

The limits of influence

The role of supply chains in influencing health and safety management in two sectors

Report submitted to the IOSH Research Committee

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Abstract

This report presents an account of an empirical study of experiences of supply chain-mediated influences on health and safety practice and performance in the construction and shipping industries. It sets out to test a set of propositions concerning the conditions and contexts of these influences that was developed by two of its authors in a previous study. It is based on four case studies, two in each sector, each selected in order to examine situations in which supply chain relationships are likely to influence and support improved health and safety practices and performance. In each case, documentary evidence and qualitative data obtained from in-depth interviews have been analysed. These analyses are further supported by a review of the research literature on trends in the structure, organisation and regulation of work in the sectors and recent evidence concerning supply chain influences.

Findings confirm the previous propositions with respect to the conditions and contexts governing positive supply chain effects on health and safety practice. They draw attention to the influence of health and safety requirements at the procurement stage and in the choice of contractors, as well as to the role of support, monitoring and surveillance in ensuring compliance with these requirements. At the same time, they show that supply chain influences on health and safety vary both according to the business interests of the actors involved and the regulatory contexts in which they work, and that leverage in supply chain relationships is only one element in a constellation of influences acting in concert to raise occupational safety and health standards. In particular, there is no evidence in our study to suggest that such leverage acts effectively without regulation or regulatory inspection. However, the study does suggest that regulatory strategies need to become more attuned to exploiting the positive features of supply chain relationships.

Executive summary

Introduction

This report details the findings of an empirical study into the role of drivers and leverage in supply chains to support improved health and safety practice. It tests propositions put forward in a previous study by two of its authors, in which they argued that that supply chain influences on health and safety vary both according to the business interests of the actors involved and the regulatory contexts in which they are embedded. Although this earlier review identified both positive and negative supply chain influences, the present study focuses on exploring circumstances in which the direct effects of supply chain intervention may support positive practices and outcomes for the health and safety of the workers involved. In this respect it pays particular attention to the nature of supportive supply chain relations and the role of monitoring and surveillance in improving supplier health and safety practice. It is not, however, restricted solely to highly interventionist relations between procurers and their suppliers; it also considers the possible role of supply chain influences as one element of a constellation of drivers of good practice that include both business and regulatory factors.

The report presents findings of detailed investigations of how these factors influence organisational and workplace health and safety management practices and performance in two very different industries: construction and merchant shipping. These industries were selected because they are high-risk sectors with significant problems of occupational injury and ill health. They are also in the vanguard of change in terms of the way work is structured and organised and business undertaken. At the same time, they both feature prominent examples of the deliberate use of supply chain relations to influence health and safety management and performance among the business organisations involved. Therefore, they offer good opportunities to explore the propositions we were seeking to test.

Methods

As a starting point the report presents a review of the relevant literature which updates the earlier review that led to the present research and focuses more particularly on the two sectors in which its empirical studies are located. In addition, it gives some special attention to research findings in the food industry, because this too is a sector in which research has identified a number of cases of both positive and negative supply chain effects on health and safety practices and performance. The review seeks to contextualise the empirically based study within existing knowledge concerning how supply chain relationships can impact on health and safety arrangements and performance. To achieve this, it uses existing literature to provide an understanding of the wider business processes and dynamics that lie behind supply chain effects. In doing so, the review identifies a spectrum of supply chain features that help to predict their influence on practices and outcomes in health and safety among the organisations involved. At the same time it notes that care needs to be taken not to overly generalise the extent to which the potential exists for supply relationships to be used positively to influence supplier health and safety management and performance given how such relationships vary in terms of their nature and, in particular, with regard to: their length; how far they extend beyond narrow, price-based, economic transactions to encompass deeper, more relational dynamics potentially based on high levels of mutuality, collaboration and trust; and the balances of dependency and power they embody. As a result, they must also be viewed as encompassing considerable variety in terms of both the degree to which they prompt downward pressures on employment conditions within supplier organisations and the potential which exists for them to be utilised to support improved health and safety management and performance.

The study investigated the quality of supply chain influences in four different situations, two of which were in the construction industry and two in the maritime sector. Specifically, it examined the influence on health and safety practices of supply relations between:

- the developers responsible for the construction of a major sports facility (the Olympic Park) and one of their principal contractors
- this contractor and its second- and third-level lower-tier contractors and their workers
- the developers in the construction of a major inner city building and infrastructure project and one of their principal contractors (which was the same company we studied as a principal contractor on the Olympic Park)
- this contractor and its second- and third-level lower-tier contractors and their workers
- four tanker ship operators, the seafarers employed on eight of their vessels, and the major oil companies whose products they carried
- a ship management company, the charters and owners of the container ships it managed, the crew of one of these vessels and the owners of the goods it carried.

The methods used to undertake these case studies included a review of documentary sources and in-depth interviews with managers and workers in all of the case studies. The documentation helped in the understanding of contractual arrangements in place between buyers and suppliers, the relevant rules and procedures implemented by the organisations studied, and prevailing standards of health and safety performance. The interviews helped to explore in detail what managers and workers saw as the significant features of the relations between service suppliers and buyers that influenced health and safety arrangements, practices and outcomes in the companies in which they worked or with which they had supply relationships. In addition, the interviews were used to examine perceptions concerning the effects of other external drivers of occupational safety and health (OSH) practice, such as experience of regulatory activity and the influence of trade unions or other actors or procedures in civil society. As well as interviewing participants in the companies on which the case studies focused, in both sectors key informants representing employer/employee organisations, trade bodies, trades unions and regulators were also interviewed following completion of the four case studies. The purpose of these interviews was to gain further insight into the generalisability and more general validity of the findings obtained through the case studies.

We have sought to disguise the identity of all of the organisations and personnel that participated in the study in order to respect their confidentiality and abide by Cardiff University research ethics procedures that governed the conduct of the study. The unique position and high profile of the Olympic Park and the organisations responsible for its development made this impossible, and in this exceptional instance we obtained their permission to report the case.

Findings

The findings of the research can be separated into three broad areas, each of which is accorded a chapter in the full report of the study.

First it was important to provide some contextual background concerning the sectors in which the case studies are located. For example, the construction industry is a highly fragmented and structurally challenging sector in which temporary worksites frequently involve large numbers of organisationally separated contractors working together and in sequence on building projects. The complex relations thus resulting between clients, designers, contractors and subcontractors present major challenges for the management of health and safety performance on such sites. Indeed, the contribution of such challenges to the poor health and safety performance of the sector is the principal reason for the supply chain orientation of the more recent regulatory provisions on health and safety management in the industry that apply within the European Union. While small and micro enterprises dominate the profile of businesses in the industry, there are also some very large operators engaged in high-profile building projects. During the last decade or so, the health and safety performance of the industry has been the subject of considerable political and regulatory attention, much of which has focused on these larger operators who, as a result, have been encouraged by various approaches to adopt more concerted efforts to find ways to improve health and safety performance. Among these approaches, procurement and supply chain initiatives have featured prominently.

The global nature of maritime trade means that much of its activity takes place in situations that are beyond the reach of conventional national regulatory scrutiny. It is a complex and fragmented sector. Its vessels and the companies that own or manage them often have distinct features according to their trade, while the major transformations occurring in the industry in recent decades have been driven largely by the price and delivery demands of clients worldwide, and have profoundly affected the nature of ownership and management of shipping, the origins of labour and its recruitment and management in the sector, as well as ship design and the design and location of port facilities. Such influences, not surprisingly, have also had a significant impact on experiences of work and its management in the industry, including that of the management of health and safety at sea.

Work in both sectors is hazardous and the documented health and safety performance in both is widely considered to be below what could be regarded as acceptable in terms of the extent of preventable occupational mortality and morbidity. The management of workplace risks in both sectors is seen as requiring improvement and is one reason for the level of political and regulatory scrutiny to which the construction industry has been subject in recent decades. It also encourages efforts to introduce more globally applicable requirements on systematic health and safety management in the shipping industry, as well as to raise the profile of regulatory inspection and gain better international conformity in its delivery.

Turning attention to the details of the case studies themselves, the available information on the documented health and safety performance suggested they were all at the better end of the spectrum of health and safety performance for their respective industries. This was certainly the case for the Olympic Park and for the other construction case study, as well as for the principal contractor on which both these case studies focused. Availability of robust data on health and safety in the two case studies on shipping was more limited, but the general impression was that the companies on which we focused were also good performers relative to the average for their trades.

The supply chains investigated in each of the case studies all demonstrated that requirements of procurers acted as positive influences on the health and safety practices of downstream suppliers. In the two case studies in construction, as well as in the case study in the tanker trade in shipping, these influences were quite strongly interventionist and featured not only the presence of health and safety requirements in procurement contracts, but also interventions such as certification schemes, training initiatives and co-ordination activities aimed at providing support to enable suppliers to meet these requirements, as well as the monitoring and surveillance of supplier OSH performance and practice.

The situation in the second shipping case study involving the container trade was somewhat different. Generally in this trade, business relations between customers and the management and crew of the vessels carrying their goods are unlikely to be characterised by features in which buyers intervene in the internal management practices of their suppliers. There is no obvious pressure from the clients whose goods are being shipped for either the ship operator or the ship management companies to conform to their direct requirements concerning the management of health and safety on board. Indeed there is rarely evidence of them imposing such requirements. There are two primary reasons for this. One is that it is not in the clients' business interests to do so, and the other is that the structure of the supply chain is too diffuse and the position of the clients whose goods are being shipped too remote, to allow processes, such as the procurement and monitoring activities examined in the other case studies, to be used effectively to influence practices on board.

This said, we nevertheless did find supply chain influences at work in the container trade. They were, for example, evident in the relations between the ship charterers and owners of the vessel on board which we undertook fieldwork and the ship management company that managed its operation. There were also references to health and safety standards in the contract between the ship management company and the charterers procuring its services. There was further evidence that the companies concerned were aware of the business advantages associated with being able to evidence good practice in their approaches to health and safety and further awareness that their business reputations risked damage from exposure of infringements of regulatory standards in this respect. There was, however, strong evidence in the container trade case study that these pressures worked in concert with other pressures flowing from the public regulation of shipping that acted to engender a motivation among businesses to achieve good health and safety standards.

The second of the chapters addressing the findings of the research presents a detailed account, based on field observations and interviews with workers, their managers and business clients, as well as with representatives of peak business organisations, trades unions and regulators, of how requirements mediated through supply chains influenced perceptions and practices in health and safety at the workplaces we studied. Looking in greater depth at workers' and managers' experiences of the operation of procurement strategies, at certification, training and co-ordination of activities on construction sites and at the requirements and control of the oil majors in the tanker trade, it shows how the contractual requirements of procurers are implemented in practice, how they are perceived by the workers and managers of supplier organisations and the nature and direction of buyer-supplier relations that influence health and safety practices and outcomes. It presents a further detailed understanding of perceptions among workers and managers concerning the role of the monitoring and surveillance they experience in these respects and shows how these interventionist strategies work towards ensuring compliance with the health and safety requirements of procurers. While our fourth case study, on the container trade, demonstrated substantial differences in the degree of procurer intervention experienced by the seafarers and their managers, their detailed experiences showed supply chain influences – albeit acting in concert with other external pressures such as those derived from regulatory inspection – to be strong determinants of compliance behaviour.

The final chapter returns to the propositions presented by Walters & James in their earlier review. It examines how they fare in the light of our empirical analysis. It demonstrates that our findings broadly support the judgement of Walters & James concerning the contexts and conditions of

supply chain effects. In doing so, it further demonstrates that such effects are neither necessarily solely vertical within supply chains, nor only in one direction. Thus, we show that in the construction industry there were substantial horizontal effects observed among organisations competing for business at the same level and that in this sector, as well as in the container trade in the maritime sector, there were sometimes upstream as well as downstream influences at work in some of the supply chains involved.

Conclusions and recommendations

In short, our findings therefore largely endorse the usefulness of the propositions to the understanding of the wider contexts of supply chain effects. That said, it is perhaps also important to note that our findings departed somewhat from the propositions in several respects. Two may be especially significant. One concerns the extent of mutuality and partnership between procurers and suppliers anticipated in the propositions. Although we found such mutuality and partnership among some first-tier suppliers and their procurers to be evident in our case studies, what struck us more forcefully for most of the supply chain relationships, in which leverage on OSH was delivered through procurement strategies, was the high degree of power imbalance between procurers and suppliers and the sense that the latter believed they had little choice other than to follow the requirements of the former if they wished to continue their business relationship. The implications of this finding for policy should not be overlooked. The second departure from the propositions concerns the possible negative consequences arising from the interventions in which procurers exploited this power in the conditions they imposed upon the affairs of their suppliers. These also should not be ignored. In particular, additional burdens imposed upon lower-tier suppliers to deliver evidence of compliance with procedures that were merely the requirements of ‘audit trails’ rather than good OSH practices raises the possibility of them acting to lead indirectly to poorer but unmonitored health and safety outcomes among workers at these levels.

A further significant finding that emerges from our case studies and which is especially important for policy considerations concerns the extent to which leverage in supply chain relationships can be developed as one element in a constellation of influences acting in concert to raise OSH standards. It is important to inquire what might be the role of public regulation in this process. There were indications in the project – especially in the maritime container trade case study, but also evident to some extent in the other case studies too – that the positive influence of supply chain-driven effects on health and safety standards may be more widespread than a focus on deliberate direct interventions suggests. That is, we found that buyers and suppliers in some supply chain relations which were not especially marked by a high degree of intervention on the part of the buyer, nevertheless were influenced to support good health and safety practice and performance because they perceived it to be of relevance to their business interests. In such scenarios – and even where buyers do not impose inspection and monitoring regimes upon their suppliers to ensure compliance – there may be opportunities for the further strategic development of public regulation in order to exploit such perceptions of business criticality in ways that would enhance the health and safety practices and outcomes for work activity that often lie beyond the reach of conventional regulatory practice. In other words, there may be further opportunities to extend existing regulatory interventions that focus on supply chain relationships, such as those in place in construction internationally as well as nationally in some other sectors such as food, footwear and apparel. To do so effectively, however, would first require further research to better understand the relationship between regulation and business criticality in these and other sectors.

As a point of departure in this respect, it is clear from the present study that, while under certain conditions supply chain relationships offer opportunities to leverage improvements in OSH arrangements and standards, they always do so within contexts framed by regulation. There is no evidence in our study to suggest they act effectively in the absence of, or as substitutes for, regulation or regulatory inspection. There is instead much food for thought concerning how regulatory strategies could be more attuned to exploiting the positive features of supply chain relationships to protect the workers whose health, safety and welfare lie at the end of these chains and who are increasingly remote from the reach of conventional regulation.

1 Introduction and aims of the study

Beginning with some background, this chapter outlines the rationale for conducting the empirical study presented in the following report. It first presents the theoretical propositions that two of its authors put forward on the basis of their previous review of existing research on the role of supply chain relations in influencing health and safety practices and outcomes among the actors involved. It goes on to outline the aims of the present research in the context of these propositions and concludes with a brief outline of the structure of the report in which the aims are delivered.

Some background

In their review of the literature on the influence of supply chain relations on health and safety management and performance, Walters & James¹ developed a number of propositions concerning the health and safety-related dynamics of supply chains, which they suggested would merit further empirical exploration. The IOSH Research Committee also indicated that the review of the research literature examining the relationship between supply chains and health and safety undertaken by Walters & James would form a useful basis for future empirical research. In this report we present the findings of such an empirical study.

Walters & James¹ argued that, somewhat in contrast with policy rhetoric, the majority of published studies show that supply chains frequently generate adverse, rather than beneficial, consequences for the health and safety of those employed within supplier organisations. Indeed, their review indicated that only relatively rarely did supply chain management encompass attempts by buyers to influence health and safety positively. It further suggested that initiatives of this latter type are most likely to occur where they are seen as supportive of the business interests of buyers and, in particular, when external economic, social and regulatory pressures serve to engender 'reputational risks'. In addition, it appeared that the success of such initiatives was dependent on their inclusion of adequate means for supervising and controlling supplier compliance with them.

The theoretical propositions

The propositions that Walters & James developed from their review suggested the following:

- Attention accorded to health and safety-related issues by supply chain buyers varies and reflects differences in:
 - how far the way in which health and safety is managed by suppliers has implications for the effective supply of required goods and services to buyers
 - the extent to which pressures are exerted by private or public regulation.
- Buyers influence health and safety consequences of supply chains, both directly and indirectly; the former exert positive effects and the latter exert negative ones.
- Attempts by buyers to influence supplier health and safety management positively will work better where:
 - they are supported by adequate monitoring and penalty regimes
 - they occur within a supply relationship which is relatively collaborative and trust-based.
- Collaborative and trust-based relations are more likely to exist where:
 - buyers and suppliers have worked together, satisfactorily, for a relatively long period
 - the wider institutional context is supportive of them
 - there is some form of regulatory scrutiny in place.
- Buyers' attempts to influence supplier health and safety management will be less successful where:
 - they clash with the business interests of suppliers
 - the risks of failing to comply with them are relatively low.

Aims and objectives of the present study

The present research seeks to explore these propositions with detailed investigations of how they influence organisational and workplace OSH management practices and performance in two very different industries: construction and merchant shipping. These industries were selected because they are both high-risk sectors with significant problems of occupational injury and ill health, while they are also both in the vanguard of change in terms of the way in which work is structured and organised and business undertaken. At the same time they both feature prominent examples of the

deliberate use of supply chain relations to influence health and safety management and performance among the business organisations involved and therefore offer good opportunities to explore our propositions.

In addition to the empirical research undertaken in these two sectors, we also originally planned to study similarly constructed experiences in food production and processing, a third sector in which, because of the organisation of its business relationships, we anticipated finding further interesting experiences in relation to our propositions. Unfortunately, access to food producing and processing companies proved too difficult for us to be able to undertake sufficiently detailed and relevant fieldwork in the sector within the timeframe of the project. Instead we diverted resources from this to more intensive study in the other two sectors and confined our attentions in food production and processing to a review of previous research on supply chain relations there.

Finally, in terms of testing the propositions from our previous study, a related objective of the present research is to provide the more comprehensive understanding that our review of previous research showed to be needed, regarding:

- which types of supply chain are more or less supportive of the effective management of health and safety within them
- what factors most influence standards of OSH management and performance within such chains
- how far interventions should be legally based and, more generally, best designed and most effectively implemented.

Structure of the report

In the following chapters we first develop some reflections on the key issues that emerge from the literature relevant to our propositions in the sectors we have studied (Chapter 2). In Chapter 3 we outline the methods we have adopted to undertake fieldwork and to collect and analyse qualitative data. We then present the findings from the case studies we have undertaken in construction and shipping. This begins in Chapter 4, with a brief review of the sectors and the emergent trends in their development, health and safety practices and performance and the challenges they present for the regulation of OSH. Chapter 5 presents an account of the extent to which the evidence of our empirical research in the construction and merchant shipping sectors contributes to a better understanding of ways in which supply chain leverage may aid improved OSH performance in examples drawn from these sectors. Chapter 6 considers the implications of these findings for our understanding of the role of supply chain leverage in the regulation of health and safety management more widely. Finally, in Chapter 7 we offer some conclusions that are situated in the wider context of the previous literature review. To do so, we revisit the propositions developed in the previous review by Walters & James¹ on the contexts and conditions in which supply chain effects are situated, and examine the extent to which they are supported by the empirical findings presented in the previous two chapters.

2 Contextualising the influence of supply chains on health and safety

This chapter contextualises the current empirically based study within existing knowledge concerning how supply chain relationships can affect health and safety arrangements and performance within supplier organisations by drawing on the previous literature review undertaken by two of the authors.¹ In doing so it also seeks more specifically to draw out what is known about health and safety supply chain effects and influences within the two sectors that form the focus of the present study, namely construction and shipping. It also reviews research literature on the food sector as here, too, are found examples of studies demonstrating both positive and negative supply chain effects on health and safety.

The chapter first explores the evidence concerning the health and safety outcomes flowing from the dynamics embedded in purchaser–provider relationships. It then moves on to highlight the factors that are important in influencing these outcomes. The key points arising from these two strands of analysis are then drawn together in a concluding summary.

The health and safety effects of supply chains

Existing research evidence indicates that the ways in which supply chain relationships affect experiences within supplier organisations vary considerably as a result of a range of factors, notably the business rationales and risks underlying them, the balances of interests and power that they encompass, and the more general form that they take.^{2–9} It also indicates that these experiences can be both of a positive and negative nature and that the former are most likely to arise in the context of particular types of business-to-business relationships.

In their earlier review of the literature shedding light more specifically on the role of supply chains in influencing health and safety within supplier organisations, Walters & James similarly found that these relationships could exert such influence either directly through the proactive interventions of purchasers or indirectly via (a) the requirements that purchasers impose in relation to such matters as price, cost, quality, demand responsiveness and just-in-time delivery and (b) management disorganisation arising in situations of ‘on-site’ or ‘co-location’ outsourcing.

The direct influence of supply chains

At the policy level in the UK, both government and the Health and Safety Executive (HSE) have drawn attention to the positive role that supply chain management could play in improving standards of health and safety in the British economy, and have actively encouraged organisations to take it more seriously. This encouragement has, however, been pursued via voluntary exhortation rather than legislative action. For example, in its ‘flagship’ guidance on health and safety management the HSE argues that organisations will want to improve their OSH management systems as a consequence of pressure from suppliers or customers, and that accidents and ill health disrupt delivery in supply chains and therefore harm profitability.¹⁰ Similarly, a Health and Safety Commission (HSC) source suggests that good health and safety standards in the supply chain are important because they ensure quality, value, competence and reputation, and claims that they are in the interests of all the organisations involved in supply chain relationships.¹¹ Moreover, an action point in an earlier joint government–HSC health and safety strategy document committed the HSC to advising ministers on ‘how the principles of good management promoted by the Construction (Design and Management) Regulations approach can be encouraged in other key sectors’; although ultimately it was concluded that further use of the law to regulate contractual chains was unnecessary.^{12,13}

In a similar vein, in the health and safety practitioner literature the business benefits of adopting such an approach have been aired frequently.^{14–21} These benefits include enhanced corporate reputation, the minimisation of reputational risk, greater efficiency and quality flowing from less disruption due to accidents and worker absence through ill health and injury, and better management more generally within supplier organisations.

Against this backdrop, there is evidence that at times attempts are made by the purchasers of goods and services to influence health and safety within supply organisations. This evidence further suggests that such attempts take three main forms.² First, the utilisation by ‘purchasers’ of procurement strategies under which health and safety standards are used as a basis for selecting contractors; in some cases, these are extended to the imposition of requirements relating to the

general management of health and safety by suppliers, such as the carrying out of risk assessments and communication within multi-contractor/subcontractor work sites. Second, industry level certification schemes aimed at ensuring the competencies of contracting organisations and those working for them. These are often used as the measures of standards that procurers require suppliers to demonstrate in the delivery of their operations. Third, there are ‘product-related initiatives’ focused around the supply of materials for use at the workplace that are undertaken by trade and industry bodies, as well as individual supplier organisations.

Furthermore, there is evidence that each of these strategies has been used in the construction industry, both domestically and internationally, and that they can yield positive results. For example, with regard to the building of the major land works supporting the land/sea link between Denmark and southern Sweden in the 1990s, evidence showed that initiatives on health and safety requirements in procurement helped to reduce the incidence of occupational accidents.²² In a similar vein, controls on subcontracting adopted by Renault in building a new industrial plant in France in the 1990s were found to have achieved a much-improved accident frequency rate when compared to the French construction industry as a whole, and to have also led to an impressive safety performance during the construction of Heathrow Airport’s Terminal 5.^{22,23}

Industry level certification schemes also exist in the UK construction industry, the most significant of these being the safety passport system developed by the Client Contractor National Safety Group in the 1990s that is used in the construction engineering industry and the parallel, and more widely applicable, Construction Skills Certification Scheme (CSCS). In the case of both of these schemes, claims have been made that they have contributed to higher standards of health and safety performance, although the evidence to support these claims is far from conclusive, comprising for the most part anecdotal opinions supplied by either their users or deliverers.^{24,25} Meanwhile, internationally, a number of examples can be identified of trade or industry bodies undertaking product-related initiatives designed to support the better management of health and safety that are of clear relevance to construction. The European Tool Hire Trade Association, for example, has developed a standard for health and safety and customer service that is aimed at supporting the safe use of equipment by construction companies.²⁶ How far the standard has achieved this aim is, however, also unclear.

Similarly, there is some evidence to indicate that supply chain procurement strategies are used in the food production and processing sector. Most large supermarkets have, for example, signed up to the Ethical Trading Initiative base code and the Gangmasters Licensing Authority’s Supermarket and Suppliers Protocol, both of which detail minimum health and safety standards, while also possessing associated internal codes of practice and the like.^{27,28} Hard evidence regarding the success of such strategies in improving supplier health and safety standards is, however, again lacking. Furthermore, this lack of evidence exists alongside findings which indicate that supermarkets vary considerably in terms of how far they seek to encourage fair and ethical employment practices among their suppliers and others, highlighting problems in some cases with regard to the effectiveness of the auditing arrangements they use to monitor the behaviour of suppliers.²⁹ The second of these observations serves to highlight a more general issue that has emerged in relation to ethical trading initiatives, namely the need for compliance with them to be rigorously monitored and enforced. Existing evidence points to the fact that in the absence of such monitoring and enforcement, compliance is likely to prove problematic.^{30,31}

Supply chain procurement strategies are similarly much in evidence in the oil and chemical tanker trade in the maritime industry, although far less obviously so in other parts of the sector. The maritime industry is itself particularly challenging for regulating health and safety standards due to a host of reasons that we detail in the following pages, and it therefore presents an interesting scenario in which to explore ways of enhancing regulation. Supply chain leverage may present one such opportunity.

The indirect influence of supply chains

In contrast to the limited evidence available as to how supply chains have been used by purchasers to improve the health and safety performance of suppliers, their indirect effects on health and safety are rather better evidenced. Furthermore, this latter evidence paints a generally negative picture of their health and safety implications.

These negative outcomes have been identified as flowing from a number of sources, most notably:

- problems which arise with regard to the co-ordination of health and safety management in situations where subcontractor and temporary staff work in physical proximity to in-house personnel
- cost and price pressures that limit the ability of suppliers to invest in preventive health and safety measures
- reforms to employment regimes engendered by contractual pressures that act to increase health and safety risks.

A number of studies and official inquiries into the causes of injuries and disasters in chemical plants and in the offshore oil and rail industries have, for example, drawn attention to the difficulties that can arise with regard to the adequate management and control of workers employed by subcontractors.³²⁻³⁶ A case in point here is the commission of inquiry established by the French National Assembly to investigate the September 2001 explosion at the AZF chemical factory in Toulouse (which killed 30 people including 21 workers, 13 of whom worked for subcontractors). The commission of inquiry determined that problems with contractor safety management constituted a critical factor in the incident and recommended a ban on multi-tiered subcontracting on so-called Seveso sites.³⁷

Other studies have reported similar findings in relation to temporary employment.^{38,39} A British study in 2000, for example, revealed that around half of the recruitment agencies surveyed did not have measures in place to ensure that they were fulfilling their legal obligations and that there was a widespread lack of awareness among agencies and host employers that responsibility for health and safety is, under current law, a shared one. It further found that agencies were frequently unaware whether host employers carried out risk assessments, and that the exchange of health and safety information between agencies and host employers was often poor.⁴⁰ More generally, a Parliamentary inquiry in the Australian state of Victoria,⁴¹ concluded that the use of 'labour hire arrangements' can complicate the co-ordination of work processes, including occupational health and safety standards, and that weak lines of communication between labour hire workers and agencies, and host employers and employees, can lead to the obfuscation of occupational health and safety responsibilities. In addition, it noted how the cost-sensitive nature of the labour hire industry could lead agencies to compromises or even non-compliance with OSH duties in relation to such matters as induction training and risk assessment.

Meanwhile, international research evidence on the OSH effects of outsourcing has produced remarkably consistent findings. For example, a 2008 review of 25 such studies found poorer OSH outcomes evidenced in all but two of them.⁴² Another review, focusing on the consequences for health and safety of the increased importance of supply chains in modern business practices, also found that a large majority of the studies it included identified poorer OSH management and outcomes as a result of outsourcing.⁴³

More specifically, these reviews reveal a considerable body of evidence showing that the types of work changes commonly resulting from supply chain pressures are linked to a variety of adverse health and health-related outcomes including increased incidence of cardiovascular disease, burnout and depression,^{44,45} as well as to poorer workplace safety outcomes.⁴⁶⁻⁵⁰ Thus, changes where such linkages have been identified include greater job insecurity, poorer pay, lowered access to training among precarious workers, and less control over working time,⁵¹⁻⁵⁶ while the reasons identified for them have included competitive pressures on subcontractors (resulting in corner-cutting, work intensification and excessive hours), and disorganisation (leading to, for example, more attenuated control systems in the workplace, under-resourced operators and undermined regulatory control).^{57,58}

Indeed, on the basis of an Australian investigation of the experiences of those working under subcontract/outsourcing arrangements in four sectors (childcare, hospitality, transport and building), the researchers involved reached the conclusion that they were associated with increased economic competition, as well as work disorganisation, regulatory failure and a divided workforce, and that in 'any organisation where outsourcing has become common, OHS standards deteriorate'.⁵⁸

There is also clear evidence of such adverse supply chain outcomes in the construction, food processing and maritime industries. In the case of construction, numerous studies have identified the widespread use of subcontracting and its often poor management as important contributors to the occurrence of accidents and associated injuries in the industry. In particular, financial and time pressures impinging on subcontractors, the lower levels of supervision and training provided to subcontractor personnel, as well as poor levels of communication with them and the problems of co-

ordinating the activities of subcontractors, have all been highlighted as important factors adversely affecting health and safety management on construction sites.^{57,59-61}

Studies undertaken in the food production and processing sector also amply demonstrate how the dynamics of supply chains act to create working environments within supplier organisations that engender risks to worker health and safety.⁶²⁻⁶⁴ They have, for example, revealed how supply chain relationships between supermarkets and their suppliers can lead to increased casualisation and agency working, unstable patterns of work and working time and work intensification, with one study concluding that:⁶⁵

... supermarkets add to the difficulties of managing health and safety as cost pressures and delivery requirements push companies towards using agency workers, increasing the pace of work and utilizing long working hours.

A recent study undertaken by the Equality and Human Rights Commission on recruitment and employment in the meat and poultry processing sector serves to reinforce such conclusions.²⁹ In finding evidence of the widespread poor treatment of agency workers, including in respect of health and safety, it found that the main reason for the use of such agency workers was to meet the demands of supermarkets. It went on to observe how a number of agencies felt that current profit margins did not allow for compliance with labour laws because of supermarkets 'driving their prices' and more generally noted that some of them thought 'the downward price pressures exerted by supermarkets and the way they went about ordering products from suppliers brought about conditions that supported unethical traders'.

Very similar dynamics and outcomes, in turn, emerge from research evidence shedding light on the way in which supply chains impact on the work experiences of seafarers. This evidence shows how the modern logistics of global supply chains have involved the employment of smaller crews, the use of faster ships and the redesign (and relocation) of ports to achieve shorter times spent on loading and unloading.^{66,67} It further highlights how these changes have prompted drives towards work intensification among a category of workers whose working conditions were already marked by long working hours, shift work, intensive work patterns and serious physical hazards,^{68,69} and among whom occupational mortality and morbidity rates are one of the highest for all occupations. In addition, clear evidence exists of a range of adverse work-related psycho-social health effects.^{70,71}

Explaining health and safety supply chain effects

The wider literature on the employment effects of outsourcing within supplier organisations indicates that they are intimately connected to the nature of supply relationships. It follows that to understand the effects of supply chains on health and safety, attention needs to be paid to how they are shaped by the nature of such relationships and the factors that influence those that develop in particular cases.

Forms of supply chain relationships

It has long been recognised that supply chain relationships can vary in terms of their nature.⁷² For example, Powell has drawn a distinction between two forms of externalisation, or contractualisation – 'market' and 'network' – and goes on to identify differences between them in terms of three sets of characteristics: the normative basis of compliance/co-operation; the primary means of inter-organisational communication used; and the methods adopted to resolve conflicts.⁷³ Other writers have drawn similar distinctions, although the terms used to describe the two categories identified have varied. For example, labels used to describe the second of the types of external relationship described by Powell include 'quasi-firm',⁷⁴ 'relational contracting',⁷⁵ 'dynamic network',⁷⁶ and 'obligational contractual relations'.⁷⁷

Perhaps the most widely used of these categorisations is that developed by Sako in an analysis aimed at shedding light on the relative competitiveness of Japanese and British manufacturing industries.⁷⁷ In this she juxtaposes the above-mentioned 'obligational contractual relations' (OCR) with 'arms-length relations' (ACR) as a means of establishing 'the ends of a multi-dimensional spectrum of possible trading relationships' that can exist between manufacturing buyers and suppliers. In doing so she views obligational relationships as being characterised by relatively lengthy and ongoing links, a substantial degree of mutual dependence and therefore a high degree of risk (and power) sharing, an emphasis on objectives that extend beyond issues of cost to embody a substantial focus on quality and innovation, and the presence of trust-based relationships which are in turn supportive of, and exist alongside, open communications and joint problem-solving behaviour. Meanwhile, transactional

relationships are seen to embody characteristics that effectively represent the mirror image of collaborative ones in that they are seen to be relatively short-term, to place a heavy emphasis on cost competitiveness, and to be less marked by trust-based relationships, power sharing, mutual dependence and joint problem-solving.

For Sako, the ACR and OCR contracting models lie at each end of a spectrum of trading relationships. A number of other analysts have effectively echoed this point concerning the way in which supply chain relationships take 'intermediate forms'. Adler, for example, has argued that all such relations can potentially embody elements of 'hierarchy', 'trust' and 'market' and that the central difference between them consequently resides in the different reliance placed on them.⁷⁸ At the same time, however, Adler further argues that while all three of these elements might be present in a particular inter-firm relationship, it needs to be recognised that within a capitalist society they operate 'under the overall predominance of the market'.

The upshot of such analyses is, therefore, that supply chain relationships vary considerably in terms of the extent to which they are of a trust-based and collaborative character and hence encompass co-operative (partnership) joint working, rather than more 'arms-length' and transactional relations. It follows from this that, from the perspective of health and safety, they are also likely to vary considerably with regard to how far they:

- encompass relational exchanges that extend beyond the merely transactional, and relatively distant, ordering of goods and services and hence potentially involve attempts to influence how health and safety is managed within supplier organisations
- embody a focus on cost minimisation and the imposition of delivery and other requirements that can engender the types of adverse indirect health and safety effects detailed above.

The determinants of supply chain relationships

A range of factors have been identified as shaping the nature and dynamics of supply chain relationships. In what follows the main factors are discussed through an exploration of three issues:

- the institutional context within which relations are established
- the outsourcing objectives of buyers
- the extent of mutuality that exists between the risks and interests of buyers and suppliers.

Institutional context

A number of pieces of research have identified that the wider institutional context within which supply chain relationships are established can exert an important influence over their nature. In doing so, this research has indicated that such contexts can differ in the extent to which they act to facilitate the establishment of collaborative, as opposed to more adversarial, relations between buyers and suppliers.

