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A Model for Best Practice Safety Regulation in the Mining Industry

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- produce regular reports on national and international developments in OHS regulation;
- develop the research skills of young OHS researchers; and
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Introduction

The authors were engaged by the West Australian government in early 2005 to provide advice on best practice safety regulation for the mining industry in that state¹. The advice was provided in the first place to a Mine Safety Improvement Group and formed the basis of its report to government, delivered in April 2005. The full report is available at

<http://www.ministers.wa.gov.au/carpenter/docs/features/interim%20report%20stage%201%20w%20text.pdf>

The present paper aims to extricate the advice outlined in that report from the particular Western Australian context and present it in a way that is of potential relevance to other Australian jurisdictions. The aim, then, is to present a model for best practice safety regulation in the mining industry generally.

Many discussions of regulatory models focus on the kinds of regulatory requirements that are to be imposed on the regulated industry. The discussion here goes beyond that to consider the regulator itself and how it might best be organized. In short, the paper deals both with the regulatory requirements and with the structure of the regulator. The latter is a pressing practical issue for any government seeking to set up a best practice regulatory regime and for this reason we devote considerable attention to it. In addition we discuss strategies for establishing such a regulator. The principles outlined are based on research carried out by the first named author (Hopkins), and on many years of practical experience as a regulator in the UK and in Australia by the second named author (Wilkinson). Wilkinson was head of the team which established the National Offshore Petroleum Safety Authority.

Prescription and Duty of Care

Mining industry safety acts in Australia and elsewhere have traditionally been full of prescriptive requirements imposed on a variety of people up to the level of mine manager. Although such legislation was often criticized as being overly prescriptive, this criticism missed two real problems. First, by stopping at the level of the mine manager, it put no obligations on mine owners, who are ultimately in the best position to control risks². Secondly, health or safety issues not covered by the particular rules, for example overuse injuries, were beyond

¹ For an account of the historical context leading to this engagement, see N Gunningham, "Safety Regulation and the mining inspectorate – Lessons from Western Australia". Working paper 33 in the present series.

² This is clearly illustrated in the response to the Moura mine disaster, for which mine employees were held accountable but not the operating company.

the scope of law. These weaknesses have been removed by the so-called duty of care approach, which has been widely adopted in Australian and UK legislation. This approach imposes a general duty on a variety of persons, most importantly employers, to ensure the safety of the workforce. This means that those who create the risks, in particular companies, can be held accountable, and furthermore, all issues of health and safety are addressed, not just those covered by particular rules. All this is clearly a major advance³.

Concerns have been expressed in some quarters that duty of care legislation would mean the abandonment of prescription and a move in the direction of self-regulation. It is true that some of the advocates of the duty of care approach thought it would replace prescription. However the reality is that duty of care has usually been an addition to prescription, not a replacement. This is as true in the “home” of the duty of care legislation, the UK, as it is in Australia.

Nevertheless, there has been a general tendency to move many prescriptive requirements out of legislation and locate them in subordinate regulations or even codes of practice or guidelines. This approach enhances flexibility, in ways which will not be enumerated here. The point to be made, however, is that it involves no reduction in detail to which employers need to attend.

In recent years, there has been an increasing emphasis on safety management systems, and new kinds of regulation have emerged specifying how companies must manage health and safety. The amount of detail involved justifies the term, the “new prescription”⁴. Where safety management systems are prescribed in this way they are generally risk-based, that is, they require companies to go through the process of hazard identification, risk assessment and risk control.

It is interesting to note that even in the absence of regulations requiring a risk management approach, the broadly stated duty of care is now widely understood as requiring such an approach. Perhaps the clearest demonstration of this was the prosecution of Esso for its failure to exercise a duty of care at Longford: the charges were particularized as failure to carry out adequate hazard identification, failure to carry out a risk assessment and failure to put in place various controls⁵.

³ Duty of care legislation is often described as outcomes-based or objective-based or performance-based or goal-setting legislation, because of the way it focuses on the outcome (N Gunningham, “The Development of a New Regulatory Model for Occupational Health and Safety in the New South Wales Coal Industry”, October 1999. Paper available at <http://www.minerals.nsw.gov.au/legislation?p=1696#Coal> p47)

⁴ See A Hopkins, *Lessons from Longford*, p99. The new prescription has sometimes been referred to as process-based (see Gunningham, op cit, p 13). The term is intended to refer to management processes; it has nothing specifically to do with process industries.

⁵ See A Hopkins, *Lessons from Longford: The Trial*, (Sydney:CCH, 2002)

National Mine Safety Framework

The Conference of the Chief Inspectors of Mines recently produced a National Mine Safety Framework Implementation Plan which has been endorsed by State, Northern Territory and Commonwealth Ministers with responsibility for minerals and petroleum, through the Ministerial Council for Mineral and Petroleum Resources⁶. The plan specified that the key features of mining legislation should include the following

- detailed duty of care obligations for all those involved at the mine including owners, managers, employees, suppliers and providers of services, with the level of obligations being appropriate to the degree of responsibility held;
- the principle that the management of safety and health should be undertaken using modern risk management practices;
- the incorporation of safety and health management systems;
- consultative arrangements between management and mine employees with the ability of employees to appoint representatives;
- reporting and investigation of accidents; and
- requirements for emergency responses.

It is clear from this list how far we have moved from the mine safety acts which prevailed from the late nineteenth to the late twentieth century.

A focus on the most serious hazards

The legislative framework laid out by the Chief Inspectors of Mines is an excellent starting point, but best practice regimes have moved beyond this in certain important respects. Major accidents in Australia, such as the Moura coal mine explosion in Queensland and the Esso gas plant explosion in Victoria, have demonstrated the need for safety management systems to pay particular attention to the most serious hazards, while not neglecting other OHS risks.

