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**Expert Views on the Evidence Base for Effective
Health and Safety Management (Phase 1)**

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EXECUTIVE SUMMARY

There is acknowledgement within the Health and Safety Executive (HSE) that there are competing views regarding effective health and safety management models. The current HSE approach to health and safety management, captured in the publication HSG 65 ‘Successful Health and Safety Management’, is eighteen years old, and the extent that it fulfils all of the developing requirements of HSE’s remit is subject to debate.

The HSE Board mandated Operational Policy and Support Division (OPSD) to “review and refresh the principles of good health and safety management.”

The Board paper further went on to recommend:

“A comprehensive review of current good practice in the management of health and safety to define our standards and develop the evidence-base supporting our work in this area.”

Objectives

The Health and Safety Laboratory (HSL) have been commissioned by the HSE to gather evidence from semi-structured interviews with experts that supports features associated with ‘effective health and safety management’. In this instance ‘effective health and safety management’ is defined as practices that contribute to the effective control and sustained reduction in incidents that have the potential to result in acute and chronic deleterious effects to employees and other exposed persons. This is referenced to the following model of risk management:

- Knowing what the risks are, and what in general should be done about them
- Planning, prioritizing and implementing risk controls
- Ensuring that risk controls are effective and sustained
- Reviewing and learning

More specifically, the objectives of the exercise were:

- (i) To collate the opinions from a range of experts regarding the evidence supporting the features associated with ‘effective health and safety management’.

With the specific aim of:

- (ii) Contributing to the building of an agreed, practical, evidence-based model of effective management of health and safety.

Main Findings

- The body of research relating to health and safety management was perceived as relatively mature by the participants, with over thirty years of research and regulatory attention dedicated to the area.
- Participants felt that research in safety management has been able to successfully define the structure and content of effective safety management systems. However, there was less agreement in defining the factors that determine how the structure of safety management should be implemented in order to work effectively in practice.
- One observation was that a greater alignment between academic theory and practice, such that each informs the development of the other, could be beneficial in defining the factors that determine how the structure of safety management should be implemented in order to work effectively in practice.
- Participants stated that one of the main weaknesses of research in this area is the lack of effective methodologies that adequately define, match and measure 'good' and 'bad' performing companies. A comprehensive review of the literature has been conducted and found only a handful of studies that utilised adequate methodology.
- There was also some criticism regarding the lack of transparency of expert judgement, particularly in relation to the development of standards such as OHSAS 18000.
- According to the opinions of the interviewees, a key feature of a successful safety management system is visible management commitment to that system, especially the consistent, visible prioritisation of safety over production issues.
- The participants interviewed considered that it was important to associate the features of effective health and safety management with their benefits to dutyholders. To persuade managers to adopt health and safety strategies, participants thought a clearer link between effective health and safety management and business costs and efficiency should be defined.
- There was agreement among the experts interviewed that safety management is not a separate activity from the function of managing the business, but is an integral part of the basic management model. Effective health and safety performance is associated with competent managers who perceive health and safety as another business process that needs to be managed efficiently.
- Consensus among the experts interviewed suggests that effective health and safety management requires effective managers, and that management competency is a key determinant of effective health and safety practices and behaviours. Management competency can be defined as the ability of managers to manage all areas of the businesses including health and safety effectively. However, there is debate regarding what precisely constitutes an effective manager, and management competency.
- The participants suggested that an organisation's capability to manage risk is associated with its awareness of the level of risk posed by its operations, and with the ability to plan and implement the detail necessary to reduce the likelihood of an unpredictable outcome.

- However, it was felt that the capability of an organisation to manage risk is also dependent on its wider ability to make effective decisions. It was suggested that emphasis should be placed on the quality of the decision-making process. Decisions at all levels that affect safety should be rational, objective and transparent, and address issues of contingency and emergency planning. Decisions should be made after ensuring that relevant available data and opinions are collected and considered, respecting and encouraging the contribution of those with divergent views. This has potential implications regarding the development of a future health and safety model, in that the model should reinforce the potential for effective decision making at both the individual and organisational level.
- Many participants posited that effective health and safety management also requires involving the workers throughout the processes of risk management decision-making. This wider engagement process can serve to: increase the discourse on health and safety amongst different operational levels of an organisation; underscore management commitment to health and safety; clarify the expectations regarding the norms and behaviours associated with health and safety; and utilise local knowledge in the practical aspects of managing risk. The issue of trust between staff at differing organisational levels is central to the success of any process of engagement.
- There was agreement that models of health and safety management exist to give organisations guidance for the optimal processes required for contributing to the effective control and sustained reduction of incidents. However, the participants were critical of these models for neglecting the dynamic nature of organisations, and reducing organisational activity to a mechanical, structured and linear process.
- It was suggested that there is potential for future developments for health and safety management systems to be more value driven, and to be sufficiently sophisticated to encompass individual organisational diversity and context. These models should also address such issues as equipping duty holders with the knowledge and skills to challenge their health and safety performance.
- The development of any future health and safety model or guidelines will need to be sufficiently broad in scope to address health related issues. This could entail a proactive approach to prevention and the maintenance of individual wellbeing, and would ideally incorporate secondary prevention and include schemes such as return to work and rehabilitation.
- The participants stated that findings from the literature on human factors (at both the individual and group level) should be formally incorporated as an intrinsic consideration for the implementation of a model of safety management.

1 INTRODUCTION

1.1 BACKGROUND

The Health and Safety Commission's (HSC's) "Strategy for workplace health and safety in Great Britain to 2010 and beyond" notes that:

"We will find ways to demonstrate the moral, business and economic cases for health and safety. We are committed to achieving higher levels of recognition and respect for health and safety as an integral part of a modern, competitive business and public sector and as a contribution to social justice and inclusion."

With this in mind, the Health and Safety Executive's (HSE's) Board Paper B-05-045 proposed a programme of five, interlinked work streams to 'renew and refresh' HSE's approach to health and safety management. The paper said:

"The philosophy underlying our approach should be to improve duty holders' ability to 'manage' their activities with particular reference to health and safety rather than to address a special function of 'health and safety management'. We consider this is essential both for success by the duty holder (in making health and safety an integral part of line management activity) and in working with other regulators (to achieve a consistent approach to assessing duty holder performance)."

1.2 AIMS AND OBJECTIVES

As part of the first work stream of the proposed programme of five, HSL have been commissioned by the HSE to gather evidence that demonstrates features of the management of organisations that are associated with good health and safety outcomes, including activities, skills and general behaviours. The purpose is to provide insight into the relative weaknesses and strengths of the evidence base (e.g. knowledge claims from the literature) for determining the extent to which the identified factors contribute to 'effective health and safety management'¹. This is referenced to the following model of risk management:

- Knowing what the risks are, and what in general should be done about them
- Planning, prioritizing and implementing risk controls
- Ensuring that risk controls are effective and sustained
- Reviewing and learning

More specifically, the objectives of the exercise were:

- (i) To collate the opinions from a range of experts regarding the evidence supporting the features associated with 'effective health and safety management'.

¹ In this instance 'effective health and safety management' is defined as practices that contribute to the effective control and sustained reduction in incidents that have the potential to result in acute and chronic deleterious effects to employees and other exposed persons.

With the specific aim of:

- (ii) Contributing to the building of an agreed, practical, evidence-based model of effective management of health and safety.

The findings of this project will be used in conjunction with the results of the other work streams to enable delivery of the HSC/E Strategy and targets through improving duty holders' ability to 'manage' their activities with reference to health and safety.

2 METHOD

Information with which to establish an understanding and gauge the relative strength of current evidence regarding health and safety management was gathered by interview with a range of experts. Participants were recruited based on a contact list supplied by the HSE Project Officer, and from discussion with HSL colleagues. Potential participants were identified according to their expertise and experience within the academic or applied fields of health and safety management. This sample was not designed to be representative of the range of potential views regarding health and safety management, but was in effect an opportunity sample because of the tight timescale of the project. Each contact was sent an email outlining the objectives of the project. This was followed up by a further communication to organise a mutually convenient time to talk and discuss the main objectives of the interview.

The experts who were consulted to provide an appraisal of current research and opinion on health and safety management were:

- 3 Academics.
- 6 HSE employees.

A semi-structured question set was devised to obtain the information required (see Appendix One). The question set was devised in consultation with the HSE Project Officer and HSL colleagues to ensure that the questions were relevant to the aims of the project, yet sufficiently broad in scope to allow the participants to express the range of their opinions.

The questions canvassed the participant's opinions regarding the main theoretical developments in relation to risk management, the type of research that is being conducted and the applicability of this to practitioners. Some of the main theoretical developments that were discussed in relation to risk management and health and safety management, included:

- A proactive, strategic approach
- Visible corporate and senior management commitment to health and safety
- Effective communication systems
- Employee participation in risk management
- A 'just' culture – i.e. trust and openness over health and safety
- Risk awareness in decision-making
- Organisational capability, i.e. sufficient competency and adequate resources
- A learning organisation

In total, 9 participants were interviewed. All of these interviews were conducted by telephone and lasted between 40 minutes to an hour and a half. The interviews took place in July 2006. There was variation in the extent that participants were able to address the issues posed in the question set, which was due to differences in experience and differing areas of research interest, but was also indicative of the open discursive approach required to investigate an area of knowledge that is far from discrete or defined absolutely.

After data collection was completed, a thematic analysis of each interview transcript was produced. The results from each interviewee were then summarised in a thematic overview. The overarching themes from this analysis are given in Section 3.

3 FINDINGS

3.1 INTERVIEW ONE

An academic and writer, the interviewee has been researching the area of safety management for the last 20 years.

Factors associated with success in health and safety management

- Safety Management - The area is perceived as relatively mature, with over thirty years of research and regulatory attention dedicated to safety management.
 - Research in safety management has been able to define the structure and content of the safety management system, as reflected in the model of risk management outlined in the research. One of the perceived weaknesses in the area is defining how the structure of safety management should work effectively and be implemented in practice. The order in which each part of the safety management system should be introduced is subject to debate.
 - A debate existed about 15 years ago questioning if safety management was just another version of quality management, this debate still influences current thinking. The interviewee believes that achieving safety by implementing a quality system is not viable because they are intrinsically different in their detail, such that a management system that concentrates on developing a deeper understanding of critical processes achieves safety.
 - An observation from this is that a management system should be developed to become a dynamic learning process for organisations rather than simply a static model. A key to which is to better understand the processes and how they can be implemented effectively in relation to the defined 'skeleton' of a safety management system.
- Research, at the social level, is developing to address the issue of effective implementation, and in part focuses on issues of culture and behavioural change, e.g. the idea of cultural maturity developed by the Keil centre. This focus on implementation is reiterated within the literature that highlights that one key feature of a successful safety management system is to encourage management 'buy in'. It is believed that if this is not adequately addressed any attempts of putting in cultural change or behavioural modification programmes might fail.
- One of the main weaknesses of research in this area is the lack of effective methodology to adequately define, match and measure 'good' and 'bad' performing companies. Harry Shannon and Linda Robson conducted a comprehensive review of the literature and found only a handful of studies that utilised an adequate methodology.

Other Factors

- Standards - At present standards (such as OHSAS 18000) are produced by the distillation of experts' practice and not empirical evidence. The interviewee is deeply critical of standards and would prefer some formal evaluation and critical assessment of expert opinion. For example, using expert judgement in a way that is transparent and traceable, getting experts to give their rating/weightings of different items to gauge more empirically the level of consensus that can be established.
- Research - One observation was that practice could be an effective tool to guide further research by identifying gaps in knowledge. Therefore the interviewee would like to see greater mutual interdependence between theory and practice such that each informs the development of the other.

3.2 INTERVIEW TWO

The interviewee is an academic whose views come from years of research on health and safety management.

Factors associated with success in health and safety management

- The most significant factor by far is commitment to health and safety, as demonstrated to the organisation through effective senior management leadership. Evidence for the impact of leadership on health and safety practice comes from personal empirical research conducted by the interviewee, and that of colleague Rhona Flin, over a number of years, supporting the general conclusions of others in the literature.
 - Effective management overrides effects of national and local culture, and influence of workmates.
 - Transformational leadership has been shown to be effective in motivating the organisation beyond compliance.
 - Management function of an organisation needs to promote consistent, visible prioritisation of safety over production issues.
- Recent research showed that companies with good health promotion programmes had better accident reporting schemes and fewer accidents than those organisations without such programmes. This effect has been interpreted as resulting from managers' demonstration of commitment to health and safety.

Other Factors

- Reporting/learning culture - Confidential reporting systems have aided more accurate recording of accidents, from which the organisation can learn. This is based on evidence from aviation and the writings of James Reason including 'Organisational causes of accidents'.
- Organisational support – Dealing promptly and adequately with issues raised by the workforce demonstrates support for the workforce needs by the organisation. This support can include such aspects as providing the necessary equipment for safety. Indeed, this factor is considered important for other aspects of business performance, and is also indicative of management commitment to health and safety.
- Employee involvement – Consistent evidence suggests that employees perform more safely with a participative approach from management. Additionally a study by Oresund Bridge indicates that employee training and stability are also factors that have an impact on effective health and safety management.
- Good health and safety performance is associated with both safety climate and 'safety management practice' – e.g. audit. The interviewee believes that both are symptomatic of overall safety culture (safety management practice linked to management safety culture, safety climate to overall staff culture).

3.3 INTERVIEW THREE

An academic with a great deal of experience with nuclear and other high-hazard industries.

