NSW GOVERNMENT

NSW Resources Regulator

COMPLIANCE PRIORITIES OUTCOMES

Self-escape systems in underground mines (Jan-June 2020)

Self-escape and refuge systems in underground mines

Issue: Self-escape and refuge systems in underground mines are critical, life-sustaining elements of the mine's emergency management system. Effectiveness of the self-escape and refuge system is heavily reliant upon worker familiarity with the equipment and processes that are rarely used. This requires a significant emphasis on training and simulated exercises to maintain an effective system in a time critical, dynamic emergency.

A range of limitations in self-escape and refuge systems have been noted in previous inspections and incidents, leading to this compliance priority focus area.

What we did

The program plan includes large underground mines (coal and metalliferous) in NSW comprising of a range of assessment methods that include both targeted assessments and planned inspections. A limited number of assessments within the scope of this program have been completed to date due to the disruptions caused by the COVID-19 pandemic. In total, two underground coal mines and four underground metalliferous mines were assessed.

What we found

The most significant issue identified during the inspections carried out relates to the training in the use of self-escape breathing apparatus given to underground workers at metalliferous mines. In some cases, there was a complete absence of this type of training. Significant deficiencies were identified at three of the four sites in relation to training, despite the requirements in Cl100 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014.

The findings below may be specific to all or only some of the sites assessed. The following observations were made:

- A number of mines had inadequate levels of initial and refresher training for underground workers regarding self-rescuers. In some cases, there had been no practical training delivered. Others had training records that incorrectly recorded workers doing practical assessments of fitting the self-rescuers.
- To prevent non-emergency use of ladderways, signage used at one mine could have led workers to believe the escapeway was out of service when it was not.
- Some communication systems at mines have backup, off-site emergency call centre links as a contingency if the surface competent person was not contactable. This also doubled as a check-in service at regular intervals by a third party, who could raise an alarm if workers did not respond.
- At some mines smoke goggles are not always supplied as part of the belt-worn self-rescuer. While visible smoke is often a trigger for the use of the self-rescuer, the effect of smoke as an eye irritant is not always considered in the escape system design / risk assessments.
- Underground refuge chambers had varying levels of serviceability. While some were very well maintained, others had mine-air supply faults, uncalibrated gas monitoring systems, faulty communications systems and instructions depicting different equipment to that installed within the chamber.
- Underground mine workers mentioned that they generally had a sound understanding of their escape and/or refuge options, triggers for initiating an escape and their self-escape breathing apparatus.
- Some escape ladderways are fitted with fall arrest systems, however inadequate training and instruction was provided to workers around the use of associated equipment.

Outcome

The assessments conducted resulted in the following notices:

- nine section 191 notices issued
- four section 23 notices issued.

Next steps

The Regulator will continue to conduct assessments within this program until all underground large coal and metalliferous mines have been assessed. At the conclusion of these assessments, a final report will be generated, with the program outcomes identified.

Recommendations

To promote the improvement of self-escape and refuge standards in underground mines, industry should:

- Ensure underground workers are adequately trained in the use of self-rescue breathing apparatus, including compliance with clause 100 of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2014. Mine operators must ensure workers can demonstrate the ability to perform the required tasks in a simulated work environment.
- Mines with refuge chambers need to ensure that inspection and maintenance systems are established and issues identified are actioned in a timely manner.
- Risk assessments and escape and refuge system development should include situations where reduced visibility and eye irritation may affect the assumptions made in the escape and refuge strategy.
- Workers need to be trained in all aspects of the escape and refuge system, and complete simulations sufficiently to ensure they can respond appropriately during an emergency.

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