

REPORT

2016 Registered Managers Forum



Government of Western Australia
Department of Mines and Petroleum
Resources Safety

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Introduction

The Department of Mines and Petroleum (DMP) has made a commitment to improve how we engage with our stakeholders. As part of this commitment, DMP held the second Registered Managers Forum on 19 August, 2016.

Over one hundred managers including registered managers, quarry managers and underground managers attended the forum. The topics covered were:

- Why is good leadership essential to improving safety and health?
- How will the proposed risk-based legislation affect your company and you as a leader?
- How will safety data help drive regulatory change, our approach to stakeholder engagement and meet the needs of industry?
- What are the key human factors supporting cultural change?

Forum format

The forum was divided into two sessions – information giving and a workshop. Also this year there was a question and answer panel to further engage with industry.

Information giving

The forum opened with a welcome from facilitator Julie De Jong, Executive Director, Approvals and Compliance. Five guest speakers then presented on the importance of safety.

DMP Director General, Richard Sellers and Mines and Petroleum Minister, Sean L'Estrange provided an overview of safety including the department and government's commitment. Following the speeches there was a question and answer panel which included Executive Director Resources Safety, Simon Ridge and Director Mines Safety, Andrew Chaplyn.

Following the panel Mr Ridge gave the audience a legislation update and Mr Chaplyn spoke on safety performance and trends. Mr Chaplyn's presentation is provided in Appendix 1. The audience then had another opportunity to ask questions of Mr Ridge and Mr Chaplyn.

Inspector of Mines, Gareth Pickering, presented on safety culture and human factors which led into the workshops. Mr Pickering began his presentation with four questions to all attendees.

Everyone was requested to remain standing if "yes" to the following question		Response	
Total number of attendees		90	%
Q1	Who is aware of the concept of safety culture and how it applies to safety outcomes?	90	100%
Q2	Who is aware of the concept of human factors and how it applies to safety outcomes?	90	100%
Q3	Who has spoken with a human factors expert?	12	13%
Q4	Who has access within their organisation to a human factors expert?	4	4%

Mr Pickering's presentation is provided in Appendix 2.

Workshop


Participants worked within their table, with a “volunteer” scribe and reporter elected to each table.

The discussion points included below.

Question 1

Workshop activity
RMs to assist with data validation by....

- Considering the relevance of Human Factors in managing safety
- Confirm importance of topic
 - Including sub-topics
 - Refine topic descriptor if required
- Identify most important topics



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Step 1 – Are we on the right track?

Do you see value in a Human Factors approach towards managing safety in the WA Mining Industry?

Why?

Feedback

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Question 2

Step 2 – Critique DMP Human Factor Topics

Table 1 & 2 Managing Human Reliability	Table 3 Staffing & Workload	Table 4 Safety Critical Communications
Table 5 & 15 Health and Safety Culture	Table 6 & 13 Organisational Change	Table 7 Fitness for Work
Table 8 Training and Competence	Table 9 Designing for People	Table 10 & 14 Maintenance Inspection and Testing
Table 11 Emergency Response	Table 12 Usable Procedures	

Each table:

- Review assigned topic and sub-topics
- Record outcomes

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Question 2 – Are the topics relevant?

Is your assigned Human Factor topic important and relevant to the WA Mining industry?

Why?


Feedback

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Question 3

Workshop activity
RMs to assist with data validation by....

- Considering the relevance of Human Factors in managing safety
- Confirm importance of topic
 - Including sub-topics
 - Refine topic descriptor if required
- Identify most important topics



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Question 3 – Are the sub-topics relevant and complete?

Are your assigned Human Factor sub-topics relevant to WA Mining Industry?

Has an important sub-topic being over-looked?

Why?

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Question 4 (impromptu question)

What are the next steps DMP/industry should take regarding human factors?

Question 5

Step 3 – Identification of key focus areas

Question:

- Which topic (or subtopic) would lead to:
the **greatest improvement in safety performance**,
if it was **managed better**?