In an analysis of how 'institutionalised rule systems, particularly of technical standards' affect supplier relations in the British and German mining machinery and kitchen furniture industries, for example, Lane found that marked national differences existed in these systems which had significant implications for the relationships established between buyers and suppliers.^{79,80} In particular, she concluded that a number of aspects of the German institutional context served to support longer-term and closer relations between customers and suppliers, notably by easing the drawing up and interpretation of contracts and, more generally, reducing opportunism and risk among contracting parties. These aspects included the much more extensive use of industry technical standards, the creation of such standards, as well as rules on the 'standardisation of business terms in contractual relations' and 'market conduct' by trade associations to which all but the smallest firms belong, the degree to which this membership of associations supports contacts between firms, and the presence of a system of contract law which affords greater protection 'to the weaker party'.⁷⁹

In a similar vein, Sako's⁷⁷ study of the comparative competitiveness of the Japanese and British manufacturing industries, referred to above, also highlights that a number of features of the historical, cultural, financial and employment relations contexts of buyer and supplier relations in Japan serve to better support OCR-type relationships. For example, attention is drawn to how the Japanese legal framework not only insists on the exchange of written contracts intended to provide legal protection to weaker contracting parties, but also appeals to the reputation effect and moral responsibility of stronger parties to prevent them from abusing their market power, and offers informal dispute resolution services to facilitate the sustenance of trust relations. Indeed, because of

such differences, Sako concludes, perhaps somewhat controversially and pessimistically, that ‘it would be neither feasible nor desirable to adopt OCR-type supplier relations in Britain’.

Such studies therefore point to the fact that supply chain relationships are shaped not only by the narrow interests and exchanges between supply chain buyers and suppliers but also by the wider institutional context within which they operate. Developments in sectors which are the focus of interest in the current study add weight to this point.

In construction, the Construction (Design and Management) Regulations (CDM) 2007 not only provide clients with legally based encouragement to influence health and safety management within suppliers, but also appear to have met with some, albeit qualified, success in this regard.^{81,82} Meanwhile, with regard to the positive examples of major construction projects mentioned earlier, it can be noted that, because of their size, prominence and degree of risk, all of them were the subject of close scrutiny from regulatory inspection. In addition, their high profile and the major contractors involved provided opportunities for inspectors to exert influence on the design, management and execution of the activities involved, not least because of the reputational risks they encompassed. The available evidence suggests that these features helped ensure appropriate leadership and commitment from both clients and contractors as well as increased will and capacity on their part to monitor and audit compliance with OSH management standards. This also means, however, that the projects concerned should be viewed as exceptional in terms of the context within which they were undertaken. This is particularly so when it is borne in mind that, as shown in Chapter 4, the construction industry is dominated by small and micro enterprises, with around 80 per cent of employment within it being based in firms employing fewer than 250 people. Thus, in terms of composition, much of the industry cannot be viewed as operating in institutional contexts marked by high levels of regulatory attention and reputational risk. It is therefore unsurprising that one study on the influence of the CDM Regulations on the procurement and management of small building work suggested that they ‘left ambiguities, primarily through specified exclusions to application, through which health and safety responsibilities may be downplayed or even simply disregarded’.⁸³

Meanwhile, there would seem little doubt that the activities of the Ethical Trading Initiative and the Gangmasters Licensing Authority, notably the latter’s protocol on supermarkets and suppliers, have both served to raise the profile and importance of supply chain management issues in the food production and processing sector. Indeed, more widely, the extensive literature on global supply chains⁸⁴⁻⁸⁸ highlights how it has been the involvement of a range of actors, including social interest groups, trades unions and non-governmental organisations beyond the immediate supply relationship, that has acted to prompt and sustain initiatives to improve conditions for vulnerable workers at the end of such chains. Of particular note for present purposes is the fact that in the global food, garment and footwear industries, the business case for supply chain controls to improve health and safety conditions in the supplying farms and factories of the southern hemisphere has not been made directly from the improvement of the health of the workers concerned, or even from the possible increased efficiency and quality arising from this improvement. Rather, it has been made from the potential for improvement in the public image of the client and the consequent selling potential of its ‘labels’ in northern hemisphere markets, which otherwise might be threatened by bad publicity associated with the exposure by such actors of poor labour conditions in its supply chains.

The available evidence on the construction and food production and processing sectors consequently suggests that attempts to utilise supply chains positively to influence the employment conditions of workers have, for the most part, not emerged spontaneously from a narrow consideration of business interests and objectives. Instead, such attempts have been intimately connected to the way in which perceptions of these interests and objectives have been re-shaped by a range of external pressures, or drivers, which serve to increase the business risks associated with the operation of supply chains in both domestic and international contexts; pressures that have arisen not just as a result of legislative requirements and the actions of regulatory agencies, although these have played a role, but also from the activities of other groups and bodies in civil society.

A similar picture can be seen, albeit more indirectly, to emerge in relation to the maritime industry. Thus, the increased usage by ship owners of ‘flags of convenience’, as again noted in Chapter 4, can be seen to have occurred as a result of a desire on their part to register vessels in national jurisdictions marked by lower regulatory employment standards. Similarly, the increased reliance they have placed on the use of labour from developing economies has also reflected a cost-reduction logic and has evolved alongside evidence indicating that non-compliance with employment standards is far from uncommon in an industry where obvious difficulties exist with regard to regulating the

employment conditions of seafarers while at sea. As a result, the industry as a whole cannot be seen to be fundamentally shaped by the presence of strong institutional pressures to utilise supply chains to enhance labour standards. Yet, as explained in Chapter 4, there do seem good grounds for believing that examples of such pressures are likely to exist in the oil and chemical tanker trade because of the reputational risks faced by major chemical and oil companies flowing from civil society groups, most notably in relation to environmental protection.

The objectives of supply chain buyers

A substantial body of literature exists on the considerations that have informed the growing reliance on the outsourcing of the supply of goods and services.⁸⁹⁻⁹⁵ In general this indicates that the growth of outsourcing has been centrally driven by rational business logics which view outsourcing as contributing to improved competitiveness and financial performance through such means as cost reductions, enhanced production and service efficiency and quality and the transference of business risks onto others, be these the suppliers of products, services or labour, or the workers engaged in the relevant work activities.

Existing survey evidence supports the view that a number of different motivations inform the use of outsourcing. In the 2004 Workplace Employment Relations Survey, for example, when managers were asked why services had been outsourced, the most common responses given were to achieve cost savings (47 per cent), to gain an improved service (43 per cent), to achieve a greater 'focus on core business activities' (30 per cent) and to 'acquire greater flexibility' (10 per cent).⁹⁶ It would further seem, on the basis of existing evidence, that such factors are frequently interrelated.⁹⁷ Thus, in a manufacturing-based study undertaken in the USA, Harrison & Kelley found that the three main reasons for outsourcing were 'capacity constraints limiting expansion', 'access to specialised skills and tools not available at the plant' and 'cost cutting'.⁹⁸ However, they further found that these motivations were not necessarily mutually exclusive, as the following quote illustrates:⁹⁸

... even where managers do cite cost-cutting as a rationale, it is rarely separable from the motivation to transcend perceived capacity constraints. In more than three out of four cases where labor costs were important to the decision to subcontract, a capacity or technology constraint was also reported by management to at least temporarily limit expansion at the plant.

It is further clear that the objectives of buyers do have potentially important implications for the type of relations they seek to, and do, establish with suppliers. In one study, for example, Cousins & Lawson found that the adoption by buyers of a 'leverage sourcing strategy' (that is one which attempts to gain access to a cost or price advantage in relation to the purchase of items that, while of strategic importance, have little supply risk) was not statistically related to collaborative supply chain relations.⁹⁹ In contrast, such relations were found to be statistically associated with the adoption of a 'critical sourcing strategy' in respect of 'scarce and/or high-valued items that have a high profit impact and high supply risk'.

A linkage between the scope and intensity of buyer-supplier interactions and relations has also been found in a number of other studies. For example, in a survey of manufacturing organisations undertaken by Heide & John, the existence of 'joint action' between buyers and suppliers, and 'verification efforts' by the former, were associated with the percentage of end product value accounted for by the component being supplied, an inability to forecast technical requirements accurately, and the existence of difficulty in measuring supplier compliance with expected outputs.¹⁰⁰

Given these differing motivations, and in particular the fact that a reduction in labour costs is not necessarily a prime motivator, it cannot be straightforwardly assumed that outsourcing necessarily has adverse implications for health and safety standards among supply chain providers. It would, however, seem reasonable to conclude that proactive attempts on the part of buyers to protect and enhance such standards are likely to be most common where the issue is viewed as being intimately connected to the business objectives underlying their outsourcing strategies and policies – for example, when good standards of health and safety are considered to play a potentially important role in ensuring that outsourced goods and services are provided reliably and to an appropriate standard. In addition, the fact that a desire to reduce costs can potentially exist alongside other more 'qualitative' objectives also suggests that proactive (positive) action of this type can exist alongside price-based pressures which at the same time act to challenge existing standards of health and safety within supplier organisations.

The observations made in the preceding section regarding the role of reputation risks in prompting some purchasers to take an active interest in how health and safety is managed by their suppliers in the

construction, food production and maritime industries can be seen to fit well with the suggestion that considerations of business criticality are important in influencing supply chain strategies. In addition, existing knowledge relating to the first two of these sectors adds further weight to the view that such an interest can exist alongside contradictory pressures that are more problematic in OSH terms.

With regard to the procurement of contractors in construction, for example, there is some evidence pointing to the fact that health and safety, along with issues relating to financial soundness, technical ability, and management capability, are the most common issues considered by procurers during the pre-qualification and bid processes.^{101,102} In general, however, the available evidence suggests that while contractor experience, quality record and reputation are the most influential criteria for selecting contractors at the pre-qualification stage, tender price exerts the most significant influence over the eventual subcontract award. These findings therefore further point to the need to take care not to extrapolate too widely from the positive supply chain effects found in the case of some large-scale construction projects, since they arguably imply that, in the absence of strong countervailing forces pushing in the opposite direction, health and safety considerations often play a relatively junior role in subcontracting decisions within construction.

Turning to the food production and processing sector, research also indicates that health and safety, while being an issue of interest to some procurers, may also be 'trumped' by other more business-critical considerations. Supermarkets, for example, have been found to pay more attention to food hygiene rather than OSH issues when auditing suppliers.⁶⁵ Furthermore, pressures on suppliers to manage health and safety effectively have been found to exist alongside strong downward cost pressures that serve to encourage suppliers to develop employment regimes which generate the types of adverse, indirect health and safety outcomes detailed earlier.²⁹

Taken together, such findings therefore point to the fact that in both the construction and food production and processing industries, proactive supply chain actions on the part of purchasers in respect of health and safety do not necessarily say much about the priority accorded to the issue relative to other business considerations. They also reinforce the point that any benefits of such proactive actions can potentially be outweighed by the negative health and safety effects flowing from the need on the part of suppliers to operate employment regimes compatible with the downward cost pressures exerted by purchasers.

Mutuality of buyer and supplier interests

The responsiveness of suppliers to the demands of buyers, both at the pre-contractual stage and subsequently, cannot be sensibly considered in isolation from the implications that these demands have for their own business interests. In line with this point, the balance of dependency between buyers and sellers has been particularly identified as exerting an important influence over the relationships established between them.

A fear of too great a dependency may lead suppliers to resist an over-close involvement with buyers. On the other hand, the existence of a high degree of such dependency may lead to willing compliance with buyer demands. In a similar vein, a low level of supplier dependency can lead them to resist to some extent the demands made by buyers. For example, a failure of a security contractor to respond to a request to provide health and safety training for emergency procedures noted in one study was observed to reflect the fact that the contract concerned 'was not important to the overall success of its business'.⁸ Meanwhile, where suppliers constitute an important source of specialist expertise/knowledge, then buyers may be in a position of relatively high dependency, with the result that they may not be well placed to gain a substantial degree of influence over the supply relationships established.³

The balance of dependency between buyers and suppliers can consequently serve significantly to shape the nature and dynamics of immediate supply chain relationships by having important implications for the distribution of power and risk within supply chains.¹⁰³ As a result, it can influence such matters as how far suppliers (rather than buyers) shape the terms on which they undertake work and the degree to which they are willing to take heed of, and comply with, buyer requirements. It can also exert an important influence over the scope that exists to establish collaborative, partnership-based relations.

Against this backcloth, within the food production and processing sector existing research clearly indicates that large supermarket chains often occupy a relatively powerful position vis-à-vis their suppliers and hence have a potential capacity to influence their health and safety policies and

practices, as well as their wider employment arrangements. Indeed, evidence relating to supermarket-supplier relationships more generally strongly reinforces this. In 2000, for example, the Competition Commission found that certain practices of large supermarkets in relation to their suppliers ‘were operating against the public interest’; a conclusion that led to the establishment of a Supermarkets Code of Practice covering such issues as standard terms of business, prices and payments, and consumer complaints.¹⁰⁴ Subsequently, in 2006, the Commission undertook another investigation, the findings of which led it to conclude that a number of problematic behaviours on the part of supermarkets would, if left unchecked, reduce suppliers’ ability and incentive to invest and innovate – which in turn could act to the consumers’ detriment.¹⁰⁵ In addition, in the light of its findings, the Commission set up a new statutory code, the Groceries Supply Code of Practice, covering all large retailers with a turnover of more than £1 billion. It unsuccessfully sought the agreement of large retailers to establish an Ombudsman to monitor and enforce compliance with the code; a failure that has resulted in the present government committing itself to introducing, through legislation, a Groceries Code Adjudicator.¹⁰⁶

Furthermore, there are good grounds for believing that large construction clients and companies often occupy a similarly powerful supply chain position. The examples of the successful management of health and safety in large-scale construction projects mentioned earlier point in this direction. The composition of the industry similarly does so given that, as highlighted in Chapter 4, while the vast majority of firms in it employ fewer than 10 workers, a quarter of the industry’s output is generated by fewer than 125 large companies which each employ 600 or more people.

As to the maritime industry, the situation is less clear. However, given estimates indicating that multinationals are responsible for around 70 per cent of world trade, there would seem to be good grounds for suggesting that such corporations will often be in a position potentially to influence the health and safety arrangements of ship operators based on what is a highly competitive industry marked by an excess of capacity.

Conclusions

Overall, then, the existing evidence lends support to the propositions advanced by Walters & James,¹ summarised in the Introduction to this report (see Chapter 1).

It indicates that a combination of managerial disorganisation arising from outsourcing and associated commercial pressures within supply chains can generate adverse health and safety outcomes in supplier organisations. Such outcomes encompass higher rates of worker injury and a range of negative occupational health outcomes prompted by commercially driven work re-organisation that gives rise to greater job insecurity, work intensification, less control over working time and poorer pay.

Paradoxically, these situations occur against the background of a growing interest among policy makers and practitioners in the role that powerful supply chain actors can potentially play in improving supplier health and safety management and performance. On the basis of existing evidence, it would seem that such potential does indeed exist to utilise supply chains in this way. At the same time, however, while a range of attempts to so use them can be identified, their detailed nature, how far they have been successful and what factors influence their impact, for the most part remain unclear.

More generally, it seems that care needs to be taken not overly to generalise either the extent to which supply relationships generate adverse health and safety outcomes or the potential that exists for them to be used positively to influence supplier health and safety management and performance. Thus, as has been seen in the existing literature, such relationships vary considerably in terms of their nature and, in particular, with regard to their length; how far they extend beyond narrow, price-based, economic transactions to encompass deeper, more relational dynamics potentially based on high levels of mutuality, collaboration and trust; and the balances of dependency and power they embody. As a result, they must also be viewed as encompassing considerable variety in terms of both the degree to which they prompt downward pressures on employment conditions within supplier organisations and the potential which exists for them to be used to support improved health and safety management and performance. Indeed, it is clear that such pressures can potentially exist alongside purchasers’ attempts to influence positively how health and safety is managed by their suppliers – a combination that raises the possibility that in some cases purchaser–supplier relationships may simultaneously generate adverse occupational health outcomes, while also apparently acting to improve the management of safety. It was to explore the dynamics of some of these issues, in situations in which it is likely that positive supply chain pressures to improve health and safety practice among suppliers are operational, that the case studies reported in the following sections were undertaken.

It is further clear that how purchaser–supplier relationships impact on supplier health and safety and the willingness of purchasers proactively to seek to influence it are both intimately connected to the business interests and distribution of power embedded within them, and the wider institutional context within which they are established. The available evidence indicates, for example, that the importance of non-price objectives relating to such matters as quality and the gaining of access to specialist skills that are important to purchasers, as well as the complexity of the goods and services to be supplied and their business criticality, are all factors exerting an important potential influence over the willingness of buyers to intervene to influence the internal operations of suppliers.

All this said, previous literature when considered as a whole suggests that only in relatively narrowly defined circumstances will market-based business motivations alone serve to encourage the proactive use of supply chains to improve health and safety standards within their suppliers. Indeed, it points to the fact that such interventions on the part of purchasers are most likely to occur in the face of non-market external pressures stemming from such sources as relevant legislative requirements and liabilities, meaningful scrutiny from inspection agencies and, as the examples provided relating to global supply chain developments demonstrate, action from civil society groups and agencies that give rise to reputational risks. The extent to which we have found this to be the case in the situations we have studied is also explored in subsequent chapters.

It is additionally clear that such general observations about the role of supply chains in influencing health and safety management and performance in supplier organisations would seem generally applicable to the two sectors, construction and shipping, which are the specific focus of this study, as well as to food processing and production. It is clear, for example, from the evidence reviewed that in each of them there are grounds for believing that negative, indirect supply chain effects are apparent. It is also clear that such chains are at times used by large, powerful purchasers to influence positively and directly how health and safety is managed by their suppliers, with some limited evidence pointing to the utility of this usage.

Furthermore, there would seem to be grounds for concluding that such attempts positively to influence supplier health and safety arrangements arise as a result of the presence of a combination of business considerations and surrounding institutional contexts that act to encourage their development. It also seems that they can exist alongside the presence of downward cost pressures that have the potential to affect adversely the working conditions of those working in supplier organisations.

The fact remains, however, that, as is the case more widely, existing evidence does not provide a sound and detailed understanding of the factors that influence the development of such proactive initiatives aimed at influencing health and safety within supplying organisations, the extent to which they are successful and the conditions under which they do generate beneficial outcomes. In the following chapters we hope to go some way towards remedying this lack of understanding through a detailed examination of several examples of potentially positive supply chain influences on OSH management among suppliers.

3 Methods

In this research a mix of methods was used to investigate propositions derived from a previous extensive review of the literature on supply chain relations and health and safety management and performance (summarised in Chapter 1).¹ This section first presents a brief account of the research design, with some caveats concerning the limitations of the methodological approach adopted in the field. This is followed by an outline of the four situations in which supply chain effects of organisational arrangements for health and safety were examined, the aims of the research approach in each case and the methods used to collect and analyse our data. Finally, a brief account is presented of the methods used in the stakeholder interviews also undertaken in the fieldwork in order to develop some broader perspectives on the findings.

Research design

The primary aim of the research was to deliver a detailed, empirical study of supply chain relationships and the factors that influence the presence, and outcomes, of attempts to use them as leverage to shape positively the way in which health and safety is managed by suppliers. Within this overall aim, the study's objective was to test the propositions (see Chapter 1) derived from our previous study¹ relating to the sources of such influence, with a view to identifying the extent of their validity and exploring any further avenues of influence.

Given the intention that the study make a contribution to future policy debates on both the management and regulation of such supply chain relations and their influence on OSH, it was further important for attention to be focused on the supply chain relations likely to generate lessons that can contribute to the development of initiatives with potentially significant health and safety benefits. This consideration, in turn, led us to wish to investigate supply chains involved in sectors where there were relatively high-risk work activities. In designing the research, therefore, two such sectors were selected: construction and the maritime industry, in which injury and fatality rates are a cause of widespread concern. They are also sectors which, because of structural and organisational features of the employment and business relations within them, are unusually difficult to reach with conventional approaches to regulatory inspection. Moreover, they are sectors exhibiting marked differences in relation to the types of supply chain characteristics commonly found within them.

In order to explore further possible differences in the effects of supply chain relations and to address the propositions outlined in the Introduction, we chose to examine two sets of supply chain relationships in each of the two sectors. As a result, the study supports both 'within sector' and 'cross sector' comparisons, allowing for insights not only into the influences exerted on the structure and dynamics of supply chains by sectoral-level factors such as the nature of product market competition, surrounding regulatory arrangements and labour market conditions, but also those stemming from variations in management attitudes, strategies and policies.

The primary focus of the fieldwork within each of the four sectoral-based studies was on the in-depth study of relationships between those at the head of supply chains and their 'first tier' suppliers. This decision reflected four considerations. First, a recognition, amply supported in our earlier conducted literature review,¹ that an adequate understanding of the 'how' and 'why' of supply chain operation cannot be gained unless such chains are investigated in a detailed and contextualised way. Second, as this literature review also highlighted, that it is the behaviour of those at the 'head of supply chains' that typically exerts the most important influence over what happens within them. Third, that gaining such a contextualised view is likely to be problematic 'along the length of a supply chain' given the difficulties associated with obtaining the required level of co-operation needed from all the organisations involved. Fourth, we reasoned that it was important that the operation of supply chain effects be explored from the perspective of both managers and workers in the light of evidence suggesting that these perspectives can vary widely. This said, in practice in the fieldwork undertaken in the construction sector we were able to examine supply chain relations with second-and third-tier contractors, while in the maritime sector use of field data gathered in the course of several long-distance sea voyages provided a rich source of information on the perspectives and practices of seafarers of all ranks concerning supply chain effects on their work practices.

In the construction industry we considered two different construction projects undertaken by the same contractor. In the first of these we anticipated finding some strong evidence of the propositions of Walters & James¹ in operation because of the unusually high profile and external scrutiny of the safety arrangements and performance in the construction activities involved. The second project, although it was a large build, was not subject to anything like the same level of external scrutiny. In

such circumstances we reasoned that it would be interesting to test the extent to which the propositions applied in this situation and to seek explanations for any differences observed.

In the maritime sector we examined a situation (in the oil and chemical tanker trade) in which we thought it likely we would find supply chain relations that were relatively simple and long-standing, with similarities to the ‘obligational contractual relation’ type of relationship classically described by Sako⁷⁷ and where the operation of the propositions of Walters & James¹ might be anticipated. Alongside this we undertook a second study in a different trade (container shipping) in which supply chain relations were considerably more ‘arms-length’ and transactional in nature. This second case study therefore focused attention on the supports and constraints relating to the transferability of supply chain management strategies to promote OSH at sea to other trades in the sector. In this way, through an examination of the same elements of external and internal influence on the systematic management of health and safety within the supply chain of labour and services in this second example, we were able to compare and contrast experiences in very different supply chain situations in the same industry. As a result, we were able not only to test the key propositions identified previously, but also to gain a better understanding concerning (a) the preconditions for the success of such strategies and (b) the role of critical external and internal drivers in achieving and sustaining such success.

Caveats

‘Opportunist and indicative’ research

In undertaking field research on industries not noted for their ease of access, located as they are in diverse and geographically separated settings, we were obliged to be flexible and accommodating in our approach to research design. At the same time, with limited resources and operating within significant time constraints, we were further obliged to be both opportunist and creative in our approach to gaining access to field situations and in undertaking research when in them. This led us to adopt a mix of methods in our fieldwork, drawing our data from situations and in ways that varied according to circumstances, on a case-by-case basis. The methodological inconsistency thus engendered, which purists in social science research methodologies will be quick to note, can be seen to limit the extent of strict comparability in the analysis of the findings we have drawn from the case studies undertaken. However, we believe that despite this limitation our approach has generated findings that are of sufficient intrinsic interest overall to justify the varying data collection approaches we have used. As Eysenck famously stated in relation to studying social phenomena, ‘sometimes we simply have to keep our eyes open and look carefully at individual cases – not in the hope of proving anything, but rather in the hope of learning something!’¹⁰⁷ We have done so in each of our cases and we think that the lessons thus learned in our analysis of these experiences are both valuable in their own right and applicable to the propositions we have set out to test.

The range of supply chain relations

In each of the two sectors we originally intended to include:

- types of supply chain activities that differed significantly in terms of the likely ‘business criticality’ of health and safety issues within them
- buyer–supplier relationships that varied with regard to their length, the distribution of power within them and the degree of mutual dependency they embodied
- buyer demands on suppliers that varied in terms of the intensity and relative importance of ‘price based’ considerations
- buyer–supplier relationships that differed with regard to the presence or absence of attempts to influence supplier health and safety management and the nature of such attempts
- supply chain relations that were established against the background of markedly different regulatory contexts.

Overall, we think we have considered situations that reflect these issues. This was especially so in the maritime sector where the structure, organisation and business arrangements in the two trades we studied were very different and where the role of supply chain influences on health and safety management practices also differed greatly in significance, as we shall argue, because of these organisational, structural and business differences. However, in the case of the construction industry it should be acknowledged that the two examples we studied were in many respects organisationally and structurally quite similar, with both close to the model of supply chain management in which buyers attempt to use their business relationship with suppliers to influence their health and safety

management practices. The principal contractor that was the subject of study in both cases was a high-profile firm with a publicly stated strong commitment to improving safety standards. Nevertheless, this similarity did have an important advantage in that it enabled us to explore how far the behaviour of this contractor varied against the backcloth of different situational contexts – the high-profile Olympic Park and a rather more typical ‘large build’ construction project, where there was less of a widely publicised and overt commitment to ensuring safety.

Field research methods

In this section we outline the methods we used to gather data in the four workplace cases.

Review of documentary sources

In both sectors relevant documentary sources were scrutinised in order to inform the development of interview schedules for the collection of data in the field. These included the material reviewed to provide the industry profiles and OSH practice and performance analysis presented in the following chapter. In addition to this and more specific to the case studies themselves, however, were materials concerning company organisation, policies, practices and outcomes, including those addressing health and safety, and those on other aspects of company organisation and business. This was generally documentation produced by the companies themselves – both buyer and supplier organisations – as well as additional relevant materials from regulators and other parties involved with the scrutiny of company activities. In certain cases, such as for example in the case of the Olympic Park where the wider profile of the work activity we were investigating was considerable, these additional sources of relevant material were very extensive.

The aims of the case studies

The main aim of our case studies was to assess the impact of the supply chain strategies of procurers on occupational health and safety management and performance among their contractors. In each case we wished to explore how significant features of the relationships between the procurer and their suppliers influenced the delivery of effective health and safety management. A second, related aim was to explore how these relationships, and the structures and dynamics of the supply chain within which they were embedded, were themselves shaped by sector-level factors such as the nature of market competition, surrounding regulatory arrangements, labour market conditions, leadership and management attitudes, strategies and policies and other external influences like public profile and reputational risk. Fulfilling these aims enabled the realisation of a third aim, which was to explore the preconditions for the transferability and sustainability of good practice in health and safety management in the sectors concerned.

The intention of the four case studies was, in short, to gain an adequate understanding of the ‘how’ and ‘why’ of supply chain operation in influencing OSH management by evaluating how those at the head of a supply chain influence what happens within it. Therefore the investigations included exploring the role of leadership, procurement strategies, systematic management, certification systems, communication, worker involvement, inspection and audit in securing good practice in health and safety management, and performance in the supply of labour and services. The operation of these factors was investigated both in the relationship between the contractor and the procurer and in that between the contractor and the firms it had contracted as second- and lower-tier contractors engaged in the delivery of its work programme. In so doing we investigated the reasons for the success of the strategies of the procurer/principal contractor in securing and maintaining high standards of health and safety management. We also examined the external and internal drivers that contributed to this success and which helped determine its sustainability and transferability to other parts of the sector. To achieve this, three of the four case studies (1, 2 and 4) involved semi-structured interviews (or group discussions where appropriate). For these case studies, participants were approached through their organisations and provided with copies of the study information sheet, summary leaflet and consent form (see Annex) in advance. Consent was obtained from each individual prior to interview. In the other case study (3), existing data (collected in a broadly similar way) were re-analysed (see below).

The construction sector case studies

In accordance with the research design, the two studies undertaken in the construction industry both focused on the same contractor (an organisation we have chosen to call TitanCF Industries). This company was a large well-established construction engineering company. In the first case study we explored its role as one of the principal contractors on the Olympic Park. Our second case study examined its role in a large inner city development and regeneration scheme.

Case study 1: The Olympic Park

On the Olympic Park, TitanCF Industries was selected, following discussions between the research team and the Olympic Delivery Authority (ODA) Learning Legacy Project team, while the lower-tier contractors were selected and approached by TitanCF Industries, again following discussions with the researchers. TitanCF Industries began work on the Olympic Park at the outset of the project and so was involved in the preparation work. At the time the interviews were conducted, the organisation was focused on the infrastructure of the Park and was involved in the construction of bridges, roads and underpasses and landscaping. As a general rule the company used subcontractors primarily for very specialised work and would tend to carry out tasks such as landscaping with its directly employed labour. On the Park, however, the company had been encouraged to contract out this work, and the participating subcontractors in this case study were primarily involved in landscaping. Table 1 gives outline details of the organisations that took part in the research in the Olympic Park case study.

Table 1
Participating organisations in the Olympic Park case study

Tier	Approximate overall number of employees	Business type
1	3,000	Civil engineering
2	500	Commercial landscaping
2	100	Landscaping and engineering
2	100	Marine-based civil engineering, dredging and remediation
3	100	Water features, irrigation and waste water treatment
3	200	Commercial grounds maintenance, gardening and landscaping
3	500	Civil engineering

Interviews and group discussions were carried out at the ODA London offices and on the Olympic Park itself between September 2010 and March 2011. In total 27 people took part in the case study across 21 interview or group discussion sessions: five from the head of the supply chain; nine from the Tier 1 contractor; eight from the Tier 2 level; and seven from the Tier 3 level (this includes one individual employed at Tier 2 but acting as a health and safety adviser at both Tier 2 and Tier 3 levels). The positions of all the participants are given in Table 2.

Table 2
Positions of the Olympic Park interview participants

Interview number	Position
Procurer – head of supply chain	
1	Head of health and safety
2	Deputy head of procurement
3	Director of construction
4	Head of procurement
	Deputy head of procurement
Supplier and procurer – Tier 1	
5	Contract manager
6	Procurement manager
7	Health and safety manager
8	Project manager
9	Contract manager
10	Supervisor
	Supervisor
11	Worker
	Worker

Interview number	Position
Supplier and procurer – Tier 2	
12	Supervisor
13	Manager (link to Tier 1 and Tier 3)
14	Health and safety adviser (Tier 2, and also for Tier 3)
15	Procurement manager
18	Project manager
19	Worker
	Worker
20	Supervisor
Supplier – Tier 3	
16	Manager (link to T2)
14	Health and safety adviser (Tier 2, and also for Tier 3)
17	Project/Procurement manager
20	Supervisor
	Supervisor
21	Worker
	Worker

Table 2 (contd.)
Positions of the Olympic Park interview participants

Case study 2: The Forum Development project

In the second construction case study, TitanCF Industries began work at the Forum Development site at the outset of the project and at the time the interviews were conducted for this study it was focused on the infrastructure of the site. The Forum Development was a large infrastructure and mixed building project on a 67-acre site at an inner city location. It was undertaken by a partnership between a developer and the owners of the land on which the building work was taking place. Together we have referred to these parties as the Rome Consortium; although the developer was the active partner and the one that took part in our interviews. The Rome Consortium employed a group of organisations to deal with logistics, data collection and other site and project-wide activities. We have referred to these organisations collectively as SPQR – the delivery partner. Table 3 gives outline details of the organisations that took part in the Forum Development case study.

Tier	Approximate overall number of employees	Business type
1	3,000	Civil engineering
2	200	Labour supply for civil engineering
2	3,000	Multi-utility company
3	50	Civil engineering

Table 3
Participating organisations in the Forum Development case study

Interviews and group discussions were carried out on site in May 2011. In total 10 people took part in the study across seven interview or group discussion sessions: one from the head of the supply chain; four from the Tier 1 contractor; four from the Tier 2 level; and one from the Tier 3 level. The positions of all the participants are given in Table 4.

Table 4
Positions of the
interview
participants in the
Forum
Development case
study

Interview number	Position
Procurer – head of supply chain	
1	Project manager
Supplier and procurer – Tier 1	
2	Project manager
3	Construction manager
4	General foreman
5	OSH adviser
Supplier and procurer – Tier 2	
6	Project manager
	Procurement manager and OSH adviser
7	Worker
	Worker
Supplier – Tier 3	
6	Supervisor

The maritime sector case studies

The maritime industry is highly segmented and the distinct trades of which it is constituted are very different in the ways in which they are organised and conduct business (see Chapter 4). We selected two trades where we anticipated finding such differences reflected in the features of the supply chains in which we were interested. Thus, we collected data from tanker companies and their trade organisations in which we anticipated finding simple supply chain relations between charterers and ship operators, and from the container trade in which relations are more complex.

Negotiating access to shipping companies, their personnel and the organisations with which they do business is not easy. Asking them questions about the nature of their business relations with charterers is even more difficult. To conduct meaningful interviews with seafarers themselves in the course of their work presents further substantial challenges for researcher access. To gather the data we required, therefore, needed an innovative and opportunist approach to fieldwork. To achieve this we approached the collection of field data at several levels.

Case study 3: The tanker trade

In our first maritime sector case study we explored perceptions among independent tanker operators and their crews of the influences that the strategies of major oil companies have on their health and safety management arrangements. Following a review of the relevant literature, it was evident that major oil companies had a strong interest in these matters and a range of systems in place requiring appropriate health and safety management on board the tankers they chartered to carry their products. We were able to analyse two extensive qualitative data sets collected to examine health and safety management practices on board oil and chemical tankers for these perceptions of supply chain effects.* There were four companies involved, two of which were large global traders and two others, which were both Chinese companies, trading on Asian routes. Some of the companies involved operated chemical tankers as well as oil tankers and, in the case of the Chinese companies, research voyages were conducted on these vessels as well as on oil tankers. However, since the seafarers on these vessels had usually also sailed on oil tankers, their responses to questions involving supply chain effects were generally based on their experiences on the latter.

In each case we explored the operation of such influences on arrangements for health and safety management on board ships from the perspective of both officers and ratings as well as the management of the ship operating companies concerned.

* The original data were collected in the course of two PhD investigations undertaken under our supervision by Syamantak Bhattacharya (in 2006) and Conghua Xue (in 2009). With the co-operation of Bhattacharya and Xue, we were able to re-analyse these data specifically for supply chain influences that had not been previously sought from the data.

In the course of their combined fieldwork, Bhattacharya & Xue interviewed nearly 120 seafarers while sailing with them on board eight different vessels. They also interviewed 23 shore-based managers in the four companies responsible for operating these vessels. Among other things, the resulting data contained a rich source of information on ship operating companies' strategies in relation to OSH management and seafarers' experiences of them on board ships. This especially included the experience of the operation of systems to implement the International Safety Management (ISM) Code, covering reporting and communication systems for safety management, inspection practices and audit and review, as well as the involvement of the seafarers themselves in securing good practice on board the tankers on which they sailed. In all cases, supply chain influences were identified by respondents in response to wider questions on the influences on shipboard management arrangements for OSH. Although the questions asked were different in both studies, there were substantial overlaps in the responses they elicited. In the analysis presented here we have focused solely on the material volunteered by respondents concerning supply chain influences on health and safety management practices.

