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**Case Examples: Business Benefits Arising From  
Health & Safety Interventions**

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# EXECUTIVE SUMMARY

## Aims

- To gather a number of case studies that provide evidence of the range of business benefits that can result from occupational health and safety (OHS) interventions.
- The case studies should provide:
  - brief summaries of OHS interventions that have been subject to cost-benefit type evaluations;
  - brief summaries of OHS interventions that provide qualitative evidence of business benefits;
  - an overview of a broad range of interventions located within a number of industrial sectors;
  - evidence that has the potential to persuade a wide audience (e.g. policymakers, industry managers and employees) of the business benefits of OHS interventions.

## Main Findings

Our review of the literature has revealed a number of interesting case examples where OHS interventions have been evaluated. The cases identify a range of business benefits that can arise from OHS interventions. However, the search for suitable cases identified significantly fewer than we anticipated might be available. This can be explained by a number of factors, not least the cost of conducting evaluations and the absence of any business motivation for publishing results.

Although cost-benefit analysis is based on a simple principle of calculation, the case examples demonstrate that methods have to be adapted to the contingent requirements of evaluation, and, depending on the preference of the evaluators, can become highly technical accounts.

The case examples demonstrate a range of benefits that can arise from OHS interventions, including:

### Direct Benefits

- reduced insurance premiums;
- reduced litigation costs;
- reduced sick pay costs;
- improved production / productivity rates;
- lower accident costs / production delays;
- reduced product and material damage.

### Indirect Benefits

- reduced absenteeism;
- reduced staff turnover;
- improved corporate image;
- improved chances of winning contracts;
- improved job satisfaction / morale.

Of the cases reviewed there was no explanation provided of the prior business motivations for implementing OHS interventions – although it could be assumed that the businesses involved have a pro-active attitude toward OHS. Neither was any indication provided of the manner in which business managers incorporate cost-benefit information into business decision making.

Throughout the research literature there is very little discussion of manager's propensity or ability to interrelate profitability and OHS issues.

On the whole, the business benefit argument for health and safety investment is unlikely to provide a principal motivation for better health and safety management. Furthermore, the business benefit argument will only provide partial support for the decisions made by company managers. Nevertheless, the results from one business survey (Wright et al 2000) indicate that 10% of UK businesses would be prompted to do more for OHS management if they were provided with evidence that business benefits would arise.

## **Recommendations**

- There appears to be a scarcity of business benefit case studies with well-designed and well-executed evaluation methodologies. On this basis, there is a justification for the generation of further case-examples that can be used as evidence of the business benefits that can arise from OHS interventions.
- OHS business benefit case examples have the potential to influence a number of employers of the economic justifications for improving health and safety controls. Presumably managers will be able to relate such case examples to their own companies and business context.
- Cases should outline any problems or ambiguities associated with the calculation of productivity benefits. Importantly, this type of information would assist managers when they make their own initial assessments of the potential for cost effective OHS interventions.
- Evaluative case examples would have greatest potential for impact if they provide clearly worked through examples, i.e. evidence should be transparent and presented in terms that are understood by business managers.
- To aid managers and safety officers with their own evaluations, clearly defined procedures for cost-benefit analyses could be provided. There already exist some useful published guides (e.g. Oxenburgh 1991; HSE 1997). There are a range of resources that could be provided to assist with evaluation; for example, an interactive web-based resource for inputting and calculating the costs and benefits arising from OHS interventions.
- Good cases need to be widely publicised if business decisions are to be influenced by the business benefit arguments.
- Although there is a range of evidence that indicates that the public consider HSE to be a trusted provider of OHS information, it is less than self-evident that businesses would turn to HSE as a source of business advice. One of the best channels for communicating the 'business benefit' message would be through business forums. Furthermore, the impact of the message would plausibly be greatest if presented by business managers or safety officers that have first hand experience of increasing productivity through OHS interventions.
- The degree to which economic arguments can penetrate OHS decisions requires further exploration. For the 'business benefit' case to win through its potential limitations would need to be understood and addressed. Indeed further insight into the nature of business decision-making would provide a valuable vantage point for proponents of the business

benefit argument. Such insights might indicate in what contexts, and under what conditions, the argument is most likely to convince business audiences. The message could then be directed in more effective ways.

- Given that the economy in the UK is re-structuring such that the majority of the workforce now works in small and medium sized businesses (Deakin 1996), further insight into smaller businesses' reception of the business benefit argument would be valuable.

# 1 INTRODUCTION

The relationship between business performance and occupational health and safety (OHS) interventions aimed at reducing accidental injury is strongly contested: on one side, there is the view that good health and safety practice is good for business and productivity; on the other side, there is the view that OHS interventions are costly and interrupt the flow of work activity, and that regulations impose a non-productive investment.

In recent years, the argument that accidents at work adversely affects company productivity has gained support from the Health and Safety Executive (HSE). The promotion of this argument has become part of their on-going strategy for promoting better health and safety management. For example, the HSE has made a range of assessments of the costs of accidents in the UK. They claim that work related injuries and ill health result in a loss of over 30 million working days per year. Furthermore, the annual costs of work related injury and ill health are estimated to be in excess of £10 billion to society taken as a whole (HSE 1997). A significant share of these costs is carried by business enterprises, with the effect of increasing their losses and reducing their profitability.

In circumstances where it can be demonstrated that the costs of OHS interventions do not outweigh the benefits, there would be a strong business argument for better OHS measures. Evidence to support this line of reasoning is building gradually within the health and safety literature. In particular, HSE has generated a number of publications that illustrate cases where good health and safety represents good business (e.g. the HSE's *The costs of Accidents at Work* (1993) and *Reducing Error and Influencing Behaviour* (1998)). It is anticipated that the case examples add weight to the claim that *there is no inherent conflict between expenditure on health and safety and productivity*, and that business managers will be persuaded to consider the benefits that might obtain from similar interventions in their particular circumstances.

Through a number of illustrative case studies, this report provides further evidence that OHS interventions have the potential to bring about combined improvements in health, safety and productivity. Each case provides evidence of business benefits that can arise from OHS interventions.

The examples draw on a range of techniques for illustrating the point; for example, they use costs-benefit, cost-effectiveness, or qualitative assessments of the interventions. Although there are many hazards that will remain unprofitable to remove, where it can be demonstrated that interventions provide some measure of benefit to the economic performance of a company, and that the benefits outweigh the costs, the argument for wider adoption of OHS measures on economic grounds would, logically, be strengthened.

