



Safety in Mining Research Advisory Committee

SIM 03 01 02

A Survey of the Health and Safety Culture in the South African Mining Industry



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Synopsis

A safety culture survey and analysis of the safety culture of the South African mining industry, initiated by The Mine Health and Safety Council's research arm, SIMRAC, was carried out by SAFEmap and completed in April 2005.

The purpose of the survey was to identify strategic opportunities and a direction for the mining industry's safety effort. This was to be done by analysing the major strengths and weaknesses in the work culture of mines in South Africa. A secondary objective was to make comparisons with other international mining industries. A total of 14 mines participated, all selected to represent a stratified sample of the industry.

The surveys were conducted during the period April 2004 – April 2005. Surveys were conducted in group sessions, using the eProfile survey technology. A total of 8991 employees participated in the survey.

The SAFEmap safety culture model used in the survey consists of 41 factors, arranged in eight categories of employee perceptions of the key factors of Organisation, Management, Supervision, Management Processes and Safety Systems, as well as Job, Team and Individual Factors.

The following summary of conclusions is made from the survey results:

- Overall, the safety and health culture in the SA Mining Industry is significantly more negative than that of the Australian and International benchmarks;
- All levels, except the Specialist group record more negative trends than the benchmarks;
- The SA Mining Industry is driven primarily by a systems and compliance based culture;
- Mines with a more positive historical performance recorded a more positive safety and health culture than those mines with a poorer historical performance;
- Large differences in the safety and health culture between the mines exist;
- The Gold Mining sector records a slight but statistically significantly negative trend when compared to the other sectors;
- Smaller Mines recorded more positive trends in the safety and health culture than the larger mines.

Based on the survey results, the following summary of recommendations is made:

- Additional focus on the role of the safety and health culture in the industry be pursued;
- Emphasis be made on creating a learning culture for safety and health in the industry;
- There should be a progression from a systems and compliance driven culture;
- Attention be given to the scope and nature of safety and health consultation;
- A changing role of leadership in the industry be pursued;
- Attempts be made to restructure large mines to be managed as smaller mines;
- The role of government and regulators to facilitate a change in the safety and health culture;
- That the report be distributed widely in the industry.

Safety Culture Survey Report

South African Mining Industry – 2005

1. INTRODUCTION

In 2004, the Mine Health and Safety Council of South Africa, through its research arm SIMRAC initiated a safety culture survey of the South African mining industry. The survey was completed during the last quarter of 2004, and the first quarter of 2005. A total of 14 mines and 8991 employees participated in the survey.

2. OBJECTIVES

The objectives of the Safety Culture Survey were as follows:

- To identify the strategic strengths and limitations of the South African Mining industry's safety culture;
- To measure against a benchmark of Australian and International employees, supervisors and managers, the trends in perceptions and attitudes of employees in different sectors of the mining industry;
- To compare the safety culture of better and poorer performing mines;
- To measure the changes in perception and attitude trends against each participating company's own baseline. Note that this process can be implemented in a second, follow-up survey;
- To provide recommendations to industry leaders on specific actions, initiatives or systems based on the results of the survey.

3. THE THEORY OF CULTURE SURVEYS

3.1 Background

The term Culture Survey is commonly used in business today, but it often has varying meanings and implications. Most will agree that a culture survey sets out to examine “the shared values and beliefs in an organisation”.

Leaders attempt to mould those values and beliefs into a desired culture, and thereby achieve the goals of the organisation. In common with other industries, the mining industry in South Africa also has a typical culture of shared values and beliefs.

3.2 Defining Safety Culture

To define the concept “safety culture” it is best to provide a brief overview of the concept “culture” and its related terms.

The concept of culture became popularised in the early 1980’s with the publication of two best-seller books, namely “Corporate Culture”, by Terrence Deal and Allan Kennedy and “In Search of Excellence” by Thomas Peters and Robert Waterman, both published in 1982.

As already mentioned, culture is popularly defined as the “shared values and beliefs”. Each of these terms requires closer scrutiny.

Schein (1992) defines culture as “a pattern of shared assumptions” that has worked well enough to be considered to be taught to new members as the correct way to perceive, think and feel”.

Kotter and Heskett (1992) take a different approach to culture by including behaviour (and values) as part of culture. They define values as “notions about what is important”, and something that can vary greatly in different companies.

Kotter and Heskett define behaviour as what people do every day, or the “patterns or style of an organisation that new employees are automatically encouraged to follow”.

Culture, for the purposes of this project, relates more to the philosophical level of thinking in the organisation, which translates into, and affects, the behaviours of people. Technically, it is very difficult, maybe even impossible, to measure the culture of an

organisation. What can be measured are the behaviours of people, and in the strict technical sense, the perception of people's behaviour. According to Rousseau, (in the International Review of Industrial and Organisational Psychology, 1988), "climate" is a more useful term to use. "Climate" is defined as the "aggregate perceptions which employees have of the work environment."

While technically speaking, we are reporting on a "climate perception survey" we will continue to use the term safety culture survey.

The term safety culture (or climate) is therefore defined as the characteristics of the organisation's approach to safety that:

- Distinguishes one organisation or work unit from another
- Endures over time
- Influences the behaviour of people in the organisation.

These "characteristics" are the "collective behaviours of people in the organisation that over time become patterns, typical or habit."

In Britain the ACSNI study group (HSC, 1990) proposed the following definition for safety culture:

"The safety culture of an organisation is the product of individual and group values, attitudes, perceptions, competencies and patterns of behaviour that determine the commitment to and the style and proficiency of, an organisation's health and safety management."

In the simplest terms, this translates into "those things that are regarded as important in the company, and how they translate into the actions and behaviours of people."

3.3 Measuring Perception

Employees have distinct perceptions of the typical or habitual behaviours in the organisation.

A person's actions will be largely influenced by his/her perceptions of what behaviours are expected, permitted or even required.

A person may perceive members of his/her group as “inclined to take risks”, and this will have a strong influence on the person’s own willingness to take short cuts in the job. A person will act without giving the (risk-taking) behaviour much or any thought.

It is therefore imperative that when measuring such perceptions, the process and technology of measurement should not be foreign, threatening or unnatural to the respondents. Measuring the perceptions that people have about their work culture should ideally be done, at work, during working hours and in a group context. The measurement should be a “snapshot” of what the culture is, and should ensure that the surveys reach all employees or at least a valid sample of them. It should not exclude those who don’t like, or have difficulty in, completing questionnaires, or who may feel threatened by them.

Terms such as attitudes, values and beliefs of employees should be avoided because these concepts are laden with ambiguities, vagueness and correctness. The focus should be on what is tangible, neutral and clear; perceptions of the employees about their work environment.

3.4 Purposes of Organisational Surveys

Conducting surveys has only one or both of two objectives, namely to assess and/or to effect changes.

- To pinpoint areas of concern, where the emphasis is on specific issues or topics. It may well be possible to introduce specific interventions to improve on areas of concern. This report will comment on a number of such issues;
- To observe long-term trends. The insight this gives into changing patterns or behaviour in an industry may make it possible to stem the tide of developing unwanted trends;
- To monitor the impact of a program, especially at the organisational and industry level. Specific strategic training or organisational change programs can be measured for effectiveness and impact;
- To provide input for future decisions by uncovering employee preferences or specific problems. From an industry point of view, strategic decisions about improving safety will be more informed and focused;

- To add a communication channel. This can be very easily achieved by making perception surveys part of the management toolkit, and by conducting surveys on a regular basis.
- To facilitate change and improvement. This is the most powerful application of surveys. Surveys are the “cutting edge” technology to assist organisations to benchmark themselves against high performing entities.

Improving safety performance is essentially the same as improving any other organisational performance, yet safety culture surveys have not been used much in the past for this purpose.

The completion of the SAFEmap survey has created a significant opportunity to improve the industry’s safety performance. It is foreseen that the quality and quantity of feedback to the participating companies could be an important catalyst for change in those companies and it is hoped that this report on findings, analysis and recommendations will trigger, facilitate, change and initiate improvements in the industry as a whole.

It is important that the feedback to the industry and companies is followed up with specific action planning and execution. It is also strongly recommended that employees in participating companies receive comprehensive feedback. For this purpose a detailed section on feedback and action planning is provided as an Annexure in the participating companies’ reports.

3.5 A Synthesis of Culture Change and Performance Improvement

Several studies have shown clear links between culture and performance. However, the link is not a simple and direct correlation. It is actually a very complex topic – which falls outside the scope of this report.

It is however clear from a variety of studies that work culture contributes significantly to performance.

The major studies include the research work of Kotter and Heskett (1992). They found that in 202 companies in the USA the strength of work culture is correlated positively with economic performance measures.

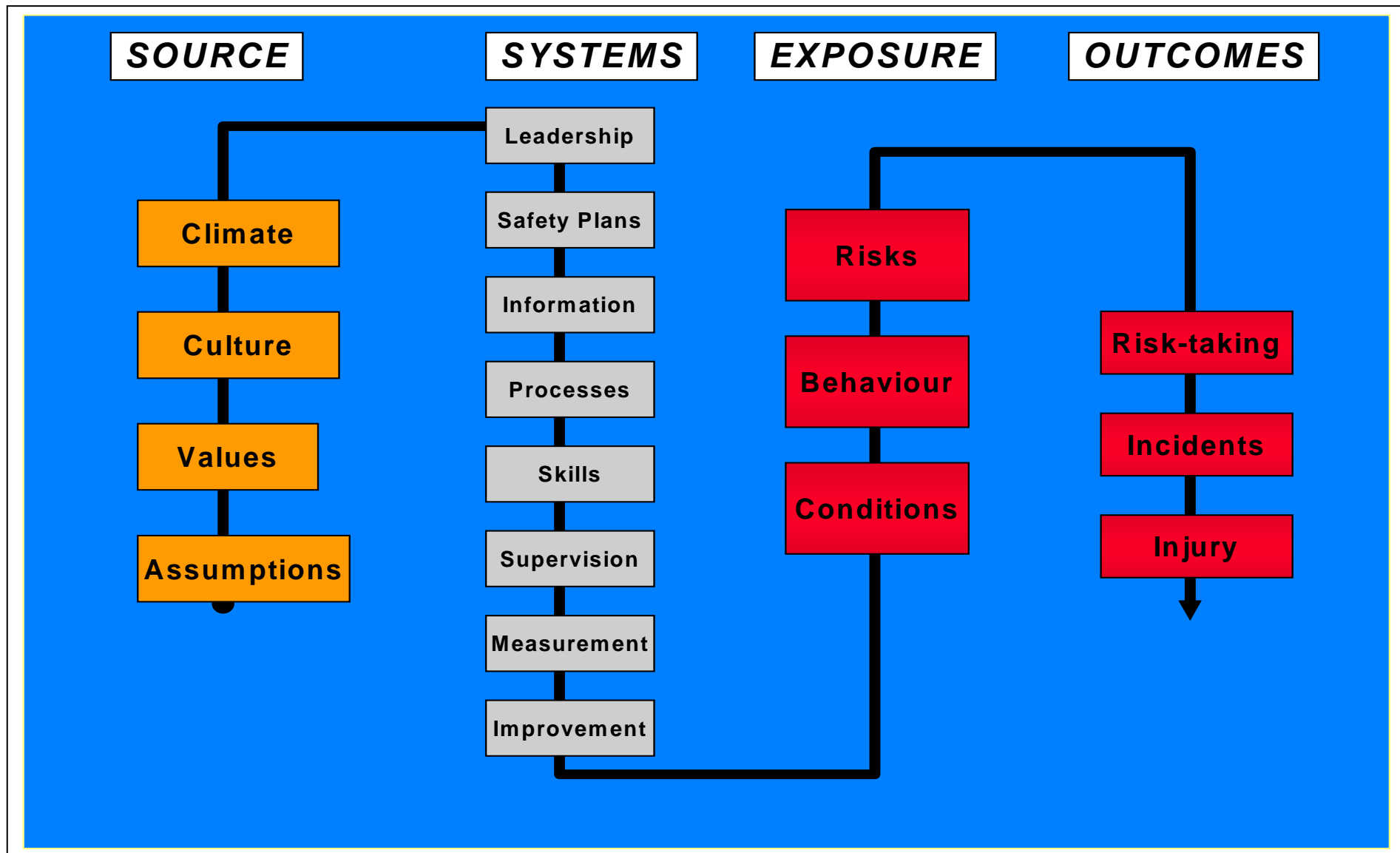
Collins and Parras (1994) came to similar conclusions after studying several companies over their entire histories. Companies with a strong positive culture outperformed similar companies by a factor of six and the general industry by a factor of fifteen.

Studies on the links between safety performance and production performance are also many and varied, but most generally conclude that the productive work environment is also a safer work environment. The most comprehensive review of these links was done by Randolph (1989) of the US Bureau of Mines, presented at the Minesafe conference in Perth, 1992 (Conference Proceedings, Western Australian Chamber of Mines). This study showed the strong links between production efficiency and safety performance in coal mines in the USA.

To link safety performance directly with safety culture is more difficult, because at this stage there are no comprehensive studies available on this topic. Safety culture is also a fairly recent concept in the literature. A study performed in the USA by the US Bureau of Mines in 1976 found strong support for the hypothesis that climate and management practices have an effect on the incidence of disabling injuries. Several other studies support this notion. Donald and Canter (1992) found that employee attitudes toward management, employee training, employee satisfaction and management support had a strong influence on accident rates. This was also reflected in the British Institution of Occupational Safety and Health statement that organisations with positive safety cultures are also those organisations that most competently control dangers at work.

The following conceptual model is provided to put the influence of culture on performance into perspective.

Figure 1.1. A Process Flow Model for safety



4. THE SAFETY CULTURE SURVEY PROJECT

4.1 Background

SIMRAC initiated the safety culture survey in 2004 with the aim of making a further contribution to the research that was conducted in SIM 030101 dealing with the “Development of Strategies and Intervention programs to establish a sustainable Health and Safety Culture in the SA Mining Industry”.

The survey process commenced in February 2004, with preparations by the consultants completed at the end of March 2004. Visits to the identified sample mines were made during the last week of March 2004, and surveying commenced towards the end of April 2004. Due to the requirement to fit into the various mines schedules, the final surveys were completed in April 2005.

The data collected from the surveys has been analysed to provide information regarding the safety culture within the South African Mining industry.

4.2 The Survey Process Design

4.2.1 The Sample of Mines

It was necessary to identify a number of mines that could be considered as “representative” of the mining industry. The criteria used to achieve a reasonable level of stratification and therefore representation is according to:

- Safety performance - above or below average for historical injury and fatality rates
- Sector - commodity mined;
- Size of operation - large versus smaller mines;
- Geographical spread – physical location of the mine site.

Given the required stratification and the limited scope of the survey (Maximum of 14 mines), only a small proportion of each level of stratification is possible.

It was decided to maintain strict confidentiality of the participating mines. Apart from legal reasons to do so, it was also considered imperative that the participating company or mine

retained the right ultimately and exclusively to disclose participation. There will therefore be no disclosures made by the consultants or SIMRAC - an undertaking given to participating companies when they were first asked to participate.

4.2.2 The Sample of Employees

The most basic organisational structure on most mines was used for determining the type and numbers of participating employees. The following categories were used:

- Management, as the most senior management team of the mine site;
- Staff/Specialists as the group of employees that performs specialist functions, without necessarily commanding other people. Examples are planning, technical environment, training, and human resources personnel;
- Supervisors, namely the first line of supervision or team leaders, who are in command of operational activities;
- Operators, namely the groups or individuals who are responsible for operational activities in the organisation;
- Contractors, normally employees who are not directly employed by the participating company, but who perform operational activities.

A total of 8991 employees have participated in the surveys.

4.2.3 Sample Size Consideration

Participating companies were required to ensure that certain minimum numbers of employees participate in order to satisfy the psychometric properties associated within samples.

The accuracy of the survey results relies to a large extent on the size of the sample. Most research designs for culture surveys try to achieve a 95% confidence level (or a margin of error not larger than 5%). This was also set as a requirement for this survey project.

If approximately 250,000 mining employees were represented by a simple, random sample, the sample could have been as small as 1% of the population, or approximately 2,500 employees (in the same way that researchers use only 1000 interviews to measure

national voting trends during elections). However, because of the significant degree of stratification of the sample it was necessary to increase the sample sizes accordingly.

Also, if individual mines were to use the data to analyse their own trends, and benchmark them against industry norms, the sample size on those particular mines needed to comply with the requirements of the set confidence level. It was therefore necessary to ensure that companies allow greater participation rates to satisfy the criteria for adequate sample sizes on their sites.

Furthermore, the various employee groups or levels also required different participation levels. When the defined group is smaller, the proportionate sample size is larger.

During the survey process, not all mines were able to achieve desired sample sizes, although for the industry study, more than adequate sample sizes have been achieved.

The following table was used as a guideline for the sample size determination. It provides an indication of population size vs. sample sizes, as adopted from Rea & Parker (Designing and Conducting Survey Research: A Comprehensive Guide. San Francisco: Jossey-Bass, 1992.)

Population Size	Sample Size @ 95% Confidence Level	Sample Proportion
10	10	100
20	19	95
40	36	90
60	52	87
100	80	80
150	108	72
200	132	66
360	186	52
460	210	46
500	217	43
1000	278	28

It is essential that in a survey project such as this one, where the results and findings are intended to be applied and used in practice, that the basic scientific parameters are satisfied and exceeded.

It may be adequate for academic research to survey relatively small groups of employees and still achieve a high level of accuracy. However, benchmarking and comparisons across the stratifications as mentioned demand larger sample sizes.

4.3 The Safety Culture Model – Definition and Content

The safety culture model used in this project was developed over a period of several years in the mining industries of South Africa and Australia. There were two phases of development and application.

The first safety culture model was developed between 1989 and 1994, resulting in a model consisting of 21 factors, in four categories, namely:-

1. Management Credibility (one factor)
2. Management Practices (seven factors)
3. Supervisory Team Issues (seven factors)
4. Individual Factors (six factors)

This original model has been applied widely in the South African and Australian resources industry. A database of approximately 30,000 employees was built up over five years of application.

This original model served as the basis for the development of an expanded model of 41 factors, used in the Australian Mineral Council's Survey Project in 1999. This model was refined and finalised during the extensive validation process to develop the questionnaires. It has subsequently also been applied in the South African Mining Industry.

The SAFEmap Model consists of eight categories (and 41 factors), namely perceptions of:

1. Organisation (the company)
2. Management (the senior management of the company)
3. Supervision (the direct supervisor)
4. Management Systems (formal systems of day-to-day managing)

5. Safety Systems (typical issues of safety management)
6. Job Factors (perceptions of job-related issues)
7. Team factors (perceptions of peer group influences)
8. Individual Factors (typically individual attitudes and perceptions)

Each of these categories is made up of a number of the so-called “factors”, described below.

Readers should always remind themselves that when observing trends on graphs and making inferences about these trends, that these merely illustrate the perceptions of employees about the various factors in the model. If a category such as “Commitment” shows a negative trend, then it is a trend about the perceptions and not an indication that the commitment is actually lacking – although for all intents and purposes, if the commitment is not visible to employees, it may as well be non-existent!

The factors in each category are best described by the statements used to measure them:

4.3.1 Safety Culture Definitions

CULTURAL FACTORS	
FACTOR	POSITIVE PERCEPTIONS
ORGANISATION	
Commitment	"This company is very serious about safety"
Policy	"This company clearly stated that safety is important"
Goals	"This company has clear goals and targets for safety"
Leadership style	"This company is interested in employees' views on safety"
Value	"This company does a lot for its employees"
Security	"Our jobs are secure with this company"
MANAGEMENT	
Credibility	"You can trust the management in this company"
Commitment	"Management is genuinely serious about safety"
Balance	"Management always puts safety first"
Management Style	"Management listens to our views on safety"
SUPERVISION	
Credibility	"I can trust my supervisor"
Commitment	"My supervisor genuinely cares about safety"
Balance	"My supervisor always puts safety first"
Supervision Style	"My supervisor listens to our views on safety"
PROCESSES	
Consultation	"The safety committee does a good job on safety"
Information	"We get enough information from management on safety matters"
Discipline	"When you break a safety rule, you will be treated fairly"
Participation	"My supervisor listens to my ideas on safety"
Follow-Up	"If you raise a safety concern, someone follows up very quickly"
Decisions	"People are mostly happy with management's decisions on safety"

CLIMATE FACTORS	
FACTOR	POSITIVE PERCEPTIONS
SAFETY SYSTEM	
Safety Staff	"Safety personnel generally do a good job"
Systems Quality	"The safety program is well managed in this company"
Safety Rules	"We have good safety standards in this company"
Training	"Safety training in this company is of high quality"
Recognition	"If you work safely, you will get recognition for it"
JOB FACTORS	
Risk Incentives	"In my job, it is not necessary to cut corners"
Work pressures	"My job is just enough to handle everyday"
Tools & Equipment	"Our tools and equipment are generally safe and well maintained"
Satisfaction	"I enjoy the work I do"
Risk Level	"I am (not) worried about the dangers in my job"
Job design	"Given the opportunity, I can make a lot of improvements in my job"
TEAM FACTORS	
Rule Compliance	"People around me generally comply with safety rules"
Risk-Taking	"I know people don't have to break safety rules to get jobs done"
Team Spirit	"There is a positive team spirit in our team"
Conflict	"I get along quite well with my supervisor"
Team Work	"Our team is often involved in safety improvements "
INDIVIDUAL FACT.	
Fatalism	"It is possible to achieve zero accidents"
Duty	"If I have an accident, it will be my own fault"
Motivation	"I am happy to work for this company"
Stress	"After a day's work, I go home and forget about work matters"
Risk Perception	"The safety standards in this company are very high"

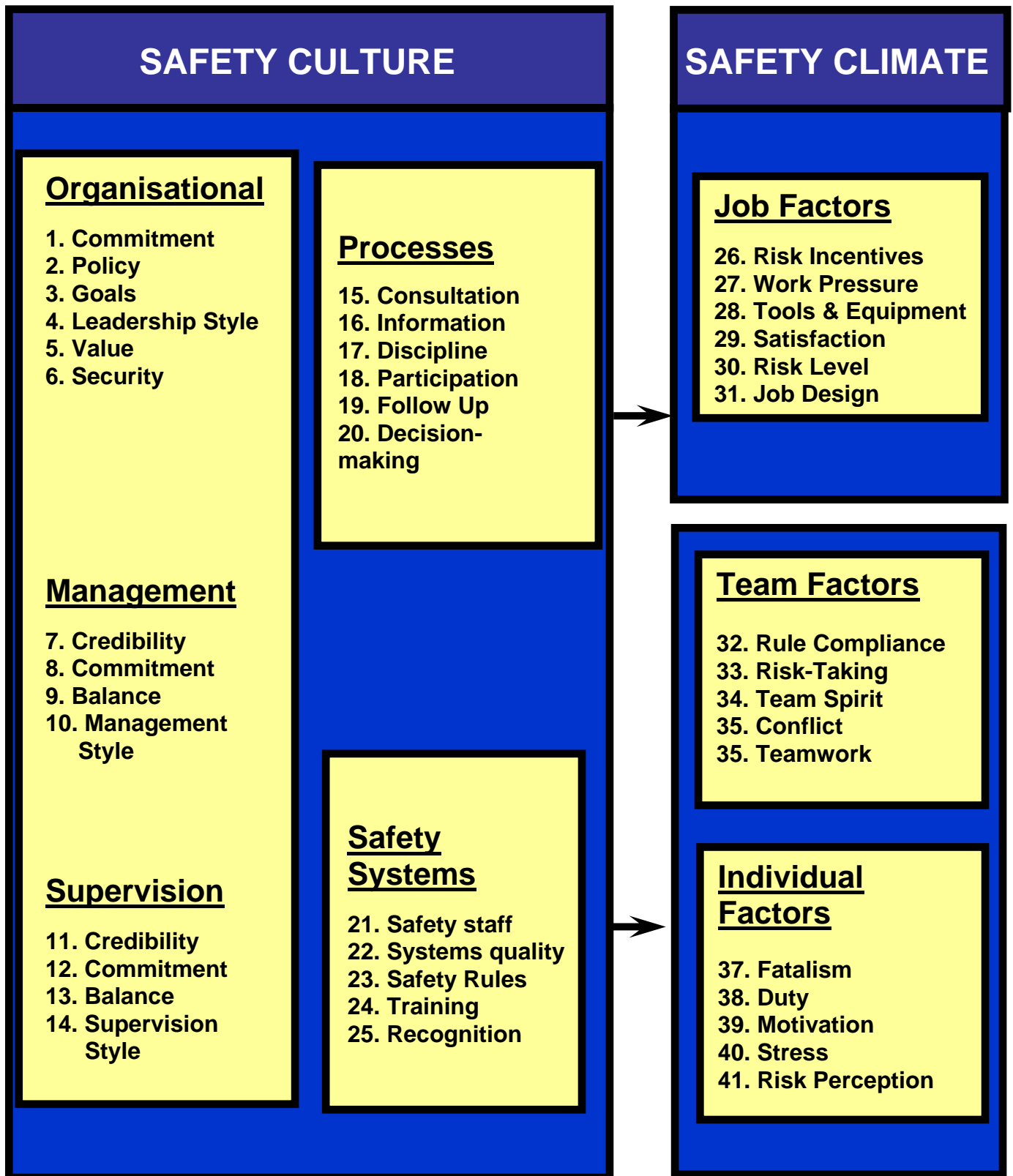
Safety Culture

Safety Culture refers to the formal safety issues in the company, dealing with perceptions of Management, Supervision, Management Systems and perceptions of the Organisation (company). Where the respondents are managers themselves, their perceptions on the Supervision factors refer to their direct supervisor/manager.

Safety Climate

Safety Climate refers to the more intangible issues in the company, such as perceptions of Safety Systems, Job Factors, Team Factors and Individual Factors. These are also commonly referred to as the social work climate and these are the dynamic influences on the individual and on the group.

4.3.2 Safety Culture Model



4.3.3 Measurement Scales

Measurements are made by calculating the Net Positive or Net Negative responses for the various factors, categories, and overall result.

This calculation of profiles allows for comparisons with the other benchmarks, namely the overall results for the International and Australian Mining Industries.

These profiles compare the responses on each factor and category with an overall benchmark, as described below. It shows, for each category, the extent to which the responses in that category were more positive or more negative when compared with the benchmark. In simple terms, these profiles show “how long the piece of string” is.

The profiles compare the various groups in the company with each other, on each of the model’s factors and categories

These graphs are calculated as shown in this example:

On the statements: “My manager can be trusted” and “My manager cannot be trusted”, the following responses were measured:

	Positive Responses (Can be trusted)	Negative Responses (Cannot be trusted)	Difference
Management	50%	30%	+20% more positive
Supervisors	35%	50%	-15% more negative
Staff/Specialists	60%	25%	+ 35% more positive
Operators	40%	45%	- 5% more negative
Contractors	55%	45%	+10% more positive

This score, the Net Positive Response (NPR), is an indication of the extent to which positive responses are higher than negative responses. It is possible that negative responses may be higher than positive responses, with the result of a Net Negative Response (NNR).

Scores above the zero line are NPR's, while scores below the zero line are NNR's.

The profiles are graphically represented as below, with the “norm” being the benchmark groups as described above.

5. THE EPROFILE SURVEY TECHNOLOGY

The surveys were conducted with a unique (patented) technology called “eProfile”. It consists of the following:

A set of electronic hardware that includes a set of 16 buttons, a length of electronic cable and an electronic monitor box.

A software component installed on a standard PC-type desktop or laptop computer.

The software program “steps” the facilitator through the survey process. A group of employees (maximum 16) gathered at a given time at a venue where the computer and electronic cables and buttons were installed. Each employee held a concealed button in his/her hand and after explanations, the facilitator read a series of statements to the group, pertaining to the safety culture model.

A second process, similar to the eProfile technology, was used when groups of more than 16 needed to be surveyed at a time. In these situations, statements were read by the facilitators, and responses recorded manually from a reading on the electronic box. This process allowed up to 32 people to participate in the survey during one sitting.

People responded by agreeing to the statement (pressing the button) or disagreeing (not pressing) or by being neutral (not pressing). Each factor was measured by two opposing positive and negative statements, and therefore resulted in certain proportions of responses to the positive and negative statements as well as a proportion of no responses to either statement (neutral). This is known as the Kuder Forced Choice format of questionnaire item design.

This survey technology (when compared with questionnaire type surveys) does have a few limitations associated with it, mainly the fact that employees must gather at specific times to participate, and that a facilitator must actually conduct the surveys. This requires more time and effort to complete a survey as compared to a questionnaire.

However, the benefits far outweigh the limitations, namely:

- Responses are more direct and more accurate because people do not get the opportunity to “think” about their responses, eliminating much of the so-called “sources of measurement error”, where respondents may construct “desirable” responses.
- Responses are clearly confidential, which in questionnaire-type surveys can at best be merely a proffered “assurance”.
- The biggest advantages of this technology are that high response rates are delivered, data manipulation is virtually error-free and that all employees can participate equally. It is often the case that employees with reading and comprehension difficulty are simply excluded in questionnaire-type surveys.

