

March 2023

Informative Note

Human and organisational factors

Introduction

This report presents the findings of the human and organisational factors analysis of incidents reported across the NSW mining sector. The scope of this review was limited to 200 incident notifications and were identified as part of the daily incident review process undertaken by Principal Inspectors. The analysis focused on the key performance shaping factors that were identified in the 5 pillars of personal, job, environment, team and organisational factors.

Background

Human and organisational factors refer to the environment, organisational and job factors that are influenced by the characteristics of individuals and the way they interact at work to health and safety. Research has identified how individuals operate within organisational structures, processes and systems, and their link with incidents. The aim of the review was to consider all performance-shaping factors, not just personal factors and human error but also the failure of controls at all levels of incidents.

Human and organisational factors assessment methodology

The HOF assessment tool is a process used by the Resources Regulator to review incidents within the NSW mining sector. The aim of the assessment is to gain a better understanding of the factors that shape human behaviour at all levels within an organisation.

The human factors analysis has a list of performance-shaping factors organised into 5 categories. As shown in table below, it is these factors that can be used to identify potential erosion factors.

What is a performance-shaping factor?

Performance-shaping factors are characteristics of the individual, job, work environment, team and organisation that can influence human performance. The performance-shaping factors used by the Regulator as part of the human factors assessment was tailored towards the mining industry. The main aim was identifying the factors that degraded human performance and influenced an incident to occur.

Assessment findings

Of the analysis that has been completed on the 200 human and organisational factors assessments, the most prevailing performance-shaping factors across the 5 key performance shaping factors include:

Factors	Performance-shaping factors (PSF)	PSF% of HOFs completed
Personal factors	Situational assessment	48%
Job factors	Fit-for-purpose tools	31%
Work environment	Time of day	26%
Team	Team risk management practices	14%
Organisation	Risk management	24%

Personal factors

Personal factors are focused on the individual involved in the incident and are made of individual technical competence, individual non-technical factors and individual wellbeing.

From the incidents reviewed, situational assessment was identified in almost 50% of incidents assessed. Situational assessment is ‘understanding what is going on around you’. It is the ability to notice and interpret information and think ahead to what might happen next. Some examples in which situational assessment were degraded include:

- The worker did not notice or seek information or did not interpret it appropriately because the worker did not have the skills or the time to conduct analysis.
- The worker missed critical information due to insufficient information being available or an abundance of information and too little time to analyse it, and determine its relevance.
- Future problems were not identified or planned for, or inaccurate future outcomes were predicted.

Job factors

Job factors are focused on what the job needs to be successful. This includes task demands, communication factors, procedures, ergonomics, tool use and equipment.

From the incidents reviewed, fit-for-purpose equipment were identified in 31% of the assessments. Fit-for-purpose equipment and tools are the availability of appropriate and well-maintained equipment and tools, and they must be supplied and used safely to perform a given task. Some examples of when fit-for-purpose equipment and tools have degraded include:

- The equipment/tool available for the task was poorly designed or not suited to that task.
- The equipment/tool was not matched to the worker using it, or was difficult to use (e.g. size, access, weight).
- The equipment/tool was poorly maintained and/or did not function correctly.

Work environment factors

Work environment factors are focused on the environmental conditions that may have influenced an incident to occur. Environmental conditions can include weather, temperature (including humidity), light and visibility, air quality, noise, time of day and road conditions.

From the incidents reviewed, time of day was identified in almost 26% of incidents assessed. Time of day is one factor that can increase a worker’s cognitive impairment (reaction time, decision making and error making/detection). If work is being conducted during the night (when people usually sleep), the potential for error is increased.

Some examples of when time of day (night time) may have degraded an individual’s performance include:

- The worker was working during a period known to be impacted by circadian rhythms (night, early morning, late afternoon), which led to an error from poor judgement, poor concentration, slow reaction time.
- The worker was nearing the end of a shift before several consecutive days off.

Team factors

Team factors are focused on how a team may have influenced an incident to occur and considered within its scope team dynamics, work practices, planning and coordination.

From the incidents reviewed, team risk management practices were identified in 14% of incidents assessed. The risk management practices accepted and used by the team will develop from many influences and be subject to many factors. Examples of these include:

- shortcuts that have worked well in the past
- a desire to achieve set goals
- a desire to achieve status as a high-performing team
- the belief that the team doesn't need to follow the rules to get the job done.

Some examples of when team risk management practice have influenced an incident include:

- Team members did not routinely follow procedures/rules and believed they knew a better way.
- Team members were willing to accept a higher level of risk to achieve goals, or did not do a risk assessment at all.
- Team members saw a benefit in taking shortcuts without consequence, increasing the likelihood that the behaviour would continue.

Organisational factors

Organisational factors are focused on the management, systems, decision making and culture. This includes planning and resourcing, training, and competence systems, safety management, organisational arrangements, and organisational culture.

From the incidents reviewed, risk management arrangements were identified in 24% of incidents assessed. Risk management arrangements include identification, analysis and control selection and involve the risk and change management processes used by organisations to assess and manage changes and risks. Effective risk management relies on identifying, assessing and analysing a hazard or risk, and the selection of appropriate, effective controls.

Some examples of when the risk management arrangements broke down include:

- The risk management process did not exist or was not working – e.g. hazards were not identified, assessed or controlled effectively. Known risks were not adequately controlled.
- Controls were not reviewed against the safety management system or any affected principal hazard management plan or principal control plan

Summary

While situational assessment has been highlighted as the most prevalent performance-shaping factor, this should only be considered within the scope of the personnel factors, across the other 3 key factors of job, team and organisational there was a cross section of factors identified.

Risk assessment practices are an area of concern highlighted across both team and organisational factors. Mine operators should review their safety management systems to ensure all potential risks are identified and appropriate controls are implemented.

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