



IMRB Russia 2017

Introduction

Slide 1: Principles of risk management

Slide 2: The principle of avoiding incidents

Mines Rescue, by its very nature, will involve taking a risk. We must accept this as part and parcel of what we do. The secret of being good at “mines rescue” is to ensure the risk we are taking is controlled to an acceptable level. In other words, we are not taking an unacceptable risk that could or perhaps will add to the incident we are dealing with.

Ultimately, we must be prepared to take an acceptable risk to save and preserve endangered life.

We should, where appropriate and within our competences, be involved in preventing mining incidents. We should be involved in putting ourselves out of business.

We should use our experience of incidents to ensure the mines we provide cover to have identified all the potential foreseeable hazards to the mining operations, and have in place the barriers or controls to ensure the risk from the hazard is at an acceptable level. In other words, make sure the mines are operating as safely (and productively) as possible.

Only when the barriers fail to prevent an incident should “mines rescue” come to the fore.

The barriers can fail for three main reasons:-

- The hazard was not foreseeable
- The barrier failed
- The workforce was not competent in the controls to reduce the risk to the acceptable level

Slide 3: The layered approach to risk assessment

We, at MRS, take the layered approach to risk assessment for all our work where there is a reasonable risk of harm to our employees. We have identified all the major mining hazards (those that have the potential to kill or seriously injure). We have identified the main



controls to ensure that, when we then deploy rescue teams, we have identified the controls required to ensure our employees are taking an acceptable level of risk. This is then supplemented, where necessary, by an 'on the job' risk assessment that we call "point of work".

Slide 4: The MRS approach.

Slide 5: What is Major Hazard Assessment about?

- Avoiding fatal/other injuries to employees
- Avoiding the loss of expensive assets
- Avoiding the deployment of rescue services
- About protecting families from tragedies

Slide 7: Highest level – major mining hazards

Major mining hazards:

Definition: An incident or accident that has the potential for a multiple casualty, multiple fatality outcome or something that would significantly impact the reputation of the business or country.

Responsibilities:

- The operator has the responsibility to consider the issues that may impact the people, the site or the business
- The manager has the responsibility for ensuring that the systems and process are in place and the people are competent to operate these systems
- The regulator has the responsibility for assisting the organisation and enforcing the legislative requirements

Examples

Underground

- Fire
- Explosion
- Ground Control (Fall of Ground)
- Inrush

Surface

- Shafts
- Surface structures
- Tips and lagoons (land slide)



Controls:

These are mainly included and considered at the design and engineering stage.

They also need to be assessed in the mine environment and this must include the competence of the workforce to implement the controls.

Slide 8: MRS approach to major hazard assessment

- Step 1: Conduct a high-level bow tie risk assessment
- Step 2: Develop the key performance indicators
- Step 3: Work with management to embed the risk assessment

Objective

- To provide a quick impact – see this as the most important step in creating the urgency (consciously incompetent)
 - Assist on challenging and changing the thinking of the leadership (senior and middle management levels)
 - Developing the questioning and intervention at the leadership level
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- Step 4: Review and produce the control documents
 - Step 5: Introduce the controls through training, education and involvement

Objective

- Review the procedure and controls to ensure that the outcomes from the bow tie assessment is captured
- Define the roles and responsibility for the key controls
- To provide the training to defined standards
- Develop the leadership/management and workforce competence



- Step 6: Review and refine the key performance indicators
- Step 7: Audit the system

Objective

- To refine the controls using observation and inputs from managers and workforce
- To audit and review the effectiveness of the system

Slide 9: Steps 1 -3 create the sense of urgency

Part 1- Includes Steps 1 – 3

- Developing the position of consciously incompetent (know what we don't know)
- Developing the imperative for change
- A bowtie assessment of the risk (80/20 principle)
- The generation of major hazard (and if appropriate fatal hazard indicators)
- The role out and support in to the organisation
- The generation of roles and responsibility for the gathering of information and the forming of reports

Slide 10: Major hazards – management control

Bow Tie

- Use a basic bow tie for the initial analysis
- Use knowledge that the business has already developed
- Use control documents that are already in place
- Identify clearly
 - Risk – what is it that the process aims to control
 - Cause – the thing that might result in the risk materialising
 - Controls – the things that need to be in place to prevent the risk from being realised
 - Mitigations – the things that stop the situations from developing further
- Use the information to form the key performance indicators



Slide 11: Major hazards – management control - Key performance indicators (if you can't measure it you can't improve it)

Key Performance Indicators

- From the bowtie, the critical control barriers are defined
- From the bowtie, the critical mitigation elements are defined
- Don't pick everything to be represented in terms of KPIs
- Develop a means of presenting that to the operational teams (and if required an up/down cascade)
- Work with the operational teams to develop the data/challenge the data
- To start with we like to see some aspirational elements, things that they don't do but want to do – provides some goal setting and improvements