The Queensland Coal Mining Safety and Health Act 1999 represents the most advanced thinking in the mining industry in this respect. It defines a principal hazard as one with the potential to cause multiple fatalities and it requires mine operators to develop principle hazard management plans, one for each such hazard. Regulations specify certain hazards for which plans must be developed, for instance, roof fall (strata control). Further down in the hierarchy of documents are the approved standards which have been developed for the management of principle hazards. The central philosophy behind these

⁶ <http://www.ga.gov.au/ccim/>

standards is that major accidents are usually preceded by indications of trouble. Plans must therefore identify these indications and specify appropriate action to be taken when they occur. For instance, the seepage of water at a coal face may foreshadow an inrush event. (Similarly, small leaks of gas on an offshore platform may be symptomatic of a corrosion problem.) In the language of the Queensland regulator, plans must identify trigger levels, or events, and action response plans, actions to be taken in response to trigger events. For each hazard, there are normally several trigger levels of increasing seriousness, with corresponding action plans, ranging up to withdrawal of all personnel from the mine. Mines have therefore developed schedules of triggers and corresponding actions and these have become known as TARPs (Trigger Action Response Plans). TARPs are the heart and soul of the principal hazard management plans. The TARP system is also in use in some NSW coal mines, although not yet with legislative backing. By all accounts, the TARP system is a major step in the direction of best practice in the mining industry.

Safety Case Regimes

In other industries the need to focus on the most serious hazards and the apparent failure of previous, (mainly prescriptive), regulatory systems has led to the development of safety case regimes. These require operators to:

- provide a detailed description of the hazardous facility
- identify all potential major hazards and major accident events
- carry out a systematic assessment of the nature of such events and their consequences
- put in place control systems to safeguard against such events
- monitor the controls to ensure that they are working
- embed this control system in a comprehensive safety management system.

Arguably, all this is already required by the general duty of care. But the crucial additional feature of a safety case regime is that it is a licensing regime. Operators are required to make a case to the regulator indicating how they intend to comply with these requirements (hence the term “safety case”). Regulators must ultimately accept or reject the safety case. Evaluating safety cases is a time consuming business and, for complex safety cases, it requires considerable expertise. This is, at least in part, because of the amount of detail in complex safety cases. Moreover, once accepted by the regulator, all the detail in the case is enforceable. Safety case regimes are therefore not a retreat from prescription; it is simply that what is prescribed is set out in the safety case rather than in legislation or regulations. However, it should be noted that the amount of detail in a safety case will be proportionate to the complexity of the operations at the site requiring the safety case.

It is sometimes observed that a safety case regime is resource intensive. This is especially true where facilities require complex safety cases. Any government which wishes to embark on safety case regulation must recognize this crucial fact. Unless the regime is well resourced it is likely to fail, in the sense that it will offer no advantages over and above non- safety case regimes. Evidence for this can be seen in the experience of the British rail system in which a safety case regime was introduced in 1996. The regime was one which sought to minimize the role of the inspectorate in approving safety cases. There followed a series of catastrophic rail accidents. It would be overly simplistic to say that an inadequate safety case regime caused these accidents, but it can certainly be said that the safety case regime failed to prevent them. Arguably this is not a criticism of safety case regimes themselves, but merely a graphic example of what can happen if such a regime is introduced without the other requisite features of good safety case regimes, namely a regulator with the capacity to professionally challenge safety cases, a workforce which is sufficiently empowered to play an active part in the process and finally, a belief at the working level in both the regulated and regulator that the safety case is a beneficial approach.

There is sometimes a suggestion that regulators which lack in-house expertise to evaluate safety cases should contract out this task to safety case consultants. This is not best practice for at least two reasons. First, regulators who adopt this approach do not build up their own expertise and may be at a disadvantage when it comes to auditing against the safety case. Second, there are so few expert consultants that it may be difficult to find consultants who have not participated in the development of the safety case which is to be assessed.

Criticism of risk assessment

Safety cases rely heavily on risk assessment and some people see this as unsatisfactory. Complex risk assessment methodologies particular where quantification is involved can be difficult to understand. Not surprisingly therefore they may not be trusted. Furthermore it is often suggested that the results or quantitative risks assessments have been “massaged” so as to reduce the risk to an acceptable level. Such misuse of risk assessment almost certainly occurs. However, this is a criticism of how risk assessment is applied and not the concept itself. For complex plant with complicated processes there is no alternative to the use of systematic hazard and risk assessment methodologies.

For many risks, especially for general occupational health and safety risks, appropriate precautions are well known. For example the law generally requires certain dangerous machines to have suitable guarding, power take off shafts on

tractors to be covered, ladders on construction sites to be secured, heavy vehicles to have efficient brakes and so on. In other words, the risk assessment part of the process of managing health and safety has already been done, and the standards are well known and documented. Thus it may need to be emphasized to those parties critical of risk assessment, that in these circumstances, it is neither necessary nor desirable to carry out a risk assessment from scratch. The assessment process is generally a narrower one of checking that the standard precautions are appropriate in this particular case.

Australian Safety Case Regimes

In Australia, the leading safety case regimes are the Victorian Major Hazard Facilities Division and the National Offshore Petroleum Safety Authority (NOPSA). The Victorian regime covers about 50 major hazard sites in that state. The legislation draws on the national standard for the regulation of major hazards, but is informed by major hazard regimes in Europe and goes beyond the national standard in various respects. There is also an excellent set of guidance notes that accompany the regulations which are worthy of consideration by other major hazard regulators⁷. The Victorian regulator is relatively well-resourced, having been set up in the wake of the Longford accident. It has been an activist regulator, scrutinizing and commenting on safety cases in great detail, leading to complaints by operators that the regulator was behaving in an overly prescriptive manner. However, such complaints should not be accepted uncritically. The alternative view is that the regulator was merely doing its job and forcing companies to justify their safety cases in a level of detail which they had not expected.

