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Rib failures in underground coal mines

This safety bulletin provides safety advice for the NSW mining industry.

Issue

The NSW Resources Regulator has been notified of several recent incidents in which strata failure, particularly rib failures, have resulted in mine workers being placed at risk. Three of these incidents below occurred within a six-week period.

Incident 1: A rib failure was found during a routine inspection. The failure occurred on the off-walk side of a conveyor. A section of rib (one metre thick) was supported by a gas drainage pipe and smaller pieces of coal falling into the walkway. Failure was attributed to continuing deterioration due to the area being mined some time ago.

Figure 1 & Figure 2– Rib failure on the off-walk side of a conveyor (SInNot-2018/00877)

Photographs courtesy of the mine.



Incident 2: In a development drivage, workers were retracting the onboard rib protection on a continuous miner when a piece of rib failed, falling under the platform and pivoting the platform up. The worker had his arm briefly pinned between the rib protection and continuous miner chassis.

Figure 3 – Rib failure striking platform. Note that the platform has been rotated back down towards the normal operating position (SinNot-2018/00854). Photo courtesy of the mine.



Incident 3: A mine had continuing reports of poor ribs that were rated red on the mine’s trigger action response plan (TARP). A mine worker was hit with a large piece of rib that failed, breaking his ankle. The piece that hit the worker was 0.6m x 0.5m x 0.5m. Larger pieces also fell. The total fall was 4.7m long, 0.85m deep and 3m high. When the area was inspected, broken fibreglass bolts were found in the panel and deputy reports showed rib conditions had been reported as poor for some time.

Figure 3 – Failed section of rib (SinNot-2018/00638).



Investigation

After reviewing these incidents and the circumstances of other recent rib failure events reported to the regulator, contributing factors identified include:

- failure to manage ribs over the lifecycle of the roadway
- inadequate support of ribs especially with changing rib height
- inappropriate support of ribs
- support not installed to prepared support plans
- failure to respond to triggers in the mine TARPs and plans

In each case the potential for fatal injuries existed.

Recommendations

It is recommended that all underground mines have a strata management plan that includes:

1. a risk-based approach for the development of the plan and supporting procedures. This must include ensuring those who contribute to the development of the plan and procedures have appropriate qualifications and experience.
2. identification of the correct support to deal with all anticipated strata and mining conditions identified in geotechnical assessments and arising from ongoing monitoring of strata conditions
3. appropriate consideration of the type and extent of support to be installed over the full lifecycle of the roadway
4. procedures for the control and rectification of deterioration or failure of installed support
5. detailed inspection requirements and TARPS
6. training of all applicable employees and contractors in the requirements of strata management systems
7. the suitability of temporary support fitted to continuous miners.

NOTE: Please ensure all relevant people in your organisation receive a copy of this safety bulletin, and are informed of its content and recommendations. This safety bulletin should be processed in a systematic manner through the mine's information and communication process. It should also be placed on the mine's notice board.

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Disclaimer

The information contained in this publication is based on knowledge and understanding at the time of writing. However, because of advances in knowledge, users are reminded of the need to ensure that information on which they rely is up to date and to check the currency of the information with the appropriate officer of NSW Department of Planning and Environment or the user's independent advisor.

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