

# MINING FATALITIES INQUIRY – WESTERN AUSTRALIA

## - Opportunities and Initiatives

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### SUMMARY

The background of events in relation to mining safety in Western Australia, in the decade leading up to this Inquiry is outlined, and the conduct of the inquiry and compilation of the report briefly described.

The immediate actions on implementing the report's recommendations are summarised, and an assessment of its general impact on the industry provided.

The process of carrying out the inquiry, and the widespread media interest attending the release of the Report, has generated a groundswell of concern which provides the industry (management and workforce) with the opportunity to drive change and pursue identified initiatives which may not have otherwise been given the attention and impetus which they warrant. The key initiatives are discussed.

### INTRODUCTION

#### Preliminary

It continues to be a regrettable characteristic of human society that major change is not readily orchestrated unless the community is motivated by some disaster, or outrage or other compelling circumstance.

Robens clearly identified apathy as a major obstacle to safe performance in industry, and collective apathy is still far from eliminated within the mining industry ethos.

There is a tendency to use the term disaster only when there is a multiple loss of life in one event or a series of connected events. The community is normally less moved to horror and concern by an incremental death rate, (where several fatalities are spaced over a year or more), than it is by a multiple fatality event.

Every single fatal accident (and every injury involving serious permanent disability) is a disaster in stark terms for the individual, the family, the workplace and workmates, the enterprise, the industry and the whole community. Its impact is irreversible and long lasting.

It is all the more devastating to have to come to terms with the fact that all such events, when thoroughly analysed, can be shown to have been avoidable by taking the most ordinary and reasonable precautions.

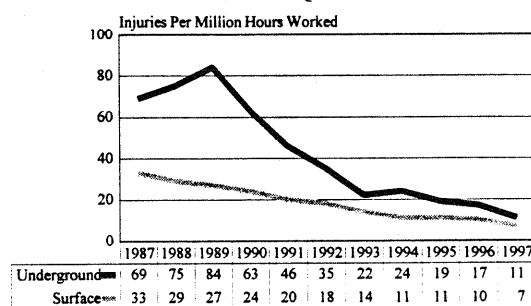
However, for a variety of reasons, the need for such precautions has often not been perceived, or at least not properly comprehended, by the parties concerned in the lead up to the event.

It is therefore of paramount importance that no present or future opportunities are lost to ensure that, so far as is humanly possible, precautions are taken to prevent not only events that are reasonably foreseeable, but those that are conceivably possible, given the unfavourable combination of forces and circumstances which can arise in the complex, tightly coupled production processes which generally characterise this industry.

#### Background Information

Over the past ten years, consistent with the longer-term trends evident decade by decade since the fifties, there has been in Western Australia, a sustained reduction in the total spectrum of serious and minor injuries across the industry. This is illustrated in Figure 1.

