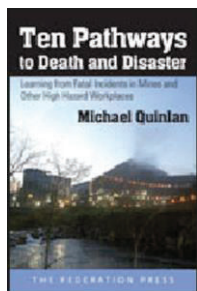# BOOK REVIEW

TEN PATHWAYS TO DEATH AND DISASTER – LEARNING FROM FATAL INCIDENTS IN MINES AND OTHER HIGH HAZARD WORKPLACES

Ten Pathways to Death and Disaster – Learning from Fatal Incidents in Mines and Other High Hazard Workplaces by Michael Quinlan (The Federation Press, 2014) ISBN: 9781862879775, pages 272.

This is a surprising book. I was expecting a dry as dust academic treatise full of facts and figures, charts and graphs, and impenetrable jargon. Instead what I got was a revolutionary critical analysis that took me back to the heady days of the 1980s and my political economy studies at Sydney University led by such luminaries as Frank Stilwell and the late, great Ted Wheelwright. I had to go to the attic to get my copy of *Das Kapital* and my Che Guevara t-shirt to really get into the mood.

I am still a little shocked. Reading this book was a little bit like opening the owner's manual on my Holden Commodore and being instructed to fix that rattle in the dashboard by blowing up the vehicle and going back to the drawing board.

On the face of it, Professor Quinlan, as a renowned occupational health and safety (OHS) academic, expert and author, has identified 10 "pattern causes" he sees as recurring in mining and other workplace disasters across the Anglosphere of Australia, the United Kingdom, Canada, the United States (US) and New Zealand (a variation, perhaps, of the Anglo-Saxon economic model, the critical analysis of which is beloved of European, particularly French economists), when compared to the welfare capitalist economic model of northern and continental Europe.[1]

Professor Quinlan identifies the pattern causes as:

1. engineering, design and maintenance flaws;
2. failure to heed warning signs;
3. flaws in risk assessment;
4. flaws in management systems;
5. flaws in system auditing;
6. economic reward pressures compromising safety;
7. failures in regulatory oversight;
8. worker or supervisor concerns that were ignored;
9. poor worker or management communication and trust; and
10. flaws in emergency and rescue procedures.

Interestingly, Professor Quinlan finds no evidence to support worker behaviour as a cause for such disasters.

Professor Quinlan is very well placed to comment on these matters. Among other things, he was engaged by the New Zealand Department of Labour to prepare background reports on mine safety in the wake of the Pike River Coal Mine Explosion in New Zealand in 2010 that tragically killed 29 miners. Closer to home, Professor Quinlan was appointed to the independent investigation into the fatal rock fall and entrapment of two miners at the Beaconsfield Gold Mine in Tasmania and in 2010 he was engaged by Work Standards Tasmania to audit the Tasmanian Mines Inspectorate.

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[1] See, eg, Chabal E, "The Rise of the Anglo Saxon: French Perceptions of the Anglo-American World in the Long Twentieth Century" (2013) 31 *French Politics, Culture and Society* 24.

The book is organised broadly as follows:

1. Chapter 1 – a critical review of the research on death and disaster at work and setting out the approach and method used in the book.

2. Chapter 2 – setting the context by examining the regulatory frameworks in the mining industry the five countries examined from 1970 to 2011. The author looks at the regulatory context in the five countries identifying broad trends as well as differences and explaining why only a limited number of countries have been considered.

3. Chapter 3 – patterns of disaster and death through an examination of fatal mine incidents in the five countries involving a review of incidents and identifying pattern causes.

4. Chapter 4 – do the patterns apply to fatal incidents in other workplaces? Professor Quinlan extends his analysis to see if similar patterns can be identified in industries other than mining and concludes that sufficient evidence exists to suggest that the parallels warrant recognition.

5. Chapter 5 – learning from failure: some practical implications. The author argues that awareness of pattern failures can help managers, insurers, unions, regulators, workers, and community groups, as well as others, better prevent fatal workplace events and possible remedies are identified that have limited value.

6. Chapter 6 – learning from failure. Broader policy implications as well as regulatory lessons are drawn from the pattern causes and an examination of why regulatory interventions have failed or corroded and possible remedies.