Factors Associated with success in health and safety management

- Much of the interviewees experience has been with nuclear and other high-hazard industries. Based on experience and personal research the most important success factors for health and safety are leadership and ‘followship’, and trust.
- Leadership for safety - In the experts opinion it is important that leadership is ‘distributed’ throughout the organisation, i.e. there are leadership skills at all levels, not just top managers but down to first line supervisors. Indeed, there is ample evidence that management development training, and ‘upskilling’ managers, does have a lasting impact on behaviour, by analogy training in safety leadership should too.
 - The interviewee suggested that leadership skills learnt in contexts other than health and safety are not always appropriate and that managers need to learn health and safety leadership specifically.
 - Leadership is linked to organisational learning when it is ‘embedded learning’.
- Trust between managers and staff is considered important for many issues, not just health and safety.
 - Trust is seen to be important for a learning culture, so that issues get discussed openly.
 - ‘Fair’ challenge to staff by management is generally seen as legitimate by employees.

Other Factors

- Worker Involvement - Health and safety management needs to be both top-down and bottom-up, employee-participation is posited as particularly important. Health and safety management therefore needs to be active, not passive.
- Organisational Management – Managers have found Key Performance Indicators very useful, but they need to be lead indicators and more process based. Emphasis needs to be placed on a company’s ability to measure their success and implement the necessary changes.
- Beyond HSG65 - The interviewee believed that companies have moved to more value-driven approaches in the years since HSG65. They suggested that an approach that the Health and Safety Executive might take would be to:
 - Present the ‘up-side’ – the health and other benefits to the company, as opposed to risks avoided.
 - Provide diagnostics.
 - Provide case-studies.
 - Position as part of being seen as ‘modern’ in management – make it ‘sexier’ for managers.

3.4 INTERVIEW FOUR

As an HSE employee the interviewee's comments are based on experience. With a background in Human Factors he is currently working on the management standards for work related stress.

Factors associated with success in health and safety management

- The participant felt that all the theoretical developments that have been identified in the question set will provide robustness to managers' approach and implementation of risk management practices. The following factors were highlighted:
 - Business Case - It is suggested that any approach to health and safety management will have to be increasingly aligned to a business led approach, as opposed to a discrete management function. This will help to convince managers of the benefits of this approach.
 - Management Commitment - Senior management commitment is a key to any effective health and safety management initiative.
 - Management Competency - Effective health and safety management requires effective managers. Management competency can be defined as the ability of managers to manage all areas of the businesses including health and safety effectively.

Other Factors

- Measurement of health and safety performance - Measurement and benchmarking regarding health and safety issues provide a useful tool for companies to understand their position relative to that of better performing organisations, and to clarify the norms and expectations for health and safety performance within specific industrial contexts.
- The Future - Advancement of any health and safety guidelines HSE offer will need to include increasingly relevant health related topics such as fatigue, shift work, muscular skeletal disorder, psychosocial hazards and so on. This means moving towards a proactive approach to prevention by developing an individual, worker based approach to health and safety issues that would ideally incorporate secondary prevention and include schemes such as return to work and rehabilitation.

3.5 INTERVIEW FIVE

A member of HSE's Nuclear Safety Directorate the interviewee has contributed to the Safety Assessment Principles, his opinions are based on experience.

Factors associated with success in health and safety management

- Research – Distilling experience of organisational failures from around the world and different disciplines helps practical tools and techniques to be developed and identified for use in industry. Particularly effective for duty holders is the use of case study evidence from high profile real life accidents. They can be poignant for many companies as they describe familiar processes and highlight the devastation and cost that can arise due to an accident.
 - A great deal of information can be gained from research from eminent business schools such as Michigan and Massachusetts. Actively disseminating pragmatic research of this nature can help persuade duty holders to adopt effective health and safety systems.
- Safety Assessment Principles - The principles combine the key features of effective safety management arising from current national law and guidance, and good safety management practice. They also combine the lessons learned from serious incident investigations such as those contained in the Columbia Accident Investigation Report, and the work of researchers who have examined the operation of high reliability organisations. These principles reflect areas highlighted by other participants, and include:
 - Leadership – Through effective leadership directors, managers and leaders at all levels should focus the organisation on establishing the safety strategies, policies, plans, goals and standards for safety and ensure that they are delivered throughout the organisation.
 - Capable organisation - The organisation should have the requisite skills, knowledge and resources within its human resource. This means having the necessary competences and knowledge in sufficient numbers so as to maintain the capability to manage safety reliably in all foreseeable circumstances, including steady state conditions, periods of change and emergency situations.
 - Decision-making - Decisions at all levels that affect safety should be rational, objective and transparent. Decisions should be made after ensuring that relevant available data and opinions are collected and considered, respecting and encouraging the contribution of those with divergent views.
 - Learning - Lessons should be learned from internal and external sources to continually improve leadership, organisational capability, safety decision-making and safety performance.

Other Factors

- Active challenge – The guidelines described above aim to provide a process to challenge duty holders and licensees' current health and safety methods. This analytical process goes beyond reactive inspection by identifying for duty holders the knowledge and skills to challenge themselves and continue to learn, thus implementing their own solutions to problems. It also highlights the need for organisations to be sufficiently motivated to implement the lessons they have learned.

3.6 INTERVIEW SIX

As a Corporate Inspector for British Energy the interviewee has a vast amount of experience of the Nuclear Industry and health and safety management principles, his comments are based on experience and literature he has read.

Factors associated with success in health and safety management

- Safety management is not a separate activity from the function of managing the business. Managing the risks from major hazards should be regarded as an application of high reliability general management that provides direction and oversight to create a climate that establishes a strong safety culture that underpins safe operation.
 - Safety is an emergent property of the socio-technical systems which comprise the business, and involves the interaction of systems for both the technology and the people.
- Management Capability - The ability of the manager to manage people and processes is critical to the effectiveness, progression and adoption of health and safety systems.
 - Decision-Making - Some of the key elements to effective management include the quality of decision-making. What is often overlooked is the quality of the decision making process, with the emphasis placed on the outcome that is then rewarded accordingly. Although one cannot control complexity or eliminate uncertainty an element of robustness to include contingency and emergency planning would improve decision-making.
 - Consensus – One of the main issues when implementing health and safety systems is effective decision making. This involves the workforce and managers developing a shared understanding of the initial problem so that it is adequately framed in order to define the solution in a way that is jointly constructed. The implication is that one of the key facets of health and safety management is in implementing workforce involvement in the risk management decision-making process.

Other Factors

- Procedures – Explicit procedures can be problematic for the organisation as reducing processes into a script of tasks takes the responsibility and accountability for health and safety away from the worker. Although such procedures are explicit and capture the learning of the organisation, ownership of the job is taken away from the worker, which reduces the amount of control the job incumbent has for each task.
- Promoting Research – For research to be more beneficial to industry and to promote the use of safety systems it needs to be more accessible to managers. Terminology should be clearly explained and the information should be clear and understandable thus benefiting implementation.

3.7 INTERVIEW SEVEN

A member of the Nuclear Safety Directorate the interviewee has a range of experience on which he bases his comments.

Factors associated with success in health and safety management

- Health and safety is an integral part of the basic management model. Good performance is about having competent managers that see health and safety as another business process that needs to be managed efficiently. Competent managers are those that understand the hazards facing their industry, and then effectively lead and supervise their workforce in managing those risks.
- Management commitment - One of the key factors to effective health and safety practices is management commitment and competence. Ensuring commitment can be defined as encouraging managers to take ownership of the health and safety processes, whilst understanding that they are responsible and accountable for their actions. Issues that were discussed regarding this, include:
 - Demonstrating the value of effective health and safety management as a business case. It is important to promote this to managers in a meaningful way in order to encourage their commitment to health and safety. The implication is that any model or guidance for health and safety management should include a persuasive element that describes the benefits of the approach to the audience. Additionally, the aim should be to reduce the barriers that may inhibit managers from implementing health and safety systems by ensuring that guidelines are simple and practical to use.

Other Factors

- Frameworks for measuring health and safety management - In order to measure a company's health and safety practice it is necessary to be able to audit health and safety activity. It is believed that HSG65 provides an appropriate framework for measurement of health and safety, through consistent and transparent assessment processes.
- Research – It is the belief of the interviewee that sufficient research exists on health and safety management systems and that no further research is needed to inform subsequent iterations of health and safety management models.

3.8 INTERVIEW EIGHT

The interviewee has been working for HSE, specialising in the mining industry for many years. His views are based on his experiences.

Factors associated with success in health and safety management

- Management buy in – The participant felt that all the theoretical developments that have been identified in the question set should be seen as inherently interlinked. However, for them to exist and be effective senior management commitment to facilitate each initiative aimed at the area is critical. To persuade managers to adopt appropriate health and safety strategies, a clearer link between health and safety and business costs and efficiency should be defined.
- Competent management of process - The key to effective health and safety management is to manage processes to a predictable outcome. Latent failures in processes such as maintenance can ultimately lead to an accident. Therefore management commitment and competency in managing and maintaining systems at source can help reduce the likelihood of an accident. Though it should be noted that this defines the areas that should be managed, but does not prescribe how they should be managed.
- Risk assessment - Effective health and safety management is dependent on the organisation understanding the level of risk their operations pose and being able to plan the detail of how the risk will be managed in order to reduce the likelihood of an unpredictable outcome.
- Worker Involvement – One of the keys to successful implementation of health and safety is to actively involve the workers throughout the risk management decision-making process. In the initial decision making stage it is important to encourage involvement with the workforce, so their expertise and opinion on how things can be improved can be incorporated. Through out the process it is necessary to obtain worker feedback to assess the impact of the change and to address problems as they occur.

Other Factors

- Agenda for action – In the interviewee’s experience using the HSE’s Climate survey tool enabled an agenda for action to be established by the organisation. The tool can be used to encourage greater discourse between the workforce and management regarding the risk management decision-making process.
- Decision-making - The quality of the decisions that organisations and their workforce make affects the likelihood of an accident occurring. The implementation of any health and safety model should reinforce the potential for effective decision making at both the individual and organisational level. Root cause analysis of accidents shows four main decision making flaws at the level of the individual, namely;
 - Non-compliance with codes and rules: - Making a decision not to follow the rules.
 - Non-compliance with recognized good practice: - Making a decision not to follow procedural safety.
 - Improvisation: -The worker decides to use an alternative tool or procedure for a specific job.

- Lack of caution: - This demonstrates a disregard for conscientious risk based decision-making.
- Guidelines - A strategy for future guidelines based on industry feedback would be to simplify the content of the literature and focus on practical solutions for organisations to implement.

3.9 INTERVIEW NINE

An employee of HSE, the interviewee's views are based on experience and literature gained from his recent MBA qualification.

Factors associated with success in health and safety management

- The participant perceives the most important factor for health and safety management is organisational capability, demonstrated by the 'fit' between the competency of the organisation and its management and production processes.
 - To manage the 'fit' businesses need to be aware of their capabilities and have a large degree of organisational sophistication. This view is based on a distillation of the literature on management from such authors as Jim Collins, John Kotter and Tom Peters. These propose defining the aims and objectives of an organisation based on the skills and knowledge of the people employed to then sell a product or service.
 - A successful organisation can be defined through organisational capability and its ability to manage change effectively. The capability of an organisation is also dependent on its ability to make good decisions. The extent to which it knows and understands its capabilities and makes choices based on those determines the extent to which an organisation finds itself successful or not.

Other factors

- Models – Organisational activity should not be reduced to a series of boxes with arrows between them. This depiction of activity is too mechanical, structured and linear. Health and safety guidelines should not just describe these linear processes, but encourage businesses to understand their capabilities and strategic fit in relation to the risks they manage. This could potentially encourage organisations to be more self-reflective regarding their risk management approaches and performance, and so foster increased responsibility for managing health and safety risks effectively. Though this approach does not indicate how to deal with companies that cannot be sufficiently motivated to take increased responsibility for risk management.
- Consensus – Generating and maintaining a consensus among workers is an effective way to achieve health and safety goals. Once people have a consistent understanding of the problem they can agree and work together towards a solution.
- Research - Human factors research is a very valuable area that opens up further discussion about how and why risks are taken and accidents occur. The area should not be treated as an addition but as an intrinsic process in any investigation as it has consequences for other industries where human concentration, response, and error are critical.

4 SUMMARY OF FINDINGS

- The body of research relating to health and safety management was perceived as relatively mature by the participants, with over thirty years of research and regulatory attention dedicated to the area.
- Participants felt that research in safety management has been able to successfully define the structure and content of effective safety management systems. However, there was less agreement in defining the factors that determine how the structure of safety management should be implemented in order to work effectively in practice.
- One observation was that a greater alignment between academic theory and practice, such that each informs the development of the other, could be beneficial in defining the factors that determine how the structure of safety management should be implemented in order to work effectively in practice.
- Participants stated that one of the main weaknesses of research in this area is the lack of effective methodologies that adequately define, match and measure 'good' and 'bad' performing companies. A comprehensive review of the literature has been conducted and found only a handful of studies that utilised adequate methodology.
- There was also some criticism regarding the lack of transparency of expert judgement, particularly in relation to the development of standards such as OHSAS 18000.
- According to the opinions of the interviewees, a key feature of a successful safety management system is visible management commitment to that system, especially the consistent, visible prioritisation of safety over production issues.
- The participants interviewed considered that it was important to associate the features of effective health and safety management with their benefits to dutyholders. To persuade managers to adopt health and safety strategies, participants thought a clearer link between effective health and safety management and business costs and efficiency should be defined.
- There was agreement among the experts interviewed that safety management is not a separate activity from the function of managing the business, but is an integral part of the basic management model. Effective health and safety performance is associated with competent managers who perceive health and safety as another business process that needs to be managed efficiently.
- Consensus among the experts interviewed suggests that effective health and safety management requires effective managers, and that management competency is a key determinant of effective health and safety practices and behaviours. Management competency can be defined as the ability of managers to manage all areas of the businesses including health and safety effectively. However, there is debate regarding what precisely constitutes an effective manager, and management competency.
- The participants suggested that an organisation's capability to manage risk is associated with its awareness of the level of risk posed by its operations, and with the ability to plan and implement the detail necessary to reduce the likelihood of an unpredictable outcome.

