Supply Chain Leverage and Health and Safety Management in Shipping – the Case of the Container Trade

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Abstract

In recent years, discourse on occupational health and safety management has been increasingly concerned with drivers of good practice. In this respect, it is suggested that alongside public regulation, there are various ways in which business relations involved in the supply of goods and services can act as leverage in improving arrangements for health and safety management.

The wider literature on the features of supply chain relations would lead us to anticipate that for buyers to be able to exert an influence on the management practices of their suppliers they first need to see it as in their best interests to do so and second, certain conditions need to prevail, to enable their influence to be effective. Similarly, the wider literature on regulation argues that 'smart regulation' could, under certain circumstances take advantage of influences within these private business relationships to promote regulatory compliance.

We have examined the role of these relations in the maritime industry, as part of a larger study which looked at their influence in situations in which they might be anticipated to occur (such as in the oil tanker trade), and in others in which pre-conditions for their effectiveness were less obvious. In this latter case in the maritime industry, we focused on the container trade and in this presentation we discuss our findings on what happens in a situation in which it is not immediately obvious that the priorities of the business interests involved, or the nature of the supply relationships concerned, would work towards assuring that there were systems in place to promote good practice in health and safety management.

Introduction

Evidence of occupational mortality and morbidity indicates that relative to other occupations seafaring remains among the most dangerous. Although there have been undeniable improvements over time, the health, safety and welfare of seafarers continues to be an issue of concern about what are largely preventable losses.

A greater incidence of occupational injury and ill health in one economic sector relative to others suggests both the presence of high level of risk and also that the system for managing this risk may not working as well as it could. Acknowledgement of the latter usually prompts attention to regulation. History is replete with inquiries that have found fault with regulatory measures and called for their improvement. The maritime industry is no exception in this respect and the International Safety Management Code (ISM) itself was a product of such concern. Its adoption during the 1990s brought the industry into line with many other sectors in which a similar approach to *regulating the process* of managing occupational health and safety (OHS) was already in evidence.

A key issue for all sectors however is not only the nature of regulation but also what drives compliance with regulatory standards. In recent years, the wider discourse on regulatory arrangements to improve occupational health and safety practice and outcomes has increasingly concerned itself with this issue. As a consequence, not only has there been a shift in regulatory policy from prescriptive to process based regulation— such as exemplified by the ISM Code, where arrangements to *manage risks* are emphasised —there has also been a search for alternative approaches to traditional command and control methods to achieve implementation and surveillance of regulatory requirements on occupational health and safety.

While the literature takes many different positions, a common standpoint is that to achieve the desired results, regulation needs to be more 'responsive' (Ayres and Braithewaite, 1992), 'smarter' and to build more on the voluntary engagement of companies in managing health and safety risks. In this respect generally, both in policy and in the (largely) theoretical discourse that helps to inform it, the central understanding of the role of institutions of public regulation has shifted somewhat so that these institutions are no longer seen as pivotal, but more as components among 'many closed self referential sub-systems seeking to use indirect means to achieve broad social goals' (Walters et al, 2011:56). In the light of this, a need is seen for new organisational forms for regulation that are capable of bridging the gap between the state and the market.

In both the policy and academic literature it has been argued that there are various ways in which business relations involved in the supply of goods and services may act as leverage in improving arrangements for health and safety management (see Walters et al, 2011). It is with achievement of such leverage and the wider institutional environment in which it is most effectively situated and supported in the maritime industry that the present paper is mainly concerned. That is, we are concerned to understand the role of supply chain leverage in promoting health and safety management at sea.

The paper draws on interviews and informal discussions, which took place in the course of a research project funded by the Institution of Occupational Safety and Health (IOSH). This wider study also included research on the construction industry and the tanker trade in the shipping industry and was reported in 2012 (Walters et al, 2012). Some of the early findings on the tanker trade were also reported in a paper presented at the last SIRC Symposium. This present paper is based specifically on the analysis of interviews conducted in the shore-based offices of a vessel manager (8) operating a small fleet of container vessels trading between the USA and Europe, and a representative of a shipping association connected with the broader container trade. In addition it utilises a range of interviews (14) and informal discussions which took place aboard one of the container vessels operated by the company.