Case study 4: The container trade

In our second maritime sector case study we examined the activities of a ship management company which, among other things, was responsible for the management of a fleet of ships engaged in the container trade between Europe and North America. Interviews were conducted in the offices of the ship management company (which we have called Eagle Shipping), where we interviewed the eight senior staff responsible for procurement, safety management, contract compliance, auditing and ship inspections. Additionally, we undertook a transatlantic voyage aboard one of the container vessels managed by Eagle (we have renamed it the *Sea Hawk*), which was operated by a second company (we have called this company QPR). On board we interviewed all of the ship's senior officers, and a representative selection of junior officers and ratings – 14 interviews in all. Informal contact with QPR staff occurred incidentally aboard the vessel and on arriving at, and departing from, the vessel. A third company owned the vessel (we have called this company Griffin). However, in the eyes of both the ship management company and the seafarers, the engagement and influence of this company with the management of health and safety onboard ship was negligible and we therefore deemed it unnecessary to undertake interviews with its representatives.

Interviews with informants at sectoral levels

In both sectors, key informants representing employer/employee organisations, trade bodies, trades unions and regulators were also interviewed following completion of the four case studies. The purpose of these interviews was to gain further insight into the generalisability and more general validity of the findings obtained through the case studies. Again, we have not named the personnel or identified their positions within their organisations as this would allow for deductive disclosure of identities. Altogether 12 such key informants were interviewed. In most cases the interview took the form of a fairly open discussion based around our propositions and the issues that participants in the case studies had found significant.

Research instruments

The formulation of the interview schedules was informed by the findings of our earlier review of the literature, as well as by the more general aim of testing the propositions that we derived from this review and detailed in the protocol for the study overall. Study protocols and information sheets were produced for the project overall and adapted for each sector. Examples of the interview schedules and prompts used in the study are found in the Annex.

Data analysis

All formal interviews were tape-recorded and written transcripts were produced. They were coded prior to further analysis, using a thematic framework, through NVivo software to identify and code issues of relevance to determining supply chain influence and addressing the research questions. Throughout the analysis considerable attention was paid to the triangulation of data and the facilitation of carrying out 'within sector' and 'cross sector' comparisons. To this end, the case study and key informant data were considered at the individual, sectoral and project levels. This involved the research team members for each case study working both independently and collaboratively throughout the analysis process.

Confidentiality

The confidentiality of all participants in the study was respected. Cardiff University has a well-developed and rigorous system for scrutiny of research proposals for ethical approval and its procedures were adhered to. All interviews carried out during the case studies were therefore undertaken on a confidential basis and care was taken to ensure that the confidentiality of interviewees was preserved as far as possible. To this end, transcripts of interviews were stored electronically on an anonymous basis

and password-protected. This said, one of the case studies was carried out on the Olympic Park. This high-profile sports facilities building project was unique in the UK. Its identity was therefore impossible to disguise. Indeed, the high profile of the building work on the Olympic Park was among the reasons why we selected it as a suitable case in which to explore the conditions that mediate the effects of supply chain influences on health and safety management, practices and experiences. Moreover, agreement with the ODA enabling the research allowed it to incorporate an account of some of our early findings into the dissemination of examples of its Learning Legacy strategies during the course of the project.¹⁰⁸ Despite this, we have endeavoured to make anonymous the principal contractor on which our case study focused as well as all of the lower-tier contracting organisations that took part in the study and each of the individuals we interviewed, following the same procedures in this respect as those in the other case studies reported here.

4 Construction, shipping and occupational safety and health

This chapter seeks to outline and contextualise the detailed qualitative findings obtained from the four case studies undertaken. It begins by providing background information on the structural and organisational features of the two industries from which the studies are drawn that have implications for health and safety management and performance within them. The chapter then moves on to outline what is known about standards of health and safety performance in these industries, as well as the companies that headed the supply chains studied. Finally, the chapter outlines the sources of information that were available to the research team regarding the health and safety effects of these supply chains. It outlines the way in which the supply chains were structured in each case and briefly describes the salient features of their effects on health and safety practices.

Structural and organisational features of the two industries

This section considers the structure and organisation of the two industries and reviews recent trends in their development that present some challenges for the regulation and management of OSH.

Construction

Current figures suggest that approximately 8 per cent of the workforce in Britain work in the construction sector.¹⁰⁹ This means that there are over 2.5 million people working in the industry in over 300,000 enterprises,¹⁰⁹ making it one of the largest industrial sectors in the UK according to Office for National Statistics (ONS) figures quoted by the HSE in 2009.¹¹⁰ It is also significant in the national economy: in 2008 construction output for Great Britain was approximately £123.6 billion and it contributed around 6 per cent of gross domestic product (ONS figures, quoted in HSE 2009).¹¹⁰ In 2009 the HSE gave this description of the sector:¹¹⁰

Projects and sites are ephemeral in nature, constantly changing in status, covering a huge range of construction processes of varying complexity and scale. The work processes and people change almost daily on sites. Projects involve those who procure, design, specify, manage and maintain buildings and structures as well as those who undertake the process of building them – the supply chain. ‘Construction’ ranges from large, high profile projects such as Heathrow Terminal 5 and the Glasgow Commonwealth Games facilities carried out by major principal contractors for large, competent clients, to small refurbishment projects of shops and domestic roof repairs undertaken by a self-employed contractor.

Overall the industry follows a ‘top-down’ structure, with principal contractors subcontracting very significant proportions of projects. Much of the workforce is mobile, with 54 per cent having worked outside their current region of employment and over one third (35 per cent) working as owner-managers.¹⁰⁹ Employment is often short-term and informal, with perhaps 600,000 informally employed in the sector, and there is significant employment of foreign/migrant workers (conservatively estimated at about 8 per cent of the construction workforce).¹¹⁰ In addition, contingent forms of employment, such as subcontracting and agency contracts have long been widely used in the industry,¹¹¹ which is increasingly characterised by such flexible forms of employment (including employment by gangmasters, conservatively estimated at around 3 per cent of construction workers) and by self-employment (both genuine and bogus; at least 40 per cent of workers are self-employed or covered by the Construction Industry Scheme for tax, and in London the level of self-employment is approaching 90 per cent).¹¹²

This trend towards contingent employment is further confirmed by recent work carried out by MacKenzie and colleagues¹¹³ which showed that 98 per cent of the (220 enterprise-size stratified) construction firms surveyed reported using subcontract labour, and 41 per cent reported using agency staff, with most reporting increases in the volume of work allocated via these contracts and many also reporting increases in the range of tasks covered by them in the previous five years. The authors went on to argue that the UK employment model, with its minimal levels of regulation on contingent forms of employment, in fact encourages employers to use such contracts to protect themselves against the risks of unpredictable market conditions. This is of particular concern during recession and economic crisis, leading to widespread redundancies throughout the sector. For example, ONS figures show that the total volume of construction output fell by 4.1 per cent from August 2010 to August 2011.¹¹⁴ Similarly, the Construction Skills Network suggests that output fell by 13 per cent between 2008 and 2009 and, in 2009, predicted a reduction of 400,000 workers by 2011.¹⁰⁹

Furthermore, for those remaining in the industry, pre-planning of work is frequently minimal, worker representation is generally weak, job security and skills training are meagre, and the level of unionisation is low (around 10 per cent), all making for frequently poor worker consultation and participation.

The construction sector is made up of a very wide range of enterprise sizes, dominated by small and micro enterprises: approximately 92 per cent are micro firms employing less than 10 workers, and most of the rest employ 10–49 workers.¹⁰⁹ Despite these figures, around 20 per cent of employment is in the 0.1 per cent of firms employing more than 250 workers, with around a third of employment in the smallest micro firms,¹¹³ and approximately a quarter of the industry's output is generated by fewer than 125 large companies which each employ 600 or more people.¹¹⁰ In particular, these very large operators are engaged in high-profile building projects which are often government or other public sector procurements: in general, the public sector procures 30 to 40 per cent of total construction output in the UK annually.¹¹² The fragmented nature of the industry is also mirrored in the many bodies and organisations representing its various parts, with no single organisation including all those involved in the industry.¹¹⁰

Arguably, therefore, the construction sector effectively operates as (at the very least) a two-tier system. High-profile, often public sector, work is carried out by very large contractors at one end of the spectrum, and very small, more often private sector, build and repair work is carried out by small and micro firms at the other, with a large gap between them with respect to management capacity.

Shipping

Merchant shipping operates on a global basis. It is arguably the first truly globalised industry encompassing a fully globalised labour market.¹¹⁵ Developments over the last 20 or so years have enabled the industry's owners to trade on a basis relatively free from state regulation, to drive down the cost of labour through outsourcing, and to improve competitiveness by increasing transportation speed. In parallel with this, organisational restructuring has meant that financial ownership has become increasingly separated from fleet and human resources management in the industry.

In 2008 some 8.2 billion tons of cargo were transported by sea, contributing about US\$380 billion in freight rates to the world economy. Since then the impact of the decline in the world economy has been felt, with trade falling by 4.5 per cent to 7.8 billion tons in 2009.¹¹⁶ According to Lloyd's Register figures, the world merchant fleet consisted of 102,194* ships in 2009, approximately 54,000 of which were cargo-carrying vessels.

The maritime industry is made up of distinct sectors or 'trades' which carry different types of cargo in a range of types and sizes of vessel, operating over varying distances. Stopford¹¹⁷ suggests there are four broad groups relating to:

- the energy trades (including oil, coal and gas) which represent 44 per cent of cargoes
- the metal industries (including ores and steel) with 18 per cent
- the agricultural trades (such as grain, sugar and forest products) which represent 9 per cent
- other cargo, such as cement and other minor bulk and dry cargo (for example value manufactured or semi-manufactured goods such as textiles and vehicles) with 28 per cent.

Stopford indicates that these sectors are served by three broad categories of shipping, based on the types of cargoes carried and the services provided: bulk transport, liner transport and specialised cargo transport,¹¹⁷ with a further two categories of service sector vessels and passenger ships.¹¹⁸ Each of these categories operates differently and under different market conditions.

In terms of ownership of the overall world fleet, Japan and Greece dominate the industry, owning 16 per cent and 15 per cent respectively in 2009, followed by Germany and China (10 per cent and 8 per cent).¹¹⁹ However, ships are registered to different maritime administrations and in terms of deadweight tonnage, which forms the basis for the adoption of international conventions, with Panama by far the largest (22 per cent), followed by Liberia (11 per cent).¹¹⁹ This is significant because flags with the largest tonnage have the greatest involvement in international bodies such as the International Maritime Organization (IMO), which make regulations and conventions.

* All vessels, including fishing and passenger vessels, of 100 gross tons and above.

As a whole, the industry operates as a service sector, with charterers renting space on board ships – or whole ships – from ship owners to carry their goods. Within this system, ship owners may retain responsibility for the vessel and crew, but in recent years this relationship has become more complex as it has increasingly also included third-party ship management (where ship management companies are responsible for vessels in which they have no financial stake). Larger management companies may manage substantial fleets and they also tend to have their own crewing agencies in the major labour supply countries (such as the Philippines and India), which in turn may outsource to locally based agencies. All of this makes for complex supply chain relationships and responsibilities.

Recent estimates suggest that there are about 1.37 million certified seafarers,¹²⁰ while others estimate that over 1 million are working onboard ships worldwide at any given time.¹²¹ Crews are normally structured into two main classes of officers and ratings responsible for navigation, cargo, maintenance functions (deck) and engineering functions (engine). In addition there are other departments for catering as well as specialist functions. Crews are predominantly male and almost always made up of a range of ethnic groups (often with officers of one nationality and ratings of another), and they frequently work together for only relatively short periods of time. Operators can and do replace crews of one nationality with those from different, and less costly, nationalities, often with little notice. This can mean that the pay and conditions of individuals in similar roles on the same vessel may be different. It can also result in communication problems because of seafarers' unfamiliarity with each other and with the vessel they are charged with operating.

Regulatory requirements of the maritime administration (flag) with which a ship is registered determine (at least in part) the number of the crew on a ship. In practice, a ship operator needs to ensure that there is an individual with the relevant certificate for each role onboard. The widespread use of crewing agencies often means that the owners and charterers, and even the ship managers, may have little in-depth or long-term involvement with the workers on board their ships.

In parallel with this, trends in ship design and shipbuilding have been towards the production of larger vessels with greater cargo capacity. At the same time, crew sizes have fallen across the range of merchant ships, with some estimates suggesting that the crew of an average cargo ship is now about 60 per cent smaller than in 1970.¹²² This reduction has been achieved primarily through advances in technology and increases in automation. As Alderton and others put it:¹²²

... during the past 20 years or so there has been a reduction in the size of crews. In the early 1970s a typical 10,000 grt [gross register tonnage] bulk cargo carrier would have had approximately 40 crew members. Today, a much larger (that is 30,000 grt) bulk carrier is likely to have only 18 to 25 crew members on board. The same crew size pattern applies to cargo-carrying ships of all kinds. The decline in the size of crews also makes it difficult for seafarers to be given shore leave. Smaller crews mean that labour is intensified with seafarers working longer hours and performing flexible tasks.

Furthermore, crew sizes also vary by flag, with those on second (as opposed to national) registers or flags of convenience generally smaller, possibly as a result of less stringent regulation.¹²³

The implications for supply chains and health and safety brought about by the extent of the outsourcing prevalent in the sector are quite complicated. For example, the shipment of goods, whether they are raw or manufactured materials, is likely to involve several levels of organisations in business relations, in addition to those between the owner of goods and the party directly responsible for their transportation.

Health and safety performance

Both construction and shipping are hazardous industries. In this sub-section we outline some broad features of OSH performance. In the case of construction, we are able to supplement this broad understanding of the industry's OSH performance with some further data on the performance of the company that was the principal contractor on both the sites on which we undertook our case studies. Unfortunately such information was not available in any reliable form from the shipping companies that were the subject of our studies in the maritime industry. However, we concluded from the testimony of all of the participants in these case studies that we were in every case dealing with organisations at the 'better end' of the industry in terms of their health and safety performance.

Construction

Health and safety performance in the construction industry, in terms of both overall numbers and rates of injuries and fatalities, has improved significantly over recent decades. In the UK, the rate of fatal injuries followed a significant downward trend during the 1990s and early 2000s, but levelled off

from about the mid-2000s.¹¹⁰ However, it is still a high-risk industry, with the largest number of worker fatalities of any sector,¹¹⁰ accounting for over one in four (27 per cent) fatal injuries, nearly one in 10 (9 per cent) reported major injuries and 6 per cent of over-three-day injuries among employees.¹¹⁴ Most recent RIDDOR figures show that in 2010/2011 there were 50 fatalities (a rate of 2.3 per 100,000 construction workers per year), 18 of which were to self-employed workers.¹¹⁴ This is an improvement on the average over the previous five years of 61 fatalities, 19 of which were to the self-employed.¹¹⁴ It also represents a reduction of two-thirds compared with figures from 1990/1991, which is comparable with the reduction seen in other industries.¹¹⁴ Falls from height are the biggest cause of fatalities (50 per cent in 2007/2008 and 2008/2009), followed by being struck by a moving/falling object, being struck by a moving vehicle, building or structure collapse and overturning plant.¹¹⁰

Similarly, RIDDOR figures show that in 2010/2011 reported non-fatal injuries have fallen by over a third (38 per cent for major injuries and 36 per cent for reported over-three-day injuries) in absolute terms, with rates reduced by about a quarter (25 per cent for major injuries and 22 per cent for reported over-three-day injuries) since 2007/2008.¹¹⁴ In 2010/11 there were 2,298 reported major injuries (a rate of 173.2 per 100,000 per year) and 4,784 reported over-three-day injuries (a rate of 360.5 per 100,000 per year) among construction workers.¹¹⁴ The most commonly reported injury types were handling (28 per cent of all injuries) and slips and trips (23 per cent), which is similar to causes and proportions for the rest of British industry (31 per cent and 27 per cent respectively).¹¹⁴

It is important to note here that these figures undoubtedly represent 'the tip of an iceberg', as most accidents are simply not reported. The significance of this under-reporting was highlighted in a government-sponsored inquiry into the causes of recent fatal accidents in 2009:¹¹²

It is a disgrace that we have such a low level of reporting serious accidents, let alone near-misses... If we had a higher proportion of reporting serious accidents, it might help us to achieve a more accurate picture about fatalities.

The HSE report¹¹⁰ which was a part of the basis of the fatal accident inquiry also identified a number of factors which are likely to impact on health and safety performance in the industry, including fragmentation and scale of the industry; supply chain and contractual influences; bogus (or false) self-employment; skills and competence; vulnerable workers; micro, small and medium-sized enterprises; leadership, planning and management of health and safety; public sector clients; and regional differences.

Reported levels of work-related ill health in the construction industry are also falling, though here again it is well known that the health effects of work in the industry are substantially under-reported. While incidence (new case) rates of certain conditions, such as musculoskeletal disorders (MSDs) and dermatitis, are significantly higher than the average for the other industries combined, others, such as mental ill health, are significantly lower.¹¹⁴ This has been confirmed by recent work by Stocks and colleagues¹²⁴ showing that male construction workers in the UK had significantly raised standardised incidence rate ratios for respiratory and skin disorders, as well as MSDs. These were 3.8 (3.5–4.2), which is a rate approaching four times higher than that for all other UK industries combined; 1.6 (1.4–1.8) and 1.9 (1.6–2.2) respectively.

Occupational cancer also continues to be a significant problem for the industry, with the recent Cancer Burden Survey 2010 suggesting that over 5,000 new cases of occupational cancer each year are the result of past exposure in the construction sector.¹¹⁴ Recent figures also suggest that over half (56 per cent) of occupational cancer registrations in men are related to the construction industry, with about half (nearly 4,000 per year) of occupational cancer deaths attributable to exposure to carcinogens in the industry.¹¹⁴ The most significant carcinogen remains past exposure to asbestos (71 per cent), followed by silica (16 per cent) and diesel engine exhaust/environmental tobacco smoke (6 to 7 per cent each).¹¹⁴

Overall in 2010/2011 about 2.3 million working days were lost in the industry (equating to 1.1 days per worker) due to self-reported work-related illness or workplace injury, with Labour Force Survey figures showing that most of this (just over 75 per cent) was the result of health problems (as opposed to injury).¹¹⁴

The available figures for the construction industry as a whole, then, suggest significant progress over recent years in relation to fatalities, injuries and ill health. However, as Philip White, the HSE's Chief inspector of construction, points out in the Construction Division's work plan for 2011/2012:¹²⁵

... these improvements are not mirrored to anything like the same extent on smaller sites where we still find many instances of unacceptable standards.

Indeed, recent figures (for the five years between 2003/2004 and 2007/2008) show that two-thirds of fatalities were among the self-employed or those working for firms employing 15 or fewer workers and, similarly, that two-thirds of accidents occurred on small sites (with 15 or fewer workers), making it very clear that those working for smaller firms in the industry are at greater risk.¹¹⁰ The Donaghy Report noted that, although some larger companies have worked to tackle work-related ill health issues, this is:¹¹²

... often a matter of last resort for SMEs [small and medium-sized enterprises] who are more focussed on the necessity to 'make do' and get the job done. For this group sometimes even the provision of adequate temporary welfare facilities proves a step too far.

Against this background, Donaghy and her colleagues suggested that fragmentation in the industry, together with issues including training and skills, pre-qualification, team working and the extent of self-employment, remained key issues in the construction sector with regard to fatal accidents.¹¹²

In terms of the regulatory responses to this situation, there are several points of relevance to the present research. The nature of the complex relations between clients, designers, contractors, subcontractors and workers in the construction industry, together with the myriad sets of worksite circumstances, present major challenges for the management of health and safety performance in the sector. At least in part as a response to these issues, the health and safety performance of the industry has been the subject of considerable political and regulatory attention during the last decade or so, much of which has focused on larger construction companies. The regulatory framework provided by the Construction (Design and Management) Regulations and its supporting guidance¹²⁶⁻¹²⁹ encourages purchasers to exploit the opportunities they have as powerful supply chain players to influence improvement among suppliers. Indeed, the contribution of the complex challenges to the poor health and safety performance of the sector is the principle reason for the supply chain orientation of these more recent regulatory provisions on health and safety management in the industry that apply within the European Union.

The construction industry, therefore, is subject to significant regulation, particularly in relation to health and safety, and merits its own division within the Field Operations Directorate of HSE, intended to provide a clear focus and responsibility for construction work, as well as a 10-year Construction Priority Programme designed to improve the HSE's impact in the industry and ensure that risks are properly controlled through engaging with stakeholders.¹¹⁰ In particular, the Construction (Design and Management) Regulations of 1994, revised in 2007, are intended to integrate health and safety into every aspect of construction from the concept and design phases, through the planning and building phases, and on to demolition work. These regulations give specific duties to the client, designers and contractors and their aim is to encourage communication, co-operation and co-ordination throughout the supply chain in order to identify and eliminate (or effectively manage) risk. In addition, the Office of Government Commerce (OGC) and Common Minimum Standards (CMSs), which are intended to drive up standards in public procurement, are other sources of potentially significant influence in this regard, though currently the OGC has no enforcement powers.

Concern about the difference between large and small contractors is also clearly reflected in the HSE's approach to the industry for 2011/2012, which involves spending more time regulating smaller sites while, for large contractors, carrying out fewer site visits and putting more emphasis on 'challenging large contractors at board level'.¹²⁵

As we will see in subsequent chapters, this approach was much in evidence on the large worksites on which the principal contractor that was the subject of our research operated and in which the HSE's aim to 'use the supply chain to influence standards'¹²⁵ was also evident.

Health and safety performance in the construction sector case studies

In 2008/09 the overall accident frequency rate for reportable construction injuries was 0.4 per 100,000 hours worked (or four per million). Both case studies, as well as the Tier 1 contractor itself, performed significantly above this industry average.

TitanCF Industries, the Tier 1 organisation involved in both construction case studies, is a recognised industry leader not only in terms of civil engineering but also in relation to health and safety practices and performance. It currently has a directly employed workforce of over 3,000 and had a turnover of

£644 million for 2009 (which has doubled since 2000). Its own figures show that in 2010 the total number of lost-time incidents for the organisation fell by 40 per cent on 2009 levels, with those resulting in more serious injuries falling by 25 per cent; while the use of Observation Cards increased significantly. The accident frequency rate at the end of 2009 was 0.21 incidents per million hours worked. In 2010 there were 18 reportable accidents, down from 30 in 2009 (and 51 in 2000); and 41 lost-time injuries, down from 63 in 2009. The organisation has had no fatalities in the period 2006 to 2010. It also has an unbroken record of a 10 per cent reduction in accidents year-on-year since 1999, giving it one of the lowest injury rates among the UK Contractors Group (UKCG). The organisation has won a number of safety awards and described 2010 as its best ever year for health and safety performance.

The safety record on the Olympic Park (on which our first case study was focused), where peak workforce levels were approximately 12,500, has remained significantly better than the industry average throughout the work. In February 2011 the Park achieved its seventeenth set of 1 million man hours worked without a reportable incident since 2006. The ODA's contribution to this has been recognised by the British Safety Council (both the five-star and Sword of Honour awards). In fact, the Royal Society for the Prevention of Accidents (RoSPA) reported that within the 60 million hours worked on the Park, 24 periods of 1 million hours were (RIDDOR-reportable) accident-free. The overall accident frequency rate was 0.17 incidents per million hours worked, which RoSPA describes as lower than for the construction industry as a whole and more in line with the average across all UK employment sectors.¹²⁷ Near-miss reporting was equivalent to 100 reports for every RIDDOR event. Similarly, the ODA reported that over the 66 million hours worked there had been 109 reportable injuries and no fatalities, with the workforce recently completing 3 million consecutive hours worked without a reportable incident. The Olympic Park is the first Olympic project in the world to have been completed without an accident-related fatality.

The safety record on the site of the Forum Development Project, which was the second case study, also remained significantly better than the industry average throughout the work. At the time of writing (December 2011), there had been no reportable accidents since the start of work. This good safety record was confirmed by the case study organisation:

We've held a good track record on this site, over the, since 2006 we've had one reportable incident and that was due to the fact that the guy had a slipped disc problem already, so in the longest sense we had to report it, but we've had a good record up to now. We are about on just about 1 million work hours without injury, so it has been very good. So from a health and safety point of view we've maintained really good standards and we are quite happy with it. (Project Manager, TitanCF Industries [Tier 1])

Shipping

Historically, merchant shipping has always been a dangerous industry to work in. Its unique work circumstances mean that seafarers are at risk of whole vessel losses (as a result of collisions, groundings, foundering, structural and engine failure, fires and explosions), as well as individual events (such as accidents and illnesses), with the latter resulting in more deaths per year than the former.

Dating back to the 19th century, when industrialisation created an increased demand for maritime transport, official records show that seafaring was among the most dangerous of occupations.¹³⁰ During the first half of the 20th century conditions improved and mortality rates correspondingly fell, but seafaring was still identified as the most dangerous occupation in the UK.¹³¹ There have, of course, been further substantial improvements over the decades since then, in terms of living conditions on board ship as well as safety measures and practices. Nevertheless, Roberts & Marlow have shown that merchant seafaring still has the highest mortality of any UK occupation other than commercial fishing.¹³² These authors reported a mortality rate of 46.6 per 100,000 person years, nearly 28 times that for the general British workforce, concluding that the fatal accident rate remained 16 times greater than that for the average British worker.⁷¹

Although there are well-recognised difficulties inherent in comparing mortality internationally (for example, in terms of the inclusion or otherwise of 'natural' deaths at sea, as well as suicides, homicides and so on), recent research shows that, like the UK, seafaring is among the most dangerous occupations for many nations, with a mortality rate seven times higher than that of shore-based workers in Sweden;¹³³ 10 to 20 times higher than the average in Germany;¹³⁴ over 11 times higher than that for men working on land in Denmark;¹³⁵ 10 times greater compared with land-based

industry in Norway (combined shipping and fishing industries);¹³⁶ and 10 times higher than in land-based industry in Iceland.¹³⁷ Indeed, comparison of their results with those from other recent studies led Roberts & Marlow to conclude:⁷¹

Seafaring is therefore often the second most hazardous occupation after commercial fishing in advanced western economies.

In fact, Li & Wonham¹²¹ suggest that the annual mortality rate (from all causes) for seafarers worldwide is 2.5 times higher than that for UK seafarers, suggesting that this significantly raised level of occupational hazard is far from limited to the West. Seafaring, therefore, is a dangerous job wherever it is carried out, but it is markedly more dangerous in some national fleets as compared to others. Comparisons between national fleets generally suggest that losses are greatest among flag of convenience (FOC) and non-OECD countries. For example, Nielsen & Roberts⁶⁹ found all-cause mortality rates per 10,000 seafarers of 3.5 in Sweden, 9.1 in the UK, 23.9 in Hong Kong and 26.5 in Singapore. Furthermore, even within this categorisation, second register rates are higher than those of national registers, and newer FOC rates are higher than older ones.¹¹⁵ Other research has also identified within-fleet differences in relation to factors such as types of vessel, as well as both their size and age. Bulk carriers, for example, have been the subject of particular concern because their structure, size, age and cargo weights are all associated with an increased risk to safety.¹³²

The picture in relation to seafarer fatalities, therefore, is complex, not least because of the long-acknowledged and widespread difficulties around data comparability. However, these problems are significantly exacerbated in relation to injuries, in particular because, as with other industries (including construction), these incidents are often simply not reported. Nevertheless, such data as there are suggest that the pattern is similar to that of fatalities, with seafarers at greater risk of occupational injury than their shore-based counterparts. For example, Hansen and colleagues¹³⁸ found notified accident rates of 3.1 per 100 employed seafarers per year, and rates of accidents causing permanent disability of 0.34 per 100 employed seafarers per year in Denmark, compared to 1.8 and 0.22 respectively for all shore-based industries. Although data from outside the advanced market economies are even scarcer, there is no reason not to conclude that the pattern of higher rates among FOCs and second registers is also apparent. However, as Ellis and his colleagues¹³⁹ point out, despite international requirements, maritime administrations have failed to systematically collect and collate incident data.

Research has identified patterns within seafarers' accident data, pointing to locations, types of work and vessels with the highest accident rates. Those involved in heavy work on deck and in holds are at greater risk,¹³⁸ as are engine room personnel and galley staff.¹⁴⁰ Moving around the vessel from one task to another is a major cause of accidents,^{140,142} which is confirmed by the findings of Jensen and colleagues¹⁴³ that over 40 per cent of non-fatal injuries are caused by slips, trips and falls; a figure similar to the 46 percent (followed by 20 per cent each for manual handling and machine operation) found in Marine Accident Investigation Branch data by Li & Shipping.¹⁴⁴ The highest accident rates also tend to be on small general cargo ships (coasters) and 'roll-on, roll-off' (ro-ro) ships, which may be linked to these vessels' work patterns and intensity of activities as a result of their frequent port visits (and associated fast turn-around times).¹³⁸ Hansen and colleagues¹³⁸ also found that the accident risk for such vessels decreased with seafarers' length of employment aboard a single ship and frequency of return to the same ship, suggesting a protective effect of familiarity with the vessel; something which is becoming less common with the increasing use of short-term and agency employment within seafaring.

In addition to the relatively higher risks of injury and fatality faced by seafarers, the profession has historically been associated with significant health risks caused by living and working at sea. These ranged from problems of nutrition, infectious disease and mental health on long voyages in the 19th century to continued problems today, often now associated with acute disease coupled with the lack of access to medical care at sea¹³⁵ or exacerbated by factors resulting from globalisation (such as increased stress and fatigue associated with the restructuring of work). Again, however, detailed, accurate and comparable data on work-related ill health among seafarers is scarce, partly because of problems of reporting and recording, but also because of the 'healthy worker' effect (where those no longer well enough to work leave the industry; a particular problem with seafarer data because of the regular medicals required to allow seafarers to work) and the frequently long time lag between exposure and the onset of illness.

Nevertheless, there is some epidemiological evidence to suggest that seafarers may be at greater risk of certain medical conditions such as coronary heart disease,¹⁴⁵⁻¹⁴⁷ lung cancer¹⁴⁸ and alcohol-related

disease (such as cancer of the liver, larynx, mouth and throat, cirrhosis and pancreatitis),¹⁴⁹ all of which may be linked to lifestyle factors and stress.^{150–152} However, it is difficult to disentangle the true extent of occupation-related risk from ‘background’ levels of the prevalence of these conditions among the general population, not least because of the weaknesses in the limited data available. Other research has also suggested that seafarers may be at greater risk of health effects linked to hazardous chemicals they encounter as part of their work and/or within cargoes,⁶⁸ such as various cancers^{145,148,153–155} and other neurotoxic effects,^{156,157} as well as injury and poisoning.¹⁵⁸ Again, however, cause and effect are difficult to establish because of a lack of adequate data and the long latency between exposure and illness. The latter is particularly problematic among seafarers who are frequently employed on a series of short contracts across a range of employers and agencies over the course of their entire careers.

Other recognised occupational diseases associated with working at sea include noise-induced deafness, MSDs, and mental health problems (including stress and fatigue, as well as complete mental breakdown and suicide). For example, an Australian study found that 80 per cent of responding seafarers reported experiencing stress, with 60 per cent indicating that this was moderate to high stress,¹⁵⁹ while work from the UK has suggested that fatigue is a significant problem¹⁶⁰ associated with specific aspects of seafaring such as shift work, sailing schedules and leave time, poor sleep quality, high job demands and stress.^{161–163} Such findings, in turn, receive support from work showing that 64 per cent of responding car carrier crew experienced fatigue, with levels higher among those on short-cycle as opposed to deep-sea vessels (78 per cent compared with 53 per cent),⁶⁶ and are of particular concern given the associations that have been identified between: (a) fatigue and ill health;^{163–165} and (b) fatigue and poorer cognitive performance,^{166,167} personal injury¹⁶⁸ and vessel accidents.¹⁶⁹ Again, however, data are generally scarce and as a result levels of concern and corresponding concerted efforts at prevention are much lower within the shipping industry than elsewhere. In addition, seafarers have long been at greater risk of injury or death from violent crime at work (both in port and at sea), a factor which continues today⁷¹ and is now further exacerbated by the piracy that is increasingly linked to the global seafaring industry.

Seafarers’ working arrangements (involving rigid hierarchical structures and frequently temporary and very short-term crews made up of combinations of nationalities as explained above) also provide significant potential for victimisation, harassment and bullying, with recent work suggesting that this may be relatively common. For example, 27 per cent of survey respondents in one study reported experiencing verbal or physical abuse in the previous 12 months, and 30 per cent reported having witnessed victimisation of others,¹⁷⁰ while more generally high levels of job insecurity among seafarers have been identified.^{66,171} Furthermore, working hours, which are subject to international regulation (specifying that seafarers should have at least six hours uninterrupted rest during a 24-hour period), are frequently falsified by seafarers in order to avoid ‘creating waves’ and making trouble for employers they wish to continue to work for; for example, 86 per cent of seafarers on board car carriers in the recent study by Kahveci & Nichols⁶⁶ reported failing to get even this minimal level of rest. These factors in combination are of very serious concern given the obvious links between levels of work and fatigue¹²³ and their potential consequences for both individuals and ships.

In addition, arrangements for seafarers’ welfare at work vary between ship types, shipping companies and ports. Although areas such as accommodation, food and sanitary conditions are covered by international regulations, provisions are frequently inadequate as identified by Port State Control inspection.¹⁷² Facilities, and access to them, also vary by vessel and often by rank as well with, for example, 84 per cent of seafarers in a recent survey reporting email provision on their ship to which they had no access, and 40 per cent of senior officers having access compared to only 3 per cent of ratings.¹⁷³ All of this is of particular significance given the very protracted amounts of time seafarers can spend in these environments, and the associations between such facilities and the mental and emotional wellbeing (and so ultimately the safety) of individuals and crews.¹⁷⁴ Indeed, seafarers often compare life on board ships to being in prison, although Kahveci has observed that:¹⁷³

... a review of the UK Prison Service information books for prisoners demonstrates that the provision of leisure, recreation, religious service and communication facilities, [is] better in UK prisons than it is on many of the ships.

Overall, therefore, it is clear that seafaring remains one of the most dangerous occupations, with seafarers at significantly increased risk of occupational accident, injury, death, illness and violence. What is equally clear, however, is that: (a) the industry has insufficient reliable data to make accurate comparisons either within its own sphere (for example between fleets, flags, vessel types)

or more widely with other sectors (such as construction); and (b) the data it does have certainly represent just the tip of the iceberg. This is of particular concern given that the global and globalised nature of the industry means that:

- FOC administrations continue to thrive (as they fulfil a market need by reducing operating costs through the reduction of registration and regulation levels and associated expenses)
- the organisation and structure of the work itself is increasingly subject to increases in speed, intensity and bureaucracy as well as decreases in job security, training and communication (again all in order to reduce costs and increase efficiencies)
- labour hire practices are increasingly exploitative with seafarers frequently subject to contingent employment contracts.

All of these are factors that reduce the incentive for monitoring health and safety performance and collecting mortality and morbidity data on the one hand, while also increasing the potential for stress, fatigue, ill health and accidents on the other.

Finally, unlike the construction industry, there is no regulatory measure in the shipping industry, either national or international, that is explicitly focused on regulating OSH management through increasing the responsibilities of the actors involved in supply chain relations.

Why supply chain influence?

Given the hazardous nature of the industries in the present study and the challenges they provide for the effectiveness of conventional regulatory strategies, it is not surprising that various innovations in regulatory strategies for risk management have been developed in these sectors. This is especially true in the construction industry, where since the 1990s regulations in the UK and the European Union have attempted to address the complex chain of responsibilities for workers' health and safety that have been created by the fragmented structure of employment in the sector. As a result, regulatory strategies have explicitly included coverage of health and safety responsibilities arising from relations between procurers and suppliers in the labour and service supply chains that permeate the sector.

