

Safety In Mines Research Advisory Committee

Project Summary: SIM 03 09 04

Project Title:	Cost, appropriate use and effectiveness of personal protective equipment including improved footwear for the mining industry (1 volume, 171 pages)		
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Summary

In terms of the Mine Health and Safety Act (Act 29 of 1996) 'every manager must ensure that sufficient quantities of all necessary personal protective equipment (PPE) are available so that every employee who is required to use that equipment is able to do so' (Section 6 (2)). The selection of proper PPE is crucial, therefore, since exposure to hazards will occur if PPE is inappropriate or fails.

The main objective of the present study is to produce guidelines on the appropriate selection and use of PPE in relation to the risk of exposure in the South African mining industry. In the study emphasis was placed on PPE available for eye and face protection, respiratory protection, torso protection, arm and hand protection, and leg and foot protection.

Conclusions

Although personal protective equipment (PPE) is regarded as a last resort in the prevention of exposure and disease, it remains an essential component of worker protection in the mining industry. Findings in the literature suggest that PPE plays a role in the prevention of accidents and injuries. Shortcomings in the information available in the SAMRASS database prevented the retrieval of detailed information regarding the mechanism and events leading to injury or disease in order to establish the efficacy of PPE. It is, however, evident from the data base that the body parts or regions injured most are the fingers, the leg below the knee, and the metatarsal region of the foot. All of these body parts could be protected, at least potentially, by PPE (gloves, leg guards and protective footwear, for example).

From statistics obtained during the study it is obvious that PPE plays a major role in health and safety initiatives on mines and that PPE is used on a regular basis. A conservative estimate is that at

least R 333 million is spent annually on PPE for mines.

A large number of items of PPE devices are available that are applicable to the broad spectrum of hazards associated with the diverse occupations involved in mining. Furthermore, each item may provide protection against one or more hazards and each mining occupation may be associated with one or more hazards, which results in myriad possible permutations of associated PPE, hazards and mining occupations. If the available data on PPE, hazards and mining occupations is incorporated into a relational database these permutations can be presented to and accessed by users via a simple software application for providing easily accessible and relevant information regarding PPE for mining occupations.

Recommendations

In general, the major ergonomics-related problem experienced with PPE, according to the findings of the study, was related to size and fit. In most of these items the anthropometry of the mining population (especially the female mineworkers) was not considered in the design of the PPE items. Information on the functional anthropometry of mineworkers that is being collected as part of SIM 04 09 01 at present should be made available to the designers of PPE as a matter of priority. This much needed information will not only assist in the design of PPE but will also enable informed decisions as far as the sizes of imported PPE are concerned.

Mines should consider the implementation of comprehensive PPE programmes as a matter of priority. Hazard identification should form an integral part of the programme and should precede the selection of any PPE item. This is also applicable to the selection of protective footwear.

As a second phase of the current study, the compilation of a Best Practice Document on the

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selection, use and management of PPE should be considered. This document must comprehensively cover several aspects of a PPE programme, including programme design criteria, management structure, promotional strategy, hazard identification, selection of appropriate PPE, fitting and wearing procedures, maintenance and inspection, training and education, and the auditing of a PPE programme.