IMPROVING HAZARD AWARENESS IN THE COAL MINING INDUSTRY

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INTRODUCTION

It has become apparent that there is a growing demand from coal mining industry stakeholders for a program to improve the knowledge, and broaden the experience of staff regarding the identification and management of hazards and the ability to recognise danger signals. Workers in the industry are generally not familiar with issues such as the latest health and safety incidents overseas, the result of recent research and the technology which is available to identify or address potential hazards. This situation can impact on responses in unusual circumstances or emergencies and may inhibit the staff from reacting optimally to a safety risk.

The limitation of current knowledge has raised considerable concern within the industry as was indicated during canvassing of SIMTARS earlier this year by most of Queensland mines, industry officials and other industry individuals and organisations.

This current need to address the limitations of knowledge within the industry is consistent with the recommendations arising from the review of the Training of Officials for the Underground Coal Mining Industry seminar conducted by SIMTARS in 1989. These recommendations identified the need to:-

Keep information current;
Repeat similar courses for those not attending;
Provide courses on specific technical subjects;
Provide similar courses for the other layers of management;
Provide training at local centres for underground supervisors
Condense the reference material for use at the mine site.

Substantial resources are required to implement such a program, and SIMTARS is now in a position to start the development of a program which will transfer aspects of hazard awareness and management to persons within the coal industry.

CURRENT TRAINING FOR HAZARD AWARENESS

At the present time, training within the coal industry basically occurs in two phases. Firstly, there is a "professional" phase with emphasis on production and safety issues associated with production and the second less formal phase is the "occupational" or "on-the-job" training.

In the first phase, workers learn the theoretical basis of their profession whether it is at manager or miner level, and this is the conventional training phase with which we are most familiar. It may involve tertiary studies, TAFE courses or formal induction programs at mines and may lead to formal qualifications, work qualifications or skills aimed at ensuring the worker is capable of satisfactorily completing the requirements of the position.

There are considerable resources dedicated to this phase of training with established courses and facilities available in many areas. However, while these resources are available for initial training, the facilities for ensuring knowledge is kept up to date with changing technology are minimal and relatively rare. This lack of opportunities for retraining means that skills required for non-routine situations may become lost through lack of use. Skills and knowledge associated with routine situations may be inadequate if they are not updated to reflect current knowledge and best practice.

As to the second phase of training, most of this is unstructured, but the impact of this process is considerable. This unstructured, informal training relies to a large extent on the knowledge of fellow workers and this knowledge may be out of date, partially inaccurate or even totally incorrect. Those within the industry will be aware of the folklore handed down from older workers, some of whom may have had no formal training. This folklore may have been correct when applied to the technology at the time but may not be applicable to new mining techniques. Alternatively, it may have applied to other mining conditions or techniques but may not be applicable under the current conditions.

The major problem with both the formal training and informal ongoing training phases is a lack of training resources. Significantly increased resources are required to address the retraining needs to keep skills up to date and to ensure the knowledge gained though occupational training is correct for the situations to which it is to be applied.

RETRAINING NEEDS

Judging by the approaches made to SIMTARS, there is a pressing need for retraining resources within the Queensland coal mining industry to ensure the hazards are managed. There are, however, a number of questions that need to be answered before these resources can be established. These include: Who, What, When and How. SIMTARS has had discussions regarding these issues with a number of industry groups and possible answers to these questions are outlined below. Further input from the industry will be sought to ensure the answers adequately address the questions.

Who?

All sections of the coal mining workforce from manager to miner have been identified as needing some form of retraining. The knowledge requirements of groups within the mining industry differ depending on duties and responsibilities and four target groups have been identified:

1. Mine managers, inspectors, mines rescue superintendents;
2. Undermanagers, engineers, surveyors, geologists and educators (eg. TAFE instructors);
3. Deputies;
4. Miners and other underground employees.

What?

The most important hazards that have been consistently indicated to SIMTARS by the industry are those which have the most serious consequences, namely, spontaneous combustion, mine fires and explosions. As these events may be encountered infrequently, the need for retraining in these areas is all the more necessary. Other areas dealing with every day work hazards also need addressing but are not seen as urgent.

Modules that have been identified by SIMTARS staff as being appropriate for a hazard awareness program have been divided into two major categories:

- Category 1 - infrequent occurrences with potentially very severe consequences;
- Category 2 - frequent occurrences with varying consequences.

Category 1

1. Spontaneous combustion
2. Fires
3. Explosions

These areas were identified by the 1989 course as being important to the industry.

Category 2

1. Electrical hazards
2. Machinery hazards
3. Roof control and bolting
4. Hazardous substances

These areas have been recognised by the Victorian Institute of Safety and Health (VIOSH) in the recently published report on health and safety in the coal mining industry[1].

SIMTARS considers that each item in each Category should be considered in terms of :

A. Risk identification
B. Risk assessment
C. Risk management

When?

For the hazards with serious consequences, the only acceptable answer is as soon as practicable. The industry realises the lack of information and knowledge of these hazards and has requested programs be developed.

Associated with the question of "when" is the question of "how often". This will depend of the rate of technological change within the industry and may also be dependent on which hazards are included in the program. The repetition rate of the program would depend on the

requirements determined by industry but it needs to address new entrants to the Queensland industry with no previous mining experience and those who have moved to Queensland from interstate.