The offshore petroleum safety case regime, as from January 1st 2005 largely administered by NOPSA, is the other world class safety case regime in this country. It takes its lead from the offshore petroleum safety case regime in the UK which was developed in the wake of the Piper Alpha platform disaster in 1988. Like the Victorian regime, it has detailed regulations and an extensive set of guidelines about how these regulatory requirements can be met. Moreover, NOPSA states in its Strategic Plan that safety cases will be checked to ensure that they are consistent with “good oil field practice” (p6). It is clear from this comment that this regulator will be quite directive where it sees the need. We shall say more about the NOPSA model shortly.

Role of inspector in world class safety case regime

⁷ www.workcover.vic.gov.au/vwa/home.nsf/pages/so_majhaz_guidance. Useful guidance is also available at <http://www.planning.nsw.gov.au/plansforaction/mihaps-docs/mihaps-docs.html>

At this point it is worth considering in more detail some of the activities an inspector carries out in a world class safety case regime and the implications these have for staffing. At the highest level the regulators job is to judge if the company has the leadership, staff, systems and procedures to safely operate the facility. Where there are deficiencies, the regulator must have the capability to recognise these and develop appropriate strategies to persuade senior staff to make appropriate changes. Only rarely will legal options be necessary to enforce change. Nevertheless it is essential that regulators can and will use formal enforcement processes when appropriate. Regulatory staff must therefore have personal credibility with senior company staff. A key aspect of this credibility is knowledge and (preferably) first hand experience of managing a complex operation in a technically challenging environment.

The traditional role of safety inspectors has been to check for compliance with specific requirements in the legislation and regulations. Compliance monitoring of this nature has its place, especially if the information obtained is used to build a picture of how the organisation health and safety systems are operating. However, it sometimes leads to the justified criticism that inspectors are concentrating on minutiae and missing the bigger picture.

With the advent of the safety management systems approach some inspectorates have switched their emphasis to auditing these systems, which essentially means checking for compliance with the requirements of these systems. This can be a time consuming process and, in any case, companies should be doing this themselves. A potentially more efficient policy for the regulator is therefore to audit the auditors, that is, to examine audits which have been done for the company and identify weaknesses in the audit process and ways it can be improved. This will be most effective if it is not just a desk-top process, but involves going out and independently collecting data to verify the conclusions in audit reports. However, for this approach to be successful, companies must have well developed in house audit systems. As with other aspects of management systems, it is far from certain that companies have developed their internal systems to a level of maturity that permits "bad news" as may be discovered by audits to be communicated back up the management chain and acted upon. Even in mature safety case regimes it is rare to find company internal audit systems able to be used in this way by the regulator, therefore we conclude that an important role for the regulatory body is to carry out its own audits.

Best practice auditing is not just passive compliance monitoring; it involves challenge. "You say your emergency deluge system has recently been checked. Can you demonstrate it in operation for me, please". "I see you have an incident reporting system. Can we follow one incident report and see what happened to it?" "You say you have trained your employees on the triggers and actions

specified in your TARP schedules. Can I speak with some of your employees to see if they really know these details?"

Best practice inspectors are engaged not only in compliance monitoring; they are also investigators. We are talking here of proactive investigation, not just reactive investigation which follows an accident or so called "near miss." Best practice inspectors ask themselves as they go around: "what might be going wrong here?" And they seek out answers. They make fundamental judgments about the quality of a company's management systems that apply to safety. They ask themselves, "are these systems capable of delivering a safe operation?" If not they seek to get the system improved. If so, they look for evidence that the system is working in practice on site. If they find some minor non-compliance, such as an isolation tag which is missing, they do not simply ask for it to be replaced; they investigate why it was missing, why it had not been replaced, what this may reveal about the isolation procedures more generally, and so on.

Finally, best practice inspectors routinely discuss safety with all parts of the workforce from the "shop floor" to the boardroom. Indeed, if they are to be effective they must be successful in influencing the behaviour of decision makers in line management who allocate resources within a company. They seek out health and safety representatives and company safety officers. These people know what is really going on at the site. They may have tales to tell which can lead inspectors quickly to what is going wrong. Moreover, they are the compliance professionals on site and the greater their prestige the better the chances of safe operation. Good inspectors will do everything in their power to enhance their prestige.

In conclusion, at the highest level, the principal activity of a regulator is concerned with making a judgment of whether the site operator has identified the hazards, assessed the risks, implemented appropriate control measures for the risks and has an adequate management system for all these processes which are implemented on site. Where there are deficiencies, the regulator must have the capability to recognise these and develop appropriate strategies, including legal options where necessary, to persuade senior staff to make appropriate changes. Regulatory staff must therefore have personal credibility with senior company staff if their views are to be taken seriously. A key aspect of this credibility is knowledge and some of the regulatory staff must have first hand experience of the industry to be regulated.

A Safety Case Regime for the Mining Industry

Against this background we can now spell out what we see as some of the principles of best practice regulation in the mining industry. Obviously, the first

principle is that safety case regimes along the lines discussed above should be introduced in the mining industry.

Principle 1: Safety case regimes should be introduced in the mining industry

We reiterate that this would not replace the duty of care which is now laid down in most mining acts; it would add to it, by indicating how operators can fulfill their duty of care. Moreover, a safety case does not do away with codes and other guidance; it invokes them, and in fact makes them enforceable. The safety case formalises the requirements of hazard identification, risk assessment and risk control and adds a further element, that this must be done to the satisfaction of the regulator, before a license to operate is issued.