Professor Quinlan favours words such as "failure" and "flaw" to describe acts or omissions leading to death and disaster in mines. He dislikes "accident" and "error" which suggest mistakes. In Professor Quinlan's view, failures and flaws leading to mining disasters are more often the result of "conscious decision-making" (but not by workers) and structured in the sense that they are the result of priorities, hierarchies, domains of authority, and even ideologies.[2]

Professor Quinlan has another reason for disliking words like "error" in this context. It suggests he says, that the remedy is some form of "behaviour modification" which "is popular because it does not question the more critical issues about how work is organised (and the interests and power underpinning this) and how this contributes to probabilistic forms of events".[3]

Professor Quinlan is also critical of concepts like "safety culture" and "safety climate" where the focus mistakenly:

is entirely intra-organisational and disembodied from … power, authority, interest and decision-making both in the organisation and wider society.[4]

For Professor Quinlan, safety system failures are more likely due to structural problems like:

1. a failure to consider all relevant factors for a particular hazard;

2. the hierarchical nature of the safety system; and

3. a failure to heed workers' concerns.[5]

Professor Quinlan argues that:

The poor safety practices in some of the mines and workplaces examined in this book were not the outcome of a "culture" within that workplace as much as the outcome of poor supervision, risk-taking that was condoned or even encouraged by management and other influences such as production pressures and incentives.[6]

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[2] Quinlan M, *Ten Pathways to Death and Disaster – Learning from Fatal Incidents in Mines and Other High Hazard Workplaces* (The Federation Press, 2014) p 7.

[3] Quinlan, n 2, p 8.

[4] Quinlan, n 2, p 30.

[5] Quinlan, n 2, p 30.

[6] Quinlan, n 2, p 31.

Surely, "poor supervision", inappropriate "risk-taking" and leadership that allows "production pressures" and "incentives" to take priority over safety could be described as examples of an unacceptable workplace "culture"?

While, as a former political economy student, I have some sympathy for the view that there are structural reasons implicit, as Professor Quinlan argues, in workplace safety compromises, to deny, or at least downplay, the impact of worker behaviour on risks to workplace health and safety seems to suggest, on one view, that individuals are mere automatons, devoid of the capacity to exercise judgment or discretion. Surely worker behaviour may be a relevant factor if, for example, an individual fails to follow or deliberately flaunts safety systems or procedures?

Professor Quinlan suggests that his "pattern flaws" should form a priority check list for any organisation wishing to assess workplace health safety management with a view to preventing serious events in the future. Some of Professor Quinlan's observations on this topic are.

1. Engineering design and maintenance flaws:

    far from the world of unsafe behaviour and culture that mesmerises some safety researchers and practitioners, this book found design, engineering and maintenance flaws to be a significant pattern of cause of fatal incidents at work.[7]

2. Failure to heed warning signs – a key question for Professor Quinlan is why did management not respond to warning signals? He says:

    What should concern those designing and implementing OHS management systems, and regulators too, is the apparent inability to learn from past errors … where a combination of communication problems, deficiencies in auditing systems, and a preoccupation with personal safety and routine risks, have contributed significantly to the failure of OHS management systems in mines and other high hazard workplaces. One implication is that these systems were neither designed nor implemented in a way that gave sufficient attention to warning signals of low-frequency, high-impact events.[8]

3. Flaws in risk assessment – Professor Quinlan says risk assessment, while a critical task, is no substitute for implementing controls when the nature of the hazard and suitable remedies are already well known. A risk assessment should be used where there are uncertainties. Essential features of effective risk assessment include:

    (a) use of a team with varied and relevant experience to conduct the risk assessment;

    (b) detailed and systematic risk identification;

    (c) use of a comprehensive checklist of possible problems;

    (d) defining the key questions to be answered before conducting a risk assessment;

    (e) defining the safety standard to be reached; and

    (f) comprehensive monitoring and auditing programs.