In the maritime industry, there has been less focus on supply relations in efforts to regulate risk management and account for the complex chains of responsibility created by the deregulation and restructuring of employment and the labour force. Nevertheless, international standards – such as those found in Safety of Life at Sea (SOLAS), the ISM Code, in the requirements of the Standards of Training, Certification and Watchkeeping (STCW) on seafarer training and qualifications, and in the International Labour Organization's Marine Labour Convention – as well as some national efforts to protect labour (eg in relation to crewing agencies in the Philippines) all to some extent represent attempts to address the complexities of the sector. As in construction, there would also seem to be potential to use supply chains to improve the management of health and safety on board vessels.

One of the most interesting elements of change in the modern maritime industry concerns that taking place in the relationships between clients, shipping companies and the seafarers that crew the ships carrying clients' goods from port to port around the world. The limited available literature suggests that the nature of these relations may have significant effects on health and safety management at sea. It further suggests that shipping companies may resemble the 'porous organisations' identified in land-based examples, where the demands of clients, superimposed upon relations between employers and employees which are themselves no longer entirely determined by the nexus of law surrounding the contract of employment, come to dominate concerns about the management of work and as such influence the nature of working conditions and the work environment.

While much of this influence may lead to work intensification and poorer working conditions, there is also the possibility that, as with the construction sector, in certain cases it may contribute to the improvement of health and safety management and working conditions, provided certain preconditions apply. Moreover, since in some parts of the world the industry is somewhat remote from regulatory scrutiny, it is possible that such 'supply chain effects' on health and safety management may even be better placed to contribute to improved health and safety outcomes in the sector than more conventional approaches to regulatory scrutiny of health and safety at work. It is also the case that, in common with the construction sector and partly as a consequence of regulatory measures, there have been varying degrees of political and business pressures placed on

major operators to introduce their own ‘voluntary’ standards and practices. As we shall see in the case studies outlined next, in parts of both industries these pressures have resulted in considerable efforts to use supply chain relations to influence OSH management practices among downstream suppliers.

Supply chains in the construction and maritime sectors: an outline of the nature and effects of the examined supply chains

This section briefly outlines the structure and effects of the supply chains in the four case studies as experienced by the workers and managers who participated in our research.

Construction

As described in Chapter 3, we undertook two case studies in the construction industry. In both cases they were examples of the conscious use of the supply chain to demand standards of health and safety management and practice among contractors and subcontractors. However, there were a number of differences between the case studies in the way this was achieved and how it was perceived by the organisations involved.

There are three main sources of evidence showing the operation of the regimes in place to ensure good health and safety management and practice in the case studies. The first and perhaps most obvious is found in data on reported injuries, ill health and incidents. As outlined above, these data strongly suggest that the systems for ensuring safety in the construction of the Olympic Park were operating effectively in terms of reported injuries. This, as far as we were able to tell from the less robust data available, was also the case in the Forum Development case study. On both sites, there were no fatalities and considerably fewer reported injuries than might have been anticipated from data on the performance of the industry overall, and fewer than experienced in comparable large construction operations. However, on its own this tells us little about the contribution of arrangements within the supply chain to achieving this improvement.

A second source of evidence is found in the operational data generated through the monitoring and audit arrangements in place. Here there was a wealth of information concerning the operation of arrangements for safety practices and procedures on the Park, including the qualification and training of personnel and the operation of risk assessment and management procedures. There was also information on recorded near-miss incidents and such like and, more importantly, actions taken in response to them. As the following chapter demonstrates, overall the evidence available from these sources would indicate that a robust, responsive and extensively monitored OSH management system was in operation on the Park, which extended beyond arrangements with principal contractors and appeared to generate substantial intelligence concerning safety. Again, there was much less robust data on these issues in the second case study, although it was sufficient to convey the same general impression of overall good practice.

However, this tells us relatively little about the perceptions of the personnel involved concerning the efficacy of these arrangements, their dependence on supply chain relations and the contribution of such arrangements and relations to improving either the safety of the workers concerned or the operational practices of their employers. A third source of data in this respect can be gleaned from information collected during interviews and discussions with representatives of employers and workers at various levels in the supply chain during the investigation. We will concentrate on these data in subsequent sections.

Working on the Olympic Park

Figure 1 is a schematic representation of the supply chain relations studied at the Olympic Park. It shows the Olympic Delivery Authority (ODA) as the procurer at the head of the chain, and CLM (a consortium made up of CH2M Hill, Laing O’Rourke and Mace) as the delivery partner charged with ensuring compliance from the principal (Tier 1) contractors on the ODA’s behalf. There were several of these Tier 1 suppliers involved in the construction of the Park and the company on which we have focused our studies, and called TitanCF Industries, was one. In turn, in their contracts with the ODA, the Tier 1 suppliers were charged with assuring compliance from their contractors and subcontractors with regard to OSH requirements. There was, however, as shown below, a ‘double assurance’ built into the arrangements for monitoring compliance with required OSH standards: not only did the immediate procurers have systems in place to monitor compliance from their contractors, but the organisations at the head of the supply chain also had monitoring procedures that reached down into the supply chain and – in theory at least – were able to provide a double check on compliance from contractors at the lower levels.

The arrows in Figure 1 indicate the direction of influence in the supply chain. Thus, in a straightforward way, through requirements at the pre-tendering and tendering stages, ODA procurement strategies made clear the expectations of the standard of health and safety management and practice required at the Park, and made successful tendering contingent upon these expectations being met. As a principal contractor, TitanCF Industries was therefore under a contractual obligation not only to implement these requirements in its own work but to demand the same level of adherence to standards of health and safety management and practice among its own contractors. These contractors likewise were further obliged to require them of their own contractors and so on throughout the supply chain. Monitoring of the delivery of these standards was undertaken by the organisation for which they were being delivered, that is the (contracting) organisation in the tier above. But as the dotted arrows also indicate, the system for ‘double assurance’ of standards was achieved through further monitoring of compliance undertaken both by the ODA and the delivery partner through the various feedback, communication and training arrangements also in place in the overall systems for managing safety and health at the Park. The operation of all these arrangements and how managers and workers at various levels of the supply chain perceived their effects will be discussed more thematically in the following chapter.

The Forum Development – working on a large infrastructure project

Supply chain relations in our second case study are represented in Figure 2. As with the Olympic Park, the simplest expression of the use of the supply chain to influence OSH is demonstrated by the direction of the arrows. The principal difference between the two case studies was the absence of any arrangements through which the procurer or its delivery partner directly monitored the activities of second- or third-tier contractors in the Forum Development, as was the case on the Olympic Park.

Shipping

Unlike the case studies in the construction industry, the two undertaken in the maritime sector concerned very different trades. As one senior trade union official stated of the industry:

It’s so different from one trade to the next – it’s not really one industry – it’s several.

A consequence of these contrasts, immediately apparent in the two case studies we undertook, was that there were fundamental differences in the structure and functions of the supply chains involved. These were created by the structure of the trades and the dominance within them of different business

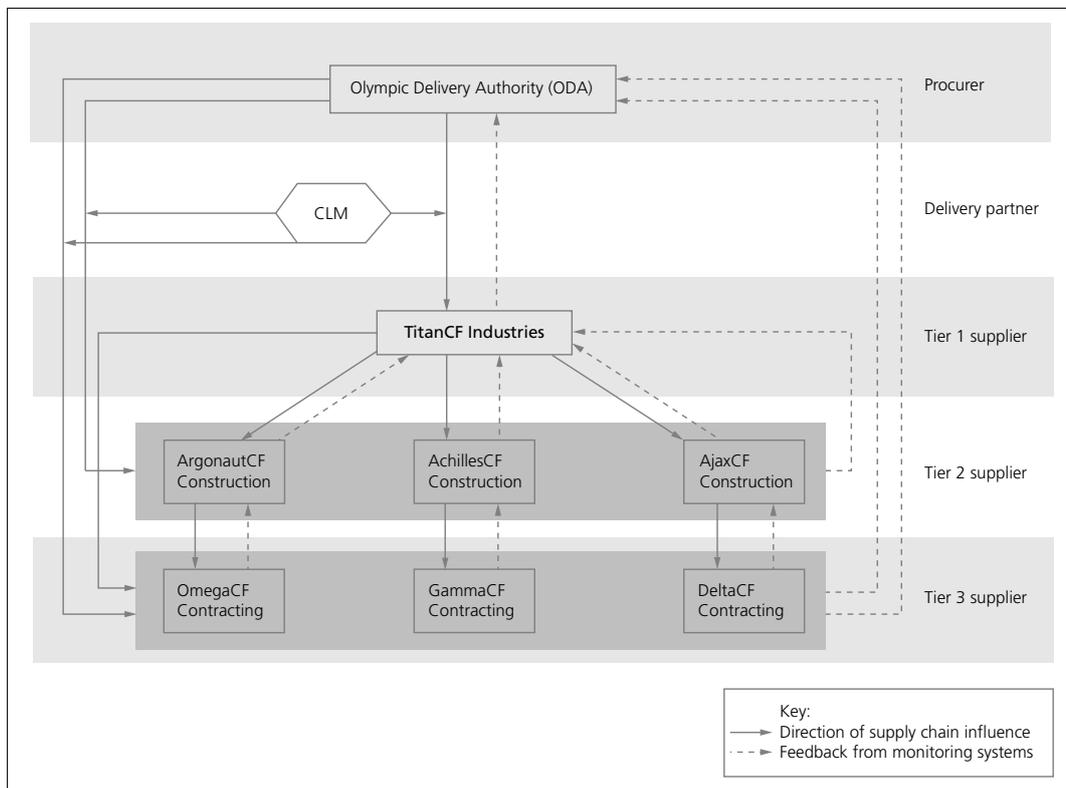


Figure 1 Olympic Park supply chain schematic

practices and associated variations in the nature of the economic relations subsisting between supply chain actors. Thus, in the tanker sector, there was a relatively straightforward situation in which major oil companies contracted with independent tanker companies; while in the container trade, relations between ship operators and the organisations whose goods they carried were more varied, diffuse and complicated. As a result, whereas the conscious use of supply chain influences by major oil companies was clearly in evidence in the tanker trade in ways somewhat comparable to that seen in the construction studies, their role and possible use to influence OSH management and practice in the container trade was both less evident and more complicated.

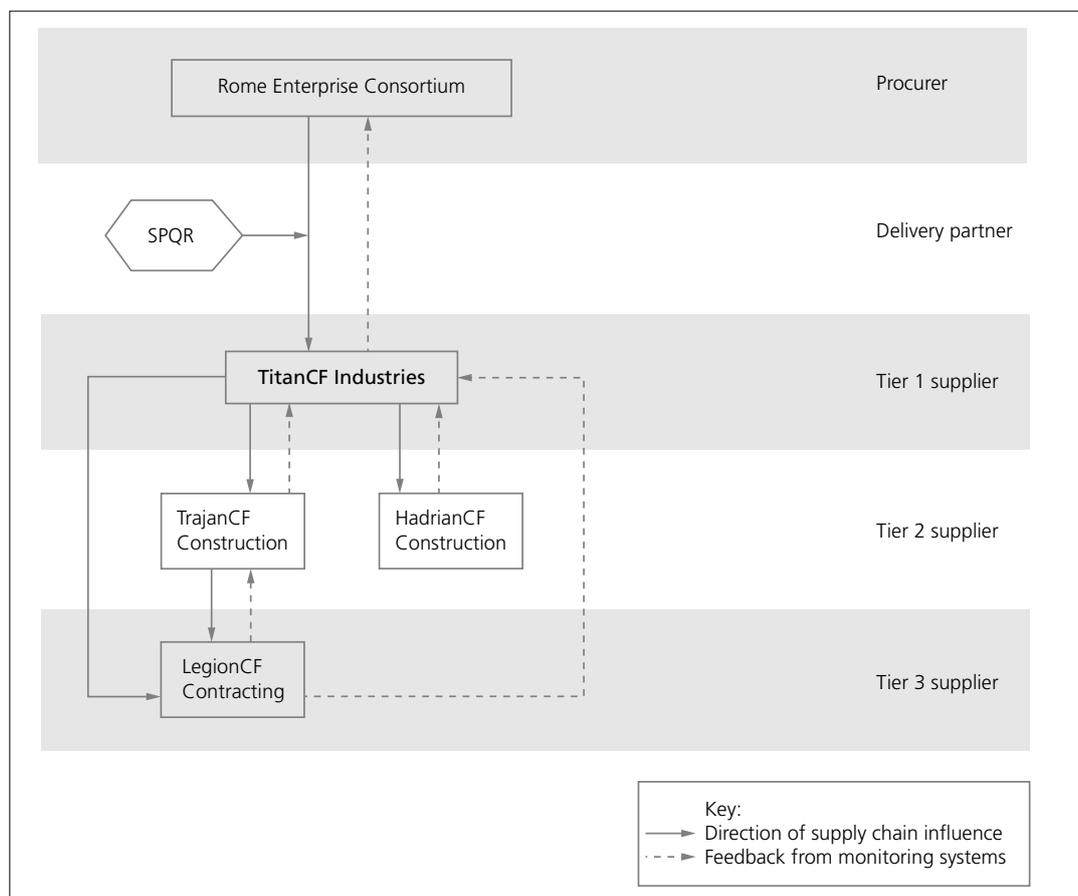
Availability and usefulness of sources of evidence in the maritime sector were also somewhat less straightforward than in construction. Data on reported injuries, ill health and incidents in the industry are notoriously incomplete and unreliable.^{69,121,175-177} We were therefore unable to make use of this source in more than a very general way. However, as we have indicated previously, overall these data suggest that while the maritime industry is among the most hazardous, there is some indication from routinely collected data that the tanker trade performs somewhat better on several measures of OSH performance when compared to other trades. This is so, for example, in terms of data on ship incidents, on Port State enforcement and, to a lesser extent, on the outcomes of inspections undertaken by or on behalf of the major oil companies.

A second source of possible evidence might be found in the operational data generated through the monitoring and audit arrangements in place within shipping companies. However, in the companies we studied, such information was either not collected in sufficient detail or with sufficient rigour to be useful for the purposes of the research, or was not made available to researchers. In effect, therefore, with the exception of some limited reference to data providing some general indication of safety performance, we of necessity concentrate on the information we have obtained from the managers and seafarers involved in the two case studies.

The tanker companies

The supply chain arrangements relating to the tanker companies studied are summarised in Figure 3.

Figure 2
Forum
Development
supply chain
schematic



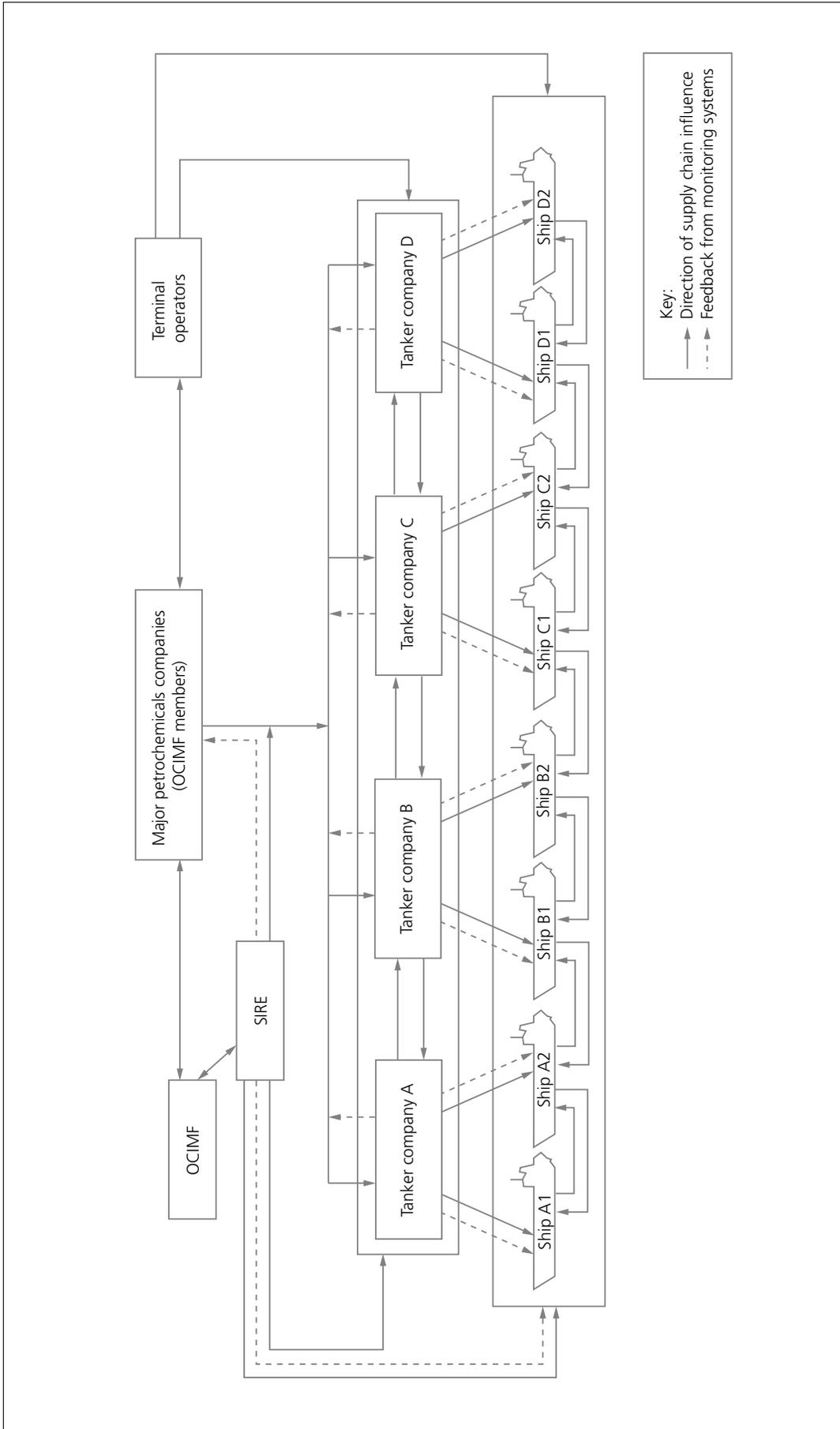


Figure 3
 Tanker supply
 chain schematic

With their capacity to choose which ships to employ, charterers have the opportunity to be influential in the way that ships are operated. The oil sector has arguably advanced furthest along this road because of the small number of large players in the sector. While the major oil companies (generally referred to as 'oil majors') claim to account for some 20 to 30 per cent of the market in the maritime transport of petrochemicals, the other 70 to 80 per cent is served by independent tanker operators. The main source of business for these companies, however, is the transport of petrochemicals for the oil majors. These companies are therefore in an extremely powerful market position at the head of the maritime oil transport supply chain. The representative organisation for the oil majors is the Oil Companies International Marine Forum (OCIMF), through which they are able to present their views within the IMO and other regulatory and legislative arenas and additionally organise more direct approaches to tanker companies in terms of improving safety in the transport of their product.

The dominance of the oil majors is much in evidence in the sector. To compete for contracts, tanker companies must ensure their ships are maintained and operated at a level dictated by the oil majors, including with respect to arrangements for the management of health and safety on board. Vessels and the companies that operate them are vetted and required to meet rigorous standards concerning a matrix of procedural and staffing requirements that influence, among other things, the management of OSH. Inspections are performed according to standard report formats developed by the OCIMF (see below) and provide each member oil company's vetting department with the information necessary to apply its criteria for the selection and/or continued use of tankers and their operating companies. Tanker vetting inspections are usually carried out during unloading operations, with the prior agreement of the ship owners and operators, and include access to confidential documents relating to the vessel's maintenance and classification. Where a fleet operation fails to meet the required standards, even if it is because of the lower performance of only one owner's ships, it may result in the entire fleet being denied business. Oil majors' investment in the management of the vetting process is considerable. The level of dominance exerted by the chemicals industry over the independent companies that transport its goods is not as great as that of the oil majors, but as we shall see below, it follows the same pattern.

As Figure 3 also shows, safety management issues with relevance to the berths at the refineries and oil terminals where tankers load and unload their cargoes are also significant. Since many of these are owned and/or operated by major petrochemical companies they are further able to require contractual safety management standards from tanker operating companies in relation to these too. A similar situation prevails in the chemicals sector.

As well as producing technical and operational guidelines for the sector, the OCIMF has developed a common ship inspection report programme (SIRE). Launched in 1993 as a response to concerns of sub-standard shipping, SIRE is presented as a 'risk assessment' tool. Using a standard inspection guide, information is entered into a database enabling potential charterers to access up-to-date inspection information concerning oil tankers.¹⁷⁸ Since its introduction, more than 180,000 inspection reports have been submitted to SIRE. On average, programme recipients access the database at a rate of more than 8,500 reports per month. OCIMF members appoint the inspectors who make these reports.

In addition to the SIRE inspection system, the Tanker Management and Self Assessment (TMSA) programme claims to provide a best practice guide to ship operations and a means by which to determine ship operator quality. It offers 'a comprehensive tool to help ship operators measure and improve their management systems'. As well as providing instruction and methods to encourage ship operators to assess their safety management systems (SMSs) against key performance indicators and develop continuous improvement, it provides an online tool enabling them to share their results with those who might request them for the purposes of their own internal vetting. The advantages to oil companies of the implementation of such a tool are obvious, as is the business necessity on the part of such tanker companies to ensure they comply with the requirements of the scheme. According to the latest OCIMF Annual Report,¹⁷⁸ the TMSA programme continues to grow, with more than 1,200 companies now registered to submit reports.

There are 576 SIRE inspectors accredited under the programme. The majority (463) are accredited to inspect larger tankers (Category 1 ships) while a few (eight) are accredited for small tankers (Category 2 ships) and others (105) for inspecting various additional kinds of vessels including barges, those used for towing vessels carrying petroleum products, and vessels carrying packaged cargoes (Category 3 ships). They are selected by OCIMF member organisations and are required to familiarise themselves with the inspection processes by attending SIRE inspections in the company of SIRE-accredited inspectors, before attending an OCIMF SIRE Inspector Training Course. Following the course they must complete a written examination and successful candidates are then further audited during an inspection before

being accredited as inspectors. The SIRE accreditation process is cyclical and each accreditation period runs for three years. There are 28 SIRE auditing inspectors who, according to OCIMF,¹⁷⁸ are at the heart of the SIRE inspector accreditation programme. They are experienced inspectors who collectively audit approximately 150 SIRE inspectors each year.

External guidance and monitoring activities through the supply chain in the petrochemical tanker trade are not limited to the activities of OCIMF, SIRE and the TMSA programme. In relation to chemical tankers, since the 1990s the Chemical Distribution Institute (CDI), a non-profit making organisation founded in 1994 and funded by the chemical industry, has aimed to ensure the development and preservation of an inspection system for the transport and storage of bulk liquid chemicals.¹⁷⁹ The CDI Marine Scheme was created to improve the safety and quality performance of bulk liquid chemical shipping. It now provides annual inspection reports on over 600 ship operators and 3,000 ships.¹⁷⁹ Ships having a CDI-Marine Scheme report are also listed on the European Quality Shipping Information System used by Port State Control authorities. Chemical terminals acknowledge the CDI standards, and their role is influential in determining whether vessels are able to visit their berths.

In our case study in the tanker trade, we found widespread awareness among seafarers and the managers of the operating companies from which our data were collected concerning pressures from the major petrochemical companies in respect of arrangements for OSH management on board their vessels. We were able to explore their perceptions of the significance of these pressures in our analysis of the OSH management on the vessels, and several themes emerged from the data which we look at in greater detail in following chapter. While the nature of the industry and its activities is considerably different from construction, there were a number of similarities in the way that supply chain influences on OSH operated. These were especially evident in relation to the scale of the potential damage to the business and reputation of powerful and influential actors in the supply chain as a result of health and safety failures among their suppliers, and in the lengths to which these actors were prepared to go to make explicit their health and safety management requirements of their contractors and to monitor compliance with them.

The container companies

The fourth of our case studies focused on a cluster of businesses 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 4. The business relations involved in the ownership, management and operation of the ships were somewhat complicated, but as our sectoral level interviews in the industry confirmed, fairly typical of those generally found in the shipping industry. Griffin owned QPR, which subcontracted technical ship management to Eagle, which in turn managed the vessels. However, QPR

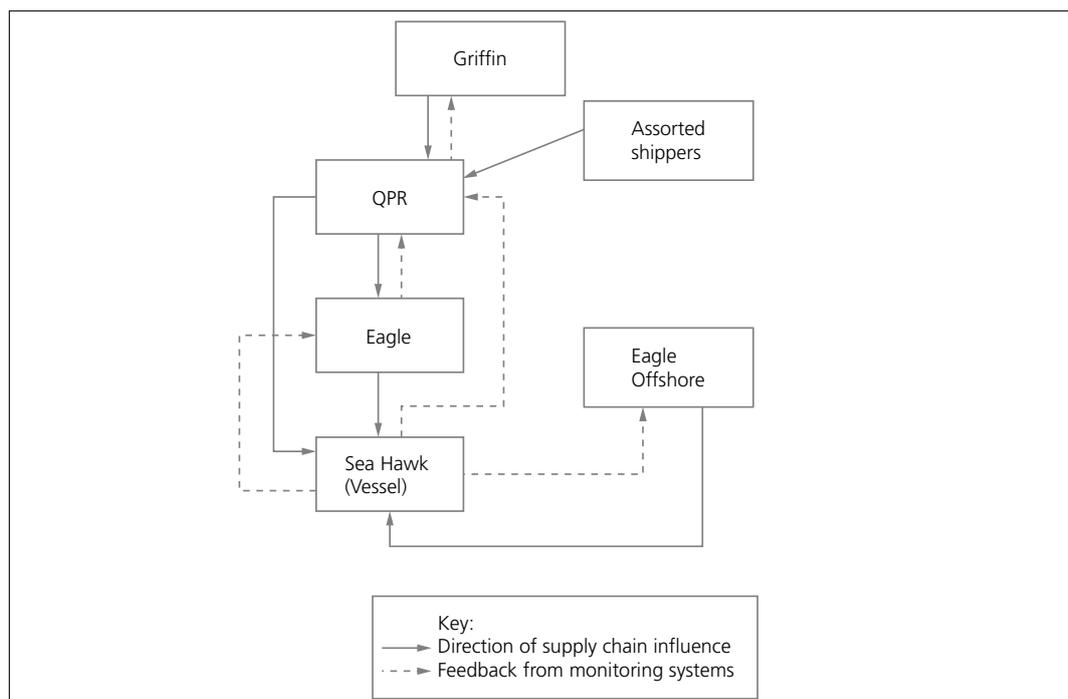


Figure 4
Container supply chain schematic

retained the role of cargo management and therefore had a relationship that might best be described as running parallel to Eagle Shipping. In relation to cargo planning, QPR therefore retained a direct relationship with the vessel, which did not run through Eagle channels. Additionally it is worth noting that Eagle Shipping contracted with Eagle Manila (a crewing agency) for the provision of crew.

Eagle Shipping provided technical management for a modest fleet, which comprised vessels for two sister companies (the same parent owned all three companies) and for a Swedish company (QPR). In total it provided technical management for 14 vessels in a variety of trades which were not associated with the offshore oil industry and four vessels which were.

The container vessels operated by this company were owned by QPR, which was in turn owned by a large shipping line – Griffin. QPR made many of the operational decisions about the vessels and was a major point of contact for Eagle management (for example, the purchasing manager liaised directly with them). However, Griffin played a more proactive role in a small number of areas, for example in relation to bunkering (fuelling), which it wholly controlled. Eagle had only held the contract to manage the vessels on behalf of QPR for around 18 months before the time of our investigation.

On board ship both QPR and Eagle were recognised by seafarers as having a strong association 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 themselves were employed by either 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 today 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 was quite different to those described in the previous case study on the tanker trade. 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 charterers. Charterers took an interest in the cargo holds, the lashings and the cleanliness, but generally this interest did not extend in any overt way to the arrangements for managing the health and safety of the crew.

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 as audits were generally approved of and sometimes picked up minor issues to be dealt with such as old paint being stored for too long:

SEA 14: [Company name] has been here doing audits, I think it is, I don’t know but for me it is feeling it started when they had, years ago when they started covering the child labour in the manufacturers, now then they took out the system to control and this includes also the transport. So they came here and they asked the crew, they want to see hospital facilities, make sure the crew get properly paid, the resting hours, so yeah [company name] they did that.

Interviewer: What did the [company name] auditors look at?

SEA 15: Safety, health, like the paint locker and how was the ventilation, and that the labels were there and the MSDS [material safety data sheet] and this stuff. And they were very interested in the engine and how it works and like this and well, the standard, how it looks like – I mean the general what you see, the housekeeping and things like that, clean linens.

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.

As we discuss in the following chapter, generally in the container trade 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 Sako⁷⁷ 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, with the exception of the one example of a client that had carried out some auditing, there was no evidence of them imposing such requirements. There were two primary reasons for this. One appeared to be because there was no immediate or obvious reason why it was in the client's business interests to require particular standards of OSH management on board the ships transporting their goods. 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 examined in the other case studies, to be used effectively to influence either the ship operators and managers or the seafarers in this last case study.

Despite this lack of an obvious direct supply chain influence of customers on their suppliers, however, our case study demonstrated that relations between parties in the network of business connections involved in container transport nevertheless sometimes influenced health and safety practices at sea. We will have cause to return to this observation in the final chapter of the report.

Conclusions

In short, both construction and shipping are comparatively hazardous industries in which the management of risks to workers' health and safety is made substantially more difficult by the structure and organisation of work in the sectors. In this respect, both represent challenges to conventional approaches to OSH management and to its regulation. Regulators, employers and trades unions in both sectors are not unaware of these challenges and have attempted to address them in various ways.

Innovative approaches to regulation that pay some regard to the fractured nature of the structure and organisation of work are evident and of relative long-standing in the construction industry; and so is strong and directive political pressure upon the leading organisations in the industry. These pressures would appear to have had some impact on the consciousness of at least some of the major organisational players in the industry and it is evident from the case studies undertaken in the present research that this consciousness is reflected in concern about public image and reputational risk, which in turn has led to conscious efforts to impose influence on the health and safety management arrangements of contractors through the supply chain. Exactly how and with what effects this is achieved in the situations we studied is explored further in the following chapter. It is important to note, however, that in this respect we are referring to large and prominent business organisations in the construction industry and not necessarily to the industry as whole. This is an issue to which we will return in the final chapter of the report.

In the case of the maritime industry, responses to the situation are somewhat more varied. To begin with, the regulatory provision for OSH management remains both limited and conventional in the extent to which it takes account of the structural and organisational determinants of OSH outcomes in the sector. The ISM Code merely requires the implementation of a fairly standard SMS among ship operators and on the vessels for which they are responsible. It makes little allowance for the challenges to implementation and operation of safety management brought about by the structural and organisational features of work and employment in the industry. Nor are there any regulations that specifically address these features in ways comparable to the CDM Regulations in the construction industry. Moreover, while structural and organisational challenges for OSH management are evident in all trades in the sector, there are substantial differences between trades in their nature and extent and in the responses to them. As our case studies demonstrate, there are some situations in which the concerns of companies at the head of supply chains about their commercial success, reputational risks, liabilities for environmental damage and so on, have led to substantial interventions in the OSH management arrangements of the downstream suppliers of transport for their goods. At the same time, our case study in the container trade demonstrates that such business and regulatory determinants and the contexts in which they occur are not found ubiquitously across the industry as a whole. In the container trade, while supply chain pressures may still play some role in influencing good practice in OSH management, they do so less obviously, and more as one element of a constellation of influences that also include regulatory compliance pressures and further business concerns among the organisations in the sector regarding matters such as image and market position. Again, we explore the detailed experience of these pressures in the following chapter and will have cause to return to their implications in the final chapter of this report.

5 Direct and indirect supply chain effects on health and safety arrangements: experiences in construction and shipping

This chapter explores how the situations we have studied in the construction and maritime sectors can be understood in terms of supply chain leverage on OSH management practice. In essence, following from the outline at the end of the previous chapter, the account in the present chapter focuses on how personnel within the organisations we studied perceived the impact of strategies adopted by buyers upon the health and safety practices of themselves and their suppliers by considering in turn four issues:

- the nature of procurement within the supply chains studied
- the provision of health and safety support to suppliers
- arrangements for the monitoring of compliance with the demands of upstream clients
- the way in which supply chain influences were in part shaped by wider aspects of the surrounding external environment.

The influence of procurement

Having identified perceived supply chain influences to a greater or lesser extent in all the situations we examined, we sought to understand the impact of these on the procedures and practices of the organisations we studied. In essence the most direct pressures were those associated with standards that could be required of suppliers in the terms of the contract under which they supplied their services and the monitoring of their delivery by buyers or their agents.

Procurement practices

By far the most common and long-standing supply chain procedure to influence the practice of those supplying goods and services is for buyers to make the practices required a condition of the contract between themselves and their supplier. Allied to this is the related procedure of demanding certain qualifications or pre-qualifications from potential suppliers and their workers, as definitions of the standards of competence required for eligibility to tender for contracts. Common requirements in relation to OSH in this respect include evidence of adoption and operation of certified OSH management systems by contractors, certification of competencies and training acquired by their managers, supervisors and workers as well as evidenced standards of performance in terms of OSH outcomes.

As might be anticipated in a complex building project such as the Olympic Park which involves large numbers of contractors and subcontractors, there were extensive procurement arrangements in place in which health and safety standards featured prominently. The ODA approach was described in detail in its Health, Safety and Environment (HS&E) standard,^{180,181} which was intended to remind contractors of their legal responsibilities and set out how consistent good practice was to be achieved across all projects on the site. Health and safety was incorporated from the inception and planning stages and the ODA's intent to involve the supply chain is clear throughout the standard:

Suppliers are responsible for adequately resourcing their work to meet this standard including self-monitoring, auditing and reporting against the KPIs [key performance indicators].* Suppliers with sub-suppliers are also responsible for communicating these requirements through their supply chain and monitoring compliance.¹⁸¹

This approach was also very clearly evident from interviews with senior OSH staff within the ODA:

... the client leadership issue is very important; the difference between us and a lot of public sector organisations is that we are incredibly intrusive, as some of the CEOs – I meet with all the CEOs of all our principle contractors every three to four months – and as one of them said to me a couple of meetings ago, he said 'you lot set out what you were going to do four-and-a-half years ago, and we all said 'oh yeah, we have heard it all before, that's what they all say.' So the only difference is that your lot have done it!' So we have been really clear about that, we are incredibly intrusive into the supply chain for all sorts of reasons in terms of how much money people are paid, are they being employed properly... (Director of construction, ODA)

* See Appendix, Table 5.

