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Towards an organizational model of occupational health and safety management: a review of the literature

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Abstract

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A review of thirteen leading management journals from 1994 to 2005 was conspicuous by the absence of interest in OHS management as the subject or field of study. An examination of six leading HRM journals over the same timeframe showed much the same. Naturally, the OHS literature was more fruitful. Five main categories were identified: prescriptive, error/disaster-based studies, culture and reliability studies, systematic OHS management studies and success/effectiveness studies. Each presents a different perspective on OHS management. However, there appears to be little in the way of understanding and explaining it at the organizational level from a perspective that views management not as a homogeneous grouping, but as a multilevel, multifunctional set of interests. The paper concludes by presenting the case for an in-depth, contextually embedded, multi-narrative examination of successful, exemplary OHS management as a basis for theory development.

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Towards, organizational, model, occupational, health, safety, management, review, literature

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Towards an Organizational Model of Occupational Health and Safety

Management: A Review of the Literature

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ABSTRACT

The enormous, tragic and largely unnoticed problem of workplace injuries and deaths continues to beset countries around the globe. Tripartite regulatory approaches to address the issues involved often place primary responsibility on employers' management of health and safety (OHS) at the workplace. This paper seeks to ascertain how OHS management at the organizational level has been treated in the research literature.

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INTRODUCTION

The enormous, tragic and largely unnoticed problem of workplace injuries and deaths besets countries around the globe, despite efforts to raise awareness and commitment to their reduction. In 2005, the International Labour Organization (Takala, 2005) estimated that, worldwide, there are annually approximately 2.2 million deaths (a 10 per cent increase on 2002 calculations) and more than 400 million non-fatal work related accidents and diseases, representing a loss of 4% of global GDP. Australia's Productivity Commission (2004) reported the annual cost of workplace fatalities, injury and disease to be in excess of A$31 billion. While it is acknowledged that developing countries bear a disproportionate amount of risk in terms of occupational mortality and morbidity, there is also variation between industrialised economies. The Australian National Occupational Health and Safety Commission (2004) undertook an international comparative analysis of fatal occupational injuries over the three year period 1998-2001 between the best performing countries. The study found that Australia came seventh with a standardised incidence rate of 2.8 per 100,000 workers, with rates that are 71% higher than Sweden and 62% higher than the UK, respectively the countries with the lowest rate of work related injury fatality. These figures do not include occupational diseases where, for example, it has been estimated that up to 24000 workers in the UK die each year as a consequence of occupational cancer (Hazards Magazine, 2005: 14). In addition to fatalities, it has been noted that Australia has an occupational injury incidence rate of 49.2 per thousand workers, with increasing amounts of lost time (Productivity Commission, 2004).

Over the years, governments throughout the world have sought to address the above problems through various forms of public regulation. In particular, Gunningham (2004:23) has observed that 'there has been a significant evolution in the style and form of safety regulation in Europe, North America and Australia, involving a substantial shift from a

prescriptive "command-and-control" style of regulation, to a "meta-regulatory" approach using less direct and process-based means to achieve broad safety goals: means which facilitate and encourage "reflexive regulation" by influencing the systems of internal self-regulation of participating enterprises.' This shift has been accompanied by the introduction of stronger sanctions in the form of stiffer financial and criminal penalties. The fundamental tripartism (Ayres and Braithwaite, 1992) embodied in a general duty approach still confers on organizational employers and their managers a major role in ensuring the health and safety of those at work, where employees and their representatives are mandated to contribute to these jointly managed responsibilities.

Given its apparent importance, what is occupational health and safety management? According to Frick's analysis (2003: 3), there is no generally accepted definition. He draws attention to varying specifications found in 'regulations, standards and marketed OHSM-systems' (Frick, 2003:3). Without a clear understanding of what constitutes occupational health and safety management, the relevant strategies, structures and tasks for organizations and their managers are likely to be fraught with ambiguities and uncertainties about what to do and what not to do, not to mention the level of desired and acceptable performance.

