



NSW DEPARTMENT OF
PRIMARY INDUSTRIES

SAFETY ALERT

Working at Heights Prevention of Falls and Fall Arrest

ISSUE:

The following extract from the Occupational Health and Safety Regulation 2001 is an essential prerequisite of working at heights:

Clause 56 (2)

If a fall arrest device is provided for use by persons at work, the employer must ensure that:

- (d) all persons using the device have received training in the selection, assembly and use of the system, and***
- (e) adequate provision is made for the rescue of a person whose fall is arrested by a fall arrest device.***

Persons must also be trained in the fitting and adjustment of full body harnesses.

The rescue time must be such that the risk of injury and suspension trauma is minimised.

FALL ARREST SYSTEMS AND HARNESS-INDUCED DEATH

Vigilance is needed to supervise persons to ensure harnesses and fall arrest devices are used correctly and safely. Prolonged suspension from fall arrest systems can cause orthostatic intolerance or suspension trauma which can quickly lead to death.



Person after a fall, unable to support his legs

Mine Safety Report No:
Prepared by:
Phone:
Date Created:

SA06-02
Gordon Jervis
02 4931 6642
16 January 2006

Suspension trauma or orthostatic intolerance results from a harness restricting blood flow from the legs. Harness restriction leads to pooling of blood in the legs which reduces the return blood flow to the heart. The brain, kidneys, and other organs are then deprived of blood and oxygen which leads to a lack of consciousness, serious injury and then death. A lack of consciousness can occur after five minutes.

Harnesses can become deadly whenever a person is suspended for durations in an upright posture, motionless with legs straight beneath the body. Unconscious or immobile workers suspended in their harness will not be able to move their legs and will not fall into a horizontal position, as they would if they fainted while standing. (If fainting while standing the body falls onto the ground and becomes horizontal which allows the blood to flow back to the heart and be pumped to the brain).

Three things happen that aggravate the problem. Firstly, the person is suspended in an upright posture with legs dangling. Secondly, the safety harness straps exert pressure on leg veins, compressing them and reducing blood flow back to the heart, leading to unconsciousness. Thirdly, the harness keeps the worker in an upright position, regardless of loss of consciousness, leading to death.

Rescue must be carried out very carefully or it can also cause death. Moving a person quickly into a horizontal position - a natural reaction - is likely to cause a large volume of deoxygenated blood to move to the heart if a person has been suspended for an extended period. The heart may be unable to cope with the abrupt increase in blood flow, causing cardiac arrest.



Motionless suspension for more than five minutes can be deadly

Signs and symptoms of an individual who is approaching unconsciousness

Faintness	Nausea
Sweating	Dizziness
Paleness	Unusually low heart rate
Hot flashes	'Greying' or loss of vision
Breathlessness	Unusually low blood pressure
Increased heart rate	

RECOMMENDATIONS

1. People should always look to use methods where there is no suspension.
2. If fall arrest devices are to be used, it is essential to ensure that anchorages, arrest devices and harnesses are fit for purpose and correctly attached, fitted and worn.
3. If people have to use a harness then they should never be permitted to work alone.
4. Time in suspension should be limited to less than five minutes.
5. It is recommended that foothold straps or a "relief step" be used.



Unopened Relief Step on harness



Opened Relief Step being used in "stand position"

6. Harnesses should be selected for specific applications and must consider compliance, potential arrest injury and suspension trauma.
7. Rope/cable tenders must ensure the harness user is conscious at all times.
8. Tie-off lanyards should be anchored as high and as tight as work permits.
9. All people should be trained that motionless suspension in an upright condition for more than five minutes can lead to unconsciousness and possible death.
10. Be aware of the signs and symptoms of harness-induced death.
11. If self rescue is not possible, or a rescue cannot be performed promptly, people should be trained to pump their legs frequently to activate the muscles and prevent the risk of venous pooling.
12. Rescue suspended persons as quickly as possible.

13. People are trained that moving rescued workers into a horizontal position too rapidly can also cause death

Signed



**Rob Regan
DIRECTOR
MINE SAFETY OPERATIONS BRANCH
NSW DEPARTMENT OF PRIMARY INDUSTRIES**

View more safety alerts at www.minerals.nsw.gov.au. If you would like to receive safety alerts by email, send your details to safetyalert@minerals.nsw.gov.au.

References:

- Seddon, Paul. Harness Suspension: Review and Evaluation of Existing Information. Health and Safety Executive. Research Report 451/2002. 104pp
- US Government Department of Labor Occupational Safety and Health Administration (www.osha.gov)
- Workcover Code of Practice, 13 August 1993, Safe Work on Roofs – Part 1
- CFMEU Industry Safety Alert for construction safety mesh on roofs, 6 October 2005

Mine Safety Report No:
Prepared by:
Phone:
Date Created:

SA06-02
Gordon Jervis
02 4931 6642
16 January 2006