Slide 12: Mines Rescue Specific Management control

Slide 13: Critical Hazards – a high level review

A High-Level Summary

- Operational Managers/Directors can get a quick summary of how their parts of the business are performing
- Questioning can be by exception
- Monitors

Stop/Review – there was an event or condition that resulted in the process/job or site being stopped to review the situation and put in place revised measures

Standard Achieved – the site is indicating that the required standards and the performance indicators have been met

Standard Not Met – the site has failed to achieve this part of the performance indicator

No Information Available – the site has been unable to supply the information for the period

Audit and Review

- Site Managers are responsible for the provision of information
- The information is auditable, and can be reviewed, helps drive the required behaviour



Slide 14: Retaining the corporate memory

Retaining Corporate Memory

- Once the major hazard indicators are developed the process is documented
- Recognise that people and roles change
- A number of key elements is recorded for each or the major hazard indicators:
 - Critical Controls/ Mitigations – from the bowtie, a number of controls and mitigations are identified
 - What the Indicator Shows – why was this indicator chosen, what is it designed to record, and what are the potential implications if the control fails
 - Where the Information is Captured – a reference that assists in maintaining the system for capturing the information
 - Who is Responsible – define the role that is responsible capturing and recording the information that is required

Slide 15: Steps 4 & 5 – Define the minimum acceptable standards

- MRS considers that there are two areas for consideration depending on the business:
 - Major Hazards – these would be the high-risk elements that are more traditionally associated with underground operations
 - Fatal Hazards – these would be the high-risk elements that are more traditionally associated with conventional heavy-duty industry
- Within steps 4 and 5, MRS would be looking to define in detail:
 - The standards – how these fit in to the overall safety management system
 - The controls and mitigations, and how these flow through the control documents and emergency procedures
 - The roles and responsibility, what people are supposed to do at each level of the organisation to ensure that the controls, mitigations and emergency procedures work effectively
 - Training, produce a training package and train the trainers to make it repeatable, start to develop the competence against the standard



Slide 16: Introduction of a revised safety management system

Policy Statement, the company statement that makes it publicly clear what the aims and objectives are for MRS in relation to SHEQ management

SHEQ Management System, these are the collection of documents that require MRS to do a number of things. Currently two documents of c120 pages, this will be 14 individual documents of 2 – 3 pages each:

- Leadership and Accountability
- Risk Management
- Compliance Assurance
- Objectives, Targets and Performance Management
- Training and Competence
- Communication and Consultation
- Management of Change
- Control of Contractors and Visitors
- Operational Management
- Control of Documents
- Emergency Procedures
- Incident Investigation
- Monitoring Audit and Control
- Environmental Process and Control
- Customer Management

Standards, these consider the risks ranging from individual to fatal risk and aim to put in place key controls.

Company Procedures, these are the things that the company will do to support the delivery of the standards. Sometimes they are not risk related.

Slide 17: Development of the fatal hazard standards

SHEQ Management System, this introduces the concept of risk management and requires to think about it in a number of ways:

- Individual hazard, day to day activities can be controlled through simple procedures, but is better through on -site assessment
- Task hazards, these are specific to individual tasks being performed and require the site to think about the risk and put controls in place (e.g. RAMS documents)
- Fatal hazards, these are the highest level of risk identified by the company, and it requires that there be some controls put in place to manage these types of risk



Fatal hazards, risk that the company has identified as having the potential for single or multiple casualty or fatality type incidents, which can adversely affect the families and business reputation.

- For MRS, there are likely to be 10-12 standards, between 1 and two pages maximum
 - Rescue from mines*
 - Confined spaces
 - Use of BA
 - Charging of BA cylinders and use of oxygen
 - Lifting equipment
 - Fall from height
 - Driving
 - Vehicle pedestrian interaction
 - Machinery plant and equipment
 - Electricity
- Etc.

Slide 18: Steps 6 & 7 Review and audit

Review

- The review is used in two areas:
 - Major Hazard and Fatal Hazard Indicators, ensuring that these capture all the information from the formation of the standards and the document review
 - An update of the roles and responsibilities to ensure that these are updated to reflect the requirement of the standards

Audit

- Creating a repeatable audit from the standard
- Going into the workplace and observing the application of the standard
- Making any recommendations for improvements or changes

Slide 19: The link to competence

- Step 1: Conduct a high-level bowtie risk assessment
- Step 2: Develop the key performance indicators (if you can't measure it you can't improve it)
- Step 3: Work with management to embed the system
- Step 4: Review and produce the control documents – a competency management and assessment system



- Step 5: Introduce the controls through training, education and involvement
- Step 6: Review and refine key performance indicators
- Audit the system and consider the effectiveness of competence

