Mines Safety Significant Incident Report No. 187

Serious crush injuries caused by falling ball-mill liner plate

Summary of incident

A worker was seriously injured during a ball-mill relining operation when he was struck by a large liner plate weighing about 1.5 tonnes. The worker had been preparing to remove two unsecured liner plates still in place inside the ball mill when the top liner plate was dislodged and fell, pinning him to the ground.

A mechanical lifting device was required to lift the liner plate from the worker. He sustained extensive injuries, including compound leg fractures, fractured vertebra, and crush injuries to his chest.

Probable causes

Direct:

- The ball-mill liner plate was unsecured.

Contributory:

- The unsecured liner plates were identified as a hazard but there were no controls in place to prevent their uncontrolled movement or prevent worker exposure to falling object hazards.
- The resting position of the unsecured liner plate was above the horizontal centre-line of the ball mill (Fig. 1).
- The workers undertaking the mill relining were not adequately trained and had not been assessed as competent for the task.

Actions required

When developing safe systems of work for mill relining operations, mine sites should apply the same rigour and standards as used for other workplace activities.

New mill designs and installations should include, where practicable, appropriate engineering controls to assist mill relining operations, such as fit-for-purpose equipment for handling mill liner plates.

Mill relining tasks should include a pre-task risk assessment. Identify the potential for objects such as liner plates to fall during mill relining operations — during both removal and installation of lining — and implement controls to prevent:

- their uncontrolled movement
- workers entering the fall zone.

Ensure competency-based training has been undertaken by those involved in the mill relining operation (including contractors). This should include awareness of the increased potential for unsecured liner plates to fall if they are located above the mill centre-line (red area in Fig. 1), and the need to prevent the mill moving as the centre of gravity adjusts when liner plates are removed or added.

Ensure critical tasks are supervised by competent persons.

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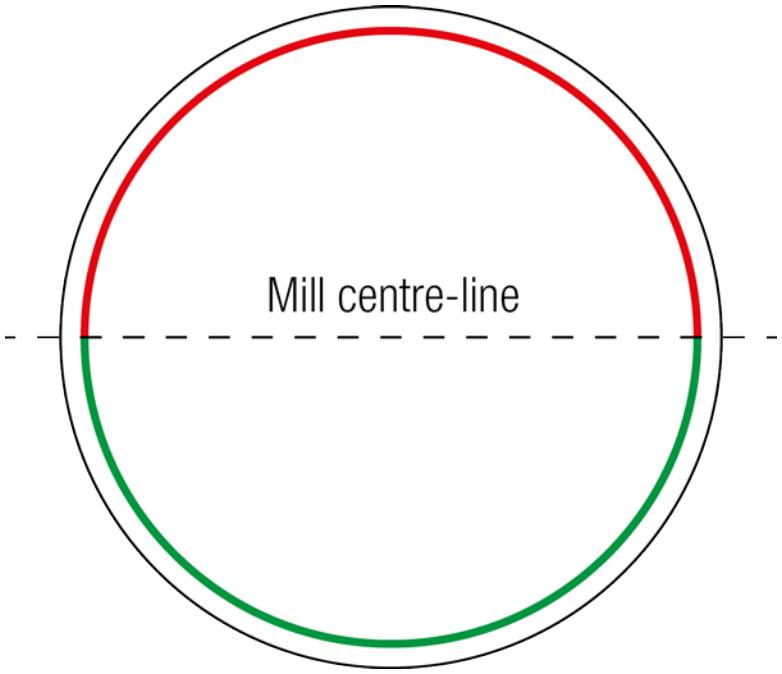

Figure 1: Cross-section schematic of mill showing potentially hazardous section above the centre-line (red) from which unsecured objects may fall, and less dangerous section below the centre-line (green).

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