Broad Lane
Sheffield
S3 7HQ

HEALTH & SAFETY LABORATORY

Occupational Health in the Supply Chain: A Literature Review

HSL/2003/06

Project Leader: **Joanne White MSc**
Author(s): **Kirsten Benjamin BSc, Joanne White**
Science Group: **Human Factors**

CONTENTS

EXECUTIVE SUMMARY

The Health and Safety Laboratory (HSL) was asked by the Health and Safety Executive (HSE) to review the literature on occupational health in the supply chain. The review is to support a project being undertaken by United Utilities with the aim of producing a best practice guide for considering occupational health in the supply chain, and the benefits of doing so.

Objectives

The purpose of the review is to identify if there is any published literature on occupational health issues in supply chains. The main aim is to see if there is any published literature on what, if anything, organisations have done to monitor and maintain occupational health in the supply chain and to identify any benefits (and cost savings) of considering occupational health performance to companies in supply chains.

The following areas are covered:

- Definitions of occupational health and supply chains.
- Contractors as well as suppliers.
- Background to occupational health and why it should be considered.
- Background to supply chains and why occupational health is important in the supply chain.
- Methods for improving occupational health in the supply chain.

Methodology

The HSE Information Centre search team conducted literature searches. The majority of relevant articles were obtained mainly from health and safety related journals and magazines. Articles reviewed were selected on the basis of their abstract or their title. In addition to the HSE search, Internet searches were carried out and various groups and associations suggested by the customers were contacted for any relevant information. Some relevant information was obtained by these means, mainly on occupational health issues.

Main Conclusions

- There is clear information about what occupational health and supply chains are, including the fact that contractors were a major part of the supply chain.

- Considering occupational health is very important, due to the increasing problem and associated costs of occupational ill health. However, there can be problems addressing occupational health, particularly due to the latency of occupational health symptoms, the issue of whether it was caused by the workplace and the problems of smaller businesses because of lack of resources or the complexity of the issue.

- Occupational (ill) health can also be a problem in supply chains and can impact on all businesses. There are many reasons given for doing something about it within a supply chain, for both client organisations and suppliers/contractors. Also, there is legislation relevant to supply chains and maintaining health and safety and those not making efforts to prevent occupational ill health could be acting illegally.

- There are quite a few initiatives and good practice suggestions that can be related to occupational health and supply chains. The literature seemed to suggest that the initiatives and good practice suggestions could be divided into contractors or the supply chain, but the

principles could probably be applied to either. In addition, improving occupational health in supply chains appeared to be related to either general information, including sharing information, standards and systems; information specific to parts of the supply chain, such as warehousing or transport; and information related to specific industries (e.g. fuels or healthcare). Literature on improving occupational health in contractors' involved general information, such as guidance, or specific contractor assessment, management and training issues (e.g. those referred to in the tender process).

- The information reviewed here has highlighted that occupational health in supply chains has been considered to a certain extent and in terms of different aspects of supply and contracting. However, there is still more that can be done, as the information reviewed (particularly the good practice and initiatives information) has often been more about health and safety in general, rather than specifically occupational health. In addition, the information and initiatives have not necessarily been specific to supply chains.

- There also does not appear to be much information on any formal comprehensive evaluation of the good practice suggestions or initiatives in order to check if they work and are successful.

In conclusion, despite there being some information on 'occupational health in a supply chain', more research, more evaluation and more understanding of this specific issue is required.

1 INTRODUCTION

1.1 BACKGROUND

In February 2003, the Work Psychology Section of the Health and Safety Laboratory (HSL) was asked by Operational Policy Division (OPD) of the Health and Safety Executive (HSE), to review the literature on occupational health in the supply chain. This literature review is to support a project being undertaken by United Utilities with the aim of producing a best practice guide for considering occupational health in the supply chain and the benefits of doing so.

1.1.1 'Securing Health Together' Strategy

This work is part of the Health and Safety Commission's (HSC) occupational health strategy 'Securing Health Together' launched in July 2000. The strategy is part of a wider initiative 'Revitalising Health and Safety', launched in June 2000, and encourages a focus on preventing ill health. The website for the strategy (Internet reference 1) reported that Great Britain still needs to achieve success in tackling high levels of work-related ill health.

The ten-year strategy represents a joint commitment by government bodies and other interested parties to work together to reach common goals. The main aims of the strategy are to:

- Reduce ill health both in workers and the public caused or made worse by work;
- Help people who have been made ill, whether caused by work or not, to return to work;
- Improve work opportunities for people currently not in employment due to ill health or disability;
- Use the work environment to help people maintain or improve health.

The key programmes and programme action groups (PAG) of the strategy include:

- Compliance - This review is part of the compliance programme, which aims to improve the law in relation to occupational health and compliance with it, including legislation, standards and best practice guidance.
- Continuous improvement – striving for excellence through continuous improvement in occupational health.
- Knowledge – to obtain essential knowledge on occupational health.
- Skills – to ensure that all interested parties have the necessary competence and skills.
- Support – to ensure that appropriate mechanisms are in place to deliver information, advice and other support on occupational health

The Institution of Occupational Safety and Health (IOSH) guidance 'Professionals in Partnership' (2001) discussed the strategy and the specific measurable targets for reducing ill health and sickness absence, all of which are endorsed by IOSH. By 2010, interested parties will work together to achieve the following targets:

- 20% reduction in work-related ill health;
- 20% reduction in ill health to members of the public caused by work activity;
- 30% reduction in the number of work days lost due to work-related ill health;
- Everyone currently in employment but off work due to ill health or disability is, where necessary and appropriate, made aware of opportunities for rehabilitation back into work as early as possible;
- Everyone currently not in employment due to ill health or disability is, where necessary and appropriate, made aware of and offered opportunities to prepare for and find work.

Such targets are believed to be essential to focus action if the occupational health strategy is to make a difference. The priority occupational health issues are musculoskeletal disorders and stress.

1.2 AIMS AND OBJECTIVES

This report presents the findings of the literature review on occupational health in the supply chain. The review aims to:

- See if there is any published literature on what, if anything, organisations have done to monitor and maintain occupational health in the supply chain.
- See if there is any published literature on what, if anything, organisations have done to identify the benefits (and cost savings) of considering occupational health performance to companies in supply chains.
- Describe the scope of the literature and the main conclusions drawn.

1.3 METHODOLOGY

Literature searches were conducted by the HSE Information Centre search team. The team searched databases such as: RILOSH; HSELINE; CISDOC; HEALSAFE; ABI/INFORM; Management and Marketing Abstracts; Social SciSearch; Gale Group Management Contents; and PsycINFO. The key words used were: occupational health and supply chains. While articles were retrieved from academic and applied journals, the majority of relevant articles were obtained mainly from health and safety related journals and magazines, rather than from academic journals. Articles reviewed were selected on the basis of their abstract or their title.

In addition to the HSE search, Internet searches were carried out and various groups and associations suggested by the customers were contacted for any relevant information. These included Institution of Occupational Safety and Health, the Confederation of British Industry and the Faculty of Occupational Medicine of the Royal College of Physicians. Also, the Sheffield Occupational Health Development Group and the Sheffield Occupational Health Advisory Service was contacted for any relevant information. Some relevant information was obtained, mainly on occupational health issues.

1.4 SCOPE OF REVIEW

The purpose of the review is to identify if there is any published literature on the consideration of occupational health issues in supply chains.

Specifically, the following areas are covered:

- Definitions of occupational health and supply chains.
- Contractors as well as suppliers.
- Background to occupational health and why it should be considered.
- Background to supply chains and why occupational health is important in the supply chain.
- Methods for improving occupational health in the supply chain, including good practice and more formal established initiatives.
- Conclusions.

2 OCCUPATIONAL HEALTH

2.1 WHAT IS OCCUPATIONAL HEALTH?

The term 'occupational health' can convey different things to different people. The Occupational Health Advisory Committee on the HSE website (Internet reference 2) referred to a broad view that occupational health can embrace:

- The effect of work on health, whether through sudden injury or through long term exposure, and the prevention of occupational disease through techniques such as health surveillance;
- The effect of health on work, addressing the fitness of the task for the worker;
- Rehabilitation and recovery programmes;
- Helping the disabled to secure and retain work;
- Managing work-related aspects of illness with potentially multifaceted causes and helping workers to make informed choices.

Similarly, a guidance booklet by IOSH 'Professionals in Partnership' (2001) suggested that the definition of occupational health has two linked components, i.e. 'effects of work on health' and 'effects of health on capacity to work'. Effects of work on health are considered to include aspects like (examples from p.7 and 8):

- Identifying the potential causes of ill health at work
- Evaluating levels of risk
- Determining the mix of reasonably practicable controls necessary to prevent people being made ill by work
- Ensuring these controls are implemented
- Monitoring and reviewing the results, making improvements based on lessons learnt
- Adapting work to the needs of individuals throughout their working lives.

Effects of health on the capacity to work are considered to include aspects like (from p.8):

- Ensuring people are physically and mentally capable of performing the required tasks
- Rehabilitating sick or injured workers
- Minimising the exclusion of people from work on health grounds, including helping disabled people secure and retain work
- Promoting health at work so that benefits reach beyond the workforce and into the community.

According to Harrington, Gill, Aw and Gardiner (1998) occupational health is:

> *'a multifaceted activity concerned with the prevention of ill health in employed populations'. (p.3)*

Harrington et al (1998) also made reference to the two-way relationship between work and health and reported that occupational health is related to the effects of the working environment on the health of workers as well as the influence of the workers' health on their ability to perform their job.

In 1950, a joint International Labour Organisation/World Health Organisation (ILO/WHO) committee defined the subject as (cited in Harrington et al, 1998):

> *'the promotion and maintenance of the highest degree of physical, mental and social well being of workers in all occupations.' (p.3)*

These definitions suggest that a broad view of occupational health is necessary and that the term 'occupational health' can be considered to include a range of aspects and issues.

Occupational health can relate to a wide variety of industries and occupations, such as manufacturing, woodworking, textiles, health care, machinery work, construction, agriculture, food manufacture, computer work etc. There is also a wide range of people involved in maintaining occupational health, for example physicians and nurses, psychologists and ergonomists, health physicists and microbiologists, and even lawyers. The main aim of such occupational health (and other) professionals is to prevent rather than cure ill health from wherever it arises in the workplace (Harrington et al, 1998).

2.2 CAUSES OF OCCUPATIONAL ILL HEALTH

There are a number of causes of occupational ill health. For example, traditional industrial processes can release hazardous substances and physical agents (e.g. chemicals, gases, dusts, light, heat, noise, vibration, pressure, radiation etc). These can cause ill health to the operators if encountered in sufficiently large doses. Other workplace issues such as biological hazards, ergonomic hazards such as display screen equipment or manual handling and psychosocial issues such as long hours/shift work or stress can also cause occupational ill health if the hazards are not dealt with and controlled.

Shepherd (1999) noted some of the more common occupational diseases that generally occur in the construction industry. These included:

- Asbestosis. This is a big health risk facing the construction industry at the moment, and is caused by exposure to asbestos.
- Musculoskeletal disorders. These are also a major problem in the construction industry. They mainly arise from manual handling activities and include back disorders, injuries to the shoulder, arm, elbow and wrist, and result from repetitive activities.
- Cement dermatitis. This is caused by an allergy to a chemical present in cement.
- Silicosis. This is caused by inhaling dust-containing silica that is found in many building materials.
- Hand-arm vibration syndrome. The most common form of this disease is 'vibration white finger'. This disease is caused by exposure to vibrating equipment.
- Permanent deafness. Many of the construction processes are very noisy and permanent deafness can result if individuals are not adequately protected.
- Solvents can also cause serious health effects. Solvents are found in paints, varnishes, adhesives and pesticides.

2.3 HOW MUCH OF A PROBLEM IS OCCUPATIONAL ILL HEALTH?

Occupational ill health is a major problem in industry. Guidance to IOSH members (2001) highlighted the extent and costs of occupational ill health problems by noting findings and statistics on this issue. For example (taken from p.9 of the guidance):

- In the UK each year, about 160,000 people are forced to give up work through long-term illness or disability (DETR, 2000).
- In the year 1995/6 (the latest for which data are available), work-related illness is estimated to have cost £6.2-7.2 billion (HSE, 1999).
- In 1995, 1.2 million people were affected, temporarily or permanently, by musculoskeletal disorders, including back problems and work-related upper limb disorders (HSE, 1999).
- The European Agency for Safety and Health at Work has also estimated that around one-third of employees in the EU suffer from some form of occupational stress (European Agency for Safety and Health at Work, 2000).

Similarly, Shepherd (1999) noted statistics in the construction industry. The article noted that the construction industry had the second highest rate of work-related illness in 1995. It highlighted this focusing on the following statistics in 1995:

- 'An estimated 7.5% of all current / recently working construction workers were suffering from a work-related illness'
- 'The estimated number of cases of work-related ill health was 123,000'
- 'Over three quarters of construction workers were suffering from a musculoskeletal problem (96,000)'
- 'Construction workers took the second highest number of days off work', and
- 'Overall, construction workers took 2 million days off work for reasons of work-related ill health' (p.47).

There are further costs associated with occupational ill health. Pickvance (2003) considered the business case for occupational health and noted a number of costs relating to occupational injury and disease. These (from p.34) and others from the IOSH guidance (2001) and Shepherd (1999) are summarised below:

1. External costs relating to the employee or country:

- costs to national or private health care service
- costs to benefit systems
- lost wages
- costs to households or community
- pain from disease or injury

2. Internal indirect costs relating to the organisation:

- lower morale
- time spent in investigation
- skills shortage from individuals leaving the workforce due to ill health or early retirement on the grounds of ill health (The IOSH guidance (2001) suggested that this can be 'severely detrimental to business performance' due to the loss of people who are often 'the holders of an organisation's corporate knowledge' (p.15)).
- recruitment and training of replacement workers
- maintaining a reserve workforce
- returning-to-work arrangements
- damage to equipment

3. Internal direct costs relating to the organisation:

- sick pay
- increased insurance premiums
- fines
- compensation claims
- loss of output and disrupted schedules

There are several reasons for the extent of the problem. For example, the IOSH guidance suggested that *'work-related ill health is often poorly identified, hidden within the mass of general sickness absence' (p.9).* In addition, it further noted the problems associated with employers treating reports of work-related ill health with suspicion, as illness or injuries can result not just from work activities, but also from lifestyle factors or non-work activities as well. However, the guidance suggested that this tendency *'misses the fundamental point that an individual has been absent from work due to ill health, possibly work-related, and that an earlier workplace intervention might have made a difference' (p.15).* In addition, Shepherd (1999) noted that *'health risks are difficult to quantify because there is a long latency period*

before disease develops and because individual susceptibility varies' (p.46). It also noted that strategies for controlling occupational health risks are seen as *'requiring time and resources to develop and as not producing immediate direct cost benefits' (p.46).* The IOSH guidance noted that although occupational health is a concern requiring systematic management, similar to safety, currently available health and safety management systems (e.g. HSG65, BS8800 and OHSAS 18001) do not sufficiently emphasis occupational health, making management difficult.

2.4 WHAT SHOULD BE DONE ABOUT OCCUPATIONAL (ILL) HEALTH?

Occupational ill health is obviously a major problem in industry with many associated costs. There are several reasons why organisations may consider it a difficult problem to deal with, but it has been argued that *'the cost of reduced availability of the workforce is one that cannot be ignored' (IOSH guidance, 2001, p.9).* A report by Pilkington, Graham, Cowie, Mulholland, Dempsey, Melrose and Hutchinson (2002) looked at the use of occupational health support in a wide range of organisations. They defined occupational health support as *'advice and practical assistance on managing health risks at work, controlling the effects of health at work, rehabilitation and promoting general health at work'*. They found that approximately 25% of companies did not provide occupational health support and that this was particularly true of smaller companies, who, due to a more limited knowledge of dealing with health issues, often relied on external, easily accessible, and cheap advice. Smaller companies also often felt that current health and safety initiatives were not relevant to their situation or needs. Pilkington et al (2002) suggested that occupational health often takes second place within health and safety, and that health and safety representatives and managers were vital for increasing awareness of occupational health issues. There is therefore much more that needs to be done to improve occupational health, in terms of both support and appropriate initiatives, throughout the entire workforce.

