

Shaft filling incident

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What happened?

A decommissioned 1.5m diameter intake cooling shaft was being filled in before the associated underground coal mine longwall operation retreated past it. The bottom of the cooling shaft was in a purpose driven stub, midway between the travel and belt roads. The stub had been sealed using a 2psi stopping to contain intake pollution (dust) from passing to the longwall. The infill began with tipping sand through a grill at the surface, using a 3.4 cubic metre loader bucket, allowing it to free-fall 321m to the bottom of the shaft. After the sixth bucket full the stopping at the shaft bottom blew out with some force and a plug of methane then travelled via the travel road to the longwall.

How did it happen?

An accumulation of methane occurred in the short time after closing the seal hatch and while the filling operations had taken place. The shaft was only partly lined with shotcrete and there were several seam intersections through its length. The methane plug peaked at 1.21% in the travel road and by iteration it has been estimated that the methane concentration in the sealed stub at the time of failure was approximately 4.9%. The risk assessment did not identify the hazard of an air blast/overpressure and methane accumulation.

Recommendations

To ensure the sealing of shafts and boreholes is conducted at an acceptable level of risk, and within acceptable limits, a comprehensive risk assessment must be undertaken considering all potential hazards in these operations. Such a risk assessment will require that relevant technical personnel and other persons experienced in all aspects of shaft filling operations are included in the relevant workforce cross section involved in the assessment. Regularly review associated risk assessments before commencing any shaft filling operations, noting the lessons from previous shaft filling incidents, including explosions, throughout coal mining history.

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