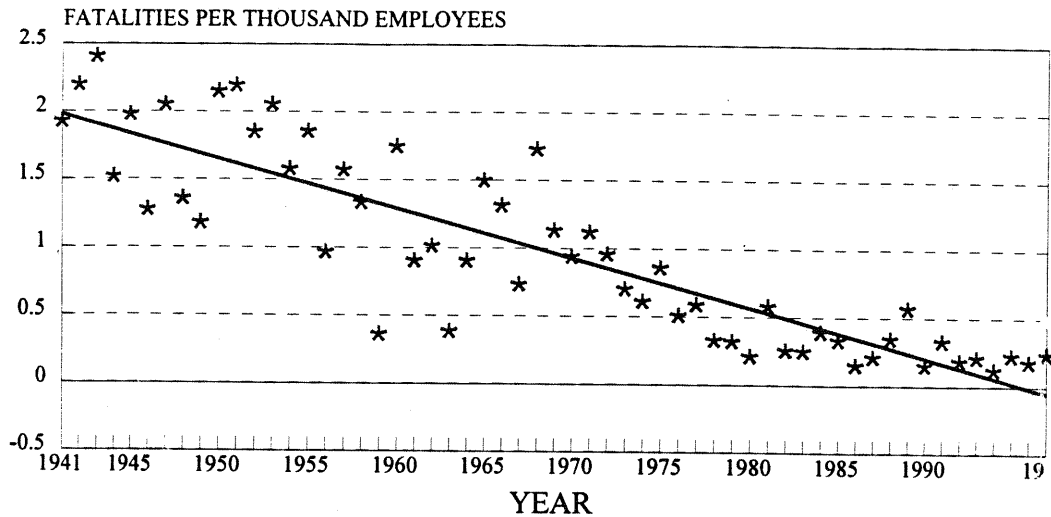
#### WESTERN AUSTRALIAN METALLIFEROUS MINES INJURY FREQUENCY



SOURCE: Atlas - Department of Minerals and Energy

Fig. 1 Injury Frequency - Metalliferous Mines

## WESTERN AUSTRALIAN MINES FATALITY INCIDENCE



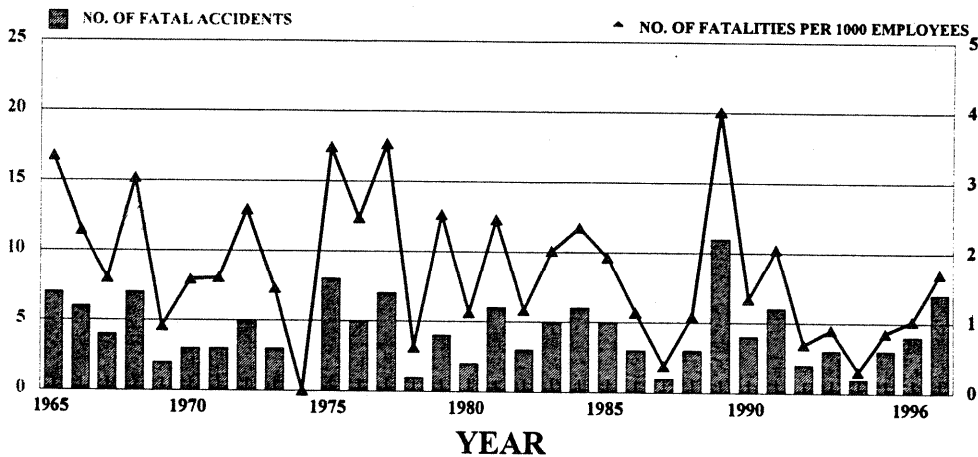
SOURCE: DEPARTMENT OF MINERALS AND ENERGY REPORTS

Fig. 2 Fatality Incidence Rate – All mining

Whereas the incidence rate of fatalities (per 1000 persons employed) has continued to reduce for the industry as a whole (Refer Fig. 2), the underground

sector incidence has shown very little improvement over the past thirty years; (Refer Fig 3).

## WESTERN AUSTRALIAN UNDERGROUND MINES FATALITIES



SOURCE: DEPARTMENT OF MINERALS AND ENERGY REPORTS

Fig 3 Underground Fatalities and Incidence Rate

During 1989, 18 fatalities occurred, six of which were in one event in the Emu Mine flooding; (11 deaths were underground, 7 were surface mining).

In 1990 an Inquiry was conducted into Safety in the Underground Gold Mining Sector, where the bulk of fatalities had been experienced in the past decade. A substantial report on the Inquiry which contained 72 recommendations, was produced and widely circulated; (some 8000 copies). In the few years immediately following the inquiry and circulation of the report, many of the recommendations were implemented, in whole or in part, across much of the industry.

A further spate of fatalities resulted in a retrospective study into fatal accidents in 1992. The period covered was 1980 to 1991, and the report was widely circulated. Again this report, believed to be the first of its type produced in Australia, provided a great deal of information which continues to be of value in hazard identification and risk management. A follow up study in the same format was repeated in 1994.

An extensive series of courses on managing safety were conducted during 1995/96 by DuPont for operating managers, across Western Australia. These courses were organised and facilitated by the Chamber of Minerals and Energy, with input and support from the Department.