Similarly, in the tanker trade members of the management of the tanker companies were under no illusions concerning the importance of meeting the oil majors' requirements in order to secure their business. This was the case in both the oil and chemical tanker companies. As one marine superintendent said:

Now it was the cargo-owner market. There were no other choices. If your ship doesn't accept inspection, it doesn't have cargoes to carry and your company goes into bankruptcy. (TMAN 5)

These requirements were felt to cover a whole range of operational activities in which the oil majors' vetting procedures were seen as intrusive:

We expect those oil majors' inspection; meanwhile, we also fear these companies' inspection. Their inspection was very strict. They would inspect from the major part to tiny point, the glove you wore, the torch you used. The inspection was very strict... as seafarers, we also feared, since their inspection included hundreds of items. The inspection was very much detailed. (TSEA 1)

On the Olympic Park, the ODA used HSE guidelines¹⁸⁰ in the development of its pre-qualification and tendering process.¹⁸¹ In addition, it held workshops with key stakeholders to identify their views, needs, aspirations and wishes for what the ODA should be trying to deliver, as well as what was both legal and realistic. The results of these workshops fed directly into the ODA's procurement policy. Its main element was a 'balance scorecard' used to rate organisations on a number of key areas, including health and safety. The ODA regarded its approach as an extension of the CDM Regulations:

And in a way, from a health and safety point of view you could say that this is a further development and extension of that legal duty in the CDM Regulations for a client to ensure that a suitable and sufficient health and safety plan is in place. (Head of health and safety, ODA)

Even before pre-qualification, in order to maximise the number and diversity of contributing businesses, a brokerage service known as 'CompeteFor' had been established by the ODA.¹⁸² Potential contractors completed a questionnaire created by a buyer, allowing buyers (generally Tier 1 contractors) to shortlist possible subcontractors for invitation to tender. Effectively, this system represented a series of vetting processes for organisations prior to the pre-qualification and tender stages. It was mandatory for Tier 1 contractors to use 'CompeteFor' to source subcontractors, ensuring a consistent approach to procurement, including the emphasis on health and safety, throughout the supply chain:

... what CompeteFor does is we mandate in all our Tier 1 contracts for your sub-suppliers you must use CompeteFor to source them. And as part of CompeteFor we are required certain policies to be published before they can publish their profile on CompeteFor and one of which is our safety policy. (ODA Deputy head of procurement)

... so get our Tier 1 supplier to use the same system, the same methodology, the same approach in procuring their second- and third-tier suppliers. (ODA Head of procurement)

The pre-qualification stage was intended to ensure that suppliers had the competencies and capacities to meet the requirements of the HS&E standard. To this end, they were required to complete a pre-qualification questionnaire (PQQ), which was fed into the balance scorecard. The health and safety section of the PQQ asked a number of questions concerning the suppliers' policies and arrangements for OSH management. In addition, they were required to submit supporting documents detailing these arrangements and their OSH performance, as well as their own procurement and monitoring arrangements to ensure their contractors met OSH standards. The weight attached to the health and safety part of the PQQ was apparent:

... they may be the greatest company, they might be potentially the cheapest but if they have got a dismal health and safety record (and these are questions that we specifically ask within our PQQ documents), and then if they have a report or – God forbid – they have had a fatality in the last year or so, I'm sorry but they don't go forward. So these are principal criteria that we start with at the beginning of our procurement process and we score those. (Procurement manager, TitanCF Industries [Tier 1])

In the Forum Development, our second case study in construction, again health and safety assurance was in evidence in the procurement procedures in the supply chain, but the client/developer, Rome

Enterprise Consortium, did not take as prominent an interventionist role as the one actively pursued by the ODA on the Olympic Park:

The way we manage the build-out of the site is that as a developer, we have a working partnership with four main contractors. So all of the work is done through those four main contractors ... they are the four main contractors we always use. Whether that will change or not, I don't know, but it seems to work quite well at the moment. (Project manager, Rome Enterprise Consortium [Procurer])

While recognising the need for high standards of health and safety management, the procurer left it to the Tier 1 contractors to work out the details of how they were to be achieved:

... the four main contractors from board level agreed some not basic, some quite intricate and advanced health and safety standards... They have to work to that as a minimum because they all agreed it together, that that was the minimum; so we are not, sort of, imposing a standard on them but we just recognise there needs to be a standard... (Project manager, Rome Enterprise Consortium [Procurer])

Similarly, the procurer remained at some distance from the day-to-day management of health and safety:

We like to do it through our Tier 1 contractors because at the end of the day they are the guys managing the activity on site, we are not actually doing that. (Project manager, Rome Enterprise Consortium [Procurer])

On the Olympic Park, the development of the PQQ was something that TitanCF Industries (the Tier 1 contractor that participated in both case studies) felt involved with and also intended to continue to use on projects after the Olympic Park:

... it is a very effective process and so it certainly is something we have developed here and, you know, to be fair with the ODA and CLM, and it is something we have developed and it's certainly a robust way for our work for major projects and special projects. And that is definitely something I will take forward to these next big jobs that we are after, and it is an effective process. (Procurement manager, TitanCF Industries [Tier 1])

It was also evidently used throughout the supply chain:

[We are] not supposed to use a subcontractor until they have done that questionnaire, and part of that questionnaire will include health and safety issues. So make sure they have got health and safety plans and policies and that kind of thing is in place. It depends on how big the company is and what kind of work it is, but the idea is we can't officially place an order or they can't get paid until they have done that questionnaire. (Health and safety adviser, ArgonautCF Construction [Tier 2, also acting for Tier 3])

In terms of subcontracting, the ODA made clear that principal contractors were responsible for ensuring that health and safety was addressed in a similar way during procurement:¹⁸¹

The supplier is responsible for ensuring during their procurement process that the competence of sub-suppliers to address HS&E matters is assessed, and only those capable of meeting the standard are appointed. When appointing sub-suppliers, checks shall be made to ensure that the sub-supplier shall devote appropriate resource to meet the standard. During this process and after appointment, it is the responsibility of the supplier to ensure that sub-suppliers are aware of and understand the requirements of the standard as it applies to them, and to manage the relationship to achieve compliance, and to monitor and report performance.

The same expectation of quality control throughout the supply chain was evident in the Forum Development project; however, here again it was clear that the site developer was less interventionist than the ODA and did not seek to influence either the procurement practice or the relationships between the Tier 1 and lower-tier contractors in terms of health and safety (or in any other matters). Rather, it expected TitanCF Industries to do this:

No we don't [ask for potential suppliers' previous health and safety records], I think it is very much driven by... it is unusual that, it is almost selected through the supply chain if you like, in that the principal contractor would vet all of that information before suggesting them to us, because we

employ them to manage that process on site... I don't think so, no we don't tend to [seek to influence relationships between Tier 1 and lower-tier contractors] because we almost feel that by doing that we might be influencing such that it is, absolving some of the responsibility of the principal contractor... It maintains their responsibility, that is the idea. (Project manager, Rome Enterprise Consortium [Procurer])

Interviews with TitanCF Industries personnel on both sites also suggested that, as a consequence of these supply chain pressures, they believed their company's investment in health and safety was increasing and that it was important that the company had appropriate documentation and an excellent safety record in order to win further work:

Yeah, I mean I think it is our performance on the Olympic Park, and definitely our health and safety performance, which has helped us on other major jobs in the last two years. So I can only think of positive things from the health and safety on site here, definitely nothing negative. (Supervisor, TitanCF Industries [Tier 1])

This was because they understood the contracting organisations' health and safety records and reputations to be perceived by clients as key factors in winning contracts:

... health and safety is fundamentally the winner of all contracts these days. People say cost, but at the end of the day if you have a bad track record anyway you are going to cost more; you are going to cost the client, you're going to cost your reputation, you are going to cost health and safety sustainability and environment – it is one of the key drivers for winning work these days in any pre-qual or any tender. (Project manager, TitanCF Industries [Tier 1])

And this was something that was also apparent when TitanCF Industries' managers talked about their approach in their own procurement procedures used for their contractors:

So the driver is very much geared around the safety element of understanding what we are going to do, and I won't deny part of that is so when we then say, 'We want you to participate in this, we want you to attend this workshop, you can't do that, that ain't in budget, you stand there till you sort it'... So if they then come back to us later on to say 'we won't stand in for it, we ain't interested' – if you aren't prepared to buy into the culture, go and work for somebody else! (Construction manager, TitanCF Industries)

The Tier 2 interviews on the Forum Development site also made it clear that participants believed an organisation's health and safety record and reputation were key factors in winning contracts:

It is comparative, it is included in our own bids basically and that is [HadrianCF Construction's] pride. We promise to beat their bid, so there is a health and safety course that goes into it, so basically it is included in the price. I mean you have to show your qualifications and your processes. (Project manager, HadrianCF Construction [Tier 2])

There was little doubt, however, that the ethos on the Olympic Park was one that generated unusually high expectations of health and safety management, and it was equally clear that health and safety was not always such a paramount factor in work for other clients. Several participants identified past health and safety record and the price of their tender as the two key factors on which winning a contract depended, but drew a distinction between the client on the Olympic Park and previous clients, particularly smaller ones. On the Park, health and safety was seen as the overriding factor, whereas for other clients money was much more significant, with health and safety regarded as a bonus but not the first priority, a perception shared at several levels in the supply chain:

... we are working with really good, proactive, intelligent clients which makes our life a lot easier to work with them and we can bounce ideas off them. (Project manager, TitanCF Industries [Tier 1])

... the level here is very high and that is drummed into you right from the very start. On other sites it is drummed in at the start and then it tends to, if production dates aren't met, on other big construction sites it does tend to slip away and get a bit of a back seat compared to getting things done. Whereas that is not going to happen and we don't want that to happen, health and safety is out right at the front. (Manager [link to Tier 2], OmegaCF Contracting [Tier 3])

The highly interventionist arrangements in construction and the oil and chemical tanker industries were less apparent in the supply chains of the container trade. Nevertheless, in subcontracting the operation of its vessels to Eagle Shipping it was evident that QPR was looking for a ‘quality’ operator with a good reputation. The management at Eagle identified its reputation with regard to both safety and regulatory compliance as an essential factor in winning the contract to run QPR’s vessels. Furthermore, in the standard contract used (and often adapted) in the subcontracting of ship management, several clauses pertain to regulatory compliance and to the management of safety. For example, a clause on regulatory compliance specifically mentions regulation relating to seafarer qualifications (STCW) and to the ISM Code. It states:¹⁸³

... 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).

Another clause dealing with SMSs requires that:¹⁸³

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 Safety Management System (SMS) and that instructions which are essential to the SMS are identified, documented and given to the Crew prior to sailing.

As we outlined in the previous chapter, here there was no obvious pressure from clients who ultimately owned the goods being shipped for either the ship operator or the ship management companies to conform to requirements from them concerning the management of health and safety on board the vessels shipping them. Indeed, with the exception of the single example given of a client that had carried out some auditing (see Chapter 4), there was no evidence of them having such requirements. As already noted in Chapter 4, this was firstly because there was no particular business advantage to clients for them to do so and secondly because, even if they did, the structure of the supply chain generally meant it would have been difficult for them to directly influence either the ship operators and managers or the seafarers in this case study.

The seafarers perceived only limited interest in arrangements made for their health and safety among the charterers (QPR) and they were unaware of the nature of the contractual arrangements between Eagle Shipping and the vessel owners (also QPR, which was in turn owned by Griffin). Instead, they generally saw the priorities of the charterers (QPR) as being focused on getting the cargo safely and in undamaged condition from point A to point B as quickly as possible:

We’ll 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. (SEA 15)

Aboard ship the overall view seemed to be that while some cargo owners dealing with QPR did take a certain interest in the vessel, this interest did not really drive 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 it provided a service were about reasonable costs, speed of delivery and avoidance of bad press.

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 long-standing 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 Shipping, 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 [name of a European port] every time there is a wander round the ship as well, they’re from QPR. But I think the clients themselves are quite responsible party, they are not Greeks. 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 if 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 old rust bucket hanging to bits. You know, you are going to say ‘are my goods going to get across the Atlantic?’ (MAN 2)

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. (MAN 3)

There were 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 Organization for Standardization (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 one of the KPIs we’ve got, I think they say 5 per cent 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)

The personnel of the ship-management company also felt that safety on board the ships it managed was primarily driven by their own efforts. The rationale they gave for doing so was a mixture of ethics and ‘good business sense’. In relation to their own procurement policies, for example, on personal protective equipment (PPE – for example coveralls, boots, gloves), the company had decided to implement higher quality 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 its offshore vessels. This was partly because it wanted one supplier for all coveralls and it needed to supply its offshore vessels, but it was also because it was thinking about its public image:

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

The contract for ship management under which the company operated meant that the cost of such items was passed directly on to the ship principals (ie to QPR in the case of its vessels). While there did not seem to be opposition to this, mention was made of one occasion where a (different) ship owner on a tight budget raised some objections. Eagle senior management had quickly dealt with these:

... those things got nipped in the bud in quite an early stage and not through myself, but through [senior manager’s name] it would be mentioned to them about the standard that we maintain and it is cheaper to pay for the extra for the PPE than to pay out for a burns claim or something like that. (MAN 1)

In relation to QPR, Eagle had never been approached to reduce standards. In fact there were examples of situations in which it had been asked to improve them. One of these was in relation to food provisioning. The feeding rate for Griffin ships was regarded as quite low (€5.75 per person per day) and requests from officers for their own specialist foods, which were quite expensive, were difficult to meet. Eagle attempted to deal with this difficulty by bringing provisioning in house and ‘cutting out the middle man’ to improve cost efficiency and quality.

When asked who or what was determining the overall standard of safety on board the vessels Eagle managed, the response was:

MAN 2: I’d say that was more down to us.

Interviewer: You would?

MAN 2: I mean I have just done a technical inspection on one of the vessels and my technical inspection I will of course look at safety items. Yeah, I would say it is more ours.

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.

They were aware of regulatory standards and knew that their contract with clients made meeting them obligatory, but argued that the company worked to a standard that was higher than regulatory minimums:

No, no, no I mean I work for Eagle, but we all have our guidelines to work with and we have SOLAS, MARPOL... 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 seen more as concern for business reputation. In this sense, therefore, charterers did become important:

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, whatever, what the client wants anyway, whatever they say. If a client says, 'well no you can operate it here', they are not saying 'the operator here will accept so many deficiencies a year'... So we offer the best. The best practice that we can.

In other words, they 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. At the same time, through the same sources they 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.

The seafarers were also aware of the drivers for safety from the ship management company, which was seen as an important influence on board:

SEA 17: I think since I was new here in Eagle... the only things I notice... Eagle is very strict for safety, that is the only thing saying about Eagle. They are very taking care really of safety. I think it is not for the [offshore] ships only, I think for all the ships in general.

Interviewer: And when you think about Port State Control or Eagle when you are working in the engine room, which one of those – [Eagle] or Griffin or QPR – which one drives your health and safety practice? Which one encourages you to work safely?

SEA 20: Of course Eagle, mostly Eagle.

Interviewer: Eagle, ok. And how do you see that? Is that because they produce documentation or procedures? How do Eagle influence your health and safety?

SEA 20: For example we are going to repair some engines... like [a] generator. We have a checklist

that we are ticking off before the job started, like: isolator, electrical switches, something like that, close all the fuel valves.

Interviewer: And the checklist comes from where?

SEA 20: Eagle also.

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 OSH management standards 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. Since the management of safety was understood and widely accepted to be an important element of managing affairs at sea, indicators of the standards to which this occurred in practice and the avoidance of situations in which safety management failure might be identified were regarded as important to the continued business between QPR and Eagle – and the business of the latter with its shippers was seen to be to at least to some extent dependent on 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 in the provision of management generally could be associated with indicators of good safety performance, this was a further influence that helped to maintain good standards of health and safety on board ship. However, as we shall discuss later, these influences on the quality of OSH 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.

Supporting health and safety practice

A criticism of the effectiveness of procurement practices in the past (and especially in the construction industry) was that their delivery, once the contract had been awarded, often fell some way short of expectations. For example, a study into fatal accidents in the construction industry found that there was an ‘absence of strong agreed paths of influence from contracting strategies to specific organisational factors’.²⁵ In our case studies in construction and the tanker trade there were signs that procurers had taken a highly interventionist approach towards achieving compliance from their suppliers. While such intervention was most obvious in terms of the monitoring/inspection strategies they used (and which are explored further in the following subsection), there was also considerable evidence of interventions intended to support improved OSH management among suppliers who might otherwise not have the capacity to operate at this level and whom it was necessary for procurers to bring up to the required standards.

There were many examples of such support evident on the Olympic Park. In particular, the ODA supported contractors with the provision of training, health checks (through the Park occupational health service), as well as with information on safety and security on the Park and by organising regular Park-wide campaigns targeting various issues. Lower-tier interviews made clear that personnel understood training was compulsory for workers on the Olympic Park, as was possession of construction skills cards. TitanCF Industries personnel indicated that everyone attended a behavioural safety training course:

... behavioural safety training that all the operatives go through ‘Beyond zero’ training, it is like a workshop that goes on for half a day, it is like a forum on issues... (Tier 1 supervisor)

This observation was corroborated by its subcontractors:

I mean we have actually attended all of ‘Beyond zero’ courses so I think all of our guys, there might be a couple of agency guys that haven’t attended, just waiting for the new course to sort of turn up again and we will send those along to it. (Health and safety adviser, ArgonautCF Construction [Tier 2, also acting for Tier 3])

Tier 2 interviewees referred, for example, to the monthly meetings for supervisors and for all Tier 2 contractors, methods statements, wearing of specified PPE, near-miss cards and weekly meetings to discuss these cards, audits and inspections (both internally and by the Tier 1 contractor), weekly progress meetings, timesheets, toolbox talks, plant record sheets, incident monitoring and daily briefings and so on, all of which, might be delivered by their upstream procurer, but which they were aware were driven by the ODA and its delivery partner CLM. There were acknowledgements from interviewees in the lower-tier organisations that their companies' health and safety systems had been improved by this support:

Ah, it's about a million times better, I can tell you that. Everything is more exaggerated so you've got to pay more attention, so it is better. (Tier 3 worker)

In addition, staff from upstream organisations were frequently 'seconded' into lower-tier organisations to help with supervision and health and safety. The extent of management of lower-tier organisations by Tier 1 contractors varied both with their size and experience, as well as with different work situations. Interviewees also spoke of how the ODA aimed to promote the creation of an effective safety culture by such means as the encouragement of near miss reporting; the use of safety climate and employee satisfaction measures; the running of behavioural safety management programmes; the employment of benchmarking, recognition and incentivise schemes; and Park-wide health and safety campaigns.¹⁸¹

In the Forum Development project, while it was not developed to the same extent as on the Olympic Park and was operated by TitanCF Industries rather than the Rome Consortium, a similar pattern prevailed. Training was provided for subcontractors and workers employed by lower-tier organisations:

It is everybody and it is thrown out to them all... An example of them all getting involved is, we run a monthly workshop out on the site. We package different areas up and they all go and look into each other's work zone, and we do inspections that way. (Construction manager, TitanCF Industries [Tier 1])

The aim of TitanCF Industries' approach was to bring its subcontractors into its own systems and culture:

So we are running 'Beyond zero', that has been running for about three years, [that] campaign. And what our supply chain would have been bought in and been made part of that. So various seminars and workshops for them to bring them onboard and buy into our belief... I mean we have a proactive approach; not everybody sees the world as we do obviously, but we would like them to. (Project manager, TitanCF Industries [Tier 1])

In the tanker trade, a typical example of support through intervention was the TMSA programme introduced by OCIMF in 2004. The programme was intended to be used as a tool to help vessel operators assess, measure and improve their management systems. Currently in its second edition, it builds on operators' earlier experience with TMSA and on feedback received from the industry. Its scope has also expanded to encompass all tanker vessel operators, including those managing coastal vessels and barges. It is based on encouraging operators to assess their SMSs against KPIs and it provides best practice guidance. Interviewees in the tanker trade were well aware of its existence:

Since TMSA they now have control even over us in the office. They can say how to run our ships, how to manage store supply, which courses we should conduct in-house, how many additional safety equipments should be placed on our ships and so on... (Manager)

As intended by OCIMF, this intervention had a direct effect on the form and content of the SMSs of some ship operators and on board some ships. As one company quality and safety manager said:

Nowadays, the revision of the SMS is directed by the syllabus of the oil majors. Since the oil majors' inspection syllabus has often been changed, the SMS was led by their change. Since their syllabus kept changing, we must track and follow their revision and its latest requirement.

How to ensure contract compliance

The findings of previous research suggest that while clients tend to be familiar with setting contractual requirements on health and safety in the procurement of services, they are generally far less engaged with efforts to monitor compliance or undertake post-completion review of such arrangements.⁸²

However, in our case studies, we found substantial examples both in construction and in the petrochemical tanker trade of ways in which this criticism is now addressed by heads of supply chains through monitoring and inspection regimes.

Monitoring compliance with the requirements of the ODA

After the procurement stage, once work was underway, the ODA had three broad approaches to monitoring health and safety management and performance on the Olympic Park:

- monthly completion of the HS&E scorecard reporting performance by principal contractors (for example numbers of toolbox talks, the presence of behavioural safety systems), lead designers and construction, design and management (CDM) co-ordinators
- monitoring and audit of the health and safety performance of suppliers
- monitoring and reporting on the practical application of risk management and compliance with the HS&E Standard to the Executive Management Board.

Tier 1 contractors were expected to use their own management systems to monitor and audit their health and safety performance and to investigate any accidents and incidents. The role of the delivery partner, CLM, was to project manage and monitor the Tier 1 organisations and their health and safety management and performance. Contractors at all levels, therefore, were periodically inspected and audited by CLM¹⁸¹ to validate and verify the self-monitoring. The formal scorecard and accident reporting systems were web-based, allowing principal contractors, designers and CDM co-ordinators to self-monitor and submit monthly reports on accidents, incidents, significant near misses and other health and safety data electronically.

The CLM assurance team, which carried out inspections and audits of contractors, identified health and safety priorities three months prior to the work using the monthly HS&E scorecards; compliance reviews; and information from the monthly meetings between the assurance team and key project personnel. CLM itself was also monitored by the ODA to ensure that its targets (on which payments depended) were met:

... there is a task order which defines what CLM has to do in order to earn their income, both their base and their bonus associated with H&S; and on a monthly basis, they have to submit a monthly report which describes activities, events, performances, etcetera, and they have to submit that to me, and I and our construction director need to sign off that we are satisfied with those reports. Both are a demonstration of their work and are valid and on that basis, that particular component of their billing for that particular month is deemed to be valid. (Head of health and safety, ODA)

The ODA's approach was summed up as follows:¹⁸¹

The emphasis throughout the works shall be on suppliers conducting their own monitoring, auditing and investigations and providing assurance that the information so generated is valid and verifiable. Suppliers and their personnel shall also cooperate fully with any monitoring, audits or specific investigations carried out by suppliers above them in the supply chain, by the Delivery Partner or its representatives and by the ODA and its representatives. Such HS&E assurance activities will be conducted in order to maintain and improve HS&E performance. The techniques to be employed include: site HS&E inspections; HS&E audits; Corrective Action Requests (CARs); fact finding meetings; coordinated HS&E reviews; and monthly reports/score card.

Interviews with ODA personnel identified a number of specific systems for monitoring health and safety performance and management including: near-miss cards which fed into the near-miss register; on-site mini safety departments (consisting of a safety adviser and an assistant); safety/accident books; risk assessments; method statements which included mini risk assessments; hold points; behavioural safety systems such as 'Beyond zero'; daily briefings; and reviews of method statements and risk assessments. The ODA's Health and safety director was supported by safety adviser assistants and by health and safety officers. Part of the health and safety officers' role was to monitor health and safety on site by inspecting and reporting two or three times each week; and by putting together a sheet of photographs each Friday of issues or areas needing to be addressed the following Monday – photographs such as these could also be issued sooner than Friday for urgent issues. For the latter, supervisors within each tier were responsible for checking and reminding workers about health and safety matters on a day-to-day basis (for example, PPE); they in turn were answerable to health and safety advisers within each tier; and these advisers were answerable to the Tier 1 Health and safety managers (who were answerable to the ODA and CLM).

Similarly, the interviews with TitanCF Industries gave details of its systems and monitoring procedures. These began with the Project Management Plan, which included an integrated management system from which was developed the Operation Mode, which controlled the management of the works through risk assessment, method statements and appropriate health and safety documentation as well as work controls (such as permits for particular operations, many of which were developed on the Park) and inspections. Interviewees described how method statements were drawn up for every job and were constantly monitored and updated if necessary. All method statements included hold points (ie points where the work must be checked and signed off by an authorised person before it can continue):

All engineers and supervisors know that if you don't get to that point and it hasn't been signed, you don't carry on. (Contract manager, TitanCF Industries [Tier 1])

They also described their electronic reporting system for near-miss recording and distribution to CLM project managers, who in turn distributed the information to all the Tier 1 contractors who could then decide which information to disseminate to their teams and subcontractors.

Tier 2 interviewees also mentioned many of these systems. They were aware that unsafe work would be stopped, possibly photographed and sent to the organisation's director:

... it is very heavily policed, I get absolutely annihilated if everything isn't in the right boxes and that box isn't filled in and the hours, and the service hours and the rest of it. Everything has to be crossed and double checked, and filled in properly. (Supervisor, ArgonautCF Construction [Tier 2])

It was understood that TitanCF Industries was the client but there were examples given of CLM stepping in on matters of safety:

... obviously they sort of come up with the rules, [TitanCF Industries]; they have to adhere to the rules and because we are Tier 2 we also have to adhere to them as well. So at the end of the day we are working for [TitanCF Industries], we are all working under CLM and the ODA, so to speak. Yeah, I mean we have had a couple of things with CLM before, they warned us that we were getting mud on the roads because our jet washer was frozen up at the time, when we had the snow – so there was nothing we could do about that, and then all of a sudden they come along and shut the gate and lock the gates up. (Health and safety adviser, ArgonautCF Construction [Tier 2, also acting for Tier 3])

Tier 3 organisations again referred to many of the same systems and procedures. They were aware that there were independent weekly safety inspections which could result in work being instantly stopped if something was unsafe. Tier 3 workers talked about the card system used for on-site offences:

... like you walk around here without your glasses on, yellow card! What happens is, if you get two yellow cards then you are issued with a straight red and that's you off! Yeah and I don't know if it is true or not, but they apparently put you on a black list, so you can't come back onto the Olympic site for five years or something like that. (Workers, OmegaCF Contracting and GammaCF Contracting [Tier 3])

Monitoring the Forum Development project

A slightly different emphasis on monitoring was evident in the second construction case study – the Forum Development project. Here, as already noted, the procurer's approach was generally 'hands off', with a number of other organisations involved in managing the supply chain. Nevertheless, it did require some monitoring:

We do collect data... we use [organisation name] as our employer's agent for the development and we ask that they collect data from the principal contractors on any accidents and the details of any accidents that happen on site. So we certainly want to know about anything that is reportable, and fortunately I don't think we have had very many of those – we may have had three or four in three-and-a-half years, so that is not bad... so [organisation name] collects that information but also on every project, on every contract we have a monthly contract meeting and health and safety forms part of the reporting. So each month each contractor will report on their project and there is a section in there about health and safety. (Project manager, Rome Enterprise Consortium [Procurer])

The procurer also took part in a weekly site tour, which involved the TitanCF Industries site safety advisor, foreman and engineer and, on some occasions, a representative of the subcontractors. However, generally the emphasis on the site was on the Tier 1 contractor taking responsibility for the monitoring of compliance from lower-tier contractors with its safety systems and this was a conscious approach from the procurer. When asked whether they checked if initiatives were being passed on to lower-tier organisations the procurer respondent said:

No, no we don't do that. But it is one of those things; it is almost we measure it through its own success in that we know it is happening. (Project manager, Rome Enterprise Consortium [Procurer])

There were various forms of feedback used for monitoring the activities of contractors, built into their systems for safety on the site, including the formal systems (for example the 'Safe on site' and 'Beyond zero' boards); as well as toolbox talks, daily briefings, method statement briefings and activity briefings (all of which were followed by discussion and consultation time); and informal approaches such as suggestions boxes, observation cards, the near-miss card reporting system and various safety workshops.

Monitoring was also a key part of these processes:

... the compliance sheet, that is basically what the ganger or the supervisor out there he'll probably sign it two or three times a day, just to check that the lads are sticking to it. (General foreman, TitanCF Industries [Tier 1])

I also audit for the company so anywhere I find something else I see I feedback... So there is always one of us picking up something that is going on in other jobs. So anything we pick up comes back, we talk about it and actually we got a merit for here. (Construction manager, TitanCF Industries [Tier 1])

In terms of its subcontractors, TitanCF Industries required them to provide their own method statements and activity plans, which had to be signed off before work could begin. And it was clear that refusal to co-operate would mean that suppliers would not win any future work. The Tier 2 interviews also suggested a detailed level of monitoring at an individual level:

... we try to follow the strict rules and you see the foreman come all the time to check if everything is safe, the general foreman [individual] comes down to have a look and [if] he finds stuff that is unsafe he stops the job. For me he said to me once to stop the job and to do [it] another way. It is good because you can see the people, the general foreman, they try to keep the job safe. They don't just come down and say, 'look I want this job done and that is it,' they say 'no I want this job done' but they try to do it in a safer way. And they are continuously watching you as well, like if you do anything wrong, they are continuously checking your work [to see] if it is alright. (Workers, TrajanCF Construction [Tier 2])

Similarly, the Tier 3 personnel also made it clear that they were expected to 'toe the line' in terms of the health and safety procedures and systems in place on the site generally (which were there at the insistence of the Tier 1 contractor):

It is mandatory; we have got to do it. If we don't do it we will not be working on the contract and I never had any complaints from anybody. (Supervisor, LegionCF Contracting [Tier 3])

Monitoring compliance in the oil tanker trade

As the section on the role of procurement procedures demonstrated, in the oil tanker trade, managers and seafarers alike regarded the system of inspections of safety matters undertaken on behalf of the oil majors as an unavoidable element of business in the sector and one with which they were obliged to comply. However, the regular occurrence of such inspections through the SIRE system also meant that they were obliged to ensure that their health and safety management systems and practices continued to be maintained at levels that would pass the requirements of such repeated scrutiny. They also felt this set them apart from other trades in merchant shipping. As one oil tanker company manager put it:

Tankers are better managed because they have so many extra inspections. Who takes interest in bulk carriers? We have [equivalent bulk charterer] but they don't get excited about safety although we all know bulk carriers are probably far weaker in construction and take a lot of beating [subject to damage during cargo operation]. Our tanker ship-owners have to allocate a

higher level of budget for safety but the same cannot be expected from the bulk carrier ship-owners. (TMAN 7)

The seafarers themselves were well aware of the consequences of failure to maintain these standards:

There is a lot of pressure to pass oil major inspections... If inspections fail the company will be in trouble. (TSEA 10)

The loss will be huge if the ship does not pass oil major inspection. (TSEA 13)

A sense of being 'set apart' in terms of OSH management was conveyed in the interviews with seafarers on oil and chemical tankers, as well as with the management of the companies operating them. To an extent this was indirectly reaffirmed in interviews with management and crew in the container trade case study. Thus, while in this case study there were virtually no interventions by customers to monitor OSH management activities on board ship, many of the seafarers had previously worked on board tankers and the ship management company involved also managed support vessels involved in the oil industry. They were therefore able to compare their experiences in the two sectors. Like those in the tanker trade, they all spoke of the strong presence of vetting and inspection practices in relation to tankers and allied vessels in the oil sector, as well as of the dominant influence of the oil companies. They frequently ascribed this dominance to the economic power of the oil companies and their ability to thus determine the business of suppliers of transport and other services in the sector.

When pressed as to the outcomes of this scrutiny, however, they agreed that while it meant adherence to procedures and practices to meet the requirements of the oil majors, there was less certainty concerning whether it led to an improved OSH performance over and above that found on other vessels. In essence, there was a view that because oil and chemical tankers carried hazardous cargoes, there was inevitably a raised consciousness of the need for safe working practices and procedures on these vessels. But good standards of OSH were not solely dependent on strict observance of the requirements of the oil majors. Indeed, interviewees were also conscious of less positive aspects of oil major requirements, such as increased bureaucratic demands, unnecessary and burdensome focus on petty issues and, in some cases, unintended consequences of over-rigid demands on the qualifications of crews and other matters which were part of the oil majors' vetting procedures and which they argued could sometimes result in reduced safety rather than the opposite. Moreover, the interviewees offered these reflections while on board a container trade vessel on which they felt relatively safe and when working for a company they regarded as doing a reasonably good job in managing health and safety on board. They attributed this to a combination not only of health and safety management systems and scrutiny, but also to the stability of the working relationships and knowledge of the work environment created by the relatively unusual human resource retention policies of the ship operators, which meant that individual crew members had a long-term relationship both with the ship and with each other:

That is the one advantage, that the crew is always there and mostly these ships – if you will take a look on it if we go around when it is empty – it is plenty doors to open, plenty doors to close, plenty panels to close down, up. And the risk of accident is very near if you are injured, or [of] a damage that will cost the company more money. And the work is much easier when you have some same crew. That is for my own opinion. (SEA 17)

Similarly, the senior officers on board were seen by many seafarers as key in driving and maintaining safety, and certainly in relation to their everyday working practices:

I think what makes a big influence when it comes to us for our safety... it starts with the captain I guess, then the senior officers, chief officer. Because if these people... don't give a damn about our safety then maybe the company people in the office, they don't see what is happening here. (SEA 23)

With regard to the SMS, particularly in relation to checklists and risk assessment documents, it was evident from the comments of seafarers (quoted on pages 54–55) that Eagle was seen as an important influence on safety on board. As part of Eagle's drive for safety, seafarers and shore-based personnel referred to internal audits conducted by the company and these were said to be very helpful in identifying areas where safety management could be improved. External audits from

agents unrelated to charterers were also identified as key to the maintenance of high levels of operational safety. For example, seafarers clearly identified responsiveness to regulatory requirements as influenced by various forms of inspection:

Regarding safety, I think the flag state has a very strong effect on the vessel, on the flag state and also the senior officers like the captain and, I believe on [safety]. (SEA 24)

But I also have to think about that now I am on a ship that is trading for the United States; we have to think about that. That is a great thing, yes it is. So it fulfils the first safety anyway if we are listening to the US coastguard. (SEA 16)

In short, inspection as a means of ensuring compliance with OSH management standards was valued and widely perceived to be both necessary and useful in all cases. This was irrespective of whether inspection was undertaken by an agency of public regulation such as that of the Flag or Port state (as was primarily the case in the container trade) or whether it was additionally the result of private regulation such as the SIRE inspections in the oil tanker trade, or a mixture of both.

