DEPARTMENT OF MINERALS AND ENERGY WESTERN AUSTRALIA

S A F E T Y B U L L E T I N No. 28

ROLLOVER PROTECTION FOR SURFACE EARTH MOVING MACHINERY

GENERAL GUIDANCE NOTE

This note is intended to assist mine operators and others in understanding the requirements regarding rollover protection in surface mining operations that are imposed by the mining safety legislation and the application of those requirements to the mining industry in Western Australia. It also indicates the policy criteria that will be used by the mines inspectorate in interpretation and in determining compliance with the legislation.

The specific requirements for rollover protection for surface earth moving machinery are given in regulation 4.15 of the Mines Safety and Inspection Regulations 1995. However, the matter also comes within the ambit of the general duty of care of employers, which is covered in s.9(1) of the Mines Safety and Inspection Act 1994.

REGULATION 4.15

The clear intent of regulation 4.15 is that the fitment of rollover protection structures to certain classes of machinery is **mandatory** before 9 December 1997 (24 months after the commencement date of the regulations - see sub-regulation 4.15(3)).

The application of the regulation is limited to **"earth moving machinery"**, which is defined in sub-regulation 4.15 (1) to include "earth moving machinery which has been modified to perform other service functions". This is intended to apply to such items as scrapers or off-highway haul trucks that have been converted for use as water trucks or other similar or related functions. Such equipment is used in surface mining operations in applications that clearly warrant protection for the operator.

A further important point is that the regulation is intended to apply to **"quarry operations"** as defined in s.4 of the Act. This term includes the "extraction of minerals and rock from the open pit" and encompasses the associated roads, ore stockpiles, waste dumps and tailings dams. Generally, the regulation could be thought of as applying to such areas of the mine where earth moving machinery is used on mining production or development work.

The regulation is **not** intended to apply to **on-highway type** trucks or similar vehicles and associated equipment, where they are used in operations on the surface at mines **other than in quarry operations**. Examples of uses where the regulation is not intended to apply might be transporting sand, gravel, lime, cement, concrete or concentrates, the movement of stores or supplies from the site entrance to the warehouse and the harvesting of salt or other evaporites. In brief, in any type of regular surface transport activity where on-highway type equipment is normally used (both on and off mine sites), ROPS structures are not mandatory within the intent of regulation 4.15.

This principle is logically extended to surface mining operations where on-highway type vehicles can be operated with minimal risk of rollover. Such operations would include extraction from sand pits, and the transport of rock from extractive industry type quarries; the rationale here is that deep open pits with extended hauls on steep gradients are not involved, nor are large waste dumps and stockpiles with up and down hauls, or tailings impoundment structures.

The guidance given above should not, however, be interpreted as a blanket approval to operate without ROPS under all circumstances. Principal employers, employers (including contractors) and self-employed owner-operators should critically examine the hazards presented by their particular types of operations and assess the risks involved. It may be that in particular cases, even in surface operations not involving large-scale deep open pit mining, the on-highway type of equipment to be used warrants ROPS fitment. Essentially, the employer must fulfil its duty of care in each individual application, in accordance with the perceived hazards and analysed risks and the foreseeable consequences.

USE OF ON-HIGHWAY TYPE VEHICLES IN OPERATIONS INVOLVING DEEP PITS, ORE STOCKPILES, WASTE DUMPS AND TAILINGS IMPOUNDMENTS

Although regulation 4.15 does not, strictly, have application to on-highway type vehicles, consideration must be given to the fitment of ROPS to such vehicles where they are used in particular applications. Again, the decision is a matter of fulfilling the employer's duty of care in accordance with the hazards that may be present and the levels and types of risks which may be assessed.

A category of vehicle for particular consideration is road watering trucks. The risk factors associated with the design and use of these units in quarry operations are readily identified:

- Other than during periods of wet weather, when their use is not required, these units operate on a continuous basis. They also interact with the haulage truck fleet and other vehicles. Their exposure is therefore high and continual.

- A heavy load is carried on the down-haul, rather than only on the up-haul, as is commonly the case for ore and waste haulage.

- Even with baffles within the tank, the load can oscillate or surge with movement of the vehicle and directional changes, which can reduce stability in operation.

It is therefore recommended that where on-highway type trucks are used for watering purposes, they be fitted with ROPS. Purpose-built units are available on the market and some commonly used models are currently being retrofitted with ROPS at engineering works in Perth

There are other applications for which on-highway type trucks are commonly used in quarry operations, including bulk explosives mixing and loading units and service trucks. These units do not have the same continuous and interactive use with other open pit vehicles and are considered to present a lower risk level than road watering trucks. Although they may be loaded on the down-haul, the load is normally taken to one or more specific locations and progressively discharged.

The decision whether the on-highway type units used in these kinds of service activities are to be ROPS fitted should be made on the basis of a thorough and diligent risk assessment, taking into account:

- pit geometry and operating conditions; and

- weather conditions (these units would normally continue in service in wet weather unless pit operations are totally closed down).

The use of on-highway type trucks for rock and ore haulage in deep open pit operations is not considered safe or appropriate. Aside from ROPS requirements, such trucks are unlikely to withstand the duty, including the rigours of loading with run-of-mine rock.

GENERAL SUMMARY

Regulation 4.15 provides adequately for the major class of equipment in the heavy-duty, higher risk functions in deep open pit operations. However, it is not possible to provide by regulation for every working situation and hence, reliance is placed on a sound grasp of the application of the duty of care and of common sense. Any operations requiring further advice on the matter or having difficulty in complying with regulation 4.15 within the specified time frame (i.e. by 9 December 1997) should contact the inspectorate.

J M Torlach
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