

STRATEGIC NOISE MANAGEMENT AT MINE SITE: CASE STUDIES FROM THE MINING INDUSTRY

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ABSTRACT

This paper discusses five core principles essential to successful operation of noise management programs at mine sites. The five core principles include:

- Organisational Commitment
- Formulated Management Systems
- Appropriate Infrastructure
- Applied Hazard Management
- Monitoring and Review Process

These elements present a generic framework from which the mine site can build its own noise management program. The paper discusses methods of structuring these elements into a noise management program. The application of the core principles are reviewed in relation coal mining and metalliferous mining operations.

Conclusions are drawn that if the mining industry is to reduce the incidence and severity of noise induced hearing loss experienced by mining workers, the industry must unify its approach to managing noise problems. Consistency in the approach taken to deliver strategic noise management programs within the industry will present long term benefits to both mine workers and operating companies.

Keywords: Noise Management, Organisational Commitment; Management Systems; Infrastructure and Staffing Needs; Applied Noise Hazard Management; Performance Based.

INTRODUCTION

Noise induced hearing loss is probably the most common injury affecting the health and well-being of miners (Mitchell and Larsson, 1994). In Australia, mining organisations recognise that the nature of mining activity produces high levels of noise and mine workers can and are being exposed to excessive noise. Generally, the causal link between noise exposure and noise induced hearing loss is well understood (NOHSC, 1993a; Mitchell and Else, 1993; NOHSC, 1991). Many mining organisations, probably most, also agree that the problem is significant and it warrants remedial action. However, closer examination of the action

being taken within the mining industry reveals that few mining organisations have progressed beyond attempting to minimise the level of noise exposure to mine workers through the application of personal hearing protection.

There are exceptions. Several Australian mining organisations have demonstrated they are able to control noise problems (Mitchell and Else, 1993). While such actions are positive, progressive and to be commended, many of the noise control interventions have resulted from a noise problem being brought to the attention of management in an ad hoc manner. A reactive response.

Throughout the industry, there is little evidence of organisations implementing programs to systematically manage noise problems. To address this issue, the New South Wales Coal Industry Noise Induced Hearing Loss Committee (1996) has supported the development of a generic framework for managing noise at mine sites. The framework, structured around five core principles, assists with the development and implementation of a management strategy for long-term control of noise problems in mining.

THE CORE PRINCIPLES

Effective management of noise at mines sites is structured around five core principles. These include:

- Organisational Commitment
- Formulated Management Systems
- Appropriate Infrastructure
- Applied Hazard Management
- Monitoring and Review Process

These five core principles complement any noise management program and are explained further in the following sections.

ORGANISATIONAL COMMITMENT - THE DECISION TO ACT

Noise problems in the mining and mineral processing industry exist today because of a general assumption that, given time and enough money, most noise problems will be remedied with developments in mining technology. Additionally, organisations within the industry have sufficient information to recognise the significance of the problem, however, the information is rarely used in a decision support capacity to assist organisations

to take action to reduce problems at their mine sites.

The fact of the matter is that noise problems are not eliminated without determined intervention and such interventions must be initiated from informed decisions made at the mine site.

Key points to assist mine sites to act on noise problems include:

- Management/Employee consult to form the central role in updating and reviewing decision support information.
- Use established consultative arrangements (e.g. OHS Committee, Work Teams, Project Groups, other arrangements involving District Check Inspectors) to initiate the decision making process.
- Encourage ownership of noise problems and doing something about them.
- Decide to act on noise at the mine site after considering economic, scientific, legal, social and industry issues associated with noise induced hearing loss.
- Establish the level of commitment that the organisation intends to provide towards the noise management program.
- Consider the allocation of resources, acknowledgment of responsibility and provision of adequately skilled people.

The decision to act is often inferred, but rarely stated. To be effective, a noise management program requires both direction and commitment, therefore senior management commitment is essential.