Dot Colour	Rank
Red	Most important (1 st)
Blue	Second most important (2 nd)
Yellow	Third most important (3 rd)

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Summary of group responses

The following lists recurring themes that were recorded across the groups during the workshop section of the forum.

Question 1

Do you see value in a human factor approach towards managing safety in the WA mining industry?

- All tables answered yes

Why?

- 80% of incidents unsolved. Different perceptions focus on time-quality
- New equipment – how much effort goes into ergonomics
- Provides a baseline structure by which the management of the safety environment can be designed and assessed
- Always about people: mistakes, lapses of concentration, poor choices, different factors, consistency
- Believe at the time that the right decision is made
- Common threads concept is important
- People are complex
- Difficult to deal with people in the workplace
- What is best/good practice – how do we share this?

Questions 2 and 3

Human factors sub-topics	Is your assigned human factors topic important and relevant to the WA mining industry? Why?	Are your assigned human factors sub-topics relevant to WA mining industry? Has an important sub-topic being over-looked? Why?
Organisational change	It is an issue, but affects so many areas	Should be rolled into other topics
	Small to big – cannot keep up (eg systems, procedures, communication)	Mental wellbeing
	Cutting workforce – psychological impact cannot be underestimated (workload, scope, mental wellbeing)	Contractor management
	Not understanding new rule – could be self-defeating (cost down but incident risks up)	Staffing and workload
	Communicate changes and timelines	Effective supervision
	Control risk from announcement	
	Morale and safety linked	
	Feedback will increase ownership	
Designing for people	Yes for work environment and equipment ergonomics	Human Machine Interface should be subset of ergonomics / environment
	Uncertain about alarm management and Human Machine Interface	Alarm acceptance is an issue and more response and escalation issue
		Ergonomics / environment needs to address access / work issues in workshop and in the field for maintenance
		Rosters
Fitness for work	Very relevant	Fatigue: <ul style="list-style-type: none"> • Compulsory awareness training • Individual responsibility • Pre-employment checks • FIFO importance • Support
	Fatigue – measurement, rosters, cultural issues in workforces, trust in individuals, organisational issues	
	Drugs and alcohol – lifestyle trends (increasing use). Complexity of substances. Complexities of testing. Developing programs (time and resources). Union involvement	

Human factors sub-topics	Is your assigned human factors topic important and relevant to the WA mining industry? Why?	Are your assigned human factors sub-topics relevant to WA mining industry? Has an important sub-topic being over-looked? Why?
Managing human reliability	Right person recruited	Motivation
	Organisational interface	Culture and focus will happen when you satisfy a person's six basic needs: certainty (or security), uncertainty (or variety), love (affection, being wanted), significance, growth, contribution (as per Tony Robbins, Life Coach)
	External distractions	We think most of the health and safety culture sub-topics could be included in "Managing human reliability"
	Reward-recognition-retention	Where does change management fit?
	Establish steady state – consistency as opposed to dynamic inconsistency	Should tools (incident investigations tool) and tool effectiveness be a sub-topic
	Dependability – common vision, peer pressure is positive	
	Feedback-coaching-leadership	
	Preventing human failure lives with system design and ensuring the equipment and environment are designed to eliminate the human error from being an impact	
	What is better – punitive vs non-punitive approach in building trust	
	Must have this accounted for within the incident investigation process	
How do you ensure people are always mindful during their task?		

