Part IV

Risk management
Health and safety and the management of risk

Laurence N. Ball-King and David J. Ball

Introduction

Health and safety (H&S) is sometimes regarded as a ‘low-level’ activity in comparison to other risk topics (Leitch, 2012), perhaps implying it to be relatively mundane within the overall context of risk studies. Although outwardly this may appear to be true, ultimately it is not a view we share. On close inspection we find there are many aspects of this area of work that demand the attention of risk professionals. Examination of the background of H&S shows that it has been, throughout its now long history, an area of evolution, turmoil and, at times, even revolution. The origins of ‘the revolution’ can be traced to Britain’s own industrial revolution (1760–1840), the consequences of which subsequently spread across Western Europe and to North America, the Antipodes and some Asian countries. Nowadays, H&S also has a growing tendency to affect everyone, whether inside or outside the conventional factory fence, and with a fair number of persons (possibly as many as 50,000 in Britain alone) being directly employed as H&S professionals.

H&S also has much to be proud of in terms of its apparent successes in reducing the risk of workplace injuries, whether fatal or non-fatal, that is in terms of the ‘S’ part of ‘H&S.’ Figure 12.1 shows the general downward trend over the last two decades in the UK alone as measured by fatalities per year and by the rate of fatal injury per 100,000 workers. In comparison, it has been reported that the rate for the decade 1961–1970 was 4–5 whilst for 1901–1910 it was 5–17 (Robens, 1972: 17).

Despite this impressive achievement, H&S has frequently struggled with its image even – and perhaps especially – in its British birthplace, although it is by no means confined to these shores. Thus, in modern times, H&S regularly features, quite disrespectfully, in the popular press and even the routines of comedians, often motivated by what the media consider to be the overzealous and unnecessary policing of trivial activities. Ironic though this is, modern day H&S relies far more on encouraging personal responsibility than on rule-observance, and it is nonetheless potentially damaging to the quest to manage safety. For this reason alone there is good reason to probe deeper, but, as will be seen, there are other issues that are also of interest to risk-based thinkers, not the least the sometimes contradictory demands of the public for, on the one hand, total safety, and on the other, the avoidance of overly expensive or restrictive control measures.
A brief history

Before examining specific matters of H&S and risk it is helpful to consider the historical evolution of the field. As will emerge, Britain has been singularly influential in this regard and with a global impact. This is not to discount the fascinating ‘pre-history,’ as it might be called, of workplace H&S, which can be traced back much earlier and further afield. It is well known, for example, that the Greek and Roman civilizations were aware of the adverse effects of lead exposure on lead workers, of which the Roman engineer Marcus Vitruvius Pollio himself wrote in the first century BC:

We can take example by the workers in lead who have complexions affected by pallor. For when, in casting, the lead receives the current of air, the fumes from it occupy the members of the body . . . and rob the limbs of the virtues of the blood.

(Reported in Jacobson, 2002: 78)

Despite this early recognition of the hazard, lead poisoning continued to be a serious industrial problem until the nineteenth century (Greenberg, 1983). In fact, the evolution of H&S across Europe was in no way short of intrigue and conflict, resulting in long periods of stagnation. The modern story, however, commences some two or three centuries ago at the birth of Britain’s Industrial Revolution when, in the mid- and late eighteenth century, industrialists were introducing all manner of novel metalworking and textile industries. Working conditions in those early factories were frequently dire, with many women and children numbering amongst the employees. The consequence was a growing societal concern and public pressure for improved conditions of work, and attempts were made from the early nineteenth century to improve the situation through the passage of Parliamentary Bills, themselves precursors of a long succession of Factory Acts. As Eves (2014) said, it was gradually dawning that ‘regulation could not simply be left “to the market” and that state intervention would be necessary when the market failed to respond to the needs and wishes of society’ (Eves, 2014).