- However, it was felt that the capability of an organisation to manage risk is also dependent on its wider ability to make effective decisions. It was suggested that emphasis should be placed on the quality of the decision-making process. Decisions at all levels that affect safety should be rational, objective and transparent, and address issues of contingency and emergency planning. Decisions should be made after ensuring that relevant available data and opinions are collected and considered, respecting and encouraging the contribution of those with divergent views. This has potential implications regarding the development of a future health and safety model, in that the model should reinforce the potential for effective decision making at both the individual and organisational level.
- Many participants posited that effective health and safety management also requires involving the workers throughout the processes of risk management decision-making. This wider engagement process can serve to: increase the discourse on health and safety amongst different operational levels of an organisation; underscore management commitment to health and safety; clarify the expectations regarding the norms and behaviours associated with health and safety; and utilise local knowledge in the practical aspects of managing risk. The issue of trust between staff at differing organisational levels is central to the success of any process of engagement.
- There was agreement that models of health and safety management exist to give organisations guidance for the optimal processes required for contributing to the effective control and sustained reduction of incidents. However, the participants were critical of these models for neglecting the dynamic nature of organisations, and reducing organisational activity to a mechanical, structured and linear process.
- It was suggested that there is potential for future developments for health and safety management systems to be more value driven, and to be sufficiently sophisticated to encompass individual organisational diversity and context. These models should also address such issues as equipping duty holders with the knowledge and skills to challenge their health and safety performance.
- The development of any future health and safety model or guidelines will need to be sufficiently broad in scope to address health related issues. This could entail a proactive approach to prevention and the maintenance of individual wellbeing, and would ideally incorporate secondary prevention and include schemes such as return to work and rehabilitation.
- The participants stated that findings from the literature on human factors (at both the individual and group level) should be formally incorporated as an intrinsic consideration for the implementation of a model of safety management.

5 REFERENCES

The following references were gathered from each participant. The references are used to embellish the points of view expressed by the interviewee whilst also directing the reader to a broader range of literature on the subject of health and safety management.

5.1 INTERVIEW ONE

Ale B.J.M., Bellamy L.J., Cooke R.C., Goossens L.H.J., Hale A.R., Roelen A. & Smith E. 2004. *Development of a causal model for air transport safety*. Safety Science Group. Delft University of Technology.

Alme, I. A. (1998) *A safety audit approach for quantifying management control of risk*. Graduation Diploma. Safety Science Group. Delft University of Technology.

Amalberti R. 2000. The paradoxes of almost totally safe transportation systems. *Safety Science* 27 (2/3) 109-126

Anderson M. 1997. *The development of site-specific failure rates for use in risk assessments of major hazard sites: a case study of road tanker loading operations*. Report for I-Risk Work package 2. HSE. Sheffield

Badger & McCare 1936. *Elements of chemical engineering*. 2nd Edition. New York: McGraw Hill

Bailey, C.W. and Petersen, D. (1989). Using perception surveys to assess safety system effectiveness. *Professional Safety* February, 22-26.

Bainbridge L. 1987. *The ironies of automation*. In Rasmussen J., Duncan K.D. & Leplat J. (Eds.) *New Technology & Human Error*. London. Wiley. Pp 271-283.

Baram M. 1997. Shame, blame & liability: why safety management suffers organisational learning abilities. In Hale A.R., Wilpert B. & Freitag M. (Eds.) *After the event: from accident to organisational learning*. Pergamon. London. Pp161-178.

Baram M. 1998. Process safety management and the implications of organisational change. In Hale A.R. & Baram M. (Eds.) *Safety management: the challenge of change*. Pergamon. Oxford. Pp 191-205.

Beaumont P. & Else D.E. 1990. Sharing solutions - The SHARE programme. *Journal of Safety and Health* Vol 4 pp15-20

Bellamy L.A. 1998a. *Technical model parameters management systems*. Document prepared for CEC I-Risk.. SAVE. Apeldoorn. March

Bellamy L.A. 1998b. *Interface management sub-systems*. Document prepared for CEC I-Risk.. SAVE. Apeldoorn. March

Bellamy, L.J. et al (1995) *Organisational Factors and Safety In the Process Industry*. Ministerie van Sociale Zaken en Werkgelegenheid, Den Haag, The Netherlands.

Bellamy L.J., Papazoglou I.A., Hale A.R., Aneziris O.N., Ale B.J.M., Morris M.I. & Oh J.I.H. 1999. *I-Risk: Development of an integrated technical and management risk control and monitoring methodology for managing and quantifying on-site and off-site risks*. Contract ENVA-CT96-0243. Report to European Union. Ministry of Social Affairs and Employment. Den Haag.

Bellamy L.J., & Tinline G. 1993. *Development of a safety management system audit which addresses loss of containment risks on major hazard installations*. Paper to 3ASI Conference. Milan. Nov.

Bellamy J.L. & Wright S. M., Hurst W. *History and development of a safety management system audit for incorporation into quantitative risk assessment*. International process safety management Conference and Workshop San Francisco California Part II. September 1993.

Benner Jr. L. 1985 *Rating Accident Models and Investigation Methodologies*. In: Journal of Safety Research 16(3):105-126, Fall.

Berends, J.J. (1995b). *Developing and using a widely applicable measurement tool for safety culture*. Unpublished interim report. Eindhoven: Eindhoven University of Technology.

Berends, J.J. (1996). *On the measurement of safety culture*. Unpublished graduation report. Eindhoven: Eindhoven University of Technology.

van Berkel C.H. 1993. Implementatie van de veiligheidschecklist aannemers (VCA) voor de petrochemische industrie (*Implementation of the safety checklist for contractors in the petrochemical industry*). Master thesis, Management of Safety, Health and Environment, Delft University, Safety Science Group. Delft.

Bernstein P.L. 1996. *Against the Gods: the remarkable story of risk*. Wiley. Chichester.

Bird F.E. 1966. *Damage Control*. Insurance Company of North America. Philadelphia.

Bird F.E. & Germain G.L. 1985. *Practical loss control leadership*. Institute Publishing. ILCI. Georgia.

Bird F.E. & Loftus R.G. 1976. *Loss control management*. Loganville Georgia. Institute Press.

Blanton M.L. & Montgomery E.W. 1991. *Contractor safety: matching owners and contractors*. Proceedings of the First International Conference on Health, Safety and Environment. The Hague. Society of Petroleum Engineers, Richardson, Texas. Paper SPE 23255. pp 487-496

Bolman L.G. & Deal T.E. 1984. *Modern approaches to understanding and managing organizations*. Jossey-Bass. San Francisco.

Bourrier M. 1998. Elements for designing a self-correcting organisation: examples from nuclear plants. In Hale A.R. & Baram M. *Safety management: the challenge of change*. Pergamon. Oxford.

Boyle A.J. 1994. QUEST. *Proposal for an integrated safety information system for health and safety management*. HASTAM. Birmingham.

Brascamp M.H., Koehorst L.J.B. & van Steen J.F.J. 1992. *Management factors in safety*. Dept of Industrial Safety. TNO. Apeldoorn.

British Standards Institution 1996. BS 8800: *Guide to health and safety management systems*. London. British Standards Institution.

British Standards Institution. 1999. OHSAS 18001:1999. *Occupational health and safety management systems*. Specification. London. BSI.

Budworth, N. (1996). Indicators of performance in safety management. *The Safety & Health Practitioner* November, 23-29.

Cabrera D.D. & Isla R. 1998. The role of safety climate in a safety management system. In Hale A.R. & Baram M. (Eds.) *Safety management: the challenge of change*. Pergamon. Oxford. Pp 93-105.

Cabrera, D.D., Isla, R. and Vilela, L.D. (1997). An evaluation of safety climate in ground handling activities. In: Soekkha, H.M. (ed.), *Aviation safety*, Proceedings of the IASC-97 International Aviation Safety Conference, The Netherlands, August 27-29, 255-268.

Canter D., Chalk J., Donald I., King-Johannessen K., Lewand K. & Thrush D. 1990. *The effects of organisational management and human factors on accidents in steel plants*. University of Surrey, Psychology Dept., Safety Research Unit.

Carthey J., Hale A.R., Heming B., & Kirwan B. 1994. *Extension of the model of behaviour in the control of danger: Literature review and analysis of model development needs*. Report to the Health & Safety Executive. UK. February. Industrial Ergonomics Group, School of Manufacturing & Mechanical Engineering, University of Birmingham.

Center for Chemical Process Safety. 1993. *Guidelines for auditing process safety management systems*. American Institute of Chemical Engineers. Washington.

Chaplin R.P.E & Hale A.R. 1998. An evaluation of the use of the International Safety Rating System (ISRS) as intervention to improve the organisation of safety. in Hale A. & Baram M. (eds.) *Safety management: the challenge of change*. Pergamon. London pp 165-184.

Cock, G. de., Bouwen, R., Witte, K. de, 1986. Organisatieklimaat. Een opdracht voor het personeelsbeleid (*Organisational climate, an assignment for personal management*) Praktisch Personeelsbeleid, Capita selecta. 16 p. 1-20

Cohen A. 1977. Factors in successful occupational safety programmes. *Journal of Safety Research*. 9. 168-178.

Cohen A. & Cleveland R.J. Safety practices in record-holding plants. *Professional Safety*. 1983.

Cohen A., Smith M., Kent J. & Anger W. 1979. Self-protective measures against workplace hazards. *Journal of Safety Research*. 11(3). 121-131.

Cooke, R.M. 1991. *Experts in Uncertainty – Opinion and Subjective Probability in Science*. Environmental Ethics and Science Policy. Oxford University Press. Oxford.

Cooke, R.M., Solomatine, D. (1990) *EXPO - Integrated System for processing expert judgements: User's Manual - Version 1.2*. Report to the Dutch Ministry of Housing, Physical Planning and Environment. Delft University of Technology.

- Cooper, M.D. and Philips, R.A. (1994). *Validation of a safety climate measure*. Paper presented at the British Psychological Society, Annual Occupational Psychology Conference, Birmingham, January 3-5.
- Cottam M.P. 1999. Certification of occupational health & safety management systems. In Schueller G.I. & Kafka P (Eds.) *Safety & Reliability*. Balkema. Rotterdam.
- Cownie, A.R. & Calderwood, J.H. 1966. Feedback in accident control. *Operational Research Quarterly* 17, 253-262 & 310-314
- Coyle, I.R., Sleeman, S.D. and Adams, N. (1995). Safety climate. *Journal of Safety Research* 26(4), 247-254.
- Cox, S. and Cox, T. (1991). The structure of employee attitudes to safety: An European example. *Work & Stress* 5(2), 93-106.
- Cox, S. and Flin, R. (1998). Safety culture. Philosophers' stone or man of straw? *Work & Stress* 12(3), 189-201.
- CPR. 1979. *Methods for calculating the physical effects of incidental releases of dangerous materials*. (Yellow book). Parts 1 and 2. (in Dutch). Commissie Preventie van Rampen. Voorburg.
- Craft M.L. 1991. *Implementation of corporate contractor safety guideline*. Proceedings of the First International Conference on Health, Safety and Environment. The Hague. Society of Petroleum Engineers, Richardson, Texas. Paper SPE 23252. pp 457-464.
- J. Culvenor, Driving the science of prevention into reverse, *Safety Science* 27 (1) (1997) pp. 77-83.
- Davoudian K., Wu J-S. & Apostolakis G. 1994a. Incorporating organisational factors into risk assessment through the analysis of work processes. *Reliability Engineering and System Safety*. 45(1-2). 85-105.
- Dawson S., Poynter P. & Stevens D. 1984. Safety specialists in industry: roles, constraints and opportunities. *J. Organisational Behaviour*. 5 253-270.
- Deal, T.E. and Kennedy, A.A. (1982). *Corporate cultures*. Reading, Mass.: Addison-Wesley.
- Dedobbeleer N. & B9land F. *Safety climate in construction sites*. International Conference Strategies for Occupational Accident Prevention. Stockholm. September 21-22. 1989.
- Dedobbeleer N & B9land F. A safety climate measure for construction sites. *Journal of Safety Research*. 1991. 22(2). 97-103.
- Deming, R., 1968. *Characteristics of an effective management control system in an organisation*. Boston.
- Deming W.E. 1990. *Out of crisis: quality, productivity and competitive position*. Cambridge. Cambridge University Press.

Department of Energy. 1990. *The public enquiry into the Piper Alpha disaster*. (Cullen report). London. HMSO.

Department of Employment. 1975. *The Flixborough disaster: report of the Court of Enquiry*. London. HMSO.

Department of Transport. 1987. *Report of the formal investigation into the sinking of the Herald of Free Enterprise*. (Sheen report) London. HMSO.

Department of Transport. 1988. *Investigation into the Kings Cross underground fire*. (Fennel report) London. HMSO.

Department of Transport. 1989. *Investigation into the Clapham Junction railway accident* (Hidden report) London. HMSO.

Det Norske Veritas. 1994. *International Safety Rating System*. 6th Edition. International Loss Control Institute. Georgia.

Diaz Cabrera D. 1994. *Some measures for the evaluation of safety courses*. Paper to 23rd International Congress on Applied Psychology. Madrid.