Slide 20: Link competence and control

- What the rescuer needs to know
- Risk assessment
- Competence
- The operation

Slide 21: The importance of creating the correct behaviour

- The vision and the mission
- Values and beliefs
- Capability of the organisation
- Management and employee behaviours – aligned and recognised
- Management and employee behaviours – misaligned then educate

Slide 22: MRS competency management:

- Aiming to develop competency tables for the various job roles
 - Major and Fatal Hazards associated with these job roles
- These will form part of the competency framework
- To be able to conduct any of the major or fatal hazard role/task, you would be required to be able to demonstrate competency
- Ultimately aim to have this in an automated records system that will prompt:
 - Refreshers
 - Audit
 - Peer review



Slide 23: Competence management

We employ rescue workers because they are competent or we can (we think) make them competent.

We must:

- Identify competencies
- Recruit and train employees
- Assess competence
- Maintain enhance competence

Slide 24: Competence management

Task Analysis

- What are the tasks that are normally carried out
- MRS, the range of work that the people are engaged in, is becoming more diverse
- Determine what the priority tasks are for the business (those with the most significant risk placed as the highest priority) [major or fatal hazard]
- Identify the correct way for the task to be completed

Identify and Review Competency

- Identify who might be involved in the task
- What are the key controls that need to be in place to reduce risk
- Construct the competencies for each role that is/might be involved in the task
- Define a standard to which the individual needs to be trained and assessed

Slide 25: Competence management (why we have had to follow this route)

The New MRS

- Seeing a higher turnover of people
- Starting to see new people coming in to the business
- The skills that the individuals require is becoming more diverse
- Selection is becoming a key element to ensuring our new recruits will make the progress required

The old Mines Rescue Service

- Traditionally MRS has retained staff over long periods
- This poses risk and benefits



- People believe they are competent through experience and time, and can be reluctant to train
- People are competent and through training and practice have honed the skills they need
- Have the ability to pass that knowledge on to people new to the organisation

Slide 26: The impact of time on training and competence

Competence is assessed by:

- Observation
- Simulation
- Testimony
- Evidence of work
- Questioning/discussion

Striking the appropriate balance:

- Understand that competence reduces over time
- The business needs to define the training and assessment regime
- It needs to have a process when its employees don't meet the required standard
- It has to allow the time to effectively maintain existing competence and develop new ones that support the safe operation and growth of the business

Slide 27: Summary

Approach

- MRS believes that this represents a realistic approach
- MRS believes that this represents a reasonable time line
- If all elements are completed, with or without the assistance of MRS, it would deliver a change in thinking and approach at all levels

Potential Issues

- Risk that organisations want to 'cherry pick' or vary the order that things are done in
- From an MRS perspective, we can do this; however, it makes the foundations more difficult to put in place



- If the engagement piece is not right, the risk is that they become nice documents on a book shelf

Slide28: Other risks - the MRS Approach

Slide 29: Middle level or supervisor – task based assessment

Routine and non-routine task planning

Objectives:

- To develop the expectations around the safe way to complete a task
- Guidelines
- Job plans
- Standard operating procedures

Responsibilities

- The operator has to make sure that there are enough people (management level) available to administer the system
- The manager has to make sure that the controls relative to the operations risk are developed, and that people carrying out the task understand how the controls are applied
- The regulator checks the effectiveness and understanding of the controls

Examples

Underground

- The systematic setting of support
- The safe use of conveyors
- The operation of the transport system

Surface

- The safe use of welding equipment
- Rules for operating plant and machinery

Mines Rescue

- The safe storage and transport of pressurised cylinders
- The safe charging of oxygen
- Procedures for testing the effectiveness of the BA



Slide 30: MRS approach to task based risk assessment

1. Identify the hazard
2. Determine who might be harmed
3. Apply the hierarchy of controls
4. Produce the documented risk assessment
5. Produce the safe system of work (method statement)
6. Review the risk assessment

Slide 31 lowest point of work assessments

On the job risk assessment

Objectives:

- To allow the supervisor and operators to have a very simple way of reviewing how a job is to be done
- To provide a mechanism to allow thinking time

Responsibilities:

- The operator to make sure that there are adequate people trained to do this type of assessment
- The supervisor/person to use the process to consider the job or any changes and how they might impact

Simple principles:

- Identify what it is that can hurt me [hazard]
- How might that thing hurt me? [hazard effect]
- How can I stop it? [control measures]
- What is the level of risk remaining?



Examples

Underground

- Unloading materials
- Lifting something

Surface

- Lifting something

Mines Rescue

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Mainly about the behaviour of people in the workplace

Slide 32: Onsite and near hit reporting

- All operators now have a pocket book for carrying out on site risk assessment and reporting near misses
- Trained in what is required
- Targets have been set for each site for the reporting of near misses