In the following account, we first briefly explain what we understand by ‘supply chain relations’ and what we already know from research concerning their influence on arrangements for managing health and safety at work. We then examine the nature of these relations in the container trade in shipping and discuss the experiences of ship managers and seafarers in our study, concerning what they regarded as important regulatory influences on their compliance with requirements on the management of health and safety at sea. We situate this discussion in the wider context of current discourse on ‘what works’ in regulating health and safety at work.

Regulating health and safety at sea and the role of supply chain leverage

Supply chains (or value chains) describe the business relationships involved in procurement and delivery of goods and services. They may involve simple buyer/supplier relationships between two entities or more commonly, quite complex chains or networks of transactional relationships in which numerous organisations may be involved in various business relationships between production and use. Business organisations are frequently simultaneously both buyers and suppliers. As modern business methods associated with the globalised economy have grown in prominence, so too has the interest in supply chain management and the price and delivery demands dominating transactions between organisations. Current business and organisational practices such as downsizing, outsourcing, just in time management, lean production and so on, have further served to increase the importance of supply chains within business relations at both national and global levels.

In shipping there are a complex array of such relationships built around the provision of a service in the transportation of goods. However, as is well known, the nature and extent of outsourcing in modern shipping makes for a complex set of business relations to the extent that the relationship between the purchaser and the provider of a maritime transportation service is seldom direct or simple.

As businesses try to manipulate features of their supply chains to improve their profitability, efficiency and market position, the question of what happens to the health and safety conditions of workers affected by these strategies has become a focus for attention and debate among OHS regulators and regulatory scholars. Current discourse reveals two very different effects on preventive health and safety arrangements. Thus, on the negative side, many studies demonstrate that the pressures of outsourcing and the price and delivery demands of powerful buyers, often generate 'indirect' adverse effects that cause OHS standards to deteriorate among suppliers (Quinlan et al, 2001; Quinlan and Bohle, 2008 and Walters and James, 2009 for reviews of these studies). Meanwhile, on the positive side, occasionally the same supply relations can be used to enhance, rather than undermine, health and safety standards, especially within supplier organisations. That is, scope exists for powerful supply chain actors to use the market power at their disposal to improve OHS management among their suppliers. They might do so for example, by laying down contractual requirements as to how this management is to be undertaken by contractors and by taking action to monitor and enforce compliance with these requirements, while threatening the withdrawal of their business should the supplier fail to meet them. Examples of such practices have come to feature significantly in discourse around public/private regulatory strategies to improve labour standards, including those on health and safety in globalised production.

However, as Walters and James 2009 demonstrated (and Walters et al, 2012 confirmed) these positive effects depend on the presence of certain pre-conditions. They are for example, likely to be crucially affected by the characteristics of the goods and services provided, the objectives and wider business interests of buyers and sellers, as well as by the distribution of power between them, and the institutional (including regulatory) context within which buyer-supplier relations are developed. They have been shown to work best in supporting improved OHS management when they are backed by adequate monitoring and penalty regimes; where the relationship between buyers and suppliers is a direct one in which they have worked together satisfactorily, for a relatively long time, and where the wider institutional context is supportive of them.

Conversely, buyer attempts to influence supplier health and safety management are less successful where they: (a) clash with the business interests of suppliers; (b) where such suppliers regard the risks of failing to comply with them to be relatively low; and (c) where the nature of the supply relationship between buyers and suppliers is indirect, distant, transactional or complex.

In the shipping industry, the most obvious example of the type of situation in which positive effects on health and safety are the result of supply chain influence is found in the oil tanker trade, where through the Ship Inspection Report Programme (SIRE) operated by Oil Companies International Marine Forum (OCIMF), the major oil companies, are able to keep the OHS management standards they require from the independent tankers companies that carry their oil under surveillance with regular SIRE inspections. As a result the tanker companies and their seafarers are left in little doubt concerning the need for compliance if the business of the oil majors is to be retained. This was described in a previous symposium paper (Walters, 2011) and more fully in the final report of the research, on which it was based (Walters et al, 2012). It indicated that from the perspective of both the managers of the companies involved and the seafarers that crew their ships, the arrangements provide powerful leverage for the achievement of compliance with the standards of health and safety management required by the oil majors (see also Bhattacharya and Tang, 2012).