Human factors sub-topics	Is your assigned human factors topic important and relevant to the WA mining industry? Why?	Are your assigned human factors sub-topics relevant to WA mining industry? Has an important sub-topic being over-looked? Why?
Staffing and workload	Understand the work first and clarity of the role	Sub-topics are relevant to WA mining industry
	Meaningful outcomes and targets in setting task	Overlooked topics: <ul style="list-style-type: none"> • Fit for role • Workforce engagement • Understand individual workloads
	People (staff) manage / lead people so staffing levels and workload is critical	
	Plan – the correct staffing levels Do – start working Check – review how staffing team is going Act – is not working change the staffing numbers or people	
Training and competence	Allows for safe and effective work process outcomes	
	Establishment of experience is possible, but must be viewed on a case-by-case basis	Training design – establishment of competence
	Competence regulation environment is to broad brush	Evidence standards – confirmation of retention
	Sub-topics: training design, evidence standards, establishment of competence, ongoing maintenance of competence, Recognised Prior Learning /Verification of Competency versus establishment of competence	Australian Qualification Training Framework – Recognised Prior Learning / Verification of Competency versus establishment of competence
		Relevance of training – task appropriate training
		Effective training delivery – use of Subject Matter Expert
		Trainer competence – measurement of competence, development of experience
		Competence overall is to broad a banner and deserves a detailed level of consideration

Human factors sub-topics	Is your assigned human factors topic important and relevant to the WA mining industry? Why?	Are your assigned human factors sub-topics relevant to WA mining industry? Has an important sub-topic being over-looked? Why?
Health and safety culture	Set framework and expectations	Communication leading to feedback on a range of topics (safety/business)
	Understanding human factors will develop leadership within management and throughout organisational structure	Leaderships (as opposed to management) setting expectations
	Should be more than supervision level	Contractor enabling as opposed to managing
	Accountability for individual behaviour and recognition	Counsellor
	Leadership, listening, feedback	Active listening and feedback
	Quality: provide a “voice”	
Maintenance inspection and testing	Human factors affecting outcomes in regards to critical time factors to respond to breakdowns	Consistent terminology
	Learning to manage people safely and time management to elevate accidents	Management of change
	Consistency of language and terminology across industry to avoid confusion and error	Consistent processes – isolation, inductions
	Huge number of incidents	Planned and unplanned maintenance – most incidents occur in unplanned maintenance
	Large transient / contractor workload (eg isolations, inductions)	Management needs to set standards, take control and ease time constraint pressures on breakdown repairs

Human factors sub-topics	Is your assigned human factors topic important and relevant to the WA mining industry? Why?	Are your assigned human factors sub-topics relevant to WA mining industry? Has an important sub-topic being over-looked? Why?
Safety-critical communications	Missing – function of control rooms, return to work communications, remote operations	Remote workers – remote work
	Filtering what is critical to whom (information overload)	Control rooms
	Use of technology is critical	Quality job hazard analysis (JHAs) and hazard awareness – paper will not protect you
	Use of change management language could be universally applied to several groups	Change management
	Feedback could form a part of “safety-critical communications” – close the information loop	Risk assessment – critical communications
Usable procedures	Great procedures give consistency and help to limit risk taking or error	
Emergency response	Preservation of life and equipment	Emergency services for remote areas – social obligations
	Collateral damage	Peace of mind for employees
	Environmental	Not just used for incidents, but knowledge that emergency response team (ERT) is available to be on site employee wellbeing physical / mental
	Isolation of sites – geographically	
	Community involvement	
	Social responsibility / license	
	Peace of mind for workforce	