Donald I. 1994. *Profiling safety climates*. Paper to 23rd International Congress on Applied Psychology. Madrid.

Donald, I.J. and Canter, D.V. (1994). Employee attitudes and safety in the chemical industry. *Journal of Loss Prevention in the Process Industry* 7(3), 203-208.

Douglas M. & Wildavsky A. 1982. *Risk and culture*. University of California Press. Berkeley.

Drucker P.F. 1954. *The practice of management*. Harper. New York.

Drucker P.F. 1961. *The practice of management*. London. Mercury Books.

Duijm, N-J., Hale, A.R., Goossens, L.H.J. & Hourtolou, D. 2004. Evaluating and managing safety barriers in major hazard plants. In C. Spitzer, U. Schmocker & V.N. Dang (Eds). *Probabilistic Safety Assessment & Management*. Berlin: Springer. 110-115

Duijm, N-J., Madsen, M., Andersen, H.B., Goossens, L.H.J., Hale, A.R., Guldenmund, F. & Hourtolou, D. 2004. *ARAMIS project: Effect of safety management's structural and cultural factors on barrier performance*. Proceedings of the Loss Prevention Conference. Prague.

Duijm N. J., Salvi.O. (editors). New stakes and opportunities in the control of major accident hazards in Europe: outputs from the ARAMIS Project. *Special issue of the Journal of Hazardous Materials (in press)*

Dupont. 1986. *Safety Training Observation System (STOP)*. Wilmington, Delaware. Dupont de Nemours.

Dwyer T. 1991. *Life and death at work: industrial accidents as a case of socially produced error*. New York. Plenum.

E & P Forum. 1994. *Guidelines for the development and application of health, safety and environment systems*. London

Eagly, A.H. and Chaiken, S. (1993). *The psychology of attitudes*. Fort Worth: Harcourt Brace Jovanovich.

Eichendorf W. 2002. *The German employer model for accident prevention in SMEs*. Keynote presentation to the Inaugural Conference of the International Network on the Prevention of Accidents & Trauma at Work. Elsinore. 3-6 September. <http://www.workingonsafety.net>

Ekvall, G. (1983). *Climate, structure and innovativeness of organisations*. Working paper of The Swedish Council for Management and Organisational Behaviour.

Else D.E. 1986. Data banks for sharing solutions. *Journal of Occupational Health and Safety (Australia & New Zealand)*. v2 pp 340-346.

Elesa K.J. & Conger D.S. 1983. *Management Oversight and Risk Tree*. In: the Risk Report, Vol. VI, no. 2. International Risk Management Institute.

Erickson, J.A. (1997). The relationship between corporate culture and safety performance. *Professional Safety* May, 29-33.

European Economic Community 1985. A council resolution over the new approach to standardisation and harmonisation. *Journal of the EEC*. 7 May.

European Commission 1989 Directive concerning the execution of measures to promote the improvement of the safety and health of workers at their work and other subjects (Framework Directive). *Official Journal of EC*. 12 June 1989.

Eyssen G.McK, Hofmann J.E. & Spengler R. 1980. Managers attitudes and the occurrence of accidents in a telephone company. *J. Occupational Accidents*. 2 (4) 291-304.

Fischhoff B., Slovic P. & Lichtenstein S. (1978). Fault trees: sensitivity of estimated failure probabilities to problem presentation. *J. of Experimental Psychology: Human Perception and Performance* 4:2, 330-344

Flanagan J.C. 1954. The critical incident technique. *Psychological Bulletin* 51. 327-358.

Four Elements. 1994. *Managers' guide to the prototype process safety management audit technique*. London. Four Elements.

Frick K. 1989. *Can management control health and safety at work? Swedish Centre for Working Life*. Stockholm.

Friedlander, F. and Margulies, N. (1969). Multiple impacts of organizational climate and individual value systems upon job satisfaction. *Personnel Psychology* 22, 171-183.

Gehman H.W. 2003. *Columbia Accident Investigation Board Report*. National Aeronautics and Space Administration, Washington

Geller, E.S. (1994). Ten principles for achieving a Total Safety Culture. *Professional Safety* September, 18-24.

Gill J. & Martin K. 1976. Safety management: reconciling rules with reality. *Personnel Management*. 8 (6) 36-39.

Glendon A.I. & McKenna E.F. 1995. *Human safety & risk assessment*. Chapman Hall. London.

- Glick, W.H. (1985). Conceptualizing and measuring organizational and psychological climate: Pitfalls in multilevel research. *Academy of Management Review* 10(3), 601-616.
- Goossens L.H.J., Cooke R.M., Woudenberg, F. & van der Torn P. 1993. *The Application of formal Expert Judgement for Establishing quantitative Assessments*. Proceedings of the SRA-Europe 4th Conference on European technology & Experience in Safety Analysis and Risk Management, Vol. III. Rome.
- Great Britain. 1974. *Safety and Health at Work etc. Act 1974* (c.37). HMSO. London.
- Groeneweg, J., 1992. *Controlling the controllable*. Doctoral Thesis, University of Leiden.
- Groeneweg, J. 1998. *Controlling the controllable: the management of safety*. DSWO Press. Leiden. 4th edition.
- Guastello S.J. 1993. Do we really know how well our occupational accident prevention programs work? *Safety Science*. 16(3/4). 445-464.
- Guion, R.M. (1973). A note on organizational climate. *Organizational Behavior and Human Performance* 9, 120-125.
- Guldenmund, F., 2000. The nature of safety culture: a review of theory and research. *Safety Science* 34. (1-3) 215-257.
- Guldenmund F., Hale A.R. & Bellamy L.J. 1999. *The development and application of a tailored audit approach to major chemical hazard sites*. Proceedings of the international conference on Seveso 2 Directive. Athens. November. Safety Science Group, Delft University of Technology, Delft, the Netherlands.
- Guldenmund, F., Hale, A.R., Goossens, L.H.J. Betten, J. & Duijm, N.J. 2005. The Development of an Audit Technique to Assess the Quality of Safety Barrier Management. *J. Hazardous Materials* 130 (3) 234-241
- Haber S.B., O'Brien J.N., Metlay D.S. & Crouch D.A. 1987. *Influence of organisational factors on performance reliability: overview and detailed methodological development*. NUREG/CR 5538 vol 1 US Nuclear Regulatory Commission.
- Haber S.B., Metlay D.S. & Crouch D.A. *Influence of organisational factors on safety*. Proceedings of the Human Factors Society. 1990. 871-875.
- Haddon Jr. W. 1966. *The Prevention of Accidents*. In: Preventive Medicine, Little Brown, Boston,
- Haddon Jr. W. 1973. *Energy Damage and the Ten Counter-Measure Strategies*. Human Factors Journal, August.
- Haddon W. Jr., Suchman E.A. & Klein D.A. 1964. *Accident research: its methods and approaches*. Harper & Row. New York.
- Hale, A.R. 1978. *The role of HM Inspectors of Factories with particular reference to their training*. PhD Thesis. University of Aston in Birmingham. UK.

- Hale, A., 1985. *The paradox of the human factor in technology and safety*. Inaugural Lecture, Delft University of Technology, the Netherlands.
- Hale A.R. 1987. *Subjective Risk*. In Singleton W.A. & Hovden J. Risk & decisions. Wiley. Chichester.
- Hale A.R. 1989. *The training of professionals in prevention*. in Proceedings of the ISSA Conference on Education and Training in Prevention. Paris, CRAMIF.
- Hale A.R., 1990. Learning to live with risks. *J. Occupational Accidents*. 13. 33-45.
- Hale A.R. 1990 Safety rules OK? Possibilities and limitations in behavioural safety strategies. *J. Occupational Accidents*. 12 3-20
- Hale A.R. 1994. Quis custodet? Implications of certification and regulatory systems for expert manpower and training. In *Insurance and Prevention: some thoughts on social engineering in relation to externally caused injury and disease*. Ed. Larsson T.J. & Clayton A. Stockholm. IPSO (ISBN 0182-0108).
- Hale A.R. 1995. Occupational Health and Safety Professionals and Management: identity, marriage, servitude or supervision? *Safety Science* 20(2-3) 233-246
- Hale A.R. (1995). Modelling integrated working conditions management systems. Paper to Workshop on *Improving the Working Environment: from medical-technical problem solving to a process of participative management*. Swedish Institute for Work Research. Stockholm.
- Hale A.R. 1997. *Regulating safety at and around airports: the case of the integrated safety management system for Schiphol airport*. Paper to the NeTWork workshop on Accelerating Technologies. Bad Homburg. June 1997.
- Hale. A.R. 1999. *Assessment of safety management systems*. Paper to 2nd International Conference on Ergonomics, Occupational Safety & Hygiene Braga. 27-28 May 1999.
- Hale A.R. 2000. *Why occupational health and safety experts?* Proceedings of the International Symposium of the International Social Security Association: Training of occupational health and safety experts; issues at stake and future prospects. Mainz 30 June – 2 July. ISSA Section on Education & Training. INRS. Paris.
- Hale A.R. 2000. Culture's confusions. Editorial for the Special issue on safety culture and safety climate. *Safety Science*. 34. 1-14
- Hale A.R. 2000. Railway safety management: the challenge of the new millennium. *Safety Science Monitor*. 4(1) 9-15.
- Hale A.R. 2000. Approaching safety in healthcare: from medical errors to healthy organisations. In Vincent C. & de Mol B. (Eds.). *Safety in Medicine*. Pergamon. Oxford.
- Hale A.R. 2001. Regulating airport safety: the case of Schiphol. *Safety Science* (37) 2-3 pp. 127-149
- Hale A.R. 2001. *Conditions of occurrence of major and minor accidents*. Proceedings of the 2nd session of the seminar "Le risque de défaillance et son contrôle par les individus et les organisations". CNRS. Paris.

Hale A.R. 2001. Conditions of occurrence of major and minor accidents. *Journal of the Institution of Occupational Safety & Health*. 5 (1) 7-21.

Hale A.R. 2002. Risk contours and risk management criteria for safety at major airports, with particular reference to the case of Schiphol. *Safety Science* 40 (1-4) 299-323

Hale A.R. 2002. *New qualification profiles for health & safety at work specialists*. Proceedings of the ISSA conference: Innovation & Safety. Vienna 27-31 May. ISSA.

Hale. A.R. 2003. Safety Management in Production. *Human Factors & Ergonomics in Manufacturing*. 13 (3) 185-202.

Hale A.R. in press. *Safety Management Systems*. International Encyclopaedia of Ergonomics & Human Factors. 2nd Edition. Louisville. Kentucky.

Hale A.R. in press. *Organizational Safety & Culture*. International Encyclopaedia of Ergonomics & Human Factors. 2nd Edition. Louisville. Kentucky.

Hale A.R. (2005). *Safety Management, what do we know, what do we believe we know, and what do we overlook?* Safety Science Group Delft University of Technology, Netherlands.

A.R. Hale, *Safety Management in Production Professor of Safety Science*, Delft University of Technology, Netherlands.

A.R. Hale, L.H.J. Goossens, M.F. Costa, L. Matos, K. Smit. *Expert judgement for assessment of management influences on risk control* Safety Science Group, Delft University of Technology, Delft, Netherlands Maintenance Management Group, Delft University of Technology, Delft, Netherlands.

Hale, A.R., Ale, B.J.M., Goossens, L.H.J., Bellamy, L.B., Mud M.L., Roelen, A., Baksteen, H., Post, J, Papazoglou I.A., Bloemhoff, A & Oh, J.I.H. *Modelling accidents for prioritising prevention*.

Hale, A.R., & Baram, M. (eds). 1998. *Safety Management: the challenge of change*. Pergamon, London.

Hale, A.R., Baram, M., Hovden, J., 1998. Perspective of safety management and change. *In: Safety Management: the challenge of change*. Hale, A.R., Baram, M. (eds). Pergamon, London.

Hale, A.R. Bellamy L.J., Guldenmund F., Heming B.H.J. and Kirwan B., 1997a. Dynamic modelling of safety management. In Guedes Soares (ed.) *Advance in Safety & Reliability*. pp 63-70. Pergamon. Oxford.

Hale, A.R, Bianchi, G, Dudka, G., Hameister, W., Jones, R., Perttula, P. & Ytrehus I. 2004. *Comparing safety professionals groups across Europe*: Paper to the 2nd International Conference of the Working on Safety Network, Dresden 31 August – 3 September.

Hale A.R., Costa M.A.F., Goossens L.H.J. & Smit K. 1999. Relative importance of maintenance management influences on equipment failure and availability in relation to major hazards. In Schueller G.I. & Kafka P (Eds.) *Safety & Reliability*. Balkema. Rotterdam. 1327-1332.

