

Safety Bulletin

Date: September 2024

Incidents and injuries associated with working on pressurised systems

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

Issue

There have been 15 incidents over 18 months that have either injured workers, or had the potential to cause serious injury or death, where workers were interacting with pressurised systems including air, water, hydraulics, and tailings. Six of those incidents occurred in the past 6 months.

Despite the industry-wide focus on isolation and dissipation of energy, in almost all of the incidents that were reported to the Resources Regulator, workers failed to successfully release the stored energies from the systems on which they were working.

Comments from the incident notifications included:

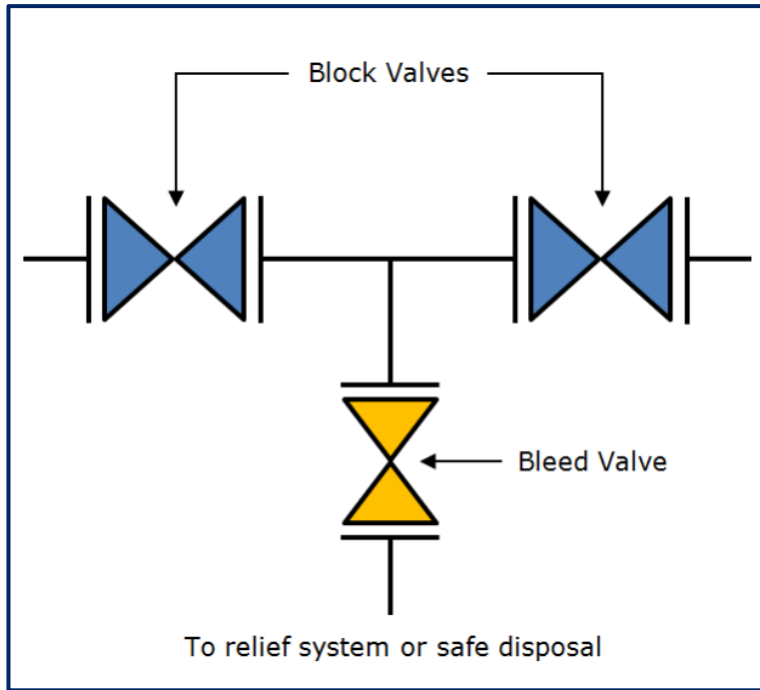
- “They thought isolation had occurred and pressure dissipated.”
- “It appears they did not isolate and dissipate the stored energy in the air line.”
- “The crew assumed that the services were successfully bled.”
- “It would appear that the accumulator circuit pressure wasn't dissipated.”

All mine operators must prepare and implement the appropriate isolation of energies procedures.

The procedures should include a step that requires workers to **test and confirm** that the pressurised systems they are about to work on have been deenergised. For pressurised systems, the use of a double block and bleed isolation is considered good practice.

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Figure 1: Double block and bleed (2 separate isolation valves and 1 drain valve)



Circumstances of the incidents reported in 2024

Incident 1 – 14 July 2024 – Underground coal mine

A person was sprayed on the underside of their arm by stone dust. Two operators were conducting the task of dusting an outbye belt road area and the discharge line then became blocked. The workers thought that an isolation had occurred and pressure had been dissipated to allow the line to be broken. An operator undid the 'camlok' fitting at the hose join on the inbye side of the pod duster, which resulted in dust being sprayed on the worker's bicep and underside of their left arm. The worker was taken to hospital with suspected fluid injection, but was found to have suffered bruising and abrasions to the arm.

Incident 2 – 3 July 2024 – Underground coal mine

A 50 mm air hose was being installed on the pan line across a longwall face. A fitter went to connect it to the supply airline at the maingate corner. The fitter did not isolate and dissipate the stored energy in the airline before removing the retainer staple. This caused the end cap to eject, hitting the fitter in the left leg just below the kneecap.

Incident 3 – 20 April 2024 – Underground metalliferous mine

About 4pm, a service crew was sent to 8395 level to unblock an air header which was reported on the previous shift and they isolated the services. They accessed an airline dropper and opened it. Nothing came from the dropper, so the crew assumed that the service was successfully bled (deenergised). They began to take the air header off using C spanners.

Once the header was loose enough to start removing by hand, the poly pipe header whipped and struck one of the operators. The operator suffered a deep laceration to the cheek and reported shoulder pain.

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Figure 2: The header and C spanner



Incident 4 – 25 March 2024 – Surface coal mine

A work party was bleeding the brakes on a Komatsu 830E haul truck while under live testing. When they tried to bleed position 1 tyre it was identified there was no pressure. They conducted troubleshooting and determined the problem was an incorrectly routed hose to the treadle valve in the cabinet at front of the operator's cab.

One of the workers disconnected the hose without having isolated the truck and bleeding down the brake accumulators. Upon disconnecting the hose pressurised fluid sprayed over the worker's head and shoulders, soaking him. The pressure source is believed to come from the 220 Bar (3,200 PSI) brake accumulator.

Figure 3: Release of uncontrolled energy - brake system hose whipping about releasing oil



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Incident 5 – 22 March 2024 – Underground coal mine

A shuttle car had a leaking main valve bank that was repaired on night shift. Day shift found it was again leaking during the operator prestart inspection. A mechanical tradesman inspected the shuttle car and found oil leaking when the brake was released. The mechanical tradesman isolated the shuttle car, and during the removal of the brake pressure solenoid, was sprayed with hydraulic oil in the face and chest. The circuit pressure was 130 Bar.

Incident 6 – 22 January 2024 – Surface coal mine

During a shutdown, workers were disconnecting piping and valves in a tailings pipeline. They had isolated the number 1 pipeline and a worker began loosening the flange on the number 2 pipeline, which had not been isolated. The worker believed it to be part of the pipeline that was isolated at the time. The worker was sprayed with tailings liquid.

Investigation

Contributing factors involved in these incidents included:

- failure to follow the mine's isolation of energy procedures
- failure to test for dead
- failure to follow original equipment manufacturer procedures
- failure to implement line of fire controls when separating pipes and/or components
- workers assuming a system is deenergised after observing an apparently deenergised drain line.

Recommendations

Mine operators:

- review their isolation of energies procedures to ensure scenarios associated with working on service pipework and hoses includes testing for deenergisation.
- review application of double block and bleed isolations on service pipe work.
- ensure all personnel are trained and competent in the sites isolation procedures
- ensure adequate supervision of tasks associated with live pressurised systems.

Workers

- verify the isolation and dissipation process is effective on pressurised systems
- ensure drain lines are clear when testing for dead
- identify and implement controls for line of fire prior to disassembly/disconnection of components, pipes, or hoses
- review and provide feedback to your supervisor on the suitability of existing isolation procedures.

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Note: Please ensure all relevant people in your organisation receive a copy of this safety bulletin and are informed of its content and recommendations. This safety bulletin 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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