University of Wollongong
Research Online

Coal Operators' Conference

Faculty of Engineering and Information Sciences

2002

Use of Booster Fan Ventilation at West Cliff Colliery

D. Benson
West Cliff Colliery, Australia

Publication Details

This conference paper was originally published as Benson, D, Use of Booster Fan Ventilation at West Cliff Colliery, in Aziz, N (ed), Coal 2002: Coal Operators' Conference, University of Wollongong & the Australasian Institute of Mining and Metallurgy, 2002, 120.

Research Online is the open access institutional repository for the University of Wollongong. For further information contact the UOW Library: research-pubs@uow.edu.au

USE OF BOOSTER FAN VENTILATION AT WEST CLIFF COLLIERY

David Benson[1]

ABSTRACT: Large underground coal mining operations, such as West Cliff are continually having to balance and co-ordinate ventilation requirements for each working face, with the overall management of gas both CO_2 and CH_4 within the mine. As mining operations expand, along with areas of goaf the potential for gas make increases. It becomes increasingly more difficult to maintain adequate ventilation to the development panels with corresponding effects or consequences on coal production.

In the case of West Cliff mine, the performance characteristics for the gas drainage system as well as the overall ventilation performance for the entire mine were fully reviewed and assessed. Various options to improve the overall efficiency of both the gas drainage system and the mines ventilation system were identified and considered. Ventilation planning and simulation allowed the various options to be reviewed in detail, highlighting the benefits and short comings of each modification or adaptation to both systems.

The use of booster fans was considered in respect of the following potential benefits:

- Provision of additional air quality at strategic locations within the mine and separate from the longwall split.
- Increased pressure to drive airflow into working splits
- Reduction of intake to return pressure differential, outbye of the booster fan location
- Reduction in outbye leakage
- Reduction of main fan airflow requirements for a given inbye performance
- Optimisation of power utilisation

The use of booster fans for underground mining operations has an extensive history of satisfactory and effective utilisation over seas, especially in the UK, Canada and Germany. Hence the use of booster fans to meet the ventilation and gas management needs of West Cliff could be thoroughly researched. This included the following inherent hazards:

- Potential for uncontrolled recirculation
- Potential ignition sources and metallic contact
- Potential for fire
- Spontaneous combustion
- Potential to pass gas plugs through fans on re-start
- Mechanical failure

This paper outlines the overall research and assessment approach adopted by West Cliff Colliery, focusing on the following key components:

- History of Booster fan use
- Overseas practice
- Department of Mineral Resources approvals
- Risk assessment process
- Major Hazards identified
- System description and design
- Control strategies

The experience gained at West Cliff Colliery demonstrates that booster fans represent a cost effective means of ventilating strategic sections of the mine on a life of mine basis. The risk assessment approach and the controls implemented as a direct consequence of this approach have supported the successful installation and operation of booster fans.

[1] West Cliff Colliery