In spite of all of this activity, and in the face of a continuing marked improvement in the decreased incidence of serious and minor disabling injuries, a series of fatal injuries again took place in 1997, most of which were in underground mines.

This led to a directive in September 1997 by the Minister for Mines to the Mines Occupational Safety and Health Advisory Board (MOSHAB) to conduct an inquiry into fatalities in the industry. MOSHAB is a tripartite body established under the Mines Safety and Inspection Act, principally to provide advice to the Minister on safety and health issues in the industry.

### **CONDUCT OF THE INQUIRY INTO FATAL ACCIDENTS**

MOSHAB established terms of reference and the scope of the inquiry, and appointed a task force of four Board members to carry out the inquiry, assisted by a technical secretary/coordinator. The time frame was tight, and the focus was on the eastern goldfields region, where much of the underground mining is located. The underground

sector was clearly the problem area for the industry.

During the period when submissions were sought by telephone and in writing, and prior to holding public forums in the several mining centres, a review of the earlier reports and fatality studies was made. Following the field visits and public forums, the collected information was discussed and reviewed at a series of meetings and the report compiled and submitted to MOSHAB for endorsement. The Report was provided to the Minister for Mines at the end of December 1997.

Both the conduct of the Inquiry and the formal release of the Report by the Minister, were attended by considerable media attention, the more so with the latter, as the first of a further series of fatal accidents which were to take place in 1998 coincided with that release.

The inquiry findings did not reveal any new or previously unidentified issues, but rather brought out the extent to which a range of deficiencies in safety performance in the underground sector in particular were more widespread and deep seated than was anticipated at the commencement of the inquiry.

Perhaps the most disturbing aspect of this is that almost all of the major issues had been identified in earlier reports and studies, and remedial action recommended and carried out with varying degrees of thoroughness, in the early to mid-nineties.

A combination of adverse factors, including sustained industry expansion, dilution of the available pool of experienced persons at all levels, and loss of "corporate memory" has re-asserted itself, and much of the ground made up earlier was lost. Coupled to these recurrent problems was a move to contracting out most of the underground development and production mining. The major deficiency manifested in relation to contracting has been failure on the part of the principals to manage the process effectively, in terms of ensuring capacity for safe performance.

### **ACTIONS ON THE RECOMMENDATIONS**

As was emphasised in the Executive Summary of the Report, the primary responsibility for rectifying the identified defects rests with the management of enterprises where they are manifested.

However, MOSHAB and the Taskforce recognised that if change and improvement is to be effected in a timely manner, organisations equipped to drive those changes must take a primary role.

The 23 recommendations in the report are being actioned by a series of tripartite working parties set up by MOSHAB, and where recommended, by mine management, the Chamber of Minerals and Energy, and the Department.

A summary of these actions in spread sheet format is attached as an *Appendix I*.

## **IMPACT OF THE INQUIRY**

The conduct of the inquiry, the media attention, and the wide distribution of the report (5000 copies), have resulted in a much greater and more rapid penetration throughout the industry in Western Australia (and interstate) than was anticipated at the establishment of the inquiry, which is a welcome outcome.

Perhaps most importantly, there has been substantial penetration into the boardrooms and senior management ranks of many mining enterprises, and a widespread positive response from that quarter.

Most of the direct outputs from the work parties (in the form of codes, guidelines and report back assignments) will be completed by the end of 1998.

However it is of critical importance that none of the momentum generated to drive change and improvement is lost with the passage of time, as has been the case too often in the past.

Several of the initiatives, by their fundamental nature, will have lasting impacts but all of the lessons which have been re-learned will need to be retained by improving the effectiveness of the corporate memory at the enterprise level. The role of regenerating the corporate memory has been largely left to the mining inspectorate in the experience to date, and better mechanisms are being developed for this purpose.