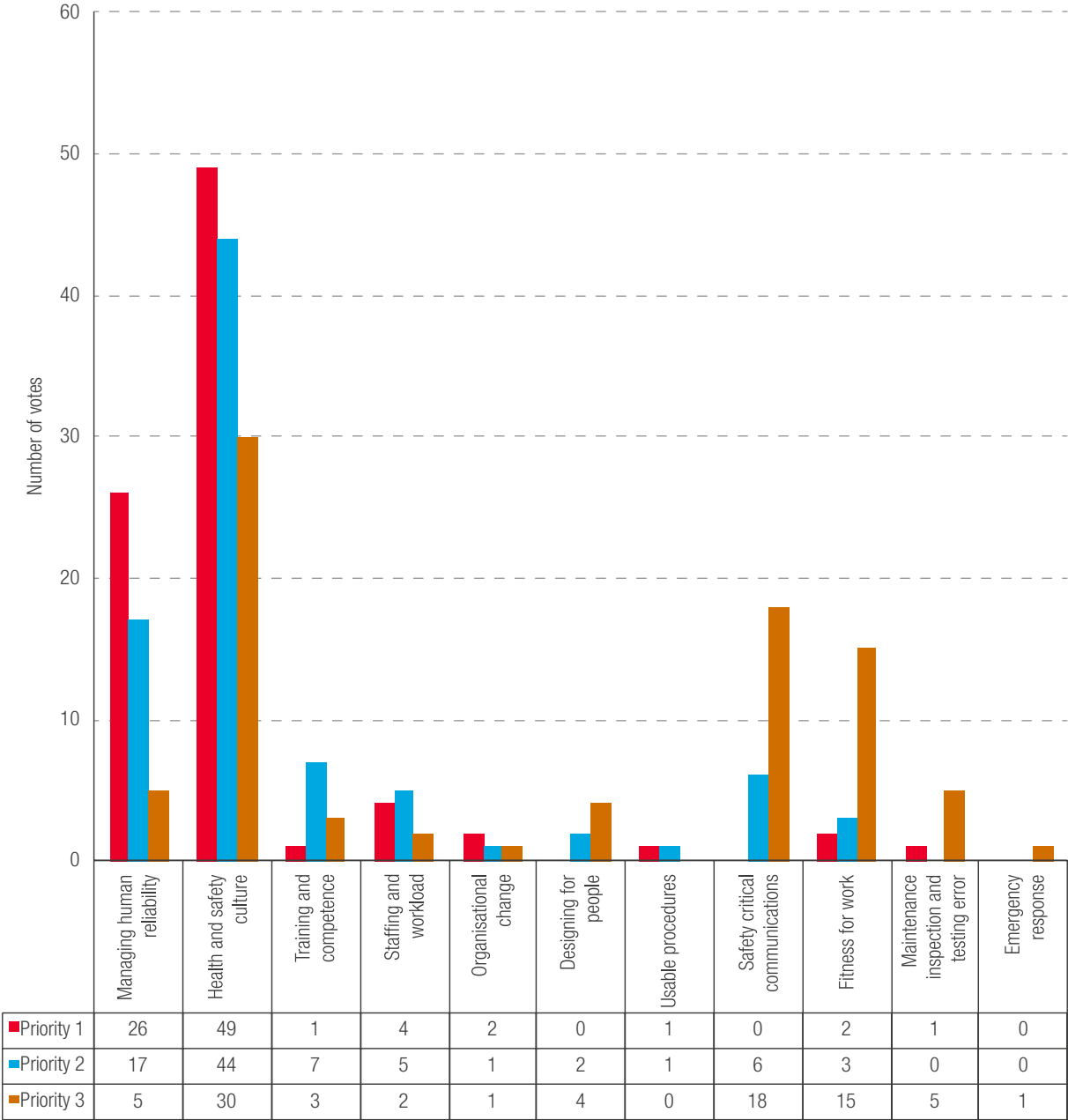
Question 4

What next steps should DMP / industry take regarding human factors?

General floor comments:

- To motivate corporate executives to dedicate resources requires a positive cost benefit analysis.
- DMP should utilise its internal data to develop the case.
- More guidance material from the DMP and continued engagement.

Question 5



Appendix 1 Andrew Chaplyn's forum presentation slides

01

Setting the scene

Andrew Chaplyn, State Mining Engineer,
Director Mines Safety

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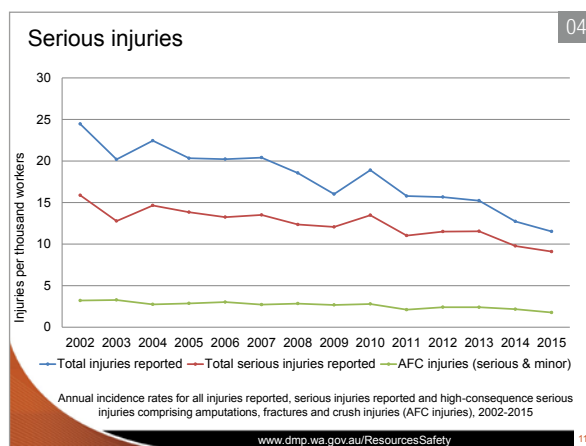
02

Our commitment

To **work with industry** to reduce serious accidents and incidents, and **provide tangible support** in achieving a positive cultural change.

