SIMRAC NEWSLETTER

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Private Bag X63, Braamfontein 2017, South Africa
http://www.SIMRAC.co.za www.simpross.co.za

GEN 701 - Best design, installation, maintenance and operation of conveyor belts

SIMRAC research Project GEN 701 has been finalised by the Anglo Technical Division (ATD). The research included an extensive literature survey, a baseline risk assessment, historic causes of accidents, and international standards and risk assessment guidelines.

Several mining and working sites were visited. The extent of conveyor-related accidents was quantified, main causes of accidents were identified and actions were defined to reduce the identified risks. Only troughed belt conveyors were considered in the project. Special conveyors such as screw conveyors, chain conveyors etc. were excluded from the study. Conveyor feed points and discharge points were included as well.

Both material conveyors and man-riding conveyors used underground and on surface were considered.

Recommendations include information on best practice, strategies, guidelines, work procedures, educating employees, and informing design engineers and manufacturers.

Download the final report from the SIMRAC Website at www.SIMRAC.co.za The report includes extensive best practice for both Material and Man-riding conveyors, as well as for only Man-riding conveyors. The SIMRAC risk assessment guideline, a conveyor belts risk assessment and applicable appendices are also available. Other informative Websites to surf are:

http://www.cominfo.org.za
http://www.worksafe.gov.au/work/statistics/indexhtm
http://nohsc.info.au.com
http://www.dme.wa.gov.au
http://www.masha.on.ca/news/conveyor.htm
http://www.statcan.ca/english/ads/72f0002X1B/table1.htm

In This Issue

CALENDAR OF EVENTS

MEETINGS

SIMRAC

12 September 2002

Government Gazette Tender for 2003

20 / 27 September 2002

Meetings: Simpross Progress Meetings

1 November 2002

EVENTS LAUNCHES AND WORKSHOPS

27 September 2002 - COL 814 [Integrated design & planning of underground coal mining processes] in Swaziland. Contact Duncan Adams for information dadams@simpross.co.za

September/October 2002 - COL 807 [Dust control for high seam longwall coal mines] in Witbank. Contact Alec Gumbie for the exact date agumbie@simpross.co.za

November 2002 Launch/Workshops will be held in Cape Town and Johannesburg on the following occupational health projects:

Health 803 [Guidelines & materials for the technology transfer of x-ray reading skills]

Health 805 [Development of percentile charts for semi-qualitative tracking of lung functions over time]

Health 808 [Technology transfer of SIMRAC research to enhance clinical performance] Contact Noeleen Woods for information nwoods@simpross.co.za

January 2003 - Workshop/seminar on Health 703 [Hand arm vibration syndrome {HAVS} and whole body vibration in gold miners in SA] Contact Noeleen Woods at nwoods@simpross.co.za for information

RESEARCH REPORTS AVAILABLE ON THE WEBSITE

The following final reports can be downloaded from the Website http://www.simrac.co.za

Health 801: Analysis of emergency care provided for injured miners in SA.

Health 808:

Health 817: A pilot study to assess heat tolerance of female miners.

Gap 602: Stope gully support and sidings geometry at all depths and varying dip.

For information, please contact SIMRAC Project Support Services at 27 011 358 9180

Lighting the Stope – Innovation in the mining industry by Mary Ross & Alec Gumbie

Background

Impenetrable darkness has been a challenge to underground mining for centuries, posing a hazard to both health and safety. Underground mines are totally dependent on artificial light and lighting in underground operations does not compare favourably with that in other industries with similar types of work.

Various forms of illumination have been introduced to improve productivity and safety. In the nineteenth century, for example, Cornish tin miners were each issued with six tallow candles per day and these were either stuck to the hard hats or to pillars with St Agnes clay, sold from the eighteenth century for this purpose. This, however, did not guarantee illumination and improved safety at work.

Two centuries later, the improvement is largely marginal, the only sources of illumination typically available at the face being workers' cap lamps.

The potential safety hazards arising from poor illumination in underground mines are numerous. The work process, avoidance of machinery and overhanging rock, and escape are all dependent on artificial light.

Adverse health effects are mainly those of eyestrain and associated symptoms. Although inadequate lighting or vision is rarely cited as a cause of accidents, many accidents and injuries could be prevented by better illumination.

SIMRAC has funded research in both the coal and hard rock mining industry to review illumination problems, make recommendations on setting illumination and visibility standards and, most recently, on the role of illumination in reducing risk to health and safety.

The potential hazards and recommendations were based on studies of underground work locations at a gold and platinum mine, respectively. Critical visual requirements were identified as: hanging wall conditions, misfires, drilling and charging, and roof supports and barricade installation.