The mining industry ranges from operations run by global corporations down to two person, perhaps even one person operations. There has been a suggestion that safety case requirements are too onerous to impose on the smaller operators and that there needs to be some cut off point. One suggestion, for example, is that only those operations which are owned by publicly listed limited liability companies, or their subsidiaries, should be subjected to safety case requirements, on the grounds that only such operations have the resource backing to prepare a safety case.

The alternative view is that the complexity of the safety case depends on the size and scale of the operation, and very small operations would not require a complex case. It should be observed that in at least one state (WA) the regulator at present requires all mining operations, regardless of size, to produce a project management plan, but it states that “the level of detail required will be determined by the scale, nature and complexity of the operation”. Our view is that, subject to the preceding qualification, safety case requirements should apply to all operations, regardless of size. Clearly, a small mine will require only a simple safety case.

Principle 2: Safety case requirements should apply to all mines, regardless of size, on the understanding that the smaller and less complex the mine, the simpler the safety case.

A safety case regime for the mining sector, although based on the same principles as the highly developed regimes which operate for Australian offshore petroleum production and for Victorian major hazards, will need to have some particular features.

In process installations such as petroleum refineries, departures from normal operating temperatures and pressures etc can foreshadow trouble. Safety cases in these contexts speak of critical operating parameters and the need to measure and react to exceedences. These ideas cannot be translated directly into the mining industry. The equivalent idea here is the action trigger, specified in the trigger action response plans discussed earlier. Safety cases for mineral extracting operations will need to emphasise the idea of triggers to action. For mining activity which is more in the nature of mineral processing, the idea of critical operating parameter remains relevant.

Principle 3: Safety cases should incorporate trigger action response plans where appropriate.

In the past, safety case regimes have primarily been deployed to address major accident type events, in other words those events which can lead to multiple fatalities. However, as is well recognized, many risk control systems are the same for major accident events, individual fatalities and injuries, and occupational health issues. For example, adequate training and supervision are needed for all three. Equally, permit to work schemes are also used to control all three sorts of risks. Thus safety cases can be used for all types of occupational risks.

Principle 4: Safety cases in the mining industry should address all risks including those to occupational health.

Fatigue is a particular problem in the mining industry, given shifts of 12 hours or more and fly-in-fly-out mine sites. This issue is alluded to in other safety case regimes, but it would need to be emphasized in this context. Safety cases would need to pay specific attention to the safety implications of proposed shift arrangements. This is a matter on which employee participation would be particularly important.

Principle 5: Safety cases should include a detailed consideration of fatigue management.

Safety case regimes in process industries often make use of QRA (quantitative risk assessment). This may not be appropriate in the mineral extraction operations (it is not required under Queensland's principle hazard management plans for coal mines), and a safety case regime for the minerals industry should make it clear that QRAs will not normally be expected.

Principle 6: Mining industry safety cases should not normally be required to carry out quantitative risk analysis.

Workforce participation in the development of safety cases is vital. This principle is emphasized in all safety case regimes. In this context it is worth quoting from the National Mine Safety Framework Implementation Plan Discussion Paper, September 2003, p43

“Consultation requires:

- sharing relevant information about safety and health with employees;
- giving employees the opportunity to freely express their views and contribute in a timely way to the resolution of safety and health issues at the workplace; and
- valuing and taking the views of employees into account.”

Employees should also have the right to raise problems about a safety case which become apparent after it has been accepted and, if necessary, to call in inspectors to examine issues which arise in this way. Safety case regulation, in addition to providing for consultation in the *development* of a safety case should also encompass this possibility.

In the case of *new* mines, the development of a safety case will occur prior to the engagement of the workforce. In these circumstances some proxy for the eventual workforce needs to be identified and consulted, such as relevant union safety officials or worker representatives from comparable existing sites.

Good OHS legislation provides for effective workforce consultation mechanisms including elected health and safety representatives who can issue provisional improvement notices, inspect the workplace and investigate accidents. Safety case regimes should include these features.

Principle 7: The workforce and their representatives should have the right to be consulted in the development of a safety case and to raise concerns about a safety case after it has been accepted.

For consultation to be effective a safety case regime will need to specify guidelines for setting up consultation arrangements. One possible model might be chapter 3 of the NSW Occupational Health and Safety Regulations, 2001.

Principle 8: The safety case regime should specify guidelines for employee participation.

For workforce participation to be effective, workers will need to undergo intensive training in risk-management principles and safety cases will need to include provision for such training. Contractor workforces will need to be included in this training. Additional training will be needed for elected health

and safety representatives in recognition of their wider role in representing their colleagues, carrying out workplace inspections and investigations. Put another way, tiered training will be necessary, with the level of training determined by job requirements. Training will also be necessary for managers.

Principle 9: Safety cases should include provision for adequate training for workforce and management.

The broader legislative/regulatory context

The regulation of safety in the mining industry occurs in the broader context of general occupational health and safety regulation and must be articulated with it. In particular, in most jurisdictions regulations are being or have been developed imposing safety cases requirements on other hazardous facilities. These developments must be coordinated and safety case regimes in the same jurisdiction should be as similar as possible, differing only to the extent required by the specific industry context.

Principle 10 The development of safety case regimes within particular jurisdictions should be coordinated and aligned where possible.

There is a good argument that all OHS should be dealt with under a single umbrella OHS Act in each jurisdiction, with industry specific regulations made under that Act, as necessary. Features which can and should be standardized in this way , include:

- general duty requirements,
- procedures for calling up regulations and codes,
- accident investigation,
- employee participation requirements,
- penalty structures ,
- enforcement options,
- evidentiary requirements,
- powers of inspectors, and so on.