Very gradually, through the succession of Factory Acts, each introducing more specific rules and requirements, and through the eventual establishment of an official factory inspectorate, the scope of the H&S movement was broadened and empowered. Furthermore, railways, mines and quarries, marine activities, agriculture and electricity production were gradually drawn into the net. These advances were hard won, however, because throughout this time there was a good deal of
opposition from some industrialists and parliamentarians who portrayed the measures as excessive, and regulators were constantly being held to account over the need for balance. Not all industrialists were opposed, however, and in 1917 the Industrial ‘Safety First’ Committee was established and as a result the British Industrial ‘Safety First’ Association (BISFA) was formed in 1918 to tackle workplace safety on a national scale. Following amalgamation with like-minded organisations with additional interests in road safety and domestic accidents, the now internationally respected Royal Society for Prevention of Accidents (RoSPA) was formed, with royal approval, in 1941.

The mid-twentieth century saw a succession of further Factories Acts – in 1937, 1948, 1959 and 1961 – that inter alia extended the scope to cover all factories, not only those involving textiles and mechanical power, and they also incorporated construction sites and strengthened fire precautions. However, concern was mounting on two fronts. First was that the regulatory regime was fragmented, piecemeal, littered with obsolete provisions (for example, the Felt Hats Manufacture Regulations 1902) and overly prescriptive. Second was that after initial success there was a worsening trend in the numbers of accidents (Robens, 1972: 17).

In 1966 a singular event – the Aberfan disaster (McLean and Johnes, 2000) in which a colliery tip collapsed and engulfed a village school in Wales – led to further concern when it was found that such activities were not even covered by the relevant legislation (Figure 12.2). Anomalies of this kind were on the increase because the length of time required to revise statutory regulations was being outstripped by the rapidly changing nature of industrial and workplace activities (Robens, 1972: 140).

This strengthened the feeling that existing factory law could not cope with the proliferation of new industries, and furthermore that the prescriptive approaches were already so complex that industry, and even the legal profession when called in, was finding it difficult to cope. Something new was evidently needed.

The Robens Report and its key concepts

During the 1960s, plans were afoot in the British Government to tackle the rising incidence of workplace accidents by further revision of the Factories Act. Instead, the Conservative Government of the day initiated a more consequential action by appointing Lord Robens, the then Chairman of the National Coal Board, to critically review occupational health and safety legislation in the UK (Robens, 1972). Unusual, and not attempted before, was that the focus was to be on fundamental issues of principle and broad questions of policy and organisation (Browne, 1973). The Robens Report, as it later came to be known, was published in June 1972 and forms the basis of most of the modern H&S legislation in Britain. It also came to have a substantial global impact, with its influence extending as far as Malaysia (Commissioner of Law, 2006) and Australia (Safe Work Australia, 2015).

The Report concluded that the existing H&S regime of the time needed a radical overhaul. It found that there was quite simply too much law, and the system of prescriptive rules, which was designed to cover every process and hazard, was both cumbersome and ever expanding. Every time a new technical situation or hazard arose an external agency imposed a new set of detailed rules (Browne, 1973). Moreover, the system struggled to keep pace with the rapid changes in processes and technologies that were occurring, resulting in much outdated detailed law on the one hand and, on the other, much that was new in industry was not covered by the legislation at all (Farmer, 1989). What was needed, Robens contended, was a return to the notion of personal responsibility in which those who create the risks would have the primary responsibility for managing them. He was evidently concerned by what he saw as entrenched apathy towards safety, which was partly driven by a culture that had become dependent upon
rules imposed by external agencies (Robens, 1972: 28). The perceived solution was to introduce a simpler ‘principle-based’ approach, under which employers had to ensure that workers were not exposed to an unreasonable level of risk and, further, that this should be overseen by a single regulatory body.

Robens (1972) identified further issues, some of which continue to have resonance to this day:

- That there was too much emphasis on physical circumstances and too little on behaviour (para. 31);
- The growing army of external agencies and inspectors who were enforcing the laws, upon whom he felt employers were increasingly reliant (para. 54–5);
- That 5 million workers were not covered (for example, those in schools and hospitals) (para. 35);
- That the public needed protection from work activities (para. 106, 283, 292);
- That laypersons did not understand the legal requirements (para. 132);
- The constant multiplication of non-statutory codes, which could be unhelpful and confusing (para. 149); and
- The need to enhance the reputation of H&S (para. 57–58).