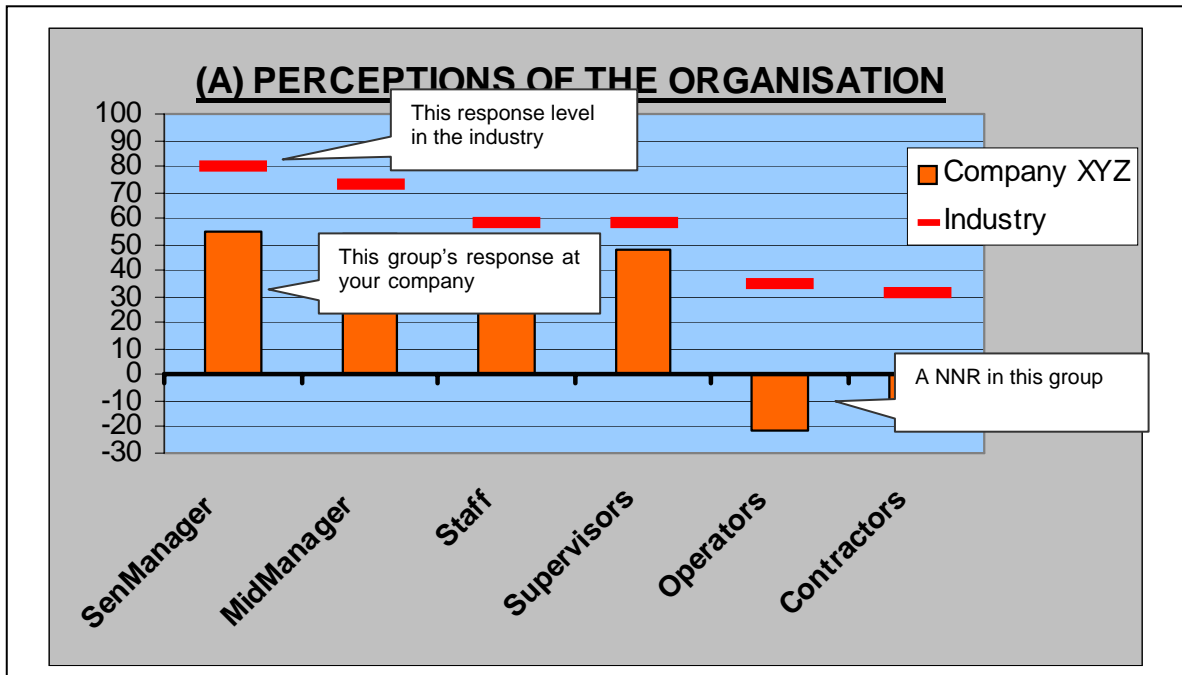
6. INTERPRETATION GUIDELINES

The following response trends and issues are used to interpret the data:

- Response level, whether there is a high or low response level.
- Net positive responses (NPR's) or net negative responses (NNR's). When the proportion of positive responses is greater than the proportion of negative responses (NPR), or when the proportion of negative responses is greater than the proportion of positive responses (NNR).
- The difference between the response levels of the various groups in the industry i.e. is there a difference between the response levels of Managers and Supervisors in the industry?
- The difference in response levels between factors in the model (p.19) i.e. is there a noticeable difference between responses on factors 4 and 7 in the model, or between a particular factor and the average responses on all of the factors. The response pattern is a comparison between the trends of responses across employee groups of the industry with a response pattern in the industry. One of the typical response patterns is that more senior employees are more positive in their responses than more junior employees.
- Response differences between similar factors. For example, perceptions of the Supervisors are measured in different categories for different reasons and unexpected

response trends may be indicative and important for interpretation purposes. The model contains a number of interrelated factors, which provide opportunities for a dynamic interpretation of data.

- Response pattern differences between the various categories of the model.



7. RESULTS OF THE SAFETY CULTURE SURVEY

7.1 Overview

The report will contain the following sets of profiles and results:

- Appendix 1: Overall total together with the various levels in the organisations
- Appendix 2: Overall total together with the various performance levels (above and below average)
- Appendix 3: Overall total together with the various participant mines (A-N)
- Appendix 4: Overall total together with the various mining sectors (commodity produced)
- Appendix 5: Overall total together with the results for “Larger” and “Smaller” mines

A brief summary of the conclusions for each of the above profiles is provided. The summary is on a by exception basis, and only highlights the most significant factors of each set of profiles.

7.2 Conclusions For The “By Level” Set Of Profiles

- This set of profiles differentiates the results according to the level of the position within the organisation. All participants are placed into one of five categories, namely:
 - **Management** – middle and senior management, above the level of supervisory management;
 - **Specialists** – tertiary qualified staff (e.g. surveyors, geologists etc.) as well as senior administrative staff;
 - **Supervisors** – people who supervise others, typically in operational roles;
 - **Contractors** – people working for contractor companies on site, as opposed to those working for the principal company who owns the mine;
 - **Operators** – people working for the company that owns the mine, typically in operational roles.

- Of the 8991 who participated in the survey, 5780 were from the operator level. This proportion is slightly higher than the proportion of operators included in the overall Australian and International benchmarks. The contractor group of 1395, as well as the specialist group of 319, are smaller proportions than the Australian and International benchmarks. The management group of 378 is similar to the Australian and International benchmarks.
- Overall, on aggregate, the safety culture in the South African mining industry, as represented by the various sample mines, is significantly more negative than the safety culture in the Australian and International mining industries.
- Most levels in the industry record significantly more negative trends than the benchmarks. This includes the management level, supervisory level, contractor level, and to a lesser extent the operator level. The lesser difference recorded by the operator level could be influenced by the lower expectations for safety by this group. Perceptions are related to expectations. The expectations of the operator group are likely to be lower, and as a consequence, the difference in perceptions with other groups is not as pronounced.
- While the specialist group records a slightly more negative trend than the Australian benchmark, and a similar trend to the International benchmark, it should be noted that the sample size for this group is relatively small. This is also the level in the South African mining industry which consistently records results similar to the Australian and International benchmarks. This group is strongly represented by “professional” employees. It is thus not surprising that the results are similar to the Australian and International benchmarks, where there is likely to be less of a difference in mindset, and a broader level of exposure to safety (e.g. through their tertiary education).
- A significantly more negative trend than the respective industry benchmarks exists at the supervisory level. This is an indication that the safety culture at this level is more negative than the benchmarks. Given that the safety culture which manifests itself at the supervisory level, typically is directly correlated with the safety culture as perceived by operators, the fact that the operator group are closer to the Australian and International benchmarks is an indication that the supervisory group within the South African industry do not play as significant a role as their Australian and International counterparts.

- The management group has the largest impact on the overall safety culture in the organization, and as can be seen, this typically cascades itself through the various levels.
- The contractor group records a marginally more positive trend than the operator group. This is consistent with the trends experienced internationally, but not as significant as the Australian trends. For the Contractor group, the difference between the South African results and the Australian and International benchmarks are less than for the results of the management and supervisory levels.
- The Operator group records a slightly more negative trend when compared to the respective industry benchmarks. As noted, the differences here are not so pronounced as with the Management, Supervisor and Contractor groups. Overall, it is noticeable that the variation between the three benchmarks is the least for the Specialist group (as discussed above), and relatively small for the Operator groups. This is an indication that overall, there are greater similarities in the overall culture for these groups (Specialists and Operators) than for the other groups (Managers, Supervisors and Contractors).
- For the Organisational category, a consistently more negative trend versus the industry benchmarks is recorded for the various groups except Specialists.
- The results for factor 3 (Goals and Targets) indicate that Managers have a similar understanding about what is required for safety as the respective benchmarks. The Specialist group is more positive than the benchmarks, and the Supervisors similar to the Australian benchmark.
- Factor 4 (Consultation) highlights the difference in perceived consultation being experienced in the South African Mining Industry. This trend is consistently recorded for all levels of management (Organisation, Management and Supervisory factors) for this factor. While the trend recorded for the formal safety communication (factor 15 – Safety Committee) is relatively positive, the result for the Consultation factor is an indication that the informal and unstructured forms of communication and involvement are not perceived to be positive.
- Factor 6 (Job Security) indicates that there is a more positive perception about Job Security in the South African Mining Industry when compared to the respective

benchmarks. This factor does however not correlate with other positive trends in the model, and is accordingly of little influence. This result is likely to reinforce the theory that in an environment of higher unemployment rates (as with South Africa), people's perceptions are more positive about their job-security by simply having a job. The general longer term focus of the South African Mining Industry and employer / employee relationships are also likely to contribute to this result.

- Factor 7 (Management Trust) records an extremely low level of trust of managers for (their) management overall.
- A significantly more negative trend when compared to the respective benchmarks is recorded for the Supervisory category. All factors in this category record negative trends. This highlights a relatively poor relationship (regarding safety and otherwise) between employees and their immediate supervisors.
- Factor 12 highlights the perception that many employees do not believe their immediate Supervisors genuinely care about safety. This result is related to the relatively negative trend for factor 17 (Discipline), factor 26 (Risk Incentive) and factor 32 (Rule Compliance).
- Factor 15 (Safety Committee) records a similar and consistent trend versus the respective benchmarks.
- Factor 17 (Discipline) records a significantly more negative trend to the benchmarks. There is clearly a significant level of fear for the repercussions of "breaking a safety rule". This perception is supporting the strong systems focus as highlighted in the Systems category.
- Overall, the Safety systems category records a similar trend to the respective industry benchmarks. This is the strongest performing category relative to the two benchmarks. Within the category, the Systems Quality, Training and Recognition factors all record relative positive results.
- A significant proportion of employees believe it is necessary to cut corners (Risk Incentive) to achieve production goals. This indicates a high level of risk-taking. Employees believing that it is appropriate or justified to take risks in the interests of production.

- Job satisfaction (factor 31) records a more negative trend, indicating that employees have a lower level of job satisfaction when compared to their international counterparts.
- The results for Factor 32 (Rule Compliance) highlight the difference between espoused safety and the application of the safety systems and rules. This factor demonstrates that there is a high level of “non-compliance” of safety standards. The informal and practical aspect of safety appears to be significantly different to the formal program. This result is related to the relatively negative trends recorded for factor 33 (Risk-taking) for the Management, Specialist and Supervisory groups.
- Factor 38 (Duty) records a similar trend to the respective benchmarks. Against a low benchmark, this is a relatively positive trend, and is an indication that there is a culture for “self preservation”.
- Overall, loyalty to the employer is lower than the industry benchmarks as is reflected in factor 39.

7.3 Results According To Safety Performance

- This set of profiles presents the results according to the historic safety performance of the mine. The reported injury and fatality rate for each participant mine was assessed against the average injury and fatality rate for the different sectors in 2003. Those mines that reported a better rate than the relevant sector average were included in the “Above Average” group, and those with a poorer record than the relevant sector average included in the “Below Average” group.
- Half of the 14 participant mines fell in each of the two groups. The number of employees represented in each group is however split with 40% falling in the above average group, and 60% falling in the below average group. This in itself is an indication that as a generalization, the larger the mine, the poorer the injury and fatality rate is likely to be.
- Overall, the “above average” mines recorded a significantly more positive trend when compared to the “below average group”.

- When compared to the respective benchmarks, the “above average” group records a result similar to the average of the international benchmark, with the “below average” group recording a significantly more negative trend.
- Most factors record this trend, although the difference in results for some of the factors is marginal.
- The biggest difference in results between the two groups is recorded for the Goals factor (factor 3) and the Safety Rules factor (factor 23).
- A few factors (Work Pressure, Risk Level, Risk-taking and Team Spirit) record marginally more positive trends for the “below average” group than the “above average” group. In the case of the Work Pressure factor this highlights that as an independent variable, negative trends for this factors do not necessarily lead to poorer safety performance. It is in the context of other factors that safety performance is influenced. For example, where there is a positive safety culture, excessive work pressure will not necessarily lead to more accidents – people adjust or compensate their behaviour accordingly.

7.4 Results According to Participant Mines

- This set of profiles compares the various mines with each other. To ensure anonymity, the 14 mines have been coded Mine A, B,, N. The charts for the various mines have also been sorted from most positive (Mine A), to least positive (Mine N) for the aggregated result (perceptions on all factors). This highlights the variations of results for the different factors. This is also an indication that a good sample of mines has been surveyed.
- A large difference in the results between the most positive mine and the least positive mine exists. This indicates that there is a significant difference in the safety culture among the mines in South Africa. This level of volatility is not unusual and similar to the mining industries in other countries.
- Of the sample of 14 mines, only one records an overall more positive trend than the Australian average (benchmark) and only three are similar or more positive than the International average (benchmark).

- Most factors display a typical and consistent trend of more positive to less positive results as compared to the two benchmarks.
- As has been noted, the Job Security factor (Factor 6) is of less influence in the South African industries safety culture. This is further demonstrated by the lack of correlation of the results on this chart with the more positive and less positive cultures.
- Similar to the above point, the Stress factor (Factor 40) does not record a typical trend. There is little correlation between the results of this factor and the overall safety culture at the various mines.

7.5 Results According to Mining Sector

- This set of profiles represents three major sectors according to the commodity produced. The fourth bar or set of results is a combination of two sectors. The Gold Mines sector is represented by four mines, and represents 48% of the total population. The Coal Mines sector is also represented by four mines, but only represents 18% of the total population. The Diamond Mine sector is represented by three mines and represents 16% of the total population. The “Other” group is represented by two Platinum mines and one Iron Ore mine.
- Overall, a small but significantly more negative trend is recorded for the Gold sector as compared to the other sectors.
- The other three group’s record similar results overall.
- Most factors record similar trends between the various sectors.
- A significant difference in results is recorded for the Safety Rules factor (factor 32). The Gold sector records a significantly more negative trend when compared to the other sectors. This is an indication that there is a lower level of rule compliance within this sector.
- Within the Diamond sector, an unusually more negative trend is recorded for factor 33 (Risk-taking) as compared to the other groups. This is an indication that informal risk-taking is higher in this sector.

7.6 Results According to Size of Mine

- This set of profiles differentiates the results according to the number of employees working at the mine. Mines with more than 2000 employees were put into the “Larger Mines” category, and mines with less than 2000 employees were put into the “Smaller Mines’ category.
- The total number of participants in the study who work for larger mines is 5912 (66%) and those working for smaller mines is 3079 (34%). The number of mines represented in each of the groups is the same. i.e. Seven in each group.
- Overall, the smaller mines record a significantly more positive safety culture than the larger mines. This result is not too dissimilar to the International Mining Industry benchmark. It is important to note that most mines represented in the International benchmark have less than 2000 employees. Likewise, the Australian benchmark is strongly represented by mines with less than 2000 employees.
- Most factors follow the trend of recording a more positive result for the smaller mines than the larger mines. This is an indication that size is a significant variable in the determination of the safety culture. The greater number of large mines in South Africa is having a negative influence on the overall safety culture of the industry.
- Factor 28 (Tools and Equipment) records a more positive trend for the larger mines, indicating that in general, larger mines are providing better and safer equipment.
- Factor 33 (Risk-taking) and Factor 34 (Team Spirit) record a significant inverse relationship in this regard. Stated differently, these factors record more positive trends for the larger mines, which is against the trend recorded on most other factors in the model. This reinforces the point made earlier regarding risk compensation. i.e These factors do not, as independent variables, necessarily lead to poorer safety performance as people will adjust their behaviour. It also indicates that Team Spirit is more likely to be stronger in larger mines. Team members are more inclined to seek “belonging” in their teams in the larger mines, while this is possibly not so important in the smaller mines as their sense of “belonging” is better defined in the smaller mines.

8. RECOMMENDATIONS

Recommendations are made based on the results of the survey, and professional experience regarding the relationship of results for the various factors. Generalisations are made as they relate to the industry, and it is likely that some of the recommendations are in place in some individual mines.

8.1 Focussing on Safety Culture

- It is recommended that as an industry, the South African Mining industry as a whole increase its focus and strategy on the role of the safety and health culture of the industry. This entails providing support and focus for the various mining companies in this field. It is demonstrated in the report that the mines with a more negative safety culture are likely to have a more negative safety performance in the past, and this can be extrapolated to the future, assuming significant change has not occurred during the interim period. The theory strongly supports the view that the safety culture in an organisation represents an accurate reflection of the future safety performance of the organisation, assuming all intervening variables remain the same. The measurement of the safety culture is an accurate pro-active and predictive measure for safety performance.
- More specifically, it is recommended that a study of this nature be conducted on a regular basis within the industry. While this is only a baseline study, second and subsequent surveys can demonstrate the specific changes that are occurring in the industry, allowing for an analysis of the effectiveness of interventions and general strategy that is being followed. It tracks and allows for a more targeted strategic understanding of the culture and changes that are occurring.
- A third element in this regard relates to the external or outward focus of the industry, to ensure that the South African Mining industry remains abreast with developments in the safety and health culture of other countries. While there can be little doubt that the industry world wide can learn a lot about safety and health from the South African Mining industry, it is also true that the industry should be aware of the status and changes that are occurring globally as they relate to the safety and health culture. It is not always appropriate to adopt the changes, but serious consideration of emerging trends should be made in this regard. A high level of exposure is recommended.

8.2 A Culture of Learning

- The broad range of results for the various mines is an indication that there are big differences between mines regarding the safety and health culture practiced.
- It is recommended that the industry identify the mines with more positive safety and health cultures, and encourage learning across the industry for other mines. While the author is not aware of the level of inter-mine sharing of strategies and processes for safety and health, there is an opportunity for a greater level of information sharing. The safety and health of employees does not operate in a competitive environment, and there should accordingly be little reason to withhold examples of success. Similarly, those mines which are experiencing difficulties should take the initiative to update themselves on the strategies and practices that are working elsewhere.
- Related to the above point, it is recommended that a forum be developed where mines are encouraged to participate in evaluation programs to determine which are the top performing mines in the country. This program could be introduced into the Mine Health and Safety Council's award scheme. A similar program to that suggested, the annual MINEX awards, has been applied in the Australian Mining industry for a number of years with success. The primary purpose of these awards is to recognise excellence in safety and health, as evaluated by their peers, thus encouraging mines to report on successful strategies. Evaluators are trained to conduct evaluations, and the quality of leadership in the industry is consequently elevated when the evaluators visit other mines with a critical eye and supporting feedback on excellence. Note that these are evaluations, and this recommendation is distinctly different from audit type programs.

8.3 Beyond Compliance and Systems as a driver of Safety and Health

- The report clearly identifies that the industry has a compliance driven culture which is the primary driver of many safety and health programs. While this is a strength of the industry which has no doubt contributed significantly to safety and health in the industry, it is suggested that this may be inhibiting the industry in moving to the next level of developing a more positive safety culture. It is recommended that a broader level of understanding, focus, support and measurement of the softer issues affecting the safety culture be pursued at the higher levels of influence in the industry (company representative bodies, government and employee representative bodies).

- At the mine level, leaders need to consider alternative ways of managing safety and health if they are to progress to the next level of safety culture. There are a number of indications in the survey which suggest that at the operational level, managers, supervisors and operators are still functioning in a manner that appears to reinforce simple compliance, rather than addressing the lack of competence in dealing with risk. In particular, managers and supervisors need to adopt a more coaching role in assisting their employees to increase the level of knowledge about risk and risk-taking behaviour, apply skills in dealing with risk in a practical manner, and ensuring that people's attitudes towards risk-taking behaviour is in line with the culture that is promoted by the mine.
- The role of safety and health should become an integrated strategy in the mine's plans, and should be measured and rewarded similarly. This has significant repercussions for safety practitioners who will need to fulfil a more prominent role in strategy design and application. Of importance in this regard is the change of focus and understanding of the cognitive, behavioural and team based approaches to safety and health management. They will need to drive this change in approach throughout the mine, including providing appropriate support for line management.
- It is recommended that a subtle, but significant change in approach be adopted. A culture which encourages a high level of competence in risk-taking is suggested. This approach will require that employees at all levels become more competent in the understanding and managing of risks, rather than relying on the prescribed rules and procedures. Stated differently, the rules and procedures should become the tools with which employees are able to manage the risks they are exposed to, rather than following the rules and procedures for the sake of compliance. It will require a reasonable level of competence (knowledge, skill and attitude). To pursue this approach, Supervisors and Managers will be required to consider how risk-taking can be optimised in the team. The ability to identify risks and accurately assess them during the normal course of work will need to be addressed. To this end, an open culture of support and discussion is required.
- Behaviourally Based Safety (BBS) programs can contribute in this regard. Caution should however be taken to ensure that these programs are not merely superficial behaviour modification programs, but that they are supported by the necessary cognitive understanding, and competence regarding risk identification and

management. Commitment and accountability of line management plays a major role in ensuring the success of these programs.

8.4 Consultation

- It is recommended that the industry develop a forum in which the three main stakeholders can discuss and focus on issues relating to the safety culture in the industry. This will require that the representative parties be well versed in the issues affecting the safety culture in the industry, and that this becomes a forum for positive debate regarding the safety culture in the industry. In particular, programs can be developed through this forum to enhance those aspects that may be inhibiting the industry as a whole in evolving a more positive safety culture. For example, an important and industry wide concern like that regarding Supervisory / Employee relationships could be addressed through this forum.
- At the mine level, it is recommended that the nature of consultation be moved from the traditional safety committee approach which is often adversarial to one where learning and mutual benefit for the employer and employees is the goal. There are a number of indications that an adversarial approach still exists. Factors like the poor perception of discipline for safety transgressions, distrust of management etc., are influencing the effectiveness of consultative opportunities. Safety and health represents an ideal opportunity for both employees and employers to benefit from positive change.

8.5 Leadership

- The survey has identified a high level of distrust between management and employees. The source of this distrust is likely to be varied and complex, and not within the scope of this project. It is however important that management and employees recognise the significant negative influence that this lack of trust has on the safety and health of the mine. This influence should be factored into decision making that will affect trust levels on the mine.
- At a Supervisory level, the survey results indicate that relationships with employees are contributing to a more negative safety culture. The critical role of the Supervisor in creating the appropriate environment within which employees can work is well documented. It is recommended that specific attention be given to competencies of

Supervision at the mines and in the industry as a whole. While this recommendations is related to other recommendations (culture of compliance etc.), the quality of leadership in the industry, both now and in the future will need to be reviewed. Programs should then be put in place to address this critical level of leadership.

- Related to the above two points, it is recommended that the Mining Qualifications Authority investigate the possibility of including competencies relating to the safety and health culture in the various levels of competency requirements for Supervisors and Managers.

8.6 Size of Mine

- One of the findings in the survey was that smaller mines generally demonstrate a more positive safety culture than the larger mines. This is perhaps not surprising as there is likely to be a more direct and personal style of management in the smaller mines. The reality however is that the South African Mining industry is relatively labour intensive, and there are numerous mines that employ a large number of people.
- It is recommended that a conscious strategy be pursued to structure mining companies and their mines to reduce the size of the mines for optimal safety and health performance. While there are obviously numerous other considerations, splitting mines into separate business operations, and managing them like smaller mines will have a positive impact on the safety culture on these mines.

8.7 Role of Government and Regulators

- For widespread change towards a more positive safety culture to occur, it will require that regulators and the legislation be adopted to integrate and support this change. This will require some change in approach as there is a move away from a systems and engineering approach towards a more behaviourally focused and team based approach. The primary intent in this regard is to minimise the complex and dynamic area of “organisational error”.
- It is recommended that regulators become more cognisant of behavioural and team based influences that affect the safe operation of mines. While it will be necessary to maintain some of the traditional roles of the regulators, a better understanding and

measurement of the impact of safety culture will make a positive contribution to the overall goal of achieving a more positive safety culture.

8.8 Distribution of Report

- One of the requirements of the project is that the process, findings and recommendations be presented to industry leaders. It is however recommended that the report be distributed widely throughout the industry. Some significant findings have been made, and due to the broad coverage of sectors, performance levels, size of mines etc., there is bound to be areas of interest throughout the industry.

9. A VISION FOR THE FUTURE

The findings suggest that the South African Mining Industry has clear, but difficult, choices to make. Making the right choices, and delivering them, can create a Safety and Health (and Environment) culture and strategy that can make it a world leader.

It will be a safety management strategy that will have the following attributes (summary of recommendations and the author's interpretation):

- Safety and Health, and the associated culture will enjoy "strategic importance" in organisations, where it will be the focus of top decision makers - who will subject "safety and health" to its formal strategic planning practices (as against merely thinking operationally about safety issues). All corporations will have organisational structures designed to position the safety discipline within those structures.
- It will be driven through dynamic management processes, systems and designs, where safety and health culture, performance and achievement will be integral to all other performances. Organisations will be able to recognise and optimise their business processes along the "MINEX" type criteria as a matter of course. Associated awards will be regarded as the highest accolade a company can receive in this field, and the Boards of all mining companies will seek, or even demand, safety achievement.

- The “safety practitioner” role will have changed dramatically. The safety strategists in organisations will be seasoned executives appointed to their positions as a reward for outstanding successes in other business fields. The safety practitioner specialists will be from, or supported by, the human sciences fields, especially organisational psychology or change management specialists. External institutions will offer education and training in this field and current safety incumbents will upgrade, change and renew their skills.
- The organisation will be “seamless” in its management of safety and health, as with most other outputs. The line manager will be truly responsible and accountable for safety performance. This will be reflected by the line managers being rewarded for excellence and punished for mediocrity in safety performance in the same way they would have been for any other performance. The safety practitioner will advise management but not control performance. Nor will the safety practitioner induct people or even train them. The “new” supervisor will do that. Employees will have the required competence (knowledge, skill and attitude) to make accurate decisions regarding risk and risk-taking behaviour, and will accordingly be empowered to make these decisions in a dynamic environment. Behaviour Based Safety programs with the associated cognitive understanding will be a common tool, and will provide some of the critical, strategic measures for safety and health.
- Safety will be established through broad-based measurements, integrated with production measurement, which in turn will trigger improvements and new measurements. All safety and health parameters will be measured by reliable end-of-process and in-process measurements designed to capture and track against goals. End-of-process measurements will cease to be “lost time accidents”, but rather measure exposure, behaviour and (less so), conditions, and will be used positively for change.
- In-process measurements will be measurements of the quality of systems, and measurements of safety culture. Organisations will be able to self-assess and benchmark against industry standards on a continuous and cost-effective way – not just as measurement, but as an accurate predictor for pro-active change, as well as an opportunity for the constructive involvement of employees.

Authored By



R. A. Hill
Director
SAFEmap

Edited By

C.J. Pitzer
Managing Director
SAFEmap

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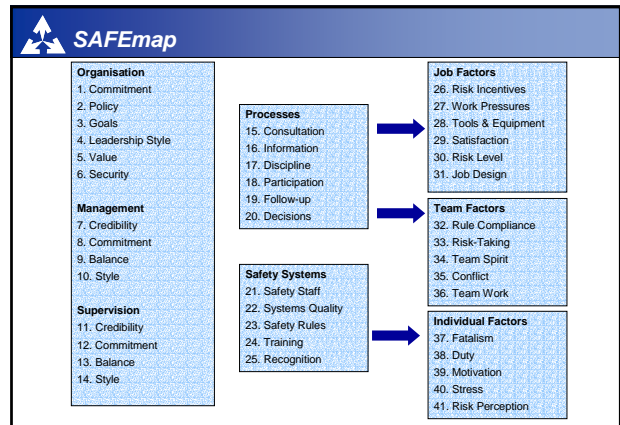
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SAFETY CULTURE SURVEY
A Survey of the Health & Safety Culture in the South African Mining Industry

By Level



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Notes on Report

The outcomes of this survey must be viewed as trends and perceptions, NOT as facts. While the reality on any given factor may be different, the perceptions of people are their realities.

