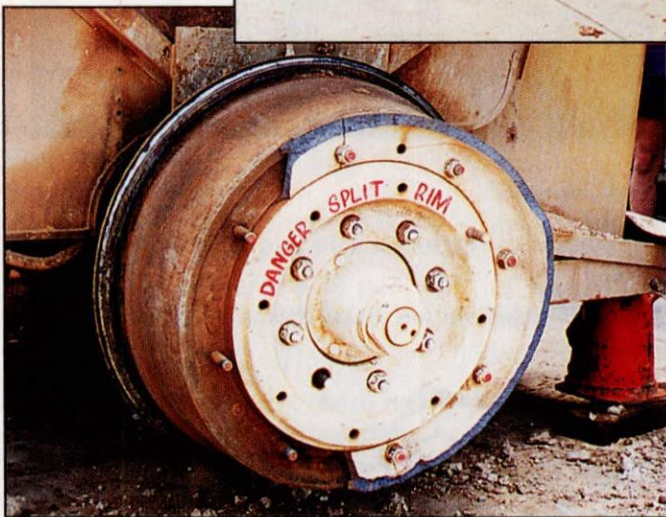




SPLIT RIM TYRE EXPLODES



The split rim of this mobile crane wheel failed catastrophically resulting in a fatality.

ATTENTION MINE SURVEYORS

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MINESAFE is published four times a year by the Mining Operations Division in conjunction with the Policy and Planning Division. Articles and news items may be used freely, although we would appreciate acknowledgment, as well as a copy of any publication in which they are used.

The MINES SURVEY BOARD has determined that an amendment to the Mines Safety and Inspection Act Regulations is required to allow a period of grace for persons who had acquired, or were in the process of completing, a survey qualification at a level which was acceptable under the now repealed Mines Regulation Act and Regulations, to apply for an Authorised Mine Surveyors Certificate Grade I. (A higher level of qualification is now required under the Mines Safety and Inspection Act Regulations, for future applicants).

It should be noted that there will still be a requirement for two years of experience acceptable to the Board for Grade I Certification, rather than the one year under the previous Act.

Notification will be given in MINESAFE and through other media when this regulation amendment is in place.

Secretary
MINES SURVEY BOARD

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The MINESAFE committee wish readers a safe and enjoyable Christmas and New Year.

L - R: Chris Stubbley, Jo Duggan, Mark Butson, Frank Richards, Anna Patton and Catherine Stedman (seated).



GUEST EDITORIAL

We've come a long way since the State's first commercial mining operation began production at Northampton in 1850.

In terms of safety and health, gone are the days of pick-and-shovel mining, underground child labour, appalling ventilation and high numbers of mine fatalities.

Since 1894, the year the Department was established, more than 1,860 people have been killed in WA mines.

The worst years were around the turn of the century. For example, there were 45 mine deaths in WA in each of the opening two years of the 20th century, with the number of fatalities averaging 41 per year between 1900 and 1909. [In 1900 there were 20,386 people employed in the WA mining industry, most of whom worked underground, compared with an industry workforce of more than 40,000 now.]

Today, despite enormous advances in mining technology, accidents and fatalities still occur.

All those involved in mining must be horrified that 46 deaths have occurred in WA's mining industry so far this decade. This is an average of about seven per year. There have been six mine fatalities in WA so far this calendar year.

The fatality incidence rate for 1995-96 was 0.11 per 1,000 employees which was an improvement over the rate of 0.26 for 1994-95. Importantly, the 1995-96 year also saw a 20 per cent improvement in the injury index for WA mines.

Impressive, maybe. But there is still much room for improvement and definitely no room for complacency.

A major opportunity for improvement is enshrined in the

duty-of-care provisions of the Mines Safety and Inspection Act which was proclaimed in December 1995. This is leading to many changes in the way we improve safety in the industry and has caused a significant change in the Department's role. We now expect our inspectors to operate more like auditors and educators rather than policemen as they check for safe work practices in the mining industry.