- Hale, A., Glendon, A., 1987. Individual behaviour in the control of danger. *Industrial safety series* vol 2. Elsevier, Amsterdam
- Hale, A.R., Goossens, L.H.J., Ale, B.J.M., Bellamy, L.A., Post, J., Oh, J.I.H. & Papazoglou, I. A. 2004. Managing safety barriers and controls at the workplace. in *Probabilistic Safety Assessment & Management*. Pp 608 – 613. Springer Verlag. Berlin.
- Hale A.R., Goossens L.H.J., Costa M.F., Matos L., Wielaard P. & Smit K. 2000. Expert judgement for the assessment of management influences on risk control. In: Cottam M.P., Harvey D.W., Pape R.P. & Tait J. (eds). *Foresight & Precaution*. 1077-1082. Balkema. Rotterdam
- Hale A.R., Goossens L.H.J. & Oortman Gerlings P. 1991. Safety management systems: a model and some applications. Paper to the 9th NeTWork workshop on Safety Policy. Bad Homburg. May.
- Hale, A.R., Goossens L.H.J. en Timmerhuis V.C.M.. 1992. Staatstoezicht op de mijnen - een verkenning van rol en toekomst (*State Supervision of Mines - an assessment of their role and future*). Report to the Ministry of Economic Affairs. 2093-2098
- Hale A.R., Goossens L.H.J. & v.d. Poel I. 2002. Oil & gas industry regulation: from detailed technical inspection to assessment of management systems. In Kirwan B., Hale A.R., & Hopkins A. *Changing regulations: controlling risks in society*. Pergamon Oxford. Pp79-108
- Hale, A.R, Guldenmund F.G. 2006. *Role and tasks of safety professionals: some results from an international survey*.
- Hale A.R., Guldenmund F., & Bellamy L. (1998). An audit method for the modification of technical risk assessment with management weighting factors. In: Mosleh A & Bari R.A.(eds) *Probabilistic Safety Assessment and Management*. Springer. London. 2093-98.
- Hale A.R., Guldenmund F. & Bellamy L. 1999. Management model. In Bellamy L.J., Papazoglou I.A., Hale A.R., Aneziris O.N., Ale B.J.M., Morris M.I. & Oh J.I.H. 1999. *I-Risk: Development of an integrated technical and management risk control and monitoring methodology for managing and quantifying on-site and off-site risks*. Contract ENVA-CT96-0243. Report to European Union. Ministry of Social Affairs and Employment. Den Haag. Annex 2.
- Hale A.R., Guldenmund F, Bellamy L., & Wilson C.. 1999. IRMA: Integrated Risk Management Audit for major hazard sites. In Schueller G.I. & Kafka P (Eds.) *Safety & Reliability*. Balkema. Rotterdam. 1315-1320
- Hale A.R., Guldenmund F., Goossens L.H.J. & Bellamy L.J. 2000. *Modelling of major hazard management systems as a basis for developing and evaluating tailored audits*. In Proceedings of the 1st International Conference on Occupational Risk Prevention. Mondelo P.M., Mattila M. & Karwowski W. (Eds). ISBN: 84-699-1242-9
- Hale A.R., Guldenmund F.W., Heming B.H.J. & Swuste P., 1993. *Evaluating improvements in safety management systems. Aiding decision making in industry*. Paper at the SRA Conference: European Technology and Experience in Safety Analysis and Risk Management. Rome. Session 1 Aiding decision making in industry. Rome, October

- Hale A.R., Guldenmund F., Smit K. Bellamy L. 1998a Modification of technical risk assessment with management weighting factors in Lydersen S., Hansen G.K. & Sandtorv H.A. (eds.) *Safety & Reliability*. Springer. London. 115-120.
- Hale A.R. & Guldenmund F. 2004. *Aramis Audit Manual version 1.3*. Safety Science Group, Delft University of Technology. 11.11.2004.
- Hale A.R. & Hale M. 1972. *A review of the industrial accident research literature*. Research paper to the Committee on Safety and Health at Work. HMSO. London.
- Hale A.R., Heijer T. & Koornneef F. 2002. *Management of Safety Rules: the case of railways*. Paper to the Inaugural Conference of the International Network on the Prevention of Accidents & Trauma at Work. Elsinore. 3-6 September. <http://www.workingsafety.net>
- Hale A.R., Heijer T. & Koornneef F. 2003. Management of Safety Rules: the case of railways. *Safety Science Monitor* v7 (1). <http://www.ipso.asn.au/vol7/vol7idx.htm>
- Hale A.R., Heming B., Carthey J. & Kirwan B. 1994a. *Extension of the model of behaviour in the control of danger: main report*. Report to the Health & Safety Executive. UK. March. Industrial Ergonomics Group, School of Manufacturing & Mechanical Engineering, University of Birmingham.
- Hale A.R., Heming B., Carthey J. & Kirwan B. 1994b. *Extension of the model of behaviour in the control of danger: a new framework*. Report to the Health & Safety Executive. UK. March. Industrial Ergonomics Group, School of Manufacturing & Mechanical Engineering, University of Birmingham.
- Hale A.R. Heming B.H.J., Carthey J. & Kirwan B. (1994) *Extension of the model of behaviour in the control of danger*. Industrial Ergonomics Group, School of Manufacturing & Mechanical Engineering, University of Birmingham.
- Hale A.R., Heming B. Carthey J., & Kirwan B. 1997. Modelling of safety management systems. *Safety Science* 26 (1/2) 121-140.
- Hale A.R., Heming B., Musson Y. & v.d. Broek B. 1997. De veiligheidskundige professie: kansen en bedreigingen (*The safety profession: chances and threats*). Utrecht. NVVK.
- Hale, A.R., Heming, B.H.J., Smit, K., Rodenburg, F.G.Th., van Leeuwen, N.D. 1998b Evaluating safety in the management of maintenance activities in the chemical process industry. *Safety Science* 28(1), 21-44
- Hale A.R. & Hovden J. 1998. Management and culture: the third age of safety. In A-M Feyer & A Williamson (eds.) *Occupational Injury: risk, prevention and intervention*. Taylor & Francis. London pp 129-166.
- Hale A.R., Karczewski J., Koornneef F., Otto E.H. & Burdorf L. 1989. *An intelligent end-user Interface for the Collection and Processing of Accident Data*. Proceedings of the 6th Euredata Conference Siena. In: Colombari V. (editor) *Reliability Data Collection and Use in Risk and Availability Assessment*. Springer-Verlag.

Hale A.R., Karczewski J., Koornneef F. & Otto E. 1991. *IDA: an interactive Program for the Collection and Processing of Accident Data*. In: Schaaf T W van der, et al (eds): *Near Miss Reporting as a Safety Tool*. Butterworth Heinemann, Oxford.

Hale A.R., Kirwan B. & Guldenmund F. 1999. Capturing the river: multi-level modelling of safety management. In Misumi J, Wilpert B. & Miller R. (Eds.) *Nuclear safety: a human factors perspective*. London. Taylor & Francis.

Kirwan B., Hale A.R., & Hopkins A. 2002. *Changing regulations: controlling risks in society*. Pergamon Oxford.

Hale A.R. & de Kroes J. 1997. System in Safety: 10 years of the chair in Safety Science at the Delft University of Technology. *Safety Science* 26 (1-2) pp. 3-19.

Hale, A.R., de Loor, M.H., Huppel, G. and van Drimmelen, D. 1988. Algemeen erkende regelen der techniek en redelijkerwijs. Probleemanalyse en aanzetten voor beleid in verband met invoering van artikel 3 van de Arbo-wet. (*The known state of technology and "reasonably practicable"*). *Problem analysis of policy proposals for introduction of article 3 of the Working Environment Law*). Safety Science group. TU Delft. December.

Hale A.R., de Loor M., van Drimmelen D. & Huppel G. 1990. Safety standards, risk analysis and decision making on prevention measures: implications of some recent European legislation and standards. *J. of Occupational Accidents*. 13. 213-231.

Hale, A., P. Oortman Gerling, P. Swuste, P. Heimlaetzer, 1991. *Assessing and improving safety management systems*. Paper at the first international conference on safety, health and environment in oil and gas exploration, Den Haag, November

Hale, A.R., Paques-Koster, M. en Vergouw, E.G.M. 1989. Veiligheidskunde, part noch deel. Aandacht voor arbeidsveiligheid in hoger technisch onderwijs. (*Safety science, neither hide nor hair: attention to occupational safety in higher technical education*) Directoraat-Generaal van de Arbeid. Rapport S 56, + Bijlage S56-1. Voorburg, Ministerie van Sociale Zaken en Werkgelegenheid

Hale A.R., van Pelt E., Heimlaetzer P., Swuste P., Guldenmund F. & Heming B. 1994. *Influencing perceptions of accident causation*. Paper to the 23rd international Congress of Applied Psychology, Madrid.

Hale A.R., Pietersen C.M., Heming B.H.J., van den Broek B., Mol W.E. & Ribbert C. 1997. *Technical certification of dangerous equipment: a study of the effectiveness of three legally compulsory regimes in the Netherlands*. Proceedings of the ESREL conference on Safety & Reliability. Lisbon. June.

Hale A.R., Smit K., Rodenburg F.G.T. & Heming B.H.J. 1993. Onderhoud en veiligheid: een studie naar de relatie tussen onderhoud en veiligheid in de chemische procesindustrie. (*Maintenance and safety: a study of the relation between maintenance and safety in the chemical process industry*). Safety Science Group. Delft University of Technology.

Hale A.R. & Swuste P.H.J.J. 1993. *Safety rules: procedural freedom or action constraint?* 11th NeTWork Workshop. The use of rules to achieve safety. Bad Homburg.

Hale A.R. & Swuste P. 1997 Avoiding square wheels: international experience in sharing solutions. *Safety Science* 25 (1-3) pp3-14.

- Hale A.R. & Swuste P.H.J.J. 1998. Safety rules: procedural freedom or action constraint?. *Safety Science*. 29 (3) 163-178
- Hale A.R., Swuste P, Wiersma E. & Guldenmund F. 1995. *Gevarenclassificatie voor de Bouw*. (Hazard classification for building work). Report to the Stichting Arbouw. Safety Science Group. Delft University of Technology, Delft.
- Hale A.R. Swuste P., Tymensen B. & Pantry S. 1994. *Collection and dissemination of information on solutions for improving working conditions at the workplace*. Report to EC. DG V. Safety Science Group. Delft University of Technology.
- Hale, A., H. Visser, P. Swuste, P. Heimplaetzer & P. Oortman Gerlings, 1991. Het individu in het veiligheidszorgsysteem. (*The individual in a safety management system TUDelft, Safety Science Group and Institute for Work Issues Tilburg (IVA)*). PSG Studiedag menselijk handelen en falen, Zeist 19 September 1991
- Hale A.R., Wilpert B. & Freitag M. (Eds.) 1997. *After the event: from accident to organisational learning*. Pergamon. London.
- Hale, A.R. & Ytrehus, I. 2004. *Surveying the role of safety professionals: objectives, methods and results*. Paper to the 2nd International Conference of the Working on Safety Network, Dresden 31 August – 3 September 2004
- Hale, A.R., Ytrehus I., Jones, R., Perttula, P. & Hameister, W., *The safety professional in Norway and the Netherlands, with some comparisons with UK, Finland and Germany* Paper to the 3rd International Occupational Risk Conference, Santiago de Compostela, 2-5 June 2004.
- Handy C.B. 1976. *Understanding organisations*. Penguin. Harmondsworth.
- HASTAM 1994. *CHASE III Complete Health and Safety Evaluation*. User guide. Version 1.01. HASTAM. Birmingham.
- HSE 1983. *100 Practical applications of noise reduction methods*. Health & Safety Executive. HMSO. London.
- Health and Safety Executive. 1985. *Deadly maintenance*. London. HMSO.
- Health and Safety Executive. 1987. *Dangerous maintenance*. London. HMSO.
- Heinrich H.W., Petersen D. & Roos N. 1980. *Industrial accident prevention: a safety management approach*. 5th edition. New York McGraw Hill.
- Heijer T. & Hale A.R. 2002. *Risk knows no bounds: how rational can we be?* Paper to the New Technology & Work Workshop, Blankensee. Safety Science Group, Delft University of Technology. Delft
- Hofstede G. 1980. *Culture's consequences*. Sage Publications. London
- Hofstede, G.R. (1991). *Cultures and organisations: Software of the mind*. London: McGraw-Hill.
- Hollnagel E. 1998. *Cognitive Reliability and Error Analysis: CREAM*. Elsevier. Oxford.

- Hollnagel E. 2004. *Barriers and accident prevention*. Aldershot, Ashgate.
- Hood C., Jones D., Pidgeon N.F., Turner B.A. & Gibson R. 1992. Risk management. in *Risk: analysis, perception and management*. London. Royal Society.
- Hopkins A. 2000. *Lessons from Longford: the Esso Gas Plant Explosion*. Sydney. CCH Australia.
- Howe J. 2001. *Warning! Behavior-based safety can be hazardous to your health and safety program: a union critique of behavior-based safety*. Publication 14. Union of Automotive Workers. Health & Safety Department. Detroit. Michigan.
- Hudson P. 1999. *Safety culture – the way ahead? Theory and practical principles*. Centre for Safety Science. Leiden University. Leiden.
- Hurst N.W., Young S., Donald I., Gibson H & Muyselaar A. 1996. Measures of safety management performance and attitudes to safety at major hazard sites. *J. of Loss Prevention in the Process Industry*. 9(2). 161-172.
- ISO 1987. *Quality management and quality assurance standards - Guidelines for selection and use. ISO 9000*. 1st ed. Geneva. International Standards Organisation.
- International Standards Organisation. 1987. *Quality systems - Model for quality assurance in design/development, production, installation and servicing. ISO 9001*.
- International Standards Organisation. 1987. *Quality management - Model for quality assurance in production and installation. ISO 9002*.
- International Standards Organisation. 1987. *Quality management - Model for quality assurance in final inspection and test. ISO 9003*.
- International Standards Organisation. 1987. *Quality management and quality system elements - Guidelines. ISO 9004*.
- ISO 1995. *Environmental Management Systems - Specifications with Guidance for Use. (ISO 14001)*. Geneva. International Standards Organisation.
- Jones, A.P. and James, L.R. (1979). Psychological climate: Dimensions and relationships of individual and aggregated work environment perceptions. *Organizational Behavior and Human Performance* 23, 201-250.
- Keil Centre. 2002. Strategies to promote safe behaviour as a part of a health and safety management system. *Contract Research Report 430/2002*. Health & Safety Executive. Sheffield.
- Kennedy, R.J. (1997). *The development of a HAZOP-based methodology to identify safety management vulnerabilities and their associated safety cultural factors*. Doctoral thesis University of Birmingham.
- Kennedy, R. and Kirwan, B. 1996. The Safety Culture HAZOP: An inductive and group based approach to identifying and assessing Safety Culture vulnerabilities. in Cacciabue P.C. & Papazoglou I.A. (eds). *Probabilistic Safety Assessment and Management*. Springer. pp 910-915.