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Groups Samples

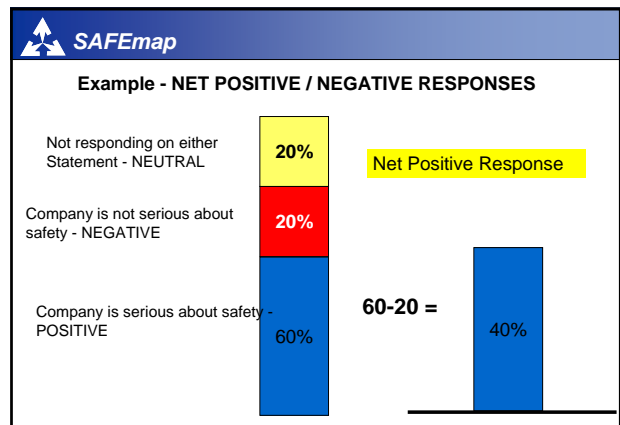
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Total SA Mining Industry	8991
Management	378
Specialists	319
Supervisors	1119
Contractors	1395
Operators	5780

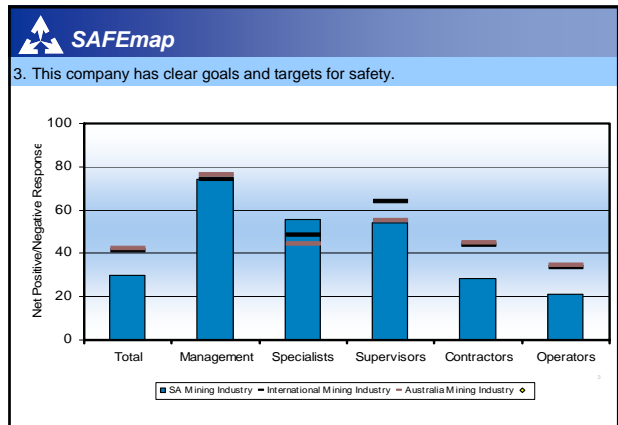
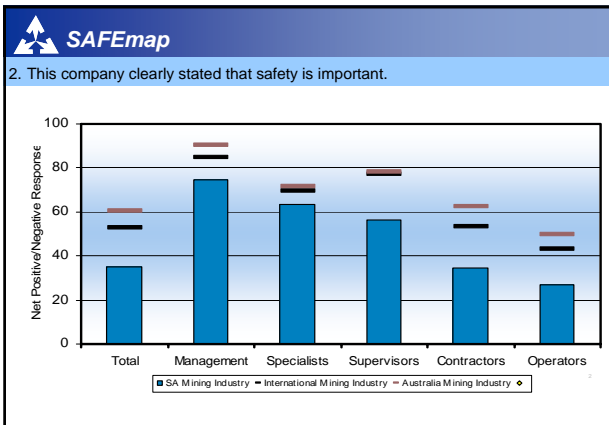
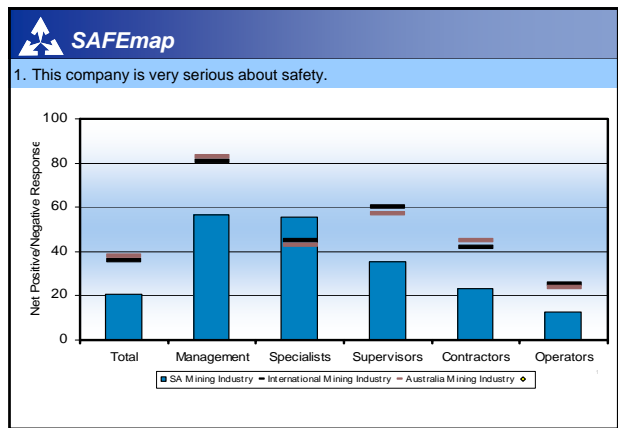
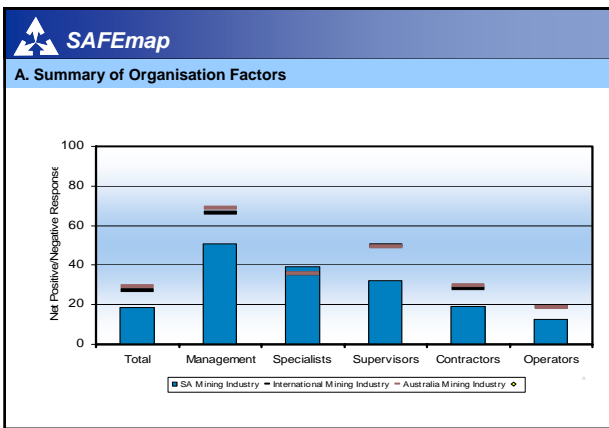
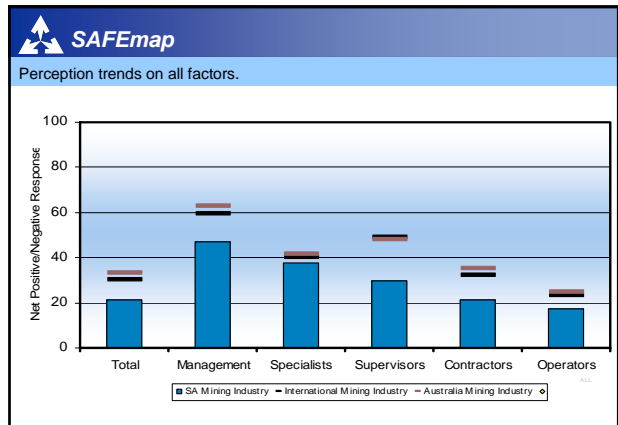
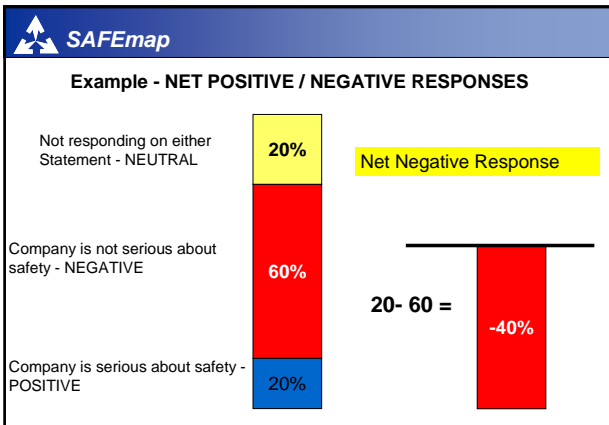
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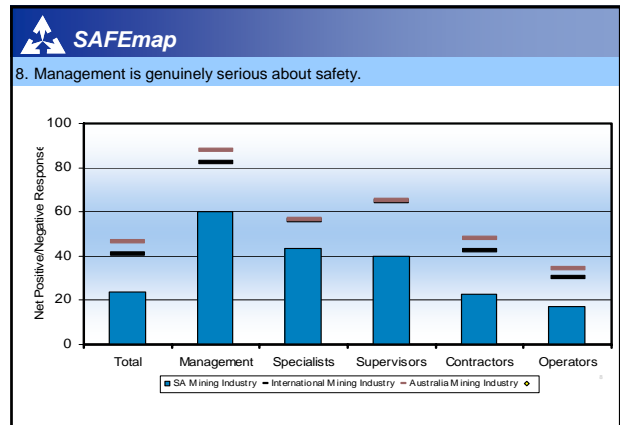
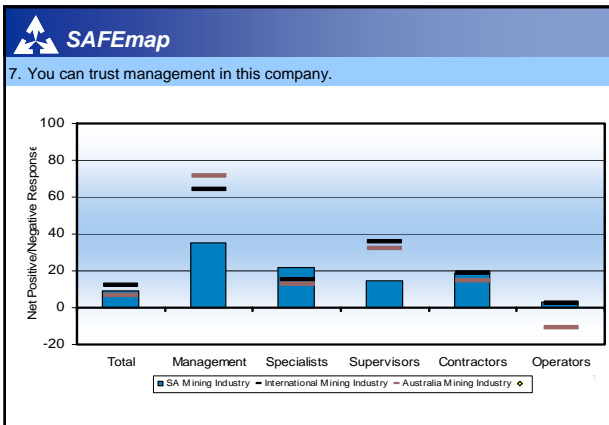
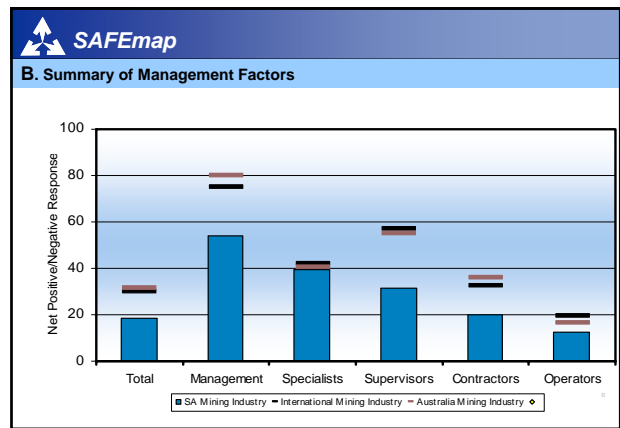
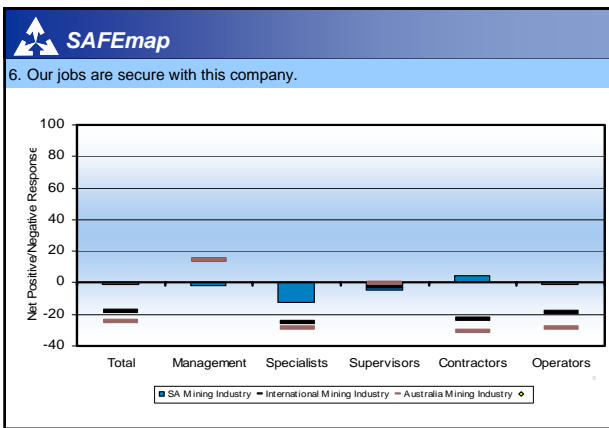
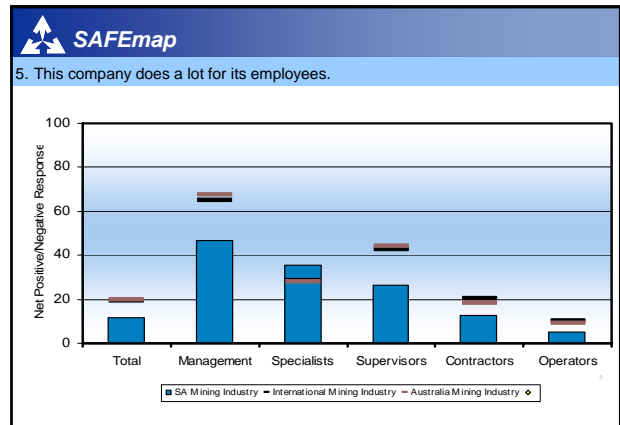
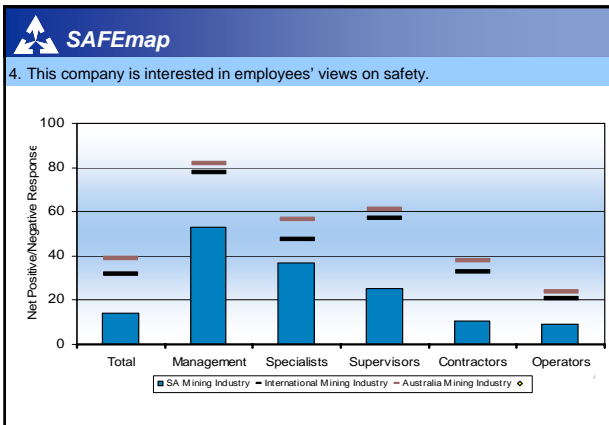
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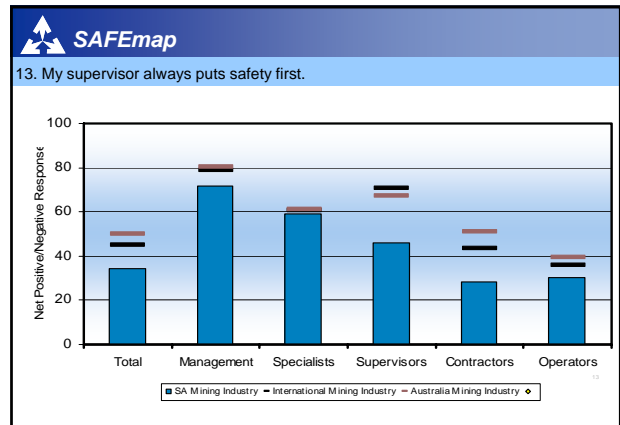
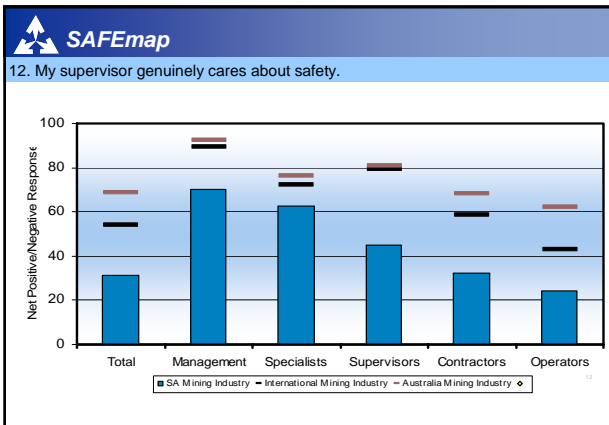
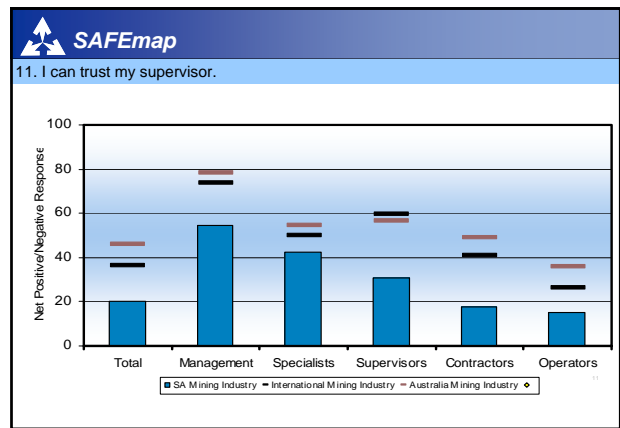
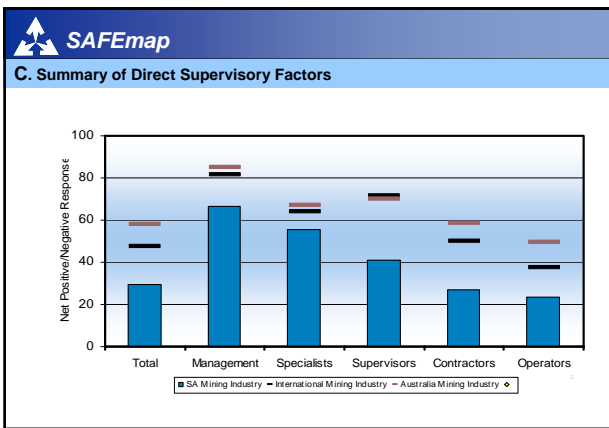
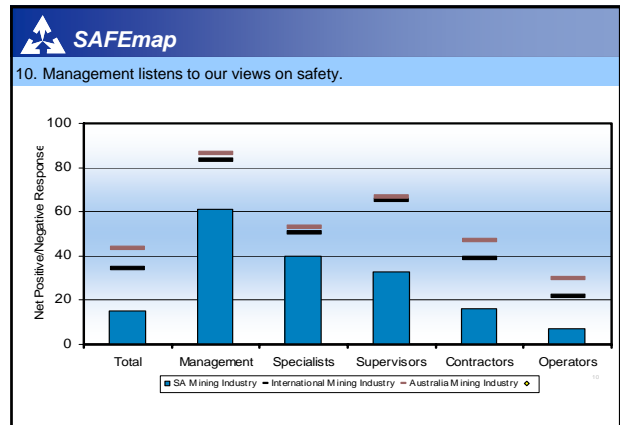
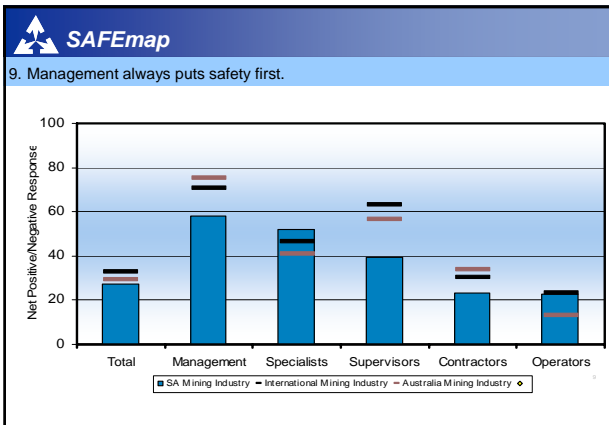
— International Mining Industry Baseline

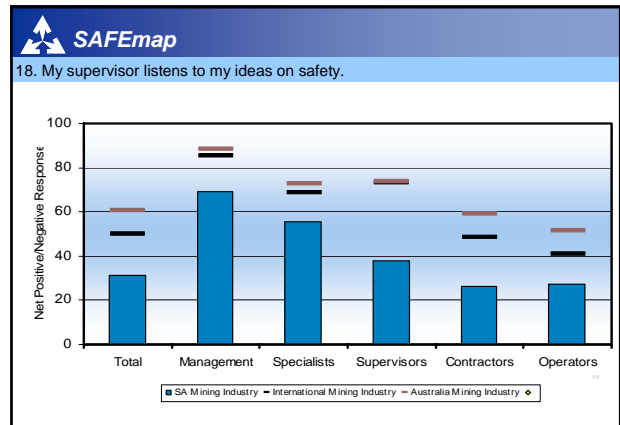
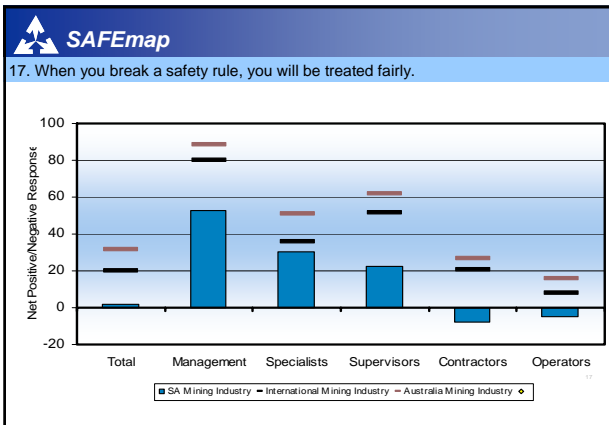
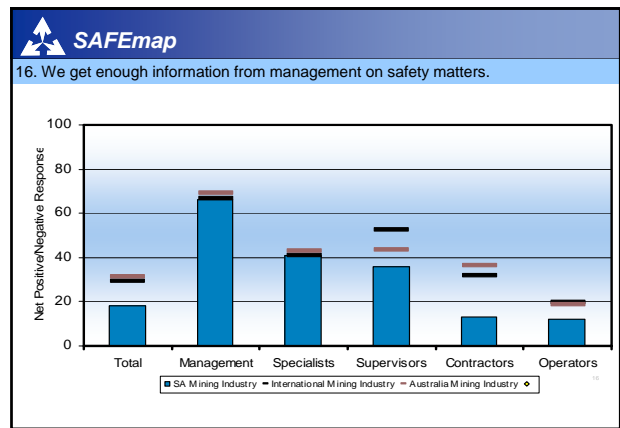
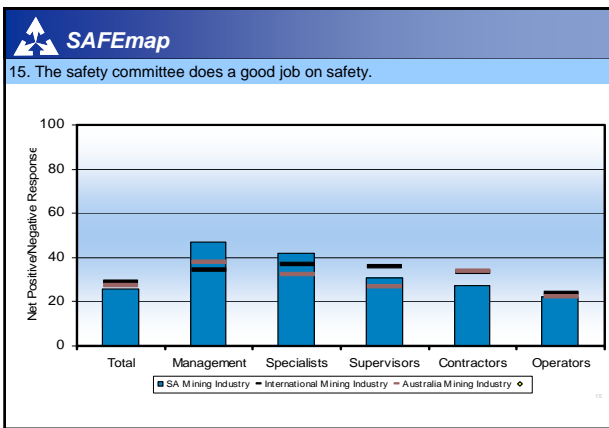
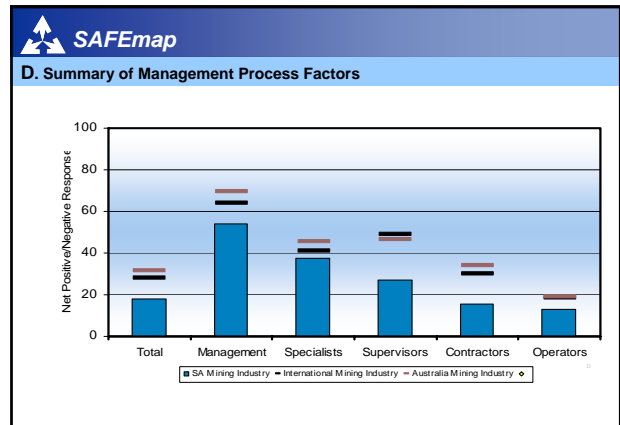
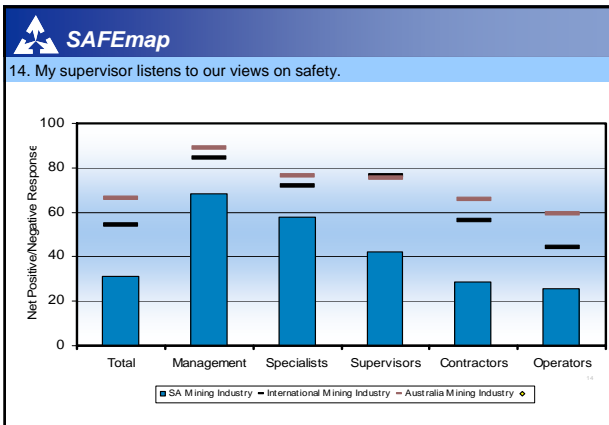
— Australia Mining Industry Baseline

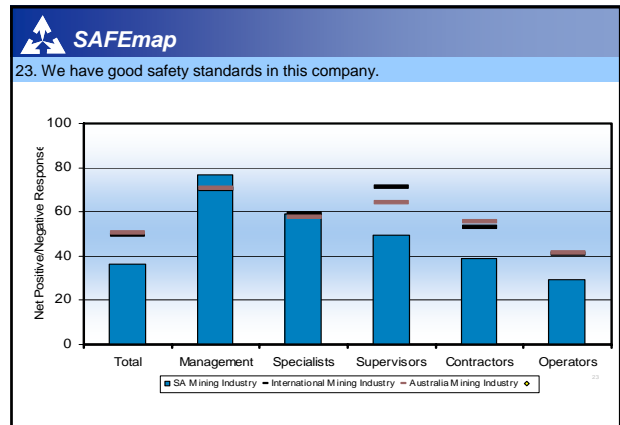
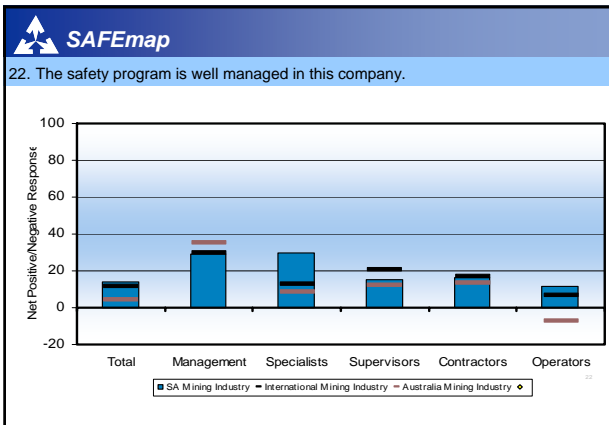
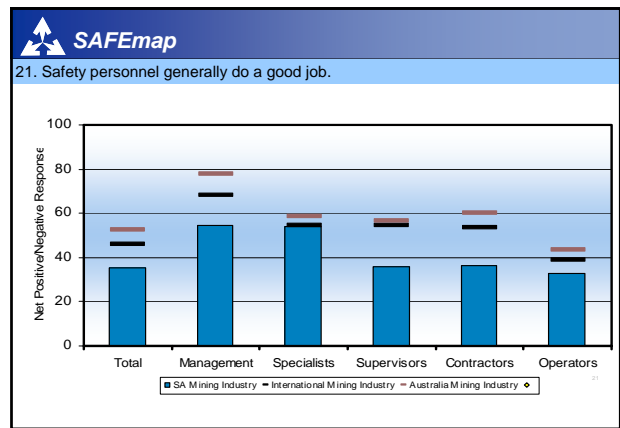
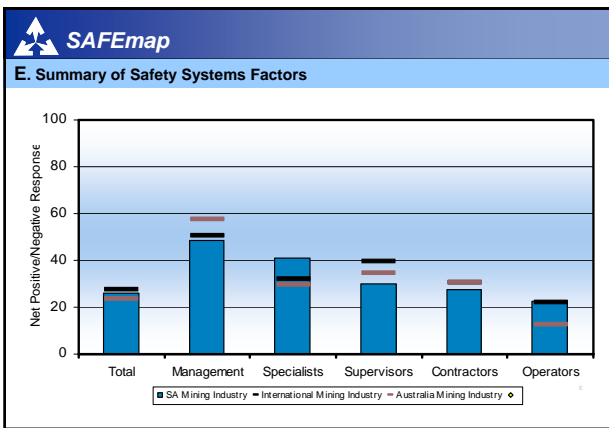
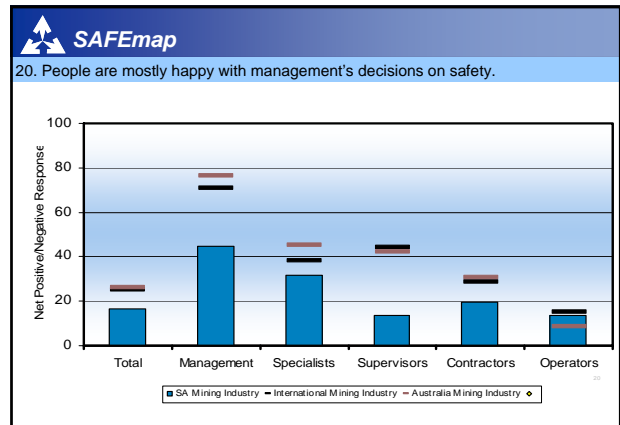
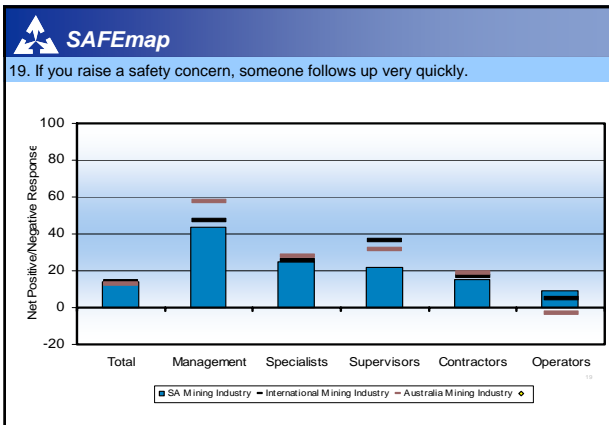


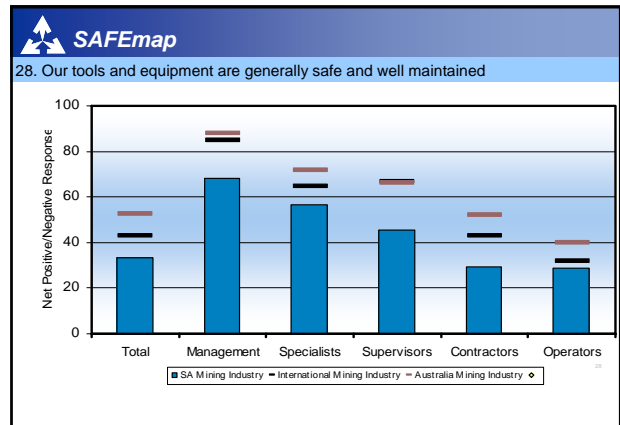
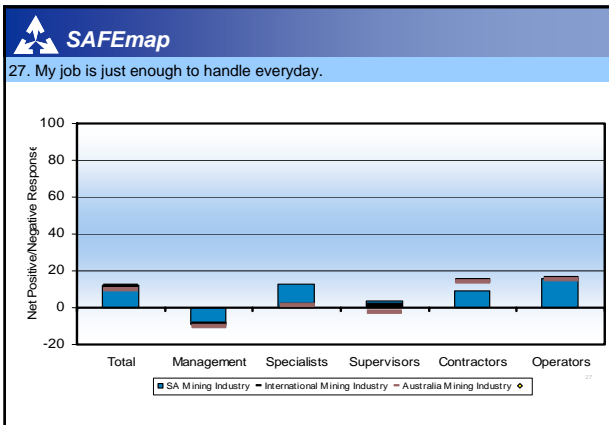
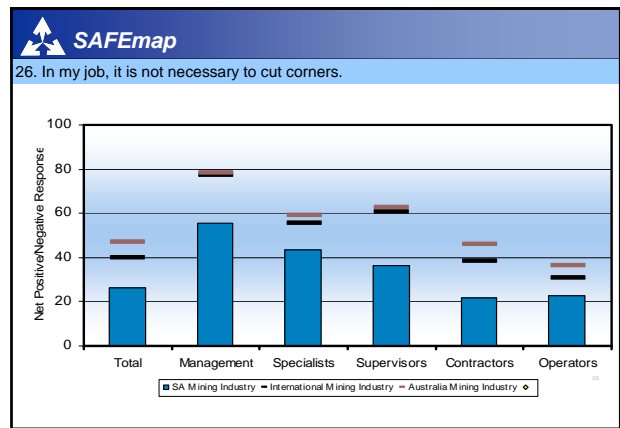
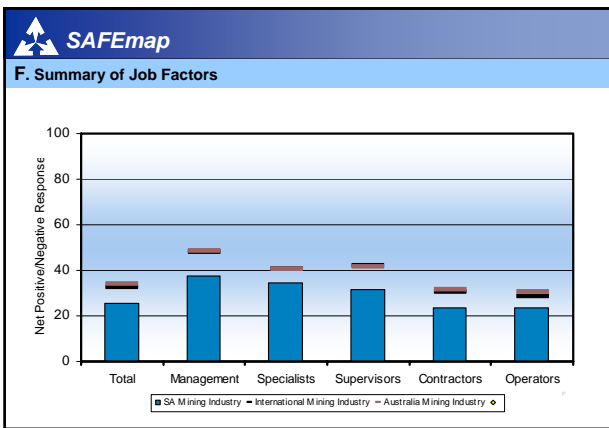
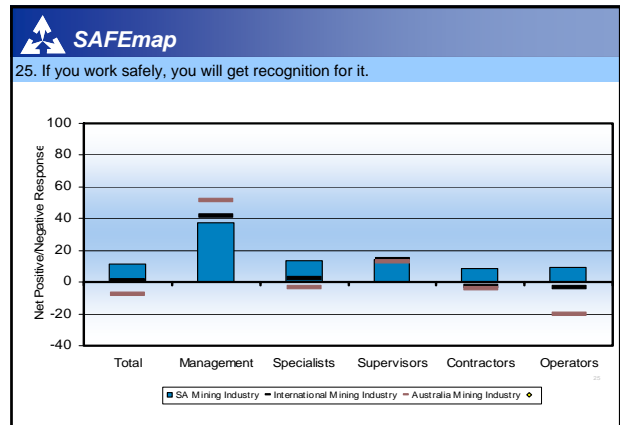
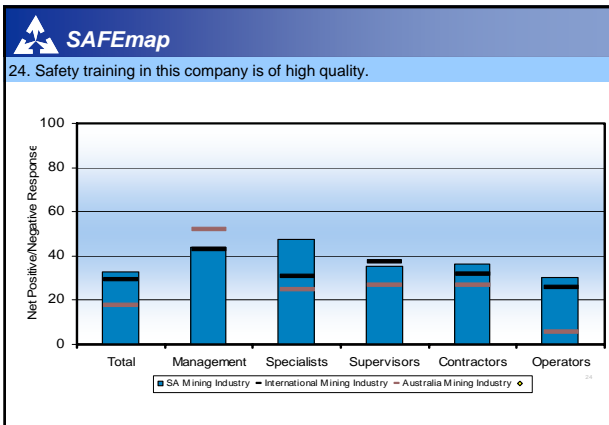