This paper reviews the literature on occupational health and safety management in organizations in an effort to ascertain its current level of conceptualization and empirical grounding. In the next section, findings from a review of leading European and American general management and human resource management journals are presented and discussed. This review is based on the proposition that if occupational health and safety is a major responsibility of management of organizations as espoused in legislation and associated regulations, then it will be likely to be of direct conceptual and /or substantive interest to management and human resource management scholars. The remainder of the review focuses directly on the OHS-related literature where, naturally, an abundance of research on OHS

management in organizations is to be expected. Based on this review, key conceptual elements of OHS management are outlined. Next, gaps identified in the overall theoretical and empirical conceptualization of OHS management lead to the proposition for developing a contextually-based model of OHS management through in-depth case study that takes account of the multiple parties often involved and their different stories about how and why OHS is managed.

MANAGEMENT LITERATURE

The management literature was examined in two main strands. The first relates to leading American and European (predominantly Anglo) mainstream management research journals. If OHS management is of general and major concern to managers in industry given the regulatory pressures to secure the safety and health of those at work and the often espoused strategic importance of human resources, then it is likely that it would receive conceptual and/or empirical treatment from perceptive management researchers and be reported in these. The second strand of management literature analysed relates to leading human resource management journals. OHS is often treated as a subfunction of human resource management in organizations and is widely listed and written up as a chapter as such in human resource management textbooks. In a similar vein to the above proposition on general management, if OHS management is of major importance to human resource managers, then it is likely to be the object of study, analysis and reporting in the human resource management literature.

The management journals selected for review were: Administrative Science Quarterly (US), Academy of Management Review (US), Academy of Management Journal (US), Strategic Management Journal (US), Human Relations (EU), Organization Science (US), Journal of Management (US), Journal of Management Studies (EU), Organization (EU), Organizational Dynamics (US), Organization Studies (EU), Sloan Management Review (US)

and California Management Review (US). The human resource management journals selected for review were: Human Resource Management (US), Human Resource Management Review (US), Human Resource Management Journal (EU), Human Resource Planning (US), Asia Pacific Journal of HRM (Australia), International Journal of Human Resource Management (EU) and Personnel Review (EU). These journals were electronically searched through available databases from the period beginning 1994 to end 2005. The searches were predominantly title, abstract and key word based, but in some instances full text was searched, according to the search capability of the relevant database. The following key words and phrases were employed: occupational health and safety management, occupational safety and health management, health and safety management, safety management, safety, health. The decreasing specificity of the terms was intended to capture papers that might address organizational level OHS management not reflected in the title, abstract or keywords.

More than ten years ago, McLain (1995: 1726) observed that '[a]lthough research attention to health and safety dates back thousands of years, management research and textbook treatments of issues related to a healthy workplace rarely go beyond stress management or brief descriptions of the laws addressing worker safety'. There has been little change since. In the management journals reviewed, there was not a single publication that examined occupational health and safety management in organizations either conceptually or empirically as a primary subject of study. There were few that addressed occupational (workplace, organizational, employee) health and safety in any way. Where these touched upon OHS management, they were typically at an elemental, albeit valuable, OHS management level.

Several years ago, Boyd (1999: 439) observed that '[g]iven that health and safety is a key area covered by HRM, it is surprising that it receives minimal coverage (or none all) in

key HRM texts and journals'. Nothing has changed since that time, either. Over the period 1994 to 2005, the human resource management journals reviewed for this paper contained *one* article that specifically focused on OHS management per se. This is in stark contrast to the regular and frequent study of other HRM policies and practices in areas such as recruitment, selection, training, appraisal and planning. The above article by Carol Boyd (1999) reports on the investigation of HRM and OHS management in the safety-sensitive international UK based airline industry. She systematically examined how health and safety is undervalued, is compromised by cost rationalization and asserted that HRM in this industry is opportunistic to the extent that OHS policies were not put into practice. She extended this analysis in a later research monograph *Human Resource Management and Occupational Health and Safety* (Boyd, 2003) to include the international call centre and nuclear power industries, and confirmed her earlier finding that HRM in these cases fails to provide effective OHS management.

As with the general management journals, occupational health and safety receives some attention from some researchers in the HRM. For example, Clarke (2003) discussed the potential HRM implications of alternative core and contingent working arrangements for organizational safety culture and pointed to the difficulty of integrating the latter category into such a culture. Overall, OHS is often treated in the HRM journals as one of a number of HRM variables in studies concerned primarily with other phenomena. For example, in their survey of 39 US services firms (out of a total of 1500 initially surveyed) to assess the effectiveness of high performance work systems, Varma, Beatty, Schneier and Ulrich (1999) found that, among a bundle of eleven effective organizational culture practices, improved workplace safety can lead to improved operations; how is not explained.