It is recognised that a range of factors will drive OHS investment decisions; the costs and benefits will not always be the main motivations. With this in mind, we also provide a discussion of the possible limitations of the business benefit argument, and a number of recommendations for advancing the argument.

## 1.1 AIMS

- To gather a number of case studies that provide evidence of the range of business benefits that can result from OHS interventions.
- The case studies should provide:

- brief summaries of OHS interventions that have been subject to cost-benefit type evaluations;
- brief summaries of OHS interventions that provide qualitative evidence of business benefits;
- an overview of a broad range of interventions located within a number of industrial sectors;
- evidence that has the potential to persuade a wide audience (e.g. policymakers, industry managers and employees) of the business benefits of OHS interventions.

## 1.2 METHOD

- Search relevant databases for published materials that identify business benefits arising from OHS interventions.
- Petition colleagues and other relevant people for suitable case examples.
- Design a template for reporting the case studies.
- Provide a written report containing a collection of case studies.

The bulk of work for this project included a review of literature that might contain evidence of the business benefits that arise from OHS interventions. An extensive search was conducted to include any literature relevant to OHS and business benefits.

A search was conducted using database, citation and HSE on-line facilities. Databases searched included:

- Osh-rom – (HSELINE, CISDOC, NIOSH, RILOSH);
- Healsafe - 113,000 records of recent work relating to public health, safety and industrial hygiene;
- Ergonomics abstracts;
- Social Sciences Citation Index – A world wide multidisciplinary index to social behaviour and related sciences literature;
- Management and Marketing abstracts – Management and marketing information.

Literature search strategy: document abstracts and titles were searched for the following keywords:

health OR safety AND: productivity, cost-benefit, cost-effective, benefit(s), evaluation etc.

Approximately 120 articles were identified following the key word search.

Following a close reading of the abstracts, or other supporting information, only a small proportion appeared to be relevant for the purposes of this report. We used the following criteria for the selection of articles:

- the article was dated post 1997 (although the interventions may have been enacted at any point prior to this date);
- the article language was English;
- the article included details of OHS intervention(s);
- the article provides evidence of business benefits arising from the interventions i.e. case studies (although quantified cost-benefit analyses were not a pre-requirement).

Another valuable source of information was the knowledge and experience of HSL colleagues.

A number of cases were ruled out if similar examples had already been identified and documented within this report.

## **2 CASE EXAMPLES**

The following cases provide insight into a broad range of OHS interventions that are reported to have generated business benefits.

The cases selected for this report draw upon a range of techniques for assessing the business benefits of OHS interventions. The techniques include cost-benefit and cost-effectiveness assessments. A number of the cases do not employ any formal methods for assessment, but they do provide qualitative evidence of benefits. It is plausible that, given the requisite resources and capabilities, a formal evaluation of direct and indirect benefits could be conducted in most cases.

All cases are presented in the same format. However, the variation between reporting styles and the differences between the cases meant that there was not an even balance of detail for each case.

## **2.1 CASE 1: SLIP-RESISTANT FOOTWEAR**

### **2.1.1 Type of Intervention**

The introduction of slip-resistant footwear to reduce incidents of slip-related accidents.

### **2.1.2 Industrial Sector**

Case example: Pet food production and supply.

Similar interventions could be applied within other sectors where there is a risk of slip-related accidents.

### **2.1.3 Description of the Intervention**

Most slip and trip accidents are avoidable. With proper management of the hazards and associated risks many can be eliminated with simple and common-sense good housekeeping measures. In some sectors, the presence of liquids and other contaminants in the process environment will increase the hazards, but there is evidence that the risks can be reduced where there is a will to do so. One factor contributing to the potential for slip related accidents are the characteristics of footwear.

The industrial setting for this footwear trial had a high propensity for slip-related accidents. Furthermore, workers at this site were known to have particular problems with footwear, or to wear their footwear particularly hard. The trial was conducted with the intention of comparing the relative effectiveness of traditional footwear with a new form of slip-resistant footwear.

### **2.1.4 Reported Costs and Benefits**

The trial was conducted during a seven-month period. Estimates for the implementation costs indicated that providing the new footwear to the total 191 workers in four operating areas would cost an additional £2,953 over a 12 month period.

Accident data revealed that fifteen slip-related accidents occurred within the seven month trial period and none of these accidents occurred in workers wearing the new footwear. Cost impact of slip-related accidents during the trial period - based on the direct costs for lost work time - are estimated at £10, 000. The additional cost of providing the new footwear to the full workforce in this period would have been around £3,000, whilst the company could have saved over £10,000 in lost work-time if the full workforce had been issued with the slip-resistant footwear.

Additional reported benefits include the potential for reduction in the Employers Liability premiums paid by the company to cover personal injury claims, and the impact on the workers' quality of life.

### **2.1.5 Source of Information**

The above information is taken from an unpublished cost-benefit evaluation of two alternative forms of workplace footwear. For further information contact HSL's infoline Tel: +44 (0) 114 289 2920.

## **2.2 CASE 2: WORKSHOP TIDY UP – THE 5S TECHNIQUE**

### **2.2.1 Type of Intervention**

The Japanese '5s' (sort, systematise, sweep, standardise, and self-discipline) technique for better workplace organisation and management.

### **2.2.2 Industrial Sector**

The study is based on 10 case examples from various industrial sectors. The companies were identified by HSE. They were recognised as having much to gain from the 5s technique as each company was beginning to outgrow their premises.

The technique could be applied within a range of industrial workshops.

### **2.2.3 Description of the Intervention**

The motivation to implement the 5s technique usually stems from aspirations to improve productivity. It follows that if a workplace is clean, tidy and organised and with everything in its designated place, that workers will be able to find items more easily and the time spent on individual tasks will be reduced.

A secondary motivation for the 5s technique is its potential to improve the health and safety at a workplace. Tidy, clean and organised workplaces inevitably mean less slip, trip and fall hazards. The act of implementing the 5s might also uncover latent hazards such as electrical wiring faults, the storage of out-of-date hazardous chemicals and damaged stock and machinery.

### **2.2.4 Reported Costs and Benefits**

The case studies were not subject to a quantitative cost-benefit assessment. However, feedback was sought from the ten companies on the perceived benefits in relation to the likely costs. The costs of 5s implementation were generally felt to be reasonable, especially in terms of the gains that can be made from the changes.