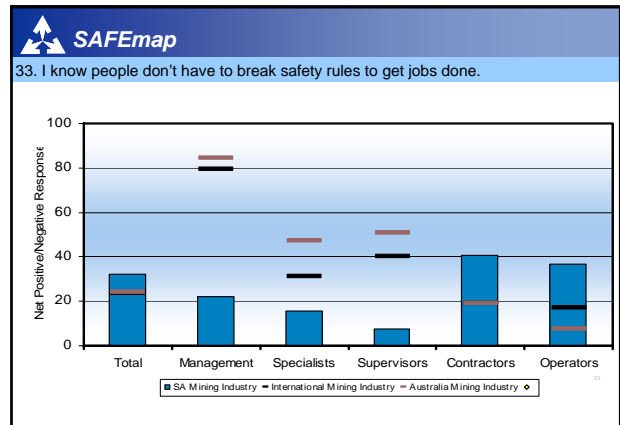
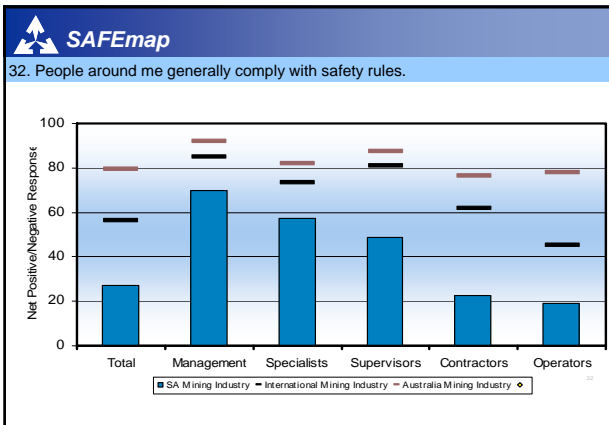
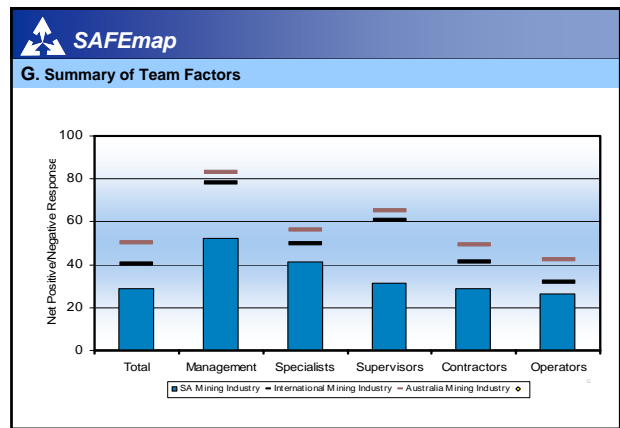
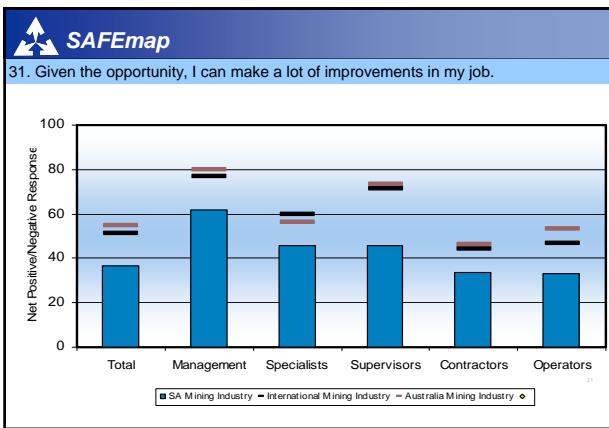
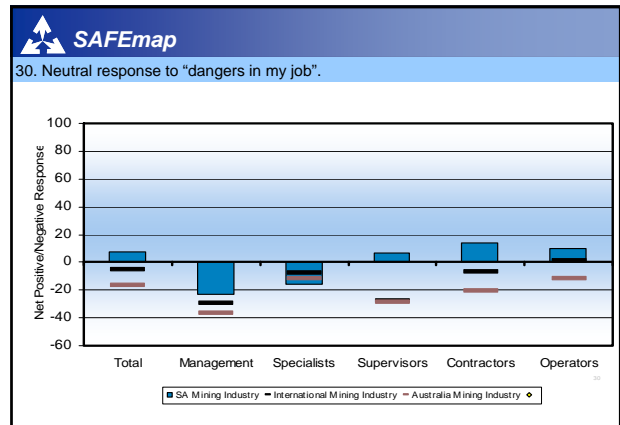
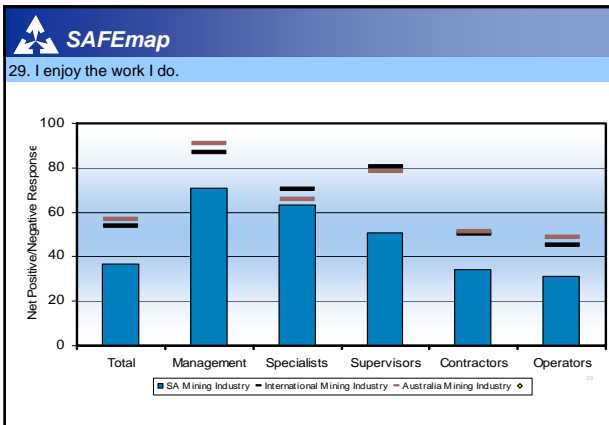


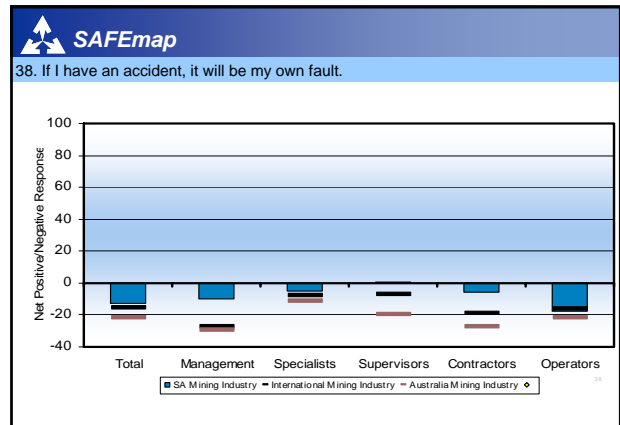
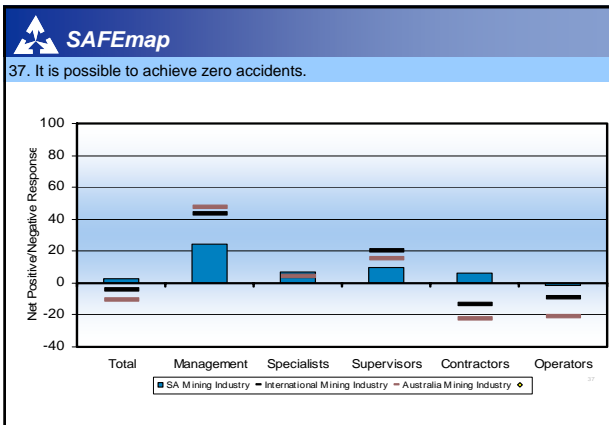
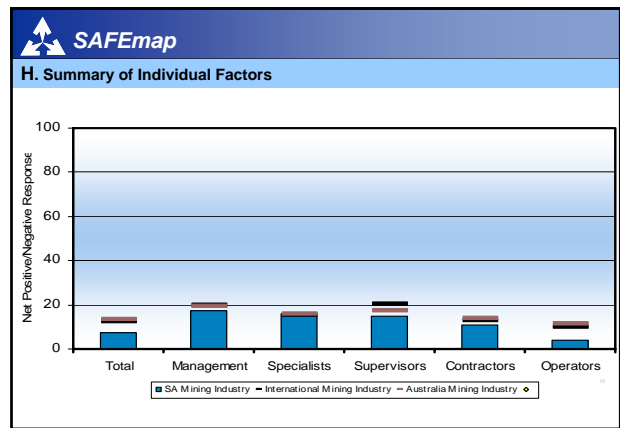
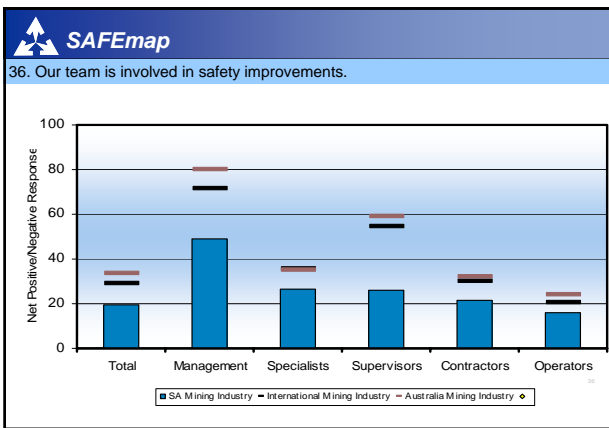
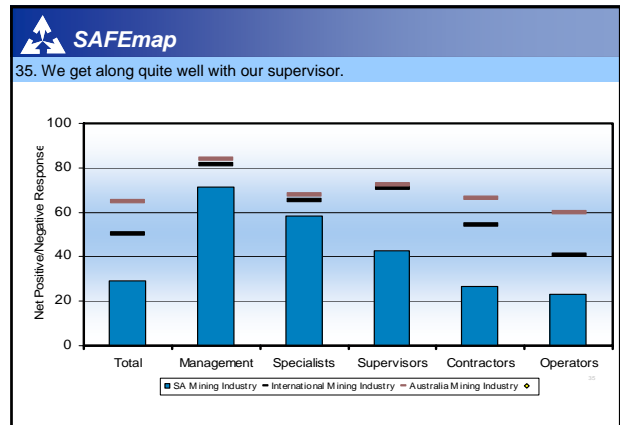
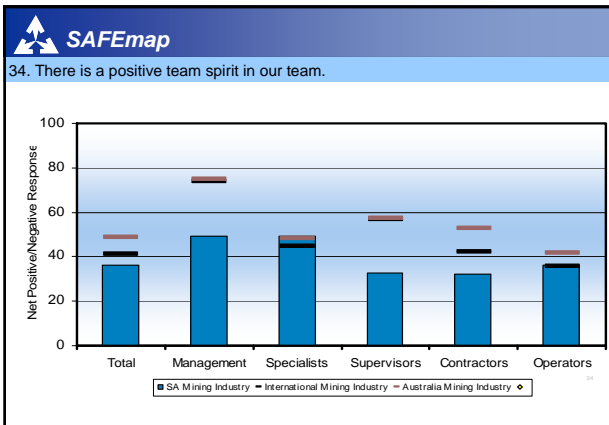


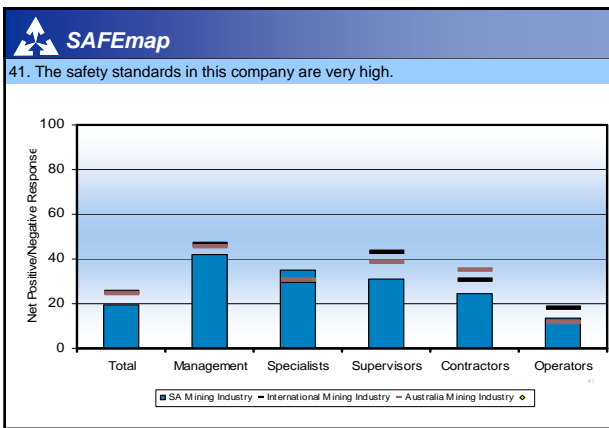
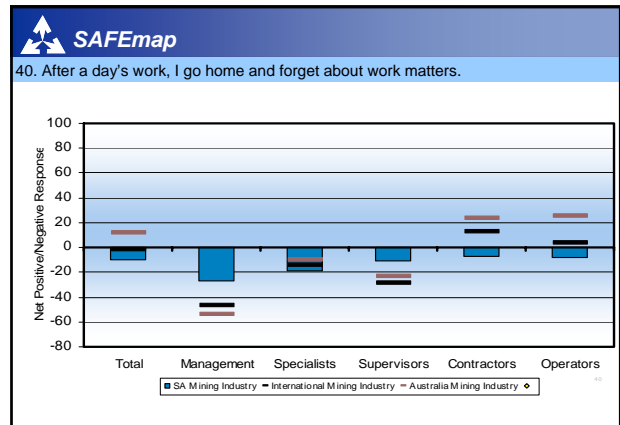
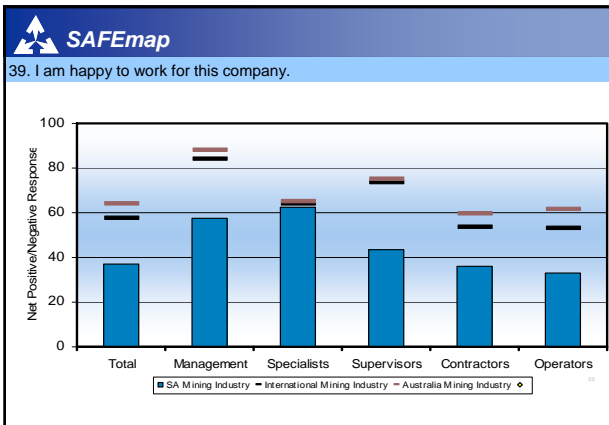










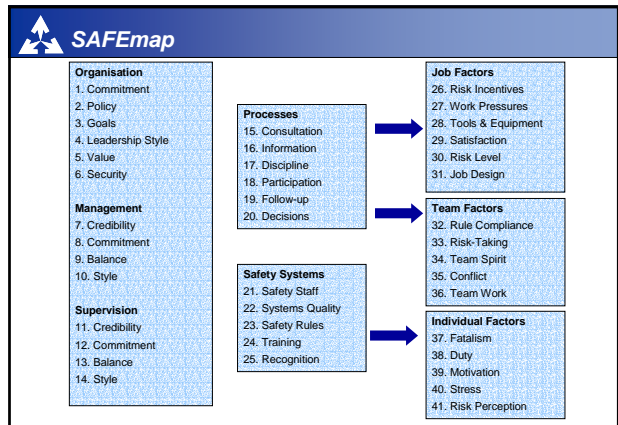


SAFemap

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By Performance



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SAFemap

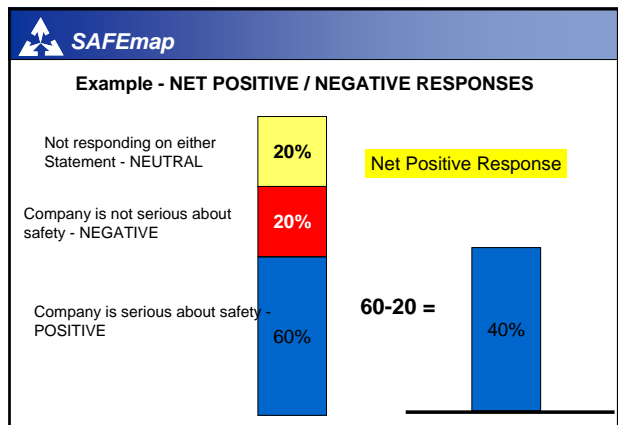
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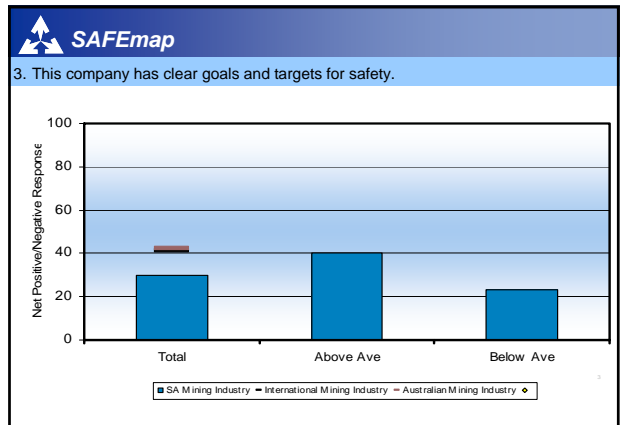
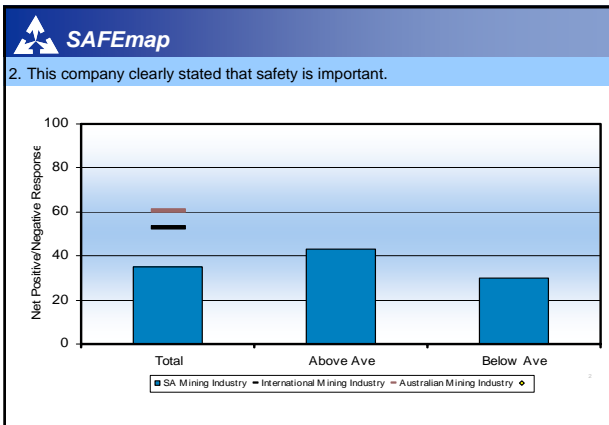
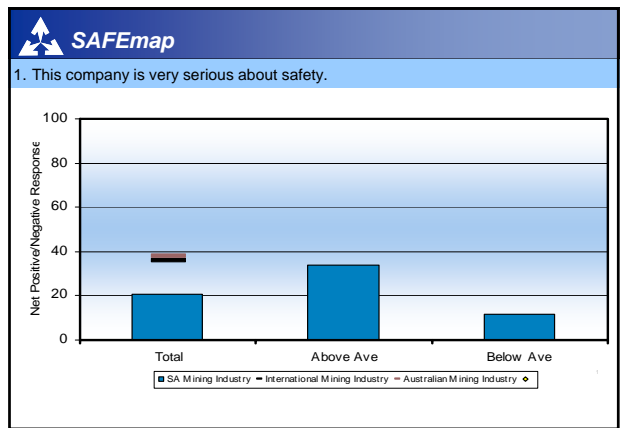
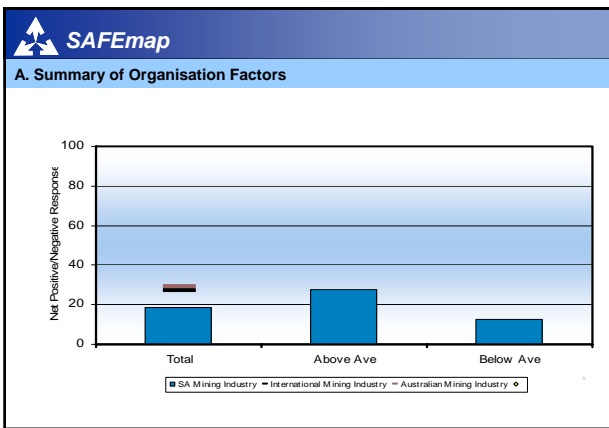
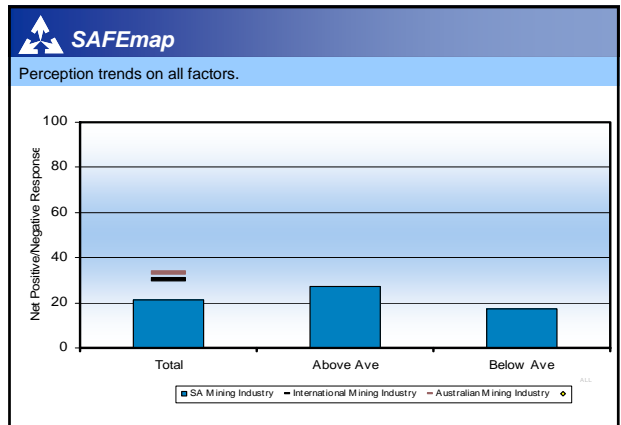
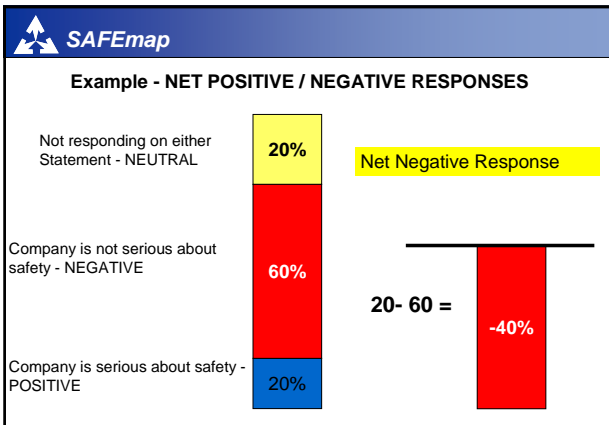
<u>Group</u>	<u>2004</u>
Total	8991
Above Average	3626
Below Average	5365

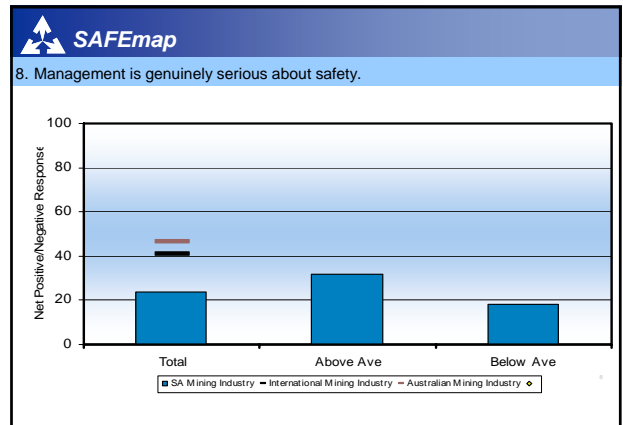
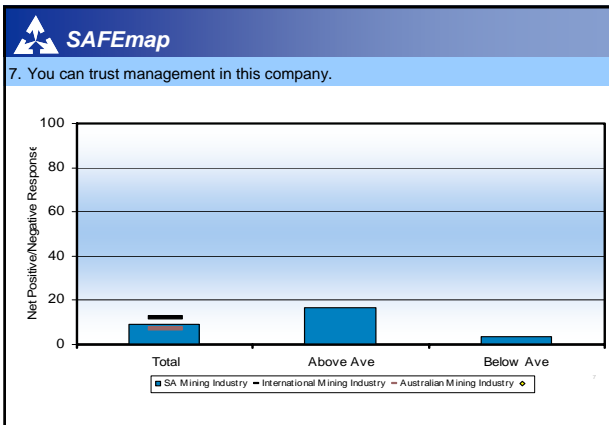
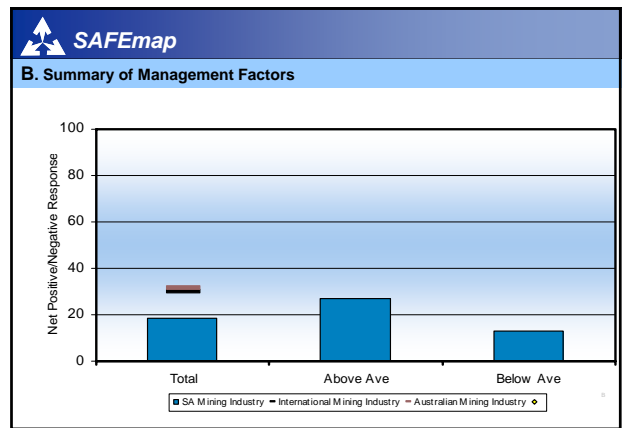
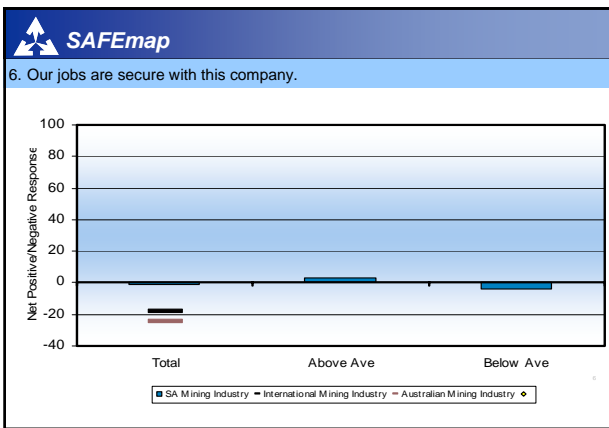
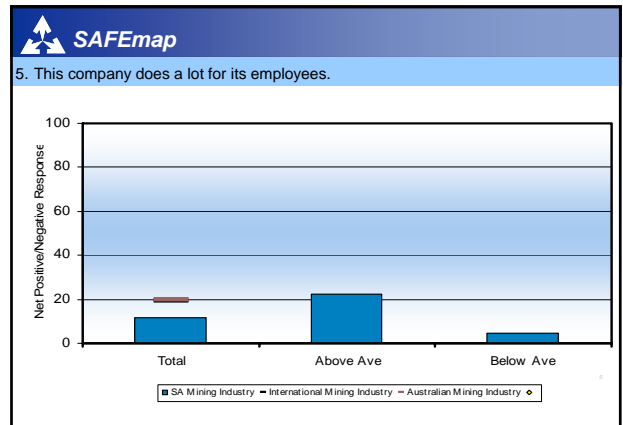
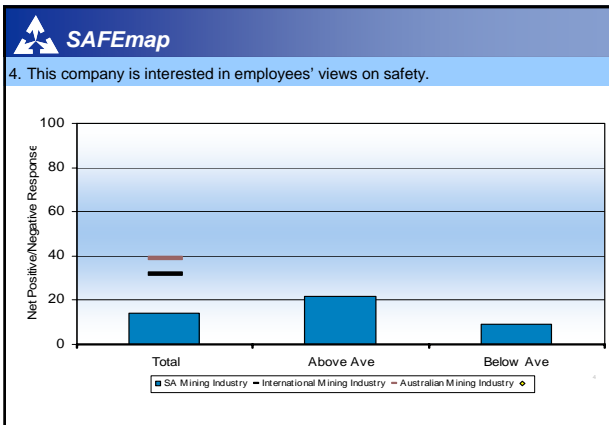
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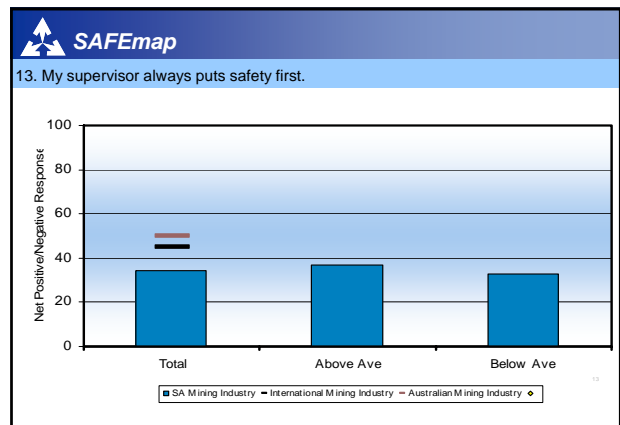
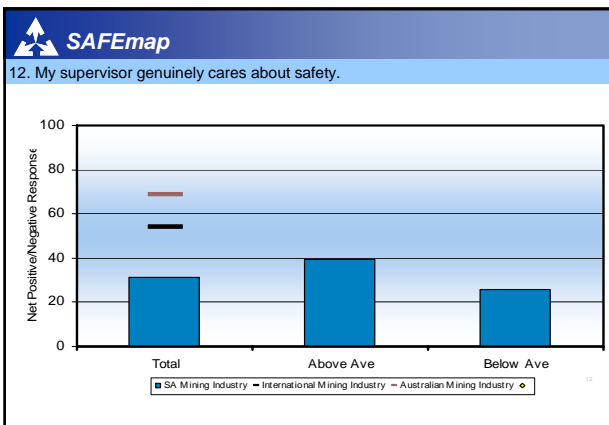
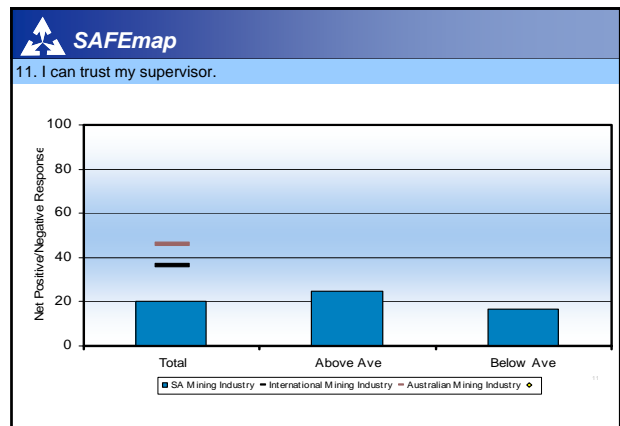
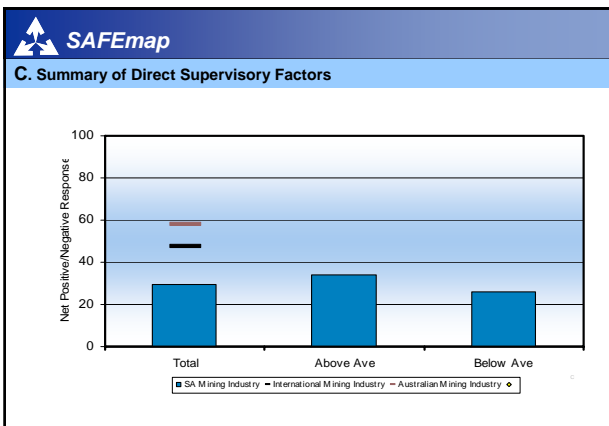
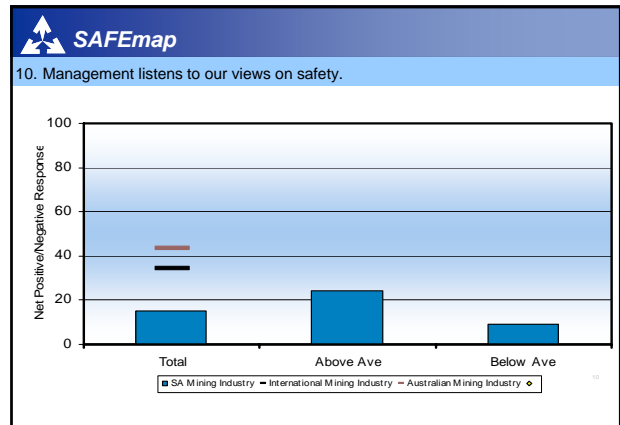
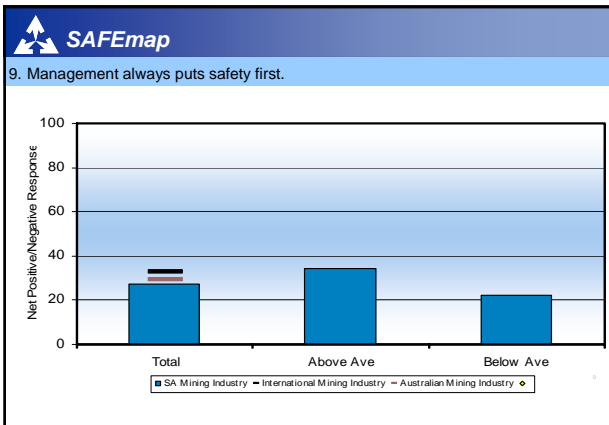
Baselines Used