## **CONCLUSIONS FROM THE REPORT**

*"Most human beings have an almost infinite capacity for taking things for granted"*

Aldous Huxley ("Themes & Variations")

On the assumption that plant and equipment, and fundamental operating practices (such as proper attention to geomechanics to ensure the integrity and safety of the underground work place) are to be brought up to the high standards required, the focus here will be on aspects related to competencies of persons and human behaviour.

The most fundamental issues to be dealt with are :

- Competency based training for miners.
- Deficiencies in front line supervision.
- Competencies required to hold statutory positions.
- Hazard identification and risk management.
- Safety culture – recognition of influencing human behaviour as the basis for safety improvement.
- Effective management of the contracting out of mining operations.

The findings of the report on these issues are briefly summarised.

- The lack of a properly structured modular competency based training system for mineworkers has been an impediment to improved safety performance which has long been recognised. The industry has lacked the will and the capacity to generate a concerted effort to rectify this major deficiency. In the present industry context of expansion and dilution of experience, the report has identified this as a first priority.
- Equally critical is the ongoing inadequacy of training and development of essential competencies for front line supervision, in the fields of personnel management skills, communication, training and risk management. The long standing dependence only on mining knowledge and skills has been manifestly inadequate.
- The present requirements for qualifications and experience to hold statutory appointments have traditionally been those contained in the legislation. The development of other essential skills and competencies including personnel management and communication skills, together with capacity to ensure effective risk management and occupational health standards, have been matters for employers to build into training programs for professionals. When the rate of movement through positions of responsibility was less rapid, there was a reasonable opportunity to acquire these

competencies, albeit in a non-structured manner.

The present situation in industry now demands a structured coordinated approach to ensure that persons appointed have the capacity to discharge the responsibilities effectively.

- Although the present legislation is based on the obligation to apply the risk management principles, in broad terms in the Act and in specific terms in the Regulations, there is manifestly a failure to carry out this essential function at all levels to the level of competency required.
- A risk taking culture in underground operations was still evident, with a degree of tolerance of this at all levels of management and supervision. The understanding of improved safety performance through safety behaviour initiatives needs urgent action.
- Contracting out of the underground development and production functions has been undertaken without putting in place mechanisms to ensure a seamless operation, and this has been detrimental to safe performance. This is rapidly being recognised.

## **RECOMMENDATIONS FOR FUTURE ACTION**

*"Progress, far from consisting in change, depends on retentiveness.*

*Those who can not remember the past are condemned to repeat it"*

- George Santayana – ("The Life of Reason")

The conduct of the Inquiry, and action on the recommendations made in the report affords a range of opportunities for the industry to effect some real and lasting improvements in the safe management of mining operations.

The recommendations detailed in the Report are being implemented. Codes of practice and guidance notes are being framed, and other initiatives, some already in process at the time of the Inquiry, are being pursued by the Chamber of Minerals and Energy.

The work party dealing with drilling hazards has the opportunity to recommend design standards which will greatly reduce the potential for injury and death to drill operators. The report is due late in 1998.

However, the greatest scope for lasting improvement exists in the following initiatives.

### **Competency based Modular Training Systems for Underground Miners and Operators**

A work party coordinated by the Chamber has undertaken the task of developing a system for uniform implementation across the industry based on the competencies developed by the national Mining Industry Training Advisory Board over the past year. Successful implementation of the system will require full commitment by all enterprises and contractors across the industry.

The Central Metropolitan College of TAFE has been actively involved in developing and conducting certificate courses for people wishing to enter the industry in various operator capacities. These initiatives warrant the wider support of the industry.

### **Training for Supervision**

The critical interface of front line supervision and the work force has only now come to be recognised as the key to success or failure, in motivating employees to achieve safe and efficient performance.

A greater emphasis on structured training and the development of essential competencies is a priority, and is being undertaken through in-house programs, and through bodies such as the Industrial Foundation for Accident Prevention (I.F.A.P.)

### **Review of Certification for Statutory Positions**

This is a matter of fundamental importance to the industry, which is reflected in the level of attention given to its execution by the work party to which it has been assigned, and the interest of the Executive Council of the Chamber of Minerals and Energy.

