



Govt. of India
भारत सरकार
Ministry of Labour and Employment
श्रम एवं रोजगार मंत्रालय
Directorate General of Mines Safety
खान सुरक्षा महानिदेशालय



सं० DGMS Technical circular/ ०७. धनबाद, दिनांक 14.11. २०११

सेवा में
खान मालिक, अभिकर्ता, और प्रबन्धक,
कौला एवं मैटालिफेरास माइन्स ।

Sub: Provision of Slack Rope and Automatic Rope Slip Protections for Winder

Recently there was an accident of due to breakage of coupling between the man-riding car of a haulage system. The enquiry revealed that the brake lever was operated inadvertently by one of the person alighting from the car and the brakes applied. Unknowingly the train guard signaled for lowering the car and the hauler operator lowered the Man riding haulage. The rope in the hauler drum uncoiled to about 15meters. As the cars did not move the train guard observed that car brakes are on, operated the hydraulic pump and released the brakes. As a result, the anchor car and man riding car ran down with speed till the slackness of the rope was over and due to sudden jerk & shock load broke the coupling between cars. Both cars traveled down with speed and due to tripping of governors and applying of brakes the cars stopped.

This accident emphasis the need of providing additional safety features such as slack rope and rope slip protection in winders.

Slack Rope Protection

The slack rope may occur due to many reasons:

- Cage stuck up in shaft.
- Derailment of man riding cars.
- Application of brakes in man riding cars.
- Negligence of operator.

There are a variety of ways in which slack rope between the winder haulage drum and the conveyance may be detected such as

- Measurement of motor current.
- Rise in tail rope loop on friction winders.
- Trip wires across the rope operating for a drum winder.
- Rope monitoring
- Load cells under head sheaves or friction winder drums.

The above mentioned detection methods are all protection systems which directly measures the tension in the hoisting ropes and if this drops below a preset threshold value initiates an emergency stop which trips winders.

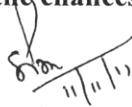
(a) Automatic Rope Slip Protection

In Koepe system of winding the rope slips on the winding drum as there is no positive locking. The movement of the rope is caused by friction in the groove of the drum. In ideal condition there should not be any slippage between the winding drum and the winding rope. Small slippage is manually adjusted at the end of travel however many times the rope may have excessive movement with respect to the drum. On the other hand the drum may rotate without making the rope to move both these situations are unwarranted and unsafe and may cause problems which can be sometimes dangerous hence the need arises to detect occurrence of such relative movement between rope and the drum and immediately stop the engine.

Both the above systems should also generate warning signals to draw attention of the engine operator to take necessary corrective action.

The above safety features shall be provided in all existing winders both drum (including man riding system) and friction winders within a specified time frame but not later than six months from the date of issue of this circular. The same features shall be included in new procurement of winders before putting in to operation in the mines.

In the interest of safety, the above requirements shall be implemented strictly to reduce the chances of accidents in winders working in mines.

A handwritten signature in black ink, followed by a horizontal line and the date '11/11/11' written below it.

खान सुरक्षा महा निदेशक,