How?

How to effectively produce such a program throughout the industry requires careful consideration. In addition to the practical problems associated with programs addressing a range of education and knowledge levels, there are the problems of ensuring that the providers of such training identify the key hazards and are aware of the technical advances and techniques available to address these hazards. Views have been expressed to SIMTARS that some competency based indicators be included in the programs.

A module system of programs would allow flexibility of content and tailoring to suit participant requirements. To be effective each module should contain:-

- Hazard awareness, identification and assessment - enabling participants to recognise the existence of, or potential for existence of, the hazard and to assess its significance.

- Technology transfer - ensuring knowledge of the latest technology for managing the hazard is available for application in the workplace.

Modules for all programs would need to be developed for the four targeted levels each with a different emphasis and technical information requirement.

CERTIFICATION OF TRAINING PROGRAMS

Certification of such re-training programs and of the trainers delivering these programs should be considered. Such certification would ensure uniformity of knowledge throughout the industry and would help to minimise the problem that currently exists with workers moving between mines and between states having to handle hazards they have not previously encountered.

SIMTARS HAZARD AWARENESS PROGRAM

In response to the need identified by the industry regarding retraining and information exchanges, SIMTARS is currently developing a hazard awareness and technology transfer program. The aim of the program is to provide the coal mining industry with a program which develops the skills required to be aware of and to identify hazards and to transfer to the mining industry the most up to date and relevant information and technology available to manage these hazards. The involvement in the program is voluntary and SIMTARS believes that the best way to generate significant industry participation and ownership is by providing a quality product tailored to the needs of the industry with continual feedback from clients to ensure relevance.

The objectives of the program are:

- To identify the competencies and knowledge base necessary to effectively and

efficiently perform the duties required of underground coal mine workers at all levels of employment.

- To identify the current and most effective methods of awareness and control of hazards in the underground coal mining industry.
- To identify the available hazard awareness and control information that is available to the underground coal industry.
- To identify the hazard awareness and control areas where the available information is not sufficient or is not in an appropriate form for use by workers at all levels in the underground coal mining industry.
- To determine the most appropriate format for the effective distribution and delivery of information concerning awareness and control of hazards to all levels of employment in the industry.
- To provide for the underground coal industry a program that delivers information on the current and most effective hazard awareness and control procedures in forms suitable for use by persona at all levels of employment in the underground coal mining industry.

The programs will be suitable for presentation at a central location such as SIMTARS or at regional mining centres. The shorter programs will be most appropriate to this regional approach and a number of different modules could be presented in a limited period of time. The presentation of programs at a regional site near mining operations (eg Emerald or Mackay) or at mine sites will limit the time participants are off-site and also the disruption to the mine. The modules need not be presented by SIMTARS staff as they will be designed to be presented by suitably trained mine personnel or other training providers.

The input into the program by the mining industry has been and will continue to be of great importance. SIMTARS has recently circulated draft module outlines, length and possible venues for comment by industry. Comment sought as part of the initial introduction of the program to industry includes any areas which require a greater depth of coverage. These comments will be taken into account during the development of the modules.

Innovative presentation techniques are considered important for this program and computer-based learning techniques and self-paced learning are being considered. The style of presentation of the hazard awareness and technology transfer program will change, depending on the needs of the target groups.

At management levels the programs will be knowledge based with an emphasis on new technologies being developed or employed to control hazards. Each topic will also include quality practical training exercises designed to use the information provided in the program and to stimulate and interest the group. The format will be designed so that small working groups can conduct the exercises in a structured manner using the resources normally

available to them at a mine.

Practical skills at identifying potential hazards during work procedures will be emphasised for groups 2, 3 and 4. Included in these practical exercises will be mine site investigations, practical monitoring techniques and recognition of limitations of monitoring techniques. Case studies of previous incidents will be used. These exercises should be appropriate for the situations experienced at Queensland mines and to be effective should also extend and challenge the program participants.

During consultation with the industry, spontaneous combustion was identified as the area most in need of immediate information and retraining. In response to this need, SIMTARS held a series of one day seminars on spontaneous combustion in Brisbane, Emerald and Mackay. As a result of these seminars, further on-site courses have been requested by Queensland mines. In response SIMTARS has developed a two day course and training material for a four hour course which can be delivered by mine site personnel. These courses will form the basis of the spontaneous combustion module for the hazard awareness and technology transfer program.

CONCLUSIONS

The key to maintaining an adequate level of hazard awareness within the coal mining industry is the availability of adequate training resources. It is suggested this can best occur through industry ownership of the education/information programs. Having established such a program it is vital to ensure that the information base used for its development is continually updated.

SIMTARS is currently developing a technology transfer program in conjunction with the underground coal mines that aims to address the needs of the industry. It will be in a format that enables effective information transfer and will use the most appropriate mechanisms to achieve this transfer.

There are a number of issues that industry needs to address in terms of competency/certification and retraining. SIMTARS is willing, within the constraints of its charter, to assist by providing the appropriate resources to facilitate clarification of, and decisions by, the industry on these issues.

REFERENCES

1. Mitchell T, Larsson T J, 1994, Final Report of the Commissioned Study into OHS Performance of the Australian Black Coal Industry, Australian Coal Association Research Program, Sydney.