

Strata support failure

Mines safety alert no. 164 | 08 June 2007 | Version 1

Mine Type

All Underground Mines

Incident

An underground mine has identified numerous strata support roof bolts that appear to have manufacturing defects.

Equipment

Strata support bolts and tensioning nuts.

Hazard

Faulty tensioning of strata support bolts could result in lack of strata support and subsequent rockfalls.

Cause

Initial investigation has identified that steel bolts appear to have been rolled with an oval rather than round cross-section at a steel manufacturing plant. As the thread has been machined onto the bolts, 'flats' on the thread section seem to have occurred on the flatter face of the oval cross-section of the bar. During the installation process when the nut is screwed up the bar to tension it against the rock strata, it appears that the nut has locked on the bolt when in fact it is jammed when the damaged portion of the bolt thread was encountered. As a result of locking in this manner, it can appear that the bolt is correctly tensioned.

Comments and recommendations

The problem was discovered during the installation and inspection process.

All mines should thoroughly check their strata support bolts for manufacturing defects that may inhibit correct installation.

Checks may include and be not necessarily limited to:

- supplier QA processes and level of statistical assurance
- mine store receipting procedures and delivery checks
- operator checks during installation with appropriate awareness of potential problems.

This issue should be brought to the attention of mineworkers involved in ground support activities, together with an awareness of possible problems that could arise in manufacture.

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