational Trust Research Unit at the Seafarers International Research Centre (SIRC) on perceptions of risk in the maritime sector. Earlier work has established that there are significant differences between the perceptions of risk held by managers² and those of lower ranks on-board vessels. These and other variations in risk perception have been outlined in prior publications by this team of authors (see Bailey et al 2006, Bailey et al 2007, Bailey et al 2010). On this occasion we consider the differences in risk perception across organisations in further detail to try to produce a more nuanced understanding of how the intentions of senior management to communicate particular messages about risk, and risk management, across their organisations may become diluted and distorted as a result of other concurrent actions and inactions.

¹ On March 2013 The Lloyd’s Register Educational Trust was assimilated into the Lloyd’s Register Foundation. For further information please visit their website www.lrfoundation.org.uk.

² In comparing the perceptions of different staff across organisations with the reported data on ship level incidents and personal injuries (largely gathered from maritime administrations) we found that the perceptions of senior managers were most closely aligned with the reported incident frequencies.

Method

The paper draws upon data collected in five organisations using a case study approach that incorporated interviews with shore-side personnel and interviews and observation on-board company vessels. The case studies focussed on two large companies and three medium/small companies engaged in different maritime trades (two tanker, two container, one bulk). Interviews were conducted with personnel at all levels of the organisations ranging from company Vice President in some cases, to Ordinary Seaman (OS). As is our normal practice, the material collected in the course of the study has been anonymised to protect participant confidentiality and thus pseudonyms are used for companies throughout the text.

The two largest case study companies were '*Boxline*' (primarily containers) and '*Vizla*' (primarily carrying oil and oil products). We also included two medium/small companies (*Roberts* and *Wyvern*). *Roberts* was a privately owned company which specialised in the operation of smaller coastal tankers while *Wyvern* operated small container and specialist cargo vessels. Our final case study company was a small part of a larger land-based organisation. The small shipping side of this larger company specialised in operating vessels associated with aggregates. We gave this company the pseudonym of '*Hardacre*'.

The management of safety

The case study companies varied in their approach to public declarations of safety and the approach they took in delivering safety messages to their employees. *Boxline* and *Vizla*, the largest companies, had very clearly announced and publicised corporate messages about safety which they attempted to convey to both the outside world (crucially their customers) and their employees. Thus managers at *Boxline* referenced what they termed the 'paramount clause' which they described as a clause determining that 'safety comes first', and at *Vizla* similarly unambiguous messages about safety appeared in company literature and at briefings and seminars. *Vizla* also insured that safety occupied a large part of each Board Meeting agenda and it appeared as the first item of the agenda for daily management meetings ashore. These steps ensured that that safety was embedded in company formalities in a transparent manner which was intended to openly convey company priorities.

In both of these larger companies there were dedicated teams of staff dealing with occupational health and safety as at least one of two priorities (the other being environmental

protection). Both companies also had incident reporting schemes in operation and these supported efforts to convey information to their sea-staff relating to new hazards and hazards encountered elsewhere across the fleet. In both case studies there were sophisticated safety management systems in place supported by considerable documentation.

The three smaller companies had smaller management teams ashore and as a result they did not operate with dedicated health and safety sections although *Roberts* did have a nominated Fleet Safety Officer who reported to a monthly Fleet-Safety Sub-Committee. In addition three-monthly company safety meetings were convened at *Roberts* that were attended by the personnel manager, the fleet safety officer, the technical department, the company secretary and the Managing Director. At *Wyvern* and *Hardacre* the Designated Person Ashore (at *Hardacre* described as ‘the only nautical person here’) reported on safety to the company Board – annually in the case of *Hardacre*, and quarterly at *Wyvern*. At *Wyvern* the DPA suggested that he also had the option of walking ‘into the chairman’s office at any time and deal with things on that level’.

In line with international regulations all three smaller companies (*Roberts*, *Wyvern* and *Hardacre*) operated safety management systems, and these incorporated a requirement for safety committee meetings to be held on-board and the reporting/recording of all injuries and fatalities. All three companies supported efforts to reduce injuries and ship level incidents by circulating information to sea-staff about incidents occurring across the fleet.

