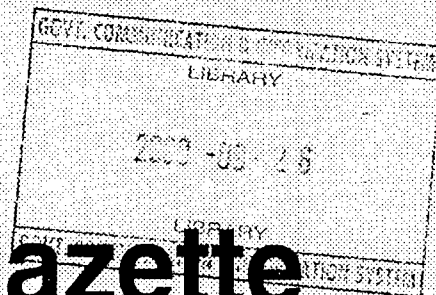


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# Government Gazette Staatskoerant

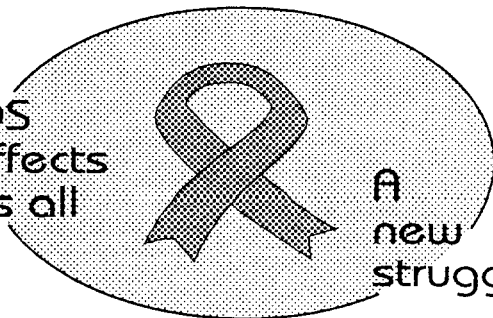
Vol. 423

PRETORIA, 8 SEPTEMBER 2000

No. 21560

**We can have the power to prevent AIDS**

AIDS  
affects  
us all



A  
new  
struggle

**Prevention is the cure**

**AIDS  
HELPLINE**

10800012322

DEPARTMENT OF HEALTH

## GENERAL NOTICE

## NOTICE 3195 OF 2000

**Safety in Mines Research Advisory Committee*****Invitation to submit project proposals***

SIMRAC was established in terms of the Mine Health and Safety Act (29/1996) to conduct research and surveys regarding, and for the promotion of, health and safety at mines in the South African mining industry. Suitably qualified agencies and/or persons are invited to submit proposals in response to the project specifications in this Notice. Proposals may also be submitted for any other projects in rock engineering, engineering and machinery and occupational health, that are aimed at improving health and safety at mines.

Prospective proposers must observe the following guidelines:

1. Proposals must be submitted in accordance with the format available from SIMRAC Project Support Services (SIMPROSS). Contact Mrs C Jones at telephone 0113589182, fax 011 4031821, e-mail [cjones@simpross.co.za](mailto:cjones@simpross.co.za) or visit the SIMRAC websites <http://www.simrac.co.za> or <http://www.simpross.co.za> to download the submission templates.
2. SIMRAC will hold a site meeting, open to all interested parties, at which the aims and objectives of the projects listed in this notice will be discussed and queries will be answered. All prospective proposers are urged in their own interests to attend the meeting. The site meeting will be held on:  
Friday 15 September 2000 from 12:00, in the Committee Room,  
**SIMPROSS** offices, 2nd Floor, **Braamfontein Centre**, cnr **Jorissen Street** and **Jan Smuts Avenue**, **Braamfontein**, Johannesburg.  
Order of Business: Occupational Health  
Engineering & Machinery  
Rock Engineering
3. For prospective proposers who are unable to attend the site meeting, queries can be forwarded to SIMPROSS, tel. 0113589180 or [dadams@simpross.co.za](mailto:dadams@simpross.co.za).
4. The closing time and date for the receipt of proposals is **12:00** on Friday 6 October 2000. Late entries will **NOT** be accepted.
5. Two copies of each proposal, in a form suitable for photocopying, must be deposited in the repository labeled "*SIMRAC proposals*" at the SIMPROSS offices, during normal business hours prior to the closing time and date,
6. SIMRAC may at its sole discretion decide to recommend the acceptance or rejection of any proposal or may attempt to renegotiate proposals prior to recommending acceptance or rejection. SIMRAC shall not furnish any reasons for its decisions regarding proposals.
7. Every proposal accepted by SIMRAC would be subject to a standard set of Terms and Conditions, which on acceptance of the proposal will form part of the contract applicable to the project. All prospective proposers should peruse a set of the standard terms and conditions prior to submitting a proposal. A copy of the standard terms and conditions is attached to this Notice.

8. In compiling proposals, prospective proposers should provide full methodological details regarding each identifiable output and its estimated costs. Personnel to be employed on each output should be identified and should be costed separately, within the standard format.
9. SIMRAC will endeavour to solicit the services of South African organisations to undertake projects, but will consider proposals from overseas-based organisations if expertise, cost considerations and local capacity building components compare favorably.
10. SIMRAC requires full disclosure regarding all subcontracts included in the proposal.
11. Where an output includes a device, mechanism, procedure, or system capable of being applied in the mining environment, a prospective proposer shall include in the proposal an output which suggests how the outputs in question might best be applied in practice. In drafting proposals, all prospective proposers should bear in mind the potential for technology transfer.
12. Each successful proposer may, during the contract period or shortly after its completion, be required to provide:
  - A competent spokesperson with appropriate materials to make not more than two separate presentations, on an annual basis for the duration of the project, and
  - A technical paper on the project for publication in the SIMRAC Symposia proceedings, without additional remuneration or reimbursement of costs.These activities must be detailed and costed as a separate output.
13. Where relevant, proposers may obtain copies of earlier project reports and other information from SIMRAC Project Support Services (SIMPROSS) at the address given under (2).
14. Proposers are advised that all SIMRAC projects may be subjected to technical and financial audits and all relevant information and expenditures should be recorded.
15. Proposers should substantiate and cost separately, all proposed travel outside the borders of South Africa in connection with the project, and provide details of all expenses such as traveling and subsistence,
16. All proposed project costs must be expressed in South African Rands. Fluctuations in the exchange rate and purchase of forward cover should be considered when costing the proposal.
17. SIMRAC will take all reasonable steps to ensure that confidentiality of proposals is maintained during the adjudication process. If an unsolicited proposal is not accepted within the programme, SIMRAC may invite additional proposals on the topic and will negotiate possible collaboration with the original proposer.
18. Proposers will be notified of the outcome of submissions during March 2001.