Persons holding statutory certification under the present legislation will need also to have completed specified appropriate training in order to undertake positions of responsibility in industry.

### **Risk Management**

MOSHAB has undertaken to develop guidance material to promote this essential capacity at all levels in the industry.

The mining inspectorate, through its evaluation of project management plans, and the ongoing program of systematic auditing of mining operations, has the capacity to maintain pressure on each enterprise to develop and maintain these fundamental processes at the required levels.

### ***Improving the Mining Culture – Eliminating Risk Taking and its Tolerance***

Definitions of “culture” may be long winded and confusing. James Reason describes it as “.....*the unwritten rules governing acceptable behaviour*”.

The old inherited perceptions that mining is a “tough game”, and some level of injury must be tolerated if you’re “having a go”, are still not yet fully replaced by the precept that all injuries are preventable.

With experience, and with training in the discipline of human behaviour, and the application of continuous effort by management and supervision, the climate of opinion can be changed.

MOSHAB has established a taskforce to visit each underground mine to gauge the climate and attitude, using a simple survey process and direct group discussions. A series of safety behaviour seminars, facilitated by operations which have made progress in this area, is planned for the 1998 year.

### ***Managing Contractor Safety***

A guideline on this process was developed and issued by the Chamber of Minerals and Energy and it has been widely circulated.

There remain some deeper seated problems in contracting out underground mining in particular.

As the work can not be specified ahead of commencement of mine development and extraction with the degree of certainty possible in most civil engineering and construction work, where much is covered by codes and standards, there is potential for conflict in respect of the extent of ground support in particular.

There is also a tendency given the capacity to pressure the contractor for leaner and meaner bids, to compromise the contractor in terms of staffing levels, and the capacity to release employees for

training and development, participate in safety meetings, etc.

These problems are exacerbated when long distance commuter and compressed work schedules are involved. The maintenance of adequate emergency response capacity becomes more difficult under these regimes of work.

The development of a code of ethics for the industry in contracting out mining development and production is needed, which will ensure that an adequate margin of safety is built into all arrangements, to meet the legislated obligations of both parties. Contracting on an efficient “partnership” basis offers a way forward for effective integration of safety into the process.

### ***CLOSING COMMENT***

This Inquiry and the actions generated from the Report provide a platform for driving continuous improvement across the industry, particularly in the underground sector.

Vigilance is required to prevent recurrence of the malady of collective amnesia in the industry, which too often in the past has resulted in gradual loss of information for which we have paid the intolerable price of fatalities, and permanent disabling injuries.

## ACTIONS ON RECOMMENDATIONS FROM THE MINING FATALITY REPORT

RECOMMENDATION	ACTION
Drilling Hazards Working Party	Tripartite working party formed to develop a strategy to improve safety standards and reduce drilling related injuries
1.1 The Chamber of Minerals and Energy actively promotes the adoption and implementation of the principles of "A Guide to Contractor Occupational Health and Safety Management for Western Australian Mines" as a matter of priority.	Chamber of Minerals and Energy actively promoting implementation of the Guide through membership
1.2 The Department of Minerals and Energy increases inspection and management system audit activities in the underground mining sector.	Inspectorate directed to plan new audits for underground operations
1.3 MOSHAB implements a program to improve the safety culture, as reflected by behaviour, that focuses on management commitment and personal aspects of safety awareness at all levels of the workforce.	Safety Behaviour Working Party to speak with and survey underground employees and supervisors on risk-taking behaviour. Industry Safety Behaviour Seminar scheduled for June 1998
1.4 The Department of Minerals and Energy and the Chamber of Minerals and Energy conduct a review of the certification process for all statutory positions for consideration by MOSHAB.	Department of Minerals and Energy and Chamber of Minerals and Energy Taskforce reviewing process and certification standards
1.5 The management of all underground mining operations to ensure a high standard of compliance with the obligations of Regulation 10.28: Geotechnical Considerations.	Chamber of Minerals and Energy to report in August
1.6 The Department of Minerals and Energy to target its resources to ensure compliance with the full obligations of Regulation 10.28: Geotechnical Considerations.	High Impact Geotechnical Audit developed and applied at Underground operations State Mining Engineer commenced program of visited underground operations to examine and promote Geotechnical standards
1.7 The Chamber of Minerals and Energy and the Department of Minerals and Energy actively promote the adoption of the requirements the Department's guideline "Geotechnical Considerations".	Guideline now available on EXIS (External Information Service) Guideline soon to be available on disk for sale Actively promoted through site visits
1.8 MOSHAB develops a code of practice for securing backs in headings of extended height and width with continuous meshing, shotcreting or other surface treatment.	Tripartite Ground Support Working Party progressing development of Code of practice
1.9 MOSHAB coordinates development of an accredited, competency-based training program for underground mining employees.	Department of Minerals and Energy and Chamber of Minerals and Energy Underground Mining Training Taskforce progressing the development of an underground training modules

