



Mines Safety Significant Incident Report No. 156

Detonation of misfired explosive during bogging operation

Incident

During waste bogging operations in a development heading at a mine, the loader operator heard a noise that sounded like a detonation of explosive.

Examination of the remaining muck pile at the face did not reveal any explosive material. A further examination of the waste that had already been bogged from the face unearthed two pieces of a cord-based explosive typically used for perimeter blasting in development headings. The detonator cord was of heavy duty construction with a nominal core charge of 70 g/m pentaerythritol tetranitrate (PETN), which can be initiated by significant impact, friction or heat.

Fortunately, no injury resulted from this incident. Detonation of misfired explosives can result in fly rock and potentially serious injury.

Immediate causes and contributory factors

- It was concluded that the loader bucket had contacted a piece of detonating cord that had misfired in the face blast.
- The development face firing was a breakthrough cut into a production area. At this particular mine, these firings are centre primed and the cord product is not usually used. The cord product was used in the perimeter holes on this occasion, it was not fully consumed in the blast and some has ended up as misfired material in the muck pile.

Comments and preventative actions

To avoid a recurrence of this type of incident, the following actions should be implemented.

- Use explosives in accordance with the manufacturer's recommendations to minimise the chance of any misfire or detrimental outcome.
- Ensure that a blast management plan is available and rigorously applied to each specific blasting application (e.g. standard development firing, breakthrough firing).
- Carry out regular reviews and audits of the blasting procedures and practices to make sure that explosives are applied correctly to ensure compliance with site procedures and standards.
- Investigate the occurrence of misfires, determine the cause, and take action to ensure that the potential for misfires is minimised. Consultation or involvement of the explosives manufacturer or supplier may be beneficial to such investigations.
- Misfired explosives can easily be hidden in the muck pile and only exposed during bogging operations. Therefore, it is important that loader operators are trained in:
 - the identification of explosives;
 - the identification of possible misfire locations;
 - the need to remain vigilant during bogging operations for evidence or signs of misfired explosives; and
 - the action to be taken when a misfire is identified or suspected to have occurred.

- These actions are particularly important in respect of those misfires involving cord type explosives that contain PETN, which is sensitive to impact, friction and heat.

A handwritten signature in black ink, appearing to read 'M. Knee', written over a light grey rectangular background.

Martin Knee

STATE MINING ENGINEER

17 July 2009