Incident summaries for industry awareness
Safety audits & significant incident reports
Fatality summaries

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Investigations

- We have completed 98% of the serious and fatal incidents from 2012 - 2015
- This increase in completed investigations is resulting in more critical safety information being made available to industry which, in turn, helps protect workers and safeguard the community
- 5 inspectors are currently seconded to the Investigations Team.

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06

Critical activities and hazards identified

Greater focus required on:

- Falling from height
- Worker under suspended load or object
- Caught, trapped and crushed between or against
- Vehicle related
 - Collisions
 - Vehicles over edges or rollovers
 - Vehicle runaway on slope or gradient

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Data analysis

07

- Edith Cowan University
- University of Western Australia
- Kiel Centre – human factors
- Fatal Serious, incidents and occurrences reports

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University projects

08

Edith Cowan University

1. Analyse the data to identify types and frequencies of injuries and use this to shape the education curricula for emergency response
2. Identify historical and contemporary models used to describe similar safety data
3. Develop statistical models from the safety data that will assist industry to forecast the risk injuries.

University of Western Australia

Proposing to obtain insights into hazards, injuries and contributing factors by analysing the text in the narrative descriptions

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Human factors

09

- Project initiated following 2015 DMP Roadshow
- Initially started by investigating “Safety Culture”
 - How build upon “Safety Culture Spectrum” concepts?
- Identified “Human Factor” concepts provides a more complete safety management picture
- Data analysed
- Proposed framework developed
- Now requires industry input

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Hazard register

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- DMP is also currently finalising a Hazard register
- Summary of 64 fatalities between 2000 and 2015
- Assist individual sites to focus on critical activities and ensure that appropriate safety precautions are taken

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Challenges and emerging issues

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- Nano Diesel Particulate Matter
- Ventilation standards
- Mental Wellbeing
- Isolation
- High Risk Work Licences
- Verification of Competency
- Structural integrity

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Resources Safety's focus on mining activities

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Improving hazard awareness and control selection

Areas of concern

- Maintenance and service activities
- Hazardous manual tasks
- Fit for purpose
- Falling from height



Promoting the adoption of appropriate risk management strategies

Areas of concern

- Principal hazard management plans
- Safety in design
- Assessment of competence
- Traffic management
- Job risk assessment tools (e.g. JRIAs, JSAs)



Supporting effective leadership and positive cultural change

Areas of concern

- Fitness for work
- Management and supervision
- Safety and health representatives

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Appendix 2 Gareth Pickering's forum presentation slides

01

Safety culture and human factors

Gareth Pickering,
Inspector of Mines-Process Engineer

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02

Overview

- Why DMP is interested in Safety Culture?
- What is the link between Safety Culture and Human Factors?
- Overview of DMP work on Human Factors
- Critique DMP proposed "critical Human Factor topics"

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03

DMP RADARS vision is for a positive cultural change within industry

...which means all mines moving towards (or maintaining) a resilient safety culture

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04

...but what exactly is safety culture?

- Is it about employees complying with rules?
- How do leaders manage safety culture?
- How does it fit into a Safety Management System?
- How is it measured?

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05

Information on safety culture abounds, but...

- There is a lack of consensus on a definition
- It is **not** the sum of employee questionnaire responses
- Its measurement requires a "multi-dimensional" approach
- Many frameworks have been proposed

Schein's Three Layer Model of Culture – one of the most widely cited for safety culture

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06

...so which models are most relevant to the WA mining industry?

Several possible, but it needs to...