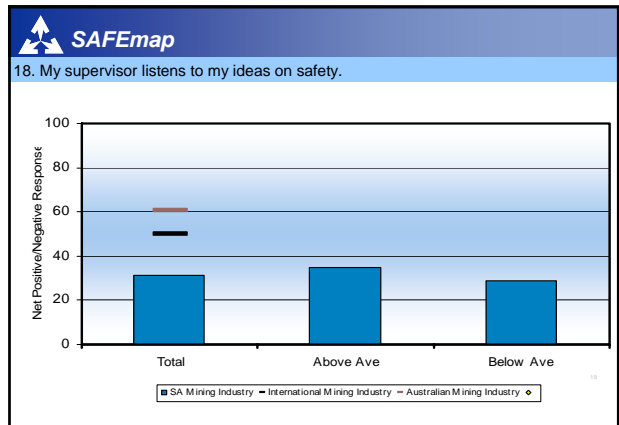
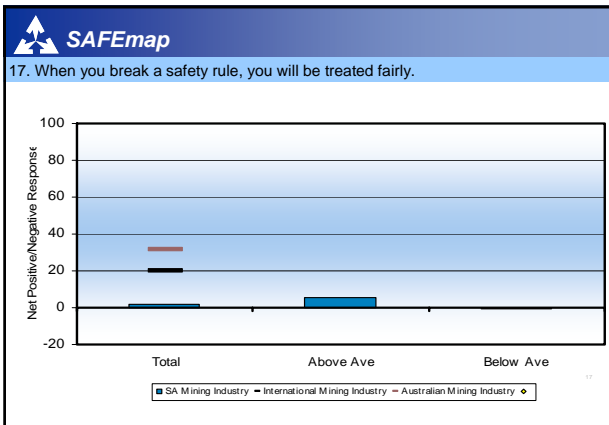
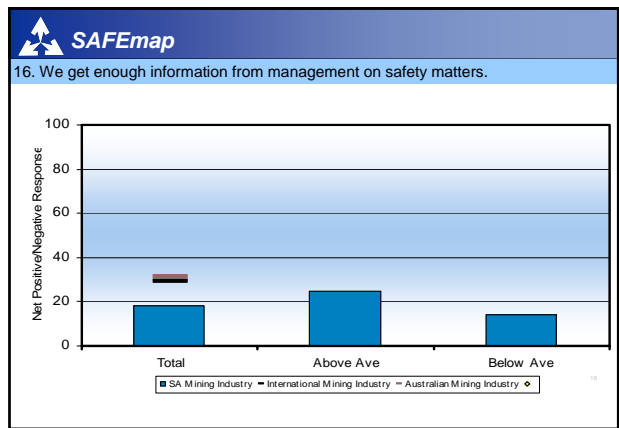
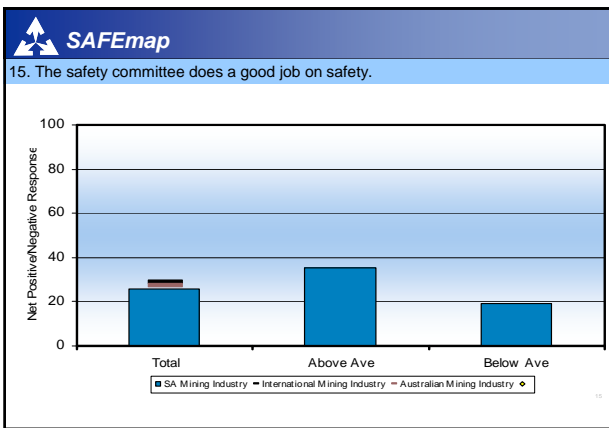
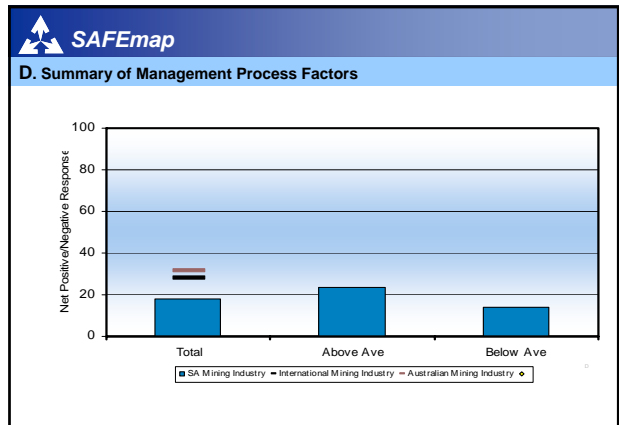
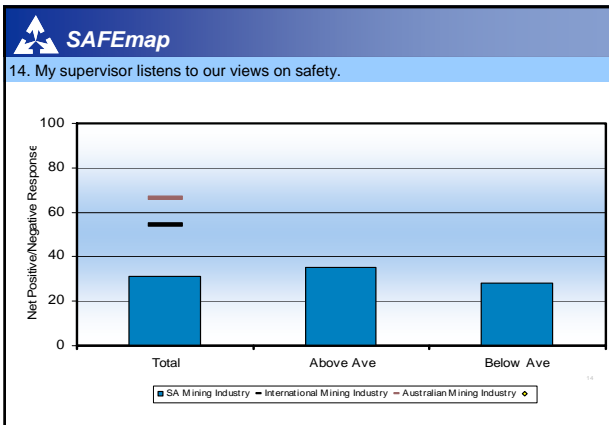
- International Mining Industry Baseline
- Australia Mining Industry Baseline

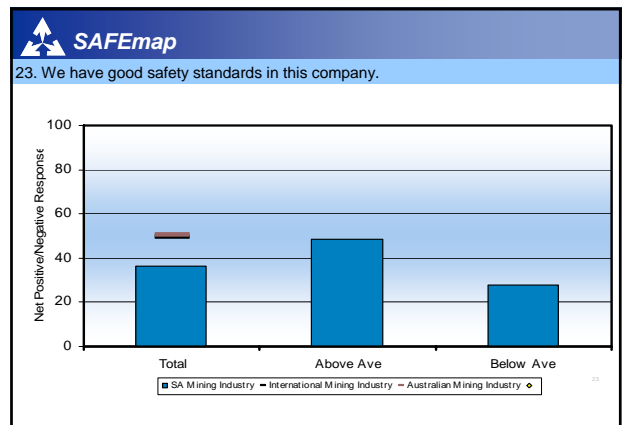
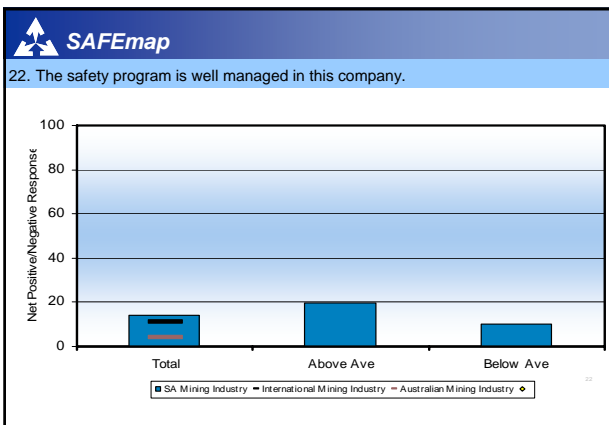
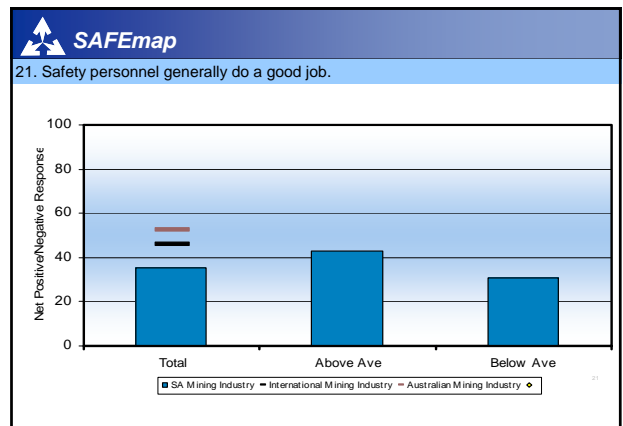
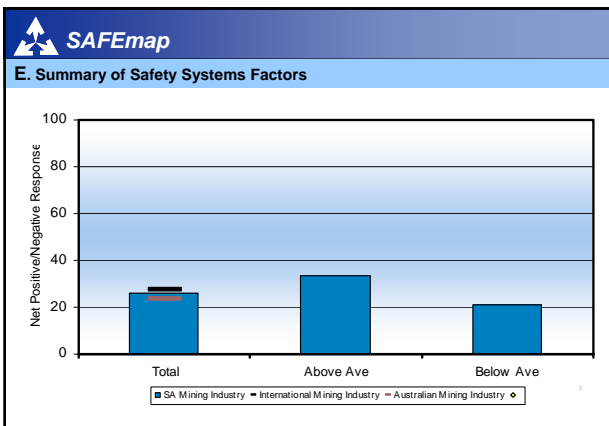
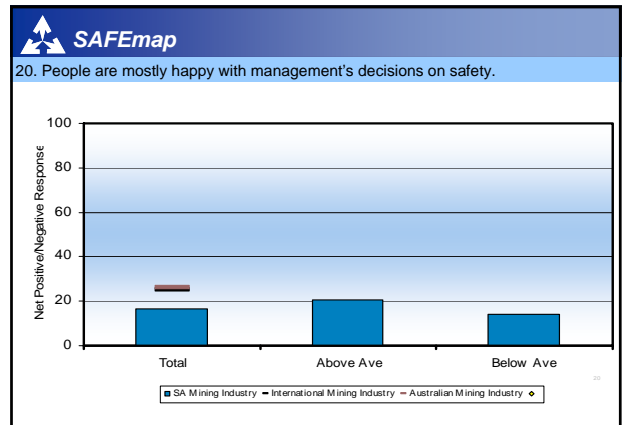
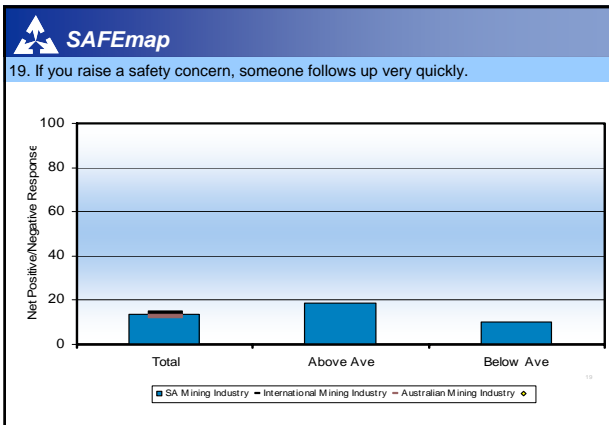


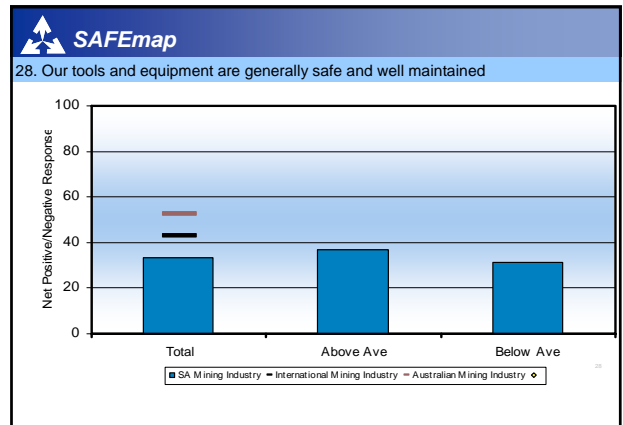
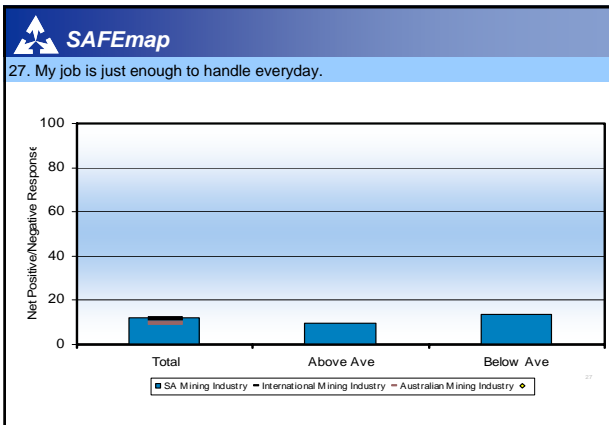
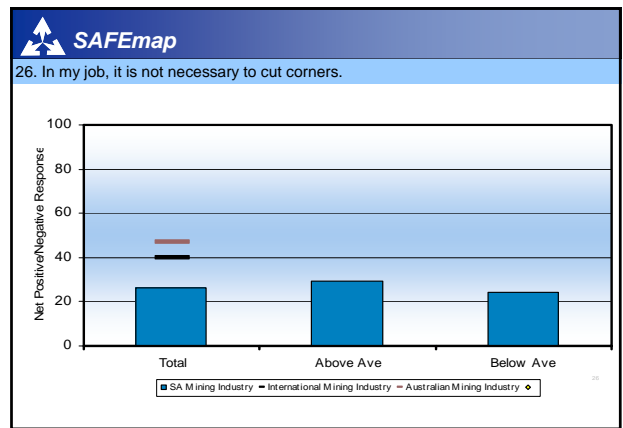
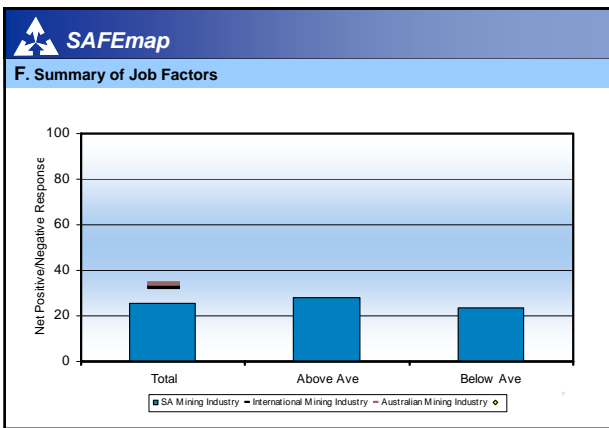
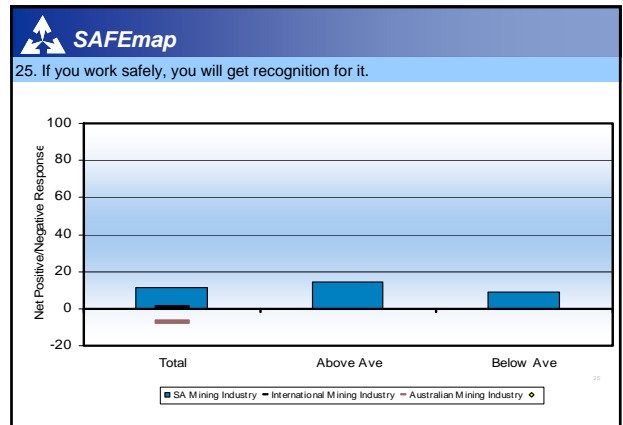
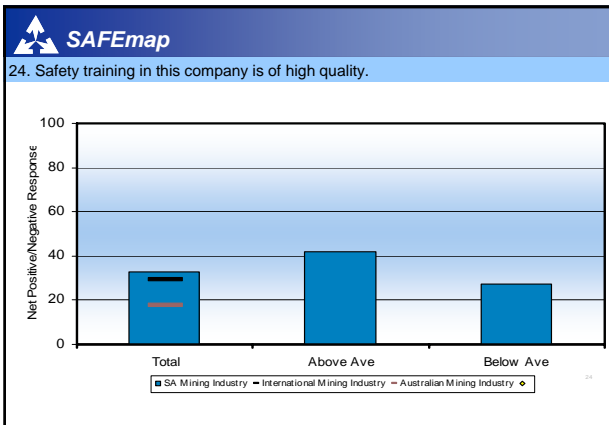


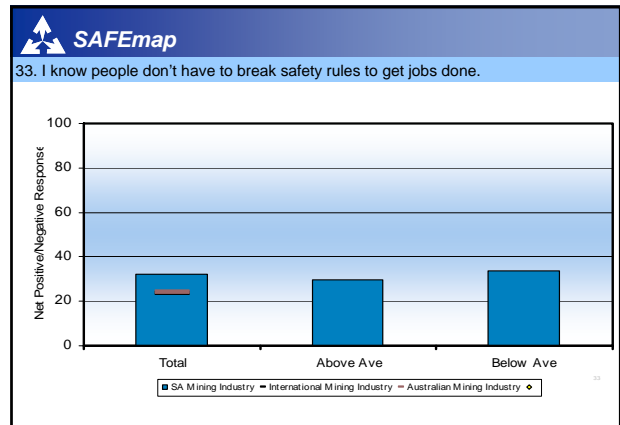
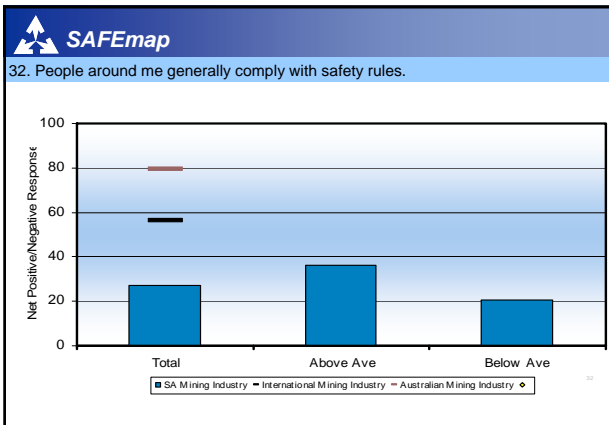
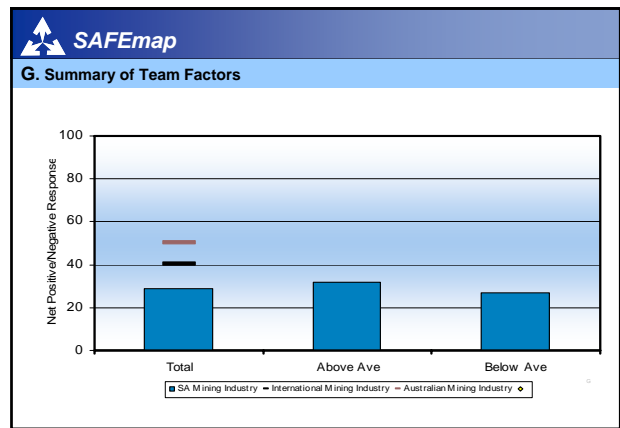
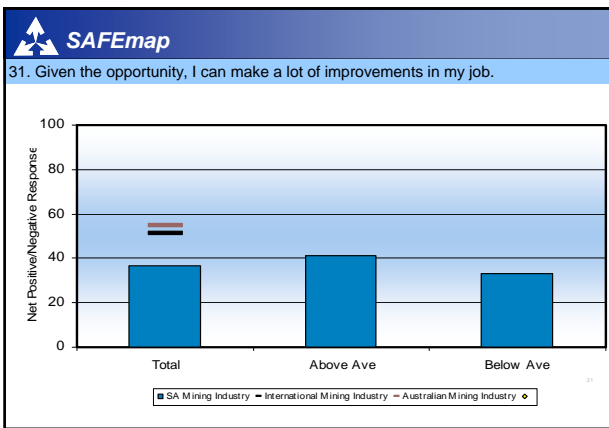
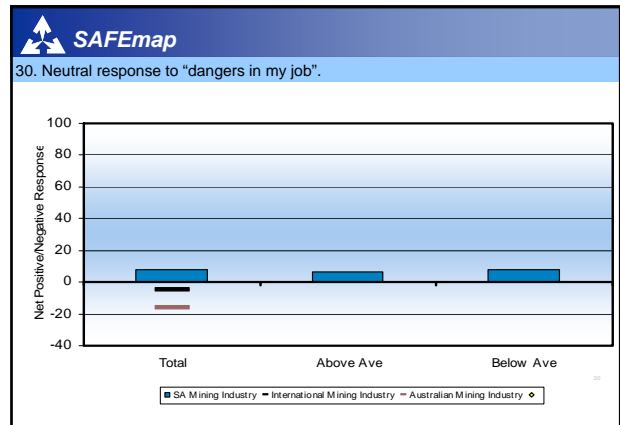
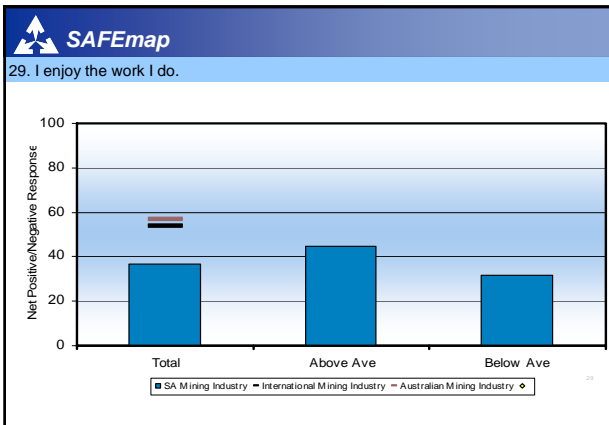


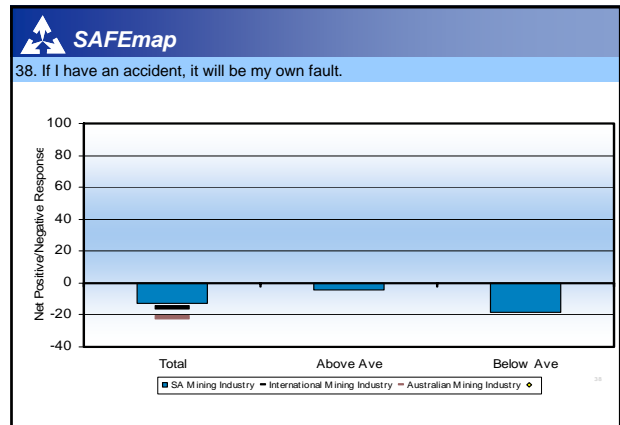
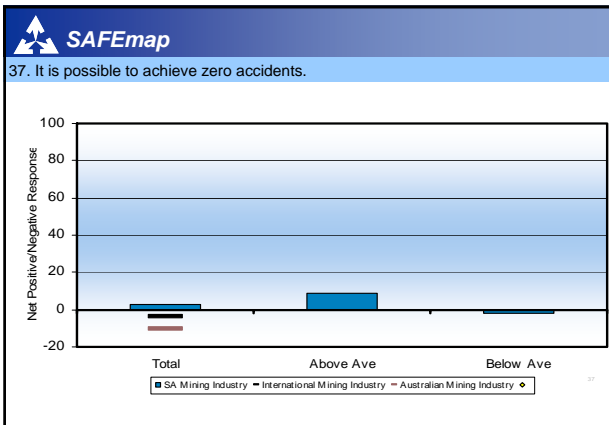
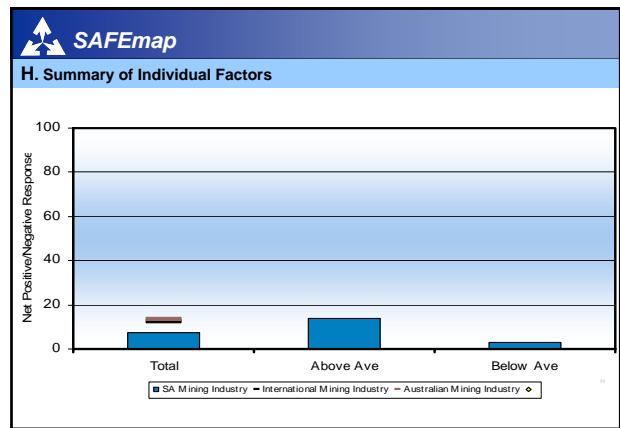
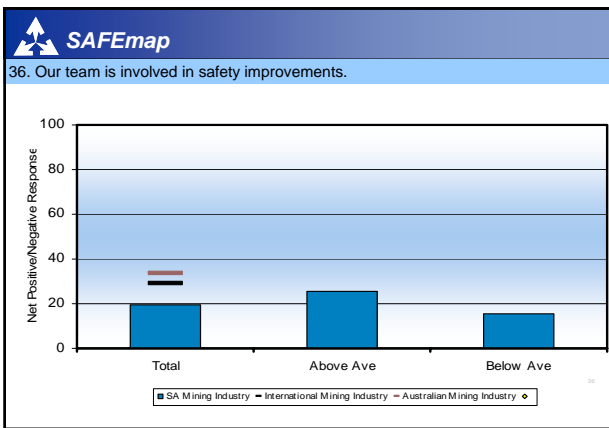
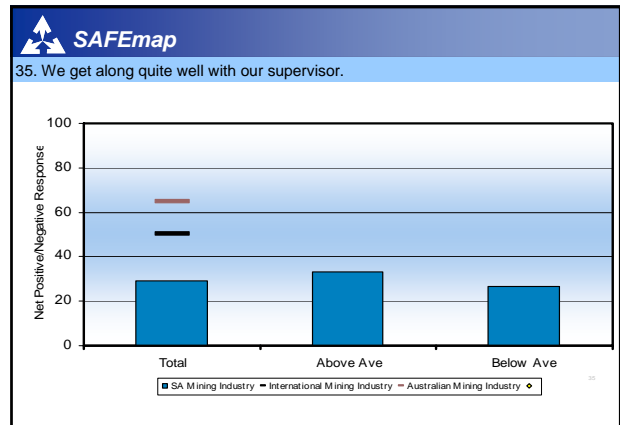
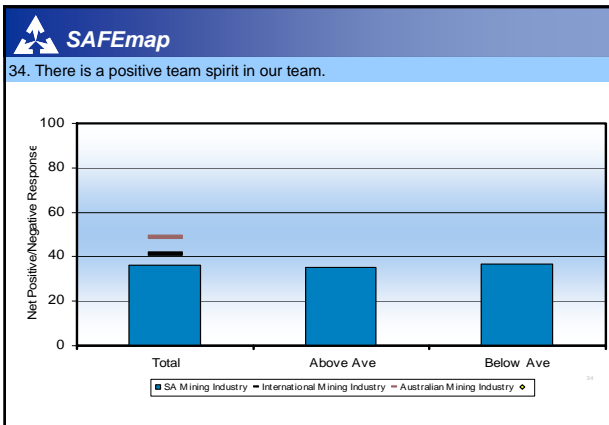


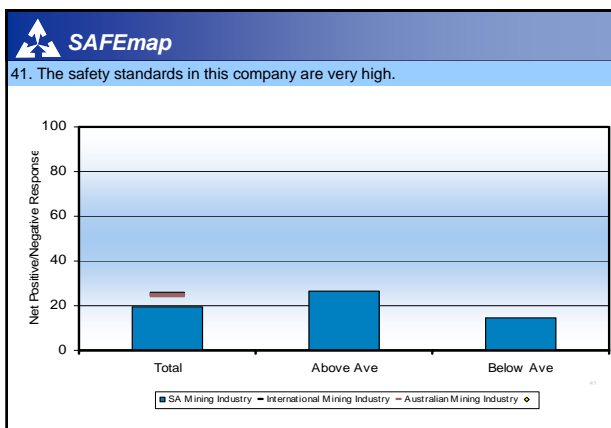
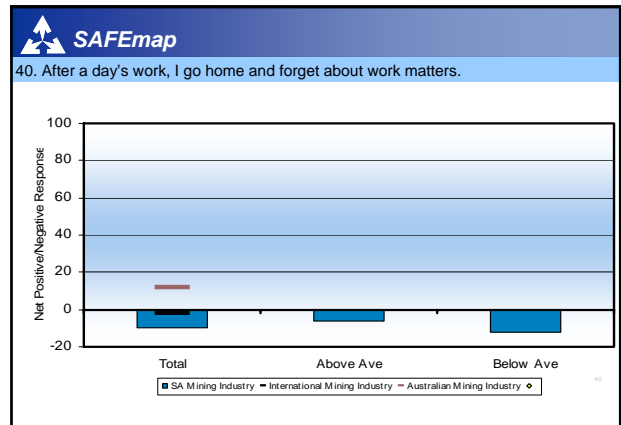
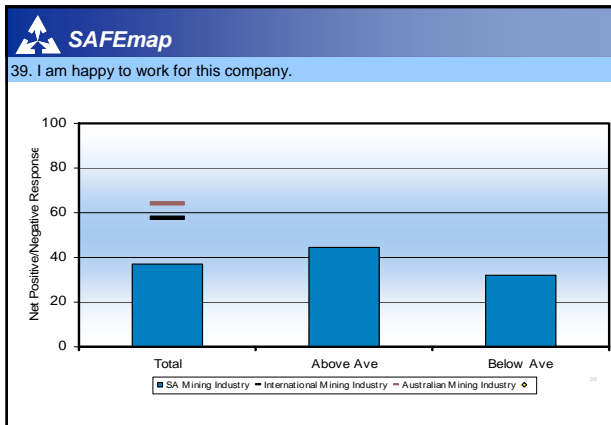










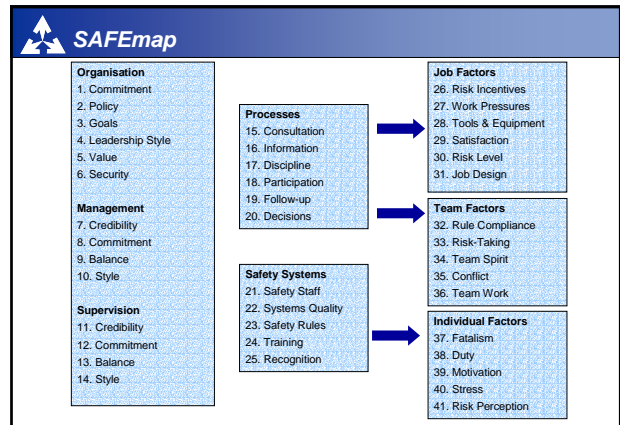


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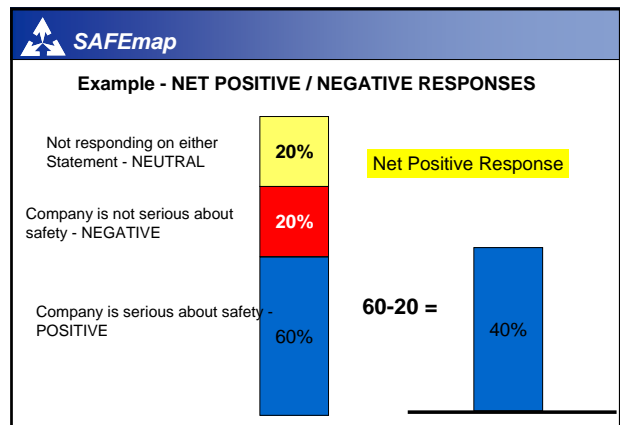
Groups Samples

