

OCCUPATIONAL HYGIENE IN THE COAL INDUSTRY – A CASE STUDY

INTRODUCTION

Occupational hygiene issues such as respirable dust and diesel exhaust fumes are well known to those within the coal industry but many other occupational hygiene issues are not well understood and thus not adequately evaluated. Consequently, the aim of the project was to quantify the effect on the workforce of all occupational hygiene issues identified at the BHP Billiton Illawarra Coal mines in a systematic and scientific manner.

As such a task is a significant undertaking, a working group comprising workforce and management representatives, site safety/training officers plus external occupational hygiene and medical professionals, was formed to identify potential issues, assign priorities to each issue, evaluate the level of risk, develop control strategies and to oversee the implementation of any agreed controls. This process identified 19 key issues and a process to evaluate each on a risk based priority over a three to five year period.

The first three issues that have been evaluated are respirable and inhalable dust and noise. A statistically based monitoring programme has been implemented to monitor the workplace of all work groups within BHP Billiton Illawarra Coal operations for dust and noise. Sampling has been conducted using a random sampling schedule over a 16-week period on all shifts and days of the week.

The monitoring programme used internationally recognised exposure assessment guidelines, and in total 1,224 individual personal samples were collected at three underground coal mines and two coal preparation plants.

DISCUSSION

At an early stage it became apparent to the working group that if the project was to be conducted in an appropriate manner then the key issues would have to be risk ranked and evaluated on a priority basis. This resulted in a schedule for evaluation of issues with dust and noise the highest risk issues.

The results indicated that respirable dust is not a significant issue, which is consistent with Coal Services Pty Ltd (Joint Coal Board) atmospheric monitoring and medical surveillance. Monitoring for respirable silica was only performed where abnormal conditions existed (eg mining stone roof), as the parent coal is known to be low in silica. Results of monitoring to date have shown levels to be well below the current exposure standard of 0.15 mg/m³ (typically less than 0.05 mg/m³).

Given the level of respirable dust and silica levels it is not envisaged that this contaminant will be evaluated further.

The results for inhalable dust and noise are of more concern. While no statutory exposure standard for inhalable dust currently exists in the NSW Coal Mines Regulations, exposures in a number of exposure groups are well above acceptable levels.

In general, levels (geometric means) of inhalable dust on longwalls and continuous miner panels were above a best practice exposure standard of 10 mg/m³. As there is a proposal to introduce such a standard into NSW Coal Mining Regulations this outcome is of significance.

The level of exposure of employees to noise within the exposure groups was found to be extreme and is consistent with published reports from Coal Services Pty Ltd in respect to noise induced hearing loss compensation claims. There is no doubt that noise is a major OH&S issue within the coal industry and BHP Billiton Illawarra Coal will implement an improved comprehensive hearing conservation programme across its operations to minimise employee exposure. This action will only serve to minimise current exposures and much work needs to be done with original equipment manufacturers to reduce employee exposure to noise.

Following the successful completion of the above exercise, work is continuing to evaluate the remaining issues identified by the project working party.

CONCLUSIONS

Results of dust and noise monitoring to date have confirmed noise exposure to be a major occupational hygiene risk for the industry. Respirable dust exposure of employees has been generally within acceptable limits, however the levels of inhalable dust measured to date indicate a potential issue for the industry.

From the data collected to date there is cause to suggest that the traditional monitoring approach used within the coal industry (ie compliance based) may not be appropriate to address the broad range of occupational hygiene issues currently facing the industry. A more extensive approach using recognised exposure assessment techniques has the potential to better define and quantify employee exposures.