Communicating about safety

Case study companies chose to communicate the corporate safety message in a variety of ways. On boarding a tanker the first safety message to be broadcast to a seafarer or client might be painted in large letters on a prominent part of the ship. It would probably read ‘no smoking’. Similarly a seafarer controlling access to a vessel might verbally communicate one company safety message by asking if a visitor was carrying any matches. The visitor might then be instructed that smoking was only permitted inside the accommodation spaces. In a similar vein, inside the vessels companies chose to display posters about safety hazards aimed at changing seafarer behaviour. However, although some of these could be ‘hard hitting’ they were not regarded by seafarers as carrying a particularly strong message because of the number of them that they were exposed to and because daily exposure tended to make posters

blend in with the scenery, eventually passing un-noticed by their target audience. Thus one seafarer explained:

You're inundated with posters and stuff like that, and quite often people just switch off to it all you know. (Chief Engineer, *Hardacre*)

Drills also provided an opportunity for safety practices to be inculcated into seafarers but these were sometimes missed opportunities as increasingly sea-staff reported combining several drills into one and implied that the requirement to 'tick drills off' served to undermine the seriousness with which they were treated given the time and commercial pressures under which vessels were operating.

Perhaps the greatest opportunity to communicate from shore to ship and from ship to shore about safety was provided by the monthly safety committee meetings held on-board all of the vessels included in the research. Bulletins and briefings were often sent by shore-side management to the fleet sea-staff to be communicated and discussed at the next safety committee meeting. Sometimes such information was also sent to seafarers individually by email. Such briefings and newsletters tended to focus on fleet-wide trends in terms of health and safety events and would often include examples of incidents that had recently occurred aboard a company ship. They would focus on the lessons to be learned from such incidents and how they could be avoided in future. Seafarers tended to appreciate this kind of information and when it was discussed in safety committee meetings it exemplified successful dissemination of 'top down' messages from shore-side management to operational staff on-board. However, safety committee meetings were less effective than they could have been in relation to improving safety on-board vessels for two different reasons.

Firstly safety committee meetings depend on the participation of employees, in this case seafarers, in order to function fully (Walters and Nichols, 2007, Bhattacharya 2009). The contribution and participation of seafarers is vital if safety committee meetings are to impact on safety on-board in any meaningful way. Seafarers need to be prepared to raise safety concerns at meetings and the more junior seafarers on-board need to feel confident that they can raise issues with senior officers without prejudice. In three of the case study companies such participation was noted by seafarers to be lacking. Fear prevented many seafarers from speaking up at safety committee meetings. In general seafarers were fearful of a poor appraisal by senior officers, of creating 'trouble' on-board, and of losing jobs. In this context

they chose to keep quiet at meetings rather than to risk their future careers at sea. As one AB explained:

They are officers, I cannot stop them what they do ... I never make complaint... I feel if I make a point maybe they make a report ... they can reverse everything... I want to work sea for my family. (AB, *Boxline*)

In this respect closed appraisal systems which do not provide seafarers with a 'right to reply' are not particularly helpful. They are evidently effective in maintaining discipline on-board given that seafarers on temporary contracts set great store by getting a decent appraisal so that they will be employed again. In this context seafarers are respectful to their supervisors and are quick to follow instructions resulting in superficially harmonious relations on-board. However, the other side of this coin is that seafarers are afraid to raise safety concerns or to challenge unsafe behaviour on-board. In this context preventable incidents are highly likely to occur no matter how hard a company attempts to 'educate' its seafarers about hazards or about contributing to safety management on-board. In such cases, a company's own human resource management practices serve to undermine its efforts in promoting safe operations.