The anecdotal evidence from the case studies identified that 5s implementation costs were variable; they depended on the level of implementation and the requirement or commitment for change at each site. Costs of 5s implementation typically related to costs of material replacement and repair and the labour costs of implementing and managing any change. The benefits were wide ranging, but most reported some evidence that production times had improved, communication had improved, less downtime resulted from better maintenance, worker morale had improved and accident rates were reduced.

### **2.2.5 Source of Information**

Wright, S. and A. Collins. 2002. 'The 5s Technique: A risk management perspective'. HSL internal report RAS/02/09. For further information contact HSL's infoline Tel: +44 (0) 114 289 2920.

## **2.3 CASE 3: HEALTH & SAFETY SUPPORT FOR SMALL BUSINESSES**

### **2.3.1 Type of Intervention**

A part-funded infrastructure of basic health and safety support and advice for small (< 50 employees) and micro (< 10 employees) businesses.

### **2.3.2 Industrial Sector**

The target groups for this intervention were 600 small and micro businesses in the South Liverpool area. From this population, 123 companies from a range of industrial sectors participated in the interventions. It was reported that sectors with higher levels of perceived risk were most likely to participate.

### **2.3.3 Description of the Intervention**

The ‘Safety and Support for Business’ initiative was based on the philosophy that levels of compliance with regulations and good practice in health and safety amongst small and micro businesses can be enhanced where information and advice is tailored to the needs of the target audience, and where it can be demonstrated that compliance can enhance the future prosperity of small businesses. Increasing levels of compliance with health and safety law and good practice should, logically, reduce the incidence of accidents and ill-health and contribute to the well-being of employees and the community as a whole.

Through working closely with small business community over an 18 month period, the initiative sought to establish trusting partnerships between project staff and local businesses. Initial interactions centred around identifying the health and safety needs for small businesses, this resulted in the identification of three OHS interventions: a free health & safety starter pack; a free health & safety inspection (not exceeding one hour); and a priced scheme for policy advice and training.

### **2.3.4 Reported Costs and Benefits**

The interventions were not subject to a quantitative cost-benefit assessment. However, feedback was sought from twenty-seven companies on the perceived benefits of the health and safety support. A number (unstated) of participating businesses cited potential economic benefits arising from participating in the scheme. Examples cited included:

- 1) ‘improved company image - as a safety conscious business’;
- 2) ‘improved chances of winning tenders for new work through being able to produce health and safety management documentation’, e.g. a formal health and safety policy statement; risk assessment and safety management documentation;
- 3) ‘We benefited from the health and safety training. We have won two awards from the British Safety Council ... we’ve had no accidents, and made the lads aware of health and safety. I feel the training has allowed us to get one foot in the door. It doesn’t guarantee us work but it gives us an advantage’.

### **2.3.5 Source of Information**

Dugdill, C., C. Kavanagh, J. Barlow, I. Nevin, and G. Platt. 2000. ‘The development and uptake of health and safety interventions aimed at small businesses’, *Health Education Journal*, 59, pp 157-65.

## **2.4 CASE 4: EMPLOYEE EXERCISE PROGRAMMES**

### **2.4.1 Type of Intervention**

The introduction of employee exercise programmes and engineering changes to relieve musculoskeletal stresses.

### **2.4.2 Industrial Sector**

Case example: A large medical supplies manufacturing facility.

Similar interventions could be applied within any workplace where job tasks cause musculoskeletal stresses.

### **2.4.3 Description of the Intervention**

The employees at this site were performing various hand and arm intensive tasks. These included attaching needles to suture threads, inspecting suture products and winding threads for packaging. Following the high incidence of staff reported upper limb discomfort and fatigue, the company introduced a comprehensive human-factors programme featuring an employee exercise programme; engineering changes to the design of workstations and jobs; and proactive interventions from the Medical Department. The exercise programmes were designed to relieve the stresses associated with various repetitive tasks. Engineering changes also brought about improvements in terms of operators' postures, forces applied and repetitiveness.

### **2.4.4 Reported Costs and Benefits**

During one pre-intervention year, the company paid about £200,000 in compensation for human factors-related injuries. And it was estimated that for every 100 employees, 14.3 had reported human factors-related problems.

The costs of these interventions arise through the exercise related production downtime and the remedial engineering changes. An annual budget of approximately £60, 000 was set aside for these interventions.

After initial reservations concerning the exercise regimes, employee feedback was very positive and operators are reporting greater physical comfort. The latest medical records indicated that out of every 100 employees, approximately 2.9 report human factors-related problems annually (a considerable drop). Annual payments for related compensation claims have decreased steadily, to the point where no money was spent for such claims in 1994.

### **2.4.5 Source of Information**

HSE. 2000. *Reducing error and influencing behaviour*. HMSO HSG48, pp. 70-71.

## **2.5 CASE 5: OFFICE ERGONOMICS**

### **2.5.1 Type of Intervention**

The introduction of new work routines and modifications to office lighting and furniture equipment to reduce the incidence of upper limb disorders.

### **2.5.2 Industrial Sector**

Case example: A leading advertisements paper.  
Similar interventions could be applied in any industrial sector where tasks are repetitive, especially within office environments.

### **2.5.3 Description of the Intervention**

The majority of 170 employees at this site perform copytaking tasks which require inputting advert information received via post, fax, e-mail, telephone and recorded messages. The work is very repetitive and employees often work to tight deadlines. In an effort to reduce the incidence of work related upper limb disorders the employer initiated a scheme to improve the work conditions and environment. A consultant Ergonomist was employed to assess the work environment and recommended range of measures that were anticipated to improve the situation.

### **2.5.4 Reported Costs and Benefits**

An evaluation was conducted which identified the estimated payback period of the ergonomic interventions. In particular, the evaluation addressed any improvements related to the prevention of injuries. These were assumed to relate to reductions in absence time, decreased staff turnover and related indirect costs.

The cost calculation comprised of estimates of four elements for the pre- and post-intervention periods: 1) the number of hours for which each employee is productive per year; 2) the average cost of the wage for each employee per productive hour; 3) costs associated with losing staff and recruiting new staff; 4) calculated costs associated with recovering or hiring temporary staff to cover for sickness and reduced productivity related to poor equipment or injury caused by the workplace.

For each element it was estimated that benefits would accrue following the related intervention. In the case of: 1) average productive hours per employee, up 3 hours/year; 2) wage cost reduced for whole site £4859/year; 3) cost of recruitment reduced by £9370/year; 4) cost of injury losses reduced by £5374/year.

The net benefits were therefore estimated at £19603/year against the cost of the ergonomic intervention at £43, 270. The costs of the ergonomic interventions would therefore be recouped in just over 2.2 years.