The process of consolidating various existing occupational health and safety acts would provide an opportunity to take what is best from each. This should be the long term goal in each jurisdiction.

When the various Acts are consolidated into one, specific industry regulation would be made under the principal Act, as would codes of practice. Many codes of practice need not be industry specific, eg in relation to fall protection; some

others might need to be industry specific. Industry specific codes of practice should only be developed where there is a clear case for them.

Consolidation of safety legislation into a single act does not require the consolidation of inspectorates into a single inspectorate. Industry specific inspectorates could continue to administer industry specific regulations and codes. This principle therefore does *not* require a single regulatory body. We note finally that the UK has pioneered the path we are recommending here, with a single safety Act covering all UK industry.

Principle 11: OHS legislation should be amalgamated into a single Act, with industry specific regulations and codes of practice as necessary.

Regulators need to have an array of enforcement options available to them so that they can tailor their response to the circumstances. Ideally there should be an enforcement pyramid⁸, with advice and persuasion at the bottom, progressing through improvement and prohibition notices and on the spot fines, to prosecution and ultimately de-licensing, if appropriate. On-the-spot-fines are necessary as an efficient enforcement mechanism for prohibition and improvement notices. They may also be appropriate for one-off safety violations that do not seem to warrant the expenditure of resources involved in a prosecution.

Prosecution can be of companies and of individuals. In relation to the prosecution of individuals, there is increasing recognition that it is appropriate to hold senior managers and directors liable in circumstances where they have failed to exercise due diligence. The importance of personal liability is that it directly affects the motivations of decision makers who are responsible for creating the risks, in a way that holding companies responsible fails to do. Individuals who are prosecuted this way may feel aggrieved, but it is undoubtedly an effective way to increase the salience of safety. Perhaps the best evidence for this claim is the fact that personal liability has been a reality under environmental law for much longer than it has under OHS law and directors have been correspondingly more concerned about environmental than OHS compliance. Our view is that such prosecutions, when they occur, should be aimed at the highest corporate level, where resourcing decisions are made, rather than at middle level managers.

Regulatory agencies sometimes become dysfunctional and unable or unwilling to mount prosecutions where they are warranted. Some jurisdictions, eg NSW, provide third parties with the right to prosecute in these circumstances. If this option is politically unacceptable, another strategy for keeping the regulator accountable in this respect is to give health and safety representatives formal authority to request the regulator to

⁸ I Ayers and J Braithwaite (1992) *Responsive Regulation*, Oxford U P: New York

investigate with a view to enforcement action. A regulator which investigated and decided to take no action would need to justify this decision.

Principle 12: The repertoire of enforcement options available to inspectorates should be as broad as possible, and the workforce, in particular health and safety representatives, should have the right to request the regulator to initiate an investigation with a view to enforcement action, including prosecution.

Finally, if the enforcement role of the regulator is to be fully credible some unannounced inspections are essential

Principle 13: Inspectors must carry out both announced and unannounced inspections.

A separate statutory Authority

There is an on-going debate about the best location for mining industry regulators. Should they be attached to departments which have the responsibility for promoting the mining industry, as they traditionally have been, or should they be located, along with other inspectorates, in organisations whose primary function is employee protection. There are good reasons to bypass this debate. We propose instead the creation of separate statutory Authorities to manage proposed new safety case regimes in all states where there is major mining activity. The precedent for this is the National Offshore Petroleum Safety Authority. Such Authorities would need to coordinate carefully with other inspectorates to ensure seamless regulation.

Principle 14: Separate statutory Authorities should be established to manage safe case regimes in the mining industry.

We recognize that the creation of separate Authorities may seem like a radical solution to the problem of where to locate the mining industry regulator and may appear to involve an unnecessary proliferation of government agencies. We believe, however, that there are good reasons for this course of action.

First a separate Authority would be less likely to be subject to or perceived as subject to interference by politicians or capture by industry.

Second, such an Authority would allow for the recruitment of new, highly skilled staff necessary for the administration of safety case regimes. Some of these staff might be recruited from existing departments but not all staff of an

existing mines inspectorate would be suitable for employment in the safety case environment and new staff would need to be attracted from elsewhere.

Third, an independent Authority could be freed from normal public service salary constraints and would be in a position to offer much higher salaries than government inspectors currently receive. This is crucial to the success of a safety case regime. Staff of the requisite caliber will be highly employable in the mining industry itself and in order to compete with the remuneration available in the mining industry, regulatory Authorities need to be in a position to offer very high salaries.

It has been suggested that regulatory staff could be located within a government department and paid a market loading in recognition of the salaries available to them in the private sector. Such a strategy would, however, create enormous tension between those on loadings and those not. A separate independent Authority would not suffer in this way.

There may also be other ways of encouraging regulatory staff to resist higher salaries elsewhere, for example, by:

- improving career paths;
- providing high standards of training and development
- ensuring that inspectors are not expected to work the unreasonably long hours which are worked by their counterparts in the private sector; and
- making long service leave entitlements available only at the end of the period of service and not pro-rata at the time of departure.

There are undoubtedly non financial benefits attached to the regulatory role, but if the salaries of regulators are too far below the industry standard, there is little hope of retaining good staff for long.

Principle 15: Regulatory staff must be paid competitive salaries in order to recruit and retain staff of the requisite quality.

Structure of the inspectorate

We have heard of the same mine site receiving visits from two inspectors with different engineering backgrounds within a couple of weeks of each other. We do not know if this is typical or “one-off,” but it suggests the need for discussion of how a regulatory body should be structured.