Fear of racism also served to undermine the confidence of seafarers in terms of taking part in safety committee meetings. On one ship, junior ranking seafarers explained that unmasking unsafe practice at a safety committee meeting might not be appreciated by supervisors who might feel that they had been demonstrated to be at fault. If any arising resentment resulted in the subsequent poor treatment of the seafarers who had raised concerns, seafarers feared that they would receive no support from Captains and Chief Engineers because they were of different nationality to them and because Captains and Chief Engineers were of the same nationality as the supervisors. Ratings suggested that white officers would band together and protect 'their own' in the event of disputes between whites and non-whites on-board. Thus one rating suggested that in such circumstances he believed that:

The captain would not listen to us because they are the white colour you know. (AB, *Boxline*)

Finally, companies that did not act on ship-shore communication about safety concerns in an appropriate manner conveyed powerful messages to their sea-staff about their 'real' commitment to safety. Where shore-side managers failed to respond to seafarer concerns they were quickly understood to be 'not really' concerned with safety and their safety rhetoric was rapidly dismissed by sea-staff who put simply saw actions as speaking rather more loudly

than words. At *Vizla* for example a huge effort was put into communicating a safe operations message to sea-staff and to the ‘world’. There was also said to be an elaborate procedure ashore for managing the safety concerns which emerged from safety committee meetings. However, when the management at *Vizla* ignored requests that had emerged from safety committee meetings for helmets and radios for smoke divers, and similarly ignored suggestions for engineers to be involved in mooring operations, as mooring teams were short-handed, this was understood by seafarers to reveal where they ‘really’ stood on safety. Seafarers considered that a lack of genuine commitment to safety was exposed by such high-handedness and they also felt that it rendered the safety committee meetings, and their input into them, fairly meaningless.

At *Wyvern* seafarers also believed that the company response to matters brought up at safety committee meetings indicated that the company was more concerned about cost than safety. They cited a situation which clearly held considerable symbolic power for them. In this case a crack had been found by seafarers in the deck of a vessel. The matter had been raised at a safety committee meeting on-board and this had then been referred to shore-side management. However, no action had been taken until such time as the crack had expanded considerably, becoming readily visible, following heavy weather. Such decisions to try to put off necessary repairs and maintenance undermined the confidence of seafarers in company commitment to safety and in the safety committee process.

Conversely, in the one case study company where seafarers did believe that the company was genuinely committed to safety it seemed the company response to communication from the ship to the shore side management following safety committee meetings contributed to this positive perception. Seafarers reported that shore-side management at *Roberts* provided a rapid and effective response to matters arising from the safety committee. As one chief engineer described:

I’ve never seen anything that’s brought up genuinely that the company have not responded to, [*Roberts*] as a company, I couldn’t name you an instance of that, any things that have come up they’ve addressed them and done something about it. You know in a fairly smart manner. (Chief Engineer, *Roberts*)

Thus a poor response from the shore-side management team to matters raised on-board through the safety meetings could serve to seriously undermine seafarers’ perceptions of the company commitment to safety leading to a belief that safety rhetoric and paper-based safety

management systems were just there for show and to ‘cover their (i.e. management’s) backs’. More positively, however, a rapid and effective response to safety matters brought up in the course of on-board safety committee meetings could support both the effective operation of the safety committee which was consequently seen as useful and worthwhile and the perception that the company really meant what it said about safety and about risk management. Such perceptions led seafarers to be more confident about following the procedures laid down in safety management systems and strengthened their confidence in resisting pressures (commercial or otherwise) to be involved in unsafe operations.

Getting the company message?

Fatigue and bad weather were the two factors routinely described by seafarers as increasing levels of risk on-board. In exploring fatigue, we were able to shed light on the extent to which the safety messages promulgated by companies were implemented in the daily operation of vessels.