FORMULATION OF MANAGEMENT SYSTEMS

There are six management systems central to any effective noise management program. These include (i) Noise Management Policy Statement (ii) Industrial Hygiene (Noise Monitoring) Program; (iii) Noise Training and Education Program; (iv) Buy-Quite Purchasing Policy and procedures; (v) Health and Medical Surveillance; and, (vi) Preventive Maintenance Program.

Key points for management systems development include:

- Review and audit the current state of any existing noise management program system components in use at the mine site.
- Mine sites with established management systems can fast track to the next stage of this framework providing the systems are operating effectively.

- Mine sites needing to develop or improve management systems may choose to:
- Cut-and-Paste examples from other mine sites to either develop or improve management systems components.
- Source information to develop a new system component.
- Remember that having a system documented is important, but the effective application of the system is the true measure of its success.

Management systems form linkages between program elements. They are the principal point of reference and provide both structure and direction. Noise management systems must be simple and where possible, they should integrate with existing "operational" management systems.

APPROPRIATE INFRASTRUCTURE - THE KEY TO PROGRAM OWNERSHIP

Mine site management in exercising their duty of care, have ultimate responsibility for reducing risk associated with mine work areas under their control. Specifically, in relation to noise management, certain aspects such as coordinating the program can be devolved. Sharing the work load for administration and coordination of the noise management program will introduce new thinking and achieve greater workforce ownership of projects being implemented.

Key points pertaining to this element include:

- Management infrastructure is linked to management systems. Therefore benefits can be gained by developing management systems and infrastructure elements simultaneously.
- Infrastructure needs will be determined by considering issues such as the size of the workforce at the mine site, resources availability and the complicity and number of noise problems.
- Infrastructure considerations should focus on:
- Designation of noise management systems coordination functions; and,
- Adequacy of resources provided to support the noise management program.

In general terms, this element is about the provision of appropriately trained and experienced personnel to coordinate the noise management program. Infrastructure options vary from incorporating program coordination functions into existing line management roles, to establishing a task group for managing noise. In selecting an

appropriate infrastructure model, organisations need to consider the nature and size of their organisation, the extent of tasks to be performed and the availability of adequate resources to support the noise management program.

So far, this paper has presented three elements viz. Organisational Commitment; Management Systems; and, Program Support Infrastructure. These core elements are critical to the long-term success of the strategy for managing noise. It must be highlighted that it is possible to control noise problems in mining without installing these elements. For example, the mine in question could pay a consultant to develop and implement an "off-the-shelf" noise control solution. However, the scope of such initiatives is limited. One problem may be solved, but many still exist and the question of maintaining the effectiveness of the implemented control measures is rarely included in the consultant's brief. Additionally, the other aspects which are essential to effective noise management are ignored because they are beyond the consultant's scope of work.

Mining organisations need to deal with noise problems strategically rather than addressing individual projects in an ad hoc manner.

APPLIED NOISE HAZARD MANAGEMENT

The core elements discussed thus far are aimed at strengthening the noise management program. The fourth element describes the methods for controlling noise problems in a systematic manner. Central to this element are the principles that preventing new noise problems from being introduced to the mine and managing existing noise problems.

Key points of this element include:

- Preventing noise problems requires some planning when equipment and processes are being designed or purchased.
- When dealing with noise problems in existing mining equipment, the program coordinator/s (e.g. problem solving team, project officer or other designated persons) should systematically identify noise hazards, assess risk, select and develop control measures and evaluate the control measures once they are implemented.
- The mine site noise control plan is a dynamic document used to keep record of work associated with noise problems, identify person/s responsible for undertaking work, indicate progress and provides a mechanism

for feeding information back to persons originating requests for noise control action.

REVIEWING PERFORMANCE AND INFORMING OTHERS

Organisational commitment at the mine site is measured by successful noise management interventions being developed and introduced in a systematic manner. The momentum of the noise management program is maintained and enforced through demonstrating to the sponsors (i.e. the organisation) the achievements of the program. Additionally, it is important to assist other organisations within the broader mining industry to benefit from any local noise management initiatives introduced.