The Health and Safety at Work etc. Act 1974 and the concept of reasonable practicability

Despite the radical nature of Robens’ proposals, the subsequent 1974 Health and Safety at Work etc. Act (HSWA) embodied almost the entirety of his thinking. It also coincided with the creation of Robens’ proposed regulator, the Health and Safety Executive (HSE), with far
reaching powers that would establish it, as some would say, as the most powerful regulator in the world on the basis of the breadth of its remit. The Act itself imposed general duties on employers to ensure H&S subject to the qualification of ‘so far as is reasonably practicable’ (SFAIRP). This was a qualification of crucial significance because it did not require the employer to do everything physically possibly in the quest for safety. The Act’s reach was also extended to cover many public sector workers in schools and hospitals, as well as the public when they were put at risk by work activities. These extensions generated surprise. As the HSE later remarked of the HSWA:

Those ‘affected by work activities’ were brought under the legislative umbrella for the first time. In the mid-1970s, this latter provision provoked widespread astonishment.

(HSE, 2004: 4)

The key philosophy embedded in the HSWA is that of reasonable practicability. The term came under scrutiny following a Public Inquiry in 1986 over the planning application to build the Sizewell B nuclear power station. The inspector at the Inquiry, Sir Frank Layfield, noted HSE’s use of the term ‘reasonable practicability’ in its evidence and requested HSE to provide clarification of what it meant, as well as general public guidance on how the regulation of nuclear safety was then conducted. The result was the landmark 1988 publication *The Tolerability of Risk from Nuclear Power Stations* (HSE, 1988). Although originally aimed at nuclear industry issues, it was envisioned that the guidance found within could apply to wider occupational H&S matters, as was reaffirmed in another landmark HSE publication (HSE, 2001).

The Tolerability of Risk (ToR) framework described in HSE’s 1988 publication, and which embraced the concept of reasonable practicability, attracted global attention and went on to have profound significance for the regulation of other major industrial risks. Its impact can be discerned in areas as diverse as offshore and onshore major hazards (Safe Work Australia, 2012), civil aviation (ICAO, 2013), and potentially even within the pharmaceutical sector (Bouder and Löfstedt, 2008). The framework as set out by the HSE can be seen in Figure 12.3.

The diagram represents the level of risk of death from an accident that an individual may face, with the level of risk increasing as one moves up the triangle. The triangle is divided into three sections. In the upper segment, risks are regarded as unacceptably high and cannot be justified in any ordinary circumstances. The activity pertaining to this level of risk should cease or be rectified immediately.

In contrast, the bottom segment represents a region where risks are considered so low as to be broadly acceptable. The view has been expressed that very low risks would normally be considered by ordinary people to be trivial or insignificant in the context of their daily lives (Royal Society, 1983). Efforts to reduce the risk level further would produce little benefit and could potentially involve significant resources, not to mention the possibility of introducing some new, unintended risk worse than the original. All that is normally required for these hazards is monitoring of the situation.

Between these two extremes lies the ‘tolerable’ region in which the decision about whether to reduce risk further is based on a comparison between the reduction in risk, which some control would bring about, and the cost of achieving it. Risks here are required to be reduced until ALARP/SFAIRP. The ALARP concept embodies the idea that the duty holder of the hazard should consider the measures available to reduce the risk and implement all those measures that are reasonably practicable – measures that give a reasonable safety improvement without excessive cost or difficulty. Crucially, it means that duty holders are not required by law to implement a measure that does not meet the reasonably practicable criterion.
The ToR framework could be said to promote a utilitarian philosophy in that it seeks the ‘maximum good’ achievable with finite resources with the added safeguard of focusing attention on risks with the highest probability. For risks that are considered trivial, the framework promotes the idea that there is a point beyond which duty holders should not be pressed to implement safety measures.

**Post-2000 developments**

Although the UK’s ALARP philosophy had been an issue on the European stage for some decades (Rimington, 2014), in 2007 it came under renewed fire from Europe where its legality...
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was challenged by the European Commission. The basis of the challenge was that the ALARP requirement of the HSWA was said not to meet the requirements of the 1989 European Framework Directive’s requirement to ‘ensure the safety and health of works in every aspect related to the work’ (European Union, 1989: 5). The 2-year legal battle that ensued was the culmination of a debate that had started a decade earlier, when the EC had complained to the European Court of Justice that the UK’s risk-based approach to H&S regulation compromised worker protection. The UK’s implied cost–benefit approach was seen as bucking the trend of other large European member states, such as Germany and France, which had adopted the Directives into national legislation in ways that seemingly promoted the reduction of workplace risks to minimum levels, with the issue of cost of control being far less prominent (although not forgotten).