The IOSH guidance (2001) further suggested that *'prevention is better than cure' (p.10)* and that it was important to improve occupational health, because it can result in improvements in productivity and reduced early retirement and sick leave. The guidance noted that apart from a few well-known hazards associated with, for example asbestos, the *'profile of occupationally-related health issues is relatively low and needs to be raised' (p.8)*, but it suggested that the public would be interested in this health issue due to their reactions to other hazards, for example BSE and mobile phones.

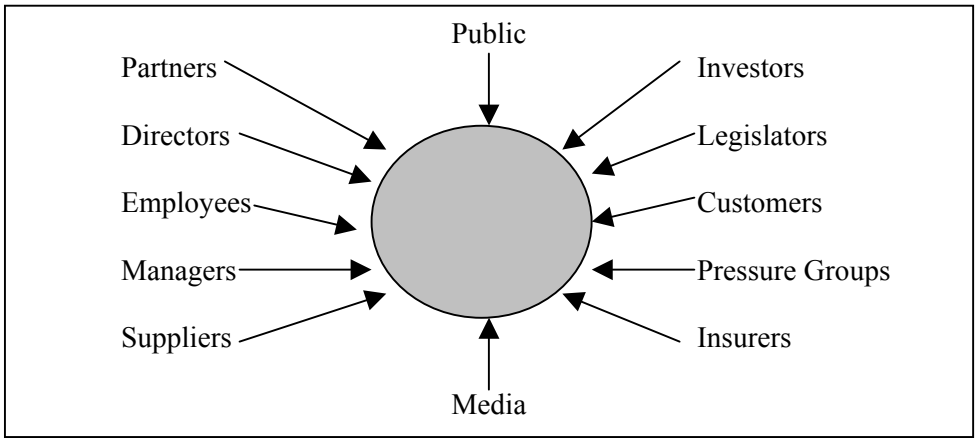
The benefits associated with improving health and safety, including occupational health, are evident from the findings of research that looked at what motivates companies to enter health and safety competitions (research was discussed in Borley, 1998). The research suggested that winning such competitions gave the companies recognition and distinction, as well as reinforcing their health and safety culture, gaining the commitment of the workforce and gaining a commercial advantage in certain sectors, where success in these competitions was used as a measure when tendering for work. These organisations also gained involvement in health and safety by senior management, as well as investment in health and safety training and good communication on health and safety throughout the organisation.

The IOSH guidance suggested that in order to achieve the national targets set in the 'Securing Health Together' strategy, it needs to be recognised that preventing ill health requires *'the careful design, selection and management of workplaces, work practices, processes, equipment and materials, as well as a trained, aware and motivated workforce' (p.6)*. The guidance noted that investing in occupational health is an investment in the future and that *'the greatest advances in protecting people from workplace injuries and ill health may well come from the better and more holistic management of health risks' (p.7)*. It suggested that *'it is preferable to consider how best the ill health can be prevented or reduced so as to allow the individual to*

continue working' (p.15) and that output measures linked to occupational health need to be relevant, simple to collect and easy to understand. The guidance further suggested that the aim of occupational health and safety professionals for new and emerging hazards, should be to *'raise awareness, ensure sound research is undertaken and then to develop risk-based communication and control strategies based on the data' (p.9)*, whilst for well-established hazards, the aim should be to *'promote good practices and disseminate tools and techniques which are proportionate to the risks and have been proven to be effective' (p.9).*

In trying to achieve the national targets for improving occupational health, it is important that all those who are responsible, involved or interested in maintaining the health of the workforce take steps towards improvement. This means involving all the "stakeholders" in occupational health. Harrington et al (1998) noted that there are a wide variety of stakeholders, who are represented in Figure 1.

Figure 1: The Occupational Health Stakeholders (taken from Harrington et al, 1998)



From the diagram, it is clear that it is not just the employers who are responsible for occupational health of employees and the public, but that external sources can be influential too. It is therefore useful to consider occupational health with regard to each of these sources and the steps available in each situation to promote occupational health. The stakeholders include suppliers of goods and services and contractors for an organisation; it is therefore valuable to review occupational health literature for the supply chain, which is the purpose of this review. Suppliers and contractors can impact on health and safety, and as such, they should be included in the management and control of occupational health. It is only by including 'everyone' at the workplace, including suppliers and contractors, that a culture of good health and safety policy and practice can develop, where everyone takes responsibility for these policies and practice.

3 SUPPLY CHAINS

3.1 WHAT IS A SUPPLY CHAIN?

> *'The supply chain' includes all aspects from the 'supplier's supplier to the customer's customer'* (Walter, 2000, p.32).

Various definitions of the supply chain were also discovered through an Internet search. For example:

> *"The network of retailers, distributors, transporters, storage facilities, and suppliers that participate in the sale, delivery and production of a particular product."* (Internet reference 3)

> *"A set of approaches utilized to efficiently integrate suppliers and clients (comprised of stores, retailers, wholesalers, warehouses, and manufacturers) so merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize system wide costs while satisfying service level requests."* (Internet reference 4)

Other definitions referred to supply chain management. These included:

> *"The integration of business processes from end user through original suppliers, that provide products, services, and information that add value for customers."*
> (Internet reference 5).

> *"Supply chain management (SCM) is the oversight of materials, information and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. Supply chain management involves coordinating and integrating these flows both within and among companies."*
> (Internet reference 6).

Kumaraswamy and Dissanayaka (1996, cited in Hope 1999) used the following definition to refer to 'procurement'. It is relevant to the supply chain as it mentions the decisions that have to be made and the expected conditions (probably including health and safety) when obtaining materials of services from a supplier or contractor:

> *'... the action or process of obtaining materials, property or services at the operational level and includes decisions on organisational structures, strategies, selection methodologies and the conditions which are expected for the duration of the contract' (p. 4)*

3.2 WHAT ABOUT CONTRACTORS?

Most of the supply chain definitions mentioned above appear to focus on the involvement of a supplier supplying a product or material. However, the supply chain could be viewed more broadly if the supply of a service by a contractor is also considered (e.g. a contractor supplying a house building company with electrical skill or an IT consultant contracted in by a company to maintain IT systems etc). Indeed, many of the references obtained for this review discussed contractors as well as suppliers and the report 'Managing Risk, Adding Value' (1998) suggested that contractors can act as either production suppliers or service providers. Therefore, for the purposes of this review the network of suppliers and contractors to manufacturing, retailing or

other companies will be considered. However, in the later section on 'Improving occupational health in supply chains', suppliers and contractors will be discussed separately, as initiatives for each are different.

The HSE leaflet "Working Together. Guidance on Health and Safety for Contractors and Suppliers" (INDG268(rev)) defined a contractor as *"anyone who is called in to work for a company but who is not an employee of that company"* and a supplier as *"someone who supplies goods or services"* (pg 4). Ascher (1997, cited in Hope, 1999) used the following definition when referring to 'contractor services', 'contracting out' or 'outsourcing', which he suggested are all inextricably linked:

> *'... the practice or situation where an organisation (public or private) enters into a formal agreement with another for the provision of a particular good or service, with the contractor then being considered as the supplier in the procurement process' (p.4)*

All the above definitions suggest that there is a big network of people involved in the supply and contracting chain. There must be some impacts from one to another and health and safety impacts are no exception. Given that the law imposes duties on employers to take reasonable care of employees' health and safety, it seems vital that in such a network of people health and safety should be considered for all those involved. Indeed, Gattorna and Walters (1996) reported that the concept of supply chain management suggests that:

> *'the company's focus extends beyond its own performance to become much more of an inter-organizational focus.' (p. xv)*

However, are companies focusing on all 'inter-organisational' links of the supply chain when considering occupational health? Section 4 attempts to discover what is being done in the supply chain to monitor and maintain occupational health.

3.3 HOW DOES OCCUPATIONAL (ILL) HEALTH OCCUR IN THE SUPPLY CHAIN?

There are likely to be many reasons why occupational health, or occupational 'ill health', occurs in the supply chain. Some of these ways are discussed here.

- ***Issues relating to suppliers or contractors***

Mayhew and Quinlan (1997, cited in Hope 1999) devised a set of factors that they considered influenced standards of occupational health and safety in contractors and sub-contractors and hence goes some way to explain how occupational health problems may occur in the supply chain. The factors that they considered are:

- Economic reward pressures
- Disorganisation
- Inadequate regulation, and
- Inability of subcontractors to band together to improve their situation.

The review by Hope (1999) explained this further by noting that *'where large contractors find it difficult to implement effective health and safety measures particularly because of cost, they would be unlikely to impose the need for strict controls on their sub-contractors. This approach, coupled with the requirement of the sub-contractors to work speedily while also minimising costs, results in the neglect of occupational health and safety' (p.28-29).*

The health and safety impacts of the changing face of work may also go some way to explaining how occupational health occurs in the supply chain. An article in a European Trade Union Technical Bureau for Health and Safety Newsletter (December 1997) looked at casual and temporary workers (who may often be contractors) and noted various reasons for how such workers can lead to occupational health problems in the supply chain. It noted that these workers were at greater risk of harassment in the workplace, were consulted less and had less access to training or influence over the organisation of work. These workers were also more exposed to strenuous work, repetitive movements and inhalation of dangerous substances. The article also noted the difficulty in monitoring occupational health in casual workers, particularly those who do not have records available. This all suggests that occupational health does appear to pose potential problems for the changing nature of workers within the chain. The article suggested that steps should be taken to improve occupational health for these workers, and the unions in the Netherlands have already made this a high priority. What has been done or what should be done as considered by the unions in the Netherlands is discussed in a later section (section 4.2.3).

Hope (1999) noted the findings of investigations into a number of explosions at chemical processing plants in the USA, namely, that the cause of the incidents were due to a lack of communication, inadequate health and safety training, failure to use safe work practices and diffused responsibility for health and safety between the contractor and the host employer (Craft, 1991; Whitaker, 1995, cited in Hope, 1999). Other general literature finds that contract employees receive insufficient training when compared to core employees and systematic training and incorporation into site safety culture is often poor for contract workers. This is often because of the transient nature of this workforce (HSE, 1995; Rousseau and Libuser, 1997, cited in Hope 1999). Therefore, specific factors that may be lacking or are inadequate, particularly for contractors, obviously can have an impact on the occurrence of occupational health and safety problems within the supply or contracting chain.

Hope (1999) discussed some further factors that may affect health and safety in contract work and hence may explain why occupational health occurs in supply chains. For example,

1. **Training provision.** Hope noted that, *'as much of the training takes place on the job due to the nature and technology in use, the question of responsibility for training in contracting is often unclear' (p.23).* Rousseau and Libuser (1997, cited in Hope 1999) suggested that training in occupational health and safety is inadequate for contract workers as the focus is often on core employees. As workforce training is considered to be a long-term investment, this means that client companies do not consider that they will see the benefits in investing in the training of contract workers and therefore see the use of contract labour as a disincentive for providing training. Hope suggested that there is a need to have structures in place that ensure the hire of competent contractors and the subsequent provisions for the management and monitoring of their health and safety practices. In addition, it was suggested that arrangements should be made for the continuous review of health and safety matters, for example, safety meetings and site tours and efforts to establish rapport and collaboration on health and safety matters between core and contract workers. Methods for ensuring health and safety in the supply chain, including contractors, are discussed in a later section.
2. **Problems with the quality and quantity of specialised machinery and personal protective equipment**, which may be required by the nature of the task but supplied by the client.
3. **Role ambiguity.** Benson (1998, cited in Hope 1999) suggested that this could be a problem, i.e. that the employer and the client may have different opinions about what the job entails. Hope noted that the perceived roles of the parties involved, i.e. clients, contractors, subcontractors and employees, all can have an impact on experiences of occupational health and safety, which may lead to problems within that chain of people.

- ***Issues relating to Organisations***

Dalling (2000) summarised generally how occupational health may occur in the supply chain. The article noted that contracting products and services has the *'potential to import problems along with the intended product or service' (p.38).* In addition, the recognition that the *'management system should contain controls to ensure that the procurement of services does not threaten the organisation' (p.38)* implies the occurrence of occupational health in the supply chain in that it requires effective management.

Hope (1999) looked at organisational changes and noted that HSE (1998b) found that technological change had resulted in the adjustment of employment patterns and the move to contracting out. These changes can have consequences for occupational health and safety, which may cause problems in the supply chain. For example, in terms of changing employment patterns, it means that it is more difficult to identify who is responsible for specific activities, and in terms of contracting out, there is more likely to be a loss of corporate memory of health and safety issues and a lack of ownership for problems. Other countries have also suggested that changes in technology have resulted in an increase in contracting, but also that these employees are more likely to incur injuries (e.g. Rousseau and Libuser, 1997, cited in Hope, 1999).

Research (Kochan, Wells and Smith, 1992; Rousseau and Libuser, 1997; Rebitzer, 1995, all cited in Hope, 1999) on the use of contract workers in the petrochemical industry, which resulted from an explosion and fire at a chemical plant that killed 23 people and injured 232, suggested that:

> *'occupational health and safety outcomes in industry cannot be simply classified as the result of inadequate enforcement, or lack of correct equipment for example, but rather, that it is important also to consider the integrity of the internal industrial relations' (p.29).*

This implied that the occurrence of occupational health and safety problems in the supply chain cannot be seen as simply arising from specific factors but instead from overall industrial employment relations between members of the supply chain.

- ***Issues relating to the supply of goods***

There is also potential for occupational health problems to arise in supply chains through the sale of safety equipment and personal protective equipment (PPE). For example:

> *'as safety equipment and PPE moves through the supply chain to the ultimate point of sale to the user ... their* [the distributors] *good intentions and expertise has less and less influence'* (Health and Safety at Work, February 1999, p.29).

In other words, the salesperson at the point of purchase may have little knowledge about the safety equipment and PPE to be able to advise users on which one is most suitable for the intended purpose, and what the differences are between those that are available. As highlighted in the article, safety equipment and PPE are *'designed to prevent injury and occupational diseases'* (p.29), so selecting the wrong one can be dangerous. The British Safety Industry Federation distributors therefore advise all safety equipment users to *'talk to specialists in all cases where people's health and welfare is at risk before making an arbitrary purchase'* (p.29).

An article in Foundry Trade Journal (July 2001) illustrated further potential for occupational health problems to occur in the supply chain. The article discussed a book called 'Radioactive

Scrap Metals', which suggested that the circulation of radioactive scrap metal was increasing and that the trend was likely to continue. It noted that the UK scrap metal industry was beginning to face a new and unforeseen danger, in that as the circulation of radioactively contaminated metals and other radioactive sources increase, they are likely to enter the scrap supply chain and become potentially hazardous to workers, the public and the environment. The article suggested that radioactive sources and metals that have become contaminated through use in the nuclear industry are increasingly escaping regulatory control and finding their way into the metals recycling industry. While the article noted that until the time of the article, the majority of incidents related to this problem had occurred at scrap dealers, according to a British Metals Federation report, only about half of UK scrap merchants had any monitoring equipment, therefore the problem was likely to be greater than the level currently detected. This report recommended that the Government had a duty to support the metal recycling industry and to ensure that public confidence is maintained in the quality and safety of its products. In addition, the report suggested that the Government should assist the industry to adequately protect itself, its workers and the public from dangers posed by contaminated metals and other sources entering the supply chain.

3.4 WHY IS OCCUPATIONAL HEALTH A PROBLEM IN THE SUPPLY CHAIN?

It has been shown how occupational health and safety issues can occur in the supply and contracting chains but exactly how big a problem is this occurrence?

Hope (1999) discussed the use of contractors within the supply chain. The author noted that occupational health might be a problem in the supply chain because the use of contractors has been associated with negative health and safety outcomes, which it suggested was in part due to the difficulties in determining responsibility for health and safety matters. She noted that contract workers are often exposed to risks that could lead to debilitating personal health problems, due to the nature of the jobs they are employed to do. One way to avoid occupational health being such a problem in the use of contractor services is the provisions for health and safety being specified within the actual contracts of contractors or suppliers.

Hope (1999) also noted Benson and Ieronimo's (1996) suggestion that there is often a lack of co-ordination when a company interfaces with contractors and sub-contractors, which can lead to poor supervision. Kochan and Wells (1994, cited in Hope, 1999) suggested that this lack of co-ordination, could then lead to poor communication, which can impact on workplace safety. This was supported by observations that the use of contractor services is linked with higher accident and ill health rates.