With the value of mineral production increasing each year, and with the number of mining operations especially underground operations also increasing, new challenges confront the Department's inspectorate. The duty-of-care approach should allow these challenges to be met with improved safety, within existing inspectorate resources.

As a first step in this process, the inspectorate is adopting an audit approach to regulation, as distinct from the "walk through" compliance inspection approach which was previously used. This will be adopted progressively as the old system is phased out.

The Department will subsequently make available the audit system to companies which wish to use it as an aid for self auditing. In the longer term, we plan to accredit third-party auditors who may then carry out formal audits for review by the inspectorate.

Meanwhile, draft guidelines for the new Mines Safety and Inspection Act have been prepared on a range of operating practices. They outline safe work practices and systems of work which are aimed at assisting industry, employers and employees meet their duty-of-care obligations. Some 23 guidelines are being prepared, three of which, to date, have been endorsed by the Mines Occupational Safety and Health Advisory Board. They

include "Guidelines for the Mines Safety and Inspection Act", "Health Surveillance of Mine Employees" and "Safety Bund Walls Around Abandoned Open Pit Mines". Preparation of the remaining 20 guidelines has been assigned to various members of the Division and is expected to be finalised over the next six months.

As part of the Department's use of new technology to improve the quality of its service to the mining industry, let me remind you of the excellent range of occupational safety and health information that is now available through the Department's networked computer system EXIS. Access is free.

The Department sees great merit in providing the mining industry with comparative statistics on safety performance and trends. We will be making increasing use of on-line systems to allow industry to access important data. Industry should be aware of this trend and take account of it when planning their information systems.

Lastly, with the approach of the festive season, I would like to wish you and your families a most enjoyable Christmas and a prosperous and safe 1997.



K R Perry
DIRECTOR GENERAL

REPORTING DANGEROUS SITUATIONS AND OCCURRENCES

Section 11 of the Mines Safety & Inspection Act requires every person working in a mine to report immediately to the person in immediate authority over that person any potentially serious occurrence that arises in the course of or in connection with that person's work, and any situation at the mine that the person has reason to believe could constitute a hazard to any person. Failure to report carries a \$10,000 fine.

The requirement raises some interesting issues. The first is that a person can identify a potentially serious occurrence or hazard when he or she sees one. After all, how easy is it to convince someone who has done something a certain way for years and never had an accident, that his or her actions are unsafe?

The requirement presupposes that employees have had hazard identification training and exposure to basic risk assessment techniques which will translate into an ability to comply with Section 11.

Does the company culture encourage employees to do what the Act requires them to do?

Asking employees why they don't report hazards produces fairly consistent responses:

THE TOP TEN REASONS

- "You get into trouble"
- "Too much paperwork"
- "It's dobbing"
- "Don't want to be responsible for someone losing their job"
- "You'll have to fix it"
- "The way they speak to you"
- "It's not appreciated"
- "Too busy haven't got time to stop"
- "It's been there a long time, and nothing's been done"
- "It's not going to change anything, so why bother"

All of these reasons indicate that employee perception of workplace reality has more influence than the remote wording of legislation.

It appears that just telling employees they must report hazards because it is a legal and company requirement isn't making much headway. If employees are not reporting then they are not fulfilling their duty of care, and that is a problem for them. If the system or culture does not encourage employees to report, that is a problem for management. If either thinks that the problem belongs to the other, that shows a lack of understanding of Duty of Care, and that is a problem for everyone.

Developing strategies for making Section (11) work in the way it is intended probably deserves to be an agenda item for workplace meetings from the boardroom to the shop floor.

Employee opinions have been gathered from all areas of the state.