Of the five companies it was the privately owned company, *Roberts*, which was the most successful in convincing seafarers that it meant what it said, and what it put on paper, in relation to safety more generally and to fatigue specifically. This was in some ways paradoxical as *Roberts* was one of two case study companies operating with small crews and consequently making use of six-on, six-off, navigational watchkeeping systems. Such watchkeeping systems are generally regarded as less safe than systems making use of three watchkeepers, each serving on duty as officer on the watch for two four-hour stretches in each twenty-four hour period. Six-on six-off watchkeeping patterns have been seen to have contributed to ‘accidents’ at sea (see for example the cases of the *MV Lerrix* MAIB 2006 and the *Jambo* MAIB 2003) and seafarers were also clear that under this system it was impossible to get six hours of rest in an ‘off’ period as a result of other demands and disruptions such as meal requirements, drills and alarms. To some extent, fatigue was a taken for granted part of the job, as a result, but in *Roberts* it was evident that not only did seafarers believe that the company meant it when they instructed Captains to go to anchor rather than to sail with an exhausted crew but they also felt confident enough of this to act on the instruction on a fairly regular basis. A shore-based manager explained that:

The hours of work regulations are obviously statutory and they are managed by the master on-board and it is in our quality system, it states that if people are going to be working excessive hours then he is within his rights to stop the ship, drop the anchor and allow everybody to catch up on their sleep until he's happy that everyone is well rested and able to go on with their duties, and this does happen, it's a busy industry and the master is fully supported, he phones up and says 'look you know we've been tank cleaning all night and we're due in port tomorrow but we need a rest'. 'Yes that's not a problem'. (Manager, *Roberts*)

Crucially his account was supported by accounts from serving seafarers. When asked about stopping his vessel to allow seafarers to rest one Captain, for example, told us that:

No, [I have] no problem at all, I call them up, before stopping and I tell them and they say 'yeah no problem'. No pressure at all. (Captain 1, *Roberts*)

This contrasted markedly with the attitude at *Wyvern* which operated the same shift system. Here we were told:

[...] now the company will say "Captain, if your crew are fatigued, stop the ship." But they're only saying that, they don't really mean it." (Captain, *Wyvern*)

In general *Vizla*, and *Boxline*, could be seen as at least partially successful in getting the safety message developed at Board level across to seafarers on-board their vessels. However, despite the extensive efforts made by the larger companies *Vizla* and *Boxline* it became evident that seafarers did not entirely 'buy into' the company rhetoric about safety. In both cases seafarers believed that the companies were more committed to the appearance of safe conduct than to the prioritisation of safety per se.

Fatigue was identified by seafarers at *Vizla* as a major safety-related concern that was brushed under the carpet by shore-side management despite the fact that seafarers frequently attempted to raise the issue at company seminars and similar events. This clearly served to undermine the efforts made by *Vizla* to communicate the overall prioritisation of safety. At *Vizla* the company attitude to fatigue, as expressed by the Vice President, was that fatigue was a matter for personal leadership and management on-board. The implication of this approach was that any fatigue was a result of failings in on-board leadership and management. This immediately conveyed a notion that the subjects of increasing crewing levels, and the disruption of schedules as a consequence of vessels going to anchor to allow watchkeepers to catch up on sleep prior to sailing, were not up for discussion. In our discussions with seafarers it was readily apparent that they had received this message 'loud

and clear'. Seafarers held the belief that for a variety of operational reasons, and given current crewing levels, it was not always possible to adequately manage work and rest hours on-board, something which shore-staff also acknowledged. However, they considered that delaying the departure of a vessel in order to comply with work/rest hour regulations would result in dismissal from the company. In particular one incident was identified by staff in the company as supporting this belief. In the accounts of sea-staff, one Captain was known to have delayed bunkering his vessel for eight hours prior to a loaded voyage because his crew were exhausted. The Captain signed off at the next port and was never seen in the company again. He was widely understood to have been dismissed for his actions and seafarers believed that any similar actions by other captains would almost certainly mean that 'you might as well book your ticket home'.

