Celebrating the NIOH jubilee

The Art and Science of Ergonomics

The Chairman, Prof. DJ Kocks, Executive Committee and members of SASOM extend their congratulations to the Director, Prof. MH Ross and all the scientists and staff (past and present) of National Institute of Occupational Health on fifty years of excellent research and service to the nation.

As part of the celebration, SASOM and NIOH presented a congress, The Art and Science of Ergonomics, in the Tony Davies Lecture Hall at NIOH, in August 2006.

Prof. Kocks opened the congress with a welcome address and Prof. Ross gave an interesting presentation on the history of NIOH, its mission, international collaboration and global initiatives. In keeping with the congress theme, she highlighted the Ergonomics Unit and the research, training and services it provides to industry.

The Keynote Address was delivered by Prof. P Scott, who recently retired from Rhodes University after many years of devotion to the study of ergonomics. She emphasised the importance of keeping task demands within the physical capabilities of the worker and that all role players – government, manufacturers, employers and employees – must become involved in the management of ergonomic health risks.

Mr P (Schu) Schutte of the Occupational Health and Ergonomics Research Group at the Council for Scientific and Industrial Research (CSIR), briefly explained why ergonomic programmes are not being implemented despite legislative requirements, and went on to describe an effective strategy for the successful implementation of an ergonomics programme in the workplace.

Prof. A Thatcher from the School of Human and Community Development at the University of the Witwatersrand, gave an excellent description of the application of knowledge of the functioning of the mind, to ergonomics. Cognitive ergonomics is the automation of physical activities and the change from physical actions to observation, supervision, monitoring, problem-solving and decision-making. He explained that ergonomics emphasises the links between the anatomical, physiological and psychological components of a task.

Human error and decision-making in complex environments was brilliantly presented from an aviation perspective, by Mr LR Heemstra, an aviation human factors specialist. He concluded that the correct attitude, knowledge and skills enhances situational awareness and ensures accurate judgement and subsequent decisions that could reduce, or even eradicate, human error.

Ms W Wilhelm, a counselling psychologist, addressed workers' perceptions, needs and expectations that influence behavioural risk and resilience, in another excellent presentation. She explained that behavioural risk management is the holistic and preventive management of behavioural issues that affect work organisations. Ventilation, noise and temperature in the work-station, safety, privacy, equipment, training and the organisational structure, all affect human behaviour, as do hours of work and shifts, health care and even transport arrangements.

An ergonomics consultant, Mr M Shaba, gave a skilful description of applied anthropometry and the designing for extreme individuals as well as the 'average' person, for movement. He advocates an adjustable range and considerations in clothing and personal protective equipment to suit the individual.

Two lecturers from the Department of Human Kinetics and Ergonomics at Rhodes University, Dr C Christie and Mr A Todd, explained the physiological and biomechanical considerations to note in the assessment of manual materials handling tasks. They highlighted important worker and task characteristics, to consider in every manual material handling setting in the workplace, in order to prevent strain on the musculoskeletal and cardiovascular systems. These theoretical and yet practical presentations were outstanding.

Another brilliant presentation was that of Mr J Hugo who introduced Human-Systems Interaction. Mr Hugo is the Lead Human Factors Engineer, responsible for the design of the human-system interface and all human factor analyses for plant and system design, at PBMR. Mr Hugo asked the question "Brain-Machine interaction?" and quoted Kurzweil (1999): "Compare the speed of technological development and the increasing relevance of IT-based technologies with the speed of evolution.... combined with a neuroscientific theory of the mind, implemented in ever faster computers, when will the engine of evolution diffuse boundaries between man and machine, and generate secondary intelligence that will exceed the intelligence of its creators?"

Ms B Nyantumbu, who is Head of the Ergonomics Unit at the NIOH, presented an interesting demonstration on setting up a computer workstation. Ms S Dyosi, a medical scientist in the same unit, gave basic guidelines on ergonomic assessment in the workplace, including self-evaluation of one's own workstation.

The well-known author of articles on ergonomics, Mr G Dekenah, described hazardous ergonomics situations in different industries. He classified ergonomic hazards into those that are due to exceeding the physical capabilities of the human body, those due to environmental factors (physical and chemical hazards and workstation layout) and thirdly, factors due to socio-technical factors (work stress, shift work, etc).

Mr J James, Chairperson of the Ergonomics Society of South Africa, described ergonomics programmes in South African mines and presented a well-researched basic model for implementing an ergonomics programme. The strategy includes the state (legislation), manufacturers (ergonomic designs), employers (safe work procedures) and employees.

Dr M la Grange and Mr C Badenhorst asked the question "Is ergonomics an economically value-adding tool for the mining industry or a 'nice to have'?" and gave an excellent summary of the situation ten years ago and the developments that have since taken place. A basic checklist and ergonomic risk profile gave a valuable starting point to those who need to implement an ergonomics programme.

Ergonomics reporting was diligently addressed by Mr C Bosch, an environmental health practitioner. He made practical suggestions about the format of such a report and the inclusion of photographs and the subsequent follow-up of the report.

The Congress was aptly concluded with another brilliant presentation on the effects and management of poor ergonomics by the biokineticist, Mr J Lubbe. He explained that the last phase included evaluation that should encompass three broad categories. Performance evaluation examines the 'bottom-line' results, programmatic evaluation examines how well the initiative was implemented and cultural evaluation examines changes in values, norms, peer and organisational support.

Report by Jenny Acutt of the SASOM National Office.
A set of the presentations is available.
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