Sharing Safety Performance Improvement and Changing the Culture

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Abstract

A PhD research programme at the School of Mining Engineering at the University of NSW is currently being finalised which aims to improve the safety performance on mine sites. The main reason this research is being carried out is because the author is passionate about safety and wants to give something back to industry.

1. This research will test the hypothesis that safety performance in the Australian Mining Industry has not improved despite all the rhetoric in the industry and may even be deteriorating.
2. That in order to improve safety performance the mining industry needs to change the culture regarding prosecution policies so that legal privilege does not prevent the sharing of safety information and heeding the lessons learned from accidents and incidents on mine sites.

Although significant advances in safety have been made throughout the mining industry, people are still being killed and seriously injured on mine sites. The rapid expansion of the mining industry has required the growing use of contractors, hence creating a more inexperienced workforce. Fatigue and awareness issues are having an impact on safety at work, which is particularly evident when people are working 12 hour shift rosters which are associated with increasing fly in fly out operations together with the social impact that is involved. Further, in order to improve safety performance, this research will ascertain if the training regarding risk management and safety and health management is considered appropriate.

The current approach to prosecution has resulted in the common use of legal professional privilege which inhibits safety investigations and causes a defensive rather than a proactive safety culture. This impedes the timely sharing of information within industry to help prevent recurrence of incidents.

In order to address these issues a survey of the mining workforce in underground and open cut coal mines in Queensland and NSW has been undertaken. The author would like to share with industry the main outcomes of this survey with the aim of improving safety performance and culture in the mining industry.

Introduction

A major part of this thesis is carrying out a survey of the coal mining workforce in Queensland and New South Wales on the following safety issues:

- Workforce Profile
- General Safety
- Risk Assessments
- Safety & Health Management Systems (SHMS)
- Fatigue & Awareness Issues

- Prosecution Policies
- Fly In Fly Out (FIFO) Operations

The above list is larger than the original due to comments from CEOs, Industry, regulators and unions. The survey has been supported by the CEOs of Peabody, Jellinbah, Queensland Mines Rescue Service, NSW Rescue Service and the CFMEU. The initial plan was to ask all the CEOs in Qld through the QRC; however the survey would have been too big for one person to finance, since no financial support for this research is available. Currently just under 1200 responses to the questionnaire from 37 mines in Qld and NSW are being analysed. There are 56 questions on the above mentioned issues.

It can be observed in Table 1 the working roles of the survey respondents

Table 1: Working Roles of Survey Respondents

Supervisors	Statutory Officials	Mineworkers	Others
7%	7%	83%	3%

Current Trends in Safety Performance

The number of fatalities, serious bodily injuries and high potential injuries in Australian mines is unsatisfactory according to community standards. People are still being killed and there is little evidence of a sustained improvement trend over the last decade particularly regarding fatalities. Although the LTIFR is now plateauing, the fluctuating annual fatality numbers continue to cause concern. In fact the 18 fatalities recorded in 2008-09 are higher than the preceding eight-year average of 11 Figure 1.

The FIFR rate of 0.05 is higher than the 0.03 recorded 7 years ago in 2001-02 Figure 2. One example of the rhetoric regarding safety performance is illustrated by the QRC (2010) when they said that the Qld mining industry reported its best ever safety performance on record when in fact there were four mining related fatalities during the financial year under review 2008-09. How can the Qld mining industry have the best safety performance on record if four fatalities have occurred?

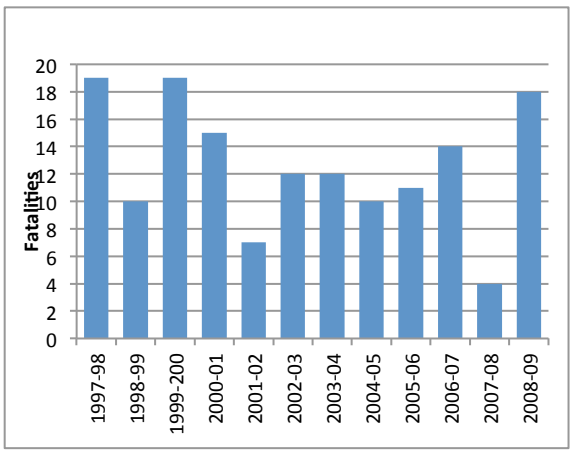

Figure 1: Australian Minerals Industry Fatalities 1997-98 to 2008-09

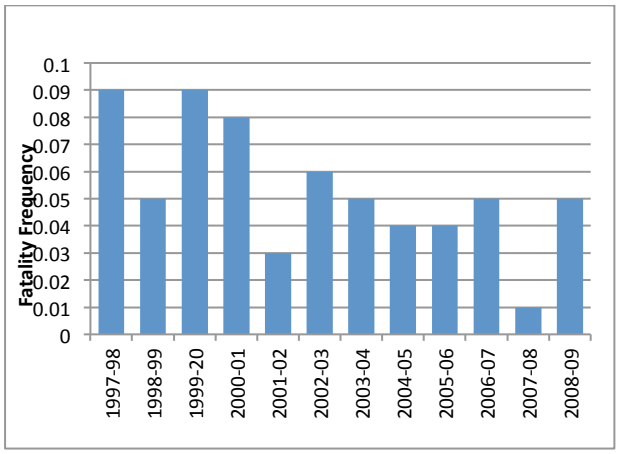

Figure 2: Fatal Injury Frequency Rate (FIFR) Australian Minerals Industry 1997-98/ 2008-09

It is a sad reflection on the individuals responsible for discontinuing the Minerals Industry Safety Performance Report after 2008-09, because we no longer have the combined FIFR information for the minerals industry and hence we do not have the ability to use the information for safety bench marking purposes, which is a huge loss to the Industry.

What is not measured cannot be controlled and could be reviewed as a management risk.

It may be observed in Figure 3 that the fatalities in the minerals sector have ranged from 7 fatalities in 2001-02 to 16 fatalities in 2013-14 which is a 44% increase. There is no consistent trend from year to year. The fluctuating nature of fatalities recorded in the minerals industry suggests that the industry is still coming to terms with the number of fatalities being recorded and how to deal with them. According to the QRC media release in August 2015, the resource sector fatalities in Queensland in 2014-15 were the highest for 20 years. In discussion with the safety hierarchy in the Australian mining industry they have stated to the author that they have their fingers crossed in the hope that they do not sustain a fatality, in other words the industry is having difficulties in preventing the occurrence of fatalities.

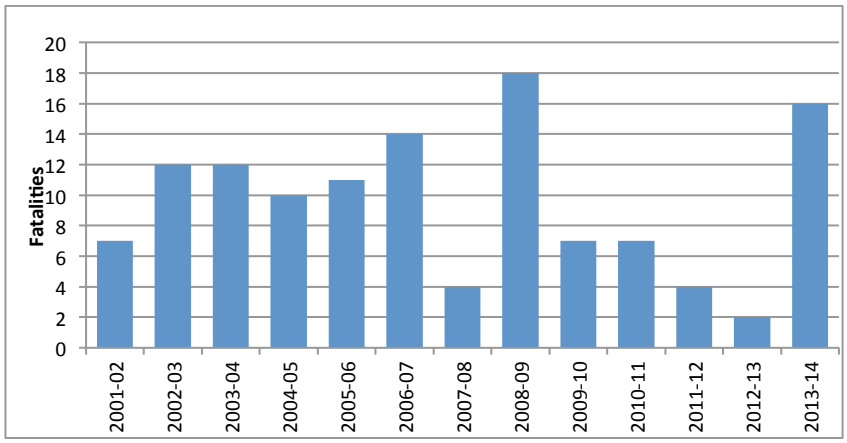

Figure 3: Fatalities in the Minerals Industry from 2000-02 to 2013-14

(This information was sourced from the Mineral Industry Safety Performance Reports 2014)

Impact of Fly – In Fly Out (FIFO) / Drive - In Drive Out (DIDO) Work Practices in the Mining Industry

Today FIFO has become a common work practice in regional Australia, especially for new mining and resource developments located in in remote locations. Queensland and Western Australia are the two major mining states where a substantial proportion of their operations are carried out with FIFO work practices. Recent studies have indicated that the magnitude of the FIFO workforce has become very substantial and is expected to increase further (Morris 2012). Table 2 provides a snapshot of FIFO growth trends in Queensland and Western Australia.

Table 2 FIFO growth trends in Queensland and Western Australia

Region Percentage of employees on FIFO rosters

	2011	2015
WA mining sector	**52%**	**57%**
Qld Bowen Basin mining sector	**46%**	**54%**

WA information sourced from (CMEWA 2011). Qld information sourced from (KPMG 2011).

The rapid expansion of FIFO work arrangements especially in recent years has raised many concerns particularly in mining based communities throughout Australia. Amongst the adverse effects suggested in the literature are:

- Increased stress levels and poor health including depression, binge drinking, recreational drug use and obesity
- Poor quality relationships leading to increased break-ups and divorce
- Family disruption and stress
- Reduced social and community interaction by FIFO workers
- Reduced socialisation by partners and
- Feelings of loneliness and isolation.

Overseas research has supported the view that FIFO workers are more likely to experience health issues compared with daily commute employees (Morris 2012). It appears that that work roster patterns and the availability of support networks for employees and their families are two key factors that play an important role in determining the extent that potentially negative effects of FIFO work practices are experienced at the worker partner and family level.

Questionnaire Survey Results

Due to the size constraints of this presentation, only the questions which reflect the main outcomes of this survey have been analysed.

1. Years of Experience in the Industry

The survey results reflect some of the inherent problems in the mining industry today and that there is a lack of experienced personnel. It may be observed in Figure 4 that 28% of the workforce have only 0-5 years' experience in the industry and 33% have 5-10 years which reflects a relatively young workforce and consequently one with little experience. Only 23% of the workforce has between 10 and 20 years' experience. If 61% of the workforce has less than 10years experience. That means that 3/5 of employees are experiencing their first industry downturn which has implications for safety management at this time. It is the Department of Natural Resources and Mines (DNRM) (2013) contention;

"that safety standards are slowly eroding due to persons being appointed who do not adequately comprehend the task at hand. A process cannot be managed effectively without comprehending the process. This is being demonstrated, not only in the increasing number of concerning incidents, but also in the declining safety standards and reduced productivity being observed. People are being promoted to supervisor level and above who do not understand legislative requirements, hazard identification or the risk management process. The Queensland Mines Inspectorate, continually through investigations or audits, uncover a poor basic understanding of the processes these people are required to be managing or supervising.

According to DNRM (2013) the Queensland Mines Inspectorate has found and continues to find persons being appointed to positions who do not meet the competency standards required by the respective acts. Further evidence suggests that the standard of competency training and assessment provided by some registered training organisations is highly questionable.

If people with insufficient experience are being appointed to senior positions in the management structure on mine sites and are not able to meet the competency standards required, then this poses a serious problem which must be addressed with some urgency if the safety performance is to improve in the industry.

The above statement supports the author's hypothesis that safety performance is not improving in the mining industry.

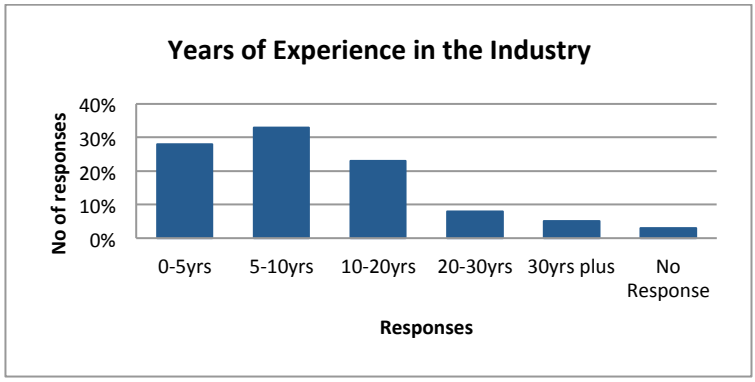

Figure 4: Years of Experience in the Industry

2. The Main Causes of Accidents and Incidents is a poor Safety Culture

It can be observed from Figure 5 that 48% of survey respondents disagreed or strongly disagreed that the main cause of accidents and incidents is a poor safety culture while 33% agreed or strongly agreed and 17% were not sure. The industry has agreed that if safety performance is going to improve it needs to change the safety culture and implement programmes that achieve the objective of changing attitudes and behaviour of the workforce on mine sites. Reason (1997) contends that 'commitment, competence and cognisance' fuel the safety engine.

"High levels of commitment are relatively rare and hard to sustain. This is why the organisation's safety culture is so important. Top management come and go. More organisational leaders are appointed to revive sagging commercial fortunes than to improve indifferent safety records. A good safety culture, on the other hand is something that endures beyond these palace revolutions and so provides the necessary driving force irrespective of the inclinations of the latest CEO".

It is therefore a poor reflection on industry if nearly half the workforce does not understand that workforce culture plays a very important part in accidents and incidents on mine sites especially since according to Research Solutions Survey (2011). 82% of Managers rated their industries performance to be a proactive, consultative safety culture.

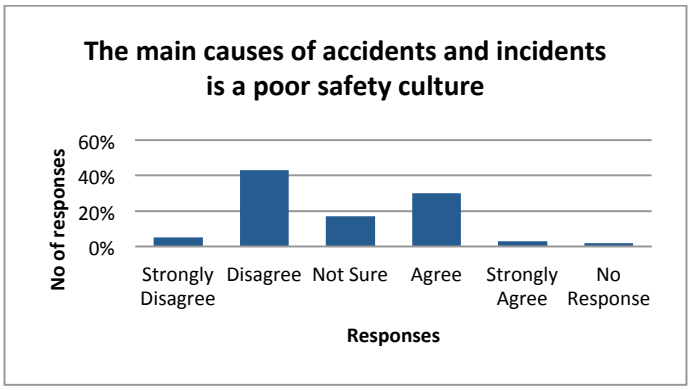

Figure 5: The Main Causes of Accidents and Incidents is a Poor Safety Culture

3. Management Influences Affect the Outcome of my Risk Assessments

It may be observed in Figure 6 that of the surveyed workforce 53% agreed or strongly agreed that management influences affect the outcome of their risk assessments whilst 23% disagreed and 23% were not sure. One half of the workforce that was surveyed agreed that management influences affect the outcome of the risk assessment, which means that the risk assessment methodology is manipulated in order to achieve a desired result. This

situation goes against the principle that risk assessments should be conducted where all parties involved contribute in an unbiased manner in order to achieve a result which is truly representative of the parties involved with the risk assessment. This is also one of the reasons why unions have expressed negative views regarding risk based legislation in favour of prescriptive legislation and also suggests that is one of the reasons for the reintroduction of statutory certification for some existing critical safety positions in Queensland mining legislation (DNRM 2013).

According to Cliff (2011) "there are some concerns within the mining industry that risk management is not being properly or rigorously applied. Like many mature processes there is a risk of increasing complacency. There are examples where risk assessments appear to be done to reach an outcome and to avoid more work rather than control a risk. Some people seem to be doing Job Safety Analyses to meet quotas rather than to improve safety".

According to Pitzer (2009) "We create a myriad of rules and procedures that are supposed to defend us and create controls in the workplace and while it is largely successful, it eventually becomes a complexity of its own. Layer upon layer of risk controls actually creates behavioural responses that expose the organisation in unpredictable ways".

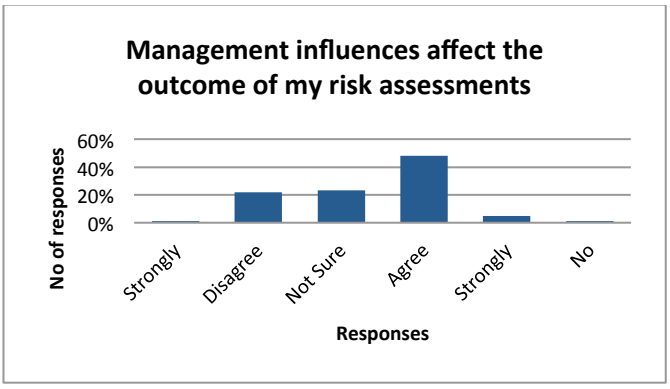

Figure 6: Management Influences Affect the Outcome of my Risk Assessments

4. More Time should be allowed for Training in the SHMS

It can be observed from Figure 7 that 70% of survey respondents agreed or strongly agreed that more time should be allowed for training in the SHMS whilst 10% disagreed and 17% were not sure. Due to the complexity of the SHMS the main challenge is how it is communicated and implemented for all to comprehend and comply with, especially those that move from site to site on a regular basis. This is another reason why the unions want more training and this fact has been substantiated by the results of this survey.

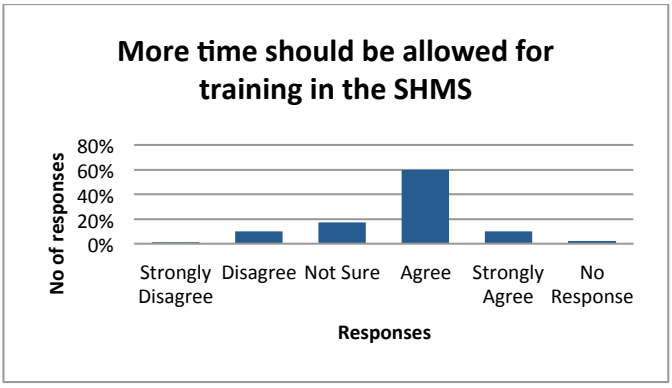

Figure 7: More Time should be allowed for Training in the SHMS

5. My Concentration is Reduced when Working 12 Hour Night Shift Rosters

In Figure 8 it can be observed that 43% of survey respondents agreed or strongly agreed that their concentration is reduced when working 12 hour night shift rosters whilst 39% disagreed or strongly disagreed. If nearly half the workforce believes that 12 hour night shift rosters reduce concentration then this presents a substantial safety problem for the industry particularly in the underground sector and poses the question of how can workers operate machinery with reduced concentration especially on night shift. This would suggest that concentration is reduced when working 12 hour night shifts, which is a concern for safety improvement.

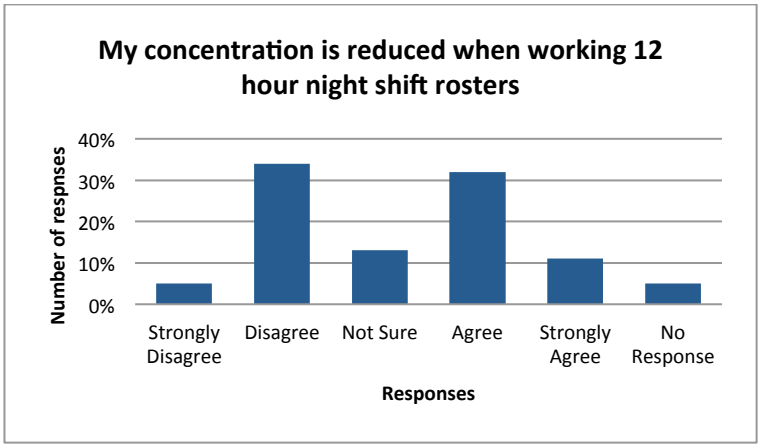

Figure 8: My Concentration is reduced when Working 12 Hour Shift Rosters

6. Accident Investigation would be best conducted by Mine Management and the Site Safety and Health Representative and not Legal People

In Figure 9 it can be seen that 66% of survey respondents agreed or strongly agreed that accident investigation would best be conducted by Mine Management and the Site Safety and Health representative and not legal people whilst only 11% disagreed. Again this supports the view that mine workers do not want legal people involved because of legal privilege and the issues of sharing and learning information from accidents which will be discussed later.

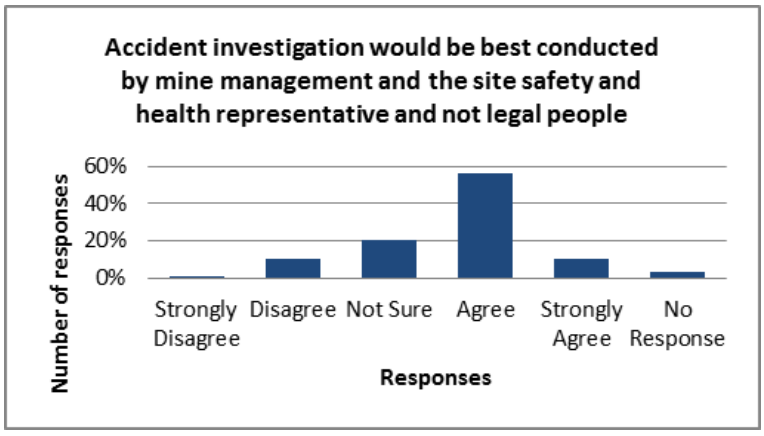

Figure 9: Accident Investigation would best be conducted by Mine Management and the Site Safety & Health Representative, not Legal People

7. Legal People's Involvement Affects the Open Provision of Facts Concerning an Accident or Incident

In Figure 10 it can be seen that 39% of survey respondents agreed or strongly agreed that legal people's involvement affects the open provision of facts concerning an accident or incident whilst only 11% disagreed and 44% were not sure which reinforces the fact legal privilege is a detriment to the open provision of all the facts relating to an accident or incident in order to learn the lession's. The not sure category would indicate the lack of education and knowledge in the industry regarding legal people's involvement.

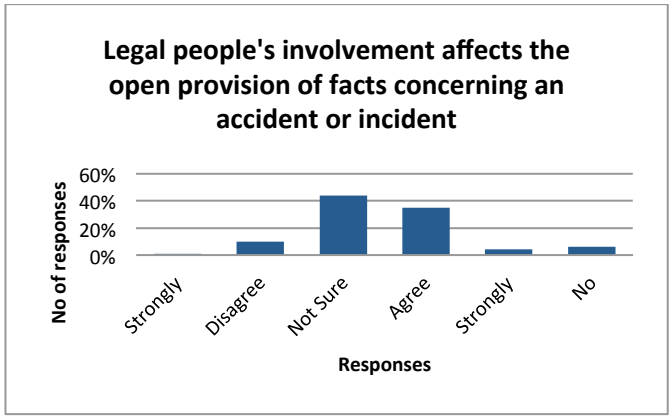

Figure 10: Legal People's Involvement Affects the Open Provision of Facts Concerning an Accident or Incident

8. Prosecution Policies should only be used as a Last Resort when Wilful and Reckless Disregard for Safety is the Case

In Figure 11 it can be observed that 54% of survey respondents agreed or strongly agreed that prosecution policies should only be used as a last resort when wilful and reckless disregard for safety is the case whilst 19% disagreed and 24% were not sure. The industry needs to take note of this result which indicates that the current prosecution policies need to be changed such as to allow all accident and incident information to flow freely and be able to share the lessons learned which will have huge benefits for safety improvement in the industry and supports the authors hypothesis.

Regarding the need for prosecutions it would make eminent good sense to adopt the "Robens Report" recommendations which essentially state that those who act "wilfully and recklessly" should be prosecuted. In regard to offences involving recklessness being treated as a criminal offence it is interesting to note the following comment contained in the Robens Report: "*We recommend that criminal proceedings should, as a matter of policy, be instituted only for infringement of a type where the imposition of exemplary punishment would be generally expected and supported by the public. We mean by this, offences of flagrant, wilful or reckless nature which either have or could have resulted in serious injury"* (Robens 1972).

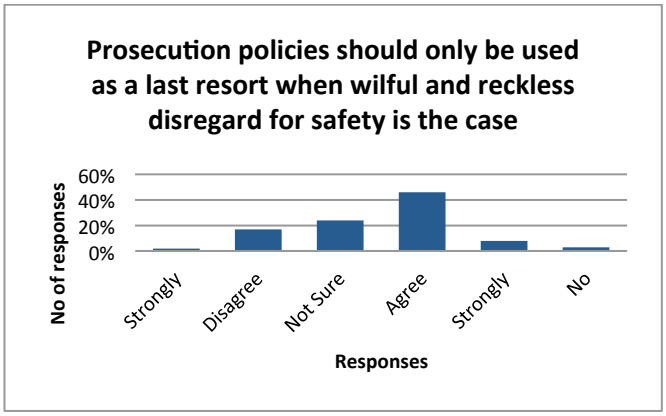

Figure 11: Prosecution Policies should only be used as a Last Resort when Wilful and Reckless Disregard for Safety is the Case

The NSW Mineral Council has argued that prosecution is counterproductive, inhibits thorough safety investigation, which stimulates a defensive rather than a proactive safety culture.
"The automatic prosecution policies are now impacting negatively on the objective of reaching zero harm" (Galvin 2006).

The reasons for this are as follows

- The lessons from serious incidents and accidents are not being used to prevent a recurrence of the incident or accident until many years after, because of legal privilege and the other considerations related to the pending charges. It creates a climate of distrust between the parties, which is in complete opposition to finding out what happened, why did it happen and what can be done to prevent a recurrence.
- This policy does not encourage near miss reporting simply because the findings could be used against the company in possible future prosecutions.
- Since recent prosecutions have not only targeted the companies concerned but individual duty holders it has become a major disincentive for young people to consider a management role in the mining industry particularly in NSW.
- It moves away from the no blame culture, which the industry must have if the safety of the mining industry is to continually improve.

This attitude promotes a defensive culture where the respective parties are encouraged to seek client privilege. To understand what "Client legal privilege" means in terms of finding out the facts regarding an incident or accident the following statement explains the situation:

"Documents produced for the purpose of obtaining legal advice or in the anticipation of possible prosecution may be subject to client legal privilege. This means there is a basis to say those documents do not need to be produced to the inspector or to a court or a tribunal" (Humphrys, 2001)

Companies are advised by the legal profession to be very careful about generating reports about the incident or accident. Employees are encouraged not to write written documents in relation to accidents without the prior approval of the manager, because they may be damaging to the company's legal position and the legal position of its directors, managers and employees. The prosecuting authority must prove its case beyond reasonable doubt. It is not for any company or individual facing prosecution to help prove the case against them. It is the inspector's responsibility to carry out the investigation. Some companies will volunteer all relevant information and provide the inspector all the information the company

has in its possession. Other companies may not wish to co-operate at all. In Queensland more and more companies ensure proper communication and co-operation with an inspector

9. FIFO Operations Causes Family Disruptions and Stress

In Figure 12 it can be observed that 45% of survey respondents agreed that FIFO operations cause family disruptions and stress whilst 34% disagreed or strongly disagreed and 19% were not sure.

A parliamentary committee has been told that FIFO is destroying towns in Central Queensland and that marriage breakdowns and struggling businesses in a once-thriving community features heavily in submissions to the Government. Many of the submissions have been made by mineworkers and most say that FIFO arrangements are discriminatory as they prevent locals from gaining employment and " the FIFO workforce arrangements need to cease or it will single handily destroy local businesses and townships" reported in the Australian (2015). An ABC 7.30 report on the 19th August 2014 stated that there were nine deaths in the last year due to suicides in the minerals industry from FIFO in Western Australian operations.

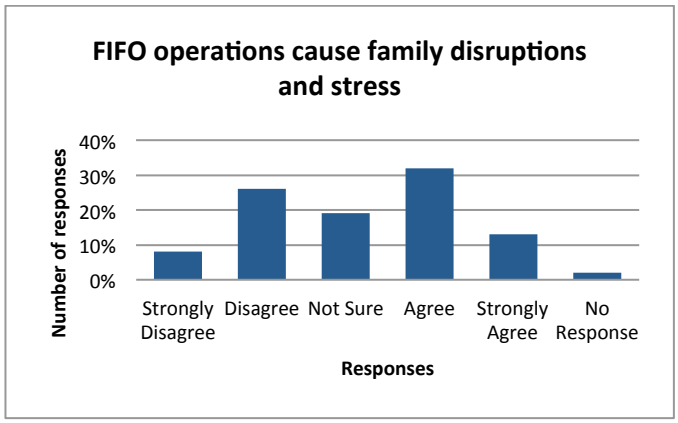

Figure 12: FIFO Operations Cause Family Disruptions and Stress

Discussion

The minerals industry has made some significant improvements in safety performance over the last decade, and although the LTIFR has plateaued people are still being killed and there is little evidence of a sustained improvement in the fluctuating annual fatalities. These fatalities have ranged from 7 in 2001-02 to 16 fatalities in 2013-14 which is a 44% increase and would suggest that the industry is still coming to terms with how to prevent these fatalities.

According to Andrew Vickers (2015) miners will attend Rio Tinto's AGM to confront the company over the casualization of coal mining jobs and its dangerous impact on mine safety. The CFMEU have indicated that contract workers represent 35 to 40% of the workforce in the Hunter valley mines and that in Rio Tinto's mines in NSW & Qld permanent job are steadily declining. "This is a bad outcome for workers, who have little job security and don't enjoy the same pay and conditions as permanent employees. It is the authors contention that;

JOB INSECURITY = SAFETY VULNERABILITY

The survey results reflect some of the inherent problems in the mining industry today and that there is a lack of experienced personnel. It is the Department of Natural Resources and Mines (DNRM) (2013) contention:

"that safety standards are slowly eroding due to persons being appointed who do not adequately comprehend the task at hand." The Queensland Mines Inspectorate has found and continues to find persons being appointed to positions who do not meet the competency standards required by the respective acts. Further evidence suggests that the standard of competency training and assessment provided by some registered training organisations is highly questionable.

It has been demonstrated that if nearly half the workforce does not understand that workforce culture plays an important part in accidents and incidents, then it is a poor refection on the industry in terms of safety improvement.

It has been shown that 50% of the surveyed workforce believes that management influences affect the outcomes of risk assessments. This situation goes against the principle that risk assessments should be conducted where all parties involved contribute in an unbiased manner in order to achieve a result which is truly representative of the parties involved with the risk assessment.

Over 70% of survey respondents agreed that more time should be allowed for training of the SHMS. The main challenge for any SHMS is how it is communicated and implemented for all to comprehend and comply with, especially those 'who' move from site to site on a regular basis. This is another reason why the unions want more training and this fact has been substantiated by the results of this survey.

If nearly half the workforce believes that 12 hour night shift rosters reduce concentration then this presents a substantial safety problem for the industry particularly in the underground sector and poses the question of how can workers operate machinery safely with reduced concentration especially on night shift.

It has been shown that 66% of survey respondents agreed that accident investigation would best be conducted by Mine Management and the Site Safety and Health representative and not legal people whilst only 11% disagreed. Again this supports the view that mine workers do not want legal people involved because of legal privilege and the issues of sharing and learning information from accidents as previously discussed.

39% of survey respondents agreed that legal people's involvement affects the open provision of facts concerning an accident or incident which reinforces the fact that legal privilege is a detriment to the open provision of all the facts relating to an accident or incident in order to learn the lessons.

54% of survey respondents agreed that prosecution policies should only be used as a last resort when wilful and reckless disregard for safety is the case. The industry needs to take note of this result which indicates that the current prosecution policies need to be changed such as to allow all accident and incident information to flow freely and be able to share the lessons learned which will have huge benefits for safety improvement in the industry and supports the authors hypothesis.

45% of survey respondents agreed that FIFO operations cause family disruptions and stress. According to the Australian Medical Association (2015) *"the policy of compulsory FIFO is detrimental to the physical and mental wellbeing of miners and their families".*

1. **Recommendations**
   That the prosecution culture is changed such that prosecution should only be used as a last resort when wilful and reckless disregard for safety is the case. The industry should consider a system similar to the Wardens Court of Inquiry where there is no

fear of prosecution with a consequent reduction in the time taken to complete the inquiry.

2. Change the legislation such that “Legal Privilege” is discontinued during accident investigation on mine sites which will allow the investigation to be conducted with site and industry personnel.
3. That industry achieves a balance between permanent and casual workforce in the interests of promoting safety improvement and use contractors for peaks and troughs in the workplace.
4. In the interests of improving safety all FIFO operations should be reviewed.
5. More training is given to mine staff in order that they are able to conduct appropriate risk assessments and more training to be given to the workforce so that they understand their obligations under the SHMS.
6. The mining industry ensures that risk assessments are conducted in an unbiased manner in order to achieve better safety outcomes on mine sites.
7. It is recommended that 12-hour shifts for underground miners should be addressed with a view to using 9-10 hour shifts with hot seat changes which are used in the USA on the most productive longwalls in the world.
8. That the MCA immediately re-start the production of the Annual Safety and Health Performance Report.
9. All companies should consider running more of these confidential safety surveys in order to find out what their employees really think regarding safety improvement.
10. Let’s put Safety First.

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