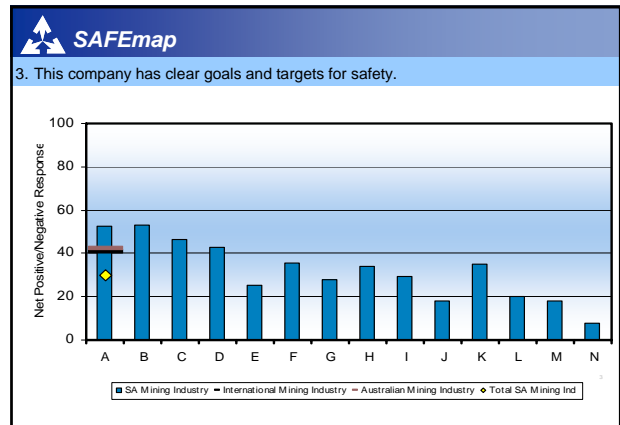
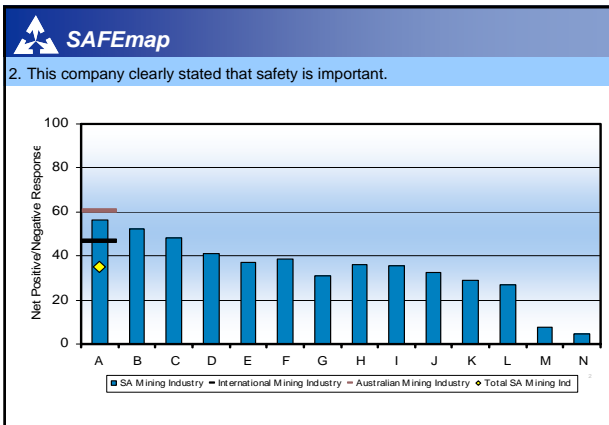
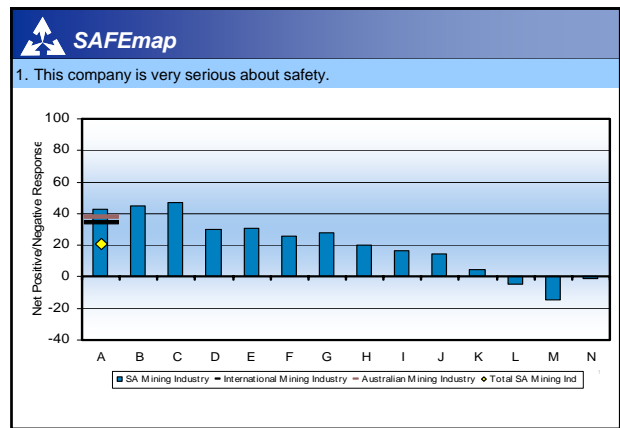
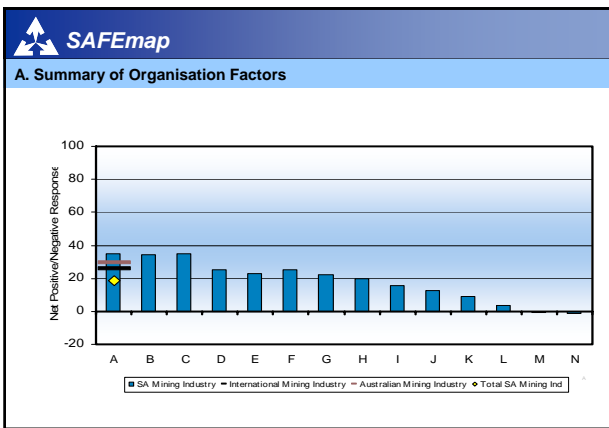
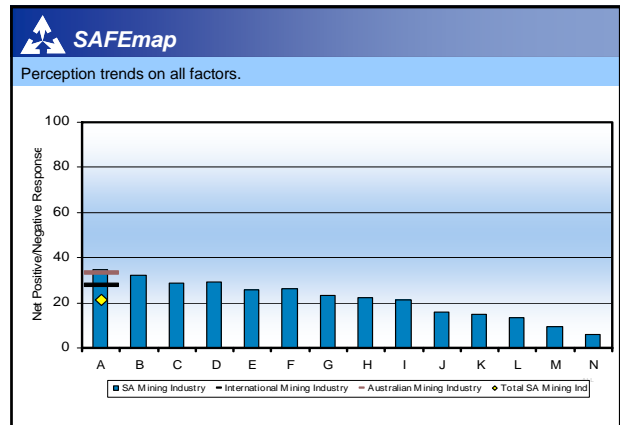
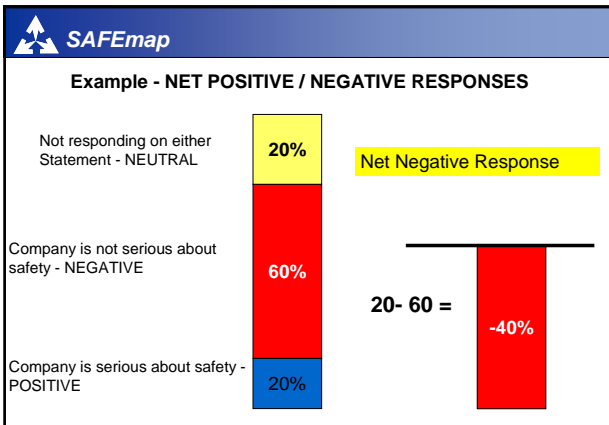
Group	2004
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B	301
C	725
D	470
E	392
F	557
G	584
H	681
I	579
J	2397
K	182
L	550
M	643
N	169

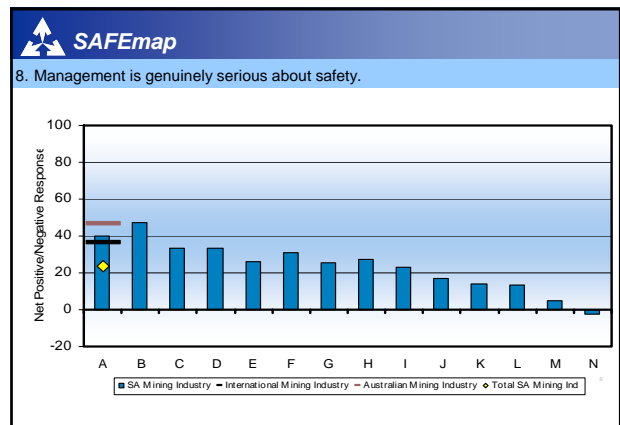
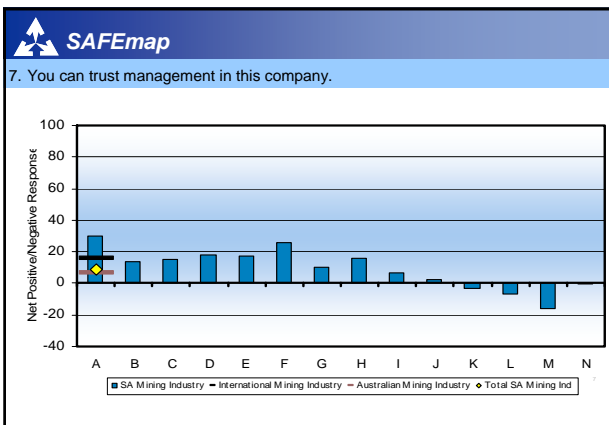
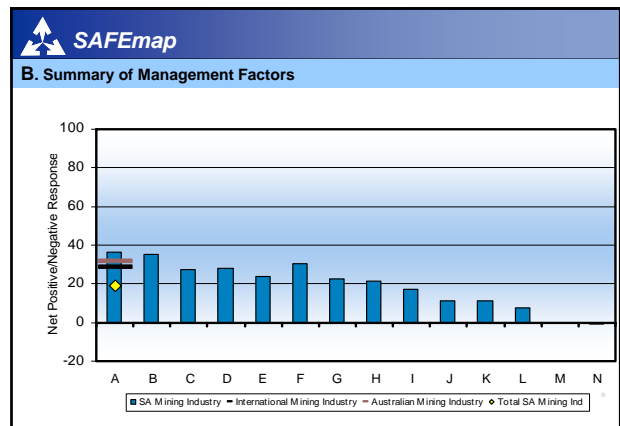
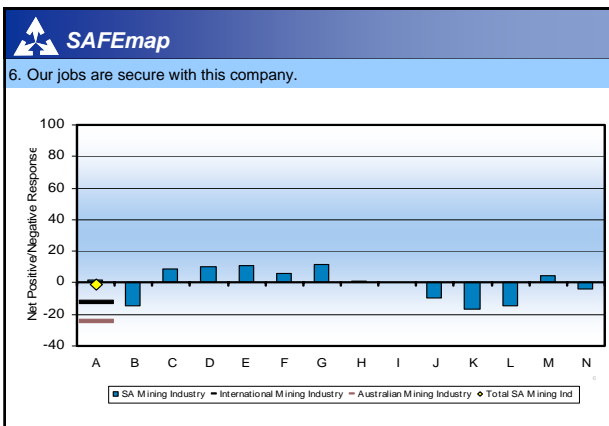
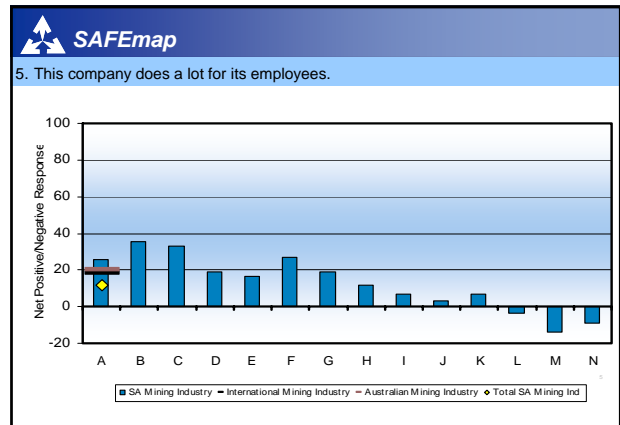
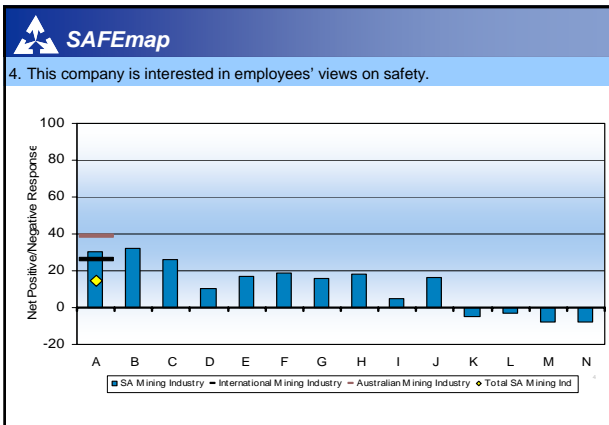
SAFemap

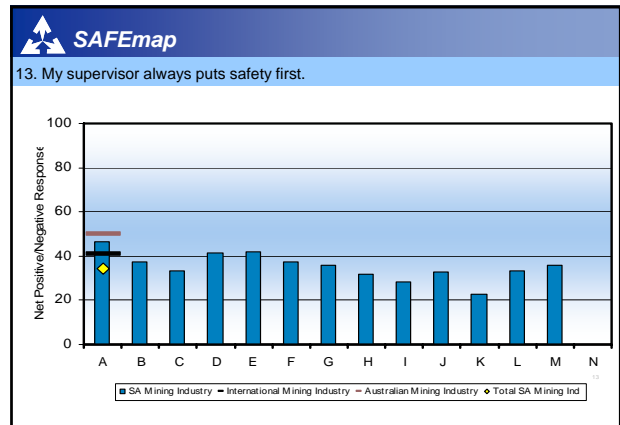
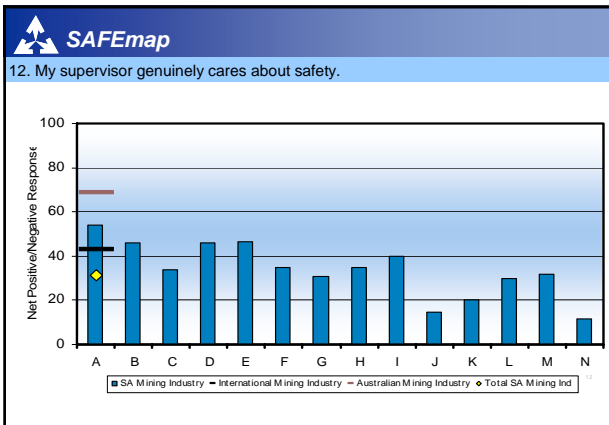
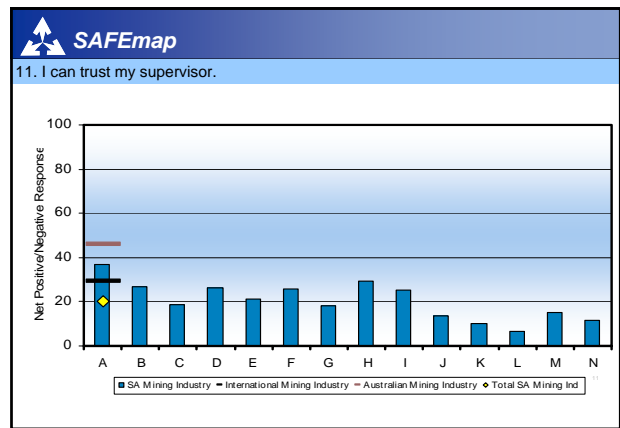
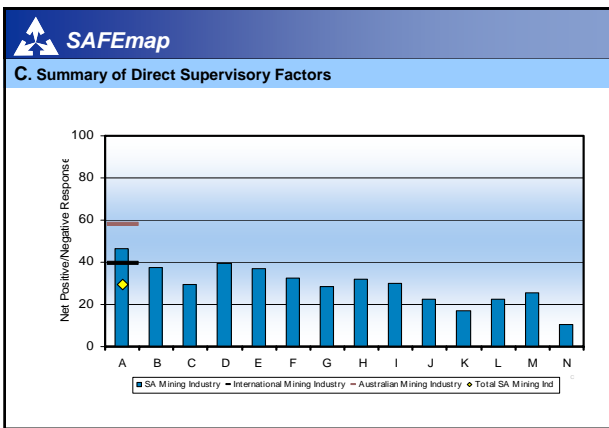
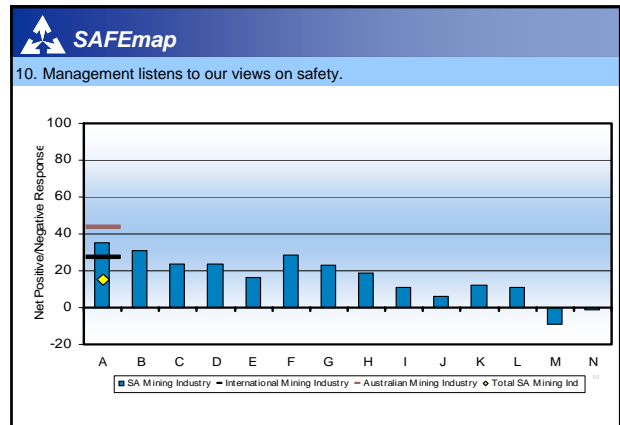
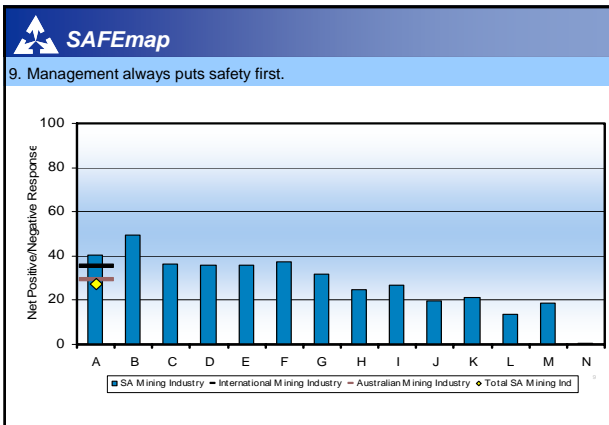
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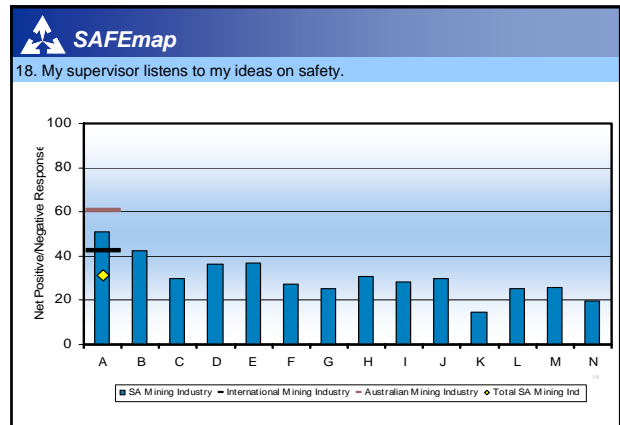
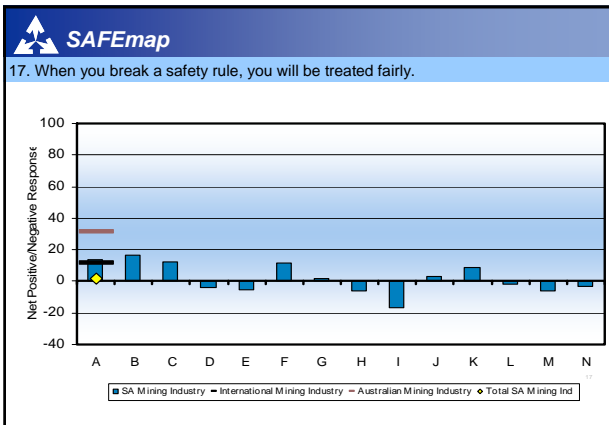
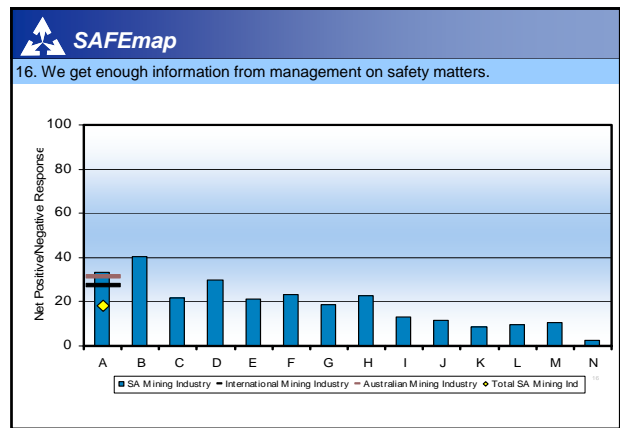
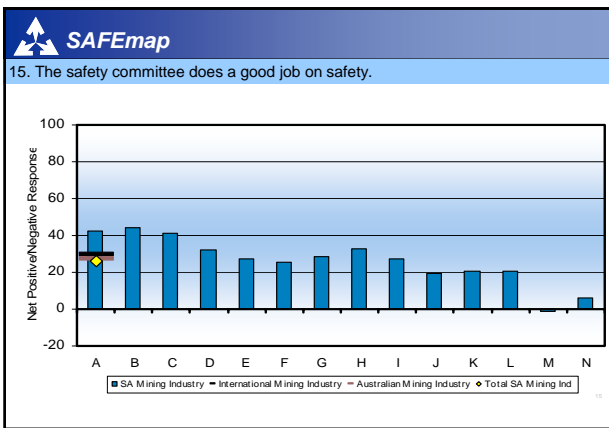
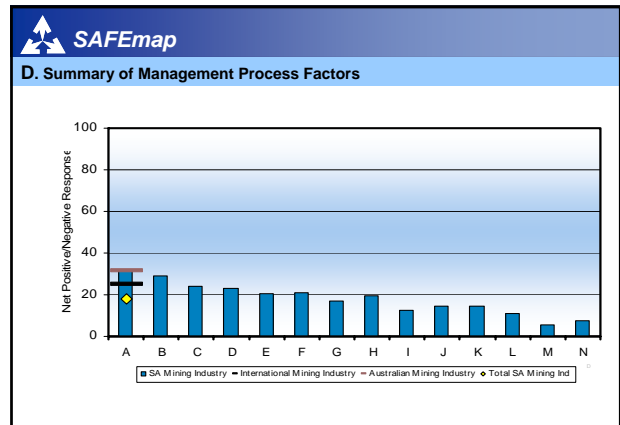
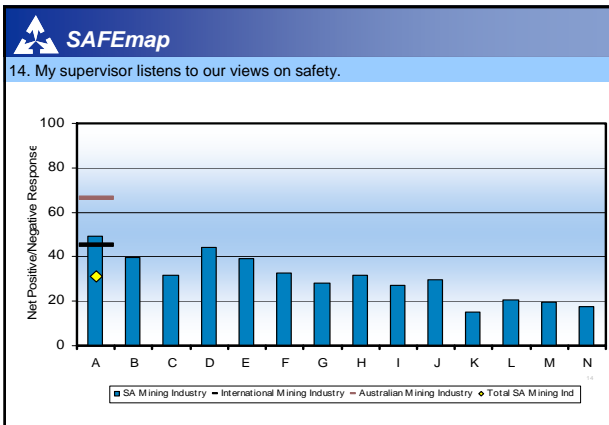
- International Mining Industry Baseline
- Australia Mining Industry Baseline
- ◊ Total SA mining Industry Baseline

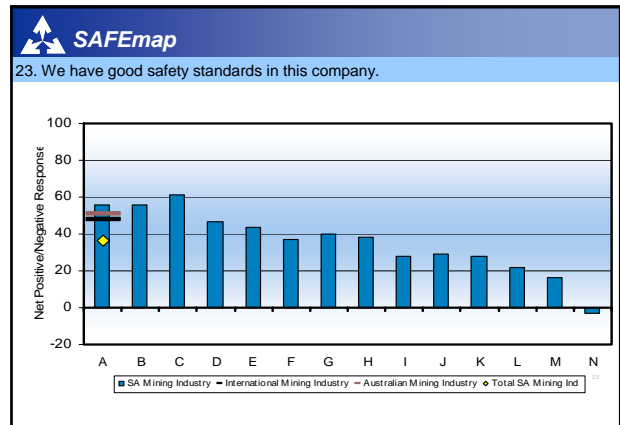
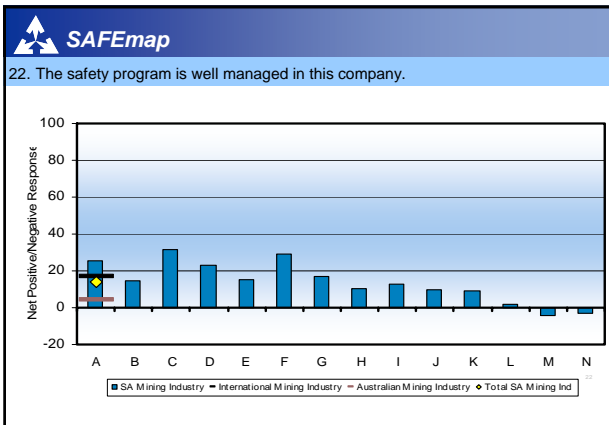
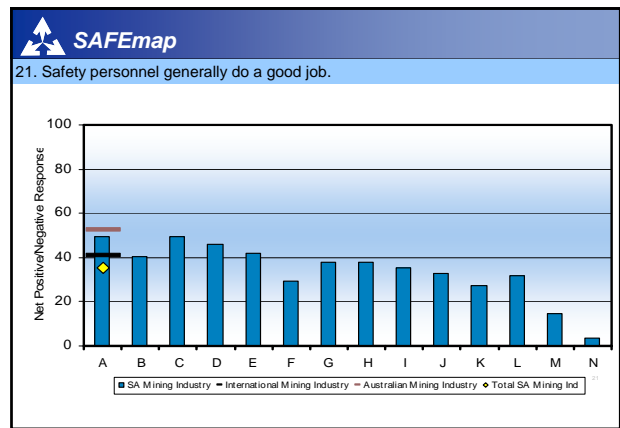
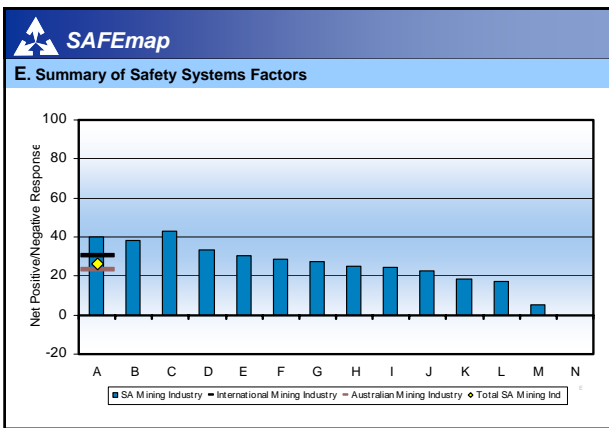
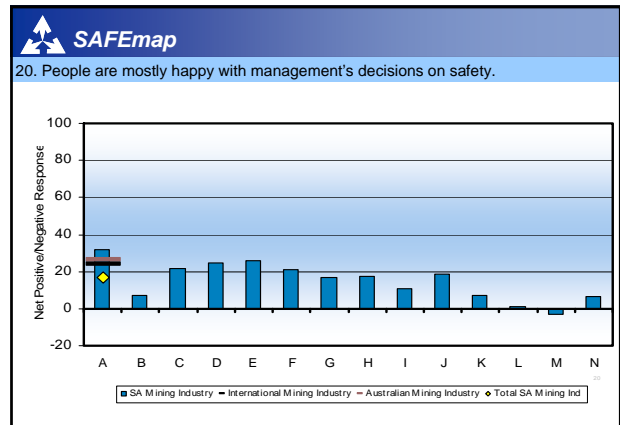
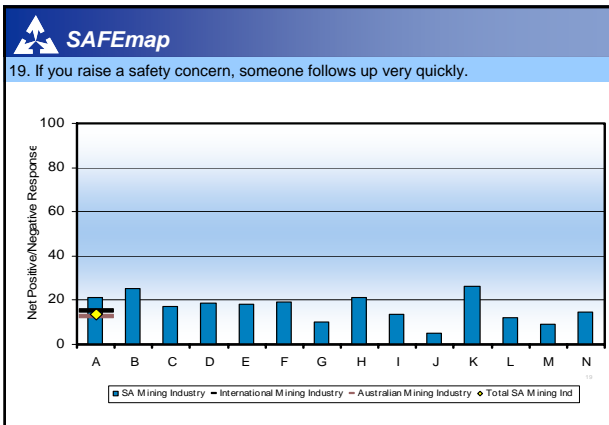


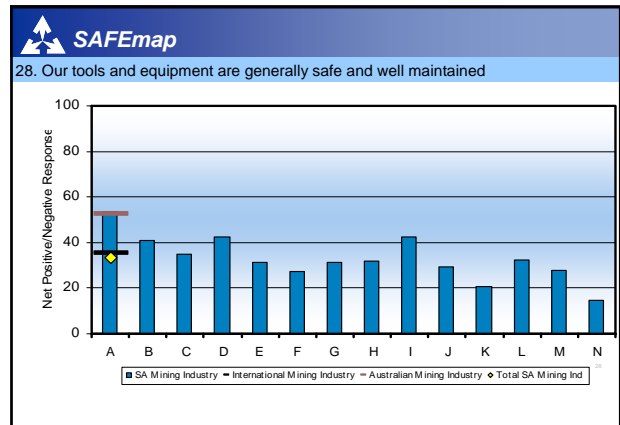
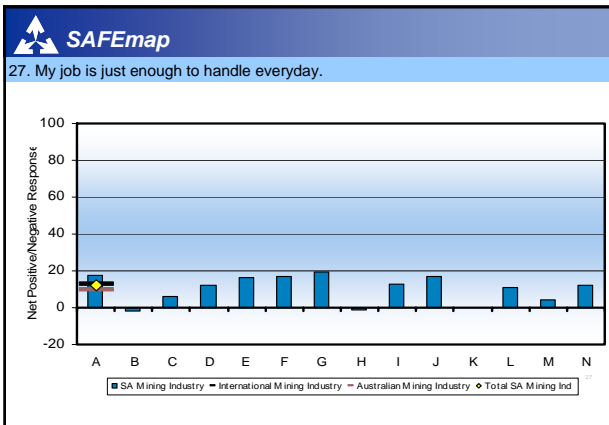
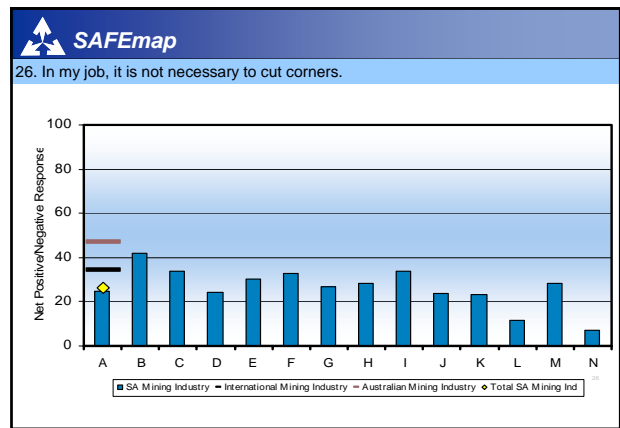
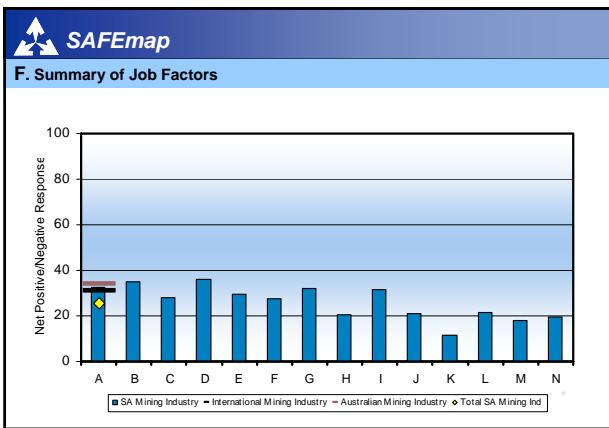
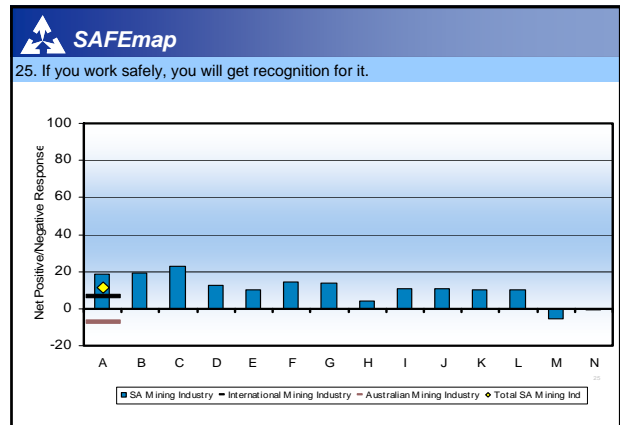
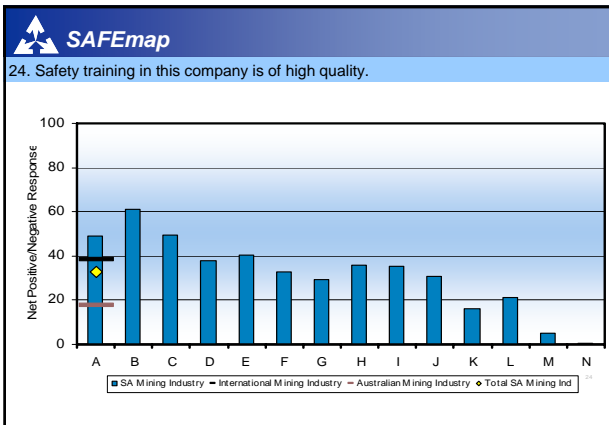


