

DATE: MARCH 2018

Workers withdrawn after methane frictional ignition

This safety alert provides safety advice for the NSW mining industry.

Issue

A frictional ignition of methane occurred at an underground coal mine when a continuous miner intersected a projected structure during production in a development panel. Workers on the machine attempted to extinguish the fire using water hoses, however this was unsuccessful. The fire was eventually extinguished using a fire extinguisher.

No workers were injured, however they were shaken following the incident.

Investigation

Based on information provided by mine workers, the flame width was 2 m to 2.5 m (half width of cutter head) and came back over the head of the machine for 2 m to 2.5 m.

Resources Regulator inspectors and investigators attended site and issued a section 195 notice prohibiting entry underground except for the purposes of maintaining the ongoing safety of the mine.

Among other issues the investigation identified:

- the mine did not have a frictional ignition management plan
- the ventilation system in the panel was not at an acceptable standard, with vent rubbers missing and numerous vent tubes damaged
- fan and vent tube sizing was marginal to ensure adequate ventilation at the face to dilute accumulations of gas
- the mine ventilation control plan did not stipulate requirements for supervisors to verify ventilation quantities at the face.

Recommendations

A frictional ignition is usually initiated by an uncontrolled heat energy source such as a blunt or cutter pick striking rock with incensive (heat generating) properties, such as high quartz or pyretic content. If ventilation quantities are insufficient to prevent a methane layer from forming, and this layer goes undetected, an incensive spark can ignite the gas and if the flame path reaches an accumulation of methane in the general body, it can explode with devastating consequences.

The Resources Regulator recommends the following:

1. Frictional ignition risks should be assessed at each mine and effective control measures implemented. Where incendive rock and methane gas are identified as a hazard, frictional ignition should be treated as a principal hazard and a principal hazard management plan developed.
2. Ventilation design should ensure that the air quality, quantity and velocity at each working place is sufficient to prevent the formation of methane layers and be capable of removing and rendering harmless, accumulations of methane gas. If necessary, additional ventilation devices such as compressed air venturis should be deployed.
3. Cutter picks should be inspected before each cutting cycle and changed as necessary. Cutter pick beds and heads should be designed with water sprays arranged to prevent incendive sparking.
4. Continuous miners should have methane sensor heads positioned to maximise the likelihood of detecting gas and, in order to protect against frictional ignition risks, have a dedicated methane gas sensor that trips power to the cutter head located at, or close to, the cutter head. Operators are reminded that where the electric cutter motors are positioned close to the cutter head, electrical trips to the cutter head should also be set at 1.25%.
5. Continuous miner operators and supervisors should be trained in frictional ignition risks and how to detect and prevent methane layering. This should include providing operators and supervisors with methanometers and supervisors with methanometer extension probes of sufficient range to enable tests for gas layers at the cutting face from a position of safety under supported ground.

NOTE: Please ensure all relevant people in your organisation receive a copy of this safety alert, and are informed of its content and recommendations. This safety alert should be processed in a systematic manner through the mine's information and communication process. It should also be placed on the mine's notice board.

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Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that information on which they rely is up to date and to check the currency of the information with the appropriate officer of NSW Department of Planning and Environment or the user's independent advisor.

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