- Kirwan B. 1994. *A guide to practical human reliability assessment*. Taylor & Francis. London
- Kirwan B. & Ainsworth L.K. (eds). 1992. *A guide to task analysis*. Taylor & Francis. London.
- Kirwan B., Carthey J., Hale A.R. & Heming B. 1994. *Extension of the model of behaviour in the control of danger: adaptation of the model to the nuclear power and reprocessing industries*. Report to the Health & Safety Executive. UK. March. Industrial Ergonomics Group, School of Manufacturing & Mechanical Engineering, University of Birmingham.
- Kirwan B., Hale A.R., & Hopkins A. 2002. *Changing regulations: controlling risks in society*. Oxford. Pergamon.
- Kjellén, U., 2000, *Prevention of accidents through experience feedback*. Taylor & Francis, London.
- Kjellén U. & Larsson T.J. 1981. Investigating accidents and reducing risks: a dynamic approach. *J. Occupational Accidents*. 3 (2) 129-140
- Kjellén U. & Sklet S. 1995. Integrating analyses of the risk of occupational accidents into the design process Part I: A review of types of acceptance criteria and risk analysis methods. *Safety Science* 18 (3) 215-227.
- Kletz. T.A. 1988. *Learning from accidents in industry*. Butterworth. London.
- Komaki J., Barwick K.D. & Scott L.R. 1978. A behavioural approach to occupational safety: pinpointing and reinforcing safety performance in a food manufacturing plant. *J. Applied Psychology*. 63(4) 434-445.
- Koornneef F. (ed). 1989. *Risk Assessment and control*. Delft. TopTech Studies.
- Koornneef F. 2000. *Learning from small-scale incidents*. Ph.D. thesis. Safety Science Group. Delft University of Technology.
- Koornneef F. & Hale A.R. 1993. *Masters course in the Management of Safety, Health and Environment: Delft University of Technology*. Paper to International Conference on University and Advanced Training Courses in the Field of the Techniques and Sciences of Danger. Bordeaux. January.
- Koornneef F. & Hale A.R. 1997. Organisational feedback from accidents at work. In Hale A.R., Wilpert B., & Freitag M. *After the event: from accident to organisational learning*. Pergamon. Oxford.
- Koornneef F. & Hale A.R. 1997. *Learning from Incidents at Work*. In: Redmill F. et al (eds), *Human Factors in Safety-Critical Systems*. Butterworth-Heinemann.
- Koornneef F. & Kingston-Howlett J. Accident data in organisational learning, or what makes accident databases useful? In Rademaker E. de & Pineau J-P. (eds.) *Accident databases as management tool*. TI-KVIV. Antwerp. Pp171-184.
- Koornneef F., Spijkervet A.L. & Karczewski J.T. 1996. *Organisational Learning using Near-Miss and Accident Data within and outside your Organisation*. In: Redmill F. *Proceedings Safety-critical Systems Symposium 1996*. Safety-Critical Systems Club. Springer.

- Krause T. R., Seymour K. J. and Sloat K. C. M. 1999. Long-term evaluation of a behavior-based method for improving safety performance: a meta-analysis of 73 interrupted time-series replications, *Safety Science*, Volume 32, (1), 1-18.
- Lee, T.R. 1996. Perceptions, attitudes and behaviour: The vital elements of a safety culture. *Health and Safety* October, 1-15.
- Lees. F.P. 1996. *Loss prevention in the process industries; hazard identification, assessment and control*. 2nd Edition. (3 volumes). Guildford. Butterworth-Heinemann
- Leplat J. 1985. Erreur humaine, fiabilité humaine dans le travail (*Human error and human reliability at work*). Colin. Paris.
- Maidment D. 1997. Responding to public criticism of safety management systems; is the response always effective and appropriate? In Hale A.R., Wilpert B & Freitag M. (Eds.) *After the event: from accident to organisational learning*. 217-232. Pergamon. Oxford.
- Maidment D. 1998. Privatisation and division into competing units as a challenge for safety management. in Hale A.R. & Baram M. (Eds.) *Safety management: the challenge of organisational change*. Pergamon. Oxford.
- Maslow A.H. 1970. *Motivation and personality*. New York. Harper & Row.
- Matos M.L.O. 1999. *Maintenance management influences on hardware and human errors*. Graduation report. Safety Science Group. Delft University of Technology.
- Mayo E. 1933. *The human problems of an industrial civilisation*. New York. Macmillan.
- McAfee R.B. & Winn A.R. The use of incentives/feedback to enhance workplace safety: a critique of the literature. *Journal of Safety Research*. 1989. 20(1). 7-19.
- McFarland R.A. 1967. *Application of Human Factors Engineering to Safety Engineering Problems*. National Safety Congress Transactions, Chicago.
- McGregor D. 1960. *The human side of enterprise*. New York. McGraw Hill.
- McGregor D. 1967. *The professional manager*. New York. McGraw Hill.
- Meric M. & Szekely J. 1980. Diagnostic de sécurité préalable à la définition d'actions de prévention. (*Safety diagnosis prior to the definition of preventive actions*). Report 399/RE. Vandoeuvre. INRS.
- Mintzberg H. 1979. *The Structuring of Organizations*. Englewood Cliffs: Prentice Hall.
- Mintzberg. H. 1980. Structure in fives: a synthesis of the research on organisation design. *Management Science* 26(3)
- Mintzberg, H., 1983. *Structures in five: designing effective organisations*. Simon & Schuster, Englewood Cliffs, NJ, USA
- Modarres M., Mosleh A. & Wreathall J. 1994. A framework for assessing influence of organization on plant safety. *Reliability Engineering & Systems Safety*. 45. 157-171.

- Muyselaar A.J. & Bellamy L.J. 1993. *An audit technique for the evaluation and management of risks*. Paper to the CEC DG 11 workshop on safety management in the process industry. Ravello, Oct.
- Nasanen M. & Saari J. 1987. The effects of positive feedback on housekeeping and accidents at a shipyard. *J. Occupational Accidents*. 8 237-250.
- OSHA (Occupational Safety & Health Administration) 1995. *Accident reporting categories in the USA*. Occupational Health & Safety Administration. Washington.
- Odrione G.S. 1965. A systems approach to training. *Training Directors Journal* 1965. 19(1) pp3-11
- Oh J.I.H., Brouwer W.G.J., Bellamy L.J., Hale A.R., Ale B.J.M. & Papazoglou I.A. 1998 The I-Risk project: development of an integrated technical and management risk control and monitoring methodology for managing and quantifying on-site and off-site risks. in Mosleh A. & Bari R.A. (eds.) *Probabilistic Safety Assessment and Management*. Springer. London. 2485-2491.
- Ostrom, L., Wilhelmsen, C. and Kaplan, B. (1993). Assessing safety culture. *Nuclear Safety* 34(2), 163-172.
- Palmer T. 1990. Safety management: Wonderland management? *Occupational Hazards*. 52 (4) 65-67.
- Papazoglou L.A. & Aneziris O.N. (1998) System performance modelling for quantification of organisational factors in chemical installations. in Mosleh A. & Bari R.A. (eds.) *Probabilistic Safety Assessment and Management Springer*. London. 2081-2086
- Papazoglou L.A. & Aneziris O.N. (1999) On the quantification of the effects of organisational and management factors in chemical installations. *Reliability Engineering and System Safety* 63, 33-45
- Perrow C. 1984. *Normal accidents. Living with high risk technologies*. Basic Books. New York.
- Peters, T.J. and Waterman, R.H., Jr. (1982). *In search of excellence. Lessons from America's best-run companies*. New York: Harper & Row.
- Petersen D.C. 1971. *Techniques of safety management*. New York. McGraw-Hill
- Petersen D.C. 1989. *Techniques of safety management. A systems approach. (3rd edition)*. Aloray. Goshen. New York.
- Phillips, L.D., Humphreys, P., and Embrey, D.E. 1983. *A socio-technical approach to assessing human reliability*. London School of Economics, Decision Analysis Unit, Technical Report 83-4.
- Pidgeon N. 1991. Safety culture and risk management in organisations. *J. Cross Cultural Psychology*. 22 (1) 129-140.
- Pidgeon N. 1993. *The role of organisational factors in major accidents: from human factors to institutional design*. British Health and Safety Society Conference. Birmingham. April.

- Pidgeon, N.F. (1997). The limits to safety? Culture, politics, learning and man-made disasters. *Journal of Contingencies and Crises management* 5(1), 1-14.
- Pidgeon, N.F. (1998). Safety culture: key theoretical issues. *Work and Stress* 13, 202-216.
- Pitbaldo R.M., Williams J. & Slater D.H. 1990. Quantitative assessment of process safety programs. *Plant/Operations Progress* 9(3) pp 169-175.
- Rasmussen, J. 1990b: Human Error and the Problem of Causality in Analysis of Accidents. *Philosophical Transactions of the Royal Society of London B* 327, 449-462.
- Rasmussen, J. 1994: Risk Management, Adaptation, and Design for Safety. In: Sahlin, N. E. and B. Brehmer (Eds.): *Future Risks and Risk management*. Dordrecht: Kluwer.
- Rasmussen J. 1997. Risk management in a dynamic society: a modelling problem. *Safety Science* 27(2/3) 183-213.
- Rasmussen J.& Batstone R. 1991. *Safety control and risk management: Toward improved low risk operation of high hazard systems*. Findings from the world bank workshops.
- Rasmussen J., Brehmer B., & Leplat J. (eds.) 1990. *Distributed Decision Making: Cognitive Models for Complex Working Environments*. Chichester: Wiley
- Rasmussen J, Duncan K, & Leplat J. (eds.) 1987. *New Technology & Human Error*. Chichester: Wiley.
- Rasmussen J & Svedung I. 2000. *Proactive risk management in a dynamic society*. Swedish Rescue Services Agency. Karlstad, Sweden.
- Ray P.S., Purswell J.L. & Bowen D. Behavioural safety programs: creating a new corporate culture. *International Journal of Industrial Ergonomics*. 1993. 12(3). 193-198.
- Reason J.T. 1990. *Human error*. Cambridge University Press. Cambridge.
- Reason J.T. 1991. Near miss reporting: too little and too late. in Lucas D.A., van der Schaaf T. & Hale A.R. *Near miss reporting as a safety tool*. Butterworths. London. (in press)
- Reason J.T. 1997. *Managing the risks of organisational accidents*. Aldershot. Ashgate,
- Reason J.T., Manstead A.S.R., Stradling S.G., Baxter J.S. and Campbell K.A. 1989 Errors and violations on the roads: a real distinction? CEC Workshop. *Errors in the operation of transport systems*. Cambridge. 26-28 May.
- Ridley J. (ed). 1994. *Safety at Work*. Oxford. Butterworth-Heinemann. 4th edition.
- Robens. Lord. 1972. *Safety and health at work: report of the committee*. HMSO. London.
- Roberts K.H. 1989. New challenges in high reliability research: high reliability organisations. *Industrial Crisis Quarterly*. 3. 111-125.
- Robinson G.H. Accidents and socio-technical systems: principles for design. *Accident Analysis and Prevention*. 1982. 14. 121-130.

- Rochlin G.I. 1999. The social construction of safety. In Misumi J, Wilpert B. & Miller R. (Eds.) *Nuclear safety: a human factors perspective*. London. Taylor & Francis.
- Roethlisberger F.J. & Dickson W.J. 1939. *Management and the worker*. New York. John Wiley.
- Royal Society 1992. *Risk: analysis, perception, management: report of a Royal Society study group*. London.
- Rundmo T & Hale A.R. 2002. Managers' attitudes towards safety and accident prevention. *Safety Science (in press)*
- Saarela K.L. 1990. An intervention programme utilising small groups: a comparative study. *J. Safety Research*. 21 (4) 149-156.
- Saarela K.L. 1995. *Towards continuous improvement of work environment*. Papers to the Workshop Understanding the Work Environment. Stockholm. Institute of Working Life.
- Saari J. & Menkel E. (Eds.) 1987. *Successful accident prevention: field tested in the Nordic countries*. Institute for Occupational Health. Helsinki.
- Safety Science*. 2000 Special issue on safety culture and climate. 34 (1-3)
- Safety Research Unit (SRU) (1993). *The contribution of attitudinal and management factors to risk in the chemical industry*. Final Report to the Health and Safety Executive. Guildford: Psychology Department University of Surrey.
- Sagan. S.D. *The limits of safety*. Princeton University Press. Princeton.
- Schein E.H 1992. *Organizational Culture and Leadership*. 2nd Edition. San Francisco: Jossey-Bass.
- Schein E.H. 1996. Three cultures of management: the key to organisational learning. *Sloan Management Review*. Fall 1996 9-20.
- Senge P.M. 1990. *The Fifth Discipline: the art and practice of the learning organisation*. Doubleday. New York.
- Shannon H.S., Mayr J & Haines T. 1997. Overview of the relationship between organisational and workplace factors and injury rates. *Safety Science* 26 (3) 201-217.
- Shaw, L.S. & Sichel, H.S. 1971. *Accident Proneness*. Pergamon. Oxford
- Shepherd A. in Kirwan B & Ainsworth L.K. (eds) 1992. *Guide to task analysis*. London. Taylor & Francis.
- Simard M. 1995. *A systematic approach for developing participative management of safety at the shop-floor level*. Paper to the Workshop: Understanding the Work Environment. Institute of Working Life. Stockholm.
- Simard, M. and Marchand, A. (1996). A multilevel analysis of organisational factors related to the taking of safety initiatives by work groups. *Safety Science* 21(2), 113-129.