The 2007 ruling was, however, in the UK’s favour – the court dismissed the action and, in so doing, effectively confirmed the UK’s right to define occupational H&S regulation as an explicit trade-off between risk and cost. Thus the proportionate approach to safety embodied in the ALARP principle lived to fight another day.

Despite these European reservations, by the turn of the millennium, the UK’s H&S model had, as mentioned, become well-established, was receiving plaudits both at home and abroad (Eves, 2014) and was being or had been adopted by other nations, for example, Malaysia (Commissioner of Law, 2006) and Australia (Safe Work Australia, 2015). The safety industry had undergone rapid growth, and, under the commanding oversight of the HSE, serious and fatal injuries had fallen to record lows.

However, by 2008 fresh clouds were gathering on the horizon at home, and concern was growing in political quarters that the H&S pendulum had swung too far, to the detriment of business and the country’s economic growth (Smith, 1998; Eves, 2014). It was argued that workplaces were increasingly preoccupied with growing red tape, bureaucracy and the fear of being sued even for minor incidents, whilst in public life, H&S interventions were intruding on activities in a way previously unknown (Almond, 2009). The consequence was a growing backlash against what some saw as a restrictive H&S culture that was felt to have increased bureaucracy and costs, especially for small and medium-sized enterprises, and impacted unfavourably upon public and private life.

Interestingly, the developing situation exhibited traits not unlike those that had triggered the Robens Report four decades earlier: a proliferation of confusing safety advice (which Robens had sought to eliminate by his introduction of broad principles), the erosion of H&S’s reputation and a growing army of external agencies and inspectors. The few thousand safety inspectors that Robens had reported in the 1960s were now numbered in the tens of thousands.

The industry’s reputational issues were compounded by a growing media circus portraying the situation as one of overzealous inspectors placing heavy-handed restrictions both on businesses and previously enjoyed public activities. Stories such as the removal of floral hanging baskets from town centres, the requirement for children to wear goggles whilst playing traditional games like ‘conkers,’ and the banning of long-established Christmas swim events on safety grounds, had become commonplace. Tales of ‘killjoy’ risk assessors prohibiting activities in the name of safety became enduringly popular among the public and spread rapidly – in some cases to the point where the stories’ appeal became more important than their factual veracity (Almond, 2009).

The situation became so acute that in 2009 Prime Minister David Cameron announced a review, to be undertaken by the business leader Lord Young, to critically evaluate the operation of H&S laws and the growth of an alleged ‘compensation culture’ whereby even trivial accidents
resulted in claims for compensation. The subsequent report, *Common Sense, Common Safety*, encompassed the role of the HSE, the nature of health and safety laws, litigation, and the role of insurance companies (Young, 2010). Among the Report’s key findings was that principles of regulation aimed at hazardous environments were being extended to relatively low-risk businesses and activities.

The government subsequently accepted all the recommendations put forward by Lord Young, which included policies for reducing the burden on small businesses plus restrictions on advertising by solicitors for ‘no win, no fee’ compensation claims. It also launched the ‘Red Tape Challenge’, which aimed to reduce the volume of legislation on statute books, with occupational H&S in particular under the spotlight.

Following the Young Report, in March 2011 the Employment Minister Chris Grayling commissioned a further independent review to be undertaken by Professor Ragnar Löfstedt of King’s College London. The recommendations in the subsequent review (Löfstedt, 2011), which were also accepted in full by the government, were aimed at further reducing the burden of unnecessary regulation on businesses whilst maintaining Britain’s H&S performance, which *inter alia* was noted to be among the best internationally.

Among the key findings of the Löfstedt Review was that the current UK H&S legislation was, in fact, broadly fit for purpose – most notably the HSWA, which stipulates, as discussed, that risks should be reduced until ALARP. Instead, the Review cited the main source of problems as being the way in which the legislation is interpreted and applied. In some cases this was caused by inconsistent enforcement by regulators and in others by the influences of third parties that promote the generation of unnecessary paperwork and a focus on H&S activities that go beyond the regulatory requirements (Löfstedt, 2011).