- ***Increased incident rates***

As a specific example of why occupational health can be a problem in the supply chain, Hope (1999) reported an association of higher accident rates with the presence of contract labour (e.g. over 22% of fatal injuries are to contractors). While there are few similar statistics on occupational ill health, there is no evidence to suggest that organisations with poor safety records will be any better on health. Such occupational health and safety weaknesses can be made worse through contracting and supply chains by delegating responsibility for health and safety (i.e. 'passing the buck'), having lack of clarity over relationships and responsibilities and having poor planning and communication. Therefore, it is important that organisations within supply chains work together in order to avoid aggravating a possibly already poor occupational health and safety record.

Another example comes again from Hope (1999) who also considered occupational health and safety outcomes in the mining, chemicals, petrochemical and construction industries. Hope noted research by Blank, Anderson, Linden and Nilsson (1995) that investigated accident rates in Sweden against 13 factors related to the presence of contractors. The research demonstrated that there were significant differences in accident levels between core employees and contract workers in terms of incidence, severity and circumstances, showing that for the year 1989, the accident rate for contractors was roughly 1.7 times higher than that for core employees. The review suggested that the ultimate goal of the client should not only be to see contracted work completed accurately and to time, but also to ensure that the necessary precautions for health and safety have been taken.

Other examples of occupational health being a problem in the supply chain include studies where occupational accidents were shown to be higher for temporary and fixed contract workers than for those employees with permanent contracts (Hery, Diebold and Hecht, 1996, cited in Hope, 1999). Hery et al (1996) also demonstrated what happens when health and safety standards have been lowered for contractors. They highlighted a case where the client relaxed their role in monitoring and supplying relevant personal protective equipment, which in turn resulted in the lowering of health and safety standards of contract employees. This ultimately resulted in excessive exposure of the contract employees to chemical pollutants.

The supply or contracting process could clearly affect the status of occupational health and safety and there can obviously be adverse health and safety implications if contractors or suppliers are used and activities are not carefully and comprehensively managed.

3.5 WHY SHOULD OCCUPATIONAL HEALTH BE CONSIDERED IN THE SUPPLY CHAIN?

'Successful Health and Safety Management' (2003) reported that organisations might have several reasons for changing and improving their performance and developing the health and safety management system. One of these included pressure from suppliers, customers or shareholders, suggesting that consideration of the supply chain when it comes to ensuring health and safety is advisable. In addition, health and safety management is integral to the successful completion of a contract or to the delivery of goods on time and to the required quality standards. One accident or incident of ill health with one employer will have knock-on effects on others in the supply chain by disrupting supply or services. Considering occupational health in the supply chain is therefore very important.

The successful management and co-ordination of supply chains is a major contributor to the success or failure of companies, which can include success or failure in health and safety performance. There is a strong move towards more collaborative relationships between people in the supply chain, which should be beneficial for considering occupational health hazards and control measures along the chain. Indeed, Siemieniuch, Waddell and Sinclair (1999) reported:

> *'...there must be both a willingness to share any mutually beneficial information along the supply chain, but also the means to do so.' (p. 89).*

- ***General reasons***

'Health and Safety – The Way Ahead' (Internet reference 7) suggested why high health and safety standards are important for the supply chain. These may include:

- **Ensuring quality**. Health and safety often appear in quality management systems and organisations may expect their contractors and suppliers to operate to the same standards.

- **Ensuring value**. Assessing and reviewing potential contractors and suppliers can be expensive and costs or loss of business from a health and safety incident can be great. Organisations may look towards reducing contractors and suppliers to achieve better value and excellent health and safety records may be an important determinant of which ones are chosen.
- **Ensuring competence**. Being able to ensure that contractors and suppliers are competent and trained in health and safety is important. This will benefit contractors and suppliers by preventing loss of business and clients by ensuring safe working and supplies.
- **Ensuring reputation**. When incidents occur organisations need to show that they were working in a healthy manner and need to know that their supplies or contractors were not to blame. Therefore, high health and safety standards are important to maintain the reputation of all organisations in the supply chain.
- **Ensuring everyone's interest**. It is important for all organisations in a supply chain to perform well in health and safety and to meet the client's health and safety requirements. This is to ensure that organisations are not pushed out of the supply chain, which may lose business for one organisation and may reduce the contractor and supply bases for other clients.

The report 'Managing Risk, Adding Value' (1998) also considered reasons for adopting high health and safety standards and reported that the majority of participant firms gave a business based (e.g. risk reduction, quality management, reputation etc) rather than legal or moral reason for pursuing high health and safety standards and for imposing it on others. This suggests that all those involved in the 'business', including suppliers and contractors, need to consider health and safety.

Pickvance (2003) cited research that suggested that, especially for specific problems such as manual handling or noise, the fear of litigation costs might be passed on in increased insurance premiums, which has encouraged preventive measures in occupational health (e.g. Honey, Hillage, Jagger and Morris, 1996; Lancaster, Jacobsen Maher and Alder, 2001). Therefore, it is important that all links of the supply chain do consider occupational health and preventive measures in order to avoid huge increases in insurance premiums. However, Wright and Marsden (2002) found that insurance premiums had little effect on the attention that employers paid to occupational health and safety.

- ***Greater problems for small organisations***

Some research, published in the HSE guidance 'Managing Risk – Adding Value' (1998), focused on how large firms manage their relations with smaller contractors and suppliers, especially in terms of health and safety performance. The findings of this research suggested that organisations have to be careful that they are not pushed out of the supply chain because of health and safety demands. For example:

> *'In the search for quality, bigger firms are putting increasing emphasis on the health and safety capability of their suppliers, as well as their capacity to deliver the goods. Those who do not measure up as either contractors or as sub contractors will find themselves increasing squeezed out of the supply chain' (p.iv).*

However, while it also found that many firms believe that *'good health and safety is good business',* Pickvance (2003) suggested that small firms might lack sufficient expertise, intelligence or resources to deal with occupational health problems even if they believe in the importance of health and safety for the business. Indeed, many small firms may not have even

encountered occupational ill health before. Nevertheless, as the article reported that the use of prevention measures could be made a condition of contract for any firm in competing markets, it is important for all organisations in the supply chain to consider occupational health and safety to ensure that they are able to offer good contracts. Indeed, 'Managing Risk, Adding Value' (1998) reported that Marks and Spencer and John Lewis Partnership make good standards of health and safety a condition of contract for both suppliers and contractors.

The 'Managing Risk: Adding Value' report by HSE was discussed in an article in the Safety and Health Practitioner (June 1998). It suggested that small and medium-sized contractors could be at risk of going out of business unless they take health and safety demands seriously as part of the tendering process. It also revealed that large companies are starting to tighten up their procurement procedures and starting to demand proof from potential contractors that HSE targets are being met, mainly as a result of the relatively new roles of project manager and procurement manager. All participating firms in this HSE report were found to be imposing stringent quality controls on themselves and on their business partners. The article also noted comments by the author of the HSE report, that:

> *"Big firms are reducing the number of their suppliers and increasing demands on them – insisting on higher standards of management and higher standards of safety in all they do business with".*

However, the report suggested that clients should be aware of the dangers of narrowing their supply base too drastically and ending up with few good suppliers/contractors.

Similarly, Percival-Straunik (1998) suggested that, as many large firms consider health and safety to be a good indicator of the general competence of a small firm, small firms may find themselves edged out of the supply chain and out of business if they do not live up to the higher standards of health and safety being demanded by these larger companies. For example, a manager at Shell UK explained that health and safety weighed heavily in their assessments of whether a contractor was suitable or not, and that they had adopted a Fully Integrated Quality Management System (FIQMS, this will be discussed further in a later section), which meant that the entire company and its partners had to adhere to stringent quality controls. Additionally, a pharmaceutical firm confirmed that they strived to ensure that their suppliers meet the highest standards, that the transportation of their products is conducted safely, that their products are used as intended and that they regularly audited their suppliers. Indeed, once a company imposes standards on itself, it is only a matter of time before they impose them on business partners (e.g. suppliers and contractors), particularly in companies who depend on 'just in time' supply. Such companies cannot afford to be held up by a supplier with a HSE prohibition notice and so, for example, Rover have now started to check the internal health and safety capabilities of key suppliers and GKN offer free health and safety assessments ('Managing risk, Adding Value', 1998).

- ***Client and Supplier Point of View***

It is an organisation's responsibility to manage health and safety for all employees. However, many organisations depend on a number of others, often firms smaller than themselves. This relationship with other companies is important to produce goods on time and to an acceptable and reliable standard. Good communications about health and safety matters between <u>all</u> parties can make these relationships better for everyone.

Walter (2000) described the requirements, benefits and effects of implementing an efficient 'green' supply chain. The author noted that in addition to the common performance indicators of quality, cost and delivery, factors such as environmental and health and safety performance

are increasingly becoming important. He recognised that from a client's point of view, association with a supplier who fails to meet health, safety and environmental standards can attract bad publicity and send adverse messages to customers.

The Engineering Employers Federation (EEF) 'Guide to safety and contractor/client relationships' noted that a well-managed supply chain and effective good practice arrangements between clients and suppliers/contractors can have the following benefits to both parties:

- Reduced risk of accidents, ill health and environmental damage
- Greater customer (client) and supplier (contractor) satisfaction
- Fewer incidents, losses, delivery problems and delays
- Less management time devoted to resolving problems
- Ability to demonstrate continual improvement within the business
- Financial savings

HSE's 'Working Together' leaflet (INDG268(rev)) reported that health and safety law applies to all work activities and employers are responsible for protecting people from harm caused by work activities, including the responsibility not to harm contractors. In addition, suppliers of chemicals, machinery and equipment have to ensure that their products are safe and provide information on this. Therefore, consideration of the supply and contracting chain by clients and suppliers is very important for health and safety.

Obviously working safely with supply companies can help client businesses and not working safely could damage both businesses, operationally, financially or even by reputation. Therefore, health and safety are clearly essential issues to consider when dealing with different companies within a chain. For example, if a supplier is supplying a material that is hazardous to health and material harms an employee of a client organisation, then both organisations may be liable for such harm, as they did not check that the supplied goods were safe. Another example may include contractors working on sites and in situations that are unfamiliar to them. An incident may occur because contractors do not know about the dangers on a site or because the client's employees may not know that contractors are working on site, which may have negative consequences for both businesses. Similarly, a client may want to audit a supplier including their health and safety systems (especially if that supplier has had an accident or had action taken against them) and if a supplier does not have suitable systems they may lose the business. Such examples illustrate the importance of considering occupational health throughout the entire supply chain.

Therefore, from both the supplier and client point of view, it is extremely important that occupational health is considered in the supply chain. For suppliers or contractors (especially smaller ones), it is vital that they take into account occupational health issues in their business in order to meet the demands made by the client and to avoid being pushed out of the supply chain and therefore losing work. Similarly, for clients, it is important that they consider occupational health to ensure that the suppliers and contractors that they use are aware of and competent in health and safety, in order to avoid possible incidents, expensive claims and bad publicity. Clients also benefit from encouraging suppliers and contractors to be aware of occupational health, as this ensures that the pool of suppliers/contractors available to them is increased.

4 IMPROVING OCCUPATIONAL HEALTH IN SUPPLY CHAINS

4.1 LEGISLATIVE BACKGROUND

Maintaining health and safety, and therefore occupational health, is part of the law and those not making efforts to prevent occupational ill health could be acting illegally.

In the UK, there are several regulations and associated guidance, which cover, often indirectly, the maintenance of occupational health. These regulations also either specifically apply to parts of the supply chain or processes involved or apply generally to employees regardless of whether they are part of the supply chain, contractors or not. For example, the Health and Safety at Work Act 1974, Section 6, and the Classification, Packaging and Labelling of Dangerous Substances Regulations 1984 imposes duties on manufacturers and suppliers of substances to label substances and inform people on how to use them safely. This forms the basis for safety data sheets and the Management of Health and Safety at Work Regulations means that this information should be made available to the entire workforce and its representatives (Glinert, 2002). Similar regulations are the Chemicals Hazard Information and Packaging (CHIP) Regulations (1993 and 1994) which regulate the supply and packaging (including labelling) of goods (HSE, INDG181(rev1), 1999).

In Great Britain, there are also the Construction (Design and Management) Regulations (CDM) 1994, which were designed as a framework for the management of health and safety activities in the construction industry. They emphasise the need for co-ordination of plans and co-operation amongst all relevant parties in a construction project who could influence the risks to those at work (e.g. the client, designer, planning supervisor, principal contractor and contractors). Some of the regulations' key requirements are that health and safety should be considered and made available to all who need it from the outset, all parties should be competent and designers should eliminate or minimise health and safety hazards. They also emphasise the importance of training as part of the management plan (Williams, 1995; HSE, 1996a, cited in Hope, 1999; 'Health and Safety – The Way Ahead' (Internet reference 7)). According to the article 'Health and Safety – The Way Ahead', the signs are that CDM is working; clients and designers are becoming actively involved in ensuring worker health and safety and the regulations have been a stimulus to improved co-operation. Furthermore, the article noted that the CDM model (not the detailed regulations themselves) is probably applicable to non-construction contractor activity. For example, it is being successfully applied in forestry using guidance which describes the roles and responsibilities of all parties – land owner, forestry manager, harvesting contractor etc.

Regulations covering occupational safety communication for hazardous goods were also discussed in Glinert (2002). This article noted the EU Directive 67/548/EEC, which requires that any special risks associated with using substances are clearly indicated using standard phrases, and the Commission Directive 91/155/EEC for the EU, which legislates for the contents of material safety data sheets (MSDS). Similar EU directives cover the carriage of goods.

Crabtree and Risstrom (1998) discussed occupational health and safety legislation and found that the legislation *'imposes duties on all companies and persons, whose activities have the potential to impact on safety in the workplace'*. The article noted that plant and equipment safety legislation placed particular duties on all people in the supply chain. The types of duties include:

- Hazard identification
- Risk assessment

- Risk control
- Information and record-keeping
- Testing
- Guarding
- Noise and asbestos control
- Inspection and maintenance

This article suggested that *'designers, manufacturers, importers and suppliers of plant and equipment may, in many cases, find themselves assuming additional onerous duties, and in turn, criminal responsibility under occupational health and safety legislation' (p.63).*

As well as being a requirement by law, it also makes good business sense for companies to try and improve their occupational health standards in every aspect that affects their business, including supply chains, so it is useful to be aware of ways this can be achieved. Various papers and articles have discussed both good practice measures and specific initiatives on this topic, and these are discussed below.

4.2 GOOD PRACTICE

4.2.1 Improving occupational health in general

There have been several articles that have addressed the issue of how to improve occupational health in organisations in general. One important way is through improved health and safety cultures. An appropriate safety culture in an organisation is required for health and safety management programmes to be effective. Health and safety cannot be managed by addressing the technological and system elements in isolation as the culture unique to organisations shapes the way it deals with health and safety issues. The definition of safety culture referred to in Successful Health and Safety Management (HSE) is:

> *"The safety culture of an organisation is the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to, and the style and proficiency of, an organisation's health and safety management. Organisations with a positive safety culture are characterised by communications founded on mutual trust, by shared perceptions of the importance of safety and by confidence in the efficacy of preventive measures." (p.16).*

Evidence indicates that successful companies have developed positive cultures and this promotes safe and healthy working. Elements of a positive safety culture include (from 'Developing a Safety Culture by the Confederation of British Industry, cited in Harrington et al, 1998):

- Importance of leadership and commitment of management;
- Safety role of line management;
- Involvement of all employees;
- Openness of communication;
- Demonstration of care and concern for all those affected by the business.

The last two points particularly imply that health and safety (including occupational health) should be considered for, and communicated to, everyone who is involved with a business, including suppliers and contractors. Good management of health and safety requires clear communication about the health and safety issues being brought into your organisation (e.g. possibly through contractors) as well as those passed onto others (e.g. when a company is a supplier). Indeed, Successful Health and Safety Management (HSE, 2003) reported that:

"Clear responsibilities and co-ordination are particularly important when two or more organisations work together, for example, when contractors are employed to provide goods or services within an existing establishment." (p.17).

Shepherd (1999) suggested that *'effective management of health risks can be achieved through good communication, co-operation and access to people with the right level of competence, at all stages of the construction project' (p.47)*. One preventative measure for occupational diseases is to limit exposure. However, it also noted that health risks could be eliminated or reduced through the design process. The article suggested that it was important to establish communication networks between all those involved, including manufacturers and suppliers of construction materials so that information can flow freely between the parties. It also suggested finding out from manufacturers and suppliers what alternative materials are available, so safer materials can be substituted for more hazardous materials.