# **GOLD AND PLATINUM PROJECTS**

Project reference number: GAP 801

## **PROJECT TITLE**

Finalisation of the design, testing and commercialisation of the quiet rock drilling system

## **MOTIVATION FOR PROJECT**

The use of PPE to protect workers against the effects of noise has proved generally unsuccessful. The best way is to design the noise out of machines such as pneumatic drills. The concept was proven by the development of the current prototype, (GAP 642) where it is evident that significant noise reduction is possible. The prototype still requires thorough testing at the face. Engineering improvements will result from the tests, before the machine is ready for use in industry. ...

This project is to provide for the testing, design finalisation and commercialisation of the quiet rock drill. So often SIMRAC has generated very good ideas and concepts, which, in many cases have unfortunately remained as concepts, to the detriment of health and safety of South African mine workers. This project aims to follow the concept through to a final tangible product that will make a positive contribution to safety and health of mine workers.

## **PRIMARY OUTPUTS OF PROJECT**

A patented quiet rock drilling system, leading to commercial production through manufacturing partners.

## **POTENTIAL IMPACT**

Reduced daily personal noise exposure for pneumatic drill operators, resulting in improved health of the workforce and reduction in potential compensation claims for hearing loss.

## **SCOPE**

### **Focus Areas**

Pneumatic blasthole drilling machine encapsulation, machine-operator interface, registration of a patent and commercialisation of final product.

### **Duration**

15 months

### **Potential for Application**

Very applicable throughout the Gold and Platinum sector.

### **Requirements for Technology Transfer**

Video demonstration of operation and handling of the machine will be necessary. Also use of an industry "champion" will be required to conduct demonstrations.

### **Special Skills Required From Project Team**

Acoustic Engineering expertise, Mechanical Engineering expertise, Measurement expertise, mining experience.

**Project reference number: GAP 802****PROJECT TITLE**

**Quantification of dust generating sources in gold and platinum mines**

**MOTIVATION FOR PROJECT**

Dust forms the major component of airborne pollutants in gold and platinum mines. It is also accepted that respirable dust containing certain levels of silica causes lung diseases. There is a need to quantify all dust generating activities and associated dust levels before appropriate solutions can be generated.

**PRIMARY OUTPUTS OF PROJECT**

A survey to determine dust levels at points associated with activities in South African gold and platinum mines. The survey must establish dust levels for specific geological areas and types of mining activity, including where there is a trend away from the use of water such as in Transvax raise boring systems.

**POTENTIAL IMPACT**

Once dust quantities are known for specific types of mining activity, the hazard will be better understood, and dust minimisation measures can be investigated in a more focused manner.

**SCOPE****Focus Areas**

- Survey to gather adequate samples from all gold and platinum mining and geological areas
- All activities and dust generating points
- Results to be reported per geological area

**Duration**

6 months

**Special Skills Required From Project Team**

Environmental engineering and ventilation expertise, mining experience.

**Project reference number: GAP 803****PROJECT TITLE**

Develop discard criteria for non-spin wire ropes

**MOTIVATION FOR PROJECT**

The strength of a winder rope deteriorates with usage. A winder rope has to be discarded well before the risk of rope failure becomes a threat. The condition of a winder rope therefore has to be assessed regularly to determine whether it is still fit to remain in service or whether it should be discarded. The Rope Condition Assessment Code of Practice (SABS0293: 1996) prescribes assessment procedures and inspection intervals. It also specifies criteria for when a winding rope should be discarded. The procedure was considered adequate for triangular strand ropes. Non-spin ropes have remained a grey area. This project proposes to concentrate on non-spin ropes.

**PRIMARY OUTPUTS OF PROJECT**

Validation and refinement of winder rope discard practices and procedures for non-spin type of rope constructions. Recommendations for revisions to SABS0293: 1996 "Condition assessment of steel wire rope on mine winders".

**POTENTIAL IMPACT**

Improved rope safety in mines. Improved discard practices for non-spin ropes will ensure the operational safety of winding installations making use of such rope constructions.

**SCOPE****Focus Areas**

Non-spin rope constructions: validation of broken wire, corroded and area reduction criteria.

**Duration**

6 months

**Potential for Application**

Very applicable to Koepe winder operations.

**Requirements for Technology Transfer**

Workshops arranged for stakeholders in strategic areas.

**Special Skills Required From Project Team**

Rope technologist and Mechanical Engineering expertise.