Explaining the effects of procurement, support and monitoring

In summary, therefore, in both construction case studies and in the case of the oil tanker trade, the health and safety demands of organisations that were at the head of the supply chain and in positions to determine the business success of suppliers, were important influences on how supplier companies represented their arrangements to manage their health and safety. This said, there was variation in the degree to which these organisations intervened in supplier companies to influence the nature of the OSH management concerned. At the risk of some oversimplification, it would seem clear that the high profile of the activities concerned (large-scale building projects and the carriage of oil at sea), the magnitude of the consequences of safety failures for the procuring organisation (both in terms of reputational risk and the not inconsiderable direct and indirect financial penalties), along with the closeness of the association between them and the supplier, were major factors which influenced the extent of their intervention. A third factor, equally important, was the power (both economic and political) wielded by the head of the supply chain and the extent of the power imbalance between it and its suppliers. Related to this was also the technical and organisational capacity commanded by the head of the supply chain to intervene appropriately. Thus, the oil companies were regarded by virtually everyone in the tanker trade – from senior managers to ordinary seamen – as omnipotent in determining the business practices involved in the carriage of their goods. They were seen as wielding sufficient economic power to drive the safety management arrangements of the tanker operators not only in their direct dealings with them, but also indirectly, through their control of oil terminals:

Even if your ship is contracted to carry cargoes by the shipper, the ship would not be allowed to call at X's [name of a major oil company] berth if the ship did not receive and pass its inspection. Like this ship: it is chartered by Y [name of a small Chinese petrochemical company]. In the contract terms, it is stated that the ship must pass X's inspection since the charterer has cargo with this oil major. It is also the case with other oil majors. If the ship failed to pass [oil major] inspections, the charter party might be cancelled or hire would be deducted. (TSEA 5)

The business dependency of ship operating company managers on their oil company charterers dominated interviews with them (for example, it was mentioned in nine of the 10 interviews conducted by Bhattacharya in two of the four companies re-analysed here), with the sense that the very existence of their business depended on them doing the oil companies' bidding:

When we go to any terminal [non-oil major] or even charter our ships to non-oil majors, we still need to be inspected and passed by them. Such is their reach in this sector. The whole [oil] industry is run by them – you can't do business without their approval. (TMAN 3)

Additionally, the oil companies' economic resources enabled them to establish and support inspection systems such as SIRE, which some seafarers saw as more significant forms of surveillance than experienced through inspection by public regulatory bodies such as Port State Control:

Compared to [Port State Control] these people are more organised, more thorough. (TSEA 12)

We didn't feel special in the [Port State Control] inspection. After the oil major's inspection we felt that it was simple to deal with the [Port State Control] inspection. We felt [that we] had confidence. (TSEA 15)

The strictness and thoroughness is more than [Port State Control]. (TSEA 11)

In combination, SIRE and TMSA lent the oil companies substantial technical capacity to demand detailed requirements for OSH management from suppliers. In a similar way, the powerful position of the ODA, the high public profile of its activities and its investment in substantial expertise in construction OSH management practice, placed it in a strong and well-equipped position not only to make OSH demands in its procurement processes, but also to engage with their effective delivery.

Such an imbalance of power and relatively close, simple (and arguably unusual) relations between procurer and supplier, as found in the petrochemical tanker trade and construction of the Olympic Park, were not present in our fourth case study – that of container shipping. Here the nature of supply chain relations was both more complicated and more arms-length than those in the tanker trade or in the large high-profile construction work such as the building of the Olympic Park. However, it is important to acknowledge that these relationships were not entirely absent from the business relations in the sector. As we showed, the standard ship management agreement which formed the basis of the business relationship between the charterer and the ship management company made clear provisions requiring the ship management company to adhere to regulatory requirements on OSH and SMSs on board specific vessels. It made further provision concerning the appropriate qualifications and competencies of the crew of the vessels. Being seen to be delivering these requirements was regarded by the ship management company as a measure of the quality of its service and therefore important in ensuring its future business success. The difference between this case study and the others seems to have rested more on the degree of intervention practised by buyers in the different situations than on the absolute presence or absence of supply chain influence.

The effects of the more complicated and arms-length relations demonstrated in the container case study illustrate the importance of understanding the relationship between supply chain actors and broader contextual factors such as the influence of public regulation and regulatory inspection. On board the case study vessel, the seafarers were quick to point to the effects of regulatory inspection and a powerful incentive to ensure compliance with good OSH management standards:

SEA 15: The Swedish Maritime Authority they are coming once a year, then we have the Port State Control, coastguard – they are doing their own and that is one of the most important ones – Port State is very important, and Eagle they are supposed to have an audit now and then and on a regular basis; they should come every six months to help us with the Swedish Maritime audit. That is how it should work.

Interviewer: And of those which would you say is the most influential in terms of bringing up standards?

SEA 15: Swedish Maritime Authority.

Interviewer: That is the flag state?

SEA 15: Yeah, and then it is [US] coastguard.

Interviewer: The coastguard.

SEA 15: Yeah this vessel is trading over there so without them this is it.

Interviewer: So you have got the flag state first, the coastguard [Port State Control] next and then the ship management company afterwards?

SEA 15: Yeah.

However, as we noted previously, the situation of the ship was relatively unusual, in as much as it was exposed to the scrutiny of both a rigorous flag state (Sweden) and Port State Control inspection (the US coastguard). This is not the situation for many merchant vessels regardless of trade and therefore a similar significance for public regulation and its inspection cannot be assumed to be the case for the maritime industry generally. We will return to a further discussion of these issues in the following chapter.

6 Explaining supply chain effects and their significance

Based on an extensive review of the research literature, Walters & James¹ suggested a number of propositions which might be useful in explaining the effectiveness or otherwise of supply chain-mediated initiatives to influence health and safety management and practice among downstream suppliers of goods or services. Here we consider these propositions in the light of our empirical findings in the four case studies carried out in construction and the maritime industry.

This chapter reviews the evidence from our case studies concerning these influences and offers an understanding of their significance at both the micro and macro levels in the situations studied. That is, it examines the usefulness of the propositions previously derived from the research literature as a means of explaining how features of supply chain relations may support positive influences on OSH management and practice. In doing so, the chapter accords attention to the extent of such positive influences and how transferable or context-dependent they are. It also identifies some unintended consequences of efforts to use supply chain leverage to influence health and safety management and, more generally, seeks to better understand the implications of our findings for wider policy and practice in regulating health and safety management in modern work situations.

The chapter begins with a reassessment, in the light of the findings in the present study, of Walters & James¹ initial overarching propositions that supply chain influences on health and safety vary both according to the business interests of the actors involved and the regulatory contexts with which they are surrounded. It goes on to consider the evidence of the study in terms of the positive and negative consequences of supply chain influence. Although our empirical study is deliberately focused on the direct effects of supply chain intervention in OSH and has not set out to examine wider indirect effects in this respect, it nevertheless has highlighted some unintended negative consequences of supply chain attention to OSH and we explore the significance of these for the application of the propositions developed by Walters & James.¹ Finally, and again in the light of our empirical evidence, we reconsider the relevance of Walters & James' third set of propositions¹ concerning the nature of supportive supply chain relations and the role of monitoring and surveillance in improving supplier health and safety practice.

The role of business interest and regulatory context

Walters & James¹ argued that attention accorded to health and safety related issues by supply chain buyers varied, reflecting differences in two main features of supply chains. First, how far the way in which health and safety is managed by suppliers had implications for the effective supply of the required goods and services to buyers and second, the extent to which pressures were exerted by private or public regulation to support the development and effective operation of health and safety focused supply chain strategies. As shall be seen below, our case studies bear out both these observations.

Implications of health and safety management for the effective supply of service

In all our case studies the extent to which OSH was managed by suppliers had implications for the effective delivery of the services they offered. As we have detailed in Chapter 5, the buyers and suppliers involved understood these implications in various ways, but in all cases their awareness of them influenced their strategies to promote effective OSH management and practice on the part of suppliers. Even in the case of the container trade where, with few exceptions, the organisations whose goods were being shipped displayed little interest in health and safety management on board, this was not the case for the charterers or the ship management company involved. They clearly identified the need for good health and safety management and, as evidenced in Chapter 5, regarded it as a prerequisite for good business relations and profitability. In the case of the ship management company they not only tried to 'badge' the quality of their company image by striving to deliver OSH management at levels they regarded as beyond minimum for statutory compliance, they also used the same approach with their own suppliers. For example, they sought to achieve better quality in the safety on board the ships they managed by ensuring good quality PPE from their suppliers. In the case of coveralls, they supplied ones with fire retardant properties on all the ships they managed, even though these were not required by regulation on board container ships. They did this partly to ensure one supplier for all of their coveralls, but also because they were thinking of their public image, as is evident from the comments made by the ship management company quoted on page 53.

There was also evidence in all the case studies that while interventions from buyers were instrumental in influencing the way suppliers managed their health and safety, there was a more subtle business influence that was felt from other sources, such as for example the practices of other companies in the same trade. Thus, in the construction case studies the principal contractor on which both studies focused – TitanCF Industries – was one of an association of construction and civil engineering companies that belonged to the UK Contractors Group (UKCG). UKCG has played a prominent and leading role in promoting the business case for health and safety in the construction industry during the last decade or so and in co-operating with the HSE in the delivery of the regulator's campaigns on improving health and safety in construction. Indeed, the strategy of the HSE's Construction Division has been to work closely with this organisation and its members to try to effect change at the highest level in the companies concerned, on the basis that this would lead to such change being cascaded downwards through organisations and through the relationships between upstream and downstream contractors. This is highlighted in the HSE Construction Division's most recent Plan of Work, in which reference is made to continuing to 'work in partnership with key stakeholders and intermediaries' on collaboration that includes 'use of the supply chain to influence standards'.¹¹⁴

On the Olympic Park, TitanCF Industries was one of a number of principal contractors that were also members of UKCG and therefore shared many aspects of a broad understanding concerning leadership and the business benefits of being seen to deliver good practices in OSH management. At the time of our fieldwork, there were various systems the ODA had put in place to ensure senior representatives of these organisations met regularly and also met with representatives of the ODA, CLM and HSE. On communications generally, the ODA's HS&E standard stated:¹⁸¹

Each supplier, the ODA and Delivery Partner shall ensure that there are effective communication arrangements to inform all site personnel of key issues including progress, lessons to be learned from incidents, campaigns, and programmes of risk control.

Opportunities existed for communication across projects through a number of forums, including Project Leadership teams, the Safety, Health and Environment Leadership team, and Health, Safety and Environment forums, which also allowed Tier 1 contractor personnel and their suppliers to share health and safety information.

That the ODA leadership used the supply chain strategically is evident from the comments of its Director of construction (quoted on page 48). Nevertheless, this was not simply a matter of the ODA imposing its own requirements on contractors. There was evidence that many of the principal contractors on the site were already using similar management standards as part of their own procedures prior to the intervention of the ODA. TitanCF Industries, for example, had been involved in the development of the site from its outset. Interviewees believed that many of their systems and procedures had been used as a basis for the systems and procedures later introduced, developed and rolled out across the Park by the ODA and CLM. They described the formation of common health and safety standards as a culmination of ideas from various different contractors as well as CLM and the ODA, including, for example, the ODA's induction programme:

... when that changed from [TitanCF Industries] managing the park to ODA then taking charge and then we all had to have our new badges for it, when you went and sat in that induction we were all sat there and went, 'hang on, that looks very much like a [TitanCF Industries] induction to me, with a little bit of [organisation].' (Contracts manager, TitanCF Industries [Tier 1])

What seemed to be taking place as a result, therefore, was a balance that used contractors' existing experience of the business benefits of best practice in managing health and safety and combined this with co-ordination and leadership from the ODA and CLM to ensure they not only adopted these standards themselves but also sought to influence their own contractors into accepting there were business benefits associated with adopting them. As the quotes from interviews with second and third-tier suppliers reported in the previous chapter attest, this was a message that was heard and acted upon by many of these downstream suppliers:

... if it is a high-profile site and high-profile job, it usually comes with high-profile health and safety awareness. (Manager [link Tier 1 to Tier 3], ArgonautCF Construction [Tier 2])

In the Forum Development project, while much of the role of the project developer as the procurer of good practices on OSH was devolved to principal contractors such as TitanCF Industries, the procurer nevertheless held regular meetings of the principal contractors on the site in a way similar to

that practised by the ODA. Again these contractors were nearly all members of the UKCG and therefore shared experiences and approaches that were derived from a variety of sources external to the project. At the monthly meetings for principal contractors organised by the developer there was an emphasis on sharing experience:

At the principal contractors' meeting... we basically have a very open discussion about what each contractor is doing and interfaces, forthcoming things... how they are managed on site is our responsibility still, but we try to encourage the contractors to have this relationship, and find it works very well. (Project manager, Rome Enterprise Consortium [Procurer])

Interestingly, there was also a sense conveyed by some of the employees of TitanCF Industries that they felt their practices influenced the procurer. A two-way process of downstream and upstream communication existed between the procurer and suppliers:

Well I like to think we are, I like to think the client learns things off us, that is why they employ us in the first place isn't it?... If you haven't got through health and safety record then you don't get through the door, it is as simple as [that] these days. You see it reflects on clients as much as anybody, it is their job at the end of the day. (General foreman, TitanCF Industries [Tier 1])

A broadly similar scenario to that previously described on the Olympic Park prevailed in terms of procedures to raise awareness among contractors concerning the business benefits of being seen to be adopting arrangements and procedures regarded by upstream purchasers as good health and safety management practices. Here again, there were also a variety of means in which the benefits of these practices were communicated among lower-tier contractors which resulted in a horizontal influence among peer group companies at the same level within the supply chain as well the vertical influence of buyers on downstream suppliers. Overall, as a result the lower-tier contractors believed that their health and safety reputation was integral to them getting more work:

At the end of the day we have got the contract; if we want more work then the incentive is to get it right in the first place... so everything for them really. They have got to do it otherwise they have got no work. (Procurement manager and OSH adviser, HadrianCF Construction [Tier 2])

In an interview with senior HSE personnel with responsibility for seeking compliance with regulation in construction, a similar concern with the achievement of horizontal influence unfolded, this time in relation to clients:

... we have challenged other clients who are engaging or are having major works done to go and speak to people like the ODA, look at the research that has come out of the Olympics.

... I mean, we are already engaged with [a large construction engineering company] who are going to be building [a nuclear power station] and we've said, 'go to the Olympic Park, go and speak to those who engage down there – the client particularly – look at the standards that they set out in relation to health and safety... See what they've done and learn the lessons and then, you know, use them for your purposes...' (HSE Chief inspector of construction)

None of these practices had occurred in a regulatory vacuum. However, the nature of the regulatory influences which existed varied across the two industries.

Pressures of private or public regulation

The second part of Walters & James¹¹ initial proposition argued that supply chain influences on health and safety management represent a response to regulatory influences of one sort or another. And they are more likely to occur where there is some form of regulatory scrutiny in place. We also found this to be generally so in our case studies.

In the construction industry the response to regulation is obvious. The Construction (Design and Management) Regulations are an overt attempt to ensure that the duty of care for workers' OSH in the UK construction industry is ensured despite the fragmented nature of its structure and organisation. To achieve this, the regulations are explicitly focused on supply chain relations on construction sites. As we have already noted, the delivery of compliance and reduction of the toll of fatal and serious incidents in the industry has been the goal of a series of high-profile government inquiries and political pressure since the early 1990s, much of which have been aimed at the top end of the industry in which companies such as the one in our investigation are located. Moreover, as also

discussed in Chapter 5, focusing on supply chain relationships is currently a central theme in the approach of the regulator towards the industry, an approach in which the strategy of the regulator has been to match its engagement with the different features of different parts of the sector. Thus at the top end, such as represented by the case studies, the HSE no longer undertakes regular proactive inspections on major construction sites, preferring instead to make its presence felt at the planning stages of the work and in general oversight of such projects.

Thus, on the Olympic Park the HSE largely exerted its influence through its engagement with the ODA Board, rather than through site inspections. Its senior officials argued that it made its influence felt at this level and thereon it was cascaded through the various levels of procurement by the demands of the procurers involved, and that it helped to drive their efforts to ensure compliance from their suppliers with OSH management requirements originally outlined in principle with the regulator at board level.

... we took things to another level... how they could facilitate health and safety... actually how you then co-ordinate and communicate the issues to be managed by the suppliers... A lot of this comes back to the issue of, dare I say it, collaborative working... where you've got people in a room... it's harnessing those skills to deliver the outcomes you need. (HSE Chief inspector of construction)

A similar approach occurred on the Forum Development project. In both cases, the regulatory inspection of compliance was therefore replaced by the monitoring activities of the procurers in the supply chain, while intelligence on the results of these monitoring activities was meant to be fed upstream to alert controlling organisations and the regulator to problems of compliance in lower tiers. It was not possible to systematically measure how effective this feedback mechanism actually was in practice. The impression gained, however, from such data that were available and from interviews with personnel in medium and upper tiers, suggested that broadly it worked. However, there was concern among some interviewees from the lower tiers about the additional administrative burdens, greater costs and perceived unnecessary precautions involved:

Half of this health and safety stuff I end up doing, I'll end up going in on a Saturday or Sunday or doing it at home. (Supervisor, ArgonautCF Construction [Tier 2])

But it is just the sheer volume of paperwork that you have to provide too. (Supervisor, DeltaCF Contracting [Tier 3])

To be honest it's [the level of client oversight] pissed my boss off. Yeah, it has made our job 20 times harder. Yeah, you've got boys here who've been planting trees for 20 years and then now they're getting told by someone who has been planting trees for three weeks, 'no this is how you [do it].' Hold on a second, I've been doing it 20 years! (Workers, OmegaCF Contracting and GammaCF Contracting [Tier 3])

It is like here, there is no incentives, they keep piling on the pressure saying the job needs to get done and they pile you with all this health and safety rubbish. (Worker, OmegaCF Contracting [Tier 3])

But even when companies and workers complained of these additional burdens associated with health and safety requirements on the site, there was no evidence from the interviews that the procedures in place were anything other than strictly adhered to. Indeed, it was the need to comply with them that was the main reason for complaint. However, the additional burdens on suppliers that are created by such interventions – and the possibility that there may have been unintended consequences of such burdens – was an issue raised in interviews among suppliers in all of the case studies. We will have cause to return to the implications of this theme later.

The regulatory strategy of the HSE therefore seems to have paid off on the Olympic Park while reducing substantially the need for onsite intervention by inspectors.

I guess it comes down to the type of client you are [working] for and the nature and profile of the job. This is the highest profile job in the country, if not Europe at the moment, so all eyes are going to be on how the client, as in [Tier 1 organisation], performs and that, sort of, snowballs down through the Tier 2s and Tier 3s and how they perform... (Manager [link to Tier 1 and Tier 3], ArgonautCF Construction [Tier 2])

Although the Forum Development project did not experience the same high profile as the Olympic Park, broadly speaking a similar situation concerning compliance behaviour and the role of the HSE seems to have prevailed here too, with generally the same results.

The position in terms of regulatory scrutiny in the maritime industry was different. As we outlined in Chapter 2, within the industry significant challenges for regulatory inspection exist. Primarily these challenges arise partly from the global nature of the shipping industry and the complications it creates for the application of national and international laws, and partly because of the problems of inspecting workplaces that are seldom within the reach of shore-based inspectors and even when they are, such as when ships are in port, they are engaged in activities that are often different to those that occur while the vessel is at sea. These challenges have, however, also been further complicated 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 experience of, and few resources for, the regulatory scrutiny of health and safety in the maritime sector. The consequence of this is a highly varied experience of the role of regulation and regulatory inspection in the sector. The case studies are, to an extent, testament to this.

As we demonstrated in the previous chapter, in the oil tanker trade, companies and seafarers alike were of the view that the forms of regulatory inspection undertaken by both Flag States and Port States were less demanding than the scrutiny to which they were subjected by the oil majors and their inspection and vetting systems. The latter was also more of an immediate cause for concern in terms of business interests and job security for tanker companies and the seafarers that worked on their vessels.

That said, compliance with regulatory standards on health and safety was nevertheless a significant issue for all the companies and seafarers in the case studies. In particular, ‘a clean sheet’ in terms of regulatory inspections by various Port State or Flag 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 and did 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.

This applied in both the oil tanker trade and the container trade. The difference between them seems to have been that in the tanker trade there were additional forms of surveillance that the oil majors used, of which the companies and crews of tankers were very much aware and in thrall. Thus, the personnel in the ship management company claimed that when they were tendering for business they would consider very carefully before tendering for a contract to manage ships that had a record of deficiencies or detentions by Port State Control, while the emphasis repeatedly expressed by oil tanker companies first and foremost concerned the need to meet the requirements of the oil companies.

Although inspection and monitoring by heads of supply chains did not feature significantly in the minds of the seafarers as an influence on health and safety practices on board the container ship, this is not to say that inspection and monitoring themselves were not regarded as important. Both on board and ashore there was a significant tendency to want to conform to regulation and to believe that non-conformity would be discovered and penalised. In relation to a notoriously difficult issue to ‘police’, one manager stated, for example:

Having worked for Port State, I can assure you they are easy to catch out because the one thing I can tell you is there is no way you can fiddle the work and rest hours, because all you have got to do as a Port State officer is take that out of the ship’s log book: when did she arrive at the pilotage, when did she arrive on the berth, when did she sail? And you then say, ‘Right, who was stationed here, here, here and here?’ ... people think you can fiddle it but it is not fiddle-able. If you get a Port State officer who has been a seafarer, it is better than when they are a graduate because then they know nothing; but if you have been a seafarer you know that there [are] other documents down the line that will disprove what you have written here. That is the one thing with seafarers, they have always kept records. There are always logs. (MAN 2)

Again, on the container vessel, as noted in Chapter 5, when asked about the drivers of safety performance on board, the seafarers identified various kinds of inspection as significant. Inspections

from regulators were fairly commonplace and seafarers discussed Flag State and Port State (mostly US coastguard) inspections and audits. In preparation for the Flag State inspection, the ship management company also conducted its own internal audit, which was supposed to help seafarers prepare. Thus, a further effect of these external audits and inspections was to encourage the double-checking of items that should be checked at regular intervals on board according to the SMS and the designated responsibilities of seafarers. For example, life-saving equipment was supposed to be subject to regular weekly and monthly checks but preparation for audits/inspections had been sufficiently thorough to uncover some oversights:

Interviewer: And do you sometimes find things that you've overlooked? You know do you find that something is...

SEA 22: Yeah, yeah I admit like this time I am suppose to have this, I ordered already two handrails because I thought... the requirements is only five, but when I check in this last regulation [the requirement is] six in each lifeboat so I missed two.

Interviewer: OK.

SEA 22: But when I check in the SOLAS regulation it should be six in each lifeboat. But now it is already ordered so probably I think in Liverpool I receive the two.

Interviewer: So you know they are coming so you go and check the regulations first to make sure you meet the regulations?

SEA 22: Yeah.

Indeed, many seafarers were keen on the Flag and Port State inspections, seeing them as their defence against an unsafe working environment:

They go onboard not for them, they go onboard for us because they are looking for safety and safety is for us. When they talk safety it is all for the safety of the crew, not for them. That is why we have some video that Eagle [is] showing us about the US coastguard going onboard, that you must know your work, you know most what to do and don't be afraid to any Port State that will be onboard as long [as] you [are] following the rules. (SEA 17)

The message was reinforced by the Flag State's capacity to force improvements onto vessels. For example, on the container vessel, the last Flag State inspection had identified that some of the vessel's loudspeakers were not as audible as they should be. The seafarers had witnessed the replacement of the old loudspeakers with new ones at the Flag State's insistence.

In short, rigorous and demanding inspections, in which significant sanctions or penalties would result from failure to meet required standards, were regarded as important drivers of the standards of health and safety practice on board ships. This was the case regardless of whether such inspection or monitoring was the result of a regime imposed by public regulation or whether it was the consequence of the private regulatory efforts of the oil majors in the tanker trade. However, in the case of the latter, it is important to acknowledge that such supply chain based auditing is additional to the inspection regime resulting from public regulation and clearly served to make up for the perceived deficiency in the rigour and consistency of public regulation in some parts of the world.

In other words, what was seen to contribute most effectively towards driving a culture of safety on board ships in both the tanker and the container trade was the constellation of external pressures in which the regulatory environment helped to create business pressures driving both companies and their workers towards compliance behaviours in relation to safety practices – as well as pressures to protect and safeguard the safety, health and wellbeing of the seafarers. In the oil sector, because of the scale of the risks involved, the oil companies at the head of the rather simple and unusual supply chains had taken it upon themselves to vet and rigorously monitor the safety standards of independent tanker companies. They were further aided in their capacity to do so by their controlling interests in many of the terminals at which the tankers berthed.

In the container trade, in which the risks for the heads of the supply chains were more remote and arguably less catastrophic, the supply chains involved in the transport of their goods more complex and the power of their influence more diffuse, the capacity to exert such unilateral influence over

health and safety management among the suppliers was considerably less. In these situations, therefore, the role of public regulation and regulatory inspection of standards of OSH occupied a higher profile in the nexus of external influences on safety practices on board ships. But in both trades, the mechanism of inspection itself helped focus the minds of the seafarers and their management on the need to meet standards.

This is of course a somewhat idealised picture and it is one that is only likely to apply at the better end of both the oil and container trades. It is worth digressing for a moment to reinforce this important limitation to our study. In both cases the ships 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 this good safety performance was one indicator of success, largely because such standards were perceived by them to be important to the commercial success of their business. In the case of the oil sector, company management and seafarers alike repeatedly made the point that to trade with the oil major members of the OCIMF there was little choice but to conform to their requirements. The seafarers' own testimony was clear on this.

However, while many seafarers and managers made reference to the oil sector being 'very strict on safety', this was not invariably the case. As one seafarer on the container ship made clear when talking about his previous experiences:

I only worked on a supply ship and their standard there was way below here. They were a small company and I got the feeling when I spoke to the pilot in Aberdeen that in the whole of Aberdeen we were known as those crazy guys; they had a very bad reputation, that ship. So I don't think that is a fair comparison, that is the only time. As [a] cadet I was on a small tanker as well, but it was about the same – a really old ship. They didn't really get the good cargo anymore so they tried to get something and their standard was very low as well. I don't really think I have anything that I can fairly compare to this. The only thing I have [in terms of experience] in oil is way below oil standard, I think. (SEA 14)

In the container sector case study both the ship manager and charterer, and the kinds of companies with which they sought to do business, were perceived to be concerned about quality in the transport of their goods and the management of their ships. High safety standards were therefore regarded as good for business. Again, this is not invariably the case in the industry, as the testimony of the seafarers made clear when discussing their previous experience working on other ships and for other companies:

Interviewer: The Port State Control survey? It couldn't pass?

SEA 27: Yes, that is why it transferred a lot in Africa. Because my previous ship chartered by [a large multinational container company], so the route from Spain, Lisbon and Europe.

Interviewer: But then when they kept finding deficiencies... ?

SEA 27: Yes, transfer to Africa, so always in Africa three months.

Interviewer: Can you remember what deficiencies they were finding?

SEA 27: In the ballast, mostly ballast, engine, some crack in the hull bottom, that is only the problem. That is why I am always work[ing]. They are supposed to be in dry dock but I always work there welding, that is why imagine more difficult job my previous company compared with this vessel...

Interviewer: Do you think this other ship was safe sailing with the cracks in the hull and so on? Do you think she was a safe ship?

SEA 27: Sometimes I [was] scared because I know to have a crack inside the hull bottom, but in the route that is it my previous ship is normally not difficult because only passing the [indicates shore], not like here going to America.

The wider maritime literature is replete with similar examples, suggesting that the global reality is somewhat less ideal than we found at the end of the market in which we undertook our investigation. This literature is extensive and long-standing; there are few indications to suggest the situation in the

maritime industry has fundamentally improved in the 21st century.^{68,115,184,185} Indeed, it seems likely that a substantial proportion of the world fleet does not adopt the approaches we have recounted in relation to either public or private regulatory pressure.

In summary therefore, the concern with compliance with OSH standards among the suppliers we studied is not solely the result of concern with business advantage. It is also because of substantial and long-term pressure to comply with regulatory standards, and especially with the development of such standards to specifically address supply chain issues in the industry. As such, our findings bear out the arguments of Walters & James'¹ initial propositions concerning the role of both business and regulatory contexts in shaping supply chain influences on OSH. They further endorse the conclusion that while supply chain influences can be important sources of leverage towards improved OSH practices, and as such are useful means of enhancing regulatory strategies in certain situations, they are not a substitute for regulatory standards.

Negative or positive health and safety consequences of supply chain relationships?

Walters & James'¹ second set of postulates argued that buyers influence health and safety both directly and indirectly, the former exerting positive effects and the latter exerting negative ones. It is important to be clear that nothing in our empirical studies of the (largely positive) direct effects of buyers' supply chain interventions on OSH management leads us to question the postulate that overall the indirect effects of supply chain management are negative in terms of health and safety outcomes. The main findings of the considerable literature reviewed by Walters & James,¹ which led them to this conclusion, are therefore not challenged by the present research. Indeed, arguably the situations we have examined are somewhat exceptional cases and for the most part, manipulation of supply chains to promote the business interests of buyers is likely to create price and delivery pressures on suppliers, which may undermine their efforts to improve their management arrangements to protect their workers' health, safety and wellbeing. This in turn may lead to poorer health and safety outcomes.

That said, in our case studies we have concentrated on exploring the direct effects of buyers' supply chain strategies and thus, as already discussed, our conclusions generally support the idea that within the somewhat narrow business and regulatory contexts we have described, buyers may indeed have positive effects on the health and safety arrangements of their suppliers. Within these direct interventions, however, there are some further unanticipated negative effects which it is important to mention.

Negative consequences of direct supply chain intervention in our case studies

The concerns of buyers to impose conditions upon suppliers sometimes resulted in onerous demands on the time and effort of the suppliers. These additional requirements were on occasion seen as unnecessary or misguided by the suppliers on which they were imposed. The examples of the concerns of lower-tier contractors and their employees given in the previous section were mainly of these kinds. The demands of procurers were also perceived to sometimes lead to situations in which the overall effects were to increase the stresses of the job tasks involved and thus potentially increase the likelihood of unsafe acts. This was especially the case with the 'paper trail' requirements associated with the monitoring of compliance in the requirements imposed by the oil majors concerning OSH management in the oil tanker trade.

I check the bridge chart correction, passage planning, echo sounder logbook, GMDSS [Global Maritime Distress and Safety System] logbook and many, many others on the bridge. I also have to check the old records to ensure that the records are also correct. All the old logbooks should also be in order. There is a lot of preparation before an oil major inspection, mostly paperwork. (TSEA 7)

It is also the case that while companies and their seafarers may put enormous effort into preparing their vessels and SMS for the scrutiny of oil major inspections, this does not necessarily mean that they will keep up such efforts once the inspection has been passed. As two Chinese seafarers put it:

Now the main issue in the management is to deal with the oil majors' inspection. After the inspection, it happened that the work became tardy, and the work would not be as serious as the time before external inspection. (TSEA 14)

After inspection, for a certain period of time, the [bad] situation was resumed. (TSEA 17)

It further needs to be acknowledged that since the introduction of the ISM Code more than a decade ago, there have been numerous studies that have failed to demonstrate its widespread effectiveness.^{186–190} These accounts have pointed to the over-bureaucratisation of safety arrangements as one reason for the limited adoption of good practices and the growth of an appropriate safety culture on board ships. Indeed, in his wider study of the operation of the ISM Code, drawing upon the same sources as the data used in this report, Bhattacharya¹⁹⁰ noted significant limitations in the application and effectiveness of SMSs on board the tankers studied, which his subjects ascribed to such over-bureaucratisation.

In addition, such inspections are focused on the signs and manifestations of safety on board ships rather than those of health and wellbeing among seafarers. Much of the current concern about the organisation of work and the work environment experienced by seafarers is addressed to its effects on their health and wellbeing,⁶⁸ but it is not obvious how such inspections aid its improvement. Indeed, as well as the additional workload such over-bureaucratisation imposes on seafarers, the reduced autonomy in job control it allows them, and the obvious stress caused to seafarers by the need to be found compliant with the stringent requirements of such inspection, all raise the possibility that such inspections actually contribute to increasing the psychosocial risks experienced by seafarers and, in this sense, potentially worsen their health outcomes.

Clearly, some kind of optimal balance between the positive effects of supply chain leverage to stimulate and support good practice and the necessary monitoring of compliance with requirements aimed at achieving this would be desirable. Equally clearly, in the eyes of many of the suppliers affected and those who work for them, there remains some way to go to achieve this. This is of course part of a wider problem of how organisations address their encounters with risk and of the so-called ‘audit culture’ that is frequently one of the outcomes of such efforts.

As has been argued elsewhere,¹⁹¹ there remains considerable mileage to be gained from further exploration of the more targeted intervention of supply chain regulation at sectoral level. Our findings add some weight to the suggestion that this could help stimulate and enhance business environment pressures to ensure more positive direct effects from the engagement of heads of supply chains and other upstream actors with interventions on OSH management practices among suppliers. Consideration of the significance of such possible interventions leads us to an assessment of the relevance of the final set of propositions developed by Walters & James,¹ with particular reference to what it is that makes the efforts of upstream actors successful.

What makes buyers’ efforts to influence supplier health and safety management work better?

Based on their review of the business literature, Walters & James¹ argued in their third set of propositions that buyers’ attempts to influence suppliers will work better when they are supported by adequate monitoring and penalty regimes. They further suggested in a final set of propositions to help explain the outcomes of supply chain interventions on health and safety that they would be more likely to support improved OSH practice when they occurred within a supply relationship which is relatively collaborative and trust based; and that these relations were more likely to exist where buyers and suppliers had worked together, satisfactorily, for a relatively long period and the wider institutional context was supportive of them. We therefore next consider the extent to which our cases studies support these arguments.

Monitoring and surveillance

The evidence from our case studies set out in Chapter 5 and the discussion elaborated in the previous sections are consistent with the suggestion that the monitoring and surveillance contribute to suppliers’ compliance with demands of the buyers that procure their services. While taking into account the limitations of audit-orientated management regimes, they confirm that it is generally the case that where supply chain interventions to promote OSH among suppliers are supported by adequate penalty and monitoring regimes, they are likely to work better than when procurement practices require compliance with OSH management standards but offer no means of monitoring this compliance. How such monitoring and penalty regimes operate varies. The model found in the oil tanker trade and on the large construction sites we studied – where buyers take a strongly interventionist role – is not necessarily the only way in which monitoring may occur or how penalties for non-compliance might be levied. As we saw in the container trade, it is possible that a combination of incentives, in which public regulatory scrutiny as well as private monitoring arrangements, act in concert in certain circumstances to promote compliance. A better and more specified understanding of such combinations would undoubtedly improve the outcomes of public policies in this respect.

The influence of power and other 'relational' elements

In their review of the business research literature Walters & James¹ noted that although there is enormous variation in the form and content of supply chain relations, they can usefully be viewed through the lens of the distinction drawn by Sako between 'obligational contractual relations' (OCR) and 'arms-length contractual relations' (ACRs).⁷⁷

These two categories of supply relationships are, as already noted in Chapter 2, best understood as representing 'the ends of a multi-dimensional spectrum of possible trading relationships' that can exist between buyers and suppliers. At the OCR end of this spectrum, supply chains are characterised by lengthy, ongoing links, mutual dependence, shared risk and power, with an emphasis on objectives likely to extend beyond issues of cost – embodying, for example, quality and innovation, and the presence of trust-based relationships which support more open communications and joint problem-solving behaviour. At the other end of the spectrum, ACR types of supply chain relationship embody characteristics that are the mirror image of these, in as much as they are relatively short-term, encompass a strong emphasis on cost competitiveness, and are less marked by trust-based relationships, power sharing, mutual dependence and joint problem solving.

While it is acknowledged that this two-fold categorisation is something of an over-simplification of a complex reality in which many supply chain relationships will lie at different points along a continuum with these two idealised forms representing the extremes, it can be seen to provide heuristics that usefully highlight some of the central ways in which supply chain relations can vary. When taken into account alongside available research evidence, it therefore led Walters & James¹ to their final set of propositions to help explain the outcomes of supply chain interventions on health and safety, namely those suggesting that improved OSH practice would be most likely to be supported in supply relationships that are relatively collaborative and trust based and in which buyers and suppliers had worked together, satisfactorily, for relatively long periods and in a wider institutional context that was supportive of them.