At the working level of the inspectorate we believe it important that there is a single point of contact between the inspectorate and the worksite. In this way the

management and the workforce, including HSRs, can get to know the inspector. However, any one inspector cannot be expected to have all the requisite skills and knowledge required of an effective regulator. Assuming most if not all the requisite skills and knowledge are contained in the regulatory body, effective teamwork will be essential to deploy these skills and knowledge. The sort of system that has for example a mechanical engineer to examine mechanical issues at a mine and an electrical engineer to examine electrical issues is not the best use of resources. However many engineering specialists there are, to focus regulatory interventions in this way can miss the bigger picture, which is how the mine (or major hazard operator) secures and maintains effective management control over hazardous activities.

Principle 16: There should be a single point of contact for a site within the inspectorate

This is not to say that various engineering competencies are not needed. On the contrary. We expect that the regulatory body would have staff that collectively would be able to deploy most if not all the appropriate skills. Furthermore, to avoid any one mine site having a variety of visits from different inspectors with different skill sets, all inspectors will need to acquire the basic OHS skills in addition to their particular specialism. These would include the regulatory skills of accident investigation and auditing, specialist knowledge areas of human error and safety management systems as well as a grounding in basic OHS standards for machinery guarding, highly flammable substances, occupational hygiene and so on. All we are saying is that from a regulatory perspective there has to be one person who has overall responsibility for the site and visits it regularly. They would in conjunction with their peers in the regulatory body determine the overall strategy for a particular site and would be in a position to request visits from staff with particular competencies as required at that particular site.

A possible way to structure the regulatory aspects of the organisation is for each team to be allocated a range of companies. These teams will:

- provide the first point of contact for their allocated companies;
- manage the assessment of safety cases, calling in expertise from other parts of the organisation as required;
- devise and manage an audit programme, (in consultation with others); and
- provide an initial response for incident investigation.

In addition, depending on the expertise within the team, one or more team members could have topic responsibility for a particular area of expertise across

the whole organisation. For example, a process engineer would have day to day responsibilities for those companies and facilities allocated to his or her team, and would also have some responsibility for maintaining and developing their expertise in their discipline. They would then be the first point of call for other staff in the organisation, wherever they are physically located, seeking advice on this specialism.

Where there is more than one person with a particular area of expertise they collectively would provide the focus for the specialist topic. This would fall into two main types - case specific work relating to a particular mine or major hazard facility and work to help to guide the organisation in its operational priorities in relation to the topic. The balance of work, between managing the day-to-day interactions with their allocated companies and of providing a source of advice to their colleagues, is of course a matter for judgment. There are two reasons for having this sort of arrangement – effectiveness and consistency.

Effectiveness in a safety case environment requires a broad exposure to a variety of mining, petroleum or major hazard operations. Without broad exposure, regulators cannot accurately decide what is appropriate in any given circumstance. Experience of a variety of different operations and operators is required because without that exposure how does a regulator decide if the standards presented in a safety case are appropriate? The required knowledge to help make these decisions comes from a variety of sources. In part, it may come from a regulator's prior work experience. However, principally it comes from experience of regulating a variety of different companies and their operations. Comparing the standards achieved in different firms allows regulators, to "calibrate" their decisions as to what is "acceptable." In other words the more experience a regulator has, both organisationally and individually, the better able they are to define benchmarks against which judgements can be made. The same argument applies to "consistency". It is difficult to be consistent in a goal setting regime if individual regulators have too narrow a field of responsibility.

There are some essential preconditions to permit this sort of structure to be implemented. Firstly, all staff need to be given training in how management systems can be structured, assessed and audited. After all this is the ultimate goal of a regulator – to encourage mine operators to manage their site effectively from a safety perspective and to use the legal powers to require this if they do not do it for themselves. Secondly, all front line regulatory staff should be given broad training in each of the main safety competencies. For example, all staff should receive training about occupational health as well as safety. This is not to make them experts at this but they should be able to identify occupational health risks, understand the main controls for these risks, be able to provide basic advice in this area and crucially know when they are at the limits of their competence and know when to request more expert help from the in-house occupational hygienist.

Inevitably not all the existing staff will feel comfortable or indeed be able to move to the new ways of working, and new staff will also need to be recruited. Consequently careful attention needs to be given, in addition to determining the size of the inspectorate, to specifying the knowledge, skills and experience required of staff.

Principle 17: The competency and accountability requirements of all staff required for the Authority should be defined.

As noted earlier, staff for a new Authority will need to be the best available and may need to be recruited from outside government, by open advertisement.

Principle 18: Recruitment of staff to an Authority will need to be by open advertisement.

Some staff will have many of the required competencies but will still need training in some subjects. Valuable experience in the development of suitable training programs exists in both NOPSA and the Victorian Major Hazard Division of WorkSafe.

Principle 19: A comprehensive training program will need to be developed and implemented as part of developing an enhanced inspectorate.

Accident investigation

It is important that accident investigations not be left to outside bodies but that inspectorates carry out their own accident investigations. Seeing where things have gone wrong will sharpen subsequent auditing activities. There are two styles of accident investigation.

- (a) root cause analysis, designed to identify the systemic causes of accidents,
- (b) evidence gathering, as a prelude to prosecution.

Inspectors need to be trained in both these techniques. In relation to root cause analysis training, we recommend that it should be based on the "Reason model" of accident analysis⁹ or some equivalent system-oriented method.

Inspectors also need to be trained in evidence gathering to facilitate prosecution where appropriate. However, we would point to the pivotal importance of safety management systems in safety case regimes. A key aspect of safety management systems is how the organisation allocates roles and accountabilities throughout the management structure. It is critical to the success of a management system (and safety is no different) that companies do this effectively and that the

⁹ Reason, J (1997) *Managing the Risks of Organisational Accidents*. (Aldershot: Ashgate)

regulatory body can monitor this and where necessary hold the company and, where appropriate, an individual to account. The inspectorate must be able to do this in its audits and incident investigations. Consequently inspectors need specific training in how to gather evidence on the extent to which the action or lack of action by senior company officers may be implicated in accidents.