4. Flaws in OHS management systems – Professor Quinlan says that the recent shift to OHS management systems has the potential to establish a more comprehensive and effective approach to controlling hazards but that some systems actually contribute to fatal incidents, for example:

    (a) management systems that focus on personal or behavioural safety and routine risks (for example, measured by injury incidents and frequency rates) are not compatible with a process safety approach which is more suited to addressing low-frequency high-impact events;

    (b) the top-down nature of some management systems involves the absence of critical feedback loops; and

    (c) complex forms of work organisation like multi-tiered subcontracting, downsizing and the relocation of key staff undermine more effective management safety systems.

5. Flaws in system auditing – Professor Quinlan identifies deficiencies in the nature of audits and who undertakes them as possible contributing factors to disasters. For example, a study of the 1994 Moura mine disaster that killed 11 workers, found that while the mine's communication system was audited to Quality Assurance Standard AS3902, the focus was on identifying

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[7] Quinlan, n 2, p 170.

[8] Quinlan, n 2, p 174.

procedures and ensuring that they were being adhered to rather than judging the effectiveness of the system or whether or critical areas of managements were familiar with it (they were not).

Similarly, the Beaconsfield mine fatality in Tasmania in 2006, involved an insurance audit of the mine which lacked the expertise to critically assess the adequacy of management's assessment and response to serious rock fall incidents that had occurred six months before the fatal rock fall.

According to Professor Quinlan, effective system auditing needs to:

(a) be genuinely independent and those conducting it to be suitably qualified with a reputation and record for rigour;

(b) be undertaken with regard to the entire safety system not just parts of it;

(c) examine paperwork and work processes at different phases, for example, operation and maintenance; and

(d) explicitly address the 10 "pattern failures".

6. Economic and reward pressures compromising safety – Profession Quinlan says:

There is long-standing research pointing to a connection between production and financial pressures and poor safety outcomes in mining and other industries.[9]

How is this to be remedied? According to Professor Quinlan:

(a) organisations need to adopt corporate structures and decision-making processes that give meaning to prioritising safety;

(b) production and profit-based reward systems should not be used in mines and other high hazard workplaces;

(c) regulators need to pay closer attention to the issue;

(d) compromising safety for economic reasons needs to receive closer attention in investigations, for example, the Pike River Royal Commission in New Zealand; and

(e) unions should pay more attention to the issue including opposing incentive-based payment systems.[10]

7. Failures in regulatory oversight – examples of this type of failure according to Professor Quinlan include:

(a) omission or inadequacies in legislation regulating mine or workplace safety;

(b) logistical restraints on the inspectorate in terms of the number and availability of suitably qualified and trained inspectors, infrastructure support and inspection tracking systems;

(c) deficiencies in inspectorate approach to inspection and enforcement; and

(d) increasingly complex patterns of work organisation, including the use of contractors, can weaken the regulatory framework and place additional demands on inspectorate resources and require a rethink of enforcement practices.

8. Worker or supervisor concerns that were ignored – examples given by Professor Quinlan include Pike River in New Zealand and Beaconsfield in Tasmania. The reasons given by Professor Quinlan are:

(a) the hierarchical nature of work relations and the downgrading of subordinates' views or expertise;

(b) the top-down nature of safety stems and inadequate feedback loops;

(c) overriding priorities like production deadlines;

(d) an unwillingness to accept unwelcome news; and

(e) workers' concerns before an incident are largely ignored in many official investigations afterwards and do not become a contributory factor in the discussion of causation.

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[9] Quinlan, n 2, p 184.

[10] Quinlan, n 2, pp 185-186.

9. Poor worker or management communication and trust. According to Professor Quinlan, possible factors that might create a climate of mistrust and poor safety communication and performance in mines includes:

  (a) workforce division;

  (b) mixed messages or inconsistent management action;

  (c) high turnover in senior management;

  (d) closed or insular management style;

  (e) resentment at corporate intervention; and

  (f) aggressive anti-union tactics by some mining companies.

Professor Quinlan's solution? Get unions more involved: "There is … evidence that union presence has a positive effect on the level of regulatory inspection and enforcement activity and that it improves OHS outcomes in mining and more generally."[11]

To build trust at the workplace Professor Quinlan recommends:

  (a) genuine participatory structures;

  (b) consistency in management decision-making;

  (c) not fomenting workforce division, for example, between contractors and direct employees;

  (d) an open management style; and

  (e) ensuring problem raising is followed up.[12]

It seems it is really management's fault after all. No mention is made of actions unions could take to build trust such as stopping the practice of using "safety" concerns as a means of advancing their industrial relations or other agendas.

