



Roll-out of fatigue management programme

Fatigue management is increasingly recognised as a critical occupational safety and health issue in industries such as mining, which are characterised by shift work and arduous physical tasks.

In 2007, AngloGold Ashanti management's attention has focused on rolling out fatigue management programmes at the African underground mines, which has identified fatigue management as one of its seven safety-related strategic issues.

Australian consulting occupational psychologist Peter Simpson, who has extensive experience in the field and had previously carried out research at Navachab Mine in Namibia, was invited to visit two of the company's operations during the year (Great Nologwa in Vaal River and TauTona in West Wits), to assess the workplace from a fatigue management perspective.

Grant Davey, General Manager of Great Nologwa, has been appointed project champion of the fatigue management initiative. In a joint initiative between Great Nologwa and the Council for Scientific and Industrial Research (CSIR), a research project team has been appointed to develop guidelines on fatigue management.

As a first step, the project team has completed a baseline measurement of physiological strain in relevant occupations (principally stoping and development teams). Two parameters, heart rate and body temperature, are observed during the complete cycle of activities that make up a shift: from these, it is possible to determine a 'fatigue index' for each occupation. (Heart rate and core body temperature are recognised as parameters for determining physiological strain index, as they indicate strain levels reflected by the body's cardiovascular and thermoregulatory systems. Prolonged strain is a determinant of fatigue.) The project's terms of reference also include the development and roll-out of mine-specific fatigue management programmes. The project team's preliminary report is scheduled for submission in early 2008.

Based on Peter Simpson's report and the recommendations of the project team, three issues have been identified as critical in the effective management of fatigue management:

- the quantity and quality of sleep;
- wellness of individuals; and
- the workplace environment.

Fatigue is commonly associated with night shift work, as the human body's circadian rhythms make it difficult, if not impossible, to adjust fully to working at night and sleeping during the day. In the South African underground mining context, this aspect is aggravated by the fact that many employees still reside in hostels with shared rooms and facilities.

"We've embarked on a programme to convert hostel accommodation to single rooms," says Davey. "We've upgraded 632 so far, with 258 planned for completion this year, and another 906 planned for 2008 to 2009. In total, the project will involve upgrading 1,796 rooms at a total capital cost of R47 million."

Room allocation is also being reviewed to ensure that, wherever possible, employees with similar working hours are accommodated in the same section of the hostel: day shift workers comprise some 85% of the workforce, with night and afternoon shift making up 14% and 1% respectively. In 2007, one fatality took place during the night shift.

Despite its initial seemingly relaxing effect, alcohol is also a factor in sleep deprivation, as it impairs the quality of sleep. "We're regulating this by reducing the opening hours of the liquor outlets," says Davey. "This reduction was implemented over a period of time, with full involvement of all interested parties, including unions and associations. The Mine Health and Safety Committees are fully involved in the launching and implementation of all relevant interventions, including the fatigue management programme. A comprehensive programme of sporting activities is also being introduced, both to promote wellness and to provide alternative leisure time activities."



Roll-out of fatigue management programme *continued*

For employees who reside outside the mine residences and travel long distances to work, fatigue is also an issue, and contributes to absenteeism. While this is largely outside management's control, awareness campaigns have been conducted among these employees.

Insofar as wellness is concerned, TB and HIV are the main issues, and for both, comprehensive management programmes are in place and are associated with a variety of factors, including anaemia, hormonal imbalances and side-effects associated with medication. The presence of opportunistic AIDS-related infections also plays a role while prolonged fatigue, in turn, weakens the immune system. Nutrition is also a factor, and sachets of protein drink are being provided to employees as they proceed on their shifts.

"Depression and abuse of alcohol are also relevant here," says Davey. "Fatigue and depression are linked. Initial research indicates an incidence of depression of between 10% and 20% at Great Noligwa, further research by an occupational psychologist is planned for 2008."

The third major issue in fatigue management relates to the working environment, and relates to reducing waiting and underground travelling times; ergonomic interventions to make tasks less physically demanding where possible; reduction of noise by silencing equipment; improved lighting and the provision of adequate supplies of drinking water underground.

Underpinning all three issues is the critical importance of education and awareness among employees, supervisors and management. "People need to understand the causes of fatigue, be able to recognise its symptoms and know the appropriate action to take," says Davey.

A book and DVD have been prepared, covering the elements of the causes, effects and management of fatigue. English versions have been distributed to all managers and supervisors, and are being used as part of the induction programme for new employees, and for employees returning from annual leave. Translated versions will be available for employees by the end of 2007, and incorporated into the Category 3-8 induction programme with effect from the beginning of 2008.