### **2.5.5 Source of Information**

MacKenzie, S., and R. Benedyk. 2001. 'The costs and benefits of office ergonomics', in *Contemporary Ergonomics* edited by M.A. Hanson.

## **2.6 CASE 6: PRIORITISING ORGANISATIONAL STRESS IN SMES**

### **2.6.1 Type of Intervention**

A stress management information pack and risk assessment tool for SMEs. It provides SME managers with a step-by-step guide how to assess and control work-related stress (Ireland & UK).

### **2.6.2 Industrial Sector**

The intervention was designed to be applicable to SMEs in a wide range sectors.

### **2.6.3 Description of the Intervention**

The rationale underlying the production of the package was that, due to limited resources, when compared with larger organisations, small businesses would benefit from an information pack that provided practicable advice on how to manage this important public health issue.

Building upon established stress audit tools and principles of effective health and safety management, at its core the approach sought to develop self-assessment tool-kit for SMEs. The 'Work positive' information pack is designed to provide organisations (SMEs), which are unlikely to enjoy established in-house expertise, with a pragmatic approach to work-related stress risk assessment and management.

The 'Work positive' information pack allows SMEs to:

- raise awareness of the importance of work related stress issues in their organisation;
- derive a benchmark measure of existing stress risk management systems;
- derive a measure of prevailing levels of stress within their organisation;
- assess the risk associated with identified sources of work related stress;
- identify suitable work related stress risk control measures.

In short, the 'Work positive' information pack provides SMEs with guidance on best practice in stress risk management, survey tools for assessing risks in the workplace and practicable advice on how to control them.

### **2.6.4 Reported Costs and Benefits**

The interventions were not subject to a quantitative cost-benefit assessment. However, ten companies piloted the pack and provided valuable feedback on the perceived benefits of the interventions. Stress alleviation solutions included: new or improved reward systems; enhanced training provision; enhanced communication and feedback; and decentred decision making. The benefits of the interventions relating to improvements in individual performance and productivity could feasibly be measured through, for example, staff absenteeism and staff turnover records.

### **2.6.5 Source of Information**

Further information on the scheme can be obtained from Health and Safety Authority (HSA), Dublin, Republic of Ireland, (tel: 00 353 1614 7000).

## **2.7 CASE 7: REDUCING THE THREAT OF VIOLENCE AT WORK - PUBLIC TRANSPORT**

### **2.7.1 Type of Intervention**

A programme of health and safety measures to reduce incidents of violence or assault to public bus service workers.

### **2.7.2 Industrial Sector**

Case example: public transport.

Similar interventions could be applied in any sector where lone workers are at risk from violence or assault.

### **2.7.3 Description of the Intervention**

Public transport companies employ large numbers of bus drivers. The nature of the job requires employees to work alone at a range of times throughout the day and night. The drivers are responsible for handling cash on most services and therefore face the risk of robbery related assault. Other potential sources of violence relate to 'road rage', irate passengers, drunken passengers, and the perpetrators of vandalism.

The record of violent incidents on public transport encouraged this company to conduct a full assessment of the risks to lone drivers and to implement a number of measures for control: driver operated attack alarms were fitted on buses; all new buses are fitted with assault screens that separate the driver from the public; twenty-six buses were fitted with CCTV systems that constantly record on a 28-day cycle.

In addition to these engineering measures, all drivers were provided with health and safety training - including anger diffusion techniques and interpersonal skills - aimed at reducing the incidence of aggressive behaviour.

### **2.7.4 Reported Costs and Benefits**

The costs of interventions were reported to be: attack alarms (number not specified), £61,000; assault screens (number not specified), £40,000; 60 radios, £34,000; training programmes, £80,000; 26 CCTV, £80,000.

Although no efforts were taken to quantify the impact of health and safety interventions on individual performance and productivity, the organisation was able to identify several benefits:

- a 30% reduction in reported incidents of assault on workers (assumed to be an outcome of the interventions);
- the reduced affect of assault related absenteeism on productivity;
- the reduced affect of compensation claims on productivity;
- improvements in staff morale were registered during a staff attitude survey;
- the reduced affect of staff turnover on productivity.

### **2.7.5 Source of Information**

The above information is taken from an unpublished study of violence at work. For further information contact HSL's infoline Tel: +44 (0) 114 289 2920.

## **2.8 CASE 8: INSTALLING RETROFITTABLE ROLL-OVER PROTECTIVE STRUCTURES ON TRACTORS (US)**

### **2.8.1 Type of Intervention**

The introduction of 'retrofittable' roll-over protective structures (ROPS) on tractors to prevent fatal and nonfatal injuries.

### **2.8.2 Industrial Sector**

The intervention relates to the agricultural sector. Similar workplace transport interventions are likely to incur benefits in other industrial sectors where vehicle overturns occur.

### **2.8.3 Description of the Intervention**

An average of 200 fatal injuries per year on USA farms are attributed to tractor overturns. In addition, tractor overturns result in hundreds of nonfatal injuries. The installation of ROPS is proven to prevent fatalities and nonfatal injuries from agricultural tractor overturns.

### **2.8.4 Reported Costs and Benefits**

The results of this cost-effectiveness evaluation for ROPS are aimed primarily at assisting policymakers in decision-making for national policies. The perspective is therefore societal, the costs and benefits of the intervention are assessed regardless of who incurs them.

An overturn results in a fatal injury 40% of the time and nonfatal injuries, given survival, 83% of the time. In the event of an overturn where the operator is not wearing a seat belt, tractors fitted with ROPS reduce fatal injuries by 95% and nonfatal injuries, given survival, by 76%. In cases where the operator does wear a seat belt, ROPS reduce fatal injuries by 100% and nonfatal injuries, given survival, by 88%.

It costs approximately \$1,000 to retrofit a tractor with ROPS. In comparison, it is estimated that the total direct and indirect cost of a fatal accident is \$665,000, while the total cost of a nonfatal injury is \$12,500.

The analysis indicates that retrofitting ROPS would cost \$489,000 per injury prevented, which is within the cost effectiveness ratios for other national injury prevention schemes (e.g. mandatory air bags). Furthermore, a ROPS would have to cost \$350 in order for monetary benefits to be equal to the costs of retrofitting with ROPS.

### **2.8.5 Source of Information**

Pana-Cryan, R., Myers, M. 2000. 'Prevention effectiveness of roll-over protective structures, part III: economic analysis'. *Journal of Agricultural Safety and Health* 6(1): 57-70.