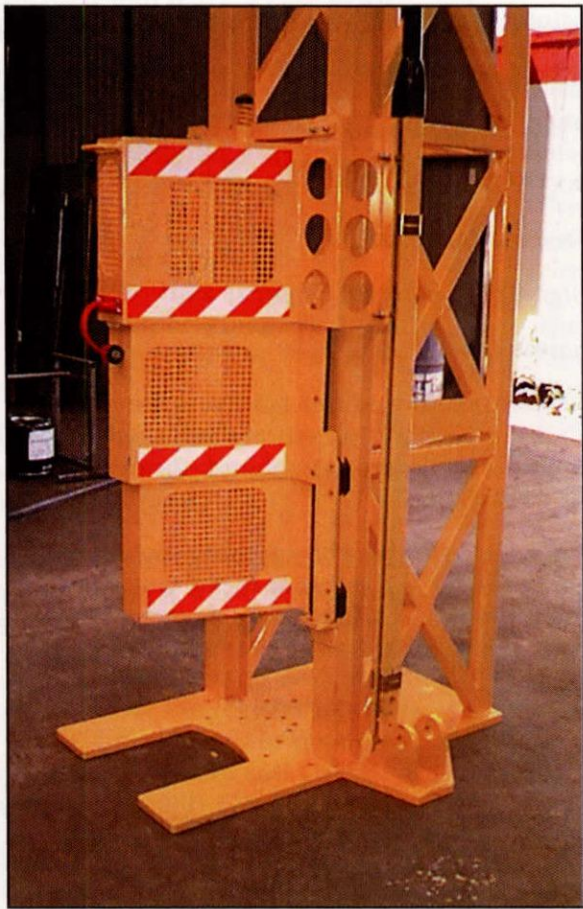
QUIETER TYRE BAY

The June 94 edition of MINESAFE contained an article highlighting the benefits of the lower noise emission produced by torque wrenches compared with impact wrenches when these tools are used to break loose or tighten nuts on heavy mining equipment.

At the time only three of these tools were used by the mining industry. However, a local supplier has recently stated that 34 units are now in use with more deliveries in the pipeline. A large mining contractor has recently expressed interest in buying 15 torque wrenches!

Keep up the good work guys. Reduced noise exposure means reduced hearing damage.

DRILL RIG SAFETY



DRILL ROD GUARD

There have been several serious accidents including a fatality, where drillers were caught between high speed rotating drill rods and masts on drill rigs. Investigations into these accidents resulted in strong recommendations for the use of guards to prevent drillers being caught in rotating drill rods. However most guards which were developed have been difficult or cumbersome to use and have consequently been removed from the drill rigs or simply not used.

This particular drill rod guard is automatically activated by extension springs as the drill head descends. The guard consists of three pieces of framed steel mesh that concertina down and effectively cover the drill rod. As the drill head retracts up the mast the guard automatically extends out of the working area. The guard can also be manually operated and locked into position.

DRILL ROD HANDLER

Serious accidents have also occurred where drillers "swing" drill rods into position using rod booms and winches.

This patented rod handler is remotely controlled and will effectively transfer a rod from several positions and place it to the drive head in a controlled manner, it will also return the rod from the drive head back to the original position. The rod handler consists of a tubular socket into which the drill rod is threaded.

For further enquiries contact Mark Butson,
Tel: (09) 222 3607



EXIS SYSTEM NOW AVAILABLE



EXIS (External Information System) is a networked computer system developed by the Department as part of the MINet project to enable the mining industry to access on-line up-to-date information pertinent to safety and health in mining. Customers requiring access to the EXIS system will need a modem and Lotus Notes (V4.1 or later) on a PC or Server.

For ease of configuration purposes it is recommended that customers hold back installing Lotus Notes software until they receive the EXIS starter pack.