A major trend in HRM research has been the growing interest in the relationship between strategy and human resource management, based on the assumption that human

resources and their management contribute significantly to sustainable competitive advantage for organizations. Without exception, OHS and OHS management are excluded from the operationalization of this relationship in terms of policy or practice.

The overriding impression is that OHS management is of no interest to mainstream and leading HRM research. In effect, it is not viewed as part of HRM. Reasons such as those posited above for general management pertain to HRM. OHS and its management are at best marginal, perhaps representing a reluctantly held relic of the welfarist days of old personnel departments. Since HRM in reality is often treated as the logical functional repository for OHS, the above findings are of some concern. If they reflect actual organizational life, then OHS management is more or less consigned to the realm of the OHS specialist or cursory treatment by managers preoccupied with other matters.

OCCUPATIONAL HEALTH AND SAFETY LITERATURE

As might be expected, the specialist and related occupational health and safety literature was much more fruitful in terms of studies, publications and reports on OHS management. Five main categories emerged from this review: prescriptive, error/disaster based studies, culture and reliability studies, systematic OHS management studies and success/effectiveness based studies. These categories vary greatly in terms of the conceptual depth and empirical understanding they shed on OHS management. They are discussed below.

Prescriptive OHS Management Literature

This category is populated largely by text books that are directed at students and practitioners in OHS. Overall, they are not empirically grounded representations of what constitutes OHS management, nor are they conceptualizations that are verified or validated through systematic field study. Rather, they are their respective authors' attempts at ordering tools, techniques, technologies and insights (for example, Bohle and Quinlan, 2000; Cox and

Cox, 1996; Ellis, 2001; Fuller and Vassie, 2004; Geller, 1998; Toohey, Borthwick and Archer, 2005). This is also the domain of government prescriptions, codes of practice and advisory pamphlets, national standards promulgated by national standards bodies, and proprietary OHS programs and systems. Fundamentally, they endeavour to tell us what OHS management should be, rather than what it is.

These different OHS management prescriptions are by no means unsophisticated in their analysis. The constituent chapters draw widely upon OHS research findings (such as those discussed in later sections) and case examples to describe and explain key points. For example, Bohle and Quinlan (2000: xiv) seek to provide 'a more holistic, multidisciplinary and participatory understanding and approach to managing OHS by bringing the social science, medical, ergonomic perspectives on occupational health together', rather than the narrow fragmented approaches that they argue characterise extant major OHS management strategies. In recent years, the increasing emphasis in this body of work on risk management concepts and methods, multidisciplinarity and on a holistic, systems organizational level approach to understanding OHS and its management has been reflected in the other categories of the OHS research literature, as discussed below.

Error/Disaster Based OHS Studies

Major conceptual and empirical contributions to a deeper understanding and appreciation of OHS management have emerged from the retrospective study and contemplation of human-made disasters, organizational accidents and critical errors that led to or that had the potential to cause significant occupational fatalities, in terms of number and/or prominence. Examples of such disasters include: the 1984 Bhopal pesticide plant disaster in India, estimated to kill between sixteen and thirty thousand people in India, and injuring many more (Hopkins, 1999: Lapierre and Moro, 2002; Perrow, 1999); mining disasters such as the underground coal mine explosion at Moura in Australia killing eleven in

1994 (Hopkins, 1999); exploration disasters such as the Piper Alpha oil rig explosion in the North Sea in 1988 where 167 men were killed (Cullen, 1990); the loss of the space shuttle Columbia and its seven crew members in 2003 (Columbia Accident Investigation Board, 2004); public transport incidents such as the Waterfall rail accident in New South Wales that killed seven in 2003 (McInerney, 2004).

These disasters and accidents, as well as many, many others typically are highly prominent in the public gaze and are subjected to government mandated and funded inquiries and investigations. As such, with the often significant financial and human resources that are committed to their undertaking to ascertain how and why the event(s) occurred, they are scrutinised far more deeply and extensively than any typical university-based study of OHS, normally for the purposes of public policy change, prosecution, allaying community concerns and learning how to avoid future recurrences. Clearly, such investigations provide a source of rich data that permits scholars of OHS and its management to examine and explain issues in the nature of such accidents and disasters that are primarily concerned with management failures, errors and 'conditions' (Reason, 1997). There are a number of key insights into OHS management that have arisen from such studies.

