

SAFETY ALERT



INJURY FROM HIGH PRESSURE FLUID INJECTION

INCIDENT

A mineworker was injected with high pressure hydraulic oil when he was working at the boot end of an underground coal mine longwall conveyor. He was sent to hospital and has had several operations to remove the fluid.

CIRCUMSTANCES

The boot end was fitted with hydraulic rams for aligning and levelling when retreating the belt. Hydraulic pressure (350 bar or about 5000 psi) was being supplied via a hose to a control valve bank, which was used to operate the hydraulic rams. The mineworker was operating the control valves when the supply hose broke away from the valve bank and struck him at the back of his right leg above the knee. Oil was injected into his thigh and down into his leg.

INVESTIGATION

The main hose connection to the valve bank was a threaded type. All the other valve bank hoses were staple locked. The valve bank was mounted on a swinging arm, which may have caused the threaded connection to work loose as the bank was moved around. The threaded joint had been found loose and was re-tightened earlier in the shift. The threaded fitting on the hose connection was damaged. This fitting had been replaced at least once in the four weeks since longwall operations had started. Hydraulic hoses were dragging on the ground, which could have damaged them. There were no guards to protect an operator from failed hydraulic hoses or connections on the control valve bank.

RECOMMENDATIONS

Mines operating equipment with high pressure hydraulics should:

1. Review the suitability of hydraulic fittings used to connect hoses to fixed components (such as valve banks and manifolds) to withstand loads under all operating conditions.
2. Identify and eliminate the risk of damage to hydraulic components.
3. Install guarding to protect operators from high pressure discharge from failed hydraulic hose/valve bank connections.
4. Review training and instruction programs so all operators and maintenance personnel are aware of the dangers of high pressure fluid release.
5. Develop an emergency procedure for dealing with high pressure fluid injection. Refer to MDG 1016 - First Aid in NSW Coal Mines, February 1999.

The following standards may be used for reference:

- ◆ AS2671 - Fluid Power/Hydraulic systems and Components
- ◆ AS2958.2 - Earth Moving Machinery Safety
- ◆ AS4024.1 - Safeguarding of Machinery

High pressure fluid injection has been the subject of other Safety Alerts (see Safety Alerts SA 00-02 and SA 98-08).

For additional information please contact Ray Leggett, District Inspector of Coal Mines on 0408 424 126 or Paul Drain, Mine Safety Officer (Mechanical) on 0407 254 290.

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