NSW DEPARTMENT OF PRIMARY INDUSTRIES

SAFETY ALERT

Dangerous Uncontrolled Release of Hydraulic Energy

INCIDENT

An operator sustained minor injuries when the hydraulic hose for the bucket tilt function burst allowing pressurised fluid to smash the front windscreen on his wheel loader.

CIRCUMSTANCE

While the wheel loader was being operated a corroded hydraulic hose end released uncontrolled hydraulic fluid which ejected towards the driver's windscreen.

The energy from the uncontrolled release of hydraulic oil was sufficient for the hydraulic oil to penetrate the front windscreen of the loader, enter the driver's compartment and hit the driver. (See attached photos)

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INVESTIGATION

Preliminary investigation shows the hydraulic hose for the bucket tilt function failed where the hydraulic hose enters the hose fitting (hose end) which is located close to the operator's cabin.

While the hose visually appeared to be in a relatively good condition, it failed due to corrosion. The hose has an operating pressure of approximately 31.5MPa (4,500psi).

While injuries were minor, this incident had the potential to be fatal.

Further investigation with the OEM revealed a safety bulletin had been released in the USA and Canada on the 26 October 2005 highlighting the issues that led to this very same incident.

RECOMMENDATIONS

This incident highlights the hazardous nature of uncontrolled pressurised fluids. Hydraulic energy is a major hazard if uncontrolled.

To meet OH&S obligations equipment designers, manufactures and hirers must take all reasonable steps to advise equipment owners of faults and details to rectify faults with their equipment. Refer to Chapter 5 Occupational Health and Safety Regulation 2001.

All mines should:

1. Inspect all high risk hydraulic hoses on equipment to ensure they are fit for purpose and free of defects.
2. Through the hierarchy of risk controls remove the exposed risk, either by relocation, guarding or other design improvements.

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3. Ensure all high-risk hydraulic systems are securely protected by guards or other such devices that will diffuse the hydraulic energy and provide equivalent levels of safety.
4. Develop a hydraulic hose management system that allows hose replacement, failures and damage to be monitored and to implement predictive maintenance strategies. For example replace high risk hoses before failure.
5. Review MDG 41 Guideline for Fluid Power System Safety for Mines (Draft) for additional information.
6. Advise equipment manufacturers of safety related defects and faults from time to time.
7. Owners and operators of CAT 988G and 988H wheel loaders should contact the OEM or representative for additional information.

Signed

Rob Regan
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DIRECTOR, MINE SAFETY OPERATIONS BRANCH
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