The interest of the oil majors in ensuring this occurs is bound up with their awareness of their reputational and regulatory risks (especially in the case of environmental regulation) where failure would mean the possibility of serious and long term financial losses through the loss of cargo, large-scale environmental pollution damage, penalties and associated loss of business. The connection between the oil companies at the head of the supply chains involved and the independent tanker companies that carry their goods is both direct and dependent, thus allowing the relatively straightforward exercise of influence of one over the other.

A somewhat similar system operates in the case of chemical tankers (see Xue 2012). But elsewhere in the shipping industry more complex business relations exist. In these situations therefore, the question of the role of supply chain influences is likely to be less straightforward. In the container and in general cargo trades for example, the structural arrangements described above do not generally occur and business relationships between the owners of the goods carried, their shippers and the companies and individuals with responsibility for managing of health and safety on-board ships, is far more diffuse. It therefore seems important to inquire as to what, if any, is the ‘positive supply chain effect’ in these scenarios

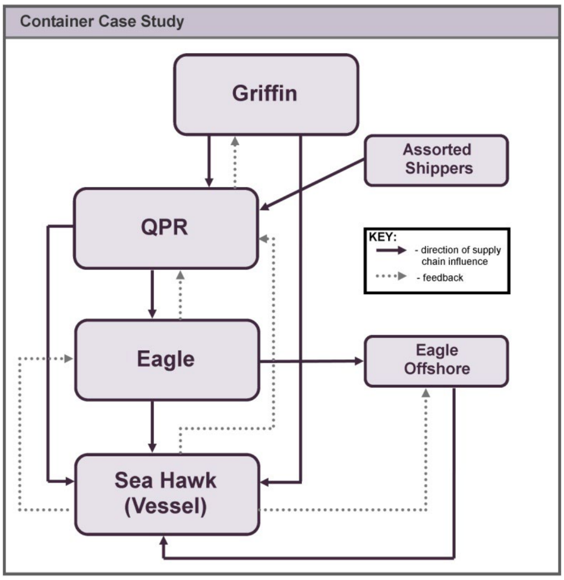
Supply chain influence and health and safety management in container and car shipping

The case study on which this paper is focused is based upon a cluster of companies connected to a ship management company based in the UK that we have called Eagle Shipping. The supply chain in which Eagle Shipping was involved is shown in Figure 1. The business relations involved in the ownership, management and operation of its ships were somewhat complicated, and as our sectoral level interviews confirmed, fairly typical of those generally found in the sector. Griffin owned QPR who subcontracted ship management to Eagle. However, QPR retained the role of cargo management and in relation to cargo planning it had a direct relationship with the vessel, which did not run through Eagle channels.

Eagle Ship Management provided management for a modest fleet, which comprised vessels for two sister companies, and for QPR, which was a Swedish company. In total it managed fourteen vessels in a variety of trades.

The vessel on which the seafarers participating in the study sailed, was owned by QPR which in turn was owned by a large shipping line – Griffin. QPR was the major point of contact for Eagle management (for example, the purchasing manager liaised directly with them) while Griffin only played a role in a small number of areas, for example in relation to bunkering, which it wholly controlled. Eagle had held the contract to manage the vessels on behalf of QPR for around 18 months at the time of our investigation.

Figure 1 Container Supply Chain Schematic



On-board the ship QPR and Eagle were recognised by seafarers as having a strong association both with them and with operational matters. Griffin produced literature for all of its fleet, which was available on-board; but notwithstanding these efforts Griffin remained largely 'off the seafarers' radar' except when it came to issues of fuel quality and bunkering. The seafarers were employed either by Eagle or its Philippines based crewing agency, Eagle Manila. Officers had permanent contracts but ratings did not. Rather unusually, all the seafarers were on rotations back to the same vessel.

While such complexities of ownership, management and operation are not uncommon in the maritime industry and also extend to practices in the tanker trade, the nature of the business relations between the companies and those whose goods they were transporting were quite different to those between the oil majors and independent tanker companies described previously. In the container and car shipping undertaken by QPR, goods belonging to a considerable range of clients could be loaded and carried on-board their vessels in any one voyage. The safety interests (if any) of the smaller of these clients appeared to have made little impact on the management and crew of the vessels, while those shown by larger clients were restricted to the conditions under which their goods were transported.

