

Safety In Mines Research Advisory Committee

Project Summary :

Project Title:	Strategies to monitor non-homogeneous atmospheres in sealed off panels in coal mines
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Category:	COL	Applied Research	
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Summary

Many South African coal mines contain large areas sealed off from the mine ventilation. These areas contain an atmosphere sampled only at or near the seals. The research described in this report was commissioned to examine whether the current methods of monitoring sealed off areas are adequate, how South African practice compares with the methods used in other countries and whether alternative monitoring systems exist.

The research has shown that monitoring deep into sealed areas is not normally a major concern worldwide and that periphery or near-seal sampling is normal. When circumstances indicate the need for multi-point sampling in sealed areas, the accepted method is the tube bundle system, where samples are drawn through small diameter tubes to a central (usually surface) installation and the atmosphere from each tube is sampled sequentially prior to being analysed for the presence of a range of gases.

Although the report identifies a number of factors which increase the risk of the occurrence of non-homogeneous atmospheres in a sealed off area, the one tube bundle installation in South Africa for which data has been analysed has indicated a remarkably uniform atmosphere, where all the sampling points gave readings very similar to standard near-seal observations.

The alternative to the tube bundle system is to use standard, fixed-point gas sampling apparatus. Because these instruments need a power supply, routine maintenance and regular calibration, their use in a sealed off area cannot be recommended.

No new or novel devices could be identified during

this study but two concepts, both using infra red detection of flammable gases, do appear to have potential but would require considerable research and development before they would become viable alternatives to the tube bundle system.