Pontng (2001) suggested ways that larger organisations could aid in the improvement of health and safety in small and medium-sized enterprises (SMEs). It suggested that currently, many small companies find themselves wasting valuable resources getting essential safety information from larger suppliers, which they should not have to do as providing safety data sheets is a legislative requirement. The article suggested that *'the problems facing small companies could be easily remedied if large organisations carried out their responsibilities efficiently' (p.22).*

Another article discussed the importance of management involvement and support in any efforts to improved health and safety standards. Topf (2001) argued that *'corporate and site leader commitment for the success of any safety, health and environmental initiative' (p.13)* was essential to the success of the initiative. He noted that the Plant Manager is an important 'spokesman and advocate', who should be willing to ensure that the human and material resources, including the time necessary, facilitates the smooth implementation of the work program. The Plant Manager is also responsible for *'incorporating safety, health and the environment into the culture and fabric of the business'*. Topf (2001) suggested that safety managers and general managers should consistently and repeatedly communicate "top-down messages" about safety, verbally and in written form, and safety messages should also target the public, suppliers and supply chain connections through advertising and marketing campaigns. All communications, regardless of form, should be authentic and believable.

4.2.2 Improving occupational health in supply chains

Other articles have discussed good practice measures for improving health and safety standards, including occupational health, in the supply chain. Some articles referred to good practice in supply chains in general, some about good practice in specific parts of the supply chain, for example during warehousing, or relating to specific aspects of supply, for example relating to supply of chemicals, whilst others discussed experiences or measures in specific industries.

- ***Good practice in supply chains in general***

One of the articles that discussed good practice in supply chains in general was by Lacey (2002). He suggested that good supply chain management is one example of good practice occupational safety and health management. He reported that through contractual obligations and assistance by larger clients to suppliers (e.g. shared training and occupational health services), positive pressure could be exerted through the supply chain, which can in turn encourage the progression of occupational health and safety standards. For example, the Swedish TCO labelling system and the Dutch safety contractors' checklist are both means of raising supply chain standards.

Some articles discussed successful cases where organisations had realised the importance of working with suppliers and specific good practice efforts made by those organisations. For example, Hewlett Packard (Internet reference 8) strive to collaborate closely with supply chain partners and have set clear expectations that their suppliers must meet specific requirements, including occupational health and safety. The suppliers are expected to demonstrate a commitment to creating a safe and healthy workplace and to pursue a policy of continuous improvement in this area, sharing relevant information where appropriate. They are recommended to carefully assess the impact of their manufacturing processes to identify potential health hazards and steps to eliminate them.

Similarly, an article in 'Safety Express' (January/February 2001) noted 'Shepherd Construction Ltd's' success in reducing accidents by involving all those in the supply chain. The company reduced their accident incident frequency by 62% over seven years, which they believe is a result of their commitment to an effective supply chain. They have worked with their supply chain and *'delivered the safety message throughout the work force making safety everyone's responsibility' (p.2)*. They provide targeted training for managers and operatives throughout the supply chain. They have also adopted the DNV (det norske veritas) international safety rating system (ISRS) and hope that the demands of this standard will further improve their safety performance.

- ***Good practice in specific parts of the supply chain or specific aspects of supply***

One of the main parts of the supply chain where good practice measures have been discussed is in the warehouse / storage of goods. For example, Basson (2000) suggested that the storage and warehousing of equipment in the supply chain is often an area that is neglected in hazard identification. It noted that although storage facilities are often sparsely manned, there is still a need to protect human life and health. The article (p. 29) provided examples of aspects that safety managers should consider:

- The warehouse: does it have adequate lighting and ventilation? Is there adequate fire protection and fire fighting equipment?
- The nature of the goods: Has the potential for goods to burst out of their containers (often at great heights) been considered, especially as they may crush / engulf all the equipment and people below if this happens?
- Escape routes: Where are they and have personnel been trained in evacuation? Are evacuations practiced? Does the lay out and planning of materials and their handling take safety aspects into account?

The article further noted (p.29) different aspects that should be established when using and selecting suitable warehouse facilities in supply chains:

1. Design: An independent party should verify the design, manufacture and installation of storage equipment to ensure the health and safety of those people employed in the warehouse. There are codes of practice for the design and manufacture of all types of storage equipment produced by the Storage Equipment Manufacturers Association (SEMA).
2. Manufacture: Companies should ensure that the manufacturer has a quality plan for each of the components ordered and that full traceability is possible.
3. Testing: The manufacturer should use tests to verify that the load capacities are as designed. This is possible with some storage systems before the handover of goods.
4. Operation: Users of equipment should be trained and retrained on a regular basis. Personnel and operators should report damage to equipment and hazardous situations. In addition, employee response to accidents should be rehearsed and applicable signage should be supplied, displayed and understood. Occupational health issues should be

considered, e.g. checking the eyesight of stackers and exposure in the cold storage facility, as well as ensuring the availability of an occupational health nurse for regular visits.

5. Maintenance: A professional person should check equipment regularly. Before storage equipment is replaced, the contractor should provide a procedure of the precautions he will take.

A leaflet called 'Working Together' (HSE, INDG268 (rev)) discussed good practice relating to specific aspects of supply, e.g. the supply of chemicals or plant equipment. It noted specific questions that clients should ask of suppliers when they are receiving goods (substances or equipment) in order to address any risks to occupational health. Some of the questions are given below, but it is important to note that this is not an exhaustive list and other questions may also be relevant:

Supply of substances

- What supplier's information is available?
- Is there likely to be any microbiological risk?
- What are the storage arrangements?
- What are the physical conditions at the point of use (e.g. ventilation, temperature etc)?
- Will you encounter substances that are not supplied but produced in the use of the supplied substance (e.g. fumes)? If so, check how much, how often, how long, control methods etc).
- What are the control measures for the substance (e.g. preventing exposure, engineering controls, PPE)?
- Is any monitoring required?
- Is health surveillance necessary?

Supply of plant and equipment

- What are the supplier/hirer/manufacturer instructions?
- Are any certificates of examination/test needed?
- What arrangements are there for inspection and maintenance?
- Are the electrics safe to use (e.g. power sockets, plugs, leads etc)?
- What assessments have been made of noise levels?

Glinert (2002) noted the three steps that the International Labour Organisation (ILO) has taken towards improving the safe transport of chemicals and supply to the workplace and the consumer, i.e.

- Labelling – specifying certain data, having graphic symbols, using risk and safety phrases and ensuring information is comprehensible
- Chemical safety data sheets – looking at the content, format, phraseology and comprehensibility, as well as how to disseminate the information.
- Training in hazard communication – looking at ways to create training packages for compilers and users.

Trying to improve performance in these three aspects is good practice for organisations and suppliers that use or supply substances.

- ***Good practice in supply chains in specific industries***

Several articles noted examples of good practice in specific industries. For example, an article in 'Occupational Safety and Health' (November 2000) focused on improving health, safety and environment standards in the global marine fuels and lubricants supply industry. It included comments by Jon Dixon, BP Marine's Health Safety and Environment Manager, who suggested that *'there could and should be an internationally recognised and applied set of standards for health, safety and environmental conduct for the global marine fuels and lubricants supply industry'*. The article suggested that, in this industry, often suppliers have their own highly organised and well-managed health, safety and environment systems, which incorporate every

activity in the supply chain, including subcontractors. However, where the supply chain involves more than one company, for example, a series of independent contractors handling products, then operations are more susceptible to substandard practices and need a greater level of control to minimise the potential risks. Dixon noted that the current initiative by the marine fuel suppliers aimed to improve and harmonise practices wherever marine fuels and lubricants are used. He suggested that the industry needs to reach a state where health, safety and environmental management becomes part of standard business practice, and that organisations need to carry out regular health, safety and environment audits on all contractors. The article suggested that to achieve this, the industry needs to set up a body to devise and agree a common health, safety and environment platform and offer all contractors the opportunity to become accredited. The aim of accreditation would be to become recognised by the marine industry and that customers would start to expect their suppliers to be accredited. In addition, it should help to improve poor performing operators and significantly reduce risk to personnel.

Similarly, Eskildson and Yates (1992) looked at improving supply chains in the American health care industry using lessons learnt from industry in general. It noted that in many industries it is not possible for firms to improve their own product and service quality unless their suppliers also do so, and the best way to do this is to terminate the contracts of those suppliers who do not provide top-quality materials and services. It highlighted the way industry leaders were beginning to select and reduce suppliers on the basis of the quality of their results and their quality management. However, the article also noted the problems with supplier selectivity in the American health care service, where the patient is not only the health care services customer, they are also their supplier, i.e. *'the most important "raw material attribute" that health care providers have to work with is the condition of their patients' (p.107)*. Given this unusual relationship, it is more difficult for health care to follow other industries and simply improve "raw material" quality by improved supplier selection. The article noted though that there were other alternatives. It suggested that it was important, particularly in the American health care service, to get the third parties (i.e. employers who pay for employees health care) involved as well, and at the time of the article, about 10% of employers were experimenting with programmes to encourage healthy lifestyles and therefore improve the health care service's suppliers. The article encouraged the use of such experiments to find ways of improving suppliers. It also highlighted the role of the government in improving the quality of health care's suppliers by developing appropriate legislation and by increasing research, analysis and education. The article concluded by suggesting that for health care suppliers, greater selectivity is not the answer to improved quality, rather that this will be achieved through the assistance of the third parties responsible for payment and the government.

Perlik (2001) discussed a successful supply chain food-safety programme used by a major fast food chain. It stated that the organisation aimed to have a "farm-to-fork" approach, in which food safety was considered not just on a restaurant level, but also through the entire supply chain. The organisation's senior director of quality assurance and chief food safety officer were attempting to find more ways to *'push product safety efforts further up the supply chain' (p.116)*, and one member of staff had been employed to ensure food safety in the raw materials supply chain. The organisation also used a 'feed certification system' to ensure cattle used for the chain's beef production were fed in compliance with legal regulations. The organisation had also conducted regular audits at the slaughter level. The Senior Director described five key features to a successful food-safety programme. These features include:

- Management commitment to food safety
- Being aware of rapidly evolving issues and technology
- Selecting high standard suppliers and verify their compliance to the required standards
- Training on food safety for all employees
- Have attention to detail.

➢ Relevance to other industries

Although the articles in this section have discussed measures taken and experiences in specific industries, there are still aspects of good practice that can be taken from their efforts. For example, the marine fuels and lubricant suppliers highlighted the importance of health, safety and environmental management becoming part of all operators' standard business practice, for example by carrying out regular health, safety and environment audits on all contractors. In addition, it advised the development of an accreditation system leading to a state where customers expect their suppliers to be accredited. The American health care industry demonstrated the importance of investigating different methods for improving occupational health and the role for the government in setting appropriate legislation. It also showed how although supplier selectivity is likely to be useful in many industries to improve occupational health, it will not be possible in all industries. In addition, it noted the importance that other relevant organisations can play in improving occupational health. The example from the fast food industry highlighted the importance of considering safety, (which would also apply to occupational health) throughout the entire supply chain, and the need to dedicate specific members of staff to this issue. It also emphasised the use of audits and other aspects that are essential to improving occupational health in the supply chain, for example commitment from senior management, raised awareness, supplier selectivity and assessment, as well as training.

4.2.3 Improving occupational health in contractors

Some articles have discussed good practice measures for improving occupational health and safety specifically for contractors within the supply chain. For example, 'Successful Health and Safety Management' (HSG65, 2003) reported that an important consideration for contractors within the supply chain is how familiar the contractor is with a client's hazards and procedures. Strategies may be needed to develop contractor competence and arrangements for verifying that contractors are suitable. Possible actions found in some HSE sponsored research (Wright, 1996) included:

- Formation of long-term relationship with contractors
- Incorporating contractors into the host's health and safety management system
- Requiring long-term contractors to produce 'safety cases'
- Shared basic training of contractors across local industry
- Measuring contractor health and safety performance
- Operating approved contractor lists
- Secondment or transfer of own staff to contractors

A review by Hope (1999) suggested that organisations should both raise awareness of contractor health and safety and effect control of contractors.

Some good practice for contractors has been issued in the form of guidance whilst other good practice focuses on different ways of ensuring contractor competence through, for example, management, selection or training. These will be discussed below.

❑ ***Guidance***

HSE have produced a guidance leaflet to clarify where health and safety responsibilities lie when clients bring in contractors: 'Use of contractors: a joint responsibility' (2002). The guidance made a number of useful points and suggestions for good practice. The main points are covered below:

1. *Legal requirements.* Health and safety requirements should be included in the civil contract that usually covers work undertaken by contractors. All parties have some health and safety responsibilities under health and safety law.

2. *Identifying the requirements of the work and the competence of the contractors.* Clients should clearly identify all aspects of the work they want the contractor to do and consider all the associated health and safety implications and risks. This includes deciding on what training is required and how the workforce should be consulted. Clients should satisfy themselves that contractors are competent and that they know what level of performance is required. The guidance offered a number of ways that clients can establish the competence of the contractors. Clients should also ensure that contractors have effective procedures for ensuring the competence of sub-contractors.
3. *Risk assessments.* Risk assessments by both the client and the contractor are essential and both parties should agree on the risk assessments.
4. *Information.* Clients, contractors and sub-contractors should provide their employees with information, instruction and training on anything that may affect their health and safety and all parties should consider what information the other parties require.
5. *Co-operation and co-ordination.* Clients should co-operate and co-ordinate with contractors and any other parties involved, ensuring the health and safety of all at the workplace.
6. *Consultation.* Clients, contractors and subcontractors should consult their employees on health and safety matters.
7. *Management and supervision.* Clients should decide on what they need to do to effectively manage and supervise the work of contractors. Management and supervision by the client should be greater as the potential impact of the contractors work on people's health and safety increases.
8. *Monitoring.* All parties should monitor their health and safety performance, but again the level of monitoring should depend on the risks, and clients should make periodic checks on performance to ensure the work is being completed as agreed.

The guidance emphasised that it was *'good practice to investigate all injuries, cases of work-related ill health and 'near misses' to find out what went wrong and why they were not prevented. Clients, contractors and sub-contractors should share lessons learnt from monitoring and investigations with each other and with all the workforce'* (p.10).

The Institution of Occupational Safety and Health (IOSH) have also produced guidance to encourage safety practitioners to be more involved in occupational health issues and to outline best practice for ensuring contractor safety. Such documents could be invaluable for ensuring occupational health along the supply chain.

Hope (1999) also noted the importance of being able to consult basic guidelines. Hope noted that from the literature there were several desirable traits that should be included in the guidelines. These included *'the development of a comprehensive management programme, the co-ordination of efforts at both the national and organisational levels, co-operation among interested parties and the introduction of an element of standardisation to the process' (p.38).* Contractor Management Programmes are now discussed briefly below.

- ***Contractor Management Programmes***

Beaumont (1995, cited in Hope, 1999) highlighted the importance of developing a site-specific management programme and the need for induction, monitoring and review stages. Beaumont examined the management strategy of a chemical manufacturing company, which identified a number of steps in the management of contractors. These steps can then be used to benchmark practices across industry.

- The first step was internal planning, where the demands of the job are outlined, including specific references to the safety and health requirements and hazard identification.

- The next stage involved submission of a written work-method statement and proof of the technical skills of employees by the contractor organisation. These activities demonstrate the importance of considering occupational health and safety before work activities begin. The operatives of the host plant and the contractor organisation should be involved in this process.
- There should then be a meeting of the supervisory staff of the contractors and relevant employees of the host company, and previous experiences of the types of work or activities involved should be discussed in order to inform how the current work activities should be managed in terms of health and safety.
- There is then also an in-house requirement to maintain and review records of contractor activity for future use.

Ryan (1995, cited in Hope, 1999) suggested that there were three key elements for such a management programme: clear expectations, clear measurement and frequent feedback.

HSE (1997a, cited in Hope, 1999) outlined a five-step plan on how to manage contractors. This included points on:

1. **Planning** e.g. the early definition of the situation in which the work will be carried out, assessment of relevant health and safety factors and identification of risks and hazards and the procedures to control these.
2. **Choosing a contractor** e.g. asking questions, obtaining evidence such as safety method statements and going through job and site-specific information.
3. **Contractors working on site** e.g. sign in and naming procedures and further imparting of site health and safety information and rules.
4. **Keeping a check of workers** e.g. being able to readily identify workers and monitor the progress of the job.
5. **Reviewing the work** e.g. reviewing the job and the contractor from experiences recorded.