The safety of the cargo was reported by seafarers on-board to be the overwhelming concern of the cargo shippers (QPR's clients).

> "Well load it as fast as possible and get out of here, I have done my job now go home. [...] I don't think they [the clients whose goods were being shipped] are really aware of this because they put their car on the dock and then the ship is gone and the car is gone. Of course they are checking that it is safe for the car of course, they have to do that."

The seafarers perceived only limited interest in arrangements made for their health and safety among the owners of the goods that were being shipped. Instead, they generally saw the priorities of the clients as being focussed on getting the cargo in an undamaged condition from point A to point B as quickly as possible. Thus, they took an interest in the cargo holds, the lashings, and cleanliness, but generally this interest did not extend in any overt way to the arrangements for managing the health and safety of the crew. In this respect, the business relations between customers and the management and crew of the vessels carrying their goods were more typical of the arms-length trading relations that Sako (1992) argues are least likely to be characterised by features in which buyers exert a direct and significant influence over the internal management practices of their suppliers. There was no obvious pressure from the clients whose goods were being shipped for either the ship operator or the ship management companies to conform to any requirements concerning the management of health and safety on-board the vessels shipping them. Indeed, there was no evidence of them imposing such requirements.[1]

There were two primary reasons for this. One was because, beyond safeguarding their goods, there was no *immediate or obvious* reason why it was in QPR's clients' business interests to require particular standards of OHS management on-board the ships transporting them. The second reason was that the structure of the supply chain in question was too diffuse and the position of the clients whose goods were being shipped too remote, to allow processes, such as the procurement and monitoring activities found in the oil tanker trade to be used effectively to influence either the ship operators and managers or the seafarer working on-board the vessel we studied.

On the vessel, *Sea Hawk*, the overall view seemed to be that whilst some cargo owners dealing with QPR did take a certain interest in the vessel, this interest did not really drive

[1] There was one customer that was regarded as an unusual/exceptional case. It had undertaken a more general auditing of the conditions of life and work on-board. This was described as useful by some seafarers and it was suggested that such practices sometimes picked up minor issues to be remedied. However, this was an exception and seemingly a spin-off from the particular corporate social responsibility agenda pursued by a large multinational retail company. It was remembered because of its exceptional nature rather than because it was in any way typical of the normal practices of customers.

standards forward or change things on-board. The seafarers thought that the priorities of QPR in acting on behalf of the cargo owners, to whom they provided a service, were about reasonable costs, speed of delivery, and avoidance of bad press.

> Interviewer – And when they come do they speak to you? Are they interested in safety on-board?
>
> Seafarer – Not totally, they are just only focused in the cargo. If they see something that is not good for the cargo then they will tell us.
>
> Interviewer – So they are checking on the cargo?
>
> Seafarer – Yeah, yeah.
>
> Interviewer – Did you ever see anybody take an interest in the crew from the customers? Any of the customers take an interest in safety?
>
> Seafarer – No they didn't actually

However, there were also signs that this was a relatively narrow expression of a more complex reality, since the seafarers were also aware that many relationships with shippers were longstanding and, to paraphrase a frequently aired view, 'if they keep coming back for more business then all must be well…' Effective safety management was regarded by both the personnel of the ship management company and the seafarers on-board the *Sea Hawk* as implicit in the maintenance of this business relationship. From the perspective of Eagle Ship Management for example, QPR — as the vessel charterer subcontracting to other customers to place their cargo on the vessels — wanted to show off a well run and safe fleet:

> "The way I see the client we've got, I mean the client's men are boarding [names a European port] every time there is a wander round the ship as well,….. You know they want to show a vessel a reasonable standard to the customer because they have got to convince the customer to send their goods, and there are a lot of other shipping companies out there. But you can show your customer a nice clean well operated, well manned ship, well maintained he is more likely to send his goods with you than somebody who comes in with a manky [sic] old rust bucket hanging to bits. You know you are going to say are my goods going to get across the Atlantic?"

