

Overslept production rings – a post-weather event analysis

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ABSTRACT

Ernest Henry Operation (EHO) is a large-scale underground copper and gold mining operation 38kms North-East of Cloncurry, Queensland, Australia. EHO employs a sub-level cave mining method where pre-charging production rings is critical to its performance. On 8 March 2023, a weather event resulted in an ingress of water to the underground workings, impacting production for nearly two months. As a result, the firing of 74 pre-charged production rings was delayed during this period, creating many unknowns around sleep-time and blast performance of the explosives.

A literature review was conducted indicating a potential world-first event for firing overslept rings after such a period. EHO's site procedure for sleeping production rings is a maximum of 28 days before firing, whilst rings that sleep longer become classified as overslept rings. Consultations with the explosives contractor ensued and specifications for the products were reviewed and evaluated. After conducting an in-depth risk assessment, vibration blast monitors were installed in ore drives, and an overslept rings management guide was developed in anticipation of firing the first post-weather event production ring.

On 24 April 2023, the first overslept production ring was fired at 77 days slept, with blast monitor vibration data captured and analysed upon detonation. Over the course of the next 37 days, all 74 overslept rings, including a combination of wireless blasting technology as well as conventional millisecond (MS) non-electric detonators were blasted, with the longest overslept ring fired at 104 days slept. This paper provides a detailed post-weather event analysis, outlining the approach, controls and results related to the firing and extraction of 74 overslept production rings.