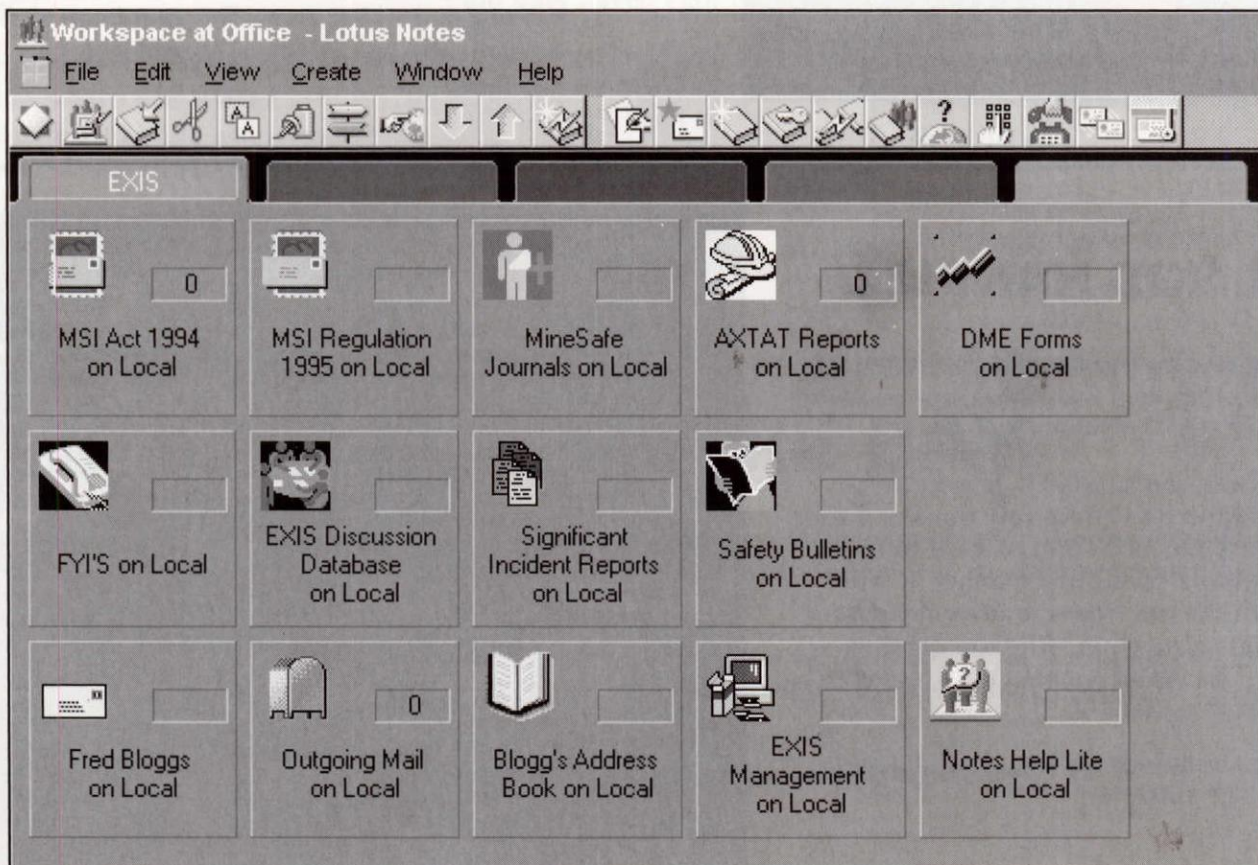
The first release is now available allowing users to access the following databases:

- Mines Safety and Inspection Act and Regulations
- MineSafe Journals
- FYIs (incident and accident summaries)
- AXTAT Reports, Graphs, and Forms
- Discussion Database
- Significant Incident Reports, and
- Safety Bulletins

One excellent feature of this system is the ability to conduct a search for information within a database by using multiple key words enabling fast retrieval of relevant information.

EXIS also provides mine sites with the option of completing the AXTAT monthly forms within the system and electronically mailing them to the Department through a dial-in connection.

A typical EXIS Lotus Notes workspace screen



SLACK ROPE AND ROPE TENSION MONITORING SOUTH AFRICAN STYLE

AXTAT reports and graphs will be updated each month. Mining companies will have access to **all general AXTAT** reports based on the total mining statistics for the State as well as reports specific to their own company and sites. Security is based on a password system. Any registered company will have access to specific reports relating to only that company. A registered mine site may have access to reports relating to that site, and depending on company policy, all other sites owned by that company.

Further releases of EXIS will expand the number of databases to provide additional information.