Aboard and ashore, reference was made to charterers visiting the vessels to inspect cargo holds and check on the safety standards relating specifically to the transport of cargoes:

> "Oh yes, yeah. If any new contractor comes along he wants to ship his cargo out, he will go and visit the ship, especially if it is Ro-Ro, because he wants to know that the ship is not going to throw it about in the bottom of a hold and it is securely lashed

> down and it is not going to move. We have had nothing yet that has broken away, they chain everything down, absolutely solid."

These visits acted as pressures on the ship management company to demonstrate that it generally maintained high standards of management. Such high standards were part of its self-image and its business strategy. It was, for example, beginning to check that its own suppliers were International Organisation for Standardisation (ISO) 9008 and 14001 accredited, because there was a belief that clients might be concerned with such matters:

> "And for the ISO 14001 this is because there is a bigger drive on us as a management company, a lot more clients that are taking the decision to be a bit more environmentally friendly, they realise that shipping gets a bit of a bad name for itself and we are just moving with the times. We are also now looking at, on 1 of the KPIs we've got, I think they say 5% of all our supplies should be ISO 14001 approved. So we are now going out to a lot of suppliers to cover those requirements as well."
> **(MAN 1)**

'Good business sense' also played a part in safety management on-board. In relation to procurement policies. For example, in relation to personal protective equipment (PPE — e.g. coveralls, boots, gloves) the company had decided to implement higher quality levels than required by minimum regulatory standards. In the case of coveralls the company spent some considerable time considering which higher standard coveralls to purchase. It searched for coveralls with greater fire retardant qualities because it was keen that these should meet the minimum requirement for their offshore vessels. This was partly because they wanted one supplier for all coveralls, but it was also because they were thinking about their public image:

> "Plus also there is an element of corporate image as well, we want to maintain that, so we want to make sure the brands are on all our boiler suits as well, as well as the control on the quality."
> **(MAN 1)**

Generally managers seemed to feel the drivers for doing so were twofold: it was the right thing to do – to keep people safe, and there was also a business case for safety.

> **MAN 2** – It is care for the individual and everyone else around, but the individual comes first. I mean you read any ISM manual and the master has overriding authority to save a life. Life comes first, safety at sea, SOLAS.
>
> **Interviewer** – But there are other companies who have a different view?
>
> **MAN 2** – There are, but within this company the promotion is, that is as [Person's Name] says that is one of our selling points to the clients is we have a safety culture.

In short, therefore, while supply chain relations with the clients who shipped their goods with QPR in the ships that it had contracted to Eagle to manage did not themselves provide much in the way of direct influence on the OHS management standards that applied on-board, these relations nevertheless did ultimately influence conditions on-board, albeit indirectly. As the seafarers themselves pointed out, there was a perception in both Eagle and QPR that if their clients had cause to believe that their goods might be at risk as the result of the poor management of their transport, then they would take their business elsewhere. It was therefore important to QPR to contract the management of the ships it had chartered to a company whose standards of management were of suitable quality and, in turn, it was important to Eagle to be seen to be delivering this quality in the way it went about managing the ships. There was clearly a perception that safety management was an important element of managing affairs at sea. Indicators of the companies' standards in this respect, as well as avoidance of situations in which safety management failure might be identified were regarded as important to the continued business between QPR and Eagle. The business of the latter with its shippers was seen to be, at least to some extent, dependent upon the maintenance of these standards. There was also a sense among these companies, which were operating at the 'better end' of the market, that quality management was one of the indicators of competitive edge and therefore worthwhile pursuing from a business perspective. Again, since quality generally was associated with indicators of good safety performance, this was a further influence that helped to promote the company's efforts to maintain good standards of health and safety on-board ship.

However, as we explore further in the following section, it was also clear that these influences on the quality of OHS management did not operate singly, but were just one element of a set of influences in which both regulation and regulatory inspection were also important.

A constellation of influences?

At first sight, our findings lend some weight to the notion that supply chain related business considerations helped duty holders such as Eagle Ship Management to regard their health and safety management strategies as part of their efforts to ensure good business. They strove to implement them for this reason, as to a lesser extent, did the charterers QPR. This occurred even though many of the preconditions for supply chain influence that we identified in the previous investigation of the situation in the oil tanker trade (as well as in our wider review of land based scenarios) were not obviously present in the business relationships involved here (see Walters et al 2012 and Walters and James 2011).