First, given the nature of high risk technologies, there are organizational characteristics of interactive complexity and tight coupling between system components in formal organizations that fail, defeat the safety devices and consequently make accidents inevitable, and in a sense normal (Perrow, 1999). Despite the putative limitations of Perrow's normal accident theory, including the types of organization and industry that are a legitimate domain for such accidents, and the difficulty operationalizing interactive complexity and the degree of coupling (see Hopkins, 1999), our attention in understanding normal accidents and accidents in general is drawn to the need to take account of 'the context of errors and failures, thus bringing in the system in which they are embedded' (Perrow, 1999: 387). In addition, as

Hopkins (1999) has observed, normal accident theory has given rise to high reliability theory, which seeks to explicate what is necessary to achieve very high reliability (through worker autonomy, a questioning attitude, focus on safety, professionalism and skills (Perrow, 1999)).

Second, culture has been widely identified among researchers and consultancy circles as a significant organizational factor impacting on OHS management and the likelihood of disasters and major accidents (Columbia Accident Investigation Board, 2003; Hopkins, 2000, 2005; McInerney, 2004; Reason, 1997; Vaughan, 1993). For example, the Columbia Accident Investigation Board (2003: 9) placed as much weight on the space shuttle program's history and culture as causal factors as it did on the found physical cause of the accident. One of the major problems with safety culture (and organizational culture for that matter) is the general absence of agreement on its definition. More prominent among the various treatments, James Reason (1997) argues for an informed safety culture underpinned by an effective safety information system that integrates the following four subcomponents: a reporting culture, a just culture, a flexible culture, a learning culture. Hopkins (2005) extends Reason's concept of safety culture to embrace the notion of collective mindfulness arising from studies of high reliability organizations and aligns it with equivalent subcomponents: preoccupation with failure, reluctance to simplify, sensitivity to operations, and commitment to resilience and deference to expertise. He contends that the above concepts as well as that of risk-awareness are interchangeable. Culture and high reliability are discussed further in the following section.

Third, there is explicit acknowledgement that there is an ongoing and dynamic tension between production and protection, where for many organizations the goals of production (efficiency, profits, share values, market growth, returns on investment etc.) clearly predominate, often at the expense of OHS (Hopkins, 1995, 2005; McInerney, 2003; Perrow, 1983; Reason, 1997). The tension is often manifested in the play of power between the

interest groups involved (e.g. frontline operators, line supervisors, senior management, OHS committees and OHS specialists) over how the tension is managed and in which direction resources are allocated. It is in this product-market/OHS context that the senior management preferences and commitment are seen to determine the allocation of resources and emphasis on OHS, and are often critical players in hindering effective OHS (Hopkins, 1995, 1999b).

Fourth, error/disaster-based studies draw attention to the role played not only by frontline operators in terms of their active errors or violations in accident causation but also to what Reason (1997: 10) refers to as 'latent conditions' and which he ascribes as the principal causes. They arise from 'strategic and other top-level decisions made by governments, regulators, manufacturers, designers and organizational managers. The impact of these decisions spreads throughout the organization, shaping a distinctive corporate culture [.] and creating error-producing factors within the individual workplaces' (Reason, 1997: 10). Clearly, OHS management is interdependent with and embedded in management in general. Fifth, a corollary of the investigation of major accidents and disasters has been to focus on their future prevention through various risk management risk techniques and approaches. Prominent among these have been the development of standards in numerous countries for the auditable design and operation of occupational health and safety management systems (OHSMS) in industry, driven by the findings of the inquiry into the Piper Alpha oil platform disaster referred to above (Cullen, 1990; Hudson, 2000). OHSMS are examined in greater detail later in this paper.

Finally, investigation, analysis and theorising about disasters and major accidents point to the great value of exceptional cases as a source for insight and learning. However, these exceptional cases are unfortunate events with negative consequences that *post hoc* and among other things, emphasise errors, violations and failures in OHS management in relation to the particular event, and assume that if they were addressed in some way that the event

would have been averted. They tend not to be explicitly concerned with OHS management in general. While these studies do not provide a holistic insight into OHS management, they do draw attention to the often critical role played by management's acts and omissions not only directly in relation to OHS but also indirectly, and to significant organizational factors that influence the play of management in OHS.