Therefore reviewing performance and informing others provides opportunity for:

- Dissemination of information;
- Identification of research and development projects;
- Recognition of mine site noise management achievement;
- Provisions of advice and resources to mine sites; and,
- Monitoring industry noise management performance.

The combined information from the reporting and performance monitoring process will make a significant contribution towards improving the mining industry's resource and knowledge base. Additionally, noise management research activities undertaken by the industry in the past have been criticised as being "too much theoretical and not enough applied" in focus. This strategy, therefore will make a significant contribution towards developing a process to identify noise control research projects with direct application to the industry.

Key points for this stage include:

- Review noise management program performance at least annually;
- Pass information, particularly case study information about noise control techniques, to other mine sites within the industry;
- Ensure dissemination of information about both noise management successes and failures.

CONCLUSIONS

The Australian mining industry must focus on noise reduction as the highest priority.

Historically, the industry has tended to accept noise in mining as being an inseparable "part of the job". In recent times, mining companies have begun to recognise the magnitude and severity of the problem and have initiated measures in an attempt to reduce the risk to employees and therefore the company.

In most circumstances however, the measures introduced have focused on managing exposure to noise, not controlling it. In the past, it was much easier to make hearing protection available to employees (even though the hearing protection was not used, or if it was used it was used ineffectively), than to reduce the amount of noise generated by an item of mining equipment. Additionally, noise control technology was perceived as being the intellectual domain of specialists, consultants and experts. As a result, people at mine sites have traditionally worked with noisy equipment and suffered the consequences. This position is changing within the mining industry.

Workers, supervisors, engineers and management have greater opportunities to learn and understand about noise, the consequence of exposure and most importantly, ways and means of controlling noise problems in the mining environment. Within the industry, people are becoming both competent and confident in the application of noise control technologies. Therefore considerable opportunity exists to rely more on noise control and less on those techniques for limiting noise exposure.

It is recognised that changing the focus of the industry noise management strategy from exposure minimisation (e.g. relying on hearing protection) to the more effective noise control techniques (e.g. using engineering interventions) will be more readily adopted at some mine sites than it will be at other. All enterprises within the industry must recognise the benefits to be gained from changing their focus to noise reduction. To this end, all mine sites should be able to set a similar goal, however the time taken to achieve the goal may vary according to the ability and resources of the mine site.

This paper has set out to present a framework applicable to the development of mine site noise management programs. The paper presents a discussion intended to provide guidance, not direction. It is intended to be used, not simply read and understood. The framework presented (by itself) will not remedy noise problems at individual mine sites. People at mine sites must accept

responsibility for noise problems and finding and developing solutions to them.

Finally, if the mining industry has an aim to reduced the incidence and severity of noise induced hearing loss experienced by mining workers, then the industry can take guidance from this document for mine sites to unify their approach to noise problems.

Consistency in approach within the industry will present long term benefits to mine workers and operating companies.

BIBLIOGRAPHY

1. National Occupational Health and Safety Commission [NOHSC] (1993a) National Standard: 1007 - Occupational Noise, Australian Government Publishing Service, Canberra.
2. NOHSC (1993b) National Code of Practice: 2009 - Occupational Noise, Australian Government Publishing Service, Canberra.
3. NOHSC (1994) Core Training Elements for the National Standard for Occupational Noise, Australian Government Publishing Service, Canberra.
4. NOHSC (1991) Noise Management at Work: Control Guide, Second Edition, Australian Government Publishing Service, Canberra.
5. US Bureau of Mines (1983) Mining Machinery Noise Control Guidelines, US Department of the Interior, Pittsburgh.
6. Mitchell, T., and Larsson, T., (1994) Commissioned Study into OHS Priorities for the Australian Black Coal Industry. Australian Coal Association, Sydney.
7. Mitchell, T., and Else, D., (1993) Noise Control in Mining: Seventy-five Noise Control Solutions. Worksafe Australia, Sydney.
8. Mitchell, T., and NSW Coal Industry Noise Induced Hearing Loss Committee, (1996) Noise Management at Coal Mine Sites, Joint Coal Board OHS Trust, Sydney.