Closer examination suggests a more complex picture of the dynamics behind these observations. In particular it demonstrates the role of the institutional framework in which the business relations are situated. This framework particularly included regulation and regulatory inspection and the strategies adopted by the regulatory bodies involved to achieve compliance. It was evident that managers in the cluster of companies we studied were aware of, and influenced by, this wider framework within which they focused their market-based attempts to improve business by demonstrating elements of good health and safety practice. The seafarers too, clearly felt that the regulatory environment in which they were embedded was particularly significant in influencing good practice on OHS. There were several examples of such areas of influence that featured prominently in our discourse with both managers and seafarers.

Adherence to regulation was repeatedly referred to as a priority in interviews with managers. The standard contract utilised (and often adapted) in the subcontracting of ship management, had several clauses addressed to regulatory compliance and to the management of safety. For example, one clause specifically mentioned regulation relating to seafarer qualifications (Standards of Training Certification and Watch-keeping (STCW)) and to the ISM Code. It states:

> ...the Managers shall in a timely manner make available, all documentation, information and records in respect of the matters covered by this Agreement either related to mandatory rules or regulations or other obligations applying to the Owners in respect of the Vessel (including but not limited to STCW 95, the ISM Code and ISPS Code)...

While another dealing with safety management systems required that:

> Where the Managers are not the Company, the Owners shall ensure that Crew are properly familiarised with their duties in accordance with the Vessel's SMS and that instructions which are essential to the SMS are identified, documented and given to the Crew prior to sailing…

Eagle managers were aware of these regulatory standards and knew that their contract with clients made meeting them obligatory.

"No, no, no I mean I work for Eagle, but we all have our guidelines to work with and we have SOLAS, MARPOL, (loadline) and MED regulations and you have got to make sure you comply with all those. And we experience you know what is and what isn't allowed."
(MAN 2)

The desire to comply with regulations (or indeed, to work to higher standards) was not for fear of the cost of penalties for non-compliance but was more particularly out of a concern for business reputation. In this sense, therefore, charterers did become important. As one Eagle manager explained:

MAN 4 - Because effectively these days, I don't know if you know the Paris MOU and the company calculator, because whatever ships you have directly reflects on the company rating.

Interviewer - So you are very much trying to avoid deficiencies and detentions?

MAN 4 - Yeah, which is exactly what, what the client wants anyway, whatever they say

MAN 4 - So we offer the best. The best practice that we can.

This said, there was little doubt that because of the Flag under which the ship was registered, in combination with its trading route, in practice the public regulatory regime to which the ship was subject was seen as especially rigorous. The ship was registered in Sweden and plied a transatlantic route, which meant it was often subject to scrutiny by the US Coast Guard and European Port State Control authorities. This combination of comparatively strict Flag State and Port State regimes meant that both managers and seafarers believed inspection played important roles in maintaining a focus of OHS management standards for both the companies and the seafarers involved. They regarded inspection as important and both ashore and on-board there was a significant tendency to want to conform to regulation, coupled with a belief that non-conformity would be discovered. The seafarers were also aware of the presence of public authority inspection, and while regarding it as burdensome in many respects, they nevertheless saw it as in their interest and ultimately beneficial.

A further effect of inspections was to encourage the double-checking of items that should be checked at regular intervals on-board according to the Safety Management System (SMS). For example, life saving equipment was supposed to be subject to regular weekly and monthly checks but preparation for inspections had been sufficiently thorough to uncover some oversights in the past.

Compliance with regulatory regimes was seen as a priority because of the likelihood of one form or other of inspection by the public authorities. This regulatory inspection environment contributed significantly to the maintenance of high standards of health and safety management on-board. However, within the general framework of a comparatively rigorous public regulatory environment, there was a further element that was especially significant in its contribution to supply chain pressures for improved OHS management. This was the effect of the 'smart' regulatory regimes adopted by regional associations of Port States. Managers were aware of the potential for a bad business image and the consequent effects on their business that could result from the public availability of records of non-compliance and sought to avoid such non-compliance as much as they could.