The review by Hope (1999) also noted the findings of an investigation by Railtrack (HSE, 1998b, cited in Hope, 1999) and the resulting conclusions. These included the fact that *'actions specific to the management of contractors, while necessary, should also be complimented by actions directed towards in-house staff, so as to enable them to adequately implement the total programme' (p.42)*. The findings of this study suggested that the following areas should be addressed in contractor management programmes:

- Organisational policy
- Co-ordination and communication
- The assurance of competence
- Conformity to industrial and site specific standards
- A delineation of responsibility
- Training
- Continuous audit and review measures.

Hope (1999) also provided two generic models. One was a general model for the management of health and safety and the way that the procurement process should be organised to integrate health and safety. One of the main points to the model was the suggestion that a multidisciplinary procurement team should meet at all stages of the procurement process. The other model was a generic framework for the management of contractors, which included the following requirements:

- Health and safety policies of both the host employer and the contractor should form the basis for the development of a site-specific framework for management.
- Training needs should be clearly identified and acted on.

- Empowerment of individuals should be considered to stop unsafe acts and enforce disciplinary procedures.
- Communication links should be established between the host company and the contracting organisation, including use of forums where contract employees can raise concerns about health and safety.

The review by Hope (1999) suggested that within such management programmes or models, it is important to effectively control the occurrence of accidents, incidents and near misses in the workplace when organising health and safety. As these tend to be higher for contract workers, the review suggested that organisations should pay specific attention to these areas and try to minimise these. Eeley (1998, cited in Hope, 1999) emphasised the importance of a 'no blame culture', where both contractors and contract employees are encouraged to report concerns or incidents. Eeley (1998) also noted that management processes such as clear communication of procedures and reporting requirements, the use of joint investigations and the communication and analysis of results have all been used to develop desired organisational cultures with clients and contractors.

Hope (1999) noted though that although the programmes, practices and models described in the literature suggest a strong element of control, there is also a greater need for fostering co-operation amongst parties in achieving adequate levels of health and safety. Hope also suggested that research demonstrates that *'where there is an organised effort and an appreciation for the importance of occupational health and safety, the objectives can be successfully addressed resulting in successful management' (p.37).*

- ***Tender Process***

Consideration of health and safety should be made from the outset in the tender process for contractors. The Engineering Employers Federation (EEF) 'Guide to safety and contractor/client relationships' (1999) offered straightforward suggestions on how clients can assess the health and safety performance of their contractors, who, in turn, can demonstrate to existing and prospective clients that health and safety is effectively managed. Many good practice organisations use an 'approved list' to help them select contractors. Those not on an approved list can expect to be checked out more thoroughly. The EEF guide reported some good practice stages for assisting with the health and safety performance of contractors (and possibly suppliers):

1. **Establishing the scope**. All parties to a contract have specific health and safety responsibilities, which cannot be passed onto someone else. Knowing key laws and regulations is the responsibility of both client and contractor and putting work out to contract does not absolve a company from its health and safety obligations.
2. **Pre-tendering**. At this stage, clients should identify the work to be done and any hazards that are likely to occur. Clients should ask contractors/suppliers questions to help assess their health and safety capability and competence for the work and for managing health and safety.
3. **Tendering**. Contractors/suppliers will be expected to show that it is assessing hazards and taking precautions to minimise risks and should be able to work within the clients health and safety management system. Contractors should also ensure that sub-contractors meet the same selection and competence criteria as the main contractor.
4. **Awarding the contract**. In good practice companies the decision to award a contract will not necessarily be solely on price, health and safety aspects are now very important as well.

5. **Managing the contract**. Clients will carry out progress checks to monitor health and safety performance and will expect contractors/suppliers to co-operate with client health and safety requirements and systems, especially the reporting of incidents.
6. **Reviewing the contract**. The client and contractor/supplier will review the quality of the work/goods against the job specification and the contractor's performance. The client will look at the effectiveness of the choice of contractor and how well they manage health and safety in order to decide whether to use that contractor/supplier again. Such a review process is very important to ensure that health is considered along the whole supply chain.

Examples of companies that make use of such a tendering process to assess the health and safety performance of their contractors are BP Chemicals, British Aerospace, British Steel, Du Pont (UK), Esso UK and GKN ('Managing Risk, Adding Value', 1998).

Hope (1999) concluded that it was essential for clients to screen proposed contractors at the pre-tendering and tendering stages, as well as evaluating them further once the contract has been awarded. The author also concluded that it was beneficial to manage the procurement process through a procurement team that includes all the relevant interested parties, and that functions are delegated amongst team members. She suggested that it was important to develop quantitative approaches to enable the clients to determine the integrity of proposed contractors. In addition, her review recommended (p.52) that:

- The design of jobs should take into account individual limitations
- Consideration should be given to the suitability of individuals for the work, based on aspects such as their personal attitudes, skills and personality traits
- An adequate level of health and safety should be established, maintained and realised by both the contractor organisation and the host employers (HSE, 1989, cited in Hope, 1999).

- ***Training***

Hope (1999) discussed the importance of training, and suggested that training programmes are necessary to orientate the workers in any type of employment situation, particularly though where workers are unfamiliar with the surroundings and processes. Training is also the means of transferring knowledge of an organisation's procedures and practices to prospective employees. Training should then be followed up by monitoring of progress to evaluate the effectiveness of the process and highlight areas for improvement.

- <u>Induction activities</u>

Beaumont (1995, cited in Hope, 1999) noted the training strategy of an organisation being studied and found that the organisation had specific activities for contract workers, i.e. a video-based health and safety induction meeting conducted by the safety manager of the host plant and a similar exercise for the specific areas of the plant. The induction meeting aimed to:

a) Introduce and emphasise the health and safety concerns specific to the plant, and
b) Form the basis for the evaluation of the knowledge of individuals regarding health and safety.

In this organisation, no contract worker is issued with a pass to work on the site until he has attended the induction meeting and successfully completed the evaluation exercise. In a similar way, a company studied by Jones (1998, cited in Hope, 1999) creates induction records, which is a pre-requisite for contract workers to gain access to a work site. Hope (1999) commented that these actions, i.e. the requirement to conform to existing health and safety rules, the intensive training and subsequent monitoring all suggest that the host plants try to fully integrate the contract workers into the occupational health and safety norms and practices of the organisation.

- Meetings

Maurno (1992, cited in Hope, 1999) noted that in an electrical company in the USA contract employees were not allowed to enter the facilities unless they were considered to have adequate knowledge of the work procedures and rules of the organisation. However, this company went about disseminating this information differently. Instead of an induction programme, organisations had annual meetings for contractors where they presented their plant rules and procedures. The contractor was then required to pass the information on to their employees. However, it was thought in the review (Hope, 1999) that this process took the responsibility for training contractors away from the host plant. In addition, the review suggested that this method also makes it difficult to fully convey the required attributes of health and safety to contract workers through their failure to address them directly.

However, Dustan (1998, cited in Hope, 1999) noted that health and safety meetings, tool-box talks and planned general inspections had been used successfully in management strategies before.

- Permit system

Beaumont (1995, cited in Hope, 1999) suggested that supervisors in the host plant should be issued with special permits called 'local area permits' for work in individual areas. However, HSE (1995, cited in Hope, 1999) also noted that although the permit system can be a useful tool for controlling activity, the quality and value could be questionable due to misperceptions by both the authorities of the host plant and the contracting organisation. Therefore, *'the purpose and intent of the permits should be clear to the management of the host plant as well as the contracting firm' (p.38).*

- Problem of lack of training

An article in a European Trade Union Technical Bureau for Health and Safety Newsletter (December 1997) discussed casual and temporary workers. The unions in the Netherlands are reorganising their services to cover all workers and joining together so that they cover the full supply chain. The article provided an example of workers in a supply chain in Luxembourg who were involved in the construction of a new steel plant. The project involved several outside firms all working on the site at the same time. As time progressed, it became obvious that the majority of workers from the outside building contractors were unskilled temporary workers with no safety training. Often the workers were unqualified, untrained, unemployed, taken on a one-day trial and often did not speak the same language as each other. The shop steward in this case demanded that the plant owner should dismiss any contractor without suitable means of protection and sack any foremen found breaching safety rules. This was because they feared that an accident in these conditions was very likely. The article noted that there was a need to collect information on trends and possible solutions and that trade union action was essential in enforcing existing legislation. It also noted the importance of improving conditions for casual workers and the potential of employee representation in SMEs to achieve that. Hope (1999) suggested that there is a need for improvements in the training of contract workers, particularly as they become a larger proportion of the workforce.

4.3 CURRENT INITIATIVES

4.3.1 Improving occupational health in general

GOOD NEIGHBOUR SCHEME

➢ About the scheme

In 1997 the HSE introduced the Good Neighbour Scheme to help overcome the problems of smaller organisations being pushed out of the supply chain because they cannot meet the client's health and safety requirements. The scheme exists to encourage organisations committed to high standards of health and safety to share their expertise with others, particularly contractors, suppliers, small neighbouring businesses and local schools who may be less knowledgeable about health and safety matters. The aim of the scheme is to set up local networks via the supply chain and intermediaries such as the British Safety Council, Engineering Employers Federation and others. Initiatives included in the scheme can include the organisation of seminars, discussions or quizzes; training events, including making places available on internal training courses; offers of health and safety expertise, such as help and advice with risk assessment and safety representatives; and offers of occupational health services. Good Neighbour Forums are also promoted whereby groups of organisations collaborate in running collective good neighbour schemes so that the range of expertise available to small firms in local communities is increased. Organisations in the forum have the opportunity to tell suppliers, contractors and others what they have been doing to manage health and safety and what help they can offer. Organisations use this scheme to secure a future local supply base with known adequate health and safety performance.

➢ Benefits of the scheme

Being part of the Good Neighbour Scheme has many benefits for member organisations, such as:

- Providing access to practical experience in managing health and safety and adding to an organisation's own experience of managing health and safety;
- Allowing organisations to feel more confident that employees of the organisations they work with are aware of health and safety issues. Overlooking the health and safety performance of workers, contractors or suppliers can be expensive with losses in time, workers, products and equipment etc;
- Enhancing the reputation of an organisation, putting them in a better position to keep existing business and to obtain future work. There is a growing tendency for employers to ask those they work with about how they manage health and safety.
- Allowing organisations to maintain their local supply base, i.e. to ensure they have trained and well disciplined personnel and contractors.
- Working together, sharing information and encouraging others can bring about overall performance improvements and successes in health and safety (Managing Risk, Adding Value, 1998).

Clearly, all such benefits apply to various levels of a supply chain, suggesting that the Good Neighbour Scheme is a useful initiative for considering occupational health in the supply chain. Such collaboration between organisations within the supply chain is important for occupational health concerns as it ensures that all parties are aware of vital health and safety information and practice needed to protect employees from occupational ill health that may occur at any stage of the chain. Indeed, Pickvance (2003) cited research reporting that improving communication within a sector (and hence between members of a supply chain) through seminars (such as that in the Good Neighbour Scheme) was effective for improving health and safety performance (Rakel, Gerrard, Langford and Shaw, 1999).

➢ Problems

Feedback from participants using this scheme in the Offshore Industry has generally been positive, but small firms are still concerned about the lack of support they receive, particularly with regard to occupational health and these firms are still considered to be more dangerous places to work than larger ones (Health and Safety Commission Offshore Industry Advisory Committee, April 2000). In addition, the Occupational Health Advisory Committee on the HSE website (Internet reference 2) reported that unless perceptions of occupational health are changed, any economic downturns will put pressure on large companies' own arrangements and their ability to help smaller companies, contractors and suppliers with occupational health issues. Also, occupational health is still seen by many employers as the responsibility of health care and human resources staff rather than a business management issue, which leads to little investment in training and resources for occupational health. Until occupational health is recognised as a management issue, the promotion of occupational health along a supply chain may be difficult.

A HSL Report (Sprigg and Beswick, 2000) evaluated the Good Neighbour Forums and made a number of recommendations for improving the effectiveness of the forums. These included:

- Having a dedicated internal driver for the Good Neighbour Schemes within HSE.
- Following up the Good Neighbour Forums.
- Making the roles of all stakeholders more transparent.
- Ensuring there is good communication and co-ordinated effort from all parts of HSE concerning the Scheme and Forums.
- Allowing greater time for dialogue between partners at the Forums themselves.
- Increasing the focus on small contractors.
- Considering arranging smaller 'sector specific' forums.

➢ Similar schemes

There are other similar initiatives to the Good Neighbour Scheme. For example, Borley (1998) discussed initiatives large organisations and their health and safety professionals often take to aid smaller firms in managing risk:

- 'Outreach' activities, where larger firms help smaller firms for example by offering places on their in-house health and safety training courses.
- Contractor management teams, where many in-house health and safety professionals have responsibility for training and monitoring and reviewing contractors' performance.

The article noted that businesses can have a great deal of influence over the health and safety standards of their contractors, by, for example, requiring others to meet their quality management standards and only award contracts to those who achieve cultural and attitudinal synergy. Other examples include the Hertfordshire Health Promotion Small Business Mentoring Programme or the Workplace Health Advisory Team projects, which links larger companies like Nissan to its small suppliers giving the latter access to health promotion activities (mentioned by the Occupational Health Advisory Committee on the HSE website; Internet reference 2). Also, the Institution of Occupational Safety and Health (IOSH: www.iosh.co.uk) have an interactive website initiative called Safestartup, which can help UK small firms and businesses to meet their health and safety responsibilities. This may be useful within the supply chain if suppliers and contractors are small organisations and therefore need help to fully co-operate with occupational health concerns along the supply chain. The Chemical Industries also consider this issue in their Responsible Care Cells initiative (Health and Safety Commission Offshore Industry Advisory Committee, April 2000).

HEALTH AND SAFETY REPRESENTATIVES INITIATIVE

➢ Background

It has been suggested that workplaces with appointed health and safety representatives and possibly union recognition have much better developed and maintained health and safety standards (Reilly, Paci and Holl, 1995). However, the growth of small firms and contracting means that the number of workplaces with health and safety representatives is declining. Also, where safety representatives are in place they are often only part of the client's employees, rather than supplier or contractor employees.

➢ About the initiative

HSC/E is committed to promoting increased employee participation in the health and safety system, hopefully involving organisations throughout the supply chain. This initiative is not yet fully established but there is commitment to develop it, and, if successful, it should have a positive impact on ensuring that occupational health is continually considered throughout the supply chain.

Health and safety professionals can also play an important role in improving occupational health, including in the subcontracting process. Research has found that these professionals *'often worked closely with contract managers', are 'generally responsible for contractor's health and safety training', and are 'closely involved in monitoring and reviewing the performance of contractors'* (discussed in Borley, 1998, p.26).

4.3.2 Improving occupational health in supply chains

❑ ***Initiatives Relating To Chemical Use***

COSHH ESSENTIALS (CONTROL OF SUBSTANCES HAZARDOUS TO HEALTH) INITIATIVE

➢ Background

A big challenge in the area of occupational health in the supply chain is the safe use of chemicals. There are thousands of products with different risks depending on the characteristics of the substance and how it is used.

➢ About the scheme

To overcome the problems associated with varying risks and characteristics of substances, COSHH Essentials (1999), which is a generic risk assessment model, has been developed. This uses available information that the supplier is legally required to provide to help organisations, particularly small and medium sized enterprises (SMEs), assess and control health risks from the use of chemicals.

Hazard or Material Safety Data Sheets

The main aspect of COSHH that involves suppliers is the provision of hazard or material safety data sheets (MSDS). The enormous range of products and substances used at work means that all organisations, especially SMEs, rely heavily on suppliers for information on the risks arising from such products and substances and the control measures needed. The task for suppliers is to provide this information and advice in non-technical language that is understood and acted on by users, and to ensure that this information is effectively cascaded down the supply chain. One way of doing this is through the MSDS. For example, the COSHH regulations 1994 (cited in Harrington et al, 1998) require that full assessments of hazards are made. As part of this, and as a duty under Section 6 of the Health and Safety at Work Act 1974, reinforced by the Consumer

Protection Act 1987, suppliers must provide adequate information on substances supplied, usually in the form of a 'hazard data sheet'. The purpose of this data sheet (MSDS) is twofold:

- The receipt of product information from the supplier;
- The provision of information to users within the company.