- Simon J.M. & Piquard P. 1991. *Contractor safety performance significantly improves. Proceedings of the First International Conference on Health, Safety and Environment*. The Hague. Society of Petroleum Engineers, Richardson, Texas. Paper SPE 23253. pp465-472.
- Smit K. & Slaterus W.H. 1992. *Information model for maintenance management*. Cap Gemini Publishing. Rijswijk. ISBN 90-71996-56-5
- Smith M.J., Cohen H.H., Cohen A & Cleveland R.J. Characteristics of successful safety programs. *Journal of Safety Research*. 1978. 10(1). 5-15.
- SSVV. 1997. *VCA: Safety checklist for contractors*. Leidschendam. SSVV.
- Stoop J. 1990. *Safety and the design process*. Doctoral thesis. Delft University of Technology.
- Suokas J. 1986. *The role of management in accident prevention*. 1st International Conference on Industrial Engineering and Management. Paris.
- Svedung I. & Rasmussen J. 1997. *Modelling accident causation and decision making in dynamic socio-technical systems*. Paper to the NeTWork Workshop on Accelerating Technology. Bad Homburg.
- Swuste P. & Buringh E. 1994. Sharing knowledge on preventive measures: workshop summary. *Applied Occupational & Environmental Hygiene*. v9 pp 74-76.
- Technica . 1988. *The Manager Technique. Management Safety Systems Assessment Guidelines in the Evaluation of Risk*. London. Technica.
- Tinline G. & Wright M.S. 1993. *Further development of an audit technique for the evaluation and management of risk*. Tasks 7 & 8. Final report C2278. A study for the Health & Safety Executive, VROM & Norsk Hydro. London. Four Elements.
- Top W. 1986. *The International Safety Rating System (Part 1)*. Loss Control Institute NL. Breda.
- Trompenaars F. & Hampden-Taylor. 1997. *Riding the waves of culture: understanding cultural diversity in business*. London. Nicholas Brieley Publishing. 2nd Edition.
- Tuli, R.W. and Apostolakis, G.E. (1996). Incorporating organizational issues into root-cause analysis. *Transactions Institution of Chemical Engineers* 74(B), 3-16.
- Turner B. 1978. *Man-made disasters*. Wykeham Press. London.
- Turner B.A. 1991. The development of safety culture. *Chemistry & Industry*. April 241-243.
- Turner B.A. & Pidgeon N.F. 1997. *Man-made disasters*. 2nd Edition. Butterworth-Heinemann. London.
- USNRC. 1989. *Human factors and regulatory research programme*. United States Nuclear Regulatory Commission.
- Vaughan D. 1996. *The Challenger launch decision: risk technology, culture and deviance at NASA*. University of Chicago Press. Chicago.

Wagenaar W.A., Hudson P. & Reason J.T. 1990. Cognitive failures and accidents. *Applied Cognitive Psychology*. 4, 273-294.

Wehrmeyer W. 1998. Corporate cultures towards strategic health and safety management and the challenge of organisational change. In Hale A.R. & Baram M. (Eds.) *Safety management: the challenge of change*. Pergamon. Oxford. Pp107-116

Weick K.E. 1995. *Sensemaking in organizations*. Thousand Oaks: Sage,

Weick K.E. & Roberts K.H. 1993. Collective mind in organizations: Heedful interrelating on flight decks. *Administrative Science Quarterly* 38, 357-381.

Westrum R., *Organisational and intra-organisational thought*. World Bank Conference on Safety Control & Risk Management, October 1988.

Westrum R. 1991. Cultures with requisite imagination. In: Wise J., Stager P. & Hopkin J. (Eds.) *Verification and validation in complex man-machine systems*. Springer. New York.

Wilde G.J.S. 1994. *Target Risk*. PDE Publications Toronto.

Williamson, A.M., Feyer, A-M., Cairns, D. and Biancotti, D. (1997). The development of a measure of safety climate: The role of safety perceptions and attitudes. *Safety Science* 25, 15-27.

Wilpert B. & Qvale T.U. 1993. *Reliability and safety in hazardous work systems* Lawrence Erlbaum. Hove.

Work & Stress. 1998. Special issue on safety culture. v12.

Wreathall J. (1989). A hierarchy of risk control measures with some considerations of "unorganisational" accidents. Paper to the *Second World Bank Workshop on Risk Management and Safety Control*. Karlstad, Sweden.

Zohar D. 1980. Safety climate in industrial organisations: theoretical and applied implications. *J. Applied Psychology*. 65 (1) 96-102.

Zwetsloot. G. 1994. *Joint management of working conditions, environment and quality*. Dutch Institute of Working Conditions. Amsterdam.

5.2 INTERVIEW TWO

Mearns K, Whitaker SM, Flin R (2003) *Safety Climate, safety management practice and safety performance in offshore environments*. *Safety Science* **41**, pp641-680

Hope L, and K Mearns (in print) *Managing health risks in the offshore workplace: Impact on health climate, safety climate and risk identification*, *Int. J. Risk Assessment and Management*

Hollnagel, E; Woods, D and Leveson, N (editors) (2005) *Resilience Engineering: Concepts and Precepts*. Ashgate.

5.3 INTERVIEW THREE

Mearns K, Whitaker SM, Flin R (2003) *Safety Climate, safety management practice and safety performance in offshore environments*. *Safety Science* **41**, pp641-680

5.4 INTERVIEW FOUR

Cox, T., Griffiths, A, Houdmont, J., 2006. *Defining a case of work-related stress*. Sudbury, UK: HSE Books.

Cox, T., Houdmont, J., Griffiths, A.J., 2006. Rail passenger crowding, stress, health and safety in Britain. *Transportation Research Part A Policy & Practice*, **40**, pp. 244-258.

Griffiths, A.J., Cox, T., Karanika, M., Khan, S., Tomas, J., 2006. Work design and management in the manufacturing sector: Development and validation of the Work Organisation Assessment Questionnaire. *Occupational and Environmental Medicine*.

Houdmont, J., Leke, S., Cox, T., 2006. International expansion of education and training in occupational health psychology. *In proceedings of: Work, Stress and Health 2006*.

Houdmont, J., Leka, S., Cox, T., Makrinov, N., 2006. Postgraduate education and training in occupational health psychology at the University of Nottingham. *In proceedings of: Work, Stress and Health, 2006*.

Karanika, M., Cox, T., 2006. Artificial Neural Networks vs. Regression: Application to risk assessment for work and organisational issues?. *In proceedings of: International Nonlinear Science conference of the Society for Chaos Theory in Psychology and Life Sciences*.

Karanika, M., Khan, S., Griffiths, A., Cox, T., 2006. Work Organisation Assessment Questionnaire: Development of an instrument for the assessment of work stressors in Manufacturing. *In proceedings of: Managing Health and Safety*.

Cox, T., Griffiths, A., 2005. Monitoring the changing organization of work: a commentary. *Sozial- und Präventivmedizin/Social and Preventive Medicine*, **47**, pp. 354-355.

Cox, T., Griffiths, A.J., 2005. The nature and measurement of work-related stress. *In: J. Wilson & N. Corlett, ed(s). Evaluation of human work: A practical ergonomics methodology*. Boca Raton, USA: CRC Press, 2005, pp. 593-613.

Cox, T., Griffiths, A.J., Leka, S., 2005. Work organisation and work-related stress. *In: K. Gardiner & J. Harrington, ed(s). Occupational hygiene*. Oxford, New York: Blackwell Publishing, 2005, pp. 421-423.

Khan, S., Karanika, M., Griffiths, A., Cox, T., 2005. Assessing work stressors in the Manufacturing Sector: The Work Organisation Assessment Questionnaire. *In proceedings of: Occupational Health Psychology: Key Papers of the European Academy of Occupational Health Psychology (Vol. 6)*.

Leka, S., Griffiths, A.J., Cox, T., 2005. Work-related stress: The risk management paradigm. *In: A. Antoniou & C. Cooper, ed(s). A research companion to organizational health psychology*. Chichester, UK: John Wiley & Sons, 2005, pp. 174-187.

Randall, R., Griffiths, A., Cox, T., 2005. Evaluating organizational stress-management interventions using adapted study designs. *European Journal of Work and Organisational Psychology*, 14 (1), pp. 23-41.

Makrinov, N., Griffiths, A., Cox, T., 2004. Psychosocial Aspects of Employment Precariousness and its Impact on Health and Safety. *In proceedings of: 6th Conference.*

Cox, T., Griffiths, A.J., Randall, R., 2003. A risk management approach to the prevention of work stress. *In: M. Schabracq, J. Winnubst & C. Cooper, ed(s). Handbook of work and health psychology.* Chichester, UK: John Wiley & Sons, 2003, pp. 191-206.

Tehrani, N., Cox, S., Cox, T., 2002. Assessing the impact of stressful incidents in organizations: the development of an extended Impact of Events Scale. *Counselling Psychology Quarterly*, 15, pp. 191-200.

Cox, T., 2000. Work-related stress, risk management and Management Standards. *Work & Stress*, 18 (2), pp. 89-90.

Cox, T., Cox, R., Kerrin, M., Griffiths, A.J., 2000. Health and safety in teleworking: assessment of risks. *Journal of The Institute of Occupational Safety and Health*,

Thomson, L., Griffiths, A., Cox, T., Kivimäki, M., Vahtera, J., 1999. Downsizing, changes in work and the general health of employees. A three wave panel study. *Anxiety, Stress and Coping*,

Cox, T., 1998. Risk assessment for work-related stress. *In proceedings of: Unknown.*

Leka, S., Cox, T., Griffiths, A.J., 1998. *Small enterprises, business start ups and work stress: an occupational health approach.* 12, pp. 31-43.

Cox, S., Cox, T., 1996. *Safety, Systems and People.* Oxford, UK: Butterworth-Heinemann Ltd.

5.5 INTERVIEW FIVE

Columbia Investigation Board (CAIB)/ National Aeronautics and Space Administration (NASA) Accident Investigation Team (NAIT). (2003) Working Scenario.

Kim, D (2001) *Organising for Learning.* Pegasus Communications.

Leveson, N; Daouk, M; Dulac, N; Marais, K. (2004) *A systems theoretic approach to safety engineering.* Massachusetts Institute of Technology.

Reason, J (2003) *Managing Maintenance Error: A Practical Guide.* Ashgate Publishing Limited.

Reason, J (1997) *Managing the risks of organizational accidents.* Ashgate Publishing Limited.

Reason, J (1990) *Human Error.* Cambridge University Press.

Safety assessment principles for nuclear facilities. Draft for public consultation, April 2006. HSE.

University of Michigan Business School – www.bus.umich.edu

5.6 INTERVIEW SIX

Argyris, C. (1995) *On Organisational Learning*. Blackwell Publishers.

Bazerman, M (2004) *Predictable Surprises*. Harvard Business School Press.

Collingridge, D (1981) *The Social Control of Technology*. Palgrave Macmillan.

Collingridge, D (1982) *Critical decision making: A new theory of social choice*. F Pinter.

Collingridge, D (1992) *The Management of Scale: Big Organisations, Big Technologies, Big Mistakes*. Thomson Learning.

Columbia Investigation Board (CAIB)/ National Aeronautics and Space Administration (NASA) Accident Investigation Team (NAIT). (2003) Working Scenario.

Covey, S (2000) *Seven Habits of Highly Effective People*. Running Press

Dixon, N (1994) *On the Psychology of Military Incompetence*. Pimlico.

Dixon, N (1987) *Our own worst enemy*. Johnathan Cape.

Dorner, D & Kimber, R (1996) *The Logic of Failure*. Holt (Henry) & Co.

Espejo, R et al (1996) *Organizational Transformation and Learning: A Cybernetic Approach to Management and Organization*. John Wiley & Sons.

Flood, R (1999) *Rethinking the Fifth Discipline*. Routledge.

Kim, D (2001) *Organising for Learning*. Pegasus Communications.

Leveson, N (1995). *Safeware: System Safety and Computers*. Addison Wesley.

March. (1992). *The Behavioural Theory of the Firm*. Blackwell Publishers.

Mintzberg, H (2005) *Managers not MBA's: A hard look at the soft practice of managing and management development*. Berrett-Koehler.

Mintzberg, H (2000) *The rise and fall of strategic planning*. Financial Times Prentice Hall.

Mintzberg, H (1998) *Strategy Safari: A Guided Tour through the wilds of strategic management*. Financial Times Prentice Hall.

Mitroff, I (2005) *Why some companies emerge stronger and better from a crisis: 7 essential lessons for surviving disaster*. Amacom.

Mitroff, I (2005) *The unbounded mind: Breaking the chains of traditional business thinking*. Oxford university press.

Mitroff, I (2005) *Crisis leadership: planning for the unthinkable*. John Wiley and Sons Inc.

Mitroff, I (1998) *Smart Thinking in Crazy Times*. Berrett-Koehler.

Nutt, P (2002) *Why decisions fail: Avoiding the blunders and traps that lead to debacles*. Berrett-Koehler

Nutt, P (1989) *Making tough decisions: Tactics for improving managerial decision making*. Jossey Bass Wiley.

Perrow, C. (1999) *Normal Accidents: Living with High-risk Technologies*. Princeton University Press.

Reason, J. (1997) *Managing the Risks of Organizational Accidents*. Ashgate.