Project reference **number:** GAP 804

## **PROJECT TITLE**

**The role of illumination in reducing risk to health and safety in South African gold and platinum mines**

## **MOTIVATION FOR PROJECT**

The quality of visual environments can greatly influence accident rates. For example European studies have shown accident rates decreasing by as much as 60% (COL 451) when the overall levels of illumination were increased. However, levels of illumination are only one of the many factors that determine the quality (and safety) of a visual environment. To ensure a safe visual environment the following factors need to be considered; luminance level, light distribution, colour and glare. These will vary per location and task and due to other environmental conditions.

## **PRIMARY OUTPUTS OF PROJECT**

- Establish relationships between illumination and risk in various areas of activities within the gold and platinum mines,
- . Recommendations on approaches to improving safety in the gold and platinum mines through the provision of better illumination

## **POTENTIAL IMPACT**

Improved safety and a reduction in the number of accidents arising from poor visual environments and lighting standards.

## **SCOPE**

### **Focus Areas**

Research must aim at providing a clear scientific database for the gold and platinum mines, within the following specific areas: stopes, haulages, loading and tipping points, crusher stations, surface and underground workshops.

### **Duration**

6 months

### **Potential for Application**

Very applicable throughout the Gold and Platinum sector.

### **Special Skills Required From Project Team**

Electrical engineering, environmental and mining experience.

**Project reference number: GAP 805****PROJECT TITLE**

**A full scale testing of the underwind/overwind protection systems recommended in GAP 638**

**MOTIVATION FOR PROJECT**

**GAP 638 recommended overwind and underwind protection systems that have successfully brought a “run-away” cage to rest within acceptable levels of deceleration for the safety of cage occupants. This was on a tenth scale model. The next logical stage is to run a full-scale test of the system to provide final proof of its viability, before recommendation can be made for its deployment in industry.**

**PRIMARY OUTPUTS OF PROJECT**

**A report on system requirements and installation-details for underwind/overwind protection. Also a video showing the test and results.**

**POTENTIAL IMPACT**

Reduced risk of loss of life and severe injury that can result from a “run-away” cage

**SCOPE****Focus Areas**

- Full scale installation and testing of
  - Underwind system
  - Overwind system
- Sourcing of collaborating mine and test site
- Record results on video
- Compile final report

**Duration**

15 months

**Potential for Application**

Very applicable throughout the Gold and Platinum sector.

**Requirements for Technology Transfer**

- Video demonstration of installation, effectiveness and operation of the system will be necessary.

**Special Skills Required From Project Team**

- Mechanical Engineering (hoists/rope technologist), Measurement expertise and mining experience.



**Project reference number: GAP 806****PROJECT TITLE**

**An investigation into the conditions under which HCFC 134A may become explosive**

**MOTIVATION FOR PROJECT**

**A catastrophic failure occurred on an underground refrigeration machine that had been converted to HCFC 134A refrigerant. It is necessary to understand the conditions that lead to this potentially dangerous situation in order to prevent it from reoccurring.**

**PRIMARY OUTPUTS OF PROJECT**

**A report detailing the conditions under which HCFC 134A may become explosive, and how to avoid such conditions.**

**POTENTIAL IMPACT**

**Reduced exposure to potentially dangerous explosive situation in the gold mines that use this substance.**

**SCOPE****Focus Areas**

- **Extensive investigation of the conditions under which HCFC 134A may become explosive**
- . **Detailed recommendations for avoiding HCFC 134A from becoming explosive**

**Duration**

**6 months**

**Potential for Application**

**Very applicable throughout the Gold mines.**

**Requirements for Technology Transfer**

- **A clear concise report summarizing the findings of the research**
- . **Workshops to communicate the findings to relevant parties**

**Special Skills Required From Project Team**

**Refrigeration expertise and experience, knowledge of the chemical behaviour of HCFC refrigerants essential.**

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**Project reference number: GAP 810****PROJECT TITLE**

**Performance of various types of containment support under dynamic and quasi-static loading conditions**

**MOTIVATION FOR PROJECT**

**Areal containment support is used widely throughout the mining industry. However, the criteria for when to apply it, how much to apply and the quality required are not well defined in the mining industry. In addition the performance of such support systems under repeated dynamic loading is not fully understood. Guidelines for the type of containment support for different conditions and the effectiveness of such types under repeated dynamic loading is needed in the mining industry.**

**PRIMARY OUTPUT/S OF RESEARCH**

**Comparative performance data for various containment support types under all loading conditions. This will include comparisons between various shotcrete types and wire mesh and lacing.**

**Guidelines** for the design of shotcretes.

**POTENTIAL IMPACT OF RESEARCH**

Improved safety in rockburst conditions.

**SCOPE OF RESEARCH****Focus Areas**

**Wire mesh, fibre-reinforced shotcrete, and various membranes, with and without wire rope lacing to be tested under quasi-static and repeated dynamic loading.**

**Duration**

1 year

**Potential for Application**

Excellent.

**Requirements for Technology Transfer**

Presentations, publications,

**Special Skills Required From Project Team**

Experience with dynamic testing, