SAFETY CULTURE: THE NEW CHALLENGE

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I would like to thank the organising committee for this opportunity to talk today about the outcomes of the Safety Culture Survey recently conducted in the Australian Minerals Industry. I am going to focus on the national outcomes but also on the specific trends identified in Queensland and discuss the following topics:

1. What is the survey and how was it done?
2. How was the sample constructed?
3. What are the main national outcomes and conclusions?
4. What are some specific Queensland outcomes and conclusions?
5. Overview of the main conclusions out of the survey?

The Australian Minerals Council commissioned the survey at the end of last year. During November 1998 all participating mines were sent the SAFEmap survey equipment and the survey commenced January, February and March 1999 at a total sample of 42 mines.

The technology that was used in the survey is quite unique. Instead of using a questionnaire-based survey, the Council decided to utilise our computer-based technology called Profile-R, soon to be re-released in an advanced format as e-Profile. The system consists of a series of buttons connected to electronic cables, in turn connected to a computer where the Profile-R software is installed. A group of employees would come together at a specific time and a facilitator would read questions or statements about the organisation's safety culture from a screen. People simply press buttons on statements with which they agree. A total of 41 categories had been measured in this way using positive and negative statements about each of those 41 categories, randomly arranged in the survey.

Two other surveys have also been included, namely a measurement of the management team's perception of the type of safety strategy they follow in their organisation and also a measurement of their performance (or self analysis of their performance) on the MINEX criteria.

The outcomes of these two surveys have been used to assess the correlation with outcomes on the safety culture survey. This is to identify what kind of safety approach would tend to deliver the most positive safety culture and what is the correlation between performance on MINEX criteria and the safety culture survey outcomes.

That was essentially how the survey was conducted, 42 mines participated and each mine facilitator installed the software and continued with the surveys in that organisation. Information was relayed to us electronically and during March of this year, all information was collated, analysed and a report was produced at the end of April. This report was published and released on the 7th of July, which I assume many of you have read.

The second question was: how was the sample constructed? The main aim with putting the sample together is obviously to represent various facets of the mining industry as fully as possible. The main structural variables that have been was the State in which the mining is conducted, namely Western Australia, New South Wales and Queensland and then the "Other States" in one category, combining including Northern Territory, Victoria, South Australia and Tasmania. The second variable was type of mining, surface or underground operations, so that the sample would include the correct proportions of those kind of employees in the overall sample as well.

The third variable was type of commodity that is being mined and the major three categories are Gold/Nickel, Coal and "Other minerals", which included manganese, ion ore, copper, aluminium etc.

Another distinction was size of the mine. Smaller and larger operations also had to be adequately represented. A figure of 200 employees or less was considered a smaller mine and above a larger mine.

The 42 mines that participated will obviously be kept strictly confidential, to ensure that the mine itself will have the right of communications about its participation. This is fundamentally to protect the confidentiality of these surveys and so from the point of view of the Australian Minerals Council and SAFEmap, we will not give an indication of who has participated in the survey.

A total of 7,100 employees have participated in this survey in the 42 companies and the total number of employees is 11,746 employees for all these mines.

Employees from different levels in each organisation where proportionally represented in the sample:

- Senior management level
- Middle management levels (who report directly to the management team, such as superintendents, foremen, etc
- Staff/specialists, people who perform specialist positions - planning, engineering, safety & health, human resource management
- Supervisors, the direct level of supervision above operators.
- Operator level of employees (who perform the on-site manual operations).
- Some organisations employ contractors to perform some of these tasks, therefore another category called contractors.
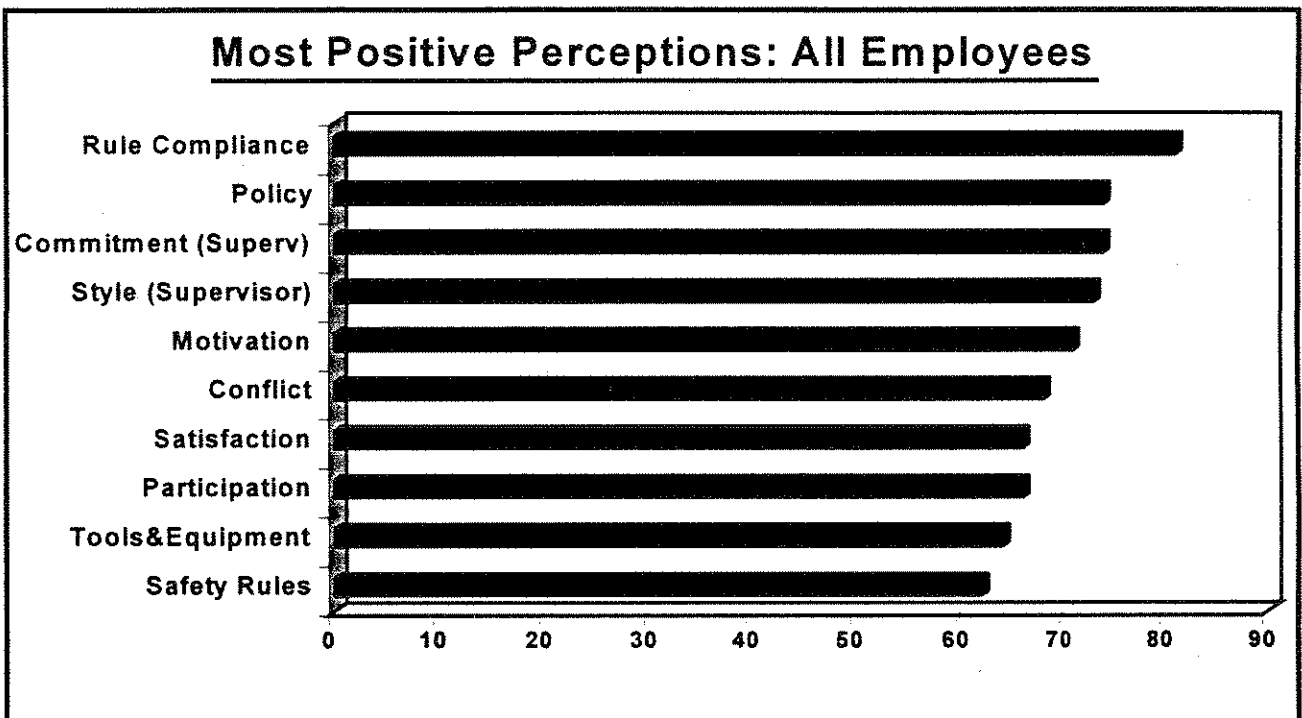
I mentioned earlier that the safety culture model that we used consisted of a total of 41 factors, grouped into 8 categories. This include:

1. Perceptions that people have about the company or organisation.

2. Perceptions about the management

3. Perceptions about the direct supervisor

4. Perceptions on management systems.

5. Perceptions about safety systems.

6. Job Factors and perceptions about job related issues.

7. Perceptions about peer group influences or team factors.

8. Individual factors which measured typically individual attitudes and perceptions towards safety.

Let us look at the outcomes nationally on the most positive and negatively perceived factors in the survey model.

What we have done on this graph is to combine all employee groups, like managers, supervisors, operators and contractors and look at the factors that were consistently more positively responded to, in other words, if the positive statement was given during the survey, most employees tended to press the button on these specific factors.

Most Positive Perceptions: All Employees

Factor	Value
Rule Compliance	~83
Policy	~75
Commitment (Superv)	~75
Style (Supervisor)	~74
Motivation	~72
Conflict	~69
Satisfaction	~66
Participation	~66
Tools&Equipment	~65
Safety Rules	~63

The first is Rule Compliance and the question that was given was "People around me generally comply with safety rules". You can see that a extremely high percentage of employees have pressed buttons on that statement. Similarly, responses on the questions about Policy for safety, ("This company clearly stated that safety is important), the perceived commitment of the supervisor, the style of the supervisor ("my supervisor listens to my ideas and suggestions about safety") were all extremely positive.

Motivation, ("I am happy to work for this Company"), Conflict (between supervisors and their teams), Satisfaction ("I enjoy the job I do"). Participation, perceptions of Tools and Equipment and perceptions of "Safety Rules", were the consistently the most highest responded to factors in the model.

Of the more negative responded to factors in all groups are shown below:

Most Negative Perceptions: All Groups
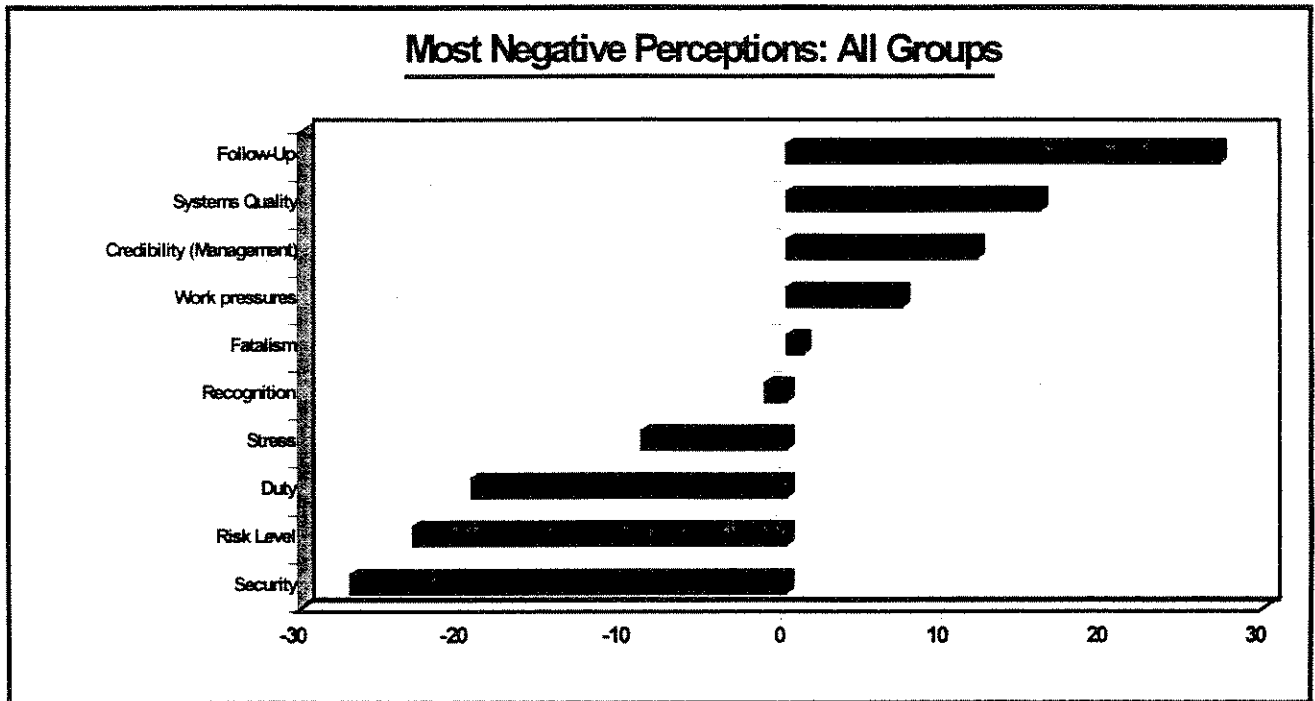
Most employees showed extremely high levels of job insecurity, while Risk Level or a measurement of risk awareness also attracted extremely negative responses.

With the factor of Risk Level, it was an attempt to measure risk awareness, the extent to which people are aware of dangers in their jobs. Two questions where combined in this measurement, "I am worried about the dangers in my job" and "I am not worried about the dangers in my job".

People who responded to those two questions were used as giving an indication that they are aware of the dangers and risks in their jobs and that they are either worried or not worried as a result of them.

The people who did not respond to either one of those two questions are really the issue. This neutral response was used as the "negative" response or "lack of awareness" response in this case.

Third most negative responded to factor was the question of duty. The question was "If I have an accident it will be my own fault" as the positive statement and the negative statement was, "If there is an accident it will be managements fault". We can clearly see that blaming management or blaming somebody else tended to be the more prevailing perception of employees.

Job Stress showed extremely negative trends at all levels, especially so in Management, Supervisor and Staff Specialist levels.

Lack of recognition also came out very clearly as one of the more negative perceptions. Fatalism, a perception that accidents or zero accidents is "not achievable" was quite a strong perception among most employees, yet it was very positively responded to by senior management levels.

Work Pressure was one of the more negatively responded to factors, as were management's Credibility, and employees' perception of safety programs, where a perception of "safety programs are mostly to much paper work" tended to prevail.

Finally, lack of Follow Up, measured by the statement "If I raise a safety concern someone will look into it", was another factor that was not responded to very highly. Based on the outcomes of this contrast between most positive and most negative perceptions of people in the industry, one can clearly see that the more positively responded to perceptions are those that can be considered the more structural or more tangible issues in an organisation, the way we run safety, through leadership, commitment and formal systems. These issues tended to be more positively perceived.

The more negatively perceived issues were the more dynamic issues, such as the Individual factors, namely duty, fatalism, job security, lack of risk awareness, lack of recognition and lack of follow-up. Management credibility and systems quality were the only two structural issues that were more negatively perceived.

It is comforting to know that safety issues driven through management, organisation and the formal aspects of safety are effective and seem to create positive perceptions at employee levels. One would have to ask the question: given our long term goal in the industry of zero accidents, can we hope to achieve that if we fail to convince employees, especially at the operator level, that accidents can be prevented?

While there is a very strong belief in that notion at management level it significantly drops at supervisor, operator and contractor level. This appears to be one of the bigger challenges ahead of us in the mining industry.

Another factor that is interrelated with many other issues in the management of a mine and outside safety management is the issue of credibility of management. It would be difficult to continue to be effective in the management of safety unless we are able to also improve perceptions of management's trustworthiness and credibility in the eyes of the operators at shop floor level.

Another factor, which would be extremely difficult to manage, is the issue of job security. We all are fully aware of current problems, trends and commodity prices in the mining industry and naturally this will have a very negative impact of peoples perceptions of job security in our industry. One needs however to realise that job insecurity should not be an excuse for not managing pro-actively towards safety improvement.

While job insecurity is extremely high in our industry it will be noticed for those who have a more in-depth look at the outcomes in the survey in Section 3 of the report, which is available off the web-site for the Minerals Council, that job

security may have been very low, but as a factor it does not contribute as strongly to safety attitudes and safety perceptions as other factors do in this model. As a basic conclusion, we can still achieve extremely high levels of safety performance and positive levels of safety culture in an environment where job security may be very low.

I am also disturbed by the trend to "blame accidents on management". We have been very successful in convincing employees of our focus on a no blame work environment, that accidents result from systems failure and therefore from management failure. This line of thinking is fundamentally correct, but at the same time we are trying to convince employees that each person is responsible for their own safety. The results of the survey suggest that we are failing on that point, because the messages may be conflicting and mutually exclusive.

Let us look at some of the comparisons of some employee groups and how the outcomes have been affected by the so called structural variables such as state, commodity, size and type of mine.

Firstly, we will look at the management group. The comparison provided on this graph is a combination of senior and middle management in each of the mines and states. It is evident from the profile that the management groups in Western Australia, New South Wales and Queensland groups are significantly more positive than in the other areas. Also, when you compare commodities, the gold and coal managers tended to be more negative than managers on other mines. There was no significant difference between the open-cut and underground managers and there is a very significant difference between the smaller and larger mine managers, with smaller mine managers more.

When comparing the outcomes for the supervisor group, a slightly different picture emerges. Western Australian and especially New South Wales supervisor groups are extremely more positive than in the remaining states. The gold mine supervisors tended to be more negative than the coal and other mineral mines and again no significant differences between open-cut and underground mine supervisors. A small difference between small and large mine supervisor comparisons is evident.

Comparisons of the specialist staff groups (ie safety, human resource, Metallurgical, Technical, planning groups), a clear difference is evident. Western Australian and New South Wales mines are more positive, the gold and coal mines again have a more negative perception than other mines and open-cut slightly more negative than

underground mines. A more positive outcome in the smaller mines is evident.

When looking at safety culture, the operator and contractor groups are the most important, as this is where the level of risk and exposure is at its highest. The Western Australian operators and contractors are much more positive and New South Wales slightly more positive than the other states. Gold mining operators and contractors are more positive than coal or other mineral mines and again not much difference between open-cut and the underground mines. The smaller mine operators and contractors were again more positive than the larger mines. An obvious conclusion I make from this analysis is that although larger mines have the resources in terms of finances and a greater number of employees who can contribute and improve safety, it still showed that smaller mines are more positive in there safety cultures. This is clearly because of the nature of these small mines: closer and more regular contact between operators, supervisors and management levels. I think however that one of the major influences is that these small mines, because they do lack finances and other resources they tend to be more simplistic in their safety management designs. This is the same observation that can be made when you compare contractor and operator employees. The contractor employees are significantly more positive than their operator colleagues on the very same mines. Given the fact that one of the more negative perceptions is about the bureaucracy and paper work of safety management systems and programs, one may conclude that the smaller mines and the contractor groups are probably more effective in dealing with the dynamics of people and safety management rather than with the formalities and the structural elements in the safety approach.

Let us look at a few of the conclusions that can be made from the actual responses and from the comparisons between the various states, types of mines and commodities:

- Employees are under no doubt about the intentions and goals of companies to improve safety. The results suggest that most organisations and the industry as a whole have been very successful in communicating the "safety message".

- Despite this powerful message, the "value" of "care about employees" that underpins the achievement of a positive safety culture seems lacking in the industry. This is evidenced by a lower response rate on the factor of Value, especially by Operator and Contractor groups. While the industry has been very successful in

communicating the importance of safety, the pervasive message employees connect with is that management does not "value" employees. This is reflected in the direct data on the Value factor and also suggested by trends on linked factors: high levels of job insecurity; low credibility of senior management; high levels of dissatisfaction with safety management systems; and diminishing value of the traditional safety committee.

Employees may view the emphasis on safety as management's reaction to external pressures, and not necessarily as management really wanting to achieve safety outcomes themselves.

- Widespread job insecurity in the industry will almost certainly hamper well-intentioned interventions and any effort to achieve improved safety. It is certainly a multi-faceted issue that requires consideration at the macro-economic and strategic levels of the industry.

- The task of managing organisations towards higher achievements in productivity and safety is seriously impeded by a lack of perceived credibility of the management group.

- The "systems" aspects of safety management – managing a safety program and providing training – seem substantially deficient, with all employee groups indicating higher levels of dissatisfaction with the quality of programs and training.

- The traditional forum of discussion and negotiation on safety, the safety committee (Consultation), may face a demise over the long-term, arising from the relatively low level of support from the management groups reducing the effectiveness of these committees.

- Higher levels of professionalism amongst safety practitioners and a gradual change in their roles more towards that of "advisers" have resulted in very high levels of positive support for their quality of work – especially high among management groups.

- The issue of Recognition (or lack of recognition) for safety and for safe work is a very serious deficiency, especially at the Operator/Contractor level in organisations, indicating a significant absence of formal and informal recognition for safety and safe work performance.

- From the results it can be concluded that the formal work environment (of safety standards) is very positively viewed by all of the employee groups, but that there may be a distinct "willingness" among most groups, especially Operators, to take risks to expedite work. When this is coupled with a very low response to the factor of Fatalism, and a low response to the factor of Recognition, it can readily be expected that risk-taking behaviour will occur frequently. This is especially the case in circumstances where employees do not necessarily have a high level of awareness of risks in their work.

- The peer group relationships and employees' relationships with their direct supervisor were consistently more positively viewed by most employees and it offers a significant opportunity to further improve workplace relationships. It seems to be an opportunity not fully exploited at this stage.

- A critical factor is the one of Fatalism (defined in this survey as the achievability of "zero accidents") which, as a psychological construct, may play a very substantial role in the occurrence of risky behaviour. It is of concern that although very high proportions of Managers responded positively to this statement, at all other employee groups this response level dropped remarkably – even to as low as 38% amongst Operators. The full scope and impact of this factor on risk-taking behaviour is not yet fully understood and may require further and in-depth research.

- The actual response levels differ significantly between the various employee groups. There is a very large "gap" between the positive responses of Managers and those of Operators, which may indicate that minerals organisations largely lack cohesion and full support for safety. Even if not detrimental, this gap will certainly limit the industry's ability to introduce change and improvement in safety performance.

I would like to refer the more statistically minded people in the audience to section three of the report. A number of trends and analysis of trends can be made by looking at the extent to which there is a correlation between the MINEX Criteria and safety culture and an investigation of the correlation between the safety strategies and safety culture.

Let us look at the correlation between the MINEX Criteria and safety culture outcomes. The managers of a mine had to individually sit down in front of the screen and make an analysis of their perceived performance against the industry and the MINEX Criteria. Managers had to compare their company's performance on each of the MINEX Criteria.

For instance, under leadership the question would have been posed "What is your assessment of how your management establishes strategic safety and health direction and goals for the company?" (taken directly from the MINEX Criteria).

For example, are they the worse, same, better or best, compared to other mines in the industry on the same criteria and secondly, how do they compare to their own past performance on that mine, on the same scale. The information for each of the participating managers was stored on SAFEmap software and used as part of the overall analysis.

You will notice from the analysis that the top ten mines on the MINEX performance were compared with the bottom ten mines on the MINEX performance and safety culture outcomes. It will be noticed that 80% of the mines ranked highest on the safety survey outcomes were also the same mines who we found to be the highest performers on the MINEX Criteria. About 60% of the bottom ten mines as ranked on the survey outcomes were also the bottom ten lower performers on the MINEX Criteria.

More extensive statistic analysis was performed and a clear correlation between MINEX performance scores and survey outcome scores on all levels were found.

There was a very strong correlation between performance on the MINEX Criteria and operator and specialist positive responses and less so the correlation between MINEX scores and supervisors responses. The correlation matrix on page 17 of section 3 in the report clearly shows that, a positive relationship exists between positive responses on the safety culture survey and higher scores on the MINEX self assessment and that an inverse relationship exists between a negative scores on the safety culture survey outcomes and the scores on the MINEX self assessment scores.

One can conclude fairly confidently, that organisations that pursue the implementation of quality systems and approaches and in the process satisfy the stringent MINEX Criteria can expect a positive impact on perceptions in there organisations towards safety, management and supervisors etc. These findings are especially encouraging because the correlation analysis established that the positive relationships exist at all employee levels of an organisation. Not only is a higher score on the MINEX Criteria positively

linked to the responses of the managers themselves who completed the surveys but is also linked to the positive responses of the operators in the organisation.

The second type of analysis of safety strategies showed some very interesting information and trends for consideration. A well known model was selected to identify what type of safety focus exists in organisations. It was based on the Human Synergistics-Verax model, which is based on the well known "managerial grid" theory. It basically measures the organisations approach to safety or to managing an organisation on two axis. First of all, on the x axis the task focus as against a people focus and on the y axis how flexible are these management systems and approaches against how controlled they are.

Below is a depiction of the four basic approaches that emerges if this grid is used. Namely, performance orientation where the focus is on tasks and physical conditions but the management systems and approaches are flexible. A directive orientation, where the focus is on tasks and physical conditions but the management is very controlled. Compliance orientation, where the management systems and focuses are very controlled and the focus is on what people do in the organisation and how they act. Finally, a team or behavioural orientation which is a people focused orientation but with very flexible management systems, lower levels of authority and decentralised decision-making.

Flexible

Task Focus — **People Focus**

Controlled
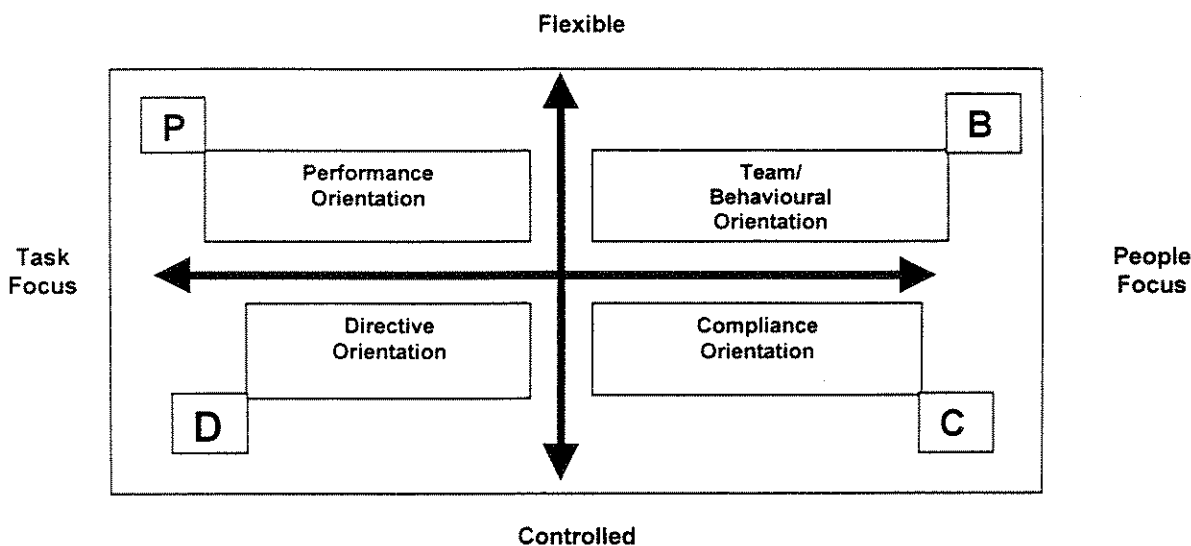
In the performance orientation the emphasis is on achieving results and in the directive orientation the emphasis is on managerial control of tasks and physical conditions. In the compliance orientation, the emphasis is on the bureaucratic control of people's work and in the team orientation, the emphasis is on behavioural issues and attitudes of people and the participation of people in safety systems.

We have developed a "safety content" to measure these various categories and approaches. The outcomes of this analysis were quite interesting. We made a comparison of the top 15 companies in terms of the safety survey outcomes and had a look at what selections the managers in their analysis of the safety strategies came up with. Again the analysis of the managers was done individually and they simply had to make selections without knowing what it is relating to. They had a choice of four approaches and simply had to indicate between a "most like" approach and a "least like" approach. The outcomes were

clear, the top 15 companies had a clear preference for Team and Performance orientations as most like approaches and selected a "Compliance orientation as a "least like" approach.

QUEENSLAND'S SPECIFIC OUTCOMES ON THE SURVEY

The survey was done by asking employees positive and negative statements, in order to simplify the feed back and to make sure there is a very clear understanding what the outcome is, I will be focusing on the positive responses only. One would have to really subtract the negative responses from the positive ones to get a truer reflection of the "remaining" positive responses. This may create some complexity of comprehension and interpretation, so I will stick to what is more well known out in the industry of surveys like this and look at the outcomes and the differences in the positive trends and perceptions.

The graphs show the various employee groups – managers, supervisors, specialists, operators and contractors and also show two responses. Firstly the "Group" response, which in this case is the Queensland employees and the "Norm" group, which is the average response level of employees in all the other states combined and is basically a measurement and comparison between Queensland employees and all other employees in the Australian mining industry.

The first question "This company is very serious about safety", shows that Queensland managers responded more positively than the other states, supervisors about the same level, specialists – more positive and operators in Queensland slightly less positive, contractors about the same.

On the statement: "This company has clear goals and targets for safety", the responses in Queensland are slightly more positive than the industry, supervisors less positive, specialists quite less positive, operators less positive and contractors significantly less positive.

On the statement of: "This company is interested in employees' views on safety", again the managers in Queensland tended to be right on par with the rest of the industry, even slightly more positive. Yet supervisors, specialists, operators and contractors were all significantly less positive about this statement compared to other states.

Similarly with the question of "This company does a lot for its employees", which is essentially a measurement of the extent to which the company generally value the employees. This response level at management level was very similar to other mining states, but again all other employees groups are significantly less positive about this specific issue.

On the issue of Job Security: "Our jobs are secure with this company", two things are apparent. The norm group showed extremely low response levels on this question compared to all the other factors that we measured. The norm group levels were generally below 40% and Queensland all employee levels significantly less positive than the norm group.

On factor 7 "You can trust the management of this company", it shows that all the Queensland employee groups were significantly less positive about that particular question. This poses a very important question: "How effective can we implement safety management systems throughout an organisation initiated by management, when we have that low level of trust in the management group of the organisation"?

On another question, "Management is genuinely serious about safety", both managers and supervisors in Queensland tended to be as or more positive than counterparts in other states. The managers in Queensland were unanimous about this question, with almost 100% response rate, yet that same level of confidence drops significantly in the operator level where only about half of operators would expressed that same level of confidence in managements commitment to safety.

Similarly with the question "Management always put safety first" & "Management always listens to our views on safety".

On average, perceptions about the direct supervisor in the Queensland groups, except of specialists and contractors, were very similar to the other states.

On factor 15: "Safety committee does a good job on safety", one can see that the Queensland employees are generally more positive than the interstate counterparts, except for contractors.

A particular area of concern throughout the survey was factor 19 "If you raise a safety concern, someone follows-up very quickly" and similarly factor 20 "People are mostly happy with managements decisions in safety". Especially on the decision-making aspect, the Queensland employee groups are consistently less positive than the interstate counterparts, particularly in the specialist group of employees.

A measurement of safety systems, as mentioned earlier, raised a few interesting questions. The perceptions of safety personnel on mines in Queensland were no different or little different from their colleagues interstate. However, on the statement: "Our safety programs are well managed in this company", the Queensland employee groups were consistently less positive.

Another issue of concern is the issue of safety training, where the Queensland employee groups, especially managers, are significantly less positive than other states. Only about 50% of the Queensland manager group expressed any confidence in the safety training.

An area or aspect in which the Queensland employee groups generally had slightly more positive perceptions than the interstate colleagues was on the question of recognition, only the specialists and contractors were less positive than similar groups interstate. Managers, supervisors and operators were slightly more positive.

One would have to give further consideration as to exactly why Queensland employees give better recognition to safe work practices.

I will not make much comment about Job Factors, other than the fact that Queensland employees were generally very similar on responses to other state employees. Consistently, contractors in Queensland tended to be far less positive than there interstate counterparts.

One aspect of interest is the one of risk perception and awareness. As mentioned earlier we have used two statements "I am worried about the dangers in my job" and "I am not worried about the dangers in my job" to measure the extent to which people at least give consideration to this aspect of danger in a work environment. If we look at the shape of this particular graph you have considerably less expression of this awareness at management level, a little bit more for supervisor and specialist levels and most so at operator level. One can clearly see that the closer employees get to the higher risk exposure areas, the more they express this concern about dangers in the job. This provided us with confidence of the validity of this measurement.

The Queensland response is no different in shape compared to interstate employees given these factors I have just mentioned. What is obvious is that managers and operators in Queensland are slightly less positive about risk awareness than the interstate counterparts.

Perceptions of the team and peer group influences again are very similar between Queensland and interstate employees, except for specialist and contractor who are both quite less positive about these factors.

One particular statement that drew a very high response, as I mentioned earlier on, is factor 32 "People around me generally comply with safety rules". Again Queensland employees are very similar in their responses, except for specialists and contractors who where less positive.

Another factor which essentially provided another angle on this issue of rule compliance is the one on risk taking "I know that people do not have to break the rules to get jobs done". What was very obvious was the difference in shape between the various employees groups both at national level and in Queensland. A very positive response was measured at manager, supervisor and specialist level and then you notice a significant drop at operator level to less than half of employees expressing confidence that people won't break safety rules to get jobs done. Compare that with the response rate from the previous question,

where almost 90% - 95% of operators stated that people generally comply with safety rules.

One of the very important factors in the whole model was fatalism, where the statement very simply measured the perception on "It is possible to achieve zero accidents". The very significant difference between manager levels and that of the operators is remarkable. At manager level, almost 75% of the employees nationally and 70% managers in Queensland agreed that zero accidents are possible. Yet, less than 40% of the operator employees expressed the same confidence in the prevention of accidents or the achievement of zero accidents.

Another important question was measured by factor 38 "If I have an accident it will be my own fault". This issue raises a far more complex topic as discussed earlier. On the one hand, we very strongly propagate that the individual is responsible for safety, on the other hand we also as strongly propagate that no one is to be blamed for an accident, that system failure is really behind an accident and that management is behind the safety failures. Essentially, we are telling employees constantly that if something goes wrong it is management's fault.

This does raise the question of accountability for accidents, compliance to rules and for not taking risks under circumstances of work pressures.

I am sure that many people here today will agree with me that very few accidents actually occur outside a very well thought out procedure. Very few people have accidents for which there is no procedure in place and that we have a significant degree of accidents as a result of people breaking rules, ignoring rules or simply not knowing about them and this is where this complex issue of accountability steps in. Who is accountable for a blatant or not so blatant breach of a safety rule? Based on the results of factor number 38 very few people in our industry are prepared to accept the responsibility or accountability for an accident should it happen. It seems that we have been effective to propagate that systems failure and management behind the systems are essentially to be blamed for an accident, but on the other hand, is that still sensible to do? Have we not reached a level of "sophistication" about this issue, where, while it was initially necessary to emphasise the need for "no-blame" work environment, it may have become necessary again to address the issue of "accountability" for safety?