Safety Management of Complex, High-Hazard Organisations. Defence Nuclear Facilities Safety Board Technical Report. Dec 2004.

Sagan, S. D (1995) *The Limits of Safety: Organisations, accidents and nuclear weapons*. Princeton University Press.

Schein, E. (2004) *Organizational Culture and Leadership*. Pfeiffer-Wiley.

Senge P.M. 1990. *The Fifth Discipline: the art and practice of the learning organisation*. Doubleday. New York.

Turner (1995). *Man-Made Disasters*. Walter de Gruyter.

Weick, K & Sutcliffe, K. (1995). *Managing the Unexpected: Assuring High Performance in an Age of Complexity*. Jossey-Bass UMS S.

Weick, K (1995). *Sensemaking in Organizations (Foundations for Organizational Science)*. Sage Publications.

5.7 INTERVIEW SEVEN

Safety Culture at Work, ILO, 2003

Resolution concerning occupational safety and health, 2003 International Labour Conference, 2003

Conclusions concerning ILO standards-related activities in the area of occupational safety and health – A global strategy, 2003 International Labour Conference, 2003

Guidelines on Occupational Safety and Health Management Systems (ILO-OSH 2001),ILO, 2001

OSHA 2003-2008 Strategic Management Plan, Occupational Safety and Health Administration, Department of Labor, United States, 2003

Managing Health and Safety: Some Issues, Dr Norman Byrom, HM Principal Inspector of Health and Safety, Health and Safety Executive, UK (paper presented at the JISHA Convention, Kanazawa City, October 2000)

Summary Report of the Joint ILO/IALI international symposium on labour inspection and occupational safety and health management system, May 2001

Report on the ILO/Japan Asia Pacific Regional Seminar on the ILO Guidelines on Occupational Safety and Health Management Systems, May 2001

HSE (1997) HSG96 *The costs of accidents at work*.

HSE (1999) HSG48 *Reducing error and influencing behaviour*, Norwich HMSO

HSE (1997) HSG65 *Successful health and safety management*, Norwich HMSO

ASNI Study group on human factors 3rd report: *organizing for safety* (1993) HSE books.

BS EN ISO 14001:1996 Environmental management systems – Specification with guidance for use.

BS EN ISO 9000-1: 1994 Quality management and quality assurance standards: guidelines for selection and use.

Bell, J. (2001) *Employee Involvement in Health and Safety: Some Examples of Good Practice*. HSL. WPS/00/03

Bird, F.E and Germain, G.L (1985) *Practical loss control leadership*. Institute Publishing (Division of International Loss Control Institute), Loganville, Georgia.

Gallagher, C (1992) *Occupational Health and Safety Management Systems: Development in Low and High Incidence Rate Establishments*, M.P.H thesis, Monash University.

Gallagher, C (1995) *Evaluation of Two Firms participating in the OHS Best Practice in the Meat Industry Project*, National Key Centre in Industrial Relations, Monash University (prepared for the Meat Research Corporation).

Gallagher, C (1997) *Occupational Health and Safety Management Systems: An Analysis of System Types and Effectiveness*, National Key Centre in Industrial Relations, Monash University.

Gallagher, C (2000) *Occupational Health and Safety Management Systems: System Types and Effectiveness*, Ph.D. thesis, Deakin University.

Pearse, W, Gallagher C and L. Bluff (eds) (2001) *OHS Management Systems, Proceedings from the First National Conference on Health and Safety Management Systems*, July 2000, Crown Content, Melbourne.

Gallagher, C, Underhill E. and Rimmer, M (March 2001) *Review of the Effectiveness of Occupational Health and Safety Management Systems in Securing Healthy and Safe Workplaces* (a report prepared for the National Occupational Health and Safety Commission).

Gallagher, C., Underhill E. and Rimmer, M. (2003), "Occupational health and safety management systems in Australia: promise and reality", *Policy and Practice in Health and Safety*, vol. 1, no. 2, pp. 67-81.

Peterson, D (2001) *Safety Management: A Human Approach*. American Society of Safety Engineers.

Peterson, D (1998) *Techniques of safety management. A systems approach*.

Peterson, D (1996) *Human Error Reduction and Safety Management*. Wiley.

Zairi, M. & M. Al Mashari (2005), "The Role of Benchmarking in Best Practice Management and Knowledge Sharing", *The Journal of Computer Information Systems*, in print

Zairi, M. and M. Al Mashari (2005), Developing a sustainable culture of Innovation Management: A Prescriptive Approach. *Knowledge and Process Management*, Vol 12, Issue No 3, pp. 190 – 202

Zairi, M. (2005), "*Hosin Planning: Strategy of a Different Kind*", Handbook of Business Strategy, 2006, pp. 149 - 159 (ISSN 0894-4318)

Zairi, M. with Ginn, D. (2005), "Best Practice QFD Application: An internal/external benchmarking approach Based on Ford Motors' Experience", *International Journal of Quality & Reliability Management*, Vol. 22, No 1, 2005, pp. 38-58, ISSN 0265-671X

Zairi, M. with M. Al Mashari and David. Ginn (2005), "Key Enablers for The Effective Implementation of QFD: A Critical Analysis", *Industrial Management & Data Systems*, Vol. 105, N0 9, pp. 1245 - 1260 (ISSN 0263-5577)

Zairi, M. (2005), "*TQM Sustainability - What it means and how to make it viable?*", Quest for Excellence, April - June 2005, pp. 21 – 24

Zairi, M. with Ashari, I. (2005), "Sustaining TQM: A Synthesis of the Literature and a Proposed Research Framework", *Total Quality Management & Business Excellence*, in print

Zairi, M. (2005), "Quality has to be learnt before it gets practised: Teaching Principles of Excellence Using the European Quality Award Model", *International Journal of Applied Quality management*, Volume 1, Issue 3, pp. 1-16, (ISSN 1742-2647), 2005

Zairi, M. with S.A Al Wabel (2005), "*Factors Influencing The Implementation of E-Commerce Technologies by Financial Services in Saudi Arabia: An Empirical Study*", Working Paper series, Working Paper No 05/17, June 2005, pp. 3-33 Bradford University School of Management, Bradford, UK.

Zairi, M. with S.A Al Wabel (2005), "*The Web and its Impact on the Provision of Financial Services: A Benchmarking Perspective of Saudi Banks*", Working Paper series, Working Paper No 05/18, pp. 3-19, June 2005, Bradford University School of Management, Bradford, UK.

Zairi, M. with S.A Al Wabel; A.M. Ahmed (2005), "*The Evolution of ERP and its Relationship with E-Business*", Working Paper Series, Working Paper No 05/19, pp. 24, June 2005, Bradford University School of Management, Bradford, UK.

Zairi, M. with S.A Al Wabel (2005), "*E-Commerce Critical Success Factors: A Cross-Industry Investigation*", Working Paper series, Working Paper No 05/20, pp. 3-39, June 2005, Bradford University School of Management, Bradford, UK

Zairi, M. with N.A. Ali; F. Mahat (2005), "An Empirical Investigation on HR-TQM Relationship in Education: The case of Malaysian Universities", *International Journal of Applied Human Resource Management*, pp.23 - 35, (ISSN 1470-4684), 2005

Zairi, M. with N.A. Ali; F. Mahat (2005), "Validating a Performance Measurement Approach in Quality management for Malaysian Universities", *International Journal of Applied Management*, pp.86-99, (ISSN 1468-5191), 2005

Zairi, M. with M. Al Azmi (2005), "Knowledge management: A Proposed Taxonomy", *International Journal of Applied Quality Management*, Volume 2, Issue 2, pp.1-23, (ISSN 742-2647), 2005

Zairi, M. with A, Al Nofal; N. Al Omaim (2005), "Critical Factors of TQM: An Update on The Literature", *International Journal of Applied Quality management*, Volume 2, issue 2, pp. 1-15, (ISSN 1742-2647), 2005

Zairi, M. with A, Al Nofal; N. Al Omaim (2005), "TQM: Theoretical Insights", *International Journal of Applied Quality management*, Volume 2, issue 2, Part I, pp. 1-22, (ISSN 1742-2647), 2005

Zairi, M. with A, Al Nofal; N. Al Omaim (2005), "TQM: Theoretical Insights", *International Journal of Applied Quality management*, Volume 2, issue 2, Part II, pp. 1-23, (ISSN 1742-2647), 2005

Zairi, M. with N.A. Ali (2005), "Service Quality in Higher education", *International Journal of Applied Quality Management*, Volume 2, Issue 2, pp. 1-17, (ISSN 1742-2647), 2005

Zairi, M. with D. Ginn (2005), "The Role of QFD in Capturing the Voice of Customers", *International Journal of Applied Quality Management*, Volume 2, Issue 2, pp. 1-18, (ISSN 1742-2647), 2005

Zairi, M. (2005), "TQM Sustainability: What it means and how to make it viable", *International Journal of Applied Strategic Management*, Volume 2, issue 2, pp. 1-5, (ISSN 1742-8204)

Zairi, M. with A. Shahin (2005), "Strategic Management, benchmarking and The balanced Scorecard (BSC): An Integrated Methodology", *International Journal of Applied Strategic Management*, Volume 2, Issue 2, pp. 1-10, (ISSN 1742-8204), 2005

Zairi, M. with A. Erskine (2005), "Excellence is Born Out of Effective Strategic Deployment: The Impact of Hoshin Planning", *International Journal of Applied Strategic Management*, Volume 2, Issue 2, pp. 1-28, (ISSN 1742-8204), 2005

Zairi, M. with I. Ashari (2005), "*Achieving Sustainable Performance Through TQM and Market Orientation: A Proposed Framework for Empirical Investigations*", Volume 2, Issue 2, pp. 1-32, (ISSN 1742-8204), 2005

Zairi, M. with I. Ashari (2005), "*Sustaining TQM: A Synthesis of The Literature and a Proposed research Framework*", Volume 2, Issue 2, pp. 1-20, (ISSN 1742-8204), 2005

Zairi, M. with, A.M.Ahmed and S.A, Al Wabel (2006), "Global Benchmarking for Internet and eCommerce Applications", *Benchmarking - An International Journal*, Vol. 13, NO 1-2, 2006, pp. 68-80 (ISSN 1463-5771)

Zairi, M. with, A.M. Ahmed and K.S. Al Marri (2006), "SWOT analysis for Air China Performance and its Experience with Quality", *Benchmarking - An International Journal*, Vol. 13, NO 1-2, 2006, pp. 160-173 (ISSN 1463-5771)

5.8 INTERVIEW EIGHT

No references were mentioned by the interviewee.

5.9 INTERVIEW NINE

Balogun, J; Hope Hailey, V; Johnson, G & Scholes, K (2003) *Exploring strategic change*. FT Prentice Hall.

Collins, J (2001) *Good to Great*. Random House Business Books.

Collins, J (2000) *Built to last: Successful habits of visionary companies*. Random House Business Books.

Cotter, J (1995) *20 per cent solution: Using rapid redesign to create tomorrows organisation today*. John Wiley and Sons Inc.

Kotter, J (1996) *The Heart of Change: Real stories of how people changed their organisations*. Harvard Business School Press.

Kotter, J (1996) *Leading change*. Harvard Business School Press.

Peters, T (1999) *Professional service firm 50 (Reinventing work)*. Alfred. A Knopf

Peters, T (1999) *Project 50 (Reinventing work)*. Alfred. A Knopf

Peters, T (1999) *The Brand You 50 (Reinventing work)*. Alfred. A Knopf

Peters, T & Waterman, R (2004) *In search of excellence*. Profile Business.

Porter, M (2004) *Competitive Advantage*. Free Press.

Porter, M (2004) *Competitive Strategy: Techniques for analysing industry and competitors*. Free Press.

Scholes, K & Johnson, G (2004) *Exploring Corporate Strategy: Text and Cases*. FT Prentice Hall.

Scholes, K & Johnson, G (2000) *Exploring Public Sector Strategy*. FT Prentice Hall.

6 APPENDICES

6.1 APPENDIX ONE – QUESTION SET

Introduction

Overview of project:

In this instance 'effective health and safety management' is defined as practices that contribute to the effective control and sustained reduction in incidents that have the potential to result in acute and chronic deleterious effects to employees and other exposed persons.

Questions

1. If we suggest that the process of risk management is broken down into 4 parts including:

- Knowing what the risks are, and what in general should be done about them
- Planning, prioritizing and implementing risk controls
- Ensuring that risk controls are effective and sustained
- Reviewing and learning

2. What would you say are the main theoretical developments in relation to risk management/health and safety management/safety culture?

For example:

- A proactive, strategic approach
- Visible corporate and senior management commitment to health and safety
- Effective communication systems
- Employee participation in risk management
- A 'just' culture – i.e. trust and openness over health and safety
- Risk awareness in decision-making
- Organisational capability, i.e. sufficient competency and adequate resources
- A learning organisation

a. Where do you think the research or discussion for this area currently is at? What are the key concerns of researchers?

b. How mature is the area?

c. What comments would you make on the relative strengths and weaknesses of the evidence base to support the importance of this area?

For example:

- Is the realisation of the aim of the research technically feasible?
- Is the research question appropriately framed?
- Is the investigation approach adopted appropriate to the subject matter?
- Is the data produced adequate for the purpose of the research?
- Is the approach likely to yield reliable results?
- Are the conclusions based upon sound evidence?
- Would the approach benefit from further development and refinement?

d. How much influence do you think the research is having on the development of risk management practices?

e. What other areas do you think influence how the 4 factors of the risk management process are conducted effectively?

f. Could you give any indication of the relative importance of these areas in comparison with each other, as regards the extent they influence effective health and safety management?

g. Could you provide any references for each point/factor?