Examining our findings in the light of these propositions, we therefore find it is important to give some consideration to their institutional contexts, and the degree of mutuality between the interests of procurers and suppliers, in order to understand their effects on OSH and the extent to which such effects might be transferable. In so doing we find there are several features of our case studies that resonate well with the propositions, but possibly some others for which it is less easy to account.

Institutional context

Research shows that wider institutional contexts within which supply chain relationships are established influence the extent to which relations between buyers and suppliers are either collaborative or adversarial. In Chapter 2 we noted some of the features of the sectors in which we have undertaken the case studies which may be influential in this respect. For example, the CDM Regulations 2007 provide clients with legally based encouragement to influence the health and safety management of their suppliers. The size, prominence and degree of risk on large construction sites mean that they are both subject to relatively close scrutiny from regulatory agencies and that operators are conscious of the significant reputational risks that are at stake in the case of poor OSH performance – thus creating opportunities for regulatory inspectors to engage co-operatively with companies and to influence the planning and management of the activities involved. As we discussed in a previous section, this certainly happened during the building of the Olympic Park and was also, but perhaps to a lesser extent, evident in the planning activities on the Forum Development project. Moreover, such engagement was seen to help ensure appropriate leadership and commitment from procurers upstream in supply chains as well as from the contractors supplying services. This in turn led to considerable monitoring and auditing of compliance with OSH management standards on the part of upstream actors.

Indeed, these institutional contexts set the projects that were the focus of our case studies at considerable distance from a large part of the construction industry. As we have already noted in previous chapters, this sector is dominated by small and micro enterprises. Thus, much of the industry does not operate in institutional contexts of the type found in our case studies. As a result, the positive aspects of supply chain pressures we have noted are unlikely to be transferable to the parts of the sector where such supportive institutional contexts are absent.

Institutional contexts in the maritime industry are very different from those in construction and indeed from those of most land-based industries. As a result, strong institutional pressures to utilise supply chains to enhance labour standards are not ubiquitous in the industry. Despite this, however,

our case studies demonstrate two significant features. First, they confirm that regardless of the situation generally in the sector, there are some exceptions and such pressures clearly do exist in the oil and chemical tanker trade. They do so primarily because of the reputational risks faced by the relatively small number of high-profile, major petrochemical companies dominating the trade. Their perceptions in this respect are largely driven by concerns about the scale of possible consequences for company liabilities for safety failures in relation to environmental protection. Second, and in some ways more interestingly, the case studies further show that even in the absence of such powerful direct pressures evident in the tanker trade, under certain circumstances supply chain relationships are influential upon safety management in other trades too. Our case study in the container trade demonstrates how both companies and seafarers are made aware of these business pressures and how they act through the supply relationship between ship managers and charterers to improve a range of health and safety management practices within their control. However, the case study also shows that these pressures do not act in isolation but rather exist alongside Flag and Port State regulatory inspection, to provide a constellation of institutional pressures that operate in concert to cause companies at the 'better end' of the container trade to use effective OSH management strategies. We concluded that while such experiences were clearly demonstrated in our case study, they were not necessarily widespread in the container trade or indeed in other trades in the maritime industry. Like the case studies in construction, our container trade case study was one in which the companies involved were projecting a trading image that they wished potential customers to understand as being concerned with the quality of the service they offered, as much as with the competitiveness of its price. We further showed that, at least as far as the previous work experiences of the seafarers we interviewed were concerned, the same high standards of quality over price were by no means universal in the sector.

Mutuality of buyer and supplier interests

Finally, returning to the experiences of monitoring compliance, as Walters & James¹ have pointed out, the responsiveness of suppliers to the demands of buyers cannot be understood without taking account of the implications such demands might have for their own business interests. The balance of dependency between buyers and suppliers therefore may serve to significantly shape the nature and dynamics of immediate supply chain relationships by having important implications for the distribution of power and risk between them, and as a result, also the degree of trust embedded in their supply relationships. In our case studies in construction and the oil tanker trade there were examples of strong dependencies by relatively weak suppliers upon powerful buyers. This was certainly the case in the oil tanker trade where, as the quotes from the tanker company managers and the seafarers make plain, suppliers had no illusions about their dependent position. In construction, in the multi-tiered supply chains we examined in both our case studies, it was obviously also the case that downstream suppliers perceived themselves in a strongly business-dependent position in relation to the upstream procurers of their services. For the sake of future business they were prepared to introduce arrangements for OSH which were heavily monitored, as well as to spend additional time and resources in training and being certified as having the capacities required by their upstream clients. However, the 'mutuality' of buyer and supplier interests in this context is heavily skewed by imbalance in the distribution of power between them. To refer to such arrangements as being 'collaborative' is therefore rather misleading, since there was no indication that downstream suppliers believed they had any choice in the delivery of their obligations on OSH matters.

More truly collaborative and partnership-based relations were seen among the major contractors and the developers in the two case studies. As we showed in Chapter 5, large contractors and members of the UKCG share a number of approaches to OSH in common, ones they have been obliged to develop in recent years as a result of both regulatory demands and high-profile political exhortation. As a consequence, major contractors are suppliers with an important source of specialist expertise/knowledge, which places the procurers of their services in positions of relatively high dependency and leaves them well placed to gain a substantial degree of influence over the supply relationships established. At the same time, however, the procurers involved in our construction case studies were in a position to offer large and high-value contracts and, as a result, also occupied a relatively influential market position. The resulting balance of dependencies in these case studies therefore acted to support relatively strong forms of collaborative working.

Indeed, it was clear that the supply chain-mediated management arrangements made by procurers on both the case study construction sites were strongly influenced by the existing practices of the major contractors involved, as were many of the arrangements to monitor them. In the Forum Development project, the developer was content to leave much of the detail of supply chain-mediated OSH arrangements to its major suppliers – the principal contractors on the site – citing their considerable

experience in these matters as the reason for doing so. While in the case of the Olympic Park, the ODA and its delivery partner played key roles in the leadership and co-ordination of these arrangements, their content and delivery was very much a result of a mutually beneficial partnership between them and the major contractors working for them.

Conclusions

The discussion in this chapter demonstrates that the empirical results obtained from the case studies undertaken in the present research broadly support the propositions concerning the contexts of supply chain effects that were developed by Walters & James¹ in their previous review. We have further demonstrated that such effects are neither necessarily solely vertical within supply chains, nor only in one direction. Thus, we showed that in the construction industry there were substantial horizontal effects observed among organisations competing for business at the same level and in our case studies in that sector, as well as in the container trade in the maritime sector, there were some upstream as well as downstream influences at work in the supply chains involved.

Therefore, our findings also largely endorse the usefulness of the propositions as ways of guiding the understanding of the wider contexts of supply chain effects. Such understanding is especially useful in policy development in relation to the increasing number of scenarios in the economy where conventional regulation, and the nexus of employment relationships to which it has applied, are no longer as commonplace as they once were.

That said, it is perhaps also important to note that our findings departed somewhat from the propositions in several respects, two of which may be especially significant for future policy development. One concerns the extent of mutuality and partnership between procurers and suppliers anticipated in the propositions. Although we found such mutuality and partnership among some Tier 1 suppliers and their procurers to be evident in our case studies, what struck us more forcefully for most of the supply chain relationships in which leverage on OSH was delivered through procurement strategies, was the high degree of power imbalance between procurers and suppliers, and the sense that the latter believed they had little choice other than to follow the requirements of the former if they wished to continue their business relationship. The implications of this finding for policy should not be overlooked. However, there were also some negative consequences arising from the interventions in which procurers exploited this power in the conditions they imposed upon the affairs of their suppliers. These should not be ignored. In particular, additional burdens imposed upon lower-tier suppliers to deliver evidence of compliance with procedures that were merely the requirements of ‘audit trails’ rather than good OSH practices raised the possibility of them acting to indirectly lead to poorer but unmonitored health and safety outcomes among workers at these levels.

A further significant finding that emerges from our case studies, and which is especially important for policy considerations, concerns the extent to which leverage in supply chain relationships can be developed as one element in a constellation of influences acting in concert to raise OSH standards, and what might be the role of public regulation in this process. There were indications in the study – especially in the case study in the maritime container trade, but also evident to some extent in the other case studies – that the positive influence of supply chain driven effects on health and safety standards may be more widespread than a focus on deliberate direct interventions may suggest. That is, we found that buyers and suppliers in some supply chain relations that were not especially characteristic of OCRs were nevertheless influenced to some extent to support good OSH standards because they perceived them to be of relevance to their business interests. In such scenarios, and even where inspection and monitoring regimes are not imposed by buyers on their suppliers to ensure compliance, there may be opportunities for the further development of such pressure from public regulation to exploit such perceptions of business criticality in ways that would enhance the health and safety practices and outcomes for work activity that often lie beyond the reach of conventional regulatory practice.

Finally, it would seem entirely clear from this study that, while under certain conditions supply chain relationships offer opportunities to leverage improvements in OSH arrangements and standards, they always do so within contexts framed by regulation. There is no evidence in our study to suggest they act effectively in the absence of, or as substitutes for, regulation or regulatory inspection. There is instead much food for thought concerning how regulatory strategies could be more attuned to exploiting the positive features of supply chain relationships to protect the workers whose health, safety and welfare lie at the end of these chains and who are increasingly remote from the reach of conventional regulation.

References

- 1 Walters D and James P. *Understanding the role of supply chains in influencing health and safety at work*. IOSH Research Report 9.2. Wigston: IOSH, 2009.
- 2 Walters D and James P. What motivates employers to establish preventive management arrangements within supply chains? *Safety Science* 2011; 49: 988–994.
- 3 Swart J and Kinnie N. Knowledge-intensive firms: the influence of the client on HR systems. *Human Resource Management Journal* 2003; 13 (3): 37–55.
- 4 Kinnie N and Parsons J. Managing client, employee and customer relations: constrained strategic choice in the management of human resources in a commercial call centre. In: Derry S and Kinnie N (eds). *Call centres and human resource management*. Basingstoke: Palgrave Macmillan, 2004.
- 5 Hunter L, Beaumont P and Sinclair D. A ‘partnership’ route to human resource management? *Journal of Management Studies* 1996; 33 (2): 235–257.
- 6 Scarborough H. The HR implications of supply chain relationships. *Human Resource Management Journal* 2000; 10 (1): 5–17.
- 7 Beaumont P, Hunter L and Sinclair D. Customer–supplier relations and the diffusion of employee relations change. *Employee Relations* 1996; 18 (1): 9–19.
- 8 Carroll M, Vincent S, Hassard J and Cooke F. The strategic management of contracting in the private sector. In: Marchington M, Grimshaw D, Rubery J and Willmott H (eds). *Fragmenting work: blurring organizational boundaries and disordering hierarchies*. Oxford: Oxford University Press, 2005.
- 9 Truss C. Who’s in the driving seat? Managing human resources in a franchise firm. *Human Resource Management Journal* 2004; 14 (4): 57–75.
- 10 Health and Safety Executive. *Guide to successful health and safety management*. 2nd edition. Sudbury: HSE Books, 1997.
- 11 Health and Safety Commission. *Health and safety – The way ahead*. London: HSC, 2007.
- 12 Department of the Environment, Transport and the Regions/Health and Safety Commission. *Revitalising health and safety*. Strategy statement. London: The Stationery Office, 2000.
- 13 James P and Walters D. *Health and safety: revitalised or reversed?* London: Institute of Employment Rights, 2004.
- 14 Deacon S. Assuring contractors’ health and safety performance. *Health and Safety Bulletin* 1999; 277: 17–19.
- 15 Dyer C. Contractor safety, Dutch style. *Health and Safety Bulletin* 2001; 299: 19–20.
- 16 Edwards P. Virtual safety: Contractors Health and Safety Assessment Scheme. *Safety and Health Practitioner* 2003; 21 (4): 78.
- 17 Mycock N. Chain reaction. *Safety and Health Practitioner* 2006; 24 (6): 37–40.
- 18 Ponting L. Changing necessity into a benefit for small firms. *Health and Safety Bulletin* 2001; 296: 20–22.
- 19 Pickvance S. Arguing the business case for occupational health. *Occupational Health Review* 2003; 103: 31–35.
- 20 Saunders G. Contracting out. *Safety and Health Practitioner* 2000; 18 (3): 24–26.
- 21 Walter S. Health, safety and environment and the supply chain. *Safety and Health Practitioner* 2000; 18 (8): 32–34.
- 22 European Agency for Safety and Health at Work. *Occupational safety and health in marketing and procurement*. Luxembourg: Office for Official Publications of the European Communities, 2000. <http://osha.europa.eu/en/publications/reports/304/>. Viewed 16 July 2012.
- 23 Ewing K. *Global rights in global companies: going for gold at the UK Olympics*. Background report 1. London: Institute of Employment Rights, 2006.
- 24 Rimington J. *Evaluation of the Client/Contractor National Safety Group (CCNSG) Passport Training Scheme*. London: HSE, 1999.
- 25 BOMEL. *Improving the effectiveness of the Construction (Design and Management) Regulations 1994: establishing views from construction stakeholders on the current effectiveness of CDM*. Research Report 538. Sudbury: HSE Books, 2007.
- 26 Ponting L. Hire firms face two ways to improve safety and profits. *Health and Safety Bulletin* 2008; 367: 19–24.
- 27 Ethical Trading Initiative. *The ETI Base Code*. www.ethicaltrade.org/eti-base-code. Viewed 16 July 2012.
- 28 Gangmasters Licensing Authority. *Supermarkets and suppliers protocol with the Gangmasters Licensing Authority*. 2010. www.dreamsmanpower.com/wp-content/uploads/2012/04/Supermarkets-and-Suppliers-Protocol.pdf. Viewed 16 July 2012.

- 29 Equality and Human Rights Commission. *Inquiry into recruitment and employment in the meat and poultry processing sector*. Manchester: Equality and Human Rights Commission, 2010.
- 30 O'Rourke D. Monitoring the monitors: a critique of corporate third-party labor monitoring. In Jenkins R, Pearson R and Seyfang G (eds). *Corporate responsibility and ethical trade: codes of conduct in the global economy*. London: Earthscan, 2002.
- 31 Esbenschade J. The private social accountability contract: private monitoring from Los Angeles to the global apparel industry. *Labor Studies Journal* 2001; 26 (1): 98–120.
- 32 Wright C. Routine deaths: fatal accidents in the oil industry. *Sociological Review* 1986; 34: 265–289.
- 33 Wright C. A fallible safety system: institutionalised irrationality in the offshore oil and gas industry. *Sociological Review* 1994; 42: 79–103.
- 34 Baldry C. Off the rails: factors affecting track worker safety in the rail industry. *Employee Relations* 2006; 28: 255–272.
- 35 Cullen W. *The Ladbroke Grove Rail Inquiry Report*. London: HSE, 2001.
- 36 Uff J. *Southall Rail Accident Inquiry Report*. London: HSC, 2000.
- 37 Loos F and Le Deaut J. *Rapport fait au nom de la commission d'enquête sur la sûreté des installations industrielles et des centres de recherche et sur la protection de personnes et de l'environnement en cas d'accident industriel majeur*. No. 3559. Paris: Assemblée Nationale, 2002.
- 38 Virtanen M, Kivimaki M, Joensuu M, Virtanen P, Elovainio M and Vahtera J. Temporary employment and health: a review. *International Journal of Epidemiology* 2005; 34: 610–622.
- 39 Benavides F G, Benach J, Muntaner C, Delclos G L, Catot N and Amable M. Associations between temporary employment and occupational injury: what are the mechanisms? *Occupational and Environmental Medicine* 2006; 63: 416–421.
- 40 Wiseman J and Gilbert F. *Survey of the recruitment agencies industry*. Suffolk: HSE Books, 2000.
- 41 Victoria Parliament Economic Development Committee. *Inquiry into labour hire employment in Victoria*. Melbourne: Government Press, 2005.
- 42 Quinlan M and Bohle P. Under pressure, out of control or home alone? Reviewing research and policy debates on the OHS effects of outsourcing and home-based work. *International Journal of Health Services* 2008; 38 (3): 489–525.
- 43 Quinlan M, Mayhew C and Bohle P. The global expansion of precarious employment, work disorganisation and occupational health: a review of recent research. *International Journal of Health Services* 2001; 31 (2): 335–414.
- 44 Ferrie J E, Shipley M J, Stansfeld S A and Marmot M G. Health effects of chronic job insecurity and change in job security on self-reported health, minor psychiatric morbidity, physiological measures and health-related behaviours in British civil servants: The Whitehall II Study. *Journal of Epidemiology and Community Health* 2002; 56 (6): 450–454.
- 45 Kivimaki M, Vahtera J, Pentti J and Ferrie J E. Factors underlying the effect of organisational downsizing on the health of employees: a longitudinal cohort study of changes in work, social relationships and health behaviours. *British Medical Journal* 2000; 320: 971–975.
- 46 Thébaud-Mony A. Contracting and subcontracting by the French nuclear power industry. *International Journal of Occupational and Environmental Health* 1999; 5 (4): 296–299.
- 47 Rousseau D and Libuser C. Contingent workers in high risk environments. *California Management Review* 1997; 39 (2): 103–121.
- 48 Benach J, Amable M, Muntaner C and Benavides F G. The consequences of flexible work for health: are we looking in the right place? *Journal of Epidemiology and Community Health* 2002; 56: 405–406.
- 49 Blank V L G, Andersson R, Lindén A and Nilsson B C. Hidden accident rates and patterns in the Swedish mining industry due to the involvement of contract workers. *Safety Science* 1995; 21 (1): 23–35.
- 50 Allan P. The contingent workforce: challenges and new directions. *American Business Review* 2002; 20 (2): 103–110.
- 51 Aronsson G, Gustafsson K and Dallner M. Work environment and health in different types of temporary jobs. *European Journal of Work and Organisational Psychology* 2002; 11: 151–175.
- 52 Draca M and Green C. The incidence and intensity of employer funded training: Australian evidence of the impact of flexible work. *Scottish Economic Society* 2004; 51 (5): 609–625.
- 53 Feldman D, Doeringhaus H and Turnley W H. Employee reactions to temporary jobs. *Journal of Managerial Issues* 1995; 7 (2): 127–141.
- 54 Bohle P, Quinlan M, Kennedy D and Williamson A. Working hours, work–life conflict and health in precarious and permanent employment. *Rivista de Saude Publica* 2004; 38: 19–35.
- 55 Walters D and Nichols T. *Worker representation and workplace health and safety*. Basingstoke: Palgrave Macmillan, 2007.

- 56 Aronsson G. Contingent workers and health and safety. *Work, Employment and Society* 1999; 13 (3): 439–459.
- 57 Mayhew C and Quinlan M. Subcontracting and occupational health and safety in the residential building industry. *Industrial Relations Journal* 1997; 28 (3): 192–205.
- 58 Mayhew C, Quinlan M and Bennett L. *The effects of subcontracting/outsourcing on occupational health and safety*. UNSW Studies in Australian Industrial Relations, No.38. Sydney: University of New South Wales, 1996.
- 59 Rebitzer J. Job safety and contract workers in the petrochemical industry. *Industrial Relations* 1995; 34: 40–57.
- 60 Kochan T, Smith M, Wells J and Rebitzer J. Human resource strategies and contingent workers: the case of safety in the petrochemical industry. *Human Resource Management* 1994; 33: 55–77.
- 61 Dawson S, Clinton A, Bamford M and Willman P. Safety in construction: self regulation, industrial structure and workforce involvement. *Journal of General Management* 1985; 10: 21–38.
- 62 Newsome K and Thompson P. *Supermarkets, systematic rationalisation and labour process change in the Scottish food supply chain*. Paper for the International Labour Process Conference. London: Birkbeck College, 2006.
- 63 Newsome K, Commander J and Thompson P. *Being worked about the knees with a stick or sitting down to a cup of tea? Power dynamics and labour process change in the UK supermarket supply chain*. Paper for the Work Employment and Society Conference, Aberdeen, 2007.
- 64 Wright C and Lund J. Supply chain rationalisation: retailer dominance and labour flexibility in the Australian food and grocery industry. *Work, Employment and Society* 2003; 17 (1): 137–157.
- 65 James S and Lloyd C. Too much pressure? Retailer power and occupational health and safety in the food processing industry. *Work, Employment and Society* 2008; 22 (4): 1–18.
- 66 Kahveci E and Nichols T. *The other car workers: work organisation and technology in the maritime car carrier industry*. Basingstoke: Palgrave Macmillan, 2006.
- 67 International Labour Organization. *The impact on seafarers' living and working conditions of changes in the structure of the shipping industry*. Geneva: International Labour Office, 2001.
- 68 Bloor M, Thomas M and Lane T. Health risks in the global shipping industry: an overview. *Health, Risk and Society* 2000; 2 (3): 329–340.
- 69 Nielsen D and Roberts S. Fatalities among the world's merchant seafarers (1990–1994). *Marine Policy* 1999; 23 (1): 71–80.
- 70 Roberts S. Hazardous occupations in Great Britain. *Lancet* 2002; 360: 543–544.
- 71 Roberts S E and Marlow P B. Traumatic work-related mortality among seafarers employed in British merchant shipping, 1976–2002. *Occupational and Environmental Medicine* 2005; 62: 172–180.
- 72 Coase R. The nature of the firm. *Economica* 1937; 4: 386–405.
- 73 Powell W. Neither market nor hierarchy: network forms of organisation. *Research in Organizational Behavior* 1990; 12: 295–336.
- 74 Eccles R. The quasi-firm in the construction industry. *Journal of Economic Behaviour and Organisation* 1981; 2: 335–357.
- 75 Dore R. Goodwill and the spirit of market capitalism. *British Journal of Sociology* 1983; 34 (3): 459–482.
- 76 Miles R and Snow C. Organisations: new concepts for new forms. *California Management Review* 1986; 28 (3): 62–73.
- 77 Sako M. *Prices, quality and trust: inter-firm relations in Britain and Japan*. Cambridge: Cambridge University Press, 1992.
- 78 Adler P. Market, hierarchy, and trust: the knowledge economy and the future of capitalism. *Organization Science* 2001; 12 (2): 215–234.
- 79 Lane C. The social regulation of inter-firm relations in Britain and Germany: market rules, legal norms and technical standards. *Cambridge Journal of Economics* 1997; 21: 197–215.
- 80 Lane C and Bachmann R. The social constitution of trust: supplier relations in Britain and Germany. *Organization Studies* 1996; 17 (3): 365–395.
- 81 Construction Confederation. *Health and safety in public procurement: survey results*. London: Construction Confederation, 2005.
- 82 Davis Langdon LLP. *Health and safety in public sector construction procurement*. RR556. Sudbury: HSE Books, 2007.
- 83 Griffiths A and Phillips N. The influence of the Construction (Design and Management) Regulations 1994 upon the procurement and management of small building works. *Construction Management and Economics* 2001; 19: 533–540.
- 84 World Bank. *Company codes of conduct and international standards: an analytical comparison*. Washington, DC: World Bank, 2000.

- 85 Wilson A and Gribben C. *Business responses to human rights*. Ashridge: Ashridge Centre for Human Rights, 2000.
- 86 Rodriguez-Garavito C A. Global governance and labor rights: codes of conduct and anti-sweatshop struggles in global apparel factories in Mexico and Guatemala. *Politics and Society* 2003; 33 (2): 203–233.
- 87 Braithwaite J and Drahos P. *Global business regulation*. Cambridge: Cambridge University Press, 2000.
- 88 O'Rourke D. Outsourcing regulation: analysing non-governmental systems of labour standards and monitoring. *The Policy Studies Journal* 2003; 31: 1–29.
- 89 Oliver C. Sustainable competitive advantage: combining institutional and resource based views. *Strategic Management Journal* 1997; 18: 697–713.
- 90 Oliver A and Ebers M. Networking network studies: an analysis of conceptual configurations in the study of inter-organisational relationships. *Organisation Studies* 1998; 19: 549–583.
- 91 Osborn R and Hagedoorn J. The institutionalization and evolutionary dynamics of interorganisational alliances and networks. *Academy of Management Journal* 1997; 18: 261–278.
- 92 Harland C, Zheng J, Johnsen T and Lamming R. A conceptual model for researching the creation and operation of supply networks. *British Journal of Management* 2004; 15: 1–21.
- 93 Williamson O. *Markets and hierarchies: analysis and antitrust implications*. London: Free Press, 1975.
- 94 Williamson O. *The economic institutions of capitalism: firms, markets and relational contracting*. New York: Free Press, 1985.
- 95 Espino-Rodriguez T and Padron-Robaino V. A review of outsourcing from the resource-based view of the firm. *International Journal of Management Reviews* 2006; 8 (1): 49–70.
- 96 Kersley B, Alpin C, Forth J, Bryson A, Bewley H, Dix G and Oxenbridge S. *Inside the workplace: findings from the 2004 Workplace Employment Relations Survey*. London: Routledge, 2006.
- 97 Deavers K. Outsourcing: a corporate competitiveness strategy, not a search for low wages. *Journal of Labor Research* 1997; 18 (4): 503–519.
- 98 Harrison B and Kelley M. Outsourcing and the search for flexibility. *Work, Employment and Society* 1993; 7 (2): 213–235.
- 99 Cousins P and Lawson B. Sourcing strategy, supplier relationships and firm performance: an empirical investigation of UK organisations. *British Journal of Management* 2007; 18: 123–137.
- 100 Heide J and John G. Alliances in industrial purchasing: the determinants of joint action in buyer-supplier relationships. *Journal of Marketing Research* 1990; 27: 24–36.
- 101 Hatash Z and Skitmore M. Criteria for contractor selection. *Construction, Management and Economics* 1997; 15 (1): 19–38.
- 102 Mbachu J. Conceptual framework for the assessment of subcontractors' eligibility and performance in the construction industry. *Construction Management and Economics* 2008; 26 (5): 471–484.
- 103 Cousins P and Crone M. Strategic models for the development of obligation based inter-firm relationships: a study of the UK automotive industry. *International Journal of Operations & Production Management* 2003; 23 (12): 1447–1474.
- 104 Office of Fair Trading. *Supermarkets Code of Practice*. London: Office of Fair Trading, 2004.
- 105 Competition Commission. *The supply of groceries in the UK market investigation*. 2008. www.competition-commission.org.uk/assets/bispartners/competitioncommission/docs/pdf/non-inquiry/rep_pub/reports/2008/fulltext/538.pdf. Viewed 16 July 2012.
- 106 Competition Commission. *The Groceries (Supply Chain Practices) Market Investigation Order 2009*. www.competition-commission.org.uk/assets/bispartners/competitioncommission/docs/pdf/inquiry/ref2006/grocery/pdf/notice_of_intention_to_make_order_gscop. Viewed 16 July 2012.
- 107 Eysenck H J. Introduction. In: Eysenck H J (ed). *Case studies in behaviour therapy*. London: Routledge, 1976.
- 108 Wadsworth E J K, Marsh K L, Turgo N and Walters D R. *Supply chain management for health and safety*. <http://learninglegacy.london2012.com/publications/supply-chain-management-for-health-and-safety.php>. Viewed 16 July 2012.
- 109 LMI. *Construction – sector information. ConstructionSkills AACS LMI report 2010 and sector skills assessment for the construction sector 2009*. www2.warwick.ac.uk/fac/soc/ier/ngrf/lmifuturetrends/sectorscovered/construction/sectorinfo/. Viewed 16 July 2012.
- 110 Health and Safety Executive. *Phase 1 report: Underlying causes of construction fatal accidents – a comprehensive review of recent work to consolidate and summarise existing knowledge*. Sudbury: Health and Safety Executive, Construction Division/Secretary of State for Work and Pensions Inquiry, 2009.
- 111 Forde C, MacKenzie R and Robinson A. Built on shifting sands: changes in employers' use of contingent labour in the UK construction sector. *Journal of Industrial Relations* 2009; 51 (5): 653–667.

- 112 Donaghy R. *One death is too many: inquiry into the underlying causes of construction fatal accidents*. Report to the Secretary of State for Work and Pensions. London: The Stationery Office, 2009.
- 113 MacKenzie R, Forde C, Robinson A, Cook H, Eriksson B, Larsson P and Bergman A. Contingent work in the UK and Sweden: evidence from the construction industry. *Journal of Industrial Relations* 2010; 41 (6): 603–621.
- 114 Health and Safety Executive. *Work related injuries and ill health*. Sudbury: HSE Books, 2011.
- 115 Alderton T and Winchester N. Flag states and safety 1997–1999. *Maritime Policy and Management* 2002; 29: 151–162.
- 116 United Nations Conference on Trade and Development. *Review of maritime transport 2010*. Geneva: UNCTAD, 2011. http://unctad.org/en/docs/rmt2010_en.pdf. Viewed 16 July 2010.
- 117 Stopford M. *Maritime economics*. 3rd edition. Oxford: Routledge, 2009.
- 118 Chrzanowski I and Wiater S J. *An introduction to shipping economics*. Fairplay Publications, 1985.
- 119 United Nations Conference on Trade and Development. *Review of maritime transport 2009*. Geneva: UNCTAD, 2010. http://unctad.org/en/docs/rmt2009_en.pdf. Viewed 16 July 2012.
- 120 BIMCO/ISF Manpower update 2010. Warwick: Institute for Employment Research, 2010. www.marisec.org/Manpower%20Study.pdf. Viewed 16 July 2012.
- 121 Li K X and Wonham J. *The role of states in maritime employment and safety: a legal and economic study*. Dalian: Dalian Maritime University Press, 2001.
- 122 Alderton T, Bloor M, Kahveci E, Lane T, Sampson H, Thomas M, Winchester N, Wu B and Zhao M. *The global seafarer: living and working conditions in a globalised industry*. Geneva: International Labour Office, 2004.
- 123 Winchester N, Sampson H and Shelly T. *An analysis of crewing levels: findings from the SIRC Global Labour Market Survey*. Cardiff: SIRC, Cardiff University, 2006.
- 124 Stocks S, McNamee R, Carder M and Agius R. The incidence of medically reported work-related ill health in the UK construction industry. *Occupational and Environmental Medicine* 2010; 67: 574–576.
- 125 Health and Safety Executive. *Construction Division plan of work 2011/2012*. Sudbury: HSE Books, 2010.
- 126 Constructing Excellence. *Common minimum standards for the procurement of works in the built environment by local authorities in England*. London: Local Government Task Force, 2006. www.constructingexcellence.org.uk/pdf/lgtf/Common_Minimum%20Standards.pdf. Viewed 16 July 2012.
- 127 Royal Society for the Prevention of Accidents. *A legacy for safety – RoSPA congratulates the Olympic ‘Big Build’*. Press release, 27 July 2011. www.rospa.com/news/releases/detail/default.aspx?id=1010. Viewed 16 July 2012.
- 128 Office of Government Commerce. *Achieving excellence in construction: procurement guide 10 – health and safety*. London: Office of Government Commerce, 2004.
- 129 Office of Government Commerce. *Common minimum standards for the procurement of built environments in the public sector*. London: Office of Government Commerce, 2005.
- 130 Australia and Clayton A. *Seamen’s compensation review*. Canberra: Australian Government Publication Services, 1988.
- 131 Home W E. Mortality of British merchant seamen. *Lancet* 1934; 225: 1081–1083.
- 132 Roberts S E and Marlow P B. Casualties in dry bulk shipping (1963–1996). *Marine Policy* 2002; 26: 437–450.
- 133 Otterland A. *A socio-medical study of mortality in seafarers*. Gothenburg: Scandinavian University Books, 1960.
- 134 Meisner B. Mortalität und lethalität bei seeleuten in der Bundesrepublik Deutschland von 1970 bis 1986. Hamburg, 1993. Unpublished MD thesis. Cited in: Nielsen D and Roberts S. Fatalities among the world’s merchant seafarers (1990–1994). *Marine Policy* 1999; 23 (1): 71–80.
- 135 Hansen H L. Surveillance of deaths on board Danish merchant ships, 1986–93: implications for prevention. *Occupational and Environmental Medicine* 1996; 53: 269–275.
- 136 Eriksen S I. Do we take the work conditions in the merchant and fishing fleet seriously? In: Kristiansen S. *Maritime transportation: safety management and risk analysis*. Oxford: Elsevier, 2005.
- 137 Rafnsson V and Gunnarsdóttir H. Cancer incidence among seamen in Iceland. *American Journal of Industrial Medicine* 1995; 27 (2): 187–193.
- 138 Hansen H L, Nielsen D and Frydenberg M. Occupational accidents aboard merchant ships. *Occupational and Environmental Medicine* 2002; 59 (2): 85–91.
- 139 Ellis N, Bloor M and Sampson H. Patterns of seafarer injuries. *Maritime Policy & Management* 2010; 37 (2): 121–128.