The service will be available 24 hours per day 7 days a week; (excluding maintenance and backup times).

To register for access to EXIS you must complete the registration form in the EXIS brochure. To obtain a copy of the brochure call Linda Cullen on Tel: (09) 222 3682.

When you have been registered you will be sent an EXIS Starter Pack. This pack consists of several 3 1/2" floppy disks, installation instructions and an EXIS User Guide.

Expansion in the mining sector is forecast to continue to the end of the century. To maintain the downward trend in mine accidents, it is necessary to improve the distribution and understanding of current safety information; EXIS will no doubt play an important role in achieving this.

For further information contact Mark Brown Tel: (09) 222 3093.

During a recent overseas trip the Principal Technical Engineer John Jance came across an innovative slack and tight rope monitoring device installed on drum and friction winder haulage systems.

The monitoring device, first installed in South Africa in 1985, is now fitted to over 310 shaft compartments and is reported to be virtually both maintenance free and free from operational problems.

The device is very simple and consists of a load cell normally mounted under the main tansom of a conveyance, a wet cell battery, a rope antenna, a surface antenna (usually mounted in the headgear) and a digital display unit that can be easily interfaced with the winder safety circuit. The cost of the supply and installation quoted was relatively low when viewed in the light of the effectiveness of the device.

The features of this system include:

- Safety - slack or tight rope condition will trip winder.
- Reliability - more than 310 systems have been in use for up to 10 years.
- Performance - guaranteed no dead spots or signal loss in shaft.
- Productivity - weight of ore hoisted is always available.

For further information contact John Jance Tel: (09) 222 3262.



INNOVATIONS

MECHANISED HANDLER

Lifting sample bags may appear to be a simple operation but many back injuries throughout the State have been caused by the continual bending and lifting involved.

Kalgoorlie Consolidated Gold Mines' Geology and Engineering Departments recently worked together to build a mechanised handler that does away with the back breaking chore of lifting ore sample bags from a vehicle to the work bench, thus making the task easier and safer.

Samples are lifted manually from the pit floor into four boxes which are in the back of a vehicle, each with a hook on it to enable the handler to lift them from the vehicle.



KCGM Geotechnician Supervisor and Safety Representative Michelle Osmetti operates the mechanised handler.

Geotechnicians use the mechanised handler, made from a Kevrek T150 crane, to lift the boxes containing the samples from the back of the vehicle and onto the work bench to be taken to the assay laboratory.

WHEEL HOURMETER

A wheel hourmeter has recently been designed and manufactured to provide minesite management with an effective means of tracking individual wheel service life, without having to maintain manual records of wheel fitment.

The hourmeter is permanently installed on the inside diameter of the wheel and measures rotational wheel service hours. When the wheel stops rotating the hourmeter stops recording hours within 10 seconds.

If a wheel is moved from one vehicle to another or from one site to another, the service hours as seen on the hourmeter LCD remain with that wheel and will only continue to increase when the wheel is re-fitted and rotating.

Rim base metal fatigue rate can be reduced with regular maintenance programs in place and this can only be achieved by the recording of accurate individual service hours.

Each wheel has its own hourmeter permanently attached to record the hours of rotational service, unlike current service hours which are recorded from the vehicle engine hourmeter. The wheel hourmeter enables minesite personnel to always know exactly the service hours of each wheel allowing maintenance schedules to be accurately planned according to the hourmeter reading.

For further information contact Chris Stublely Tel: (09) 222 3531.

INNOVATIONS

These access steps at Pannawonica are an improvement on 'chain' ladders. They are firm but flexible.



ACCIDENT INVESTIGATION - LOOKING FOR ANSWERS

Accident investigation is about identifying root causes - not laying blame. That is the principle of good investigation, but is there a possibility that one of the root causes of why so many accidents are repeated is because many of those "minor" investigations are not thorough enough?

Take the case of an employee who apparently has not followed a procedure. A common comment to the question about corrective action taken is: "The employee will be re-inducted". This raises the following questions:

- If the employee didn't learn in the first induction, why should another one be any more successful?
- What evidence points to the employee rather than the induction itself?