10. Deficiencies in emergency and rescue procedures. These are commonly found to be latent failures but only become apparent once a critical incident has occurred and then exacerbated as a consequence according to Professor Quinlan, for example the Pike River mine disaster where the lack of an effective second exit had been recognised as a danger since the 1860s.

Professor Quinlan urges us to eschew the study of "best practice" and instead to embrace failures and learn from them. He says:

> Key lessons could be reinforced and new insights gained by devoting greater attention to failure and particularly the pattern failures of the type identified in this book, including their capacity to interact. Detailed studies of failures like those described in this book should be an essential element in the training of managers, engineers and others who may come to take significant responsibilities at high hazard workplaces.[13]

Professor Quinlan acknowledges that progress has been made in western democracies over the last 150 years with dramatic increases in wealth and productivity coinciding with significant decreases in work-related injuries and death. For example, in the US in the period 1900 to 1910 there was an average of 2,168, fatally injured coal miners annually whereas in the period 2000 to 2010 the figure had fallen to 32. However, he is troubled that workplace disasters continue to occur even though countries are rich, the hazards have long been recognised, and the means of managing them well known. Professor Quinlan argues that we need to look at the broader "political economy of safety" having regard to interest groups and power imbalances to explain why some policy responses to work safety are chosen and others are not.

According to Professor Quinlan there are other broad lessons to learn like:

(a) the regulatory, social and labour market context is important when it comes to workplace safety;

(b) giving workers rights and powers to better safeguard their own safety remains "deeply contested terrain"; and

(c) the dominance of "neo-liberal" ideas on market-driven policy has affected regulation, mainly by criticism of the regulatory "burden".

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[11] Quinlan, n 2, p 190.

[12] Quinlan, n 2, p 193.

[13] Quinlan, n 2, p 196.

Professor Quinlan is also critical of internal government processes, the role of interest groups and lobbyists, and the consequential corrosion of reform which undermine legislative attempts to promote workplace safety. There are a number of villains identified here by Professor Quinlan, apart from lobbyists, including:

(a) "high-priced legal counsel";

(b) public relations consultants who take control of public communications on behalf of corporations in the wake of workplace disasters;

(c) psychologists, who Professor Quinlan sees as forming the dominant group in work health and safety "discourse" who focus on individual and small group behaviour, an approach which does the least to challenge existing authority structures in industry;

(d) universities that promote Masters of Business Administration programs which epitomise modern management leadership models whose approach to safety is characterised by a focus on individual behaviour and rule-breaking, the solution to which is changing worker behaviour; and

(e) global mining corporations, who also get a serve for taking this "behaviour-based safety model to heart".

For Professor Quinlan, echoing my political economy lectures from years gone by, the apparent failure of organisations to recall or learn from similar incidents in the past:

> Fundamentally … is an outcome of the social and economic relations of production where irrespective of public rhetoric the pursuit of worker (and community) safety is subordinated to other objectives and interests.[14]

This sort of comment sits somewhat uneasily with the evidence previously acknowledged by Professor Quinlan of significant progress made by western democracies in delivering huge improvements to standards of living while simultaneously driving down the incidence of workplace deaths. It also raises the question of: what is the alternative? Professor Quinlan himself acknowledges that Communist and other totalitarian regimes have very poor workplace safety records compared to western democracies. What then, is the solution?

Part of the answer for Professor Quinlan is to hold the bosses accountable. For example, by ensuring that regulatory accountability for breaches leading to death reaches board level in corporations.[15] Of course, that is just what the legislation in New South Wales and other Australian jurisdictions has done for many years,[16] where, if not routine, it is certainly common for directors and other officers to be prosecuted for breaches of work health and safety legislation. A recent example is *Inspector McCarthy v Mathiaparanam*.[17] The book is curiously silent about this aspect of Australian harmonised work health and safety laws, and those laws generally. While the focus of the book is on the mining industry and industry-specific legislation, readers may have benefited from a closer consideration of the ways in which work health safety legislation holds directors and other offices of corporations to account for safety breaches.