## **2.9 CASE 9: IMPROVEMENTS TO A WORK ENVIRONMENT IN THE STEEL INDUSTRY (SWEDEN)**

### **2.9.1 Type of Intervention**

Concurrent improvements in the production process and work environment for ladle service work in the steel industry.

### **2.9.2 Industrial Sector**

The Steel industry.

Similar interventions are likely to incur related benefits in other heavy industrial work.

### **2.9.3 Description of the Intervention**

Ladle work in the steel industry is characterised by extreme climatic conditions. As a result, ladle operatives have high levels of absenteeism and high rates of staff turnover. Due to the extreme nature of the work, the company faces difficulties when attempting to recruit new staff. In addition, a pre-intervention assessment demonstrated that the poor working conditions make it difficult to maintain the quality of ladle service work; this resulted in production disruptions and inferior steel quality.

A new work environment was designed that shielded the work area from the hot ladle and other work area hazards.

### **2.9.4 Reported Costs and Benefits**

The work environment improvements resulted in average annual savings in direct costs of 5,140,000 SEK. The estimated savings related to the following factors:

- 90% fewer disturbances in production process (e.g. reduced breakdowns caused by poor ladle service work), saving 1,350,000 SEK per annum;
- 90% reduction in the need for slag handling (due to breakdowns), saving 200,000 SEK;
- 35% reduction in returned steel (i.e. steel which could not be cast), saving 1,500,000 SEK;
- 30% reduction in maintenance and materials consumption, saving 200,000 SEK.
- 20% reduction in manpower, saving 1,800,000 SEK;
- 45% reduction in absenteeism due to illness, saving 90,000 SEK.

The assessment of the work environment improvements demonstrates that investment in the work environment and production process brought about improvements in productivity.

The investment costs were 11,300,000 SEK. A profitability calculation indicated a pay-off period of 2.2 years and an internal interest rate of 36%.

### **2.9.5 Source of Information**

Abrahamsson, L. 1998. 'Improved working environment – investments or costs?' in *Global Ergonomics*, edited by P. A. Scott, R. S. Bridges, J. Charteris. Oxford: Elsevier.

## **2.10 CASE 10: OFFICE ERGONOMICS TRAINING PROGRAMMES FOR DISPLAY SCREEN EQUIPMENT USERS (US)**

### **2.10.1 Type of Intervention**

Training programmes for display screen equipment (DSE) users to reduce the incidence of musculoskeletal disorders (MSDs).

### **2.10.2 Industrial Sector**

Office workers in a petrochemical research and development company. Similar interventions are likely to incur related benefits in other industrial sector office environments.

### **2.10.3 Description of the Intervention**

The goals of the training programme were to encourage DSE users in self-directed good practice with workstations, with the aim of reducing musculoskeletal symptoms. The office ergonomics training programme included information about:

- reducing risks through adjustments to the workstation;
- health and safety aspects of work, including details of correct posture; and
- the need to seek medical advice when musculoskeletal symptoms first appear.

A total of 292 (78%) of the 373 employees who identified themselves as using DSE for two or more hours a day attended the course.

### **2.10.4 Reported Costs and Benefits**

The evaluation did not provide an assessment of the costs related to this intervention, i.e. costs of training programme and provision for medical advice. The evaluation focused exclusively on the examination of worker compensation costs and reported injury rates for the (4 year) pre- and (4 year) post-intervention periods.

A greater number of claims were filed in the post- (n=18) versus pre-intervention period (n=12), but the average cost per claim was considerably reduced (\$1553 in the post- versus \$15,141 in the pre-intervention period). This reduced cost per claim is consistent with the programme's emphasis on seeking early treatment for MSD-related symptoms. The average injury rate was also reduced in the post- (6.94 per 1000 employees) versus pre-intervention period (16.8 per 1000 employees).

Although there were only a small number of claims during the evaluation study period, it was maintained that the training programme effectively reduced MSD-related worker compensation costs and injury rates.

### **2.10.5 Source of Information**

Lewis, J. R., M. Krawiec, E. Confer, D. Agopsowicz and E. Crandall. 2002. 'Musculoskeletal disorder worker compensation costs and injuries before and after an office ergonomics program', in *International Journal of Industrial Ergonomics* 29: 95-99.

## **2.11 CASE 11: MEASURES FOR NOISE CONTROL AT SOURCE (AUSTRALIA)**

### **2.11.1 Type of Intervention**

The introduction of noise control measures to reduce the risk of noise induced hearing damage and to increase the life span of machinery.

### **2.11.2 Industrial Sector**

The case describes the use of a 110 tonne press in the manufacturing sector. Similar noise control techniques could be introduced in manufacturing environments with sources noise generation.

### **2.11.3 Description of the Intervention**

This intervention is intended to control the noise from a power press at source. The strip-fed, 110 tonne power press used to blank oil filter base plates generated an average of sound pressure level of 96 dBA at the operator position. The noise was characterised by 'bell-like' tones that radiated from the flywheel.

Although enclosures were likely to reduce the ringing noise and the noise related health effects, diagnosis suggested that mechanical damping at the source would reduce noise, at a fraction of the cost and would plausibly reduce tool wear.

The vibration response of the flywheel was checked to confirm that it was the source of the ringing noise. A vibration absorber that consisted of a mass on a spring was attached to the press and effectively absorbed the vibration energy. The flywheel tones were effectively reduced, and the sound pressure level was reduced by 10 DBA at the operator position.

### **2.11.4 Reported Costs and Benefits**

The proponents claim that this intervention represents certain advantages over other noise control methods, as the costs are low (compared to enclosures) and there are no impacts upon the production time (compared to shift rotation). Although the costs of expert noise diagnosis were not specified, manufacturing and fitting costs include one day's labour and \$50 of materials. Estimates based on previous experience suggest that the reduction of vibration in the flywheel can increase the life of the machine by eight years. Other benefits relate to improved working conditions and reduction of the risk of hearing damage.

### **2.11.5 Source of Information**

Scannell, K. 1998. 'Low cost methods of noise control at source'. *Journal of Occupational Health & Safety* 14(5): 493-503.

## **2.12 CASE 12: WORK ENVIRONMENT IMPROVEMENTS (US)**

### **2.12.1 Type of Intervention**

The renovation of an indoor storage facility to improve the work environment, i.e. thermal conditions, air quality and lighting conditions.

### **2.12.2 Industrial Sector**

Case example: a harbour storage facility.