Factor 39 shows that despite very low levels of job security people express very high levels of satisfaction working for their companies: more than 90% at manager level and more than 70%

on average at operator level, and the Queensland response pattern is very similar to the other states.

Factor number 40 is an interesting measurement about job stress, very simply measured by the statement "After a days work I go home and forget about work matters". The Queensland overall pattern looked really similar to the norm group responses, that managers predicably expressed extremely high levels of job stress, less so at supervisor and specialist level and much less at operator and contractor level. What is significant in the Queensland outcomes, is the fact that Queensland managers, supervisors, specialists and contractors are more exposed to job stress than interstate counterparts. This possibly requires further analysis.

In summary, the overall outcomes at Queensland mines is cause for concern, one would have to ask the question, why is it that Queensland companies generally tended to be more negative than their interstate counterparts. What factors in our industry in our state had affected that kind of trend. Is it the kind of regulations, employers or the entrenched safety culture that we have in our state? The more important question is: how are we going to change it? What do we need to do at state, government, employee group and employer/company levels to ensure that this kind of trend does not continue to exist into the future of the mining industry in Queensland? In fact, no state can afford to have these kind of deficiencies.

Dick Wells raised the question of the complex relationship between attitude and behaviour. There is the popular notion that changing the behaviour of people will change their attitudes, which come a very long way in the behavioural sciences and almost everybody has heard and believe it. I would like to state, that changing behaviour and changing attitude is a far more complex than that simple statement. Dick has mentioned in his speech earlier today, that not only do people change their attitudes if they find that to be inconsistent with their behaviour, they also change their behaviour if they find that to be inconsistent with their value systems or attitudes.

That shows that there surely are no simple answers to this question. We have to take a multi-faceted look at all the issues in our industry, the regulations, the kind of history of various mining companies, the kind of influence that various employer and employee groups have on the perceptions of employees at the operator levels of their organisations. The credibility of management, direct supervisors, regulations, management systems and programs: everything should be scrutinised, questioned and reviewed,

with only one question in mind being how can we improve the safety culture of their organisations?

It is imperative that we do not only look at this survey as a measure in time of the safety culture as it was on April 1999. The safety culture we have now will only change with great effort from all stakeholders and change very slowly over the long term, and so will continue to affect the behaviours of mining people for years to come. It is therefore in our interest as an industry to take an in-depth look at the determination and influences on people's behaviour.

The issue of safety culture is indeed as I have said a very complex issue. Not a single person goes out to work on any given day and does not care about staying alive on that day. Everybody has a very basic survival instinct and it is technically not correct to say that people have "poor" attitude to safety. One of the most powerful influences on human behaviour is his or her need to fit in. We observe our work environments, the behaviours of people around us, what they do and don't do, which tells us in often very clear terms what it is that is expected and what it is that is permitted in those work places. Changing the safety culture of an organisation, industry or work team starts with changing the behaviour of people around them and most importantly the behaviour of the supervisor.

If there is one single important conclusion from the findings of this survey, then it is that the influence of the supervisor may not be as clear and as strong on the behaviours on the people that work for them. How I came to that conclusion may take too long to further discuss in this talk and I would urge you to read Section 3 of the report in more depth.

In Section 3 an analysis had been done of the so-called alignment between the various levels of the organisation. In the mining industry there is a closer alignment between response patterns of management and the patterns of responses of the operators than what there is between the supervisors and operators. While this is good on the one instance - it shows that there is effective leadership emanating from the management levels, that they do have an influence on employees in the organisations. But the result may be that we are "missing out" the most important person in that design, the supervisor. The supervisors themselves responded quite positively overall, but themselves being very positive is not enough - it is how much effect do they have on the people around them. At this stage I have doubts in my mind, based on the survey findings, whether this effect is truly happening.

I would like to end with the final words out of the main section of the report, which goes as follows:

Risks cannot be avoided, accidents can. An industry like ours needs to develop a "competency" to identify and manage risks. We are already extremely competent in identifying and engineering the physical risks. We now need to become competent in identifying and managing the most and elusive risk: the organisational risks embedded in "culture".

Accidents, big or small, seldom occur because of isolated events or mistakes. Organisations "breed" mistakes and through an insidious accumulation of deficiencies, latent forces and a culture of risk-taking, the scene is set for accidents to occur.

While it may not be possible to trace each accident directly to an organisational deficiency, there are complex links and influences operating in the mindset of the organisation and the mindsets of individuals and teams.

These mindsets are a potent mix of attitudes, perceptions, beliefs, biases and stereotypes and they are the single most powerful influence on behaviour. The future of safety management does not lie in managing that behaviour; it lies in managing the mindsets.

To date, we have successfully managed safety improvement through the engineering functions and technology, and that will continue to be important. But far more important will be our ability to engineer the safety cultures of organisations and the role of the human resource specialist will increase significantly. Do they have the ability, the technology and the know-how to meet this challenge?