Principle 20: Inspectors should be trained both in systemic accident analysis and in evidence gathering, particularly concerning neglect by senior company officers.

All significant accidents should be subjected to a systemic cause investigation, as outlined above, and the results should be published. The Australian Transport Safety Bureau reports provide an excellent model. Reporting in this way ensures that lessons are identified and that others have the opportunity to learn from them.

Principle 21 Inspectorates should publish reports on all significant accidents, using the Australian Transport Safety Bureau reports as a model.

Size and Cost of an Authority

There is no universally accepted algorithm which we can use to determine the size of a regulatory body. In public sector regulatory bodies, running costs, as opposed to start-up costs, are dominated by staff costs, principally their remuneration. This may consume 70% of the organisation's costs.

In determining the numbers of staff needed, as a starting point we would suggest the number and duration of site visits and other activities should be considered. For example how often should the smallest mines be visited? Twice a year, unless a higher frequency of visits is judged necessary because, for example, of a lack of confidence in the managements ability to maintain standards? Conversely, the largest sites might warrant a visit 6 times a year. Other regulatory activities that need to be considered include the broader educational role which can be integrated with regulatory activities. Special activities, such as mandatory educational programs, may need to be carried out for the smallest mines. All these factors will affect the size and hence cost of the inspectorate.

Related to this issue is the length of a visit. More frequent and shorter visits are generally preferable to fewer longer visits. The same range of topics can be covered in a series of shorter visits with the substantial benefit of meeting a larger number of the management and workers. The downside is cost. But as we have said before, effective safety regulation inevitably costs more than current systems do.

Principle 22: The size and cost of a safety Authority should not be determined by any historical method but should be worked out from first principles. The assumptions upon which the size is determined should be transparent.

Funding an Authority

The manner in which an Authority is to be funded will be controversial. The mining industry will undoubtedly argue that, in view of the royalties it already pays, funding should be from existing government revenue.

An alternative argument is that the cost of an Authority should be paid for out of company profits. Specifically, an Authority should be funded by an industry levy. This is the manner in which NOPSA is funded and we see this as a precedent for any new Authority. It may be appropriate to relate the levy to sales revenue. We prefer this second funding strategy for various reasons.

First, it provides the Authority with a more secure funding base. Government funded agencies frequently experience funding cuts imposed on them by treasurers who are inevitably more concerned with the overall government budget than they are with the capacity of any particular agency to function effectively. Funding, or at least part funding, by industry levy, would protect the Authority against this process.

Second, staff in other government safety agencies are likely to feel resentful of the much higher salaries being paid to staff in an Authority and to argue, with considerable justification, that there is a pressing need for better resourcing for health and safety regulators in other sectors of the economy such as farming, fishing and construction. Such arguments are difficult to counter if resourcing for all health and safety regulators comes from the same source. An Authority funded by industry levy will be protected from such comparisons.

Third, the argument for funding an Authority by industry levy is based in part on a consideration of who will benefit from its regulatory activities. Safety regulation is often seen as a cost to industry, imposed by governments in the interests of employees. In economic terms, it is seen as an attempt to internalize costs which industry would otherwise externalize onto employees and the community. This is an inadequate view in the present context. Safety case regimes are focused on the prevention of major accidents. Such accidents result not only in fatalities but also in major damage to plant and interruption to production. For example, the Esso gas plant explosion at Longford in Victoria, not only cost two lives, but it also cost the company many millions of dollars in

lost production and hundreds of millions of dollars to get the plant up and running again. A safety case regulator can therefore be seen as protecting not only the safety of the workforce but also the profits of the operator. Companies benefit greatly from going through the exercise of preparing a safety case and they benefit greatly from the watchful eye of an effective regulator which seeks to ensure that they comply with the provisions of a safety case. That being so, it is appropriate that industry bears the cost of a service from which it derives such benefit.

A number of regulatory agencies have adopted this model in Australia and overseas. For example Victoria's major hazard regulator recovers some of its costs from industry and NOPSA, all of its costs. Overseas, the UK recovers approximately 40% of its costs of onshore and offshore major hazard regulation. Norway recovers all the costs of its offshore petroleum administration. There will be one-off start up costs if a new body is developed and we propose that government pay all those costs.

Principle 23: Government should be aware that any proposed Authority would cost substantially more than the present regulator and should seriously consider the possibility of external funding options.

Principle 24: One-off start up costs should be paid by government.

There is always a danger when industry funds regulation that it will seek to influence the regulator in inappropriate ways. This danger is at its greatest when there is a tight correspondence between the fee and the service. In these circumstances, there is a risk that industry will press for the right to use other, cheaper service providers, with a corresponding reduction in the quality of the service. If industry provides funding, a new Authority will need to be carefully protected from these possibilities. In particular, companies should not be charged on the basis of specific services provided. The cost recovery strategy adopted by NOPSA could provide an appropriate model. In this case industry pays an annual levy for all routine regulatory services including inspections, audits and incident investigations. Investigations of major incidents are cost recovered on an actual cost basis.

Principle 25: If the decision is to fund an Authority in part or in whole from industry sources, the funding arrangement should not be set up on a fee for service basis.

The Governance of an Authority

As with funding, governance of any new Authority is likely to prove controversial. In principle and in accordance with the Westminster model of parliamentary democracy, Ministers must remain accountable for the overall performance of the regulatory body, whilst not getting involved in individual compliance judgments. Day to day management of the Authority should be the responsibility of its most senior manager who could be styled as a “Director General” or “Chief Executive Officer.” However, stakeholders must have confidence in the performance of such an Authority. Consequently, what role should stakeholders have?