RECOMMENDATION	ACTION
2.1 The Department of Minerals and Energy reviews the mechanisms for recording and updating safety and health information and the timeliness with which it is provided to industry.	Department of Minerals and Energy internal review in action
2.2 MOSHAB considers the means by which safety and health hazards can be reported to management without such reporting resulting in any disadvantage to either the contractor, employees or group of employees.	Trades and Labor Council / Australian Workers' Union Mining Safety Hotline established to collect evidence, MOSHAB to review situation
2.3 The Department of Minerals and Energy, in conjunction with the Chamber of Minerals and Energy, determines the effectiveness of distribution and communication of safety and health information and works through MOSHAB to improve the process to a high standard.	Department of Minerals and Energy and Chamber of Minerals and Energy review in action
2.4 MOSHAB develops guidance material to assist the industry to implement the principles of risk management to achieve compliance with the legislation.	Tripartite Risk Management Working Party progressing development of Risk Management Guideline and supporting documentation and promotional material
2.5 Mining industry employers conduct safety and health training for all supervisors and managers, with a specific emphasis on hazard identification, risk assessment and risk control, as matter of priority.	Chamber of Minerals and Energy coordinating Safety Management training for senior management
2.6 MOSHAB recommends to the Minister for Mines the implementation of the recommendations of the Chamber of Minerals and Energy's September 1996 in-depth report " <i>Future Role of the Mines Inspectorate</i> ".	For MOSHAB consideration
2.7 MOSHAB examines current industry incentive-based remuneration schemes to ensure safety and health is not compromised.	Tripartite Incentive-Based Remuneration Working Party to review and report on a survey of remuneration scheme in all underground mines
2.8 MOSHAB develops a code of practice for compressed work schedules, extended shifts and effective hours of work for airleg mining work.	Tripartite Work Schedules Working Party surveyed underground mines to evaluate shift hours and travel schemes. Code of practice in development
3.1 MOSHAB commissions a confidential survey of all underground employees to elicit their views on the role of the Inspectorate and their understanding of the current legislation, including the duty of care principles and consultative mechanisms.	Tripartite Underground Employees Survey Working Party progressing survey scope to out source survey
3.2 The Department of Minerals and Energy considers options to improve understanding within the industry of the role and function of the Inspectorate.	Department of Minerals and Energy review in action
3.3 The Department of Minerals and Energy develops a formal policy and structured system for processing complaints, and for recording the action and consequences in a central database.	Department of Minerals and Energy's complaints handling process under review
3.4 The Department of Minerals and Energy produces guidance material on the fatality investigation process and the coronial inquiry process.	Draft document prepared for publication
3.5 The Department of Minerals and Energy trains all inspectors involved in fatality investigations in critical incident stress management.	Department of Minerals and Energy to progress
3.6 The Chamber of Minerals and Energy actively promotes implementation of the principles contained in its publication " <i>Shiftwork and Occupational Health and Safety in the Western Australian Mining Industry - Guidelines for Workers and Management: 2<sup>nd</sup> Edition</i> ".	Chamber of Minerals and Energy actively promote adoption of principals to membership