In particular, 'a clean sheet' in terms of regulatory inspections by various Port State authorities was regarded as an important measure of the reputation of both the ship management company and the charterer/ship owner. In all cases, the public availability of this information meant that both buyers and suppliers of services could use it as a source of information with which to gauge the quality of ships, their owners and their operators. Indeed, the case studies showed that these measures could be used in both directions in determining potential business relations between buyers and suppliers of services.

In subcontracting the operation of their vessels to Eagle Ship Management, QPR was looking for a 'quality' operator with a good reputation. The management at Eagle identified their reputation vis a vis both safety and regulatory compliance as an essential factor in winning the contract to run QPR's vessels. Equally, however, through the same sources Eagle could make themselves aware of ships with records of poor compliance and thus avoid taking on the management of such ships when seeking new business.

Conclusions and some reflection on the limits of influence

In sum, our study of supply chain influences on OHS management in the cluster of companies involved in container and car shipping, indicated that what contributed most effectively towards driving a culture of safety on-board was a constellation of external influences in which the regulatory environment helped to create business pressures driving both companies and their workers towards compliance in relation to regulated safety management practices. In the container trade, in which the risks for the shippers at the heads of the supply chains were more remote and arguably less catastrophic than those, for example seen in the oil tanker trade. Supply chains were complex and the power of their influence diffuse. In these situations, the capacity of buyers to exert unilateral influence over health and safety management among the suppliers was weak. Therefore, the role of public regulation and the regulatory inspection of standards of occupational health and safety occupied a relatively high profile in the nexus of external influences on safety practices on-board ships. In particular, the 'smart' regulatory strategies adopted by regional associations of regulatory administrations in which enforcement actions taken in relation to ships were made public, helped to create an environment in which knowledge of the availability of this information helped to make supply chain relations important in shaping and influencing the priorities of both ship managers and charters in addressing safety management on-board.

Of course our case study presents a picture of what is likely to be most relevant at the better end of the trade. It is worth digressing for a moment to reinforce this important limitation. The ship on which we sailed and the companies that allowed us access to their management and workers had comparatively good safety records and were striving to meet quality standards in which they regarded this good safety performance as an indicator of success, largely because such standards were perceived by them to be important to the commercial success of their business. A major question remains as to how transferable this practice is and to what extent practices such as the 'smart' regulation discussed in the previous section can contribute to driving such transference to other parts of the industry.

Within the maritime industry, as is well known, significant challenges for regulation exist. They arise partly from the global nature of the shipping industry and the complications it creates for the application of national and international laws. These are greatly exacerbated by the highly developed trend towards deregulation pursued by the industry in recent decades, in which 'flagging out' has resulted in a major shift of ship registration (and hence regulatory control) from the embedded maritime states to new administrations, many of which have little capacity for regulatory scrutiny. The consequence of this is a highly varied experience of the strength of the institutional framework for regulation in the industry globally. This strength, was evident in the particular situation on which the present study focused and it was a significant factor in the creation of an environment in which supply chain pressures work positively towards enhancing OHS standards. In the absence of such a strong institutional framework however, there is little in our findings to suggest that the market-based business interests that were significant in creating the supply chain leverage on

OHS management that we observed would act in the same way, or on their own be sufficient, to raise and maintain OHS management standards on a significant scale.

The challenge therefore remains one of achieving a stronger and more consistent regulatory framework globally. As such, while our findings show that actors within supply chains can positively influence OHS management conditions in the organisations with which they have relations, they suggest that such effects are most likely to occur in contexts where surrounding institutional pressures serve to create supporting market contexts. That is in institutional contexts where market, and related inter-organisational, logics are importantly shaped by supplemental regulatory and reputational risks. In pointing in this direction, our findings therefore both accord with, and receive support from, conclusions reached following other analyses focussed for example on the adoption of corporate social responsibility policies (Gjolberg, 2009), the facilitators of self-regulatory corporate behaviour (Short and Toffel, 2010), and the limits of forms of private governance (Mayer and Gereffi, 2010). In the maritime context they further endorse the conclusion that while supply chain influences can be important sources of leverage in relation to OHS practices, and constitute a useful driver in enhancing safety in certain situations, they are not a substitute for regulatory standards and do not eliminate the need to further develop stronger and more broad-reaching smart regulatory regimes.

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