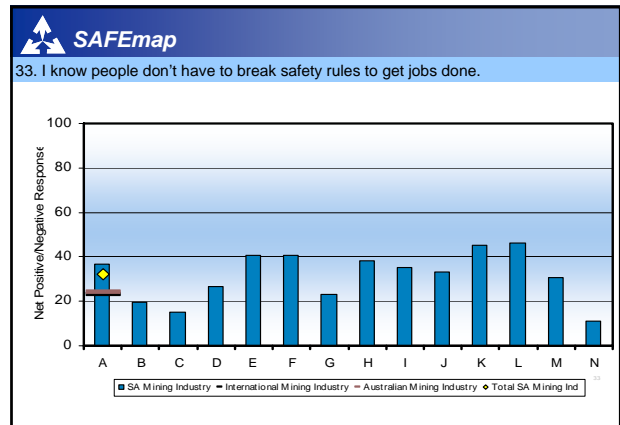
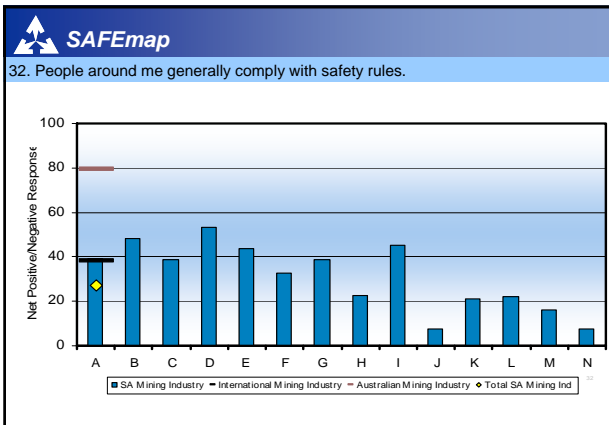
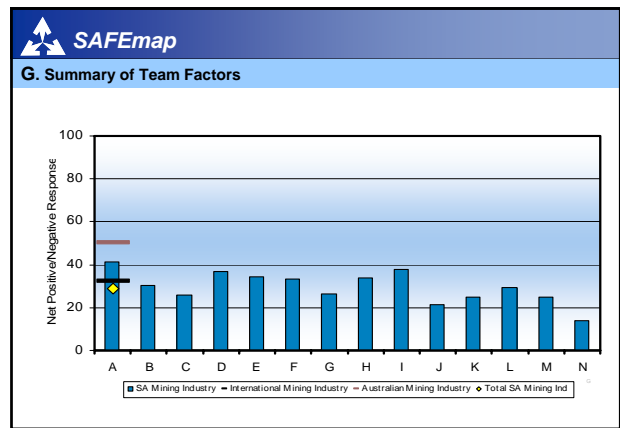
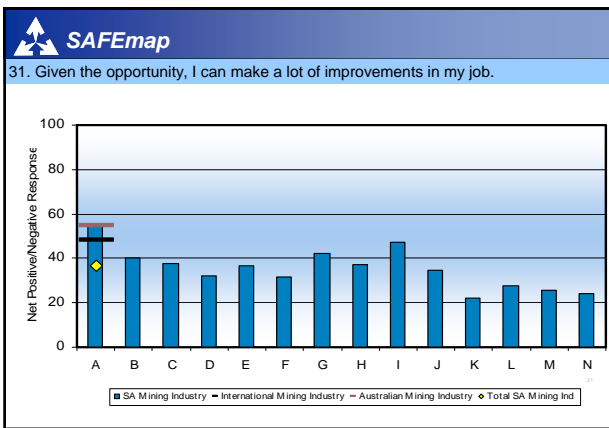
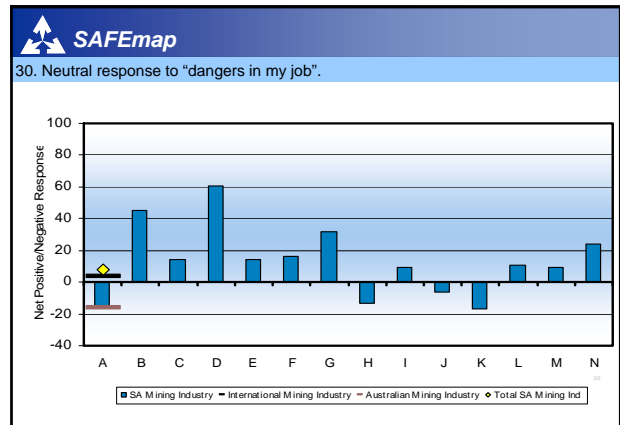
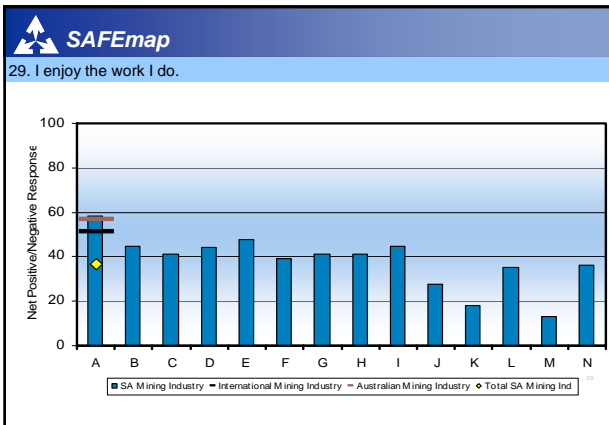


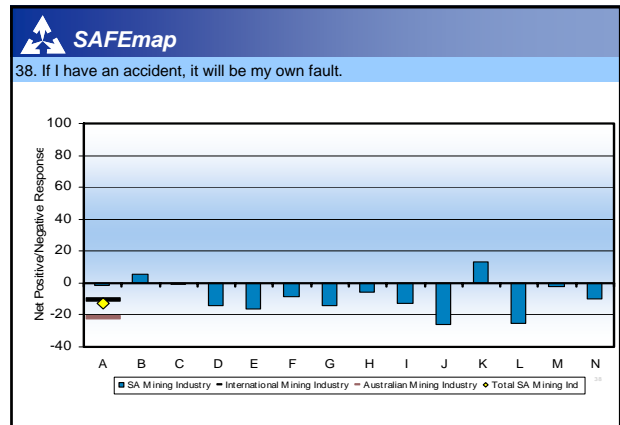
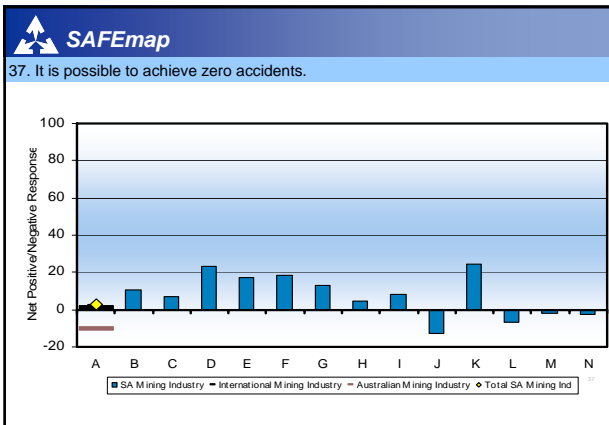
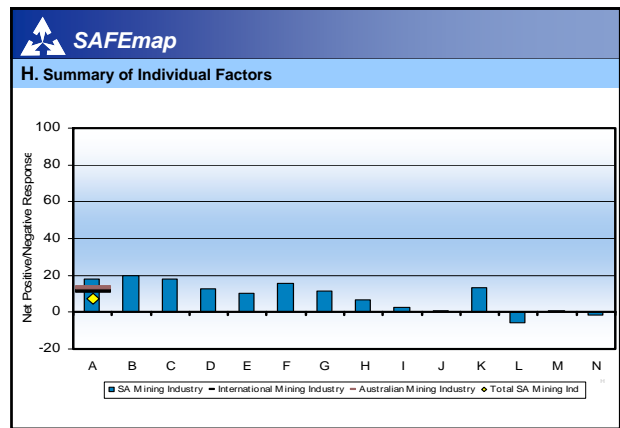
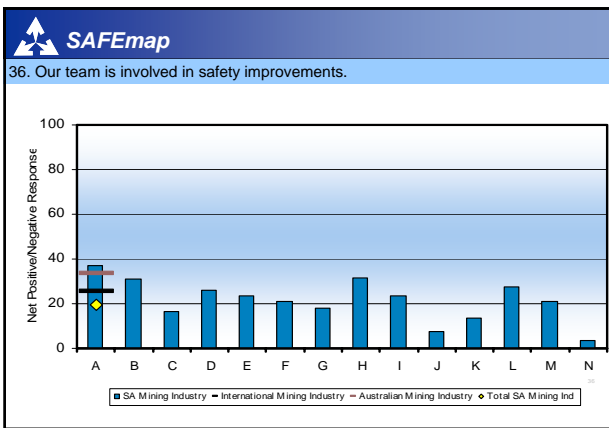
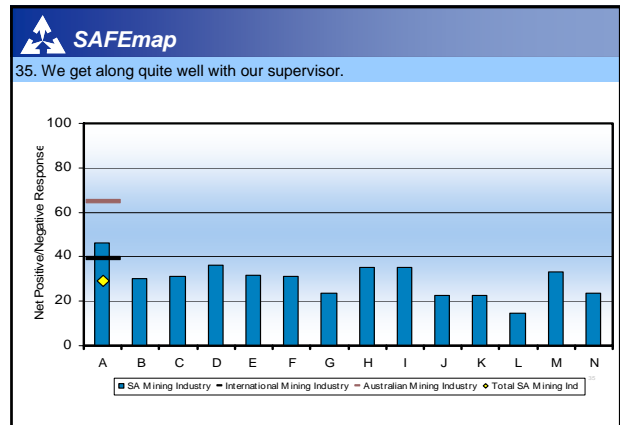
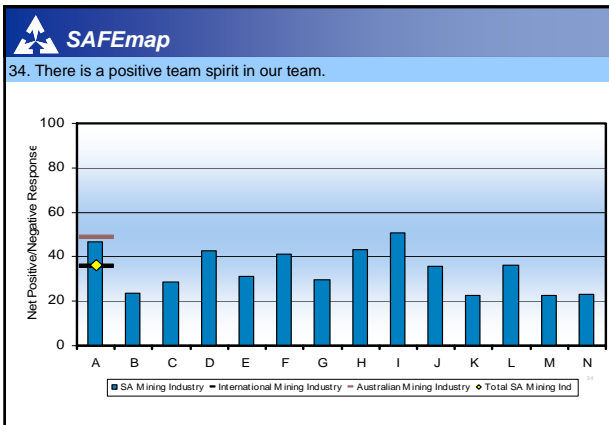


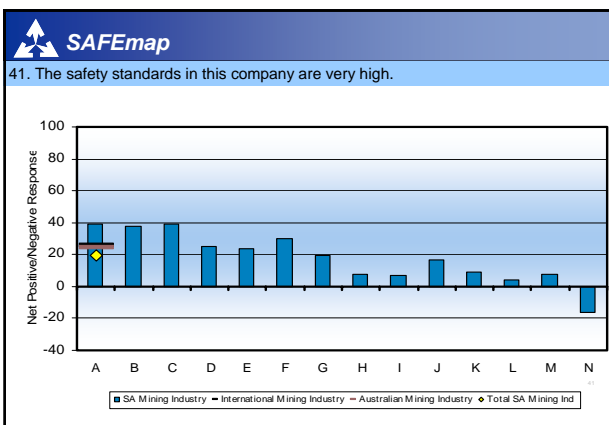
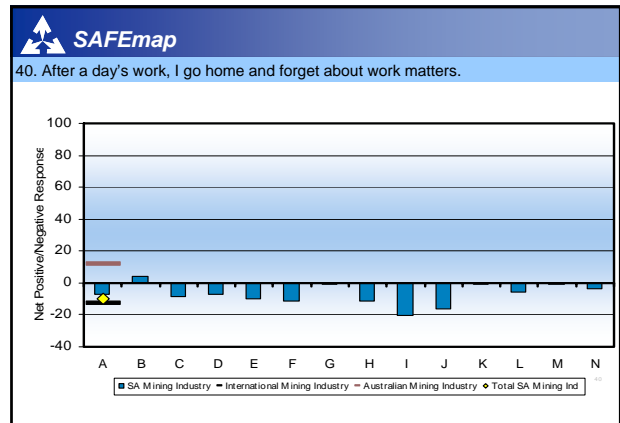
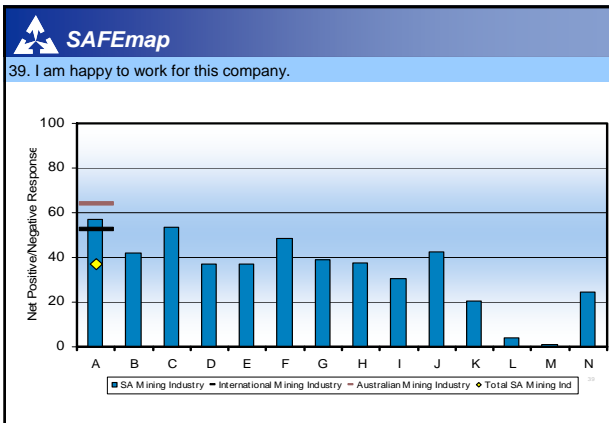










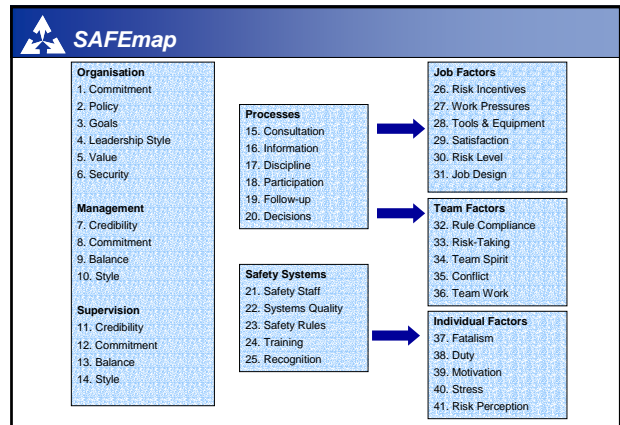


SAFemap

SAFETY CULTURE SURVEY

A Survey of the Health & Safety Culture in the South African Mining Industry

By Mining Sector



SAFemap

Notes on Report

The outcomes of this survey must be viewed as trends and perceptions, NOT as facts. While the reality on any given factor may be different, the perceptions of people are their realities.

SAFemap

Groups Samples

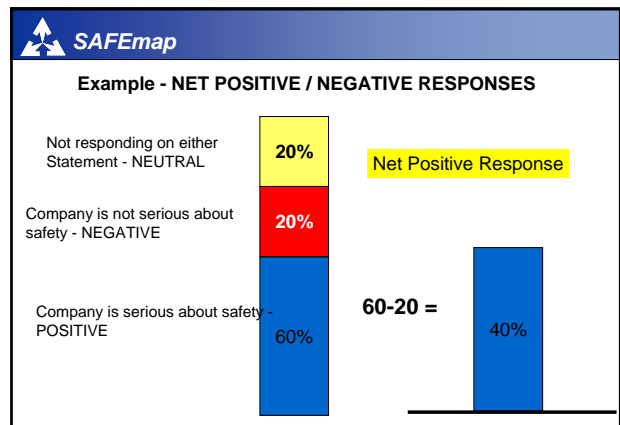
<u>Group</u>	<u>2004</u>
Total	8991
Gold Mines	4351
Diamond Mines	1478
Coal Mines	1601
Other	1561

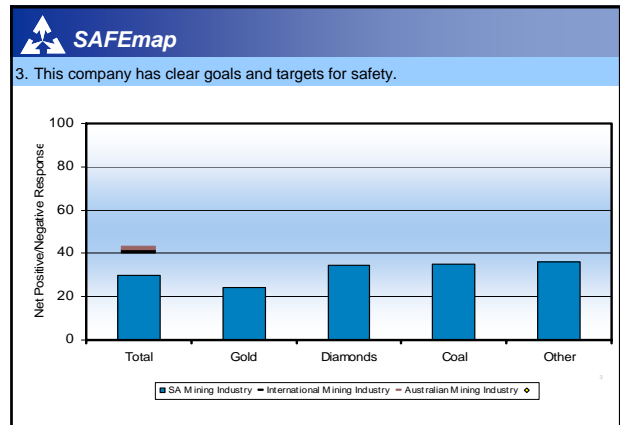
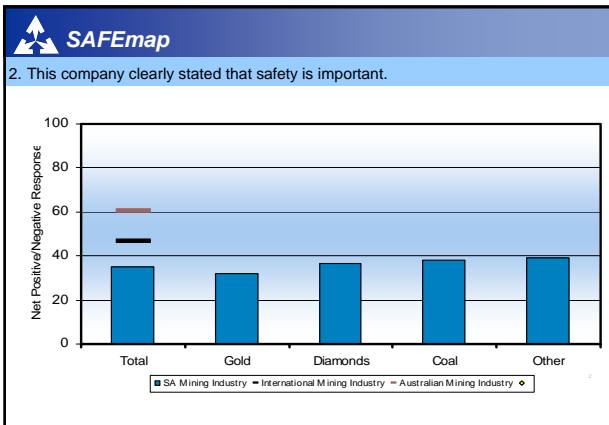
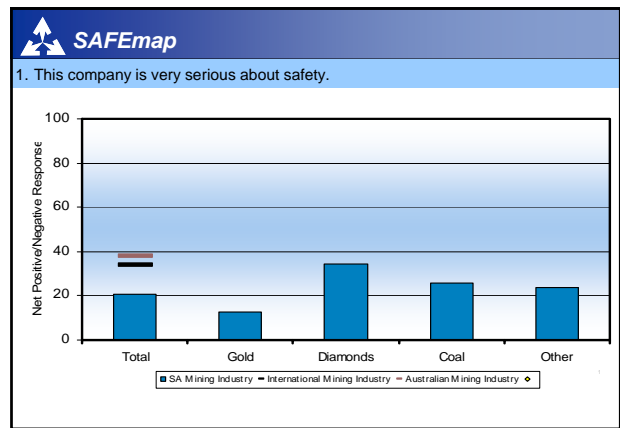
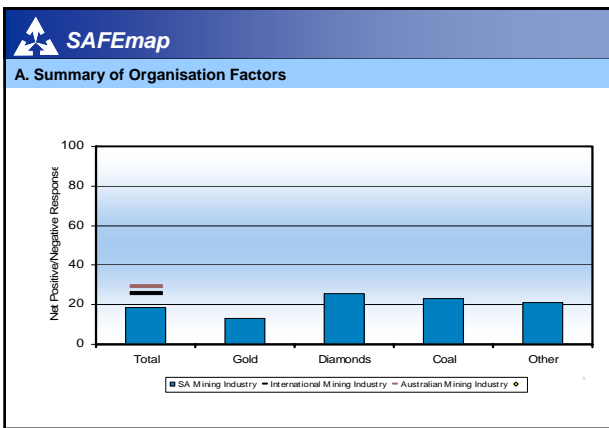
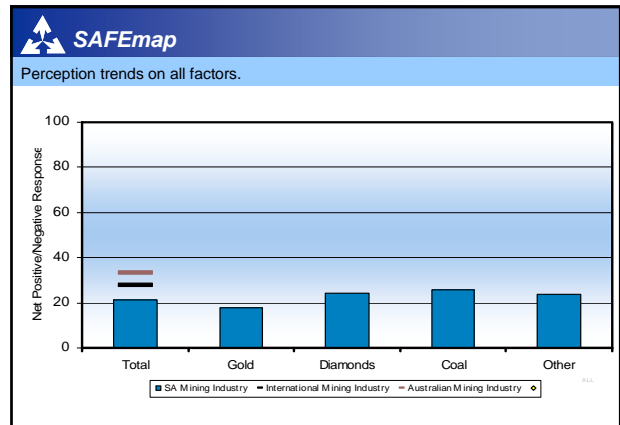
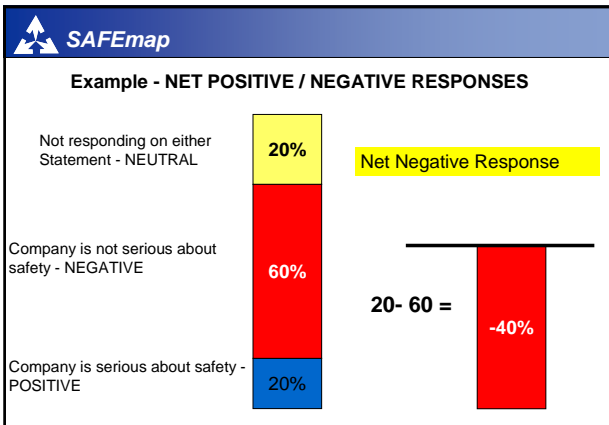
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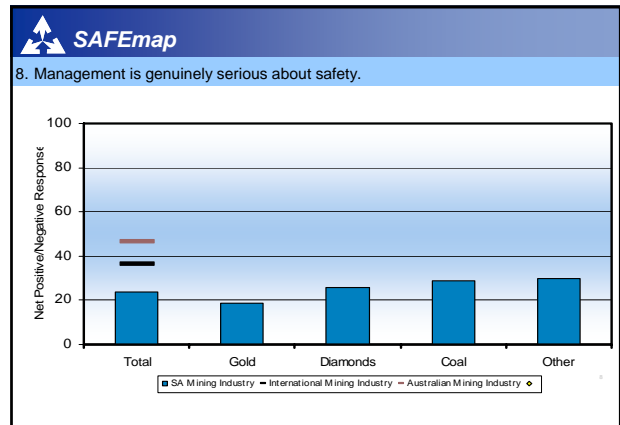
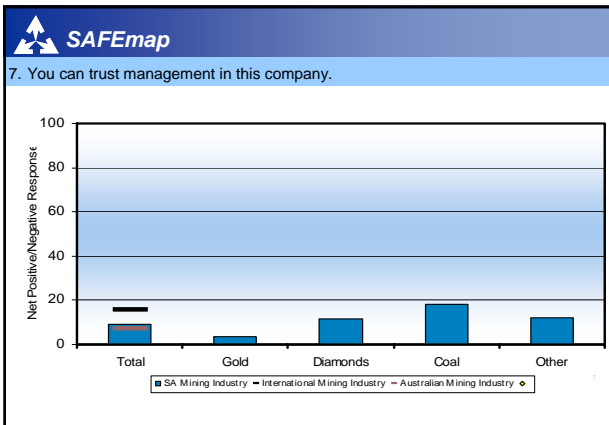
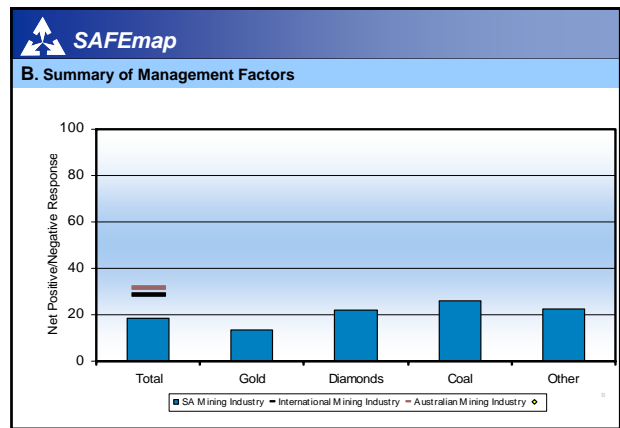
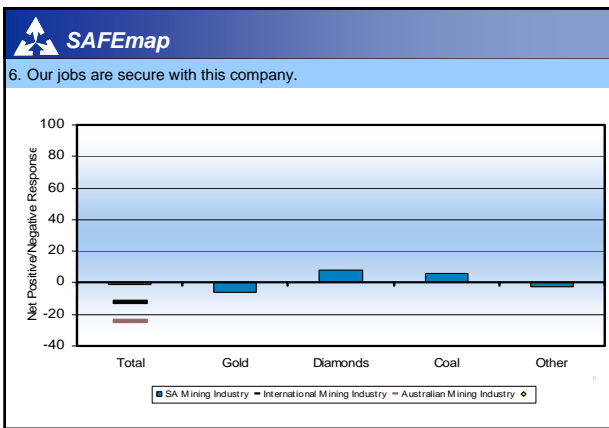
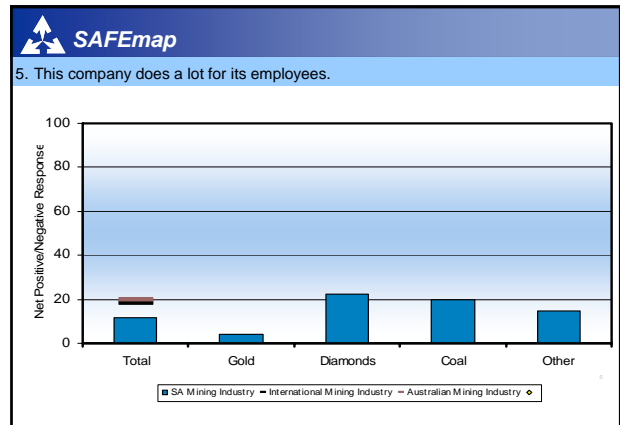
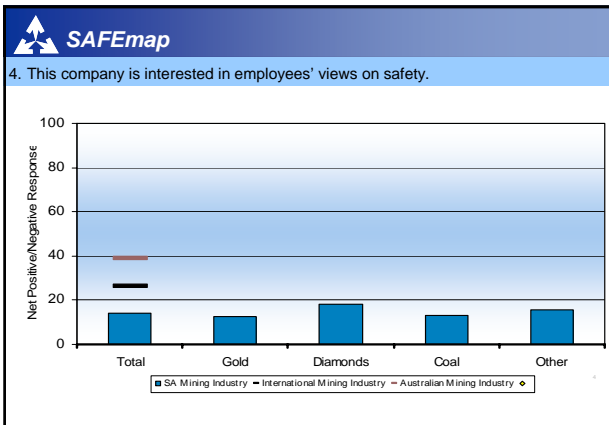
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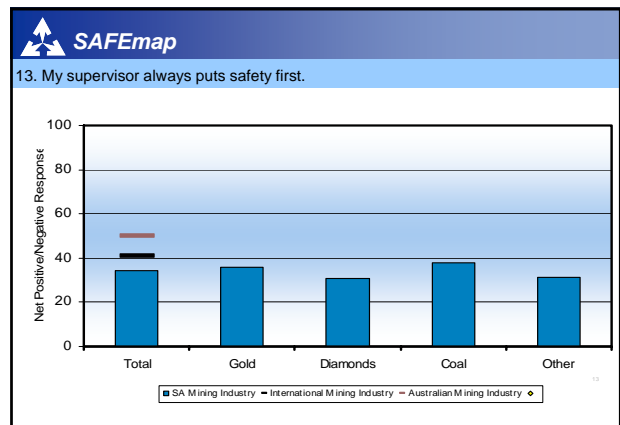
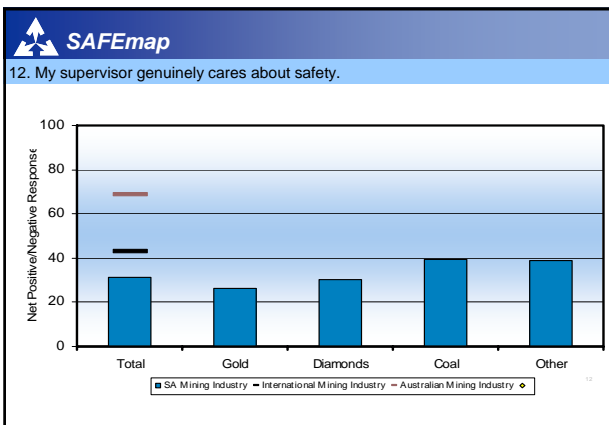
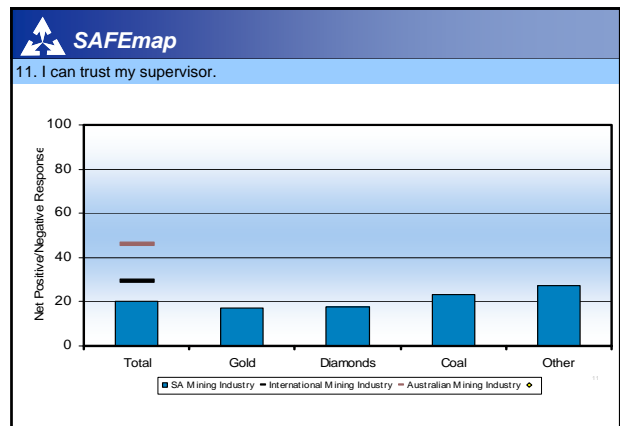
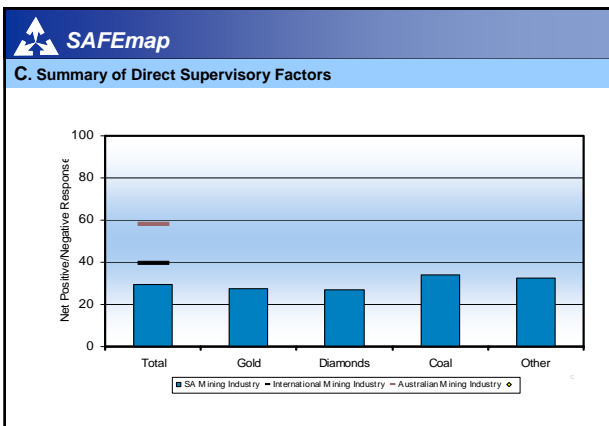
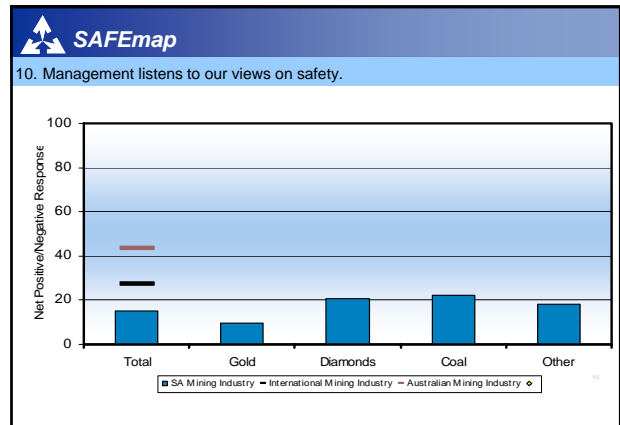
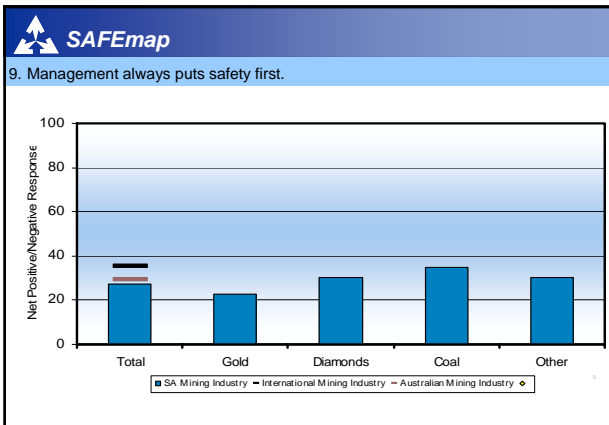
— International Mining Industry Baseline