- 140 Department for Transport/Marine Accident Investigation Branch. *Safety Digest: Lessons from Marine Accident Reports* 2006; 2: 48–62. www.maib.gov.uk/publications/safety_digests/2006/safety_digest_3_2006.cfm?view=print&. Viewed 16 July 2012.
- 141 Anderson D M. From accident report to design problems: a study of accidents on board ship. *Ergonomics* 1983; 26: 43–50.
- 142 Saarni H. Industrial accidents among Finnish seafarers. *Travel Medicine International* 1989; 7: 64–68.
- 143 Jensen O C, Sorensen J F L, Canals M L, Hu Y, Nikolic N and Mazer A A. Non-fatal occupational injuries related to slips, trips and falls in seafaring. *American Journal of Industrial Medicine* 2005; 47 (2): 161–171.
- 144 Li K X and Shiping Z. Maritime professional safety: prevention and legislation on personal injuries on board ships. In: *IAME Panama 2002 Conference Proceedings*. Hawthorn, Australia: International Association of Maritime Economists, 2002.
- 145 Brandt L P A, Kirk N U, Jeneva O C and Hansen H L. Mortality among Danish merchant seamen 1970–1985. *American Journal of Industrial Medicine* 1994; 25: 867–876.
- 146 Hammar N, Alfredsson L, Smedborg M and Ahlbom A. Differences in incidence of myocardial infarction among occupational groups. *Scandinavian Journal of Work and Environmental Health* 1992; 18: 178–185.
- 147 Zorn E W, Harrington J M and Goethe H. Ischaemic heart disease and work stress in West German sea pilots. *Journal of Occupational Medicine* 1997; 19 (11): 762–765.
- 148 Kaerlev L, Hansen J, Hansen H L and Nielsen P S. Cancer incidence among Danish seafarers: a population based cohort study. *Occupational and Environmental Medicine* 2005; 62 (11): 761–765.
- 149 OPCS/HSE. *Occupational mortality decennial supplement*. Series DS, No. 10. London: The Stationery Office, 1995.
- 150 Filikowski J. Changes in the state of health of seamen induced by their working environment. *Bulletin of the Institute of Marine and Tropical Medicine, Gydnia* 1989; 40 (1–2): 41–49.
- 151 Johnson B D. Job stress, social support and health among shrimp fishermen. *Work and Stress* 1994; 8 (4): 343–354.
- 152 Rodahl K. Stress at sea. In: Rodahl K. *The physiology of work*. London: Taylor and Francis, 1989.
- 153 Moen B E, Riise T and Helseth A. Mortality among seamen with special reference to work on tankers. *International Journal of Epidemiology* 1994; 23 (4): 737–741.
- 154 Pukkala E and Saarni H. Cancer incidence among Finnish seafarers. *Cancer Causes and Control* 1996; 7: 231–239.
- 155 Saarni H, Pentti J and Pukkala E. Cancer at sea: a case control study among male Finnish seafarers. *Occupational and Environmental Medicine* 2002; 59: 613–619.
- 156 Riise T and Moen B E. A nested case-control study of disability pension among seamen, with special reference to neuropsychiatric disorders and exposures to solvents. *Neuroepidemiology* 1990; (9): 88–94.
- 157 Nilsson R, Nordliner R, Hogstet B, Karlsson A and Jarvholm B. Symptoms, lung and liver function, blood counts and genotoxic effects in coastal tanker crews. *International Archives of Occupational and Environmental Health* 1997; 69: 392–398.
- 158 Hansen H L, Tuchsén F and Hannerz H. Hospitalisations among seafarers on merchant ships. *Occupational and Environmental Medicine* 2005; 62: 145–150.
- 159 Parker A W, Hurbinger L M, Green S, Sargeant L and Boyd R. *A survey of health, stress and fatigue of Australian seafarers*. Canberra: Australian Maritime Authority, 1997.
- 160 Allen P H, Wadsworth E J K and Smith A P. The prevention and management of seafarers' fatigue: a review. *International Maritime Health* 2007; 58 (1–4): 167–177.
- 161 Burke A, Ellis N and Allen P. The impact of work patterns on stress and fatigue among offshore worker populations. In: McCabe P (ed). *Contemporary ergonomics*. London: Taylor & Francis, 2003.
- 162 Wadsworth E J K, Allen P H, Wellens B T, McNamara R M and Smith A P. Patterns of fatigue among seafarers during a tour of duty. *American Journal of Industrial Medicine* 2006; 49: 836–844.
- 163 Wadsworth E J K, Allen P H, McNamara R L and Smith A P. Fatigue and health in a seafaring population. *Occupational Medicine* 2008; 58: 198–204.
- 164 Matheson C, Lawrie T, Morrison S, Ritchie L, Murphy E and Bond C. *Health in the catching sector of the fishing industry*. Aberdeen: University of Aberdeen, 2001.
- 165 Smith A, Allen P and Wadsworth E J K. *Seafarer fatigue: the Cardiff research programme*. Southampton: MCA, 2006.
- 166 Foo S C, How J, Siew M G, Wong T M, Vijayan A and Kanapathy R. Effects of sleep deprivation

- on naval seamen: II. Short recovery on performance. *Annals of the Academy of Medicine, Singapore* 1994; 23 (5): 676–679.
- 167 How J, Foo S C, Low E, Wong T M, Vijayan A, Siew M G and Kanapathy R. Effects of sleep deprivation on naval seamen: I. Total sleep deprivation on performance. *Annals of the Academy of Medicine, Singapore* 1994; 23 (5): 669–765.
- 168 Raby M and Lee J D. Fatigue and workload in the maritime industry. In: Hancock P A and Desmond P A (eds). *Stress, workload and fatigue*. Mahwah: Lawrence Erlbaum, 2001.
- 169 Department for Transport/Marine Accident Investigation Branch. Zzzzzz – bump – where am I? *Safety Digest: Lessons from Marine Accident Reports* 2005; 1: 33–34. www.maib.gov.uk/cms_resources.cfm?file=/Safety%20Digest%201_05.pdf. Viewed 16 July 2012.
- 170 Mayhew C and Grewal D. Occupational violence/bullying in the maritime industry: a pilot study. *Journal of Occupational Health and Safety – Australia and New Zealand* 2003; 19 (5): 457–463.
- 171 Bhattacharya S. Sociological factors influencing the practice of incident reporting: the case of the shipping industry. *Employee Relations* 2011; 34 (1): 4–21.
- 172 The Paris Memorandum of Understanding on Port State Control. *Steady as she goes: Port State Control annual report 2006*. Paris MOU: The Hague, 2007.
- 173 Kahveci E. *Port-based welfare services for seafarers. Summary report prepared for the ITF Seafarer's Trust, 2007*. www.itfglobal.org/files/extranet/-1/30194/Port-Based-Welfare-Services%202007.pdf. Viewed 16 July 2012.
- 174 Sampson H. Why we should talk about swimming pools. *The sea: London mission to seafarers* 2006; 184: 4–5.
- 175 Jepsen J R. Arbejdsmiljø og helbred i den maritime erhverv. *Nordisk Medicin* 1991; 106: 301–304.
- 176 Larsson T J and Lindquist C. Traumatic fatalities among Swedish seafarers 1984–1988. *Safety Science* 1992; 15 (3): 173–182.
- 177 Ellis N, Sampson H and Wadsworth E J K. Fatalities at sea. In: *Seafarers' International Research Centre Symposium Proceedings 2011*. SIRC: Cardiff University, 2011. www.sirc.cf.ac.uk/Uploads/Symposium/SIRC%20Symposium%20Proceedings%202011.pdf. Viewed 16 July 2012.
- 178 Oil Companies International Marine Forum. *Annual report 2012*. www.ocimf.com/News/NewsHome/727f3117-2711-4a0b-8588-7b861dcc2f2f. Viewed 16 July 2012.
- 179 Chemical Distribution Institute. *The CDI Marine Scheme*. www.cdi.org.uk/marine_scheme.aspx. Viewed 16 July 2012.
- 180 Health and Safety Executive. *Guidelines for the selection of designers and contractors under CDMR*. Research report 422. Sudbury: HSE Books, 2006.
- 181 Olympic Delivery Authority. *Design and construction: Health, Safety and Environment Standard*. Fourth edition. London: Olympic Development Authority, 2010. www.london2012.com/documents/oda-health-and-safety/oda-health-safety-and-environment-standard.pdf. Viewed 16 July 2012.
- 182 CompeteFor. *Vision and objectives*. <https://www.competefor.com/business/visionAndObjectives.html>. Viewed 16 July 2012.
- 183 BIMCO. *Standard Ship Management Agreement*. BIMCO, 2009. www.bimco.org/en/Chartering/Documents/Ship_Management/~/_media/Chartering/Document_Samples/Sundry_Other_Forms/Sample_Copy_SHIPMAN2009.ashx. Viewed 16 July 2012.
- 184 Couper A. *Voyages of abuse*. London: Pluto Press, 1999.
- 185 Parliament of the Commonwealth of Australia. *Ships of shame: inquiry into ship safety*. Report from the House of Representatives Standing Committee on Transport, Communications and Infrastructure. Canberra: Australian Government Publications Service, 1992.
- 186 Anderson P. *Cracking the code – the relevance of the ISM Code and its impacts on shipping practices*. London: The Nautical Institute, 2003.
- 187 Bailey N. Risk perception and safety management systems in the global maritime industry. *Policy and Practice in Health and Safety* 2006; 4 (2): 85–101.
- 188 International Maritime Organization. *Role of the human element – assessment of the impact and effectiveness of implementation of the ISM Code*. London: International Maritime Organization, 2005. www.imo.org/OurWork/HumanElement/SafetyManagement/Documents/17-1.pdf. Viewed 16 July 2012.
- 189 Knudsen F. Paperwork at the service of safety? Workers' reluctance against written procedures exemplified by the concept of 'seamanship'. *Safety Science* 2009; 47: 295–303.
- 190 Bhattacharya S. The effectiveness of the ISM Code: a qualitative enquiry. *Marine Policy* 2011; 36 (2): 528–535.
- 191 James P, Johnstone R, Quinlan M and Walters D. Regulating supply chains to improve health and safety. *Industrial Law Journal* 2007; 36 (2): 163–187.

Annex: Sample documents

The empirical research for this study was originally intended to focus on the food production and processing sector, as well as construction and shipping – hence the mention of three sectors throughout the documents included in this Annex. However, access to food producing and processing companies proved too difficult to enable sufficiently detailed and relevant fieldwork within the timeframe of the project, and the researchers diverted resources from this sector to a more intensive study of construction and shipping.

Case studies leaflet

THE ROLE OF SUPPLY CHAINS IN HEALTH & SAFETY MANAGEMENT



This research considers how, and to what extent, health and safety can be enhanced via strategic supply chain management. In particular, it will focus upon the factors that determine the development, implementation and successful operation of such management. The research is being undertaken jointly by the Cardiff Work Environment Research Centre (Cardiff University) and Oxford Brookes University Business School, and it is funded by the Institution of Occupational Safety and Health (IOSH). The study will include a consideration of the following questions:

What factors most influence standards of OHS management and performance within supply chains?
 In which industry sectors could these factors be best focused?
 How could they be best designed and most effectively implemented?
 How far should such factors be legally based?

To address these questions the study is examining the operation of supply chains among organisations in three economic sectors. These sectors were selected because they encompass activities with significant work-related risks, while exhibiting marked differences in relation to supply chain characteristics. More specifically, the study will examine, via detailed case studies, two sets of supply chain relationships in each of these sectors in order to support both 'within sector' and 'cross-sector' comparisons. During these case studies, information is being collected in two ways:

- 1) By conducting interviews with key actors including: procurement and contract managers, health and safety managers, workers, and their representatives in both buyer and supplier organisations and line managers in supplier organisations.
- 2) By gathering and analysing relevant documentary material.

The findings of these case studies is being supplemented by interviews undertaken in second and third tier supplier organisations with contract managers, line, and health and safety, managers and worker representatives, where present. By using this combined approach we hope to shed light on 'lower level' supply chain dynamics in the context of those operating at the 'higher level'. This will enable the study to make an important and unique contribution to existing knowledge concerning health and safety related dynamics within supply chains.

To further explore the case study findings obtained, key informants representing employer/employee organisations, trade bodies, and regulators in each of the three sectors concerned will also be interviewed.

Participation in the study is voluntary. All interviews carried out during the project will be undertaken on a confidential basis and care will be taken to ensure that the anonymity of both participating organisations and interviewees is preserved in any publications arising from the study. Interviews will be audio-recorded and subsequently transcribed. All transcripts of recorded interviews will be stored anonymously on University password protected computers in strict accordance with the Data Protection Act. These will only be accessible to members of the research team and will be kept securely.

If you have any questions about the study please contact Profs David Walters, Helen Sampson, or Phil James at the address below:



Construction sector case studies: information sheet

The role of supply chains in influencing health and safety management in three sectors

Summary for the investigation of supply chain management and health and safety

[Researchers' names]

Cardiff Work Environment Research Centre (CWERC), Cardiff University

[Researchers' email addresses]

[Researchers' telephone numbers]

Participant Information Sheet

You are being invited to take part in a research study. Before you decide it is important for you to understand what the research will involve and why it is being done. Please take time to read the following information carefully. Talk to others about the study if you wish.

What is the purpose of the study?

Over the last 30 years there has been an increase in businesses outsourcing or contracting out the provision of goods and services to other organisations. This has meant that supply chains are playing an increasingly important role in the economy. As a result, there is now a great deal of interest in how, and to what extent, supply chains can be used to support and improve health and safety management in the supplier organisations in the chain. We are now trying to find out more about what works and why in these situations by interviewing key people in a number of organisations.

Who are the researchers and who is funding the research?

The researchers are based at the Cardiff Work Environment Research Centre (CWERC) which is part of the Cardiff University School of Social Sciences. You can find out more about CWERC and our work on our website:

<http://www.cardiff.ac.uk/cwerc/index.html>

The study is being led by [researcher's name] and [researcher's name] with the assistance of other members of CWERC staff. The research is funded by the Institution of Occupational Safety and Health (IOSH).

Who can take part?

The organisation you work for has agreed to take part in the study and has allowed us to approach a number of staff with invitations to be interviewed for the research.

What do I have to do?

Taking part in the study involves being interviewed by the research team. The interview will cover a number of areas around your views of health and safety management in your own and in other organisations. It should take no more than about an hour.

Will my taking part be confidential?

All interviews carried out during the project will be undertaken on a confidential basis and will be audio-recorded and subsequently transcribed. As far as possible all comments will be anonymised in any reports or papers that are produced as a result of the research. No individuals or organisations will be named in any publications about the study and its findings but there is a possibility that some may be identifiable through comments that are made.

What will happen to the information that I give?

All transcripts of recorded interviews will be stored anonymously on University password protected computers in strict accordance with the Data Protection Act. These will only be accessible to members of the research team and will be kept securely.

Do I have to take part?

Taking part in the study is entirely voluntary. You can decide whether you would like to be interviewed or not and you can choose to withdraw from the study at any time.

Contact information

If you would like further information about the study please do not hesitate to contact:

[Researcher's name]

[Researcher's telephone number]

[Researcher's email address]

Construction sector case studies: consent form

The role of supply chains in influencing health and safety management in three sectors

Summary for the investigation of supply chain management and health and safety

[Researchers' names]

Cardiff Work Environment Research Centre (CWERC), Cardiff University

[Researchers' email addresses]

[Researchers' telephone numbers]

Consent Form

- I confirm that I have read and understood the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.
- I am willing to take part in the interview for this study and for the interview to be recorded.
- I understand that no one will have access to the recording beyond the Cardiff University research team.
- I understand that as far as possible all comments will be anonymised in any reports or papers that are produced as a result of the research. Individuals' names will not be included in reports, but I understand that there is a possibility that I may be identifiable through comments that I make.
- I understand that taking part in the research is voluntary and that I may withdraw at any time.

Name of interviewee

Signature

Date

Name of interviewer

Signature

Date

Construction sector case studies: interview schedules

The interview schedules that follow were used on the Olympic Park case study. They were altered as appropriate for use on the Forum Development site.

A) Used with procurers

The role of supply chains in influencing health and safety management in three sectors

Summary for the investigation of supply chain management and health and safety on the Olympic Park

[Researchers' names]

Cardiff Work Environment Research Centre (CWERC), Cardiff University

[Researchers' email addresses]

[Researchers' telephone numbers]

The aim of this study is to consider how, and to what extent, health and safety can be enhanced via strategic supply chain management. We are particularly interested in investigating what factors determine the development, implementation and operation of successful influence of this kind. We are therefore talking to key players in the Olympic Park supply chain, including both managers and workers and their representatives, to try and determine what works best and why. Below, we have outlined the kinds of areas we would like to cover in the interview by giving some sample questions. However, these are only our suggestions – if there are other areas that you think are important but are not covered then please do tell us about them during the interview.

- Background
- Consent form
- Introductions
- Recording
- Abbreviations/specific terms – explain for the tape

Can you start by telling us a little about yourself please – who you are, what you do and what your background is?

- Supply chain health and safety management – general
- How is H&S management and performance in suppliers influenced?
- How is this evaluated?
- Relative importance of H&S in the tender process
- How does this vary by supplier?
- What about TitanCF Industries in particular?

So, in terms of health and safety, can you tell us the main methods you use to seek to influence the health and safety management and performance of suppliers – ie how do you exert this influence?

And how do you evaluate that? Presumably you have a set of criteria to evaluate that against?

So can you tell us a bit about the criteria for successful tenders? Can you tell us, for example, the kind of comparative importance of different aspects of the tender? [Prompt: order of importance; relative importance of health and safety in the tender process?]

Could you outline in more detail what you do in each of these areas of activity?

- Supplier selection
- Gateway/holding process?
- Provision of guidance and training materials
- Delivery of training
- Documentary based monitoring
- Use of performance data
- Workplace inspections/audits.

How far does the use of these activities vary in relation to different suppliers?

Why do these variations exist?

To what extent do attempts to influence suppliers extend to cover occupational health issues, including psycho-social risks arising from job design, working hours etc?

How would you describe relationships with suppliers, in general, on a continuum ranging from 'adversarial' to 'co-operative'?

What factors do you feel influence the degree to which particular supply relationships are towards the co-operative end of this continuum?

And do you feedback any of this information to suppliers? I mean, is there a feedback loop so that suppliers know how they are doing over time, in relation to each other and so on?

As you know, we are doing a case study focusing on TitanCF Industries. Can you tell us a bit about how this process has worked with them in particular please? [Prompts: they are a construction engineering firm which, traditionally, might be expected to be at 'the better end of the spectrum' in terms of H&S – given this, what have your systems etc done to try to influence their H&S management and performance? What is the added value here?]

Supply chain health and safety management – historical evolution and motivations

How did your approach to influencing health and safety management and performance in supplying organisations develop? [Prompts: You seem, to some extent, to have a uniform set of standards – how did this come about? How did you get to where you are?]

How has the approach adopted to influencing health and safety management in supplying organisations changed over time?

What are the main factors which have influenced your present arrangements and the way in which they have evolved over time?

In what ways do you feel that present arrangements for influencing supplier health and safety management might change in the future? [Prompts: After the Olympics, what aspects of the system will you take away and apply to the next project?]

Supply chain health and safety management – effectiveness

Overall, how effective do you feel that present arrangements for influencing suppliers are in ensuring that they manage health and safety adequately?

To what degree do you feel that the effectiveness of current arrangements varies in relation to different suppliers?

Why do you think that this variation in effectiveness exists?

How far would you say that attempts to influence supplier health and safety sit uneasily with other demands placed on them, notably in relation to cost, and obligations to respond to changes in supply requirements?

[How many contractors? How many tiers?] How confident are you that the system you have in place is able to reach down below Tier 1? Because often that is the problem that people kind of elaborate on the supply chain influence, that you can have systems in place that focus on Tier 1, but that you kind of lose it as you go down?

Thinking about slightly wider perspectives, we very much wanted to do this project on the Olympic Park because we would expect to find key examples of good practice here given the high profile of the Park. But in dealing with procurement, what are the main influences on you outside of the contract type relationship – what is driving your approach to procurement?

B) Used with Tier 1-3 managers

The role of supply chains in influencing health and safety management in three sectors

Summary for the investigation of supply chain management and health and safety on the Olympic Park

[Researchers' names]

Cardiff Work Environment Research Centre (CWERC), Cardiff University

[Researchers' email addresses]

[Researchers' telephone numbers]

The aim of this study is to consider how, and to what extent, health and safety can be enhanced via strategic supply chain management. We are particularly interested in investigating what factors determine the development, implementation and operation of successful influence of this kind. We are therefore talking to key players in the Olympic Park supply chain, including both managers and workers and their representatives, to try and determine what works best and why. Below, we have outlined the kinds of areas we would like to cover in the interview by giving some sample questions. However, these are only our suggestions – if there are other areas that you think are important but are not covered then please do tell us about them during the interview.

[Aim to cover:

- Background
- Working as a supplier in general
- Working as a supplier to the ODA
- Working as a buyer in general
- Working as a buyer on the Olympic Park]

Background

[Aim to cover:

- Consent [including recording
- Abbreviations/specific terms
- Introductions]

Can you start by telling us a little about yourself please – who you are, what you do and what your background is?

Can you also tell us a bit about your organisation – what does it do, how many people does it employ?

Can you tell us about what your organisation is doing at the Olympic Park – which projects are you (and have you been) involved with, for how long?

Working as a supplier - general

[Aim to cover:

- How H&S management and performance is influenced by buyers
- Variations from buyer to buyer
- Level of co-operativeness]

How is health and safety managed in your organisation?

Can you tell us a bit about your usual health and safety monitoring system? What sort of data do you collect, how do you use it and so on?

What are the main challenges to maintaining and improving your current standards and performance?

To what extent is your H&S management and performance influenced by the enterprises your organisation has provided services for? [Prompts: Is health and safety generally part of the tendering and contract process? If so, how and what is its influence relative to other factors such as cost in securing the work? And once the work starts, is health and safety management and performance monitored by these enterprises? If so how? Is it incentivised?]

Does this vary? If so, how and why?

Would you say that relationships with buyers vary in terms of the degree to which they are co-operative? So are they more or less co-operative, or closer or more “hands off”? Why do you think these variations in co-operativeness exist?

Working with the ODA

[Aim to cover:

- Differences in working with ODA
- Costs and benefits
- Legacy]

How have you found working with the ODA? [Prompts: Has this relationship been similar to that with others or different? If different, in what way? What are the positives and negatives? Specific examples?]

Thinking about health and safety in particular, has this been managed in the usual way for the Olympic Park project? [Prompts: Is anything done differently? If so what, and in what way? Why have these changes been made? How effective do you think these changes have been?]

If things are done differently, when did this start? Can you take us through the process from tendering, through the contract stage to working on the park? Is it incentivised?

What about the health and safety monitoring system used on the Park? What sort of data does this collect, how is it used and so on?

Do you think these changes have affected your organisation's performance in other ways? [Prompts: What have been the costs, benefits, drivers, barriers? How does this sit with other factors like costs?]

How would you assess the current level of your organisation's health and safety performance on the Olympic Park? [Is it better, worse or about the same as previous projects elsewhere?]

Do you think any of these changes will be continued when you move on to other projects? If not, why not? If yes, which ones and why?

Working as a buyer – general

[Aim to cover:

- How H&S management and performance in suppliers is influenced
- How it is evaluated
- Variations by supplier
- Relative importance in tender process]

Does your organisation generally contract others as part of a project?

Do you seek to influence these suppliers' health and safety management and performance? If so, can you tell us the main methods you use?

And how do you evaluate that? Presumably you have a set of criteria to evaluate that against?

So can you tell us a bit about the criteria for successful tenders? Can you tell us, for example, the kind of comparative importance of different aspects of the tender? [Prompt: order of importance; relative importance of health and safety in the tender process?]

Could you outline in more detail what you do in each of these areas of activity?

- supplier selection
- provision of guidance and training materials
- delivery of training
- documentary based monitoring
- use of performance data
- workplace inspections/audits.

How far does the use of these activities vary in relation to different suppliers? Why do these variations exist?

To what extent do attempts to influence suppliers extend to cover occupational health issues, including psycho-social risks arising from job design, working hours etc?

Would you say that relationships with buyers vary in terms of the degree to which they are co-operative? So are they more or less co-operative, or closer or more 'hands off'?

How would you describe relationships with suppliers, in general, in terms of the degree to which they are co-operative? So are they more or less co-operative, or closer or more 'hands off'?

What factors do you feel influence the degree to which particular supply relationships are towards the co-operative end of this continuum?

And do you feedback any of this information to suppliers?

Overall, how effective do you feel these arrangements for influencing suppliers are in ensuring that they manage health and safety adequately?

To what degree do you feel that the effectiveness of current arrangements varies in relation to different suppliers?

Why do you think that this variation in effectiveness exists?

How far would you say that attempts to influence supplier health and safety sit uneasily with other demands placed on them, notably in relation to cost, and obligations to respond to changes in supply requirements?

Working as a buyer – Olympic Park

[Aim to cover:

- Differences in on the Olympic Park
- Costs and benefits
- Legacy]

Thinking about the methods and process you've just described, are there any differences in the way things have been done for this Olympic Park project? [Prompts: If so, what are they? Why are they different? What difference do you think this has made to their effectiveness?]

How would you assess the current level of your suppliers' health and safety performance on the Olympic Park? [Is it better, worse or about the same as previous projects elsewhere?]

Do you think these changes have affected your suppliers' performance in other ways? [Prompts: What have been the costs, benefits, drivers, barriers? How does this sit with other factors like costs?]

Do you think any of these changes will be continued when you move on to other projects? If not, why not? If yes, which ones and why?

C) Used with Tier 1-3 Supervisors

The role of supply chains in influencing health and safety management in three sectors

Summary for the investigation of supply chain management and health and safety on the Olympic Park

[Researchers' names]

Cardiff Work Environment Research Centre (CWERC), Cardiff University

[Researchers' email addresses]

[Researchers' telephone numbers]

The aim of this study is to consider how, and to what extent, health and safety can be enhanced via strategic supply chain management. We are particularly interested in investigating what factors determine development, implementation and operation. So, that is about the preconditions, drivers/pushes and barriers that affect these. We are therefore talking to key people in the Olympic Park supply chain, including both managers and workers and their representatives, to try and determine what works best and why; how H&S can be influenced by the supply chain. So, that's both up and down the chain.

To do this we are looking at the Olympic Park, with its very unique qualities, and also comparing how things work here to how things work elsewhere in construction (both prior to the Park and since). Also, we are looking at other sectors (food processing and marine transport) to see what sort of things can be learnt from here and taken across to other sectors.

Below, we have outlined the kinds of areas we would like to cover in the interview by giving some sample questions. However, these are only our suggestions – if there are other areas that you think are important but are not covered then please do tell us about them during the interview.

[Aim to cover:

- Background
- Working as a supervisor in general
- Working as a supervisor for [Tier 2/3]
- Working as a supervisor for Tier 2/3 with ODA/CLM/TitanCF Industries/Tier 2 as client]

Background

[Aim to cover:

- Consent (including recording
- Abbreviations/specific terms
- Introductions]

Can you start by telling us a little about yourself please – who you are, what you do and what your background is?

Can you also tell us a bit the company you work for (Tier 2/3) – what does it do, how many people does it employ? How many workers do you supervise? How many supervisors are working on the park? Is there a maximum number of workers that you are allowed to supervise on any one project? Do you supervise workers from other organisations? [NB IF YES REMEMBER TO ALSO ASK QUESTIONS ABOUT INFLUENCING TIER 3/4 H&S]

Can you tell us about what your company is doing at the Olympic Park – which projects are you (and have you been) involved with, for how long?

And where is your organisation in the supply chain here on the Park? Which organisation are you a supplier to and which organisations do you buy services from?

Working as a supervisor - general

[Aim to cover:

- How H&S management and performance is influenced by clients
- Variations from client to client
- Level of contact – instruction/presence]

How is health and safety managed in your organisation?

Can you tell us a bit about your usual health and safety monitoring system? What sort of data do you collect, how do you use it and so on?

What are the main challenges, as you see them, to maintaining and improving your current standards and performance?

To what extent do you feel your H&S management and performance is influenced by the clients your company has provided services for?

[Prompts:

- Is health and safety generally an important factor in new projects? Have you found that its emphasis has changed on different projects?
- If so, how and what is its influence relative to other factors such as more traditional concerns (money, timelines)?
- And once the work is underway, is health and safety management and performance monitored by the clients (those that Tier 2/3 are doing the work for)?
- If so, how? Can you give some examples? Is there an incentive/reward around good health and safety? If so, does this come from the client or in-house?]

Can you give some examples?

Does this vary? If so how and why?

Would you say that relationships with clients vary in terms of the degree to which they are working/involved with you day to day? So are they closer or more 'hands off'?

Why do you think these variations exist?

Working for Tier 2/3 with ODA/CLM/TitanCF Industries/Tier 2 as client/on the park

[Aim to cover:

- Differences in working with [ODA/CLM/TitanCF Industries/Tier 2]
- Costs and benefits
- Legacy]

What is it like to work for Tier 2/3? [Prompt: What do you like most about working for them? What do you like least?]

How have you found working with [ODA/CLM/TitanCF Industries/Tier 2] as the client? [Prompts: Has this experience been similar to that with others or different? If different, in what way? What are the positives and negatives? Specific examples?]

Thinking about health and safety in particular, do you think this has been managed in the usual way for the Olympic Park project? [Prompts: Is anything done differently? If so what, and in what way? Why have these changes been made? How effective do you think these changes have been? Can you give some examples?]

If things are done differently here, when did this start? Can you give us an example of how they are different? [Meetings, paperwork, protocols, method statements, near misses?] Is this incentivised/rewarded? If so, by whom?

What about the health and safety monitoring system used on the Park? What sort of data does this collect, how is it used and so on? How effective do you feel this is?

Do you think these changes have affected your company's performance in other ways? [Prompts: What have been the pitfalls, positives, pushes/reasons to do it, barriers? How does this sit with the company's usual outlook to outcome/completing works?]

Have the changes or executing them affected the way you do your job? If so how? Can you give some examples? Has this made life easier or more difficult for you?

Do you think these changes and the effect of them on your role have been recognised by Tier 2/3? If so how? Has this been helpful? If not, is there anything you would like them to do?

How would you assess the current level of your company's health and safety performance on the Olympic Park? [Is it better, worse or about the same as previous projects elsewhere?] Can you give some examples of what is different?

Do you think any of these changes will be continued when you move on to other projects? If not, why not? If yes, which ones and why?

Which changes would you like to see made to other work that you undertake in the future?

What changes would you not like to see made, and why?

What do you think the workers think about how things have been done on the Park? Has it made their job easier or more difficult? Can you give some examples?

Occupational Health – use and access

Does your organisation provide you with an occupational health service? If so, what do you think about it? How do you find the availability of your occupational health – easy or not? Do you think it is well used? Do you think people feel at ease to use it?

On the Park there's an on-site health centre, 'Park Health'. Has this made a difference to you and your workers? If so, how? Why?

Have you ever had to use any occupational health services? How would you rate Park Health in comparison to your own occupational health?

Differences: Ease of use? Why?

D) Used with Tier 1-3 Workers

The role of supply chains in influencing health and safety management in three sectors

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[Researchers' names]

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[Researchers' email addresses]

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The aim of this study is to consider how, and to what extent, health and safety can be enhanced via strategic supply chain management. We are particularly interested in investigating what factors determine development, implementation and operation. So, that is about the preconditions, drivers/pushes and barriers that affect these. We are therefore talking to key people in the Olympic Park supply chain, including both managers and workers and their representatives, to try and determine what works best and why; how H&S can be influenced by the supply chain. So, that's both up and down the chain.

To do this we are looking at the Olympic Park, with its very unique qualities, and also comparing how things work here to how things work elsewhere in construction (both prior to the Park and since). Also, we are looking at other sectors (food processing and marine transport) to see what sort of things can be learnt from here and taken across to other sectors.

Below, we have outlined the kinds of areas we would like to cover in the interview by giving some sample questions. However, these are only our suggestions – if there are other areas that you think are important but are not covered then please do tell us about them during the interview.

[Aim to cover:

- Background
- Working in general
- Working for Tier 2/3
- Working for Tier 2/3 with ODA/CLM/TitanCF Industries/Tier 2 as client]

Background

[Aim to cover:

- Consent (including recording)
- Abbreviations / specific terms
- Introductions]

Can you start by telling us a little about yourself please – who you are, what you do and what your background is?

Can you also tell us a bit the company you work for (Tier 2/3) – what does it do, how many people does it employ? How many people do you work with directly?

Can you tell us about what your Company is doing at the Olympic Park – which projects are (and have you been) involved with, for how long?

And where is your organisation in the supply chain here on the Park? Which organisation are you a supplier to and which organisations do you buy services from?

Working – general

[Aim to cover:

- How H&S management and performance is influenced by clients
- Variations from client to client
- Level of contact – instruction/presence]

How is health and safety managed in your company?

Can you tell us a bit about your usual health and safety monitoring system? How do you use it and so on?

What are the main challenges, as you see them, to maintaining and improving your current standards and performance?

To what extent do you feel your H&S management and performance is influenced by the clients your company has provided services for?

[Prompts:

- Do you think health and safety generally is an important factor in new projects? Have you found that the emphasis on H&S has changed on different projects you've worked on?
- If so, how and what do you think has made it change in relation to other factors such as more traditional concerns (money, timelines, completing the work)?
- Once the work is underway, is health and safety management and performance monitored by the clients (those that Tier 2/3 are doing the work for)?
- If so how? Can you give some examples? Is there an incentive/ reward around good health and safety? If so, does this come from the client or in-house?]

Can you give some examples?

Does this vary? If so, how and why?

Would you say that relationships with clients differ in terms of the degree to which they are working or involved day to day with you/Tier 2/3? So are they more or less visible, or closer or more 'hands off'?

Why do you think these differences exist?

Working for Tier 2/3 with ODA/CLM/TitanCF Industries/Tier 2 as client/on the park

[Aim to cover:

- Differences in working with [ODA/CLM/TitanCF Industries/Tier 2]
- Costs and benefits
- Legacy]

What is it like to work for Tier 2/3? [Prompt: What do you like most about working for them? What do you like least?]

How have you found working with ODA/CLM/TitanCF Industries/Tier 2 as the client? [Prompts: Has this experience been similar to that with others or different? If different, in what way? What are the positives and negatives? Specific examples?]

Thinking about health and safety in particular, do you think this has been managed in the usual way for the Olympic Park project? [Prompts: Is anything done differently? If so what, and in what way? Why have these changes been made? How effective do you think these changes have been? Can you give us some examples?]

If things are done differently here, when did this start? Can you give us an example of how they are different? [Meetings, paperwork, protocols, method statements, near misses?] Is this incentivised/rewarded? If so, by whom?

What about the health and safety monitoring system used on the Park? What sort of information does this collect, how do you think this is used and so on? How effective do you feel this is?

Do you think these changes have affected your company's performance in other ways? [Prompts: What have been the pitfalls, positives, pushes/reasons to do it, barriers? How does this sit with the company's usual outlook to outcome/completing works?]

Have the changes or executing them affected the way you do your job? If so how? Can you give some examples? Has this made life easier or more difficult for you?

Do you think these changes and the effect of them on your work have been recognised by Tier 2/3? If so how? Has this been helpful? If not, is there anything you would like them to do?

How would you describe the current level of your company's health and safety performance on the Olympic Park? [Is it better, worse or about the same as previous projects you've worked on elsewhere?] Can you give some examples of what is different?

Do you think any of these changes will be continued when you move on to other projects? If not, why not? If yes, which ones and why?

Which changes would you like to see made to other work that you undertake in the future?

What changes would you not like to see made, and why?

What do you think other people you work with think about how things have been done on the Park? Has it made doing the job easier or more difficult? Can you give some examples?

Occupational Health – use and access

Does your organisation provide you with an occupational health service? If so, what do you think about it? How do you find the availability of your occupational health – easy or not? Do you think it is well used? Do you think people feel at ease to use it?

On the Park there's an on-site health centre, 'Park Health'. Has this made a difference to you and your colleagues? If so, how? Why?

Have you ever had to use any occupational health services? How would you rate Park Health compared to your own occupational health?

Differences: Ease of use? Why?

Appendix

Issue	Aim	Indicator/target
Accidents	Prevention of accidents	Zero fatalities Accident frequency rate (AFR): aspirational benchmark of 1 in 1 million (RIDDOR-reportable accidents; total person hours worked) Proportion of near-miss (accident) reports: aspirational benchmark of 80%
Health	Prevention of ill health Provision and use of excellent occupational health service	Ill health frequency rate (RIDDOR-reportable ill health; total person hours worked) Provision and attendance – health checks, health surveillance Provision and awareness of support available for workers returning after ill health absence
Wellbeing	Promotion of wellbeing	Health promotion programme activities and participation
Competence	Development and maintenance of competent workforce	100% of site workers hold CSCS or equivalent cards, logged into scheme Five days training per year Training records log all training activities, including 'toolbox talks'
Designing for HS&E	Reduction of HS&E risk through design	Evidence of processes to identify and evaluate design options with regard to: <ul style="list-style-type: none"> • HS&E risks and opportunities • lead designer and CDM co-ordinator scorecards
HS&E culture	Positive HS&E culture Incorporate sustainability objectives for carbon, water, waste and material into a positive HS&E culture	Evidence of leadership, behaviour and culture (scorecard) Employee responses to HS&E climate surveys Indicators to quantify practice and impact
Compliance and continual improvement	Maintain a regulatory compliant project Maintain a competent workforce	Zero non-compliances, breaches of planning conditions, exceedance of conditions; and zero work, prohibition, enforcement and prosecution notices Incident investigations and prevention of recurrence, and compliance with project health, safety and environment plans Training and awareness records

Table 5
ODA aims and indicators (adapted from ODA¹⁸¹)

IOSH

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IOSH is the Chartered body for health and safety professionals. With more than 40,000 members in 85 countries, we're the world's largest professional health and safety organisation.

We set standards, and support, develop and connect our members with resources, guidance, events and training. We're the voice of the profession, and campaign on issues that affect millions of working people.

IOSH was founded in 1945 and is a registered charity with international NGO status.