A good supplier hazard or material safety data sheet should contain the following information:

- Identification of the product and its form (e.g. powder, liquid, odour etc);
- Supplier contact details;
- Composition of the products, reactivity data, and occupational exposure limits;
- Physical data such as boiling point, vapour pressure, melting point etc;
- Health hazards (short and long term) concerning inhalation, skin contact, ingestion, injection, eye contact, signs of overexposure etc;
- Emergency, first aid and spillage procedures;
- Recommended personal protective equipment (PPE);
- Recommended control measures other than PPE;
- Storage, packaging and labelling advice;
- Special precautions and legal requirements;
- Sources of information.

Glinert (2002) discussed the international standard no. ISO 11014 (International Organisation for Standardisation [ISO], 1994). He noted that the standard included aspects on safety data sheets for chemical products and that this standard suggested that the sheets should be communicated between the supplier and the "recipient", which the standard describes as *'a party receiving a chemical product for industrial or professional use'*.

Glinert also discussed the effectiveness of material data sheets in informing workers of hazards by quoting observations by Cohen, Schmitt and Colligan (1989). Cohen et al suggested that MSDS were not very effective for informing workers because the technical data included on the sheets often has no meaning to the average worker. It also suggested that the technical data on the sheets could interfere with workers' comprehension of other information on the sheets referring to hazard recognition and safety. In addition, Cohen et al. (1989, cited in Glinert, 2002) suggested that because the descriptions of hazardous conditions, signs or symptoms of exposure and safe handling practices are written generically, workers were unlikely to see the connection between the information and their use of the chemical. The article noted that it is difficult to get suppliers to fill in existing material data sheets accurately and quoted the findings of a paper looking at material safety data sheets from a user's perspective (Altvater, 1990, cited in Glinert, 2002) which suggested that there *'are no regulations dealing with accuracy, completeness and clarity of MSDS (Material Safety Data Sheets) information, and it is these areas that cause major user problems' (p.19 in Glinert)*.

Harrington et al (1998) also noted that the quality of information supplied in some data sheets was very variable, at best giving all the information required for a substance and at worse giving misleading and possible dangerous information. They further noted that how comprehensive a data sheet is will depend on how much of a risk the substance poses but heavy consumers of a product will require regular and reliable information from such data sheets.

Several suggestions have been made about how the sheets could be made more effective or improved. For example, Harrington et al (1998) suggested that for 'shop-floor' purposes, the data sheets may need to be reviewed but they must still contain details of safe systems of use and local methods of control, as well as being written in language that all workers can understand. Similarly, Cohen et al. (1989, cited in Glinert, 2002) suggested that *'MSDS should be used as a basis for generating more 'reader-friendly' messages to workers' (p.16 in Glinert)*,

and that live training and demonstrations and audio-video techniques are more likely to be effective in informing and affecting actual behaviour in workers. HSE (Successful Health and Safety Management, 2003) have agreed though that much can be done to prevent or control risks to health by taking straightforward measures, and that one such measure involves talking to suppliers of substances, plant and equipment about the health risks and minimising exposure. This is one of the functions of the data sheets.

➢ Similar initiatives

In Israel, they have developed policies similar to those in Britain. One policy requires the carrier of goods to carry an emergency card. The card is to:

- Identify the chemical
- Identify the hazard
- Specify safety measures in the event of accidents
- Provide emergency telephone numbers

This is similar to the material safety data sheets but focuses more on what to do in an emergency.

EUROPEAN ISOCYANATE PRODUCERS ASSOCIATION INITIATIVES

➢ Background

The European Isocyanate Producers Association (ISOPA) tries to ensure safety in the supply chain. The chemicals toluene diisocyanate (TDI) and diphenylmethane diisocyanate (MDI) are both hazardous substances, used widely in the chemical industry and require care during transportation. In 2000, the number of recorded incidents that occurred in the transport chain was 74, and in 2001 it was 68. Of the 68 incidents in 2001, 60 involved road transport, and 40 occurred during loading or unloading (Hazardous Cargo Bulletin, July 2002). Most incidents resulted from human error and the article suggested that the industry needs to take *'a big step towards behaviour-based safety procedures' (p.63)*. TDI vapour, if inhaled, can lead rapidly to breathing problems and lung injury. As there is potential for these employees to be affected by the fumes, those involved in its transportation (both driver and terminal personnel) have to wear breathing apparatus, full protective clothing and gloves during the loading process.

➢ About the initiatives

Initiative 1

In order to protect employees, ISOPA hold regular exercises to highlight hazards and check the effectiveness of company response plans. In one exercise, for example, they create a simulation of what could happen in a loading process if the loading hose is mistakenly left fitted to the truck as it drives away. They use water instead of the hazardous substances and show the rupturing of the hose and the resulting spillage. They then get companies to perform their emergency response to the situation. The exercises can highlight potential problems with company emergency response plans. For example, although loading personnel may be required to wear protective clothing and breathing apparatus, personnel working on racks next to loading areas may not. In the event of emergency, it is unlikely that they would be able to get themselves away from the area before inhaling vapours. Companies have found this exercise very useful and been able to learn from it. Many companies believe it is important to be able to share data in order to drive performance improvements.

Initiative 2

Another initiative is aimed at improving safety at loading racks. It is called the MDI / TDI Bulk Unloading Checklist and aims to assess customer safety by providing a user-friendly and powerful auditing tool. This checklist is an extension of the European Chemical Industry

Council's (CEFIC) Safety and Quality Assessment System (SQAS) but is more specific to the hazards associated with isocynate handling. The intention of the checklist is to lead to a consistent approach and better quality information, as well as raising safety awareness among customers. The ISOPA is also working on a similar checklist for the transport and storage of TDI and MDI in package form. Transport companies believe that the biggest safety problems in transporting TDI occur at the receiver's end because chemical companies take great care of their own facilities; therefore the initiative should go some way to dealing with this problem. Some companies are also assessing their customers and making recommendations about how safety can be improved at their end.

Initiative 3
The article in 'Hazardous Cargo Bulletin' (July 2002) suggested that drivers should be trained to be aware and identify shortcomings at the receiver's end, as that is where the majority of incidents occur. One company contacts particular customers if it receives several negative reports from drivers to request improvements. The customer has the choice to go elsewhere, but it noted in the article how helpful it would be if the industry as a whole got together and demanded similar standards. Similarly, another company keeps a log of each individual shipment completed by the loading operator, the unloading operator and the driver. These logs are analysed by the company and information is fed to local management and corrective actions ordered. Drivers are motivated to complete the logs because they know that their input has a beneficial outcome.

Initiative 4
ISOPA is developing a driver-training programme specifically for the Middle East and Africa. This will focus on the transport of chemicals in package form.

- Benefits

'The combined efforts of producers, transporters and receivers can make real and valuable progress in improving safety levels throughout the business' (Hazardous Cargo Bulletin, July 2002, p.64).

- ***Initiatives Relating To Management And Trading Standards And Systems***

INTERNATIONAL ENVIRONMENTAL MANAGEMENT STANDARD ISO 14001

- About the scheme

The International Environmental Management Standard ISO14001 requires organisations to communicate relevant environmental requirements to suppliers. Walter (2000) highlighted the importance for managing environmental aspects, of *'recognising that activities with significant environmental impact in one part of the supply chain can affect other parts' (p.33).* The Turnbull report was a report developed from a working party on internal control, which requires companies to develop and monitor systems of internal control. Some organisations, for example in the automotive and electronics sectors, have already required suppliers to meet targets for implementing the ISO 14001.

- Ways to implement the scheme

A number of initiatives have been established to encourage organisations to improve their environmental performance; for example, 'Project Acorn' was established by an environmental consultancy and aims to help small-to-medium enterprises (SMEs) adopt ISO 14001. In addition, Business in the Environment introduced the initiative 'greening the supply chain' in 1993, which included a training package for companies to hold supplier briefings and communicate the need for suppliers to demonstrate improved environmental performance.

➢ Problems

Although there is some legislation covering environmental aspects, e.g. the dismantling and recycling of electrical equipment, there are no similar 'supply chain' requirements in health and safety legislation, making it difficult to encourage companies to adopt the standard. There are some health and safety specifications in OHSAS 18001, which are similar to some of those in ISO 14001.

HEALTH AND SAFETY MANAGEMENT SYSTEMS

➢ Background

Hope (1999) argued that *'effective health and safety management must be undertaken to safeguard the welfare of employers, employees and the public, where the latter may be affected by activities of contractors' (p.30).* In addition, Harrington et al (1998) reported that over the last few years, there has been a shift away from reactive prevention towards proactive prevention of workplace hazards. In order to do this, an integrated 'safety management system' would need to be implemented into the workplace. The Health and Safety Executive publication "Successful Health and Safety Management (2003) stated four key functions for the management of health and safety:

1. **Policy and planning.** Determine goals and a programme of work to achieve objectives.
2. **Organisation and communication.** Determine clearly defined responsibility and two-way communication (which perhaps suggests the involvement of people not directly working at one workplace).
3. **Hazard management.** Identify and assess hazards and risks and determine and implement appropriate control measures.
4. **Monitoring and review.** Ensure steps 1, 2, and 3 are in use and are seen to be working.

➢ About the initiative

Hope (1999) suggested that occupational health and safety management should be addressed during the procurement process, as well as in the terms and conditions written into the final contracts. In addition, the review suggested that an appropriate management programme should be developed to ensure these intentions become actions, and that the programme should be accompanied by the relevant enforcement and monitoring procedures and should have the support of the host employer and contracting organisation. The programme should also emphasise the concept of 'shared responsibility' for occupational health and safety and the importance of self-regulation.

'Fully Integrated Quality Management Systems' (FIQMS), are health and safety management systems, which include making managerial attitudes more competitive, flexible and efficient, searching for higher product standards and reacting appropriately to increased liabilities. Firms with these types of management systems are often considered to be *'strongly quality conscious, imposing high standards on themselves and their suppliers and contractors'* ('Managing Risk, Adding Value', 1998, p.3). Organisations with FIQMS subject all aspects of management to quality controls. They do this by defining overall quality goals, which describe the values for their organisation, and then audit and enforce operational procedures, which reflect these goals or standards. Some organisations produce 'value plans' or statements about how they are progressing towards those standards, which they communicate with staff periodically. These value statements are intended to communicate important company wishes. FIQMS helps large firms coordinate their activities and change their culture if necessary. The systems ensure that organisations strive for excellence in all aspects of health, safety and environment management. The 'Managing Risk, Adding Value' (1998) document included case studies of organisations which use these types of management systems, ranging from organisations employing large numbers of employees (50-60,000), such as British Steel and ICI, to organisations employing

fewer employees (1,000-4,000), such as ESSO and Shell. Other health and safety management systems include the Quality, Environment, and Safety and Health (QUENSH) management approach, which combine three mutually supportive objectives: to increase quality, minimise environmental implications and reduce accidents and ill health. HSE believes that procurers stand to secure better value for money if contractors (suppliers) improve their health and safety management systems (Walter, 2000).

OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT SYSTEMS

➢ About the initiative

The International Labour Office's (ILO) has drafted an international standard for contracting and supply chains. The Occupational Safety and Health Management Systems (OSH-MS) are intended to cover the main features of health and safety management, but also the management and control of contractor and supply chain relationships. The standard has specific requirements on contracting and procurement, which stated that 'top management' should establish and maintain procedures:

- *'to ensure that safety and health requirements are evaluated and incorporated into purchasing and leasing specifications*
- *for ensuring that the safety and health aspects of contractor work are not less than those applying to permanent workers'* (noted in Health and Safety Monitor, April 2001, p.1)

The draft of the standard also suggested that top management should:

- *'develop procedures to evaluate and select contractors*
- *set up communication between appropriate levels of the organisation and the contractor, prior to commencing work ...*
- *provide relevant safety and health hazard awareness and training, if necessary, to the contractor's workers prior to commencing work*
- *monitor regularly safety and health performance of contractor's activities on site*
- *ensure that site safety rules are followed by contractors'* (noted in Health and Safety Monitor, April 2001, p.1)

The intention is for the ILO standard to be voluntary and to be internationally recognised. It aims to influence the approach of organisations in developing health and safety management systems. If the standard is taken up, its requirements for contractors and procurement will mean that many more companies would be affected.

SA8000 CERTIFICATION SCHEME

➢ About the scheme

The SA 8000 certification scheme is an international trading standard, which aims to set minimum, and achievable, health and safety objectives that can form part of the purchasing relationship for participating organisations. The standard was developed out of an increasing need for companies to demonstrate their commitment to ethical purchasing policies and is intended to require a commitment to develop health and safety systems with the suppliers. The standard was developed by the Council on Economic Priorities Accreditation Agency (CEPAA) and is called the Social Accountability 8000 (SA8000). It is a standard that *'ensures the ethical sourcing for production of goods and services'* (Miller, 1998, p.10). The reasons for the development of this standard include the fact that it is very difficult to monitor the multitude of suppliers that many companies now use and the fact that many companies in industrialised nations had already implemented their own corporate codes of conduct that specified the conditions under which their products should be made. In addition, producers themselves often find that if they work with a number of companies, they can be working to a number of criteria. The standard is based on the approach of the successful ISO 9000 series and establishes basic standards and procedures and includes management standards for each issue.

➢ Aspects included in the standard

Ballard (1998) discussed the requirements of the standard and noted that the SA 8000 requires companies to comply with a number of requirements, such as national laws and occupational health and safety. Under this, organisations are required to minimise hazards to health and safety "so far as reasonably possible", as well as to appoint a senior manager to be responsible for health and safety. Companies have to be committed to documenting health and safety training and refresher training for all staff and have systems for the detection of hazards. They also have to provide adequate welfare facilities and restrict working hours to 48 hours per week with no more than 12 hours overtime. The standard also requires companies to have procedures to evaluate and select suppliers *'based on their ability to meet the requirements of this standard'*, and to maintain records of their suppliers' commitment to "social accountability" and evidence of their suppliers' compliance.

The standard covers many areas including the following issues:

- Health and safety – procedures, emergencies, training, fire prevention and protection, access to bathrooms, portable water and food storage.
- Pay and working conditions, including working hours – working hours should be set according to local laws; not exceeding 60 hours per week, over-time should be voluntary and workers should have one day off in seven.
- Reporting – communicating audit findings to stakeholders.

➢ What is required to become certified?

Before becoming certified, organisations need to nominate someone to take responsibility for SA 8000 and gain commitment from top management. They also need to identify what needs to be done to existing management systems to comply with the certification system and implement any required changes, at all times keeping records to demonstrate compliance. Following this, they need to apply for certification and in cases where e.g. non-compliant suppliers are identified, actions should focus on helping them improve rather than disqualifying them.

➢ Benefits

The standard is relevant to companies of all sizes across all industries and anywhere in the world. It is independently assessed and certified by a third party body. It is not a government project and is not dominated by any single interest group. The management systems are based on 'continuous improvement' so companies should always be working towards more efficient compliance with the standard. One company that uses SA 8000 suggested that *'the SA 8000 provides a means by which companies and consumers can accurately know the policies and the practices of the companies whose goods they purchase'* (Ballard, 1998, p.18).

CEPAA feels that SA 8000 should be seen as an initiative of continuous improvement and others agree that it needs to be applied flexibly. One company suggested that participating companies should support their suppliers with *'positive, effective tuition to help them comply within a specified time frame'* and that suppliers should be selected on the basis of their *'commitment to the standard rather than, necessarily, their immediate compliance to the letter'* (Ballard, 1998, p.19). It is thought that although there may be some cases where companies will know instantly that they do not want to work with a supplier or that there is no point as they are not committed to improvement, the majority of cases where improvement is needed will be related to health and safety issues in which improvements are usually possible.

Ballard (1998) suggested that 'occupational health' is about protecting workers from the hazards of work and that the SA 8000 is as much about protecting the companies' own employees as those of their suppliers. Companies should therefore be able to demonstrate with hard evidence high standards of health and safety and workers' representation before expecting compliance by

their suppliers. The article further suggested that by complying with the standard, *'participating firms will help workers down the supply line, instead of simply shifting the burden from those they see, to those they do not' (p.19).*

➢ Problems

SA 8000 does not include labelling criteria, partly because it is difficult to establish if there has been 100% compliance. One organisation suggested that an alternative to making sure that every product was labelled, was to state *'we try to involve all of our suppliers in this process but that we cannot be sure at the end that all the suppliers have fulfilled the standard'* (Ballard, 1998, p.18).

In addition, a company, noted in the Ballard (1998), suggested that although it was important that companies try to help their suppliers and do not expect them to do it all themselves, it will not be possible to help all their suppliers. They suggested that they would be more likely to try and help their main suppliers, and tell any smaller suppliers about the certification system and encourage them to try and get certified.