- Are any ensuing conclusions valid if the procedure is not enforced, and this particular employee just happened to be unlucky?

Your investigation should provide answers, and if a lack of enforcement is identified, then what you have is a systems failure, and a lot of distance between the root causes and the result, which means that reinducting the employee isn't likely to eliminate re-occurrence. Sadly many employees don't really believe reassurances about "blamelessness". It becomes important when those involved are also providing the information. Understandably, those most directly involved (which includes those in authority in a work area as well as the victim) have a vested self interest in the accident not being their fault. That is human, but

guarded information is not good information. A team approach to investigation, with at least one disinterested member, may be a solution to the problem.

Another solution is to provide comprehensive guidelines for accident investigation which include "must do's" for establishing the sequence of events, and "interview questions, and subject headings" for completing investigation reports as opposed to accident reports, which in their traditional form can seldom provide the comprehensive information needed to eliminate causal factors. At best the accident report can identify some of the contributing factors which act as a road map for the investigators.

It may be worthwhile taking a closer look at your investigation procedures.

GUIDELINE QUESTIONS FOR WRITING THE REPORT AND RECOMMENDATIONS

WHAT SYSTEMS FAILED?

- how can we prevent failure or make it less likely?
- how can we detect approaching failure?
- how can we detect failure when it occurs?
- how can we control failure?

WHAT DOES THE SYSTEM DO?

- why do we do this?
- what could we do instead?

WHICH PERSONS FAILED?

- what did they fail to do?
- how can we make failure less likely?
(Training, design, supervision, practice)

WHAT IS THE PURPOSE OF THE PERSON'S ACTION?

- why do we do this?

WHAT COULD WE DO INSTEAD?

- how else could we do it?
- who else could do it?
- when else could it be done?

WHAT SPECIFIC ITEMS IN THE SYSTEM TRIGGERED THE INCIDENT?

- what does it do?
- why do we do this?
- what could we do instead?
- what could we use instead?
- how else could we do it?

Source: CCH International

MINESAFE CONFERENCE



The triennial Minesafe International Conference was held at the Burswood Convention Centre in September.

Minesafe was attended by some 450 representatives from most workplace occupations. The Conference once again received an encouraging commendation from attendees.

Here are some scenes of the week's activities.



PEOPLE AND PLACES



*"Well, you never know, have you done a proper analysis on training room eye hazards?"
Hamersley Iron Geology Department discover Job Safety Analysis the Karratha College way.*

*"Only 10 seconds left on the clock."
Employee's Inspector, Bob Leggerini and National Mine Management team members wait to win the early knock off.*



*"First one to finish gets the Minties"
MacMahons Contracting Supervisors come to grips with the Mines Safety and Inspection Act.*



*"Here it is, folks! The way of the future!"
MARCSTA president, Greg Harris (BGC Contracting) has lots of reasons to be proud of the MARCSTA Generic Induction package.*



*"Could we have the chicken and avacado focaccia, please?"
Lunch break at Nimary mine.*

SHOCKS - SHOULDN'T HAPPEN

Electric shocks are high on the list of recurring incidents which have a high potential for fatalities.

From touching a live 240v terminal in a fume hood control box to receiving a shock from touching a damaged isolation switch. Brushing live terminals of on/off switches when changing main control computer cards, and turning on lights after the switches have been reset (just after hosing down a path outside) adds to the tally. Standing on an extension cord socket (wet ground and muddy boots) or hosing down a toilet block and spraying a 10 amp powerpoint with water also result in shocks. These are just some of the incidents reported to DME.

A lack of work procedures, or a breakdown in the system often have the same result, people get hurt or killed.

The Department has had 129 reported electrical incidents since 1994. This is cause for concern and mining companies should review critically their procedures and carry out a full risk assessment of electric hazards.