This general approach by shore-side staff of passing responsibility for the management of sometimes irreconcilable operational and regulatory challenges to sea-staff, and abrogating responsibility for them ashore, served to significantly undermine seafarer belief in the safety message proclaimed by companies. At *Boxline*, sea-staff were less concerned about instant dismissal over fatigue than sea-staff at *Vizla*, but here too when fatigue issues emerged the company criticised sea-staff and their management of fatigue on-board when shore-side decisions for scheduling and crewing were certainly implicated in the problems encountered. Thus we were told of cases where delays resulted from substantial engineering work in port which caused senior engineers to be fatigued. In these kinds of instances, when vessels had proceeded to anchor to alleviate fatigue and comply with rest hour regulations, the engineers had been criticised by managers ashore for failing to appropriately delegate work, the implication being that they could, and should, have managed the work without requiring any delays to the vessel schedules.

It was not only in relation to fatigue that companies were serving to undermine the safety messages they worked so hard to put across. A number of operational decisions were offered as examples of practice that seafarers identified as showing the 'true colours' of management and demonstrating that cost savings were more important to the company than safety.

Seafarers at *Boxline* described several incidents where they believed that safety had been compromised by the company in order to save money. These incidents had sent a very strong message to seafarers across the fleet that ultimately the company was more concerned about the financial 'bottom line' than about safety, despite all the documentation and all the

procedures designed to indicate otherwise. One incident recounted to us at *Boxline* related to a decision made by shore-side managers to allow the watertight integrity of an engine room to be compromised in order to save time preparing for required repair work at the next port. The Captain of the vessel concerned had reservations about this proposal believing that it rendered his vessel temporarily less safe and he reported his concerns to the company. The company response made him aware that not only was his intervention to be overlooked on this occasion but that it was regarded as unwelcome which sent him a very strong signal with regard to the company attitude towards seafarer participation in operational safety. The Captain described how:

I expressed my concerns to it as I thought was my duty of care for the people on-board to report this to the office, and I was told I was being obstructive, rather than just getting something back saying your concerns have been noted. (Captain 1, *Boxline*)

At *Vizla* it appeared that the company did not fall into this trap to the same extent and took great care in communications with senior sea-staff to explain decisions and decision making when such instances occurred³. In this sense it had greater success in engaging seafarers in safety management, something that has long-since been identified as central to effective safety management ashore (Walters and Nichols 2007). However at *Wyvern* and *Hardacre* we also found that seafarers had become cynical about the company commitment to safety as a result of a variety of operational decisions. At *Hardacre* the company message that safety should not be compromised for profit was not entirely believed by seafarers as a result of a variety of recent cost-cutting measures which had been implemented and which were understood to undermine safety. Chief amongst these were decisions relating to crewing. A company decision to replace existing crew members with seafarers from Eastern Europe, who were regarded by colleagues as having poor English language skills, was seen to illustrate that the company was not genuinely committed to safety. As one seafarer put it:

Having [East Europeans] on the ship is cost effective. It saves money and they're not bothered whether they can speak English....and the next meeting they tell you how concerned they are about safety. You think, 'they're just lying, all they're bothered about is money'. (Seafarer *Hardacre*)

³ NB it was less successful at explaining decisions about matters brought up at safety committee meetings as previously outlined.

In a similar vein, a company decision to move from the employment of two second engineers on-board their vessels to a pattern where a single second engineer would be supported by a third engineer to save cost, was also understood to undermine safety. Moreover a number of seemingly trivial opportunities taken by the company to save money (such as refusing to pay for refreshments when seafarers travelled to join or return from a ship) served to demonstrate to seafarers what they believed to be the company's real attitude towards them and their safety and welfare.

Conclusions

In the course of this research a number of key findings emerged. Firstly companies generally appeared to be placing considerable emphasis on the transparent and public conveyance of safety messages. However, it emerged in the course of the case studies that seafarers and shore-side staff readily distinguish between what they regard as 'real' statements of intent with regard to safety and what they regard as empty rhetoric aimed at charterers, clients, and inspectors. In the small family run company included in the case studies there were less personnel devoted to safety management ashore and there was less glossy publicity about safety than was found at the much larger companies - *Vizla* and *Boxline*. However, it was nevertheless at *Roberts* that seafarers most consistently held the view that the company's safety commitment was genuine and could be trusted. Thus the effort and resource put into the promulgation of safety messages did not straightforwardly translate into a belief in company rhetoric on the part of employees.