One model that could be adopted would be for an advisory board appointed by the Minister to provide advice to the Minister and the head of the Authority on regulatory policy issues. The advisory board would not be responsible for running the Authority, nor for making individual regulatory decisions – these would be matters for the Authority and its head - but the board would have a key role in helping shape the strategic direction for the Authority. As with any board the quality of the members and their ability to work together would be crucial. In the case of NOPSA there is an expertise based advisory board and it is recognized that the board needs to include experts from management, the workforce and government, in order to cover all points of view. The role of the board will be to monitor the activity of the Authority to ensure that it is indeed delivering high quality regulatory outcomes. Its advisory function will need to be limited in such a way as to ensure that it does not overlap with broader advisory groups. It will need to have a statutory right of access to information from the Authority.

Principle 26: A proposed Authority should have an expertise based advisory board which should include representatives of industry, the workforce, unions and government.

One issue to be decided is which Minister an Authority should be answerable to. We do not believe that this is a vital issue. We also recognize that it is likely to be a highly political issue which will inevitably be up to government to decide.

Principle 27: The Authority should report to parliament, through a Minister to be decided by government.

Accountability

In addition to the formal governance structure of the Authority, if it is to obtain and retain the confidence of stakeholders, it will have to demonstrate that it is effective and efficient. In this context effectiveness is about discharging its responsibilities properly and efficiency is related to carrying them out for a

reasonable cost. Transparency is a key tool in promoting effectiveness and efficiency. Stakeholders must see what they are getting. This applies at both the organisational and individual level.

Thus the Authority's methods of working, its systems and procedures must be publicly available and subject to external scrutiny. These include audit priorities and protocols, enforcement policies and crucially how they are to be applied in practice. Aggregated industry level results of the Authority's audit activities should be published, as well as summaries of its investigatory activity. In turn this material should be used to help determine regulatory priorities.

Elsewhere we have commented on the importance of a single point of contact so that those working at the worksite have the opportunity to develop a working relationship with the Authority, reinforced by a legal obligation for the regulator to consult with HSRs. Apart from listening and learning from people at the worksite, this provides an opportunity for regulators to explain their priorities and the reasons for them. Given regulators of the requisite quality, this personal contact alone can be a powerful influence for change.

Similar principles of openness apply equally to the efficiency aspect of the Authority. This will be particularly important if a funding model is developed, based on some direct contribution from industry.

Principle 28: The Authority's ways of working, systems, procedures and activities should be as transparent as possible.

Managing the change

Managing the change from an existing regulatory regime to a new Authority is a complex task and requires significant resources in terms of senior management time, a dedicated project team, appropriate financial resources, a professional project management approach and stakeholder involvement. The lessons learnt by other jurisdictions in Australia in managing such a change could usefully provide a starting point for planning the change. In addition to NOPSA there have been changes taking place in mining or major hazard regulators in Victoria, South Australia and Queensland.

Experience from establishing NOPSA strongly supports the need for a full time project team leader. If managing the project is simply added to the day to day tasks of staff, then it is inevitable that the day to day pressures and priorities will mean that insufficient time and energy is devoted to developing the new body. In addition a full time project team should be established under the project leader. Such a team can be quite small but it must be adequately funded to enable specialised help to be employed when necessary to supplement the full time team.

Principle 29: A project manager should be appointed to oversee the development of a new Authority. The project manager should be at Senior Executive Service (SES) level.

Principle 30: The project manager should have a full time implementation team and an appropriate budget.

Given the variety of pressures that are placed on the most senior managers it is unrealistic to expect them to be full time members of the project team. However, their involvement is of course essential. Good practice in project management of this type would involve the formation of a project management Board. The Board would consist of the most senior staff involved in the project, would be responsible for delivering the new Authority, make the most significant decisions, be responsible for approving significant expenditure and would receive regular reports on project progress. In other words it would be responsible for monitoring the progress of the project. To maintain the involvement of key stakeholders in the development phase of the project consideration should also be given to inviting them to board meetings, perhaps as observers.

Principle 31: A senior project management board should be appointed to oversee the project.

A project of this complexity is unlikely to succeed without a formal and disciplined project management approach. There will be a variety of work streams running in parallel. New legislation will be needed and guidance documents developed to support it. There will be work to design a new body, deciding on its size, structure, composition, location and hence finding property, agreeing pay levels and conditions, recruiting staff running training courses and so on. This will prove a challenging task. The difficulties of building a new Authority must not be underestimated. In particular a detailed scoping study will need to be carried out to establish the scope, resources required, (financial and human) and timing of the project.

Principle 32: A project to establish a new Authority must be established on formal project management principles.

Principle 33: A detailed scoping study should be carried out led by the project manager to establish the extent of the project.

Summary

We propose that a safety case system is used as the basis for the regulation of health and safety in the mining industry. This will require significant changes to legislation and a more sophisticated approach to its application than is currently adopted. All the established features of successful safety case regimes should be incorporated, in particular a focus on identifying hazards, assessing risks, applying control measures and managing them effectively backed up by effective workforce involvement. Best practice regulation requires the ability to effectively monitor and audit companies safety cases as well as the provision of high quality advice, encouragement and stimulation to the industry to improve its own performance as well as effective enforcement and prosecution of the (revised) law, where appropriate. This will require more and better qualified staff. The regulatory staff and hence the regulatory body will be seen as helpful and supportive to industry leaders, managers, workforce and their representatives, as a result of the helpful, fair and where necessary firm regulatory approach. This will inevitably cost significantly more money than current regulatory regimes. We believe that the regulator is best set up as a statutory Authority with an advisory board comprised of people with expertise from the various stakeholder groups.