This evaluation suggests that productivity gains are likely to follow improvements in hazardous work environments, and it is plausible that this relationship will be true for a range of sectors/workplaces.

### **2.12.3 Description of the Intervention**

The intervention consisted of the renovation of an indoor storage facility in which heavy equipment and materials are handled and transported. The facility is used for storing zinc bars. Prior to loading on ships, workers are responsible for weighing and labelling the bars. The main health concerns relate to the winter-time cold air flows from the open transport doors, the workplace transport exhaust gases and particulates in the enclosed storage area and acetate exposure during the labelling process.

The interventions consisted of:

- fitted horizontal air curtains to reduce the inflow of cold air;
- improved ventilation and a warm air supply unit;
- painted interior and upgraded lighting system;
- an automated zinc bar and labelling line.

### **2.12.4 Reported Costs and Benefits**

The evaluation of the intervention sought to establish whether improvements in labour productivity were gained following changes to the work environment. The physical and chemical factors of the work environment, the worker's perceptions of the environment and labour productivity were measured pre- and post-intervention.

The costs of the interventions have not been provided. However, detailed analyses of the benefits were provided: the average air temperature increased from 11°C to 15-18 °C; the inflow of cold air was effectively removed; the air quality was improved (30-90% decrease in air contaminant concentrations); and luminance improved by 38 to 60%. Employees' subjective evaluations of the work environment also improved. Furthermore, according to supervisors observations, employees took less unofficial breaks.

The productivity over the pre- and post-intervention periods was measured as labour productivity, expressed as zinc tons/work-hour. It was reported that productivity improved by 9.1%. It is anticipated that the work productivity improvement related to the combined effect of the range of interventions.

### **2.12.5 Source of Information**

Niemela, R., et al. 2002. 'Work environment effects on labor productivity'. *American Journal of Industrial Medicine* 42: 328-335.

## **2.13 CASE 13: STRESS PREVENTION WORKSHOPS**

### **2.13.1 Type of Intervention**

Stress management workshops in a large company aimed to reduce incidence and causes of work-related stress.

### **2.13.2 Industrial Sector**

The intervention was aimed at white-collar workers in the pharmaceuticals industry. Given that stress has the potential to adversely affect all workers, similar interventions could be introduced in most workplaces.

### **2.13.3 Description of the Intervention**

Through recognition that stress is likely to adversely affect many workers and have a negative impact upon workers performance, managers of this large company invited members of their staff (700 over a period of 5 years) to attend in-house stress management workshops.

Case studies, presented through role-play and videos, provided a useful mechanism to raise employees' awareness of stress and the causes of stress. Participants were encouraged to change their perceptions of stress, recognise that it is a part of everyday life, although there are points at which 'overload' may be reached. The workshops included active participation exercises, such as group tasks and brainstorming activities (e.g. 'what are stressors?': late trains, workload, etc.). These activities are reported to identify similarities between individuals, which encourages empathy and support. Stress management techniques were also discussed.

### **2.13.4 Reported Costs and Benefits**

The interventions were not formally evaluated for costs and benefits. There were, however, three approaches used to assess the benefits:

- Stress measurement questionnaires indicated that stress levels, some 2-3 months after the intervention, had fallen by 15-20%;
- Employee referrals to psychiatrists or psychologists following the introduction of the workshops had significantly dropped;
- Feedback from participants had been positive, with signs that individuals were better equipped to manage stress-related problems and were more inclined to discuss and the causes of stress with managers.

Other encouraging signs include:

- The Chief Executive endorsed the continuation of the scheme without the need for detailed cost-benefit analyses;
- The management seem to accept that the creativity and decision-making capabilities of white-collar workers are dependent on the absence of high levels of stress.

### **2.13.5 Source of Information**

Cooper, C. L. 1998. *Stress Prevention in the Workplace*. Dublin: European Foundation for the Improvement of Living and Working Conditions.

## **2.14 CASE 14: CONTRACTORS PROVISION OF HEALTH & SAFETY TRAINING IN CONSTRUCTION COMPANIES (US)**

### **2.14.1 Type of Intervention**

This study provides insight into contractors' perceptions of the impact of training provision for construction workers.

### **2.14.2 Industrial Sector**

This study provides an evaluation of health and safety training in the construction sector.

### **2.14.3 Description of the Intervention**

This study differs from the other case examples in this report as it is focused on the perceived benefits of health and safety training provision and does not specify the content of those interventions. Forty-five construction sector contractors were asked about their provision of health and safety training. Eighty-nine percent of the respondents indicated that they provided some type of training for their supervisors and/or workers. The training ranged from formal or structured training programmes (5%) to on-the-job instruction (10%), or a combination of formal and on-the-job training (85%). Of those that provided training, only 9 (22%) included sub-contractors in their safety training.

### **2.14.4 Reported Costs and Benefits**

Given the quantity and quality of training was reported to be variable, assessment of the impact of health and safety training was provided at a general level. Overall, the contractors perceived effect of the training was good.

When asked about the impact of health and safety training, 79% believed that it increased or greatly increased employee productivity, 13% believed that it decreased productivity, and 8% recorded that it had no significant impact. A range of anecdotal examples of the benefits of training were provided:

- 'workers are able to perform tasks without interruptions';
- 'there are better attitudes and there is less worker turnover';
- 'if you care about the workers, they will work harder';
- 'there is less downtime due to worker injury'.

When asked about the impact of their safety training on quality of work and company profits, 73% believed that it increased or greatly increased quality and profit. Only 5% believed that training led to a reduction in the quality of work produced, and 8% believed that it had a negative impact on company profits. A range of comments were provided as anecdotal evidence:

- 'there is better quality when employees have a good attitude';
- 'fewer accidents' lower insurance premiums, reduced lost time due to injuries'.

### **2.14.5 Source of Information**

Goldenhar, L. M., et al. 2001. 'Health and safety training in a sample of open-shop construction companies'. *Journal of Safety Research* 32: 237-252.

## **2.15 CASE 15: ERGONOMIC REDESIGN OF A FLESHER MACHINE (US)**

### **2.15.1 Type of Intervention**

The introduction of new work routines and modifications of the operation and layout of a fleshing machine to reduce the incidence cumulative trauma disorders.

### **2.15.2 Industrial Sector**

The food production industry – a beef packing plant.