In general, the more minute the detail required in the activity and the less the contrast between the task target and its surroundings, the greater the illumination required, particularly if there is additional time pressure.

The South African mining workforce is ageing and the effect on vision will have an additional impact↗

on safety and lighting requirements. Because workers perceive most of their environmental information visually, the quantity and quality of lighting is critical to the safe and efficient performance of work. Recommendations from the SIMRAC research were to select caplamps on the basis of task and worker visual requirements and to consider provision of additional portable light units at the face and other work stations underground. The latter would be ideal but there are challenges to providing artificial lighting. Light fixtures must be easily assembled and disassembled to be protected from blast damage and must be intrinsically safe which imposes restrictions on the nature of the lighting and sources of power.

The Harmony Way - Before and After

In April 2001, a novel lighting system was introduced at a stope face in Harmony, Merriespruit 3 shaft. This movable stope lighting system has revolutionised operations in the shaft. In the first year since installation, there have been no accidents and "dressing" cases of which there was previously, on average, one every two months. Management and the workers attribute this reduction in injuries to the improvement in illumination. In addition, productivity has more than doubled during the same period. Workers interviewed during a recent visit of the authors and Simpross colleagues to the illumination project expressed their pleasure at the improvement in working conditions since the project commenced. Not only has the safety aspect been improved but also remuneration which is coupled to improved productivity from the shaft team.

The lighting system for the 30 metre stope panel comprises 10 lights, hung from support packs and powered from a 550/32 volt transformer which is situated about 60 metres away from the stope face. Each light is an intrinsically safe, 15-watt fluorescent tube. (See photographs)

This system gives an illuminance reading of between 15 and 25 lux at the face of the lit-up stope. The lighting is sufficient for all the activities at the stope, from drilling to cleaning and inspecting the hanging walls. Cracks in the hanging wall are much more easily detected and this makes barring more effective. The lighting system is removed during blasting and reinstated during cleaning and preparation.

The greatest initial drawback of the system was that, as the lights were easily portable and operated off 12-volt batteries, they were pilfered for numerous 'above ground' uses. That challenge has, however, been resolved by modifying to the current 32-volt system.

Acknowledgements

Thanks to the Mine manager, Len Rauch for permission to visit and photograph the project and to Harry de Lange, Resident Engineer, for organising the SIMRAC support staff visit to Harmony Mine and to the miners for their assistance and consent to appear in the photographs.

Historical information from the South African Mining industry – Can you help?

SIMRAC responded to the concern of health practitioners in the mining industry about the loss of valuable information, by commissioning a project to collate historical documents. Information sources will include limited copies of past publications from organisations such as the Mine Medical Officers Association (MMOA) and the Mine Ventilation Society (MVS), various commissions and also major accident reports and also leading authorities who have retired from the industry.

The objectives of the research are:

- To identify all commissions, reports and publications relevant to occupational health practice in the South African mining industry as well as the seminal accident investigation reports which can contribute to prevention of similar disasters
- to assemble all the material and convert reports to electronic format
- to identify occupational health experts with extensive experience in the mining industry and create a focus group to analyse the material, identify themes and prepare summary reports for inclusion in the final CD; and
- to collate the information and produce an interactive CD.

The CD will contain information culled from all accessible published as well as "grey" literature, and information from focus group discussion with experts who have been involved with mining health and safety. Material to be captured include the Erasmus, Niewenhuizen, Leon, and Benjamin & Greef Commissions of Inquiry, plus reports from the Department of Minerals and Energy, mining houses and mining professional associations.

The CD will be an interactive source of documents and summarised reports with hyperlinks and search facilities and will be accompanied by a hard copy guide. Material will also be available through the MMOA and SIMRAC web sites.

The project leader, Haggis Guild, has assembled some of the relevant material but is experiencing difficulty locating some accident reports and electronic versions of commissions. He would welcome assistance from anyone who may have material or any other health or safety input that could enhance the CD. Readers are urgently requested to contact Haggis at rguild@iafrica.com or Mary Ross at mross@simpross.co.za or 011-3589183 regarding any contributions.

DEMONSTRATION OF FACE AREA SUPPORT PROTOTYPE SYSTEMS - GAP 813

On 11 May 2002, about 50 industry representatives, design engineers and Simpross personnel crawled under the surface mock-up stope at the Kloof Training Center to see the GAP 813 (a) and (b) prototypes in action. The University of Pretoria and CSIR Miningtek are contracted by SIMRAC to develop the prototypes




Elsie Zinsser produces the SIMRAC Newsletter three times per year. Contributions are very welcome. Please contact her by email ezinsser@simpross.co.za telephone 011 358 9188