The overarching principle of the Löfstedt Review was that regulation should be risk-based and evidence-based, rather than hazard-based (Löfstedt, 2011). Hazard-based assessments look at hazards in isolation and seek to control them, ignoring considerations of likelihood. Löfstedt contended that without an assessment of actual risk, activities that could be beneficial to individuals and society should be inhibited. The review ultimately endorsed the proportionate approach embedded in the HSWA.

HSE further attempted to respond to the spread of disruptive H&S stories by launching a ‘Sensible Risk Management’ policy (HSE, 2005). The then chair of the HSC, Sir Bill Callaghan, noted in a speech to the House of Lords that frivolous health and safety stories trivialised the work of HSE, as well as ‘making it harder for all [stakeholders] to focus attention on the significant risks that result in serious harm and even death’ (Callaghan, 2005: 2).

HSE has further sought to challenge such stories by establishing a Myth Busters Challenge Panel, which assesses items brought to its attention and publishes a ‘Myth of the Month’ feature on its website (HSE, 2015). This activity seeks to provide a mechanism to independently challenge advice or decisions, made in the name of health and safety, that are believed to be disproportionate or inaccurate. Between 2007 and 2015, over 330 cases had been reported on the website, with many others having been received (HSE, 2015).

Another area to come under scrutiny in recent times is that of safety management systems, including auditing and internal control systems. *Inter alia*, these practices have seemingly transferred from the financial sector to the workplace, where they had been held in considerable veneration, and also to public life more widely.

Behind such systems lies the belief that they will lead to improved outcomes in terms of risk control, and to this end the UK has invested significantly. Rick Haythornthwaite, former Chair of the Better Regulation Commission, has estimated that the country spends around
£100 billion per year on regulation (Haythornthwaite, 2006), much of which is likely consumed by management costs of which a portion is related to safety; however, and to the perplexity of some, there are suspicions that this investment may not have led to a corresponding improvement in safety outcomes in terms of reduced rates of injury and ill health (Ball and Ball-King, 2011).

This is one reason why such management systems have been increasingly questioned. Power (2004), for example, has highlighted the unintended consequences of this spread of administrative style internal controls, and even argued that management systems can increase risk by changing the way individuals perceive their responsibility. Instead of focusing on managing risk in the first instance, individuals are waylaid by forms and recordkeeping. Adherence to such safety management systems (SMSs) has previously been strongly endorsed by the HSE, but recent HSE literature suggests a shift in approach.

For example, in 2013 the HSE released an updated version of its popular guide Successful Health and Safety Management, commonly known as ‘HSG65’, following the recommendations of the L öfstedt report. First published in 1991, the guide had been the yardstick for managers responsible for safety within their businesses (HSE, 1991). The revised version Managing for Health and Safety (HSE, 2013) is slimmed down, promotes simpler models and places more emphasis on behavioural aspects of safety over ‘box-ticking’ and form filling. In fact, it states that ‘There is a need for a sensible and proportionate approach to risk management, in short, a balanced approach – this means ensuring that paperwork is proportionate, does not get in the way of the job...’ (HSE, 2013: 8). This is viewed positively by those who have previously questioned the role of paperwork (Power, 1994, 2004; Collins and Evans, 2007).

A further dichotomy that has arisen is that between quantitative and qualitative risk assessment. Risks have been subject to quantification since the first forays into probability theory and statistics in the seventeenth century (Hubbard, 2009). The select few industries in which it was first prevalent have since expanded to cover everything from investment volatility in finance to nuclear safety, information security, food safety, environmental pollution and natural disasters. Modern tools such as Monte Carlo Simulation have been developed to enable the computation of the probability of failure of complex systems with some degree of accuracy and objectivity (Hubbard, 2009). Insurance companies utilise vast datasets on past events in order to predict the future. In occupational and public safety, however, it is curious that risk assessments tend to shun the use of such statistical evidence (Ball and Ball-King, 2011). This may be because there remain some H&S practitioners whose actual goal is to eliminate hazards rather than to manage risks, but that would amount to what we would call a ‘hazard-based approach’ as opposed to the ‘risk-based approach’, which lies at the heart of the ToR framework and the philosophy of reasonable practicability.