Professor Quinlan is critical of regulatory regimes that provide for individual liability of directors but rarely convict and almost never send them to gaol as having little deterrent effect. I can assure the Professor, speaking as someone who has practised in the area, including having advised boards of directors and other officers about their statutory workplace health and safety duties, factors like the risk of litigation, criminal conviction, significant monetary penalties possible custodial sentences and damage to reputation all have a salutary deterrent effect on individuals exposed to those risks. I have never encountered a director or other officer who takes their responsibilities or those issues lightly. Without exception, in my experience, all do what they can to ensure they exercise "due diligence" as required by the law and much more in many cases. No doubt there are exceptions but my experience suggests they are a small minority.

[14] Quinlan, n 2, p 217.

[15] Quinlan, n 2, p 219.

[16] See, eg, *Work Health and Safety Act 2011* (NSW), s 27.

[17] *Inspector McCarthy v Mathiaparanam* [2015] NSWDC 16.

Putting to one side the "political economy of safety", there is a lot to be learnt from this book and Professor Quinlan is to be congratulated on raising a number of detailed, practical and useful suggestions for further improvements in work health and safety. It is a pity that message is sometimes difficult to make out amongst what appears to be a politicised critique of Anglo-Saxon capitalism and "neo-liberalism".

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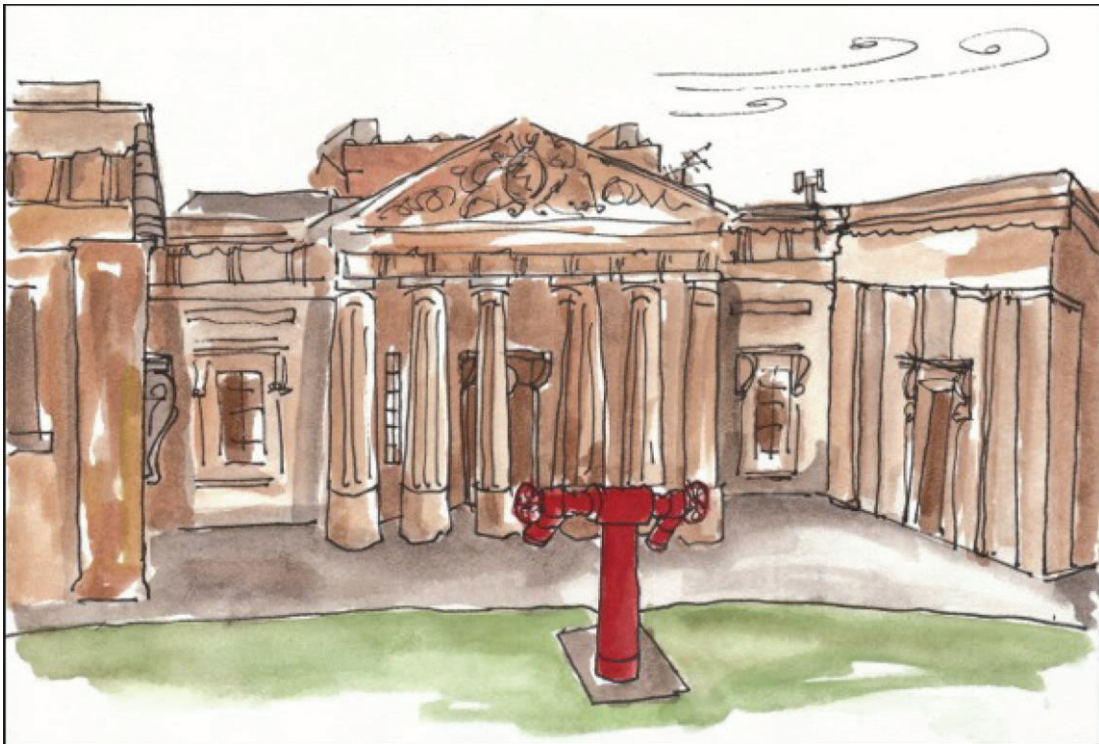
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