- Be consistent with legislative trends
 - i.e. safety case / principal hazard type concepts
- Be "defendable" with research and data
- Be well documented and accessible
- Capable of converting "knowledge" into "application"

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UK HSE approach is to view “safety culture” as a component of Human Factors...

The goal:

- To minimise unwanted outcomes, by...
- Maximising human performance by...
- Managing performance shaping factors.

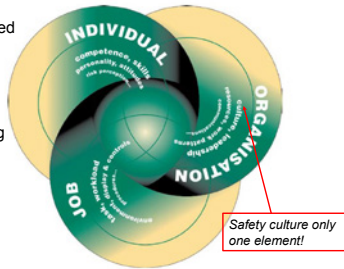


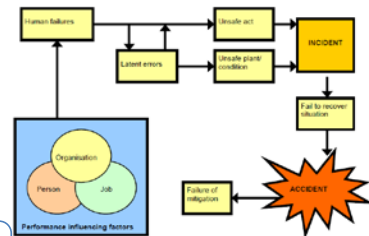
Diagram reference: Reducing error and influencing behaviour, HSE, HSG48 page 5

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07

...but what are Human Factors? Best viewed in terms of human error and accidents

Human Factors is concerned with the application of what we know about people, their abilities, characteristics, and limitations to the design of equipment they use, environments in which they function, and jobs they perform.



Source: Human Factors and Ergonomics Society, Formed 1957

“up to 85% of accidents are attributed to some degree to human error”
US Bureau of Mines, Rushworth et al., 1999

Diagram reference: HSE Inspectors Toolkit, 2005 page 29

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08

To focus efforts the UK HSE developed a “Top 10” Human Factor topic list as follows...

Goal

- Managing Human Failures and Reliability (1)

Organisational Behaviour

- Organisational Culture and Development (9)

Task Performance Issues

- Procedures (2)
- Safety critical communications (6)
- Fatigue and shift work (8)
- Maintenance inspection and testing (10)

Human Factors and SMS

- Training and competence (3)
- Staffing levels and workload (4)
- Organisational Change (5)
- Human Factors in design (7)

Emergency Response (11)

Ref: <http://www.hse.gov.uk/humanfactors/top-ten.htm>

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09

...but are the UK HSE Human Factors relevant to the WA Mining industry? To answer this...

- DMP Mine Safety Branch initiated a project
- Engaged a Human Factors expert
- Analysed a sample of data from:
 - Background industry literature
 - DMP publications
 - DMP incident and inspection data
 - Inspector focus groups
- Identified events where a “Human Factor” was contributory cause
- Collate HF causes against UK HSE Top 10 topics



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From the study key findings were...

- UK HSE Human Factors topics are relevant
- However, they require inclusion of health issues
- “Top 10” concept needs expanding to include “Emergency Response”
- Language and context requires modifications to suit our industry



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Proposed DMP critical human factors for WA mining

No.	Topic	Sub-Topic
1	Managing Human Reliability	Preventing Human Failure
		Human Factors in Incident Investigations
2	Health and Safety Culture	Leadership
		Effective Supervision
		Individual Duty of Care
		Procedural Compliance
		Contractor Management
3	Training and Competence	Nil
4	Staffing & Workload	Staffing Levels
		Staffing Workload
5	Organisational Change	Nil
6	Designing for People	Human Computer Interface
		Alarm Management
		Equipment Ergonomics
		Work Environment
7	Usable Procedures	Nil
8	Safety Critical Communications	Isolations & Permit to Work
		Operations
9	Fitness for Work	Fatigue Risk Management
		Drugs and Alcohol
		Physical fitness
		Mental Wellbeing
10	Maintenance Inspection and Testing Error	Maintenance Error
11	Emergency Response	Nil

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Further information? There is plenty...

- Energy Institute:
 - Human Factor Briefing Notes
1 -20
- Guide – Railway Industry -
Understanding Human
Factors
- UK Health and Safety
Executive





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