FIRE SAFETY ALERT

The Fire and Rescue Service of WA (FRS) recently investigated the cause and origin of a fire that occurred in a transportable accommodation unit located at a remote mining site. The fire originated in the exhaust fan installed in one of the 'Donga' units.

The exhaust fan was severely affected by the dusty environment which caused mechanical failure of the bearings leading to electrical overload and fire.

Other exhaust fans inspected were similarly impacted by the dusty situation and were found to be in varying degrees of deterioration.

The FRS strongly recommends that all exhaust fans installed in 'Donga' units and which are subject to extremely dusty conditions, be inspected and serviced regularly to avoid the potential risk of fire.

Installers of exhaust fans in accommodation units should

consider the use of heavy duty fans more suited to dusty environments.

This alert is issued by the Department of Minerals and Energy in conjunction with FRS to promote industry awareness in relation to this hazard.

If you would like more information about this or any other fire safety matter please contact the FRS Fire Investigations Unit on Tel: (09) 323 9325.

QUIZ FOR SHIFTWORKERS

1. **A circadian rhythm is:**
 - (a) a tempo in rhythm and blues music;
 - (b) a biological rhythm;
 - (c) a species of grasshopper.
2. **Your body rhythm will adjust to a change in shift in two or three days.** True False
3. **Frequent changes to schedules and disruption to circadian rhythms can lead to chronic fatigue and other health problems.** True False
4. **On average, nightshift workers eat more junk food than those who work during the day.** True False
5. **After nightshift, workers should have a rest period of at least:**
 - (a) 12 hours;
 - (b) 24 hours;
 - (c) at least 24 hours, but the more consecutive nightshifts worked, the more rest period should be allowed.
6. **Shiftwork education should include:**
 - (a) potential health and safety effects of rotational shifts;
 - (b) education about managing the effects of shiftwork;
 - (c) education for families;
 - (d) recognising stress factors;
 - (e) all of the above.
7. **Shiftworkers should maintain regular eating patterns with balanced varied meals.** True False
8. **Shiftworkers should avoid greasy food, particularly on nightshift.** True False
9. **Shiftworkers should avoid heavy meals at night because:**
 - (a) your digestive system is not as active at night;
 - (b) night-time kilojoules may be stored as fat rather than used up;
 - (c) you are more likely to suffer from heartburn, constipation and indigestion;
 - (d) all of the above.
10. **While a shiftworker may think he/she is having a few days off, his/her body may think it is just another shift change.** True False
11. **Mobile Plant operators don't need to have regular breaks on nightshift if they feel OK.** True False
12. **It is normal for nightshift workers to experience periods of fatigue.** True False
13. **Caffeine based drinks help you to keep awake.** True False
14. **If there is a break during a cycle of nightshifts, workers should maintain their routine.** True False
15. **Shiftworkers can accumulate "sleep deficits".** True False

Answers:

1. (b), 2. (false - individuals adjust at different rates), 3. (true), 4. (true), 5. (c), 6. (e), 7. (true), 8. (true), 9. (d), 10. (true), 11. (false - your muscles need regular reminders that you are not asleep), 12. (true), 13. (true - but they may also affect your ability to sleep after the shift), 14. (true), 15. (true).

WHAT'S ON

**AUSTRALIAN CENTRE
FOR GEOMECHANICS**



AN INTRODUCTION TO SOIL MECHANICS 19-21 February, 1997

Venue: The University of WA, Nedlands, Civil Engineering Department

This course is designed to promote an understanding of the terminology and concepts of basic soil mechanics, and is aimed at non-specialist personnel involved with the operation and management of tailings facilities.

For further information contact Christine Neskudla
Tel: (09) 380 3300 Fax: (09) 380 1130

WA SCHOOL OF MINES MASTER'S DEGREE IN MINING GEOMECHANICS

Commencing early February 1997

Venue: WA School of Mines, Kalgoorlie

This course is of two years duration and will provide the necessary skills to apply modern geomechanics principles in mine design and mine production. The course is designed for mining, geological and civil engineers, mine geologists and other suitably qualified professionals.