### **2.15.3 Description of the Intervention**

The operation of the fleshing machine required that two operators follow a procedure that requires them to lift and flip beef hides. Eight operators are paired to work at two machines over a two shift period. Within a period of one year there was a turnover of fourteen employees and seven reported incidents of cumulative trauma disorders. A consultant Ergonomist introduced an ergonomics training course on which all relevant staff were enrolled. In addition the two fleshing machines were turned to face each other, to allow one machine to automatically feed into the other. This resulted in the automation of the manual handling tasks, removing the need for one pair of operatives – they were subsequently reassigned to other duties. Following further modifications to the machines, the remaining manual handling tasks - and the associated risks - were reduced.

### **2.15.4 Reported Costs and Benefits**

An evaluation was conducted which identified the estimated payback period of the ergonomic interventions. The costs of the engineering changes were reported to be \$113,000. These changes were introduced over a number of weekends to reduce the impact on weekly production. The costs of the training programme and its interruption of work patterns were not reported.

The benefits were derived from a comparison between the 12 month periods pre- and post-intervention. Employees reported 'comfort' on the job increased by 30 percent. The employee turnover reduced from fourteen employees to one. This was conservatively estimated to save \$19,500 in employment and training costs. The incidence of cumulative trauma disorders reduced from seven to two and time lost days decreased from 126 days to zero days. The comparative cost savings consisted of \$6,445 for time lost days; \$11,783 for medical costs; \$23,917 for workers' compensation costs; and, \$93,000 for the wage reduction under the new operating regime.

The annual savings were estimated \$154,645 against the cost of the ergonomic intervention at \$113,000. In addition, the intervention was thought to have brought about zero quality defect claims which had cost \$131,962 in the previous year.

### **2.15.5 Source of Information**

Worrell, G. A., and S. Wirtz. 1999. 'Complete ergonomics benefits case study', in *Applied Ergonomics Case Studies, Volume 2* edited by D. C. Alexander. Norcross: Institute of Industrial Engineers.

## 3 DISCUSSION

### 3.1 ABOUT THE CASES

The survey of literature provided significantly fewer health and safety business benefit case studies than we anticipated. We believe there are a number of reasons for this short fall. For the most part health and safety interventions will be adopted in order to comply with regulations or to meet contractual arrangements (Wright 1998). And companies operating within a major hazard industry will presumably implement health and safety management measures as a matter of principle. In such cases it is unlikely that a consideration of the economic business benefits, or an evaluation of the benefits, would be deemed necessary. That is to say, health and safety interventions are generally implemented on the basis of motivating factors other than their potential for business benefits.

A further factor ruling against formal cost-benefit evaluations of health and safety interventions can be the associated costs. The practice of evaluating benefits from business interventions can be highly technical and require significant resources. Even where companies do formally evaluate the benefits of health and safety interventions, it is unlikely that they would opt to make them available in the public domain.

Of the OHS literature that we reviewed, there were far more cost-benefit evaluations provided for ergonomics related interventions. Indeed, the ergonomics literature (especially conference proceedings) included many calls to strengthen the business case for ergonomics interventions. It is not apparent why this professional body demonstrates greater levels of interest in the business case for OHS interventions<sup>1</sup>. Nevertheless, it is an encouraging sign that the business case appears to be endorsed by certain groups.

There were notably fewer cost-benefit evaluations of cases that relate to the health effects of noise, stress<sup>2</sup>, radiation, chemical agents, respiratory sensitisers, and hand arm vibration, etc. This imbalance may relate to the nature of the subject matter, the type of enforcement regimes and other factors. In particular, evaluation is problematic if the occupational health effects have long gestation periods, or the effect is too indirect for simple cost-benefit calculations.

It is notable that the cases we identified relate to both low and high risk industries or work processes. The strength of the business benefit argument appears to stand in a range of contexts, whether the risks are perceived to be high or low. Presumably many high risk industries are motivated to implement health and safety measures for regulatory compliance, but in some cases additional benefits may be sought based upon perceived productivity gains. Similarly low risk industries can realise the benefits of OHS interventions, and the reported payback periods appear to be favourable.

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<sup>1</sup> This outcome may relate to the databases and the search terms that we used. It may be the case that other professions have adopted the business benefit argument, but that we have not tapped into the evidence.

<sup>2</sup> We do provide two case examples for stress. However, neither case provides detailed cost-benefit assessments. In part this will relate to the difficulties associated with quantifying the business benefits that arise from certain interventions.

### 3.1.1 The Reported Benefits

The case study interventions are wide ranging, and relate to a number of different work environments. The interventions include:

- job / task (re)design;
- engineering process (re)design;
- work environment (re)design;
- personal protective equipment;
- education and training measures;
- improvements to management and monitoring;
- improvements in inter-personnel communication.

On the whole, the range of the benefits identified within these case studies is similar to those reported elsewhere (e.g. HSE 1997). The case examples demonstrate a range of benefits that can arise from OHS interventions, including:

#### Direct Benefits

- reduced insurance premiums;
- reduced litigation costs;
- reduced sick pay costs;
- improved production / productivity rates;
- lower accident costs / production delays;
- reduced product and material damage.

#### Indirect Benefits

- reduced absenteeism;
- reduced staff turnover;
- improved corporate image;
- improved chances of winning contracts;
- improved job satisfaction / morale.

The provision of case studies with *ex post* evaluations has the potential to change the perception that OHS interventions are costly and a constraint on productivity. The cases we have identified go some way to demonstrate that interventions can bring considerable business benefits with prompt payback on the cost of investment.

### 3.2 POTENTIAL LIMITS OF THE 'BUSINESS BENEFIT' ARGUMENT

The 'business benefit' argument is founded on a number of related assumptions, explicitly that:

- business decisions are rationally determined by cost-benefit type analyses;
- businesses are principally motivated by productivity gains;
- businesses perceive the costs of injury and ill-health to be significant.

The validity of the business benefit argument will depend on the strength of these assumptions. However, there are a number of issues that complicate this simple formulation. In particular, there is a body of evidence from the business studies literature that suggests manager's actual decision making is not rule-bound or rational. Empirical studies indicate that managers 'real' decision making is far more complex (Callon 1998), and that decisions are made in response to a range of contingencies and personal interests, often in circumstances in which the outcomes (e.g. costs and benefits) are uncertain.

