

# COMPLIANCE PRIORITIES OUTCOMES

July – December 2017

## Heat stress

**Issue:** Heat stress has been identified as a significant risk at several underground metal mines. Working in intense heat can raise normal body temperature and lead to serious dehydration, heat stroke and possibly death.

In July 2017, a Western Australian mine operator was found guilty of failing to take measures to prevent hazardous levels of heat that contributed to the death of a contractor at a Pilbara underground gold mine in 2015. Following this, the NSW Resources Regulator undertook a compliance inspection program targeting heat stress management plans (HSMPs) at underground metalliferous mines in NSW.

## What we did

To establish an understanding of how mines managed this hazard, a desktop assessment of heat stress management plans was completed. This occurred in parallel with a review of available guidance and literature before assessing mines that were considered the highest risk operations. The Resources Regulator also:

- wrote to mines advising of our intention and our expectations
- published a fact sheet on heat stress titled ‘Heat stress – underground metalliferous mines’
- presented details of the compliance program at a forum for metalliferous mines
- reviewed the available literature and guidance to determine what elements were key inclusions for managing heat stress and to further identify good practice
- undertook a desktop review of heat stress management plans from 13 mines (see Annexure A)
- conducted a detailed assessment of the two underground metal mines where it was considered workers were exposed to the greatest risk of heat stress

## What we found

A search of the guidance and literature specific to management of heat stress, revealed a significant amount of guidance was available to industry. Much of this guidance was designed to assist operators develop and improve their own HSMPs.

Findings suggest that most mines relied upon mining-specific guidelines for their information on how to best manage heat stress and overall the necessary management elements were incorporated into their HSMPs. Refer to our 'Heat stress – underground metalliferous mines' fact sheet for reference to guidance materials.

However, the desktop review revealed that the overall standard and general adequacy of HSMPs was poor. The plans, in general, require review and updating to meet requirements. Further investigation is required to determine actual practices at mines and this will be done through planned inspections during the latter half of 2018.

The detailed assessment at the two mines exposed to greatest risk of heat stress revealed:

1. A lack of TARPs developed for managing heat stress.
2. Re/acclimatisation provisions were neither well understood by workers and supervisors, nor were these provisions implemented as per the plan.
3. Hydration testing was done inconsistently or on an ad hoc basis.
4. Contract workers had poor to no understanding of heat stress symptoms or treatment.
5. During several underground observations, ventilation (heat stress mitigation) was found to be poor and dust in the environment confirmed this.
6. Withdrawal zone protocols and monitoring results were not consistent with guidance and plans.
7. Heat stress monitoring equipment was in limited supply and not always readily accessible, particularly on backshifts.

Both mines were issued section 191 improvement notices requiring the mines to:

- review and update HSMPs and any working in heat procedures
- ensure that all workers who enter the underground workings are informed and trained (if necessary) on any changes made to HSMPs or any working in heat procedures
- review the ventilation control plan to ensure that the minimum ventilation standards are maintained in areas where people work and travel and the wet bulb temperature exceeds 27 Celsius

- conduct regular audits of the ventilation control plan and any working in heat procedures.

## Outcomes

Industry has been informed of the risks associated with heat stress and should be better equipped to manage the risks following direct engagement with mine operators and the publication of the fact sheet.

- There is improved awareness and understanding of the management of heat stress risks by mine operators in underground metal mines in NSW. This is borne out by the positive feedback from the participating mines.
- Several mines reported refocusing and reviewing their practices and a greater level of understanding and awareness was obvious in discussion with operators.
- A clearer picture of the efficacy of heat stress management is now available to the regulator. Compliance operations in the future will 'test' improvements in the management of heat stress as they pertain to the sector.

## Recommendations

- Mines and petroleum sites must ensure their HSMPs meet legislative obligations.
- Specific and straightforward heat stress management guidance is available and should be reviewed to address deficiencies, against each mine's existing approach.
- There is a need for greater oversight in the implementation of key elements of the heat stress management plan. This will better enable mines to meet their legislative obligations.
- Mines operators must ensure their contractors use and employ the same level of risk controls and heat stress management as permanent employees. Greater supervision, communication and management of these workers will assist in reducing the risk to workers hot working environments.
- Ensure ventilation levels are monitored and air flows are maintained at planned volumes. Good ventilation design can assist in cooling workings and keeping conditions below hazardous levels.

## Next steps

All underground metalliferous mines will be subject to further planned inspections on their heat stress management plans. This continued program of work has commenced and will be finalised during the latter half of 2018 and early 2019.

### Annexure A

Mines whose heat stress management plans were reviewed

MINE NAME	MINE NAME
Perilya Southern Operations	Tritton
Perilya North	Cadia
Perilya Potosi	Rasp
New Cobar and Chesney	Peak
Murrawombie	Hera
Northparkes	CSA

### Endeavor

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