The SA 8000 is considered to be a set of targets to aim for, although some suppliers in developing nations may find some of the requirements, particularly in occupational health and safety, difficult to achieve. However, Ballard (1998) suggested that the suppliers in these developing countries should still be working towards the standard.

RISK CONTROL SYSTEMS

➢ About the initiative

Risk Control Systems (RCSs) are the basis for ensuring that adequate workplace precautions are provided and maintained. The main elements of RCSs suggested in the 'Managing Risk, Adding Value' document (1998) are:

- Product conformity with standards
- Fire
- Security
- Health and Safety
- Environmental control

Sometimes organisations will appoint people as 'loss and risk controllers' whose main purpose is to ensure control over risks and losses. RCSs are needed for certain activities including those related to the supply chain:

- Organisations relying on significant numbers of contractors will need an effective risk control system (RCS) to select and control contractors.
- Organisations supplying materials or substances for others use will focus on specific output issues such as storage, transport, packaging, labelling, handling and use of substance.

The 'Managing Risk, Adding Value' document (1998) included examples of organisations who use RCSs. Organisations included electrical engineering companies such as Adtranz UK and chemical producers such as ICI.

❑ ***Other initiatives***

PRODUCT DESIGN INITIATIVE

➢ About the initiative

Product design can be an important point of the supply chain to consider health and safety. Specific initiatives regarding the design of products and their possible impact on occupational health include ("Health and Safety – The Way Ahead" – Internet reference 7):

- Preparing guidance for designers on methodologies that can be used to produce safer plants and products.
- Attempting to embed essential health and safety requirements into international product standards.
- Targeting high-risk products and processes, such as the elimination of the dry stripping of asbestos and limiting the weight of concrete building blocks and bags of cement etc.
- Persuading professional bodies and academic institutions that health and safety should be a core requirement for any product design professional qualifications.

All such initiatives should ensure that health and safety is considered by all people involved in the supply chain so that occupational health risks are kept to a minimum.

AUTOMOTIVE INDUSTRY ACTION GROUP WORKING GROUPS

➢ About the initiative

The Automotive Industry Action Group (AIAG) is progressing a global occupational health and safety initiative, which has been given the support of, amongst others, General Motors Corporation, Ford Motor Company and Daimler Chrysler Corporation. The initiative was formed to bring attention to global occupational health and safety issues in the automotive industry, to reduce the number of work-related injuries and to improve overall work environments. The initiative involves workgroups that focus on key safety issues in the industry and on educating the supply chain on these issues. The AIAG's Occupational Health and Safety Steering Committee will oversee the initiative and firms involved in this committee will identify safety issues, gather new ideas, share best practice and lessons learnt, and develop solutions (discussed in Professional Safety, September 2001).

➢ Benefits

The aim of the initiative is to add value to the industry as it provides a forum for auto companies and suppliers to come together and share their unique and specific knowledge on workplace health and safety issues. The AIAG Executive Director has described his vision for the initiative (Internet reference 9):

> *"We hope the guidelines and standards that AIAG defines will help save lives and improve work environments throughout the automotive supply chain. The automotive industry spends billions of dollars each year on work-related injuries and illnesses. With this new initiative, AIAG will help play a role in identifying key health and safety issues and in educating the supply chain on how to reduce and prevent these injuries and illnesses".*

PREFERRED SUPPLIER LISTS

➢ Background

Organisations tend to check suppliers, as opposed to manage them, in the process of gaining a tighter grip on their chains of suppliers. As checks can be expensive to do, the result is a reduction in the number of suppliers organisations rely on, and the development of partnerships between organisations and their chosen suppliers. In addition, lists of 'preferred suppliers' are developed.

➢ About the initiative

The lists of preferred suppliers are developed on the basis of whether suppliers successfully pass checks by the organisation. The checks often involve suppliers completing a questionnaire as part of the bid process, on all aspects of their management, including health and safety. The suppliers may also need to be audited or have an examination on their own or a third party

premise. The organisations may also communicate with other organisations who have experience of their health and safety performance, because often the organisations consider health and safety performance to be a good indicator of general competence of the supplier or smaller firm (Managing Risk, Adding Value, 1998).

➢ Example of how 'preferred supplier lists' can be used

One organisation where this principle has been used successfully is British Aerospace (BA). They have used this initiative to change the safety culture at one of their major assembly plants. The change was considered necessary as the defence market was reducing and some of the elements used to achieve this change in safety culture included:

- Establishing health, safety and the environment as a business focus issue
- Developing an auditable process
- Creating ownership of health, safety and environment by all.

BA used several initiatives to change the safety culture in their supply chain, but one of them was the Preferred Supplier Process (PSP) (discussed in Martland and Henry, 1997). This system goes further than a simple list of preferred suppliers and uses a business process improvement model to encourage suppliers in partnership with BA to improve their performance. The system involves rating suppliers by examining their whole business, including their performance on health, safety and the environment. Assessors rate each business expectation and the results are fed back to the supplier, including their strengths and opportunities for improvement. If opportunities for improvement are identified, BA provide the supply chain organisations with information about similar activities in other supply chain companies or benchmarked BA sites, so that, if they wish to, they can use this information to improve their performance. A table of the benchmarking model, which describes health, safety and environment practice and performance, from activities that are considered to be 'learning' through to 'world class' or 'benchmark' performance, is included in Martland and Henry (1997).

➢ Benefits

'Effective health, safety and environment management, using a cross section of staff, has proven to be a tremendous team builder, with everyone chasing the common goal of a healthy, accident-free workplace' (Martland and Henry, 1997, p.32).

SANDWELL WORKWELL PROJECT

➢ About the project in general

The Sandwell Workwell Project is part of the government's 'Securing Health Together' strategy to develop better access to occupational health for small businesses. The project aims to improve the health of the 123,000 workforce in the Sandwell borough of the West Midlands and was formally launched in March 2000. The project involves the collaboration of local enterprises, primary care and the NHS, and works directly with businesses to aid in the management of health in their workplaces. The project works by:

- Initially offering companies a baseline assessment of health in their workplace, which integrates the concepts of occupational health and health promotion, as well as health and safety.
- The assessment then identifies a number of priority areas to be addressed by the company.
- Finally, the project can offer further advice, support and limited partial subsidy for any further work.

The project involves working with both SMEs and larger organisations in the borough.

➢ Benefits of the project

A survey of companies in the borough and an in-depth pilot study of eight companies was conducted prior to the formal launch. This indicated that SMEs particularly liked the project's use of intermediaries (e.g. local Business Link, business community representatives, chamber of commerce, etc) to access their businesses. In addition, the pilot found that companies wanted *'access to an independent source of straightforward, sector specific health information'* (Carroll and Wilkes, 2001, p.34). Several large organisations wanted to use the project to benchmark their performance against others and wanted the project to conduct second or third audits of their performance over time. In addition, involvement by larger organisations is often considered as one of the chief motivation factors responsible for change in SMEs.

➢ Problems

Generally, the project has found that although individuals in larger organisations responsible for health and safety have a fairly good understanding of health and safety management systems, they have less understanding about occupational health and health promotion.

➢ Aspects of the project specific to supply chains

The main motivating factor for SMEs is the desire not to loose the confidence of their stakeholders. The project found that SMEs react positively to the requirements of larger organisations, which are imposed on all those involved in the supply chain. For example, *'many larger organisations request health and safety policies, method statements, insurance details, risk assessments, permits to work, etc.'* (Carroll and Wilkes, 2001, p.37). Large organisations request this information from existing and potential suppliers of services / products, often before they contract their services and during the activities. In addition, some larger organisations request details of their supply chain's contingency plans, to ensure that their business is not affected if a problem occurs. Other organisations include health and safety arrangements of their supply chain when conducting customer / supplier audits and some large organisations have recognised that they have a role to play in influencing the workplace health of others in the supply chain.

MODEL CONTRACTS

➢ About the initiative

The Institution of Chemical Engineers (IChemE) has developed model contracts for suppliers or contractors (Hope, 1999), which include aspects relating to issues such as welfare facilities. The model or standard contracts, vary depending on the type of pay involved, i.e. Red, Green and Yellow contracts for the three types of remuneration, i.e. lump-sum contracts, reimbursable contracts and sub-contracts respectively (Wright, 1994, cited in Hope, 1999). The contracts require the provision of welfare facilities to be established and assurances of general safety to be made. These are addressed under categories of 'site services' and 'site working conditions'. The types of requirements covered in the contracts (particularly the Red and Green contracts) included:

- access to medical and first aid treatment,
- sanitary, medical and canteen facilities
- appropriate accommodation during operation
- consideration given to working hours.

Hope (1999) also noted the legal requirements for employers to ensure that there is *'an adequate level of supervision so as to maintain the integrity of health and safety conditions' (p.17)* and the need to establish *'clear guidelines as to the chain of command' (p.18)*. Members of the IChemE can use these contracts.

4.3.3 Improving occupational health in contractors

CONTRACTORS HEALTH AND SAFETY ASSESSMENT SCHEME (CHAS)

➢ Background

The Contractor Health and Safety Scheme (CHAS: www.chas.gov.uk), was set up by the Greater London Employers Association's (GLEA) health and safety forum. The forum (discussed in Saunders, 2000) aims to be recognised as the foremost point of competence for health, safety and welfare for the local government in London and to provide structures for peer support. These structures included the creation of Special Interest Groups (SIGs), the first of which tackled asbestos, the assessment of contractors and occupational health provision. The most significant was the Contractor SIG, which was established in October 1997 and led to the development of CHAS. Before CHAS, each local authority evaluated contractors differently, and, in some cases, this meant no evaluation. Each authority maintained its own lists, and there was little consistency, explicit standards, benchmarking or transparency in the way this was done. This is why the Contractor SIG felt there was a need for a common approach.

In addition, CHAS fulfils the following responsibilities (as identified by Successful Health and Safety Management, 2003) of organisations:

- Checking contractors' health and safety performance before awarding contracts.
- Examining the abilities of contractors where they work close to, or in collaboration with, direct employees.

➢ About the scheme

CHAS is an independent health and safety assessment scheme owned and run by local authorities from across the UK. The need for this scheme arose from the pressures on local authorities to provide higher standards of service from both HSE and the general public. It aims to eliminate the need for each public sector client to request and evaluate a contractor using a pre-qualification questionnaire. The scheme works on the basis that if a contractor satisfies the pre-qualification criteria once (providing the criteria were sound and the responses properly evaluated) then they should not need to keep completing the questionnaire each time. This allows groups of clients to collectively assess contractors in order to save costs. Organisations do though have to be a member to access the database. CHAS provides a national database of contractors with demonstrable health and safety standards and, as of 2002, had 40 local authority/public sector client members and over 2,000 contractors registered. The scheme means that authorities can choose contractors that meet their health and safety standards.

➢ How the scheme works

CHAS uses current local authority evaluation skills and pools the information into a single pan-London database. It is the first stage of the contractor management process in that it provides an initial evaluation of occupational, health, safety and welfare management. It forms a baseline and means that evaluation officers can direct their attention to the more important aspects of their work. The second and third stages of the process involve providing method statements and monitoring the work respectively. If a contractor wants to make a submission to an authority, they will be asked whether they are on the CHAS list. If they say they are this will be checked with the database. The local authority can then make a judgement about whether they want to use the contractor.

➢ Benefits

CHAS provides the opportunity to commit to raising standards and should mean that workload in the long term can be reduced. The database also means that one authority can discuss with another the details of an assessment. They may want to do this when a contractor has failed an

assessment or when an authority is concerned about a contractor's performance. CHAS includes a necessary measure to indicate if a contractor makes fundamental errors. The scheme includes quality control measures: Contractors are required to submit their assessment to a specified safety practitioner at predetermined intervals for them to review their adherence to standards and processes. The benefits of the scheme for the local governments include not having to resource putting all contractors through the first stage evaluation every time, whilst the benefits for contractors include not having to provide full occupational health, safety and welfare management documentation every time.

- Problems

The scheme does not actually check the safety competence of the contractor but rather uses a questionnaire and occasionally a telephone call as assessment (Edwards, 2003). There are also a number of other independent schemes with accredited contractors and access to the CHAS list of accredited contractors is restricted so that prospective users of the service have to pay to view the list. Edwards (2003) considered the scheme to be a good idea, although suggested that it would need to be extended to become a useful tool to the contractor.

In addition, although the CHAS scheme aims to create a list of approved contractors, HSE ('Working Together' leaflet, INDG 268 (rev)) suggested that ensuring the safe engagement of contractors requires close attention at all stages of the process beginning with a thorough assessment of competence beforehand, but also close co-operation of all parties and supervision during work, and reviewing and recording the health and safety performance of contractors at the end of the contract.

- Success of the scheme

Since CHAS was implemented in November 1998 it has failed contractors at a rate of around 65% of those applying. Second applications have a significantly reduced failure rate. Saunders (2000) suggested that the lesson that can be taken from this is that *'contractors are either operating at below what is required by law and / or they are unable to demonstrate what they do in their documentation' (p.26)*. The article further suggested that *'most contractors want to get their standards right',* but that *'many contractors get health and safety documentation from consultants'* and that this *'raises many important questions during the company's assessment for CHAS'*. Some local authorities have set up partnerships to provide training to local business to overcome this problem. There has been a great deal of interest shown in CHAS by other local authority groups.

- Related initiatives

An initiative related to CHAS is Constructionline (discussed by Lacey, 2002). This was created and owned by the Department of Environment, Transport and the Regions (DETR) and is the UK's largest register of qualified construction contractors and consultants. Organisations can subscribe to a database (www.constructionline.co.uk) of contract firms that have been vetted for their viability and quality etc, which may include occupational health and safety performance via a link to CHAS.

Large organisations often also have their own 'approved' lists of contractors and suppliers, similar to the CHAS scheme. Getting on one of these approved lists depends on many factors, including health and safety performance. If contractors and suppliers want to work with other organisations it is in their own interests to work safely without risking health and be able to explain how they manage health and safety. This is because clients may ask for evidence of a contractors or suppliers health and safety performance or may even ask the contractor/supplier to prepare a detailed method statement about the job, its risks and necessary controls.

SAFETY PASSPORT SCHEMES

- About the schemes

Difficulties in ensuring the competence and training of contractors and suppliers (but mainly contractors), particularly in the hazardous industries, have led to the development of Safety Passport Schemes. These are mainly for contractors that provide evidence of validated health and safety training. There have been several different safety passport schemes developed, some applying to specific industries, whilst others applying to more than one industry but including specific training for the relevant industry. The schemes have been around since approximately 1992 and are a means of assessing the competence of contractors working for large firms. The schemes are usually controlled either by industry associations or by health and safety organisations that run the relevant courses. These associations and organisations determine the course content, training providers and audits. One such scheme in the petrochemical industry involves a 2-day basic health and safety training course, a test, and a refresher course after 3 years (Health and Safety – The Way Ahead - Internet reference 7). This scheme is controlled by IOSH who verify that the 'Passport' holders are trained in basic health and safety awareness, core training and sector specific training.

- Benefits

The idea of safety passport schemes are that workers are only allowed on the sites of participating firms if they have a card (known as a 'passport') certifying that they have attended a specific course of health and safety training and that their understanding and competence has been assessed. As a result, benefits to clients and contractors include a recognised and validated standard, improved health and safety awareness/performance, HSE support and shorter and more specific site and project health and safety training/inductions at participating organisations, which may lead to savings to both contractor and client. Rimington (1999, Internet reference 10) investigated the costs and benefits of these schemes and concluded that *'there seems no doubt that the benefits of the passport scheme outweigh the costs'*.

This initiative is extremely beneficial when considering occupational health in the supply chain because clients can be assured that contractors are aware of health issues and how to avoid or control them. However, the scheme does not appear to be as widely used for suppliers of products and substances.

DUTCH VEILGHEIDS CHECKLIST AANNEMERS (VCA) SCHEME

- About the scheme

The Veiligheids Checklist Aannemers (VCA) scheme operates in the Netherlands in the petrochemical, railway and offshore sectors, and mainly focuses on employees working in engineering or technical roles in these sectors (Dyer, 2001). There are several aspects / initiatives to the scheme.