Culture and Reliability Studies

In addition to the cultural issues discussed above, significant contributions to the OHS management literature have been made by social science scholars concerned with safety culture (eg Guldenmund, 2000), the related area of safety climate (eg Flin, Mearns, O'Connor and Bryden, 2000) and high reliability organizations (eg Weick and Sutcliffe, 2001). The problems of operationalising safety culture means it is often conflated with safety climate (Hale, 2000; Mearns et al, 2003; Williamson, Feyer, Cairns and Biancotti, 1997), although based on a extensive review of the respective literatures, Guldenmund (2000: 222) distinguished safety climate as attitudes to safety in the organization, whereas safety culture represents the 'strong convictions or dogmas underlying safety attitudes'. Even though Guldenmund (2000) recognises the two concepts are poorly defined, their relationship is unclear, their construction and aetiology are confused and there is no integrating model, what is clear is that these two constructs represent collective, organizational level dimensions that permeate all aspects of OHS (from values to artefacts), regardless of technical concern, and thus have profound effects on OHS outcomes.

The development of high reliability theory in the 1980s and 1990s through the study of organizations (such as aircraft carriers and nuclear power plants) that experience lower than expected error focused on collective mindfulness as means of its achievement. According to Weick and Sutcliffe (2001) collective mindfulness is visible in safety cultures and finds expression through processes including: a focus on failures, a reluctance to simplify

interpretations, a commitment to resilience, sensitivity to operations and deference to expertise through a flexible decision-making system (Weick and Sutcliffe, 2001).

Systematic OHS Management Studies

Over the last twenty years, there has been a growing body of literature on what appears to be a global trend in the adoption of systematic OHS management (e.g. Bluff, 2003; Borys, 2000; Frick, Jensen, Quinlan and Wilthagen, 2000; Gallagher, Underhill and Rimmer, 2000; Saksvik and Quinlan, 2003). According to Frick and Wren (2000: 19), systematic OHS management 'aims to identify sources of injury and ill-health early in the production process and to produce countermeasures before injury or ill health occurs'. They view this as an outgrowth of quality management's emphasis on enacted managerial responsibility, as well as integrated, systematic production management. Bluff (2003) asserts that effective risk management lies at its core.

Given the acknowledged breadth and looseness of the above definition and qualifications, systematic OHS management is found in a variety of mandated and voluntary forms and at a number of different environmental levels (international, national, state, organizational). Bluff (2003) identifies how systematic OHSM is variously mandated by public regulation in a number of countries as well as by the European Union under its Framework Directive. Second, she notes the wide range 'proliferation of corporate systems, proprietary products, standards, guidelines and certification tools' available on a voluntary basis from governments and private sector organizations (Bluff, 2003: 5). It is hardly surprising that with such diversity that systematic OHS management is difficult to operationalise. Nevertheless, based on a number of standards and guidelines from a number of countries which she contends are broadly similar, Bluff (2003: 7) identifies the core elements that operate as a system as: 'integration of OHSM into other business activities; management commitment; OHS policy; planning and resourcing of OHSM; designation of

responsibility and mechanisms of accountability; policy; procedures and documentation; risk management; worker participation; development of OHS competency; reporting, investigating and correcting deficiencies; and monitoring, auditing and reviewing OHS performance'. In a similar manner to Bluff, Gallagher et al (2001) assert that senior management commitment, effective communication, employee involvement and consultation are critical for effective occupational health and safety management systems. How this occurs within an organization is not discussed. Based on his analysis of the evolution of safety in the Shell Oil Company, Hudson (2000) considered the problem with systematic OHS management is that it can be over-complicated, expensive and foster mechanical adherence. Therefore, he contends that it is necessary to breathe life into the system through the introduction of an increasingly informed, trusting and generative safety culture.