Thus, the modus operandi in this arena has traditionally been qualitative or subjective forms of risk assessment. This itself has brought with it a raft of associated issues, centred on the impacts of human psychology and the shortcomings of human decision making. The US risk expert Louis Cox (2007: 38), for example, has described a total of 17 psychological factors that affect judgement and that apply equally to lay people and experts. His research chimes with that of psychologist Daniel Kahneman, whose theories on the vast array of cognitive biases to which humans are susceptible challenge the very notion of human rationality (Tversky and Kahneman, 1973). With this in mind, it is perhaps unsurprising that non-quantitative forms of risk assessment can lead to suboptimal or even erroneous conclusions (Ball and Watt, 2013). Risk matrices and other popular forms of risk decision making give the appearance of being quantitative in that numbers are used to rank different hazards, but actually require subjective interpretation, and different users may obtain opposite ratings of the same quantitative risks.
In the worst-case scenario, this can lead one to take a more dangerous route than would otherwise have been taken.

Finally there is growing recognition that H&S practices developed in the workplace and industry, where few question their achievements in terms of injury prevention and lives saved, are less effective and indeed may be ill-suited when applied in other domains such as public life. In such arenas, the single-minded quest for safety from injury has been shown to have unintended consequences, including the undermining of health and welfare, by unintentionally imposing restrictions on healthful activities and places (Ball and Ball-King, 2013).

Instead, an alternative framework is being promoted by a variety of UK agencies engaged with public activities, such as the Visitor Safety in the Countryside Group (2003), the Play Safety Forum (2002) and others. The new approach recognises that safety from injury is but one consideration of many, and should be managed in proportion to other important goals. This means that hazards are, at times, unavoidable if certain benefits are to prevail. In fact, exposure to a degree of risk is increasingly acknowledged as potentially beneficial in some domains (see, for example, Play Safety Forum, 2002). This approach, which recognises the inherent tradeoffs in risk decisions, is what some term as *compensatory decision making*. It contrasts with *non-compensatory decision making*, which unequivocally views risk reduction as the driving priority. Once again it appears that Britain may be leading the way in H&S. Having instigated an influential and effective approach to safety based upon a key principle, it now seeks to rescue that principle from corrosive effects of over-interpretation and excessive formalisation.

**Conclusions**

H&S has made impressive progress in many countries, particularly with regard to injury reduction. Periodically, though, it has run into operational problems. The present situation appears to be less to do with the basic underlying approach (which is sound) than with how it is put into effect. Misconceptions arise from both inside and outside the sector. A commonly occurring dilemma is that the non-prescriptive approach promoted by regulations and requiring the adoption of reasonably practicable solutions to risk, whilst giving a lot of freedom and responsibility to duty holders, at the same time demands a sophisticated level of understanding. Practitioners may therefore err, but it would be wrong of stakeholders (the public) to presume that occasionally faulty decision making is a sign that the system is defective, over-burdensome in general and in need of major overhaul. In fact, the system promotes personal responsibility and freedom, and does not demand more than that which is reasonable.

In particular, we hope it can be seen from this brief account that H&S is confronted with many issues that permeate risk decision making in general. These may relate to the perception of risk, the effectiveness of risk management systems, the nature of decision making itself and the type of philosophy adhered to. We noted at the beginning of this chapter that Lord Robens had identified a number of issues troubling H&S during the 1960s. In our view many of these issues persist or have re-emerged. These include an over-emphasis on hazards as ‘things’ as opposed to the interaction of human beings with those hazards; the proliferation of advisory documents (partially rectified by the Young–Löfstedt Review and now being taken forward by the Department for Work and Pensions); the need to enhance the reputation of H&S; and the complexity of decision making outside the conventional factory fence where other issues besides safety from injury are important. One further area that we have not covered is the ‘H’ of H&S. Workplace health continues to be a major issue and the spotlight is gradually shifting in that direction, although there are also challenging philosophical questions about how far this should go (Callaghan, 2010).
Notes
1 ‘Apparent’ applies because some of the reduction is attributable to changes in the composition of industry rather than H&S itself.
2 Also known as ALARP (as low as reasonably practicable).
3 This trend, post-Robens, of the emergence of more and more regulations and guidance on how to comply with the law was also included in a 25-year progress review of the HSWA (Smith, 1998).

References
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