Planning & Environment
Resources Regulator

Fact sheet 3
Human factors in mining

Human factors

This fact sheet describes a real life case study in the mining industry and was designed as an educational tool for supervisors, safety specialists and managers. It aims to provide an understanding of the potential impact of human and organisational factors in mining.

Human factors in mining

Human and organisational factors support critical controls within the safety management system. These factors can affect health and safety in the workplace in many ways. They include environmental, organisational and job factors, along with human and individual characteristics, that influence behaviour at work.

If an accident occurs, an investigation into the incident needs to identify the critical controls that have failed and any factors that had an impact on the situation.

Read the case study below and think about what human and organisational factors may have contributed to the incident. See page 2 for an explanation of each factor.

Case study: fatal outburst

Two mine workers were killed when a pressure burst of coal or ‘pressure bump’ occurred in the major rib/sidewall of a longwall development roadway.

Both workers were experienced miners and at the time of the incident both were on the left side of the bolter miner. The burst caused a large section of the left rib that was supported with steel bolts and mesh to collapse sideways into the roadway on top of both workers.

The mine was aware of the frequent relief of stress within the strata that is commonly known as ‘pressure bumps’. Reports by workers at the mine indicate that they were quite common and most workers had become used to the vibration, sound and rock movement of a pressure bump. The mine had previously had a pressure bump that caused the loss of 60 m of sidewall on a roadway.

The mine had a detailed strata control management plan in place but it did not sufficiently identify the risk of a pressure burst. The mine operator’s view was that the pressure bumps indicated that the strata had settled and that these bumps did not represent a risk to workers. The mine did not investigate the international literature available on the subject, which indicated that this was a risk. The same crew involved in the incident had experienced a major pressure bump 24 hours before - the pressure in this bump was large enough to distort the plates on the rib support outwards. This incident also led to the deputy on the crew to amend the sequence of support.

Pressure bump incidents were frequently reported at the mine but there was inconsistency in the information and details in reports. Due to this inconsistency, senior management had insufficient knowledge of the nature and extent of the problem. Where information concerning strata bumps was recorded no further investigation or follow up had occurred. Lastly, the information that was available was poorly communicated between all levels of staff at the mine.

For more information on this case, read the full report Fatal outburst investigation report.

Mining tunnel where the fatal outburst occurred.

Exercise

What human and organisational factors do you think may have contributed to the incident in the case study? Explain why.

Think of a task or incident in your workplace that is similar to the case study. Give a brief description of it below.

Identify the human and organisation factors in your task or incident. Outline how the factors relate.

Common human and organisational factors

- **Fatigue and shift work**: fatigue caused by poorly planned rostering of shift work.
- **Human factors in design**: tasks, equipment and plant are not designed to suit users.
- **Human failure**: relying on people for safety-critical tasks increases the risk of errors, mistakes and violations.
- **Maintenance, inspection and testing**: lack of structured processes.
- **Organisational change**: the organisation is undertaking a change and it is not being effectively managed.
- **Organisational culture**: the organisation does not have a strong, safety-focused culture.
- **Procedures**: lack of easy to read, user-friendly procedures.
- **Safety-critical communication**: lack of structured processes for key information sharing, including shift and task handovers.
- **Staffing and workload**: insufficient staffing numbers on a shift, task or job.
- **Training and competence**: staff assigned to a task do not have the right combination of skills, experience and knowledge.

More information

The legislation and rules that regulate mining provide more detailed information on human factors that you need to consider when updating your work health and safety procedures. Download the relevant legislation and rules below:

- Work Health & Safety (Mines and Petroleum Sites) legislation
- Work Health & Safety legislation
- MDG1004 Outburst mining guideline

Visit our website for more information: resourcesandenergy.nsw.gov.au/safety