For further information contact Graham Baird
Tel: (090) 88 6172 Fax: (090) 88 6151

HAZMAT - HAZARDOUS MATERIALS DATABASE

This updated database is the result of a comprehensive five year program review and update of the information in the previous electronic database. HazMat has a number of significant advantages.

**COST SAVINGS TO USERS OF THIS INDUSTRY
SPECIFIC DATABASE ARE ENORMOUS AND
COMMENCE AS SOON AS IT IS INTRODUCED**

Demonstration, Stand-alone
and Network versions are available

Enquires: BERYL INGLETON
The Chamber of Minerals & Energy
of Western Australia Inc
Tel: (09) 325 2955 Fax: (09) 221 3701

STAFF CHANGES

Welcome to **Stephen Kamarudin** who has transferred from the Explosives and Dangerous Goods Division to the position of Senior Chemical Engineer.

Farewell to **Stephen Humphray** who has resigned from the position of District Mining Engineer (Kalgoorlie).



Stephen Kamarudin

MEMORIAL

Dave Collie died on 7 September after a short illness, having retired from the Mining Operations Division as Assistant Director - Mining in mid 1995.

Dave gave half of his working life to the mining inspectorate, following a varied and practical mining career in East Africa and in Western Australia.

He joined the Department in 1978. He was firmly committed to the role of the inspectorate in improving safety in mines, and held a deep conviction that this was a worthwhile function.

Dave took the lead role in developing the AXTAT system in 1986/87, which has proved to be of great value, and provided the vision and the drive to establish the MINet, AXTAT EXIS system, which is now operational.

In this system he has left a legacy which will be of enduring benefit to all who work in the mining industry.

Our heartfelt condolences to Diane and Lynda; we all share in your loss.

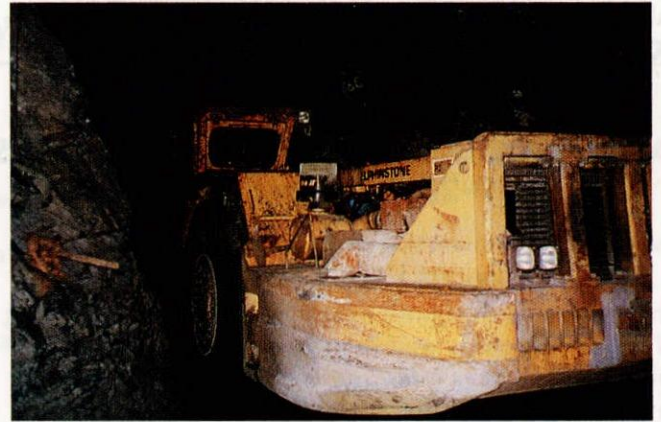
INCIDENT ALERT

THE INCIDENT

A remotely controlled load haul dump machine in an underground mine was being reversed towards the operator when the service brakes failed. The operator managed to run clear of the machine and escape injury. The machine came to rest against the sidewall of the roadway where the operator had been standing.

CAUSE

An investigation revealed that the remote controls were functioning correctly, and that the brake failure was caused by an air operated shuttle valve which jammed in the brake-off position. Contamination in the compressed air supply system indicated that the provision and maintenance of necessary air intake filters was less than adequate.



COMMENTS AND PREVENTATIVE ACTION

This incident is not unique; there have been several incidents in the past related to remote control load haul dump machines, some resulting in tragic consequences.

The incident emphatically demonstrates that any one of many defects or conditions can arise which may cause mobile machinery to respond in a life threatening manner. It follows that the system of work must place the operator and other persons in safe working positions at all times.

More specifically, employers using remotely controlled machines which rely on pneumatic systems, need to consult with the machine manufacturer and ensure that air supply filtration and routine maintenance procedures are both satisfactory.

Minimum requirements relating to remotely controlled equipment are detailed in Regulation 10.45 of the Mines Safety and Inspection Regulations 1995.



*Season's Greetings
and best wishes for the New Year
from all at Leader Press.*

*Proud producers of
Minesafe*

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