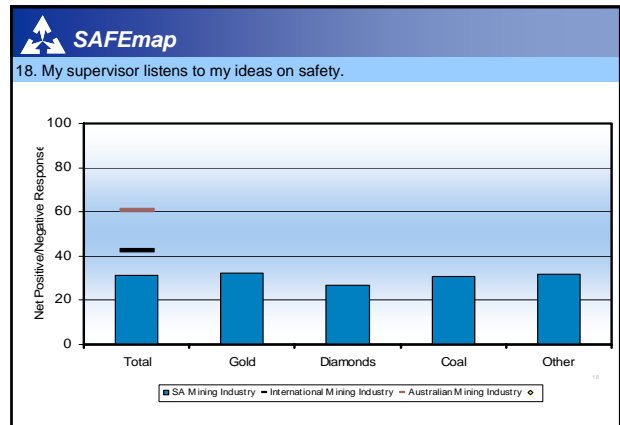
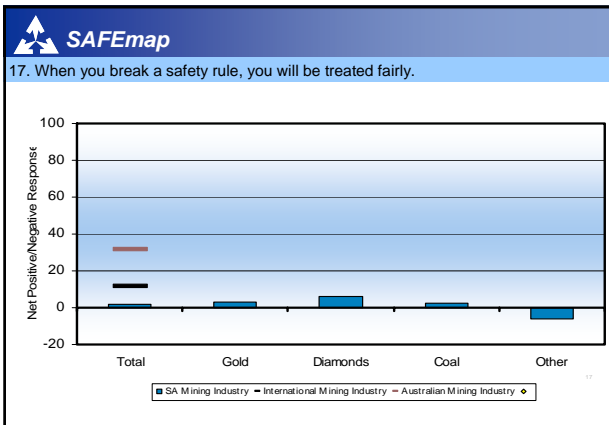
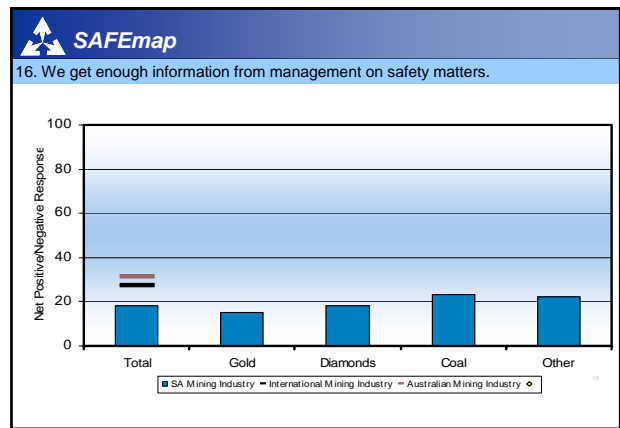
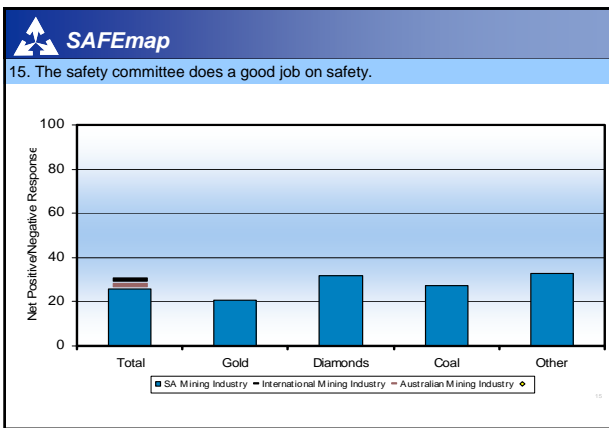
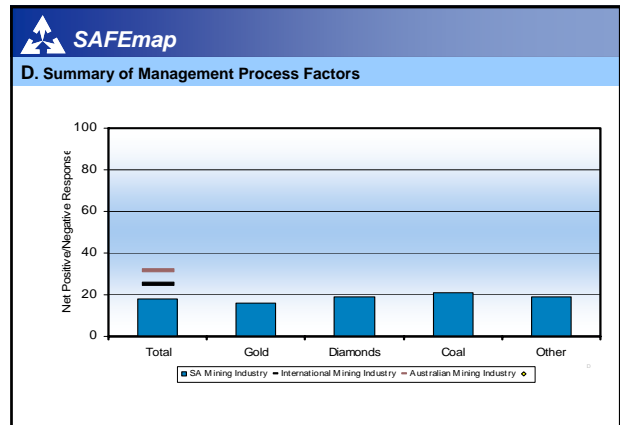
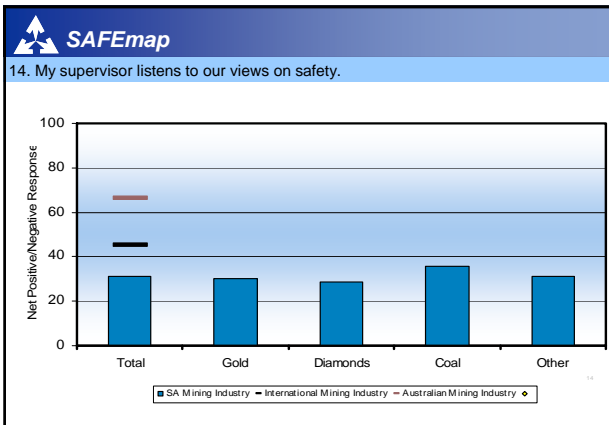
— Australia Mining Industry Baseline

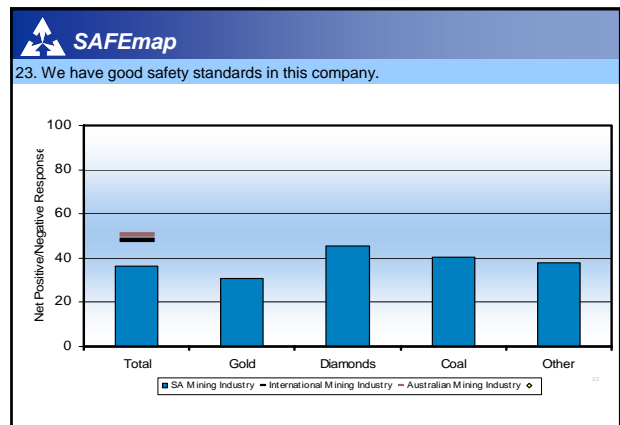
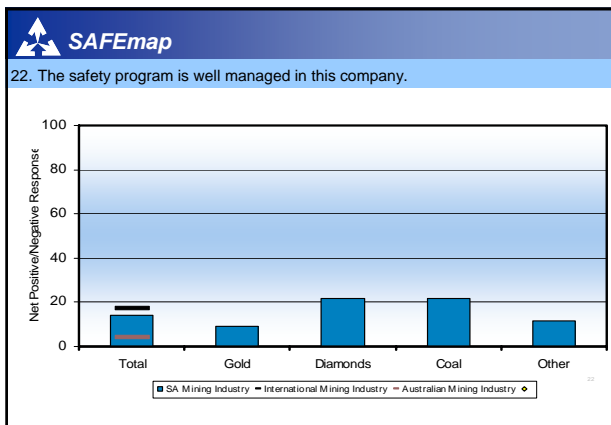
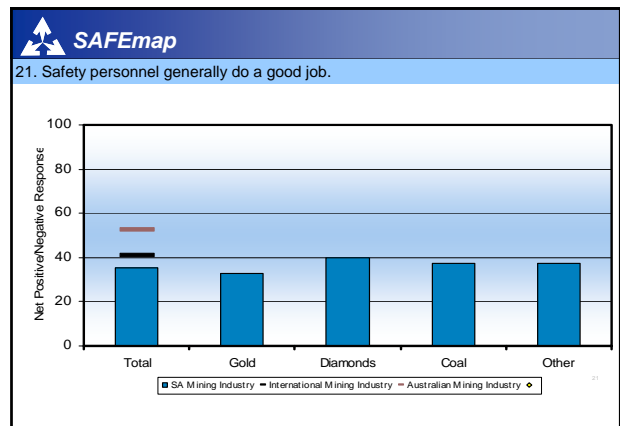
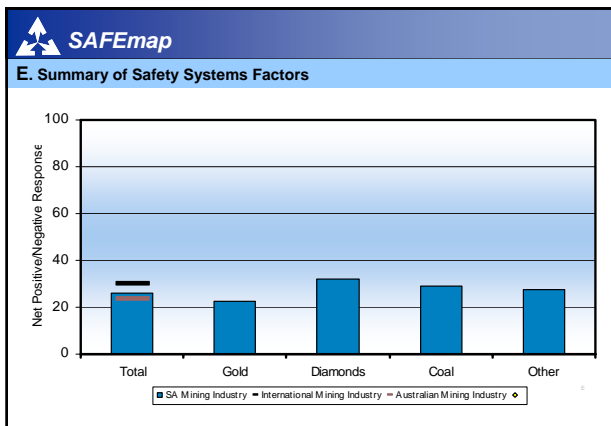
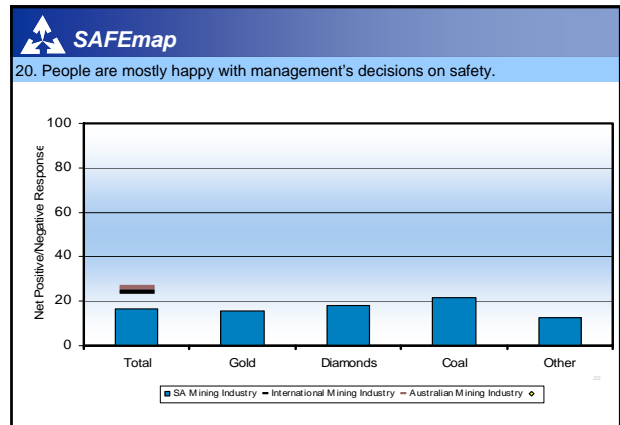
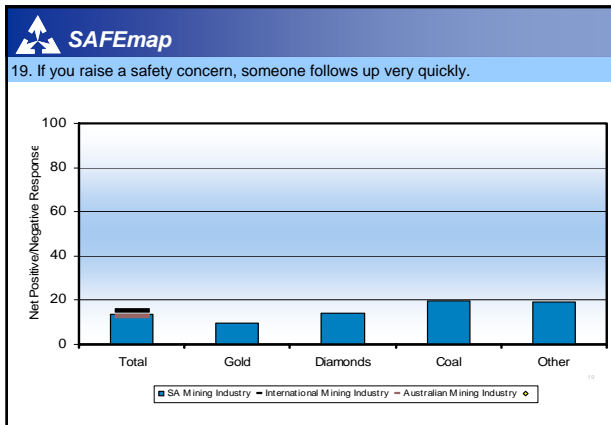


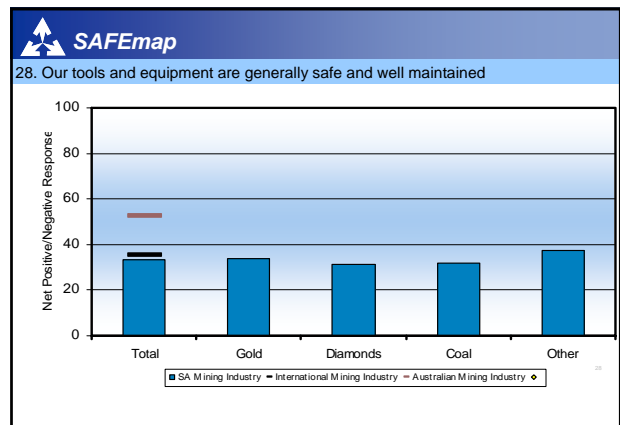
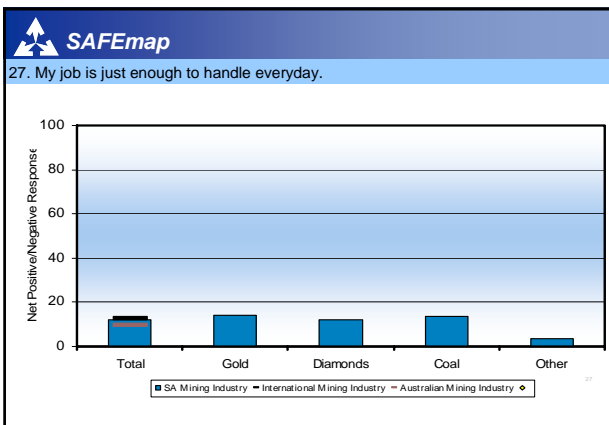
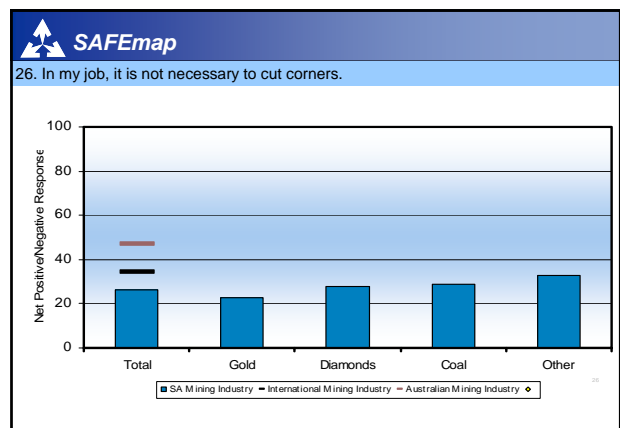
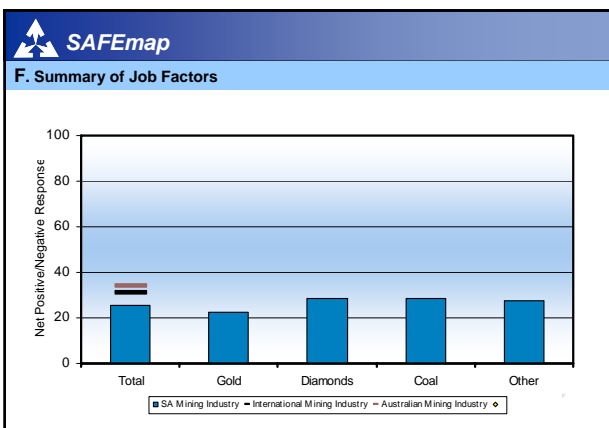
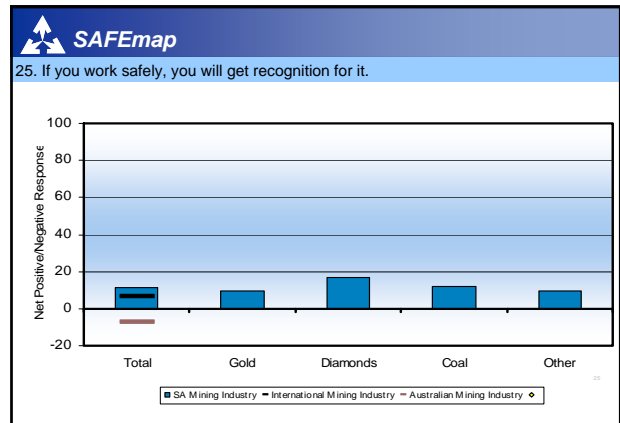
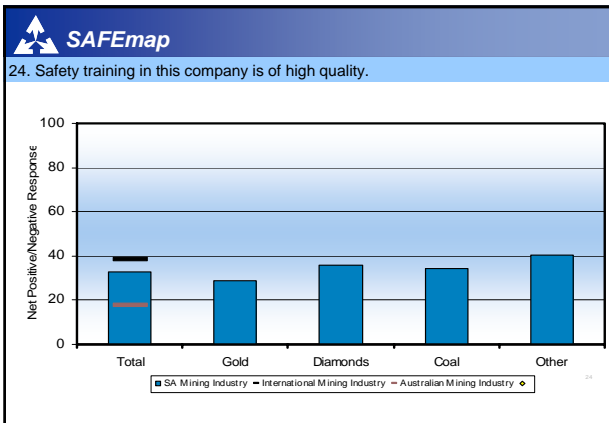


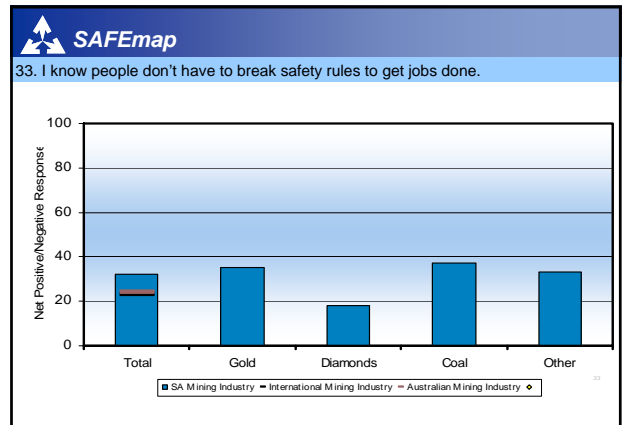
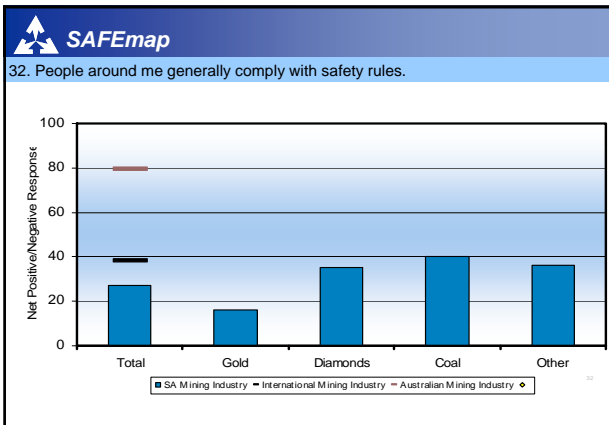
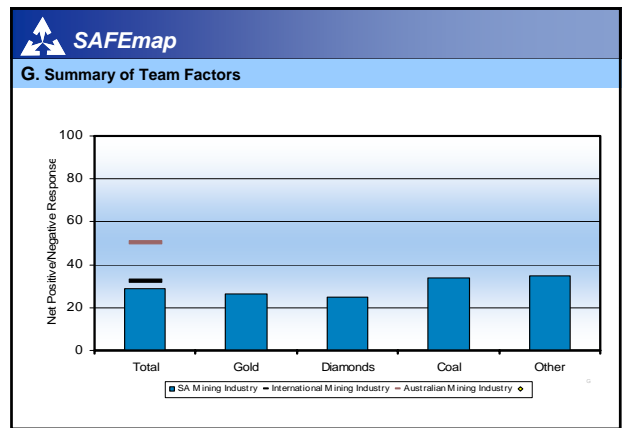
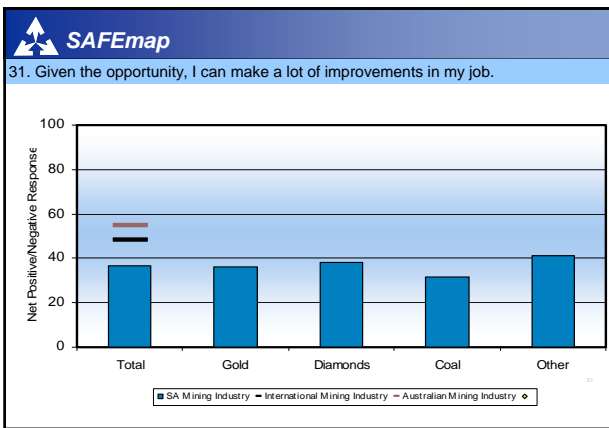
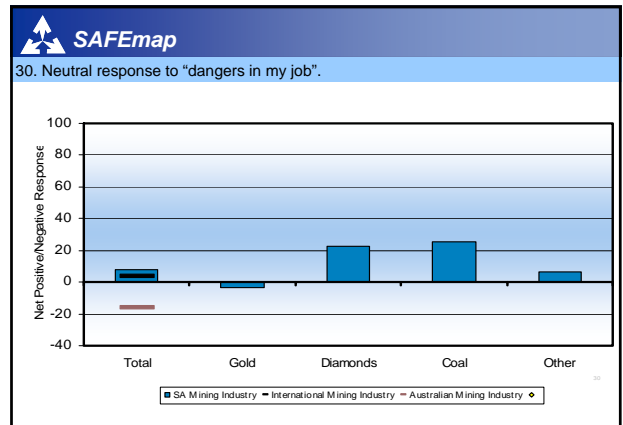
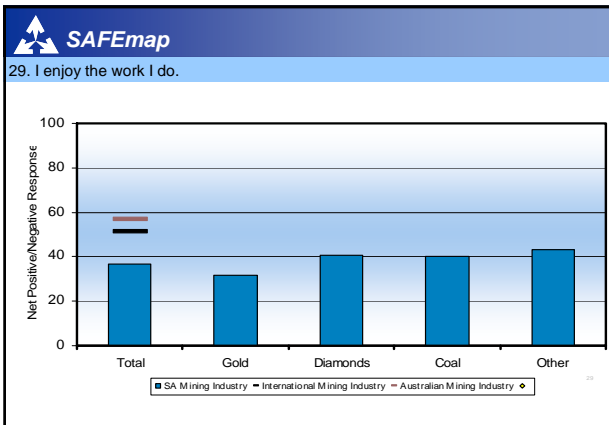


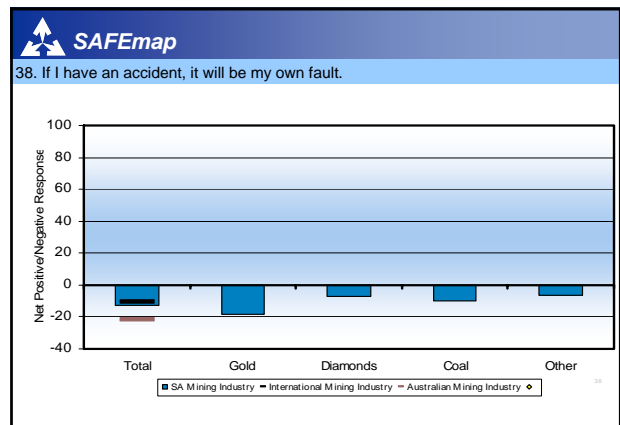
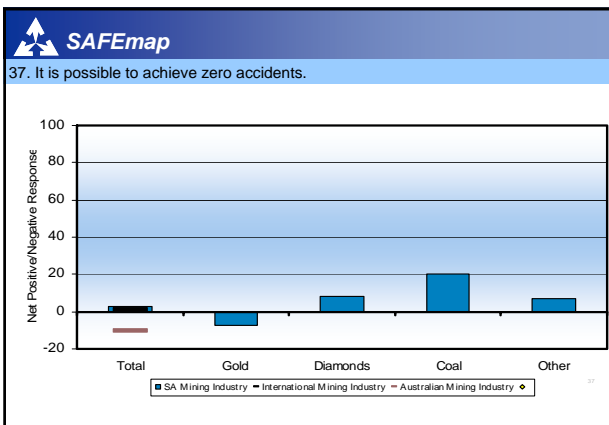
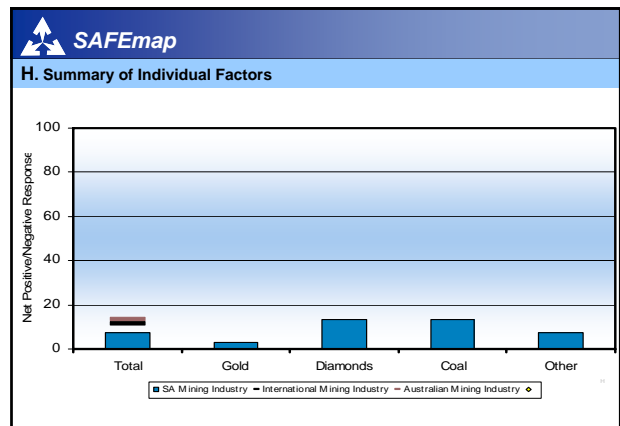
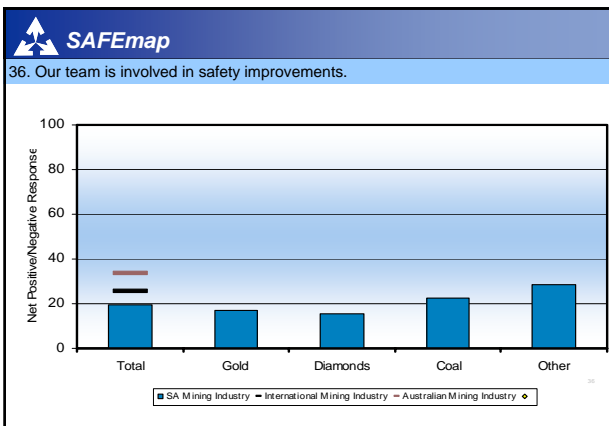
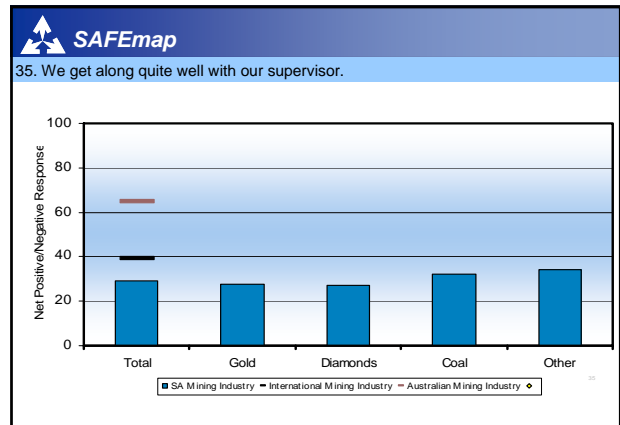
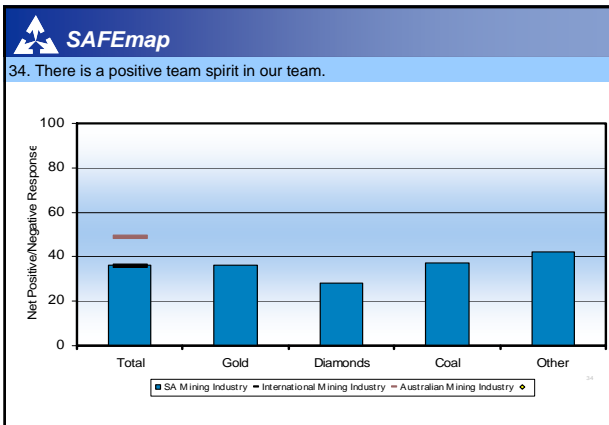


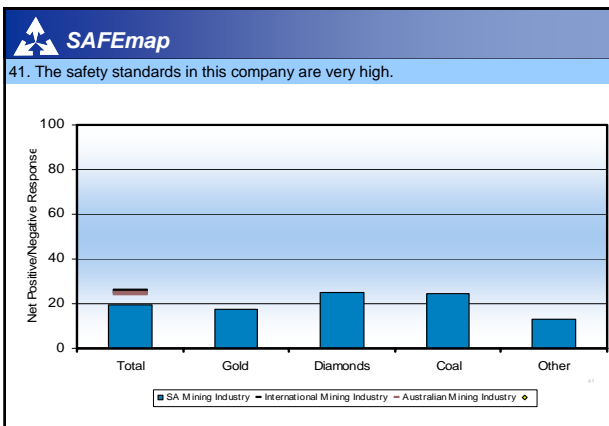
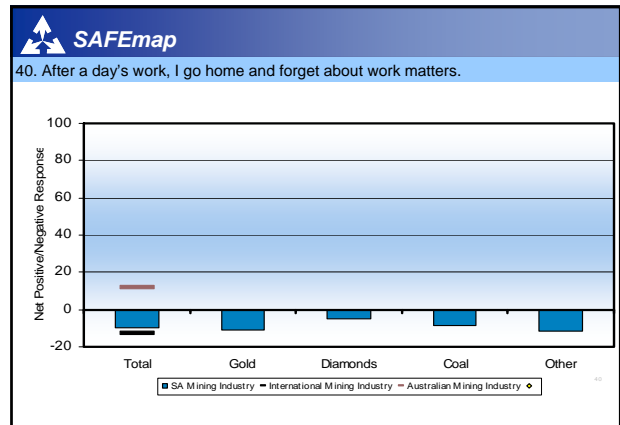
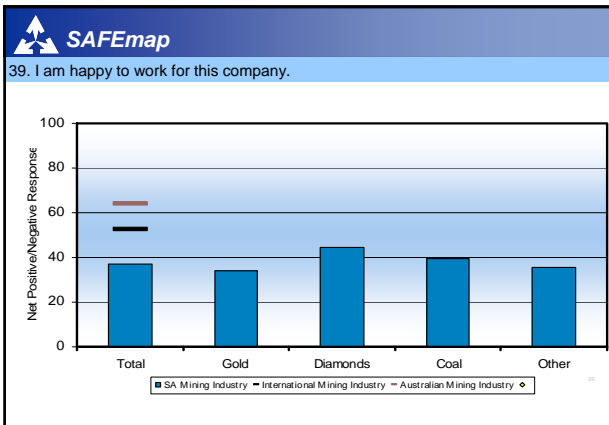










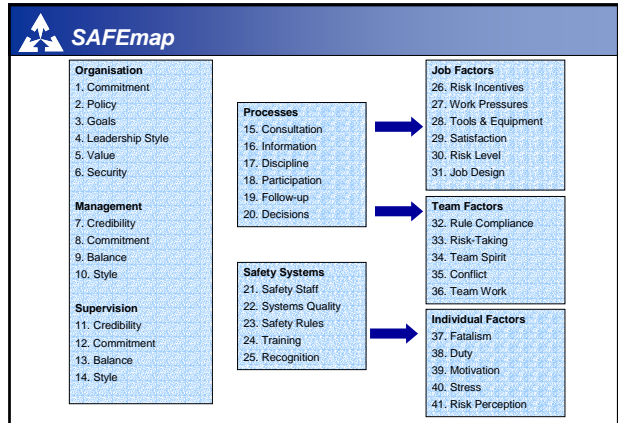


SAFemap

SAFETY CULTURE SURVEY

A Survey of the Health & Safety Culture in the South African Mining Industry

By Size



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Notes on Report

The outcomes of this survey must be viewed as trends and perceptions, NOT as facts. While the reality on any given factor may be different, the perceptions of people are their realities.

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Groups Samples

Group	2004
Total	8991
Larger	5912
Smaller	3079

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Baselines Used

- International Mining Industry Baseline
- Australia Mining Industry Baseline