Since this paper is focused on OHS management at the organizational level, studies on systematic OHS management are largely lacking detailed insight into its holistic form and implementation. A possible exception is Wokutch and VanSandt's (2000) comparison of the DuPont OHS management and Toyota's total quality management driven OHS systems where, based on their analysis, they believe that safety management is effective in both organizations, but are more equivocal on occupational health and environmental performance in DuPont, and silent on Toyota in this regard due to absence of data. However, even in this study the extent of depth analysis was limited to three site visits to DuPont facilities, none to Toyota and interviews with employees from both companies, plus publicly available data. The lived experience of those involved in the processes of installing, operating, maintaining and adapting systematic OHS management at the organizational level, such as senior managers, managers, OHS specialists and other employees, is fundamentally absent.

Success/effectiveness based studies

Overall, studies of OHS management effectiveness and success have tended to be atomistic in nature, with a focus on factors or elements that are considered to lead or contribute to improved OHS performance. OHS management as an organizational whole has been neglected. There are many varied prescriptions that claim to establish how to create success and effectiveness in OHS management.

While many arenas in management are concerned, *inter alia*, with explaining the link between success/effectiveness in the particular managerial domain and some aspect of organizational performance (often financial), systematic research into how OHS management contributes to organizational performance, even in terms of OHS outcomes, is somewhat equivocal. In evaluating best-practice evidence in the OHS management literature for OHS impact measurement purposes, Niven (2005 found it to be lacking in positivistic scientific rigour. Similarly, Gallagher et al (2001) found very little empirical research evaluating OHS management systems despite their wide application internationally.

One case study-derived examination of effective OHS that sought to adopt a holistic approach to OHS management was carried out by Dawson, Poynter and Stevens (1983) in UK industries. Using interview, survey and observational data gathered from eight establishments in the petrochemical, chemical and allied industries (and later in the retail and construction industries), they identified a framework for local OHS management strategies that led to improved OHS outcomes. In doing so they embedded a risk management decision-making process that takes account of the external organizational context in terms of the regulatory environment, and the internal organizational context, significantly identifying the politics of OHS where different interest groups, such as managers, employees, OHS representatives, OHS professionals, have different commitments to OHS. These different groups also have varying levels of power with regard to the human, financial and knowledge

resources they are able to marshal for OHS. Consistent with earlier and later studies, senior management were found to be the most powerful and influential in this regard. Thus, commitment to the technical control of specific occupational hazards such as noise, fire, manual handling etc., was seen to be directly influenced by the organization's motivational controls for generally encouraging commitment to use technical controls, through cultural, responsibility and accountability systems.

CONCLUSIONS

This review has shown that holistic organizational-level OHS management, the target of much public regulatory attention, has received scant treatment in terms of empirical research. OHS management has been of no interest as far as the top academic management journals are concerned, and has fared little better in the mainstream and leading HRM research. The OHS literature provides many empirical and conceptual insights into OHS management, but mainly at an elemental, factor level.

A challenge, then, for future research is to build on the knowledge gained, through a focus on holistic OHS management in organizations. Of particular interest is the relationship between OHS management and OHS and organizational performance, since its fundamental purpose notionally is to prevent and mitigate occupational injury and disease. The human resource management (HRM) research literature has recently made some interesting advances in conceptualizing the linkages between HRM and organizational performance. Paauwe's (2004) contextually based human resources theory is probably the most advanced and relevant (to OHSM) current conceptualization in that in addition to 'strategic' financial/ product/market goals, it embraces institutional demands such as those from regulators, the involvement of dominant internal coalitions and their choices, the particular technical and motivational configurations employed by the organization, the expectations and needs of

internal and external 'customer' groups, the administrative heritage of the organization, as well as functional and organizational performance outcomes. This model may be modified to refocus more explicitly on OHS management, thereby accommodating the extant scientific insights into OHS management as well as the empirical and theoretical gaps in OHS management discussed in this paper. A qualitative methodology is suited to the empirical development of such a contextually based theoretical model of OHS management in organizations, in particular, an in depth exceptional case study analysis of an organization whose OHS management and performance are deemed outstanding. Thus, it may be possible to present a thick description of what constitutes actual effective holistic OHS management, one that takes account of the salient multiple narratives and lived experiences of those engaged in influenced by it, one that 'recognizes subjective dimensions and cultural values and [..] shows a skepicism about human-made systems and institutions, and emphasizes social bonding and the tentative, ambiguous nature of experience' (Perrow, 1999: 328).

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