

Safety Bulletin

December 2022

Workers sucked onto end of auxiliary ventilation ducts

Issue

Two underground coal mines recently reported similar incidents where workers were injured during the process of extending the auxiliary ventilation ducting at development production faces.

Incident 1

A mine worker was sucked onto the end of a ventilation duct while it was being installed in a roadway development panel from the platform of the continuous miner. The worker suffered soft tissue bruising and a scan later identified a fractured rib.

Circumstances

The incident occurred at a coal mine in the NSW southern coalfields.

The worker was unable to free themselves from the duct, and another worker made 2 attempts to free the first worker from the end of the ventilation ducting. The second worker was successful on the second attempt, however, was also injured when falling backwards onto the miner platform with the first worker falling onto the second.

First aid was administered, and the first worker was transported to the mine surface, then to hospital.

The auxiliary fan was 200kW and 25 m³/s open circuit capacity. The variable inlet vanes (VIVs) were set at 20 m³/s and 618-millimetre diameter ducts were being used with a smaller diameter slider duct at the face end.

The ventilation duct run was about 170 m to the face. The run included a 90-degree elbow where the fan duct line connected to the duct line in the roadway to the development face.

Investigation

The NSW Resources Regulator conducted a site assessment, which focused on the exposure of workers to excessive negative pressure while installing fan ducting and the following observations were made:

- The mine normally used onboard ventilation systems with their continuous miners, however a decision was made to change to face ventilation using the slider duct arrangement.
- The mine had a procedure for using the slider duct arrangement that listed the suction to be something to be aware of.
- The duct line was a single run from the auxiliary fan to the working face with no relief valve type arrangement.

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- There was no determination regarding the safe operating range of the auxiliary fan (in terms of air quantity, air velocity or pressure) to allow for safely adding of ventilation ducting.
- The procedure lacked detail about safe standing zones while extending the ventilation ducting.
- The process steps for workers to install ventilation tubes safely required further development.
- There were no details about guarding requirements of the most inbye tube to protect loose items and debris being sucked into the duct or workers being sucked into or against the duct while working in close proximity (such as working on continuous miner platforms).
- Safety Alert SA20-05 was not considered prior to conducting this activity.

Incident 2

A mine worker, who was assisting another mine worker installing an auxiliary fan ventilation duct, was sucked into the end of the duct hitting the upper part of his nose on the upper arc of the duct resulting in a facial fracture.

Circumstances

The incident occurred at a coal mine in the NSW western coalfields.

The worker was installing the next ventilation duct in sequence from the platform of a continuous miner when the operator was pulled against the ventilation ducting. The worker's head and torso were influenced by the pressure at the end of the ventilation ducting.

First aid was administered, and the worker was transported to the mine surface, and then to hospital. The auxiliary fan was 150kW and 22 m³/s open circuit capacity. The variable inlet vanes (VIVs) were set at 15 m³/s and 720-millimetre diameter ducts were being used.

The ventilation duct run was 97.5 m to the development face.

Investigation

The NSW Resources Regulator conducted a site assessment which again focused on the exposure of workers to excessive negative pressure while installing fan ducting and the following observations were made:

- No risk assessment was ever undertaken in relation to installing and recovering ventilation tubes or auxiliary fan operations.
- The mine had procedures for using auxiliary fans and installing ventilation ducting however, the ventilation pressure at the end of the duct was not considered.
- The duct line was a single run from the auxiliary fan to the working face with no relief valve type arrangement.
- There was no determination regarding the safe operating range of the auxiliary fan (in terms of air quantity, air velocity or pressure) to allow for safely adding of ventilation ducting.
- The procedure lacked detail about safe standing zones while extending the ventilation ducting.
- The process steps for workers to install ventilation tubes safely required further development.
- There were no details about guarding requirements of the most inbye tube to protect loose items and debris being sucked into the duct or workers being sucked into or against the duct while working in close proximity (such as working on continuous miner platforms).
- Safety Alert SA20-05 was not considered prior to undertaking this activity.

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Recommendations

The following recommendations are made:

- Mine operators should review their auxiliary fan operational risk assessments (for each type of auxiliary fan in use at each site) and ensure the risks to health and safety for people working in close proximity to ventilation ducts during installation, operation, maintenance and repair are identified and controlled. The specific hazard identified with this incident (workers being drawn into or against the ventilation ducting) should be considered.
- With the review of risk assessments above, mine operators should implement controls in accordance with the hierarchy of control measures as required in clauses 35 and 36 of the Work Health and Safety Regulation 2017.
- The operating range of auxiliary fans (i.e. VIV settings) should be determined through modelling and testing, to ensure the ventilation tubes can be added into the circuit without risk to workers being sucked into or onto the end of a tube while clearing gas, dust, and diesel exhaust pollutants, as well as preventing recirculation.
- The location used for monitoring ventilation performance and hence determining any change in fan operational parameters must be formalised in the mine’s safety management system (for example – the procedure for auxiliary fan operations).
- Safe standing zones and the detailed process steps to safely install ventilation ducting should be formalised and documented in the mine’s safety management system.
- The relevant sections of the workforce should be trained and refreshed (at a frequency determined by the mine) in the safe operation of auxiliary fans on site – including the installation/extending of ducting.
- Consider Safety Alert SA20-05.

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 common area, such as your notice board where appropriate.

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