In the main, top down messages about safety in the form of bulletins and memos relating to real incidents that had occurred in the fleet were appreciated and were influential as far as sea-staff were concerned. Posters and drills appeared to be less effective in relation to their impact on behaviour. Safety committee meetings, which were found to carry considerable potential for influencing safety management, were found to vary in terms of their effectiveness. In terms of safety committee meetings a variety of human resource practices were found to have the potential to negatively impact on participation in safety committee meetings. Chief amongst these was the practice of hiring staff on 'per voyage' fixed term contracts. Such contracts led seafarers to feel very vulnerable in terms of their future careers at sea undermining their capacity to actively participate in safety meetings or to challenge unsafe practices. Closed appraisal systems and, in one case, multinational crewing practices

involving 'white' senior officer and 'non-white' subordinates further contributed to seafarer vulnerability and reinforced their fears about participating in risk management on-board. Safety committee meetings could also be hugely undermined by inadequate shore-side responses to requests for support for safe practice on-board. Such poor response led seafarers to perceive safety committees as a waste of their time and also reinforced their perception of companies as being unconcerned about real safety issues and only concerned to 'be seen' to be bothered about safety.

One of the most compelling findings from the case studies relates to the extent to which seafarers respond to the perceived commitment of their companies to safety and to regulatory compliance more generally. Where seafarers felt a company held a genuine commitment to safety, as in the case of *Roberts* this impacted upon their own readiness to take radical action should safety appear to demand this (such as anchoring a vessel to allow for rest or in bad weather). Where companies were not perceived to be entirely genuine in their safety rhetoric seafarers were far more fearful of such radical action and frequently felt that it could result in their dismissal. In this, the power of stories passed from seafarer to seafarer about things that had happened to personnel in the fleet who had taken actions of this kind were persuasive. Seafarers were also strongly influenced by their company's response to issues relating to safety when these were raised on-board. Where companies were slow to react to these issues or where they made decisions to circumvent safety in favour of cost-savings, seafarers took such actions to be powerful indicators of the company's true position vis a vis safety. Similarly, seafarers appeared to be influenced by their company's more general attitude to their welfare, and where they found this wanting they also failed to believe that the company was genuinely committed to safety and the principles of its own safety management system. Thus seafarers' understanding of the corporate stance vis a vis safety was found to be very holistic. As a result, companies could potentially spend a considerable amount of effort, time, and perhaps money, attempting to consciously convey one message about safety whilst concurrently, and inadvertently, undermining it on a daily basis as a result of the actions and policies of particular personnel and corporate divisions (for example middle managers and human resource managers). There is some indication therefore that where companies feel that seafarers are not 'getting the message' about safety they would be best served by starting with a consideration of the ways in which their shore-side management and operational decision making may be undermining safety rhetoric, before turning further attention to what more can be done at sea.

References

Bailey, N., Ellis, N., Sampson, H. (2010) *'Safety and Perceptions of Risk: A Comparison Between Respondent Perceptions and Recorded Accident Data'*, SIRC Publication, October, ISBN: 1-900174-38-3

Bailey, N., Ellis, N., Sampson, H. (2007) *'Perceptions of Risk in the Maritime Industry: Personal Injury'*, SIRC Publication, October , ISBN: 1-900174-32-4.

Bailey, N., Ellis, N., Sampson, H. (2006) *'Perceptions of Risk in the Maritime Industry: Ship Casualty'*, SIRC: Cardiff University, August, ISBN: 1-900174-29-4.

Bhattacharya, S. (2009) *The Impact of the ISM Code on the Management of Occupational Health and Safety in the Maritime Industry*, Unpublished PhD Thesis, Cardiff University.

Walters, D., Nichols, T. (2007) *Worker Representation and Workplace Health and Safety*. Palgrave MacMillan.