Initiative 1

The VCA scheme is mainly a safety checklist for contractors, and was developed in response to the Dutch Labour Conditions Act (Arbowet) of 1994. As part of the system's requirement for instruction, information and training, the industries have developed a safety passport scheme for employees and supervisors, which is a form of certification. The VCA checklist includes a handbook that enables contractors to formulate adequate policies on health, safety and the environment. The handbook includes 54 questions of varying importance and includes information on, for example, occupational healthcare, selection of personnel, and communication and consultation. There are two levels of VCA certification, 'limited' and 'general' certification. They vary in terms of the depth of evaluation needed and the number of

employees in a company. 'General certification' emphasises the need to develop annual plans to manage sick leave, including ways to limit the duration of sick leave and reduce the possibility of reoccurrence, as well as encouraging the investigation of any possible links with working conditions. In order to obtain a VCA certificate, all operational personnel need to have a "Basic Safety VCA". This is a nationally recognised certificate of safety competence and is obtained following attendance at a 15-hour training course. The course is to ensure they are familiar with health and safety legislation, risks and relevant controls, hazardous substances, fire hazards and the use of personal protective equipment. Operational managers, in addition to the basic safety certificate, also need to have a "Safety for Managers VCA" certificate. This is to ensure that managers have the skills to get shop floor personnel working in an efficient, safe and health manner. These certificates act as safety passports. This system shows how a certified standard could be used to improve health and safety performance.

Initiative 2
At the same time as the development of the checklist, the petrochemical and construction industries set up a safety management system for their contractors based on the quality standard EN ISO 9001, with the aim of creating a system with uniform standards.

- Benefits

The main advantage of this system is that contractors are tested and certified against the criteria stipulated in the VCA, and are required to demonstrate that they operate an adequate safety management system. Therefore, no further safety screen should be required by the clients. It should ensure the competence of contractor personnel for companies.

- How this scheme applies to the UK

The Government produced a 'Revitalising Health and Safety' strategy statement (Fidderman, 2000), which identified 44 action points to be implemented if the UK is to achieve the Government's 10-year injury and ill-health targets. One of the areas identified where there are opportunities to progress towards the targets is in the supply chain. One of the ways identified in the consultation exercise to raise health and safety standards was to apply accreditation schemes more widely. The exercise suggested that *'a certifiable standard could provide a clear benchmark and help to promote supply-chain initiatives'* (discussed in Dyer, 2001, p.19).

Similar safety passports and schemes for the accreditation of contractors are being used in the UK, but the UK needs to develop a more uniform approach with agreed standards. Dyer (2001) noted that in the Government's 'Revitalising' consultation, 90% of respondents thought that supply chain initiatives should be more widely adopted, and two-thirds thought that accreditation schemes could raise health and safety standards. However, they also noted that in order for these schemes to be of benefit, they *'should be widely accepted, more than a paper exercise, focused on management competence and training, and voluntary' (p.20).* The Government consultation also found that small companies thought that consultancy advice and training should be subsidised and that they should be given financial rewards upon becoming accredited to a recognised standard. The article suggested that the Dutch VCA scheme could be a model for progressing towards the Government's health and safety targets.

5 CONCLUSIONS

While there initially did not appear to be much information on occupational health in the supply chain, the importance of considering this issue has been recognised by industries etc. For example, Baker (2002) recommended that the role of the supply chain in disseminating good health and safety practices should be investigated further. The author stated that large companies reported requiring their suppliers to adopt particular health and safety practices but the impact of the supply chain on the adoption of good practice needs to be subjected to more in-depth study so that important lessons about how to communicate best practice using the supply chain as a mechanism can be realised. In addition, an article by the Confederation of British Industry (December 2001, Internet reference 11) noted that better management of occupational health and procurement/contracts by a range of people or organisations (e.g. those in the supply chain) is needed and that the diversity of such a range of people or organisations may help to encourage improvement where required.

5.1 MAIN CONCLUSIONS FROM THE LITERATURE

Despite such recognition that further investigation, and better management, of occupational health in the supply chain is needed, this literature review has in fact revealed some interesting and important information for the consideration of occupational health in supply chains. With reference to this review the main conclusions are:

5.1.1 General Conclusions

- There is clear information about what occupational health and supply chains are.

- While the review was about the supply chain, it became apparent that contractors were a major part of the supply chain and there seemed to be equal amounts of relevant information for contractors as for supply chains.

- It was clear that considering occupational health and how to monitor and maintain it is very important, due to the increasing problem and associated costs of occupational ill health. However, it is recognised that there can be problems addressing occupational health. This may be particularly due to the latency of occupational health symptoms and the issue of whether it was caused by the workplace. Also, smaller businesses may have problems addressing occupational health due to the complexity of the issue and the resources (or lack of) they have available to deal with it.

- It is clear that occupational health can also be a problem in supply chains and can impact on all businesses. There are many reasons given for doing something about occupational (ill) health within a supply chain, for both client organisations and suppliers/contractors. Also, it is important to note that there is legislation relevant to supply chains and maintaining health and safety (and therefore occupational health) and those not making efforts to prevent occupational ill health could be acting illegally.

5.1.2 Good practice/Initiatives Conclusions

- There are a number of initiatives and good practice suggestions that can be related to occupational health and supply chains. The literature seemed to suggest that the initiatives and good practice suggestions could be divided into contractors or the supply chain, but the principles could probably be applied to either. In addition, improving occupational health in supply chains appeared to be related to either general information, including sharing

information, standards and systems; information specific to parts of the supply chain, such as warehousing or transport or information related to specific industries (e.g. fuels or health care). Literature on improving occupational health in contractors involved general information, such as guidance, or specific contractor assessment, management and training issues (e.g. those referred to in the tender process).

- The information reviewed here has highlighted that occupational health in supply chains has been considered to a certain extent and in terms of different aspects of supply and contracting. However, there is still more that can be done, as the information reviewed (particularly the good practice and initiatives information) has often been more about health and safety in general, rather than specifically occupational health. In addition, the information and initiatives have not necessarily been specific to supply chains.

- There also does not appear to be much information on any formal comprehensive evaluation of the good practice suggestions or initiatives in order to check if they work and are successful.

In conclusion, despite there being some information on 'occupational health in a supply chain', more research, more evaluation and more understanding of this specific issue is required.

6 REFERENCES

Baker, E. (2002). A Survey of UK Approaches to Sharing Good Practice in Health and Safety Risk Management. HSE Contract Research Report CRR 412/2002. HSE Books: Sudbury.

Ballard, J. (1998). Ethical Trading Standard. *Occupational Health Review*, Mar/Apr 1998, no **72**, p.17-19.

Basson, E. (2000). Risk Management in Storage Facilities. *Safety Management*, no **28**, p.29.

Borley, J. (1998). Why Big is still Beautiful. *Safety and Health Practitioner*, **16**, no 4, p.26-28.

Building (April, 2002). Industry Must Do Better, Says New Egan Report. Volume **267**, no 8228, p.12.

Carroll, M. and Wilkes, B. (2001). Spreading the Message. *Management of Occupational Health, Safety and Environment Journal*, **5**, no 4, p.33-34, 37, Apr/May 2001.

Complete Idiots Guide to CHIP (Chemicals (Hazard Information and Packaging for Supply) Regulations 1994) (1999). Health and Safety Executive. INDG181(rev1). HSE Books: Sudbury.

COSHH Essentials – Easy Steps to Control Chemicals. (1999). HSG 193. HSE Books: Sudbury.

Crabtree, M. and Risstrom, J. (1998). Are you a Designer, Manufacturer, Supplier or Importer of Workplace Plant and Equipment? If your answer is no – read on!: Deeming Provisions and Extended Duties Under Occupational Health and Safety Legislation. *Australian Business Law Review*, **26**, no 1, p.61-63, (3), Feb 1998.

Dalling, I. (2000). The Future is Unified: A Model for Integrated Management. *Quality World,* **26**, no 4, p.34-39, Apr 2000.

Dyer, C. (2001). Contractor Safety, Dutch-style. *Health and Safety Bulletin*, Jun 2001, no **299**, p.19-20.

Edwards, P. (2003). Virtual Safety: Contractors Health and Safety Assessment Scheme. *Safety and Health Practitioner*, Apr 2003, p.78.

Engineering Employers Federation (EEF) (1999). Safety and Contractor/Client Relationships. The Good Practice Guide for Manufacturing. London.

Eskildson, L. and Yates, G.R. (1992). Improving Health Care's Suppliers. *Quality Progress*, **25**, no 4, p.107-108, (2), Apr 1992.

European Trade Union Technical Bureau for Health and Safety Newsletter (December, 1997). Health and Safety Impacts of the Changing Face of Work (December 1997). No **7**, p.14-15.

Fidderman, H. (2000). Employers face major health and safety at work shake-up. *Health and Safety Bulletin*, Jul/Aug 2000, no **290**, p.17-21.

Foundry Trade Journal (July, 2001). Growing Hazard from Radiation. Volume **175**, no 3580, p.15.

Gattorna, J.L. and Walters, D.W. (1996). Managing the Supply Chain. A Strategic Perspective. Macmillan Press Ltd: Basingstoke, Hampshire.

Glinert, L.H. (2002). Occupational Safety Communication for Hazardous Goods: The Development of a Policy in Israel. *International Journal of Occupational Safety and Ergonomics*, **8**, no 1, p.3-22.

Harrington, J.M., Gill, F.S., Aw, T.C., and Gardiner, K. (1998). Occupational Health (Pocket Consultant, 4th Edition). Blackwell Science Ltd: Oxford.

Hazardous Cargo Bulletin (July, 2002). United we Stand. Volume **23**, no 7, p.62-64.

Health and Safety at Work (February, 1999). Expert Advice Needed at the Point of sale to Ensure Personal Protective Equipment does the Right Job. Volume **29**, 2, p.29.

Health and Safety Commission Offshore Industry Advisory Committee (April, 2000). Small Firms: Update on Progress. OIAC/00/21.

Health and Safety Monitor (April, 2001). Contracting and Supply in ILO Management Standard. Volume **24**, no 4, p.1.

Honey, S., Hillage, J., Jagger, N. and Morris, S. (1996). The Costs and Benefits of the Noise at Work Regulations 1989. HSE Contract Research Report 116/1996. HSE Books, Sudbury.

Hope, C. (1999). The Impact of Procurement and Contracting Practices on Health and Safety – A Literature Review. HSL report RAS/99/02.

Lacey, J. (April 2002). European Experience and Progress – OHS Corporate Social Responsibility. Institution of Occupational Safety and Health.

Lancaster, R., Jacobsen Maher C. and Alder, A. (2001). Second Evaluation of the Manual Handling Operatiosn Regulations (1992) and Guidance. HSE Contract Research Report 346/2001. HSE Books, Sudbury.

Managing Risk – Adding Value: How Big Firms Manage Contractual Relations to Reduce Risk (1998). HSE Books: Sudbury.

Martland, D. and Henry, B. (1997). From Theory to Best Practice – the Changing of a Culture. *Safety and Health Practitioner*, **15**, no 10, p.28-32, Oct 1997.

Miller, M. (1998). A Commitment to Ethical Sourcing. *Business Consultancy*, **2**, no 3, p.10-11, Oct 1998.

Occupational Safety and Health (November, 2000). Call for Global Standards Body for Marine Fuel Suppliers. Volume **30**, no 11, p.7.

Percival Straunik, L. (1998). Are you Losing your Grip? *Director*, **51**, no 11, p.29, (1), Jun 1998.

Perlik, A. (2001). Burger King Monitors Supply Chain Safety. *Restaurants and Institutions*, **111**, no 17, p.116, (1), Jul 2001.

Pickvance, S. (2003). Arguing the Business Case for Occupational Health. *Occupational Health Review*, **Issue 103**, (May /June 2003).

Pilkington, A., Graham, M.K., Cowie, H.A., Mulholland, R.E., Dempsey, S., Melrose, A.S., and Hutchinson, P.A. (2002). Survey of Use of Occupational Health Support. HSE Contract Research Report CRR 445/2002. HSE Books, Sudbury

Ponting, L. (2001). Changing Necessity into a Benefit in Small Firms. *Health and Safety Bulletin,* Mar 2001, no **296**, 20-22.

Professional Safety (September, 2001). Progress on OSH Initiative. Volume **46**, no 9, p.1, (1).

Professionals in Partnership. (2001). Institution of Occupational Safety and Health: Leicester.

Quality Progress (April, 2001). AIAG Announces Initiative for Occupational Health and Safety. Volume **34**, no 4, p.28.

Rakel, H., Gerrard, S., Langford, I. and Shaw, K. (1999). Evaluating the Impact of Contact Techniques. HSE Contract Research Report 212/1999. HSE Books, Sudbury.

Reilly, B., Paci, P., and Holl, P. (1995). Unions, Safety Committees and Workplace Injuries. *British Journal of Industrial Relations,* **33**, 2, June.

Safety and Health Practitioner (June 1998). Health and Safety Demand puts the Squeeze on Contractors. Volume **16**, no 6, p.6, (1).

Safety Express (January/February, 2001). Seven Year Safety Record, 2.

Saunders, G. (2000). Contracting Out. *Safety and Health Practitioner*, **18**, no 3, p.24-26, (3), Mar 2000.

Shepherd, L. (1999). Health in Construction. *Safety and Health Practitioner*, **17**, no 6, p.46-48, (3), Jun 1999.

Siemieniuch, Waddell and Sinclair (1999). The Role of 'Partnership' in Supply Chain Management for Fast-moving Consumer Goods: A Case Study. *International Journal of Logistics: Research and Applications*, **2** (1), 87-101.

Sprigg, C.A. and Beswick, J.L. (2000). An Evaluation of the Good Neighbour Forums. HSL report WPS/00/06.

Successful Health and Safety Management (2003). HSG 65. HSE Books: Sudbury.

Topf, M. (2001). Ensuring Success: Spreading the Word. *Occupational Hazards*, **63**, no 9, p.13-15, (2), Sept 2001.

Use of Contractors: A Joint Responsibility. (2002). Health and Safety Executive. INDG368. HSE Books: Sudbury.

Walter, S. (2000). H,S&E and the Supply Chain. *Safety and Health Practitioner*, **18**, no 8, p.32-34, Aug 2000.

Working Together. Guidance on Health and Safety for Contractors and Suppliers. (2002). Health and Safety Executive. INDG268(rev). HSE Books: Sudbury.

Wright, M. and Marsden, S. (2002). Changing Business Behaviour – Would Bearing the True Cost of Poor Health and Safety Performance make a Difference? HSE Contract Research Report 436/2002. HSE Books, Sudbury.

Wright, M.S. (1996). Business Re-engineering and Health and Safety Management: Best Practice Model. HSE Contract Research Report 123/1996. HSE Books, Sudbury.

Internet References

1. 'Securing Health Together'. An Occupational Health Strategy for England, Scotland and Wales. www.ohstrategy.net (viewed on 4/6/03).

2. Occupational Health Advisory Committee. Report and Recommendations on Improving Access to Occupational Health Support. Health and Safety Executive. Http://www.hse.gov.uk/hthdir/noframes/access.htm. (viewed on 24/3/03).

3. Http://www.investorwords.com/cgi-bin/getword.cgi?4823 (viewed on 21/5/03).

4. Http://www.stanford.edu/~jlmayer/Article-Webpage.htm (viewed on 21/5/03).

5. Http://www.pcnolan.com/logistics.html (viewed on 21/5/03).

6. Http://www.mariosalexandrou.com/glossary/scm.asp (viewed on 21/5/03).

7. Health and Safety – The Way Ahead. Syndicate on Working Together to Manage Health and Safety in the Contracting and Supply Chain. Health and Safety Commission. Http://www.hse.gov.uk/events/wayahead/syndebak.htm (viewed on 5/2/03).

8. Partnering with Suppliers for Social and Environmental Performance. Http://www.hp.com/hpinfo/community/environment/operations/supply chain.htm (viewed on 24/3/03).

9. "AIAG Newest Initiative Tackles Health and Safety Issues". Automotive Industry Action Group (AIAG). Http://www.aiag.org/press/9125-00.html (viewed on 24/3/03).

   "Key Auto Suppliers Pledge their Support to AIAG's Occupational Health and Safety Initiative. Automotive Industry Action Group (AIAG). Http://www.aiag.org/press/ 9028-01.html (viewed on 24/3/03).

10. Rimington, J. (1999). Health and Safety Executive Passport Training Schemes. Http://www.hse.gov.uk/policy/passport.htm (viewed on 25/4/03).

11. Confederation of British Industry (CBI). (December 2001). Business and Healthcare for the 21st century. Http://www.cbi.org.uk/pdf/healthcare.pdf (viewed on 10/6/03).