Concurring with this view, we feel that the real world situations in which managers make decisions about OHS interventions requires more than the application of cost-benefit analyses. A range of issues come into play when investment decisions are being made. Take, for example, the following issues that go some way to illustrate this point:

- Organisations are arranged such that senior managers that make decisions concerning business investments may not be aware of the range of relevant health and safety issues. This point was graphically illustrated in the ro-ro ferry disaster (see Cutler and James 1996). For example, rather than consider work hazards as problems that can be removed through fail safe engineering measures, managers conceptualised safety as a problem of workforce behaviour and attitude, and an issue that should be resolved through employment contract arrangements.
- Resources for investment in OHS may be limited or in competition with other company priorities. Within the investment context, trade-offs are regularly made. The case studies indicate that the financial outlay for the range of interventions can, in some cases, be significant. Where the costs for OHS interventions are expected to require a significant stake of available investment budgets, and where interventions are not directly related to core business activities, it is probable that companies will sideline OHS interventions, despite the potential for business benefits. This problem will be compounded if the payback periods of OHS interventions are expected to be long term, and where core business activities are expected to bring immediate investment benefits.
- Although the case studies suggest that the business benefit argument applies across a range of industrial sectors, the literature we reviewed provides little or no commentary on the relevance of the argument for smaller businesses that employ, for example, less than 50 people. It is widely accepted that small businesses lack the time, technical knowledge and resources to implement basic health and safety systems and training for their employees. Smaller businesses are likely to have little or no in-house safety expertise, or the resources for investing in non-core business interventions, whereas large companies, through economies of scale, are likely to have regular access to safety experts and have greater available resources for OHS interventions. For these reasons, it is anticipated that the small business sector will be less receptive to the business benefit argument.
- One factor that prevents wider assessment of business benefits relates to the problem of quantifying certain benefits. A number of the case studies referred to benefits - such as improvements in worker's morale, business image or inter-personnel communication - that are not readily translated into economic benefits. The costs of OHS interventions are generally unambiguous, whereas the determination of commensurate (i.e. quantified) benefits may depend on a range of subjective assessments. Despite the level of agreement that qualitative benefits often constitute an important feature of OHS interventions, the assessments are nearly always based on estimated impacts using surrogate measures for benefits. Given that assessments are often associated with some level of interpretation, gaining wider acceptance of calculated benefits can prove to be problematic.
- Even in respect of 'direct benefits' that can be quantified - such as reduced litigation costs and productivity improvements - it may not always be clear whether interventions are the main (or direct) cause of any measured improvements, as there are always a range of mitigating factors. However, though weakened on these grounds, methods employed for calculating accident costs, or intervention benefits, are no different (or worse) than assessments that are made to assist other business decisions. Many business decisions depend on some level of arbitrary judgement (Frick 1997).

Further evidence of the limits of the business benefit argument is provided in a recent HSE contract research report (Wright et al 2000). The report outlines the results of a survey of 1900

UK employers regarding their motivations for managing OHS. The survey indicated that only 8% of respondents are prompted to make health and safety improvements due to 'business impacts', bad PR or customer pressure. The survey also identified that only 10% of respondents would anticipate that evidence of business impacts would prompt them to do more to manage work related ill-health. The majority of the respondents indicated that they are prompted by regulations, awareness of hazards, or moral duty. From this evidence, the business benefits argument will be limited to a small portion of the UK's business audience. Of those that are receptive to the principle, their understanding will be shaped by a of range factors that are likely to vary between companies.

Lastly, some observers may be concerned that the emphasis on productivity lessens the importance of, for example, political and moral arguments for the improvement of work conditions. Indeed, if the economic case were to prove thoroughly convincing, the role of HSE as a regulator would need to be addressed (Cutler & James 1996).

## 4 CONCLUSIONS

Our review of the literature has revealed a number of interesting case examples where OHS interventions have been evaluated. The cases identify a range of business benefits that can arise from OHS interventions. However, the search for suitable cases identified significantly fewer than we anticipated might be available. This can be explained by a number of factors, not least the cost of conducting evaluations and the absence of any business motivation for publishing results.

Although cost-benefit analysis is based on a simple principle of calculation, the case examples demonstrate that methods have to be adapted to the contingent requirements of evaluation, and, depending on the preference of the evaluators, can become highly technical accounts.

Of the cases reviewed there was no explanation provided of the prior business motivations for implementing OHS interventions – although it could be assumed that the businesses involved have a pro-active attitude toward OHS. Neither was any indication provided of the manner in which business managers incorporate cost-benefit information into business decision making. Throughout the research literature there is very little discussion of manager's propensity or ability to interrelate profitability and OHS issues.

In most situations, the business benefit argument for health and safety investment is unlikely to provide a principal motivation for better health and safety management. The business benefit argument will only provide partial support for the decisions made by company managers. Nevertheless, the results from one business survey (Wright et al 2000) indicate that 10% of UK businesses would be prompted to do more for OHS management if they were provided with evidence that business benefits would arise.

### 4.1 RECOMMENDATIONS

- There appears to be a scarcity of business benefit case studies with well-designed and well-executed evaluation methodologies. On this basis, there is a justification for the generation of further case-examples that can be used as evidence of the business benefits that can arise from OHS interventions.
- OHS business benefit case examples have the potential to influence a number of employers of the economic justifications for improving health and safety controls. Presumably managers will be able to relate such case examples to their own companies and business context.
- Cases should outline any problems or ambiguities associated with the calculation of productivity benefits. Importantly, this type of information would assist managers when they make their own initial assessments of the potential for cost effective OHS interventions.
- Evaluative case examples would have greatest potential for impact if they provide clearly worked through examples, i.e. evidence should be transparent and presented in terms that are understood by business managers.
- To aid managers and safety officers with their own evaluations, clearly defined procedures for cost-benefit analyses could be provided. There already exist some useful published

guides (e.g. Oxenburgh 1991; HSE 1997). There are a range of resources that could be provided to assist with evaluation; for example, an interactive web-based resource for inputting and calculating the costs and benefits arising from OHS interventions.

- Good cases need to be widely publicised if business decisions are to be influenced by the business benefit arguments.
- Although there is a range of evidence that indicates that the public consider HSE to be a trusted provider of OHS information, it is less than self-evident that businesses would turn to HSE as a source of business advice. One of the best channels for communicating the ‘business benefit’ message would be through business forums. Furthermore, the impact of the message would plausibly be greatest if presented by business managers or safety officers that have first hand experience of increasing productivity through OHS interventions.
- The degree to which economic arguments can penetrate OHS decisions requires further exploration. For the ‘business benefit’ case to win through its potential limitations would need to be understood and addressed. Indeed further insight into the nature of business decision-making would provide a valuable vantage point for proponents of the business benefit argument. Such insights might indicate in what contexts, and under what conditions, the argument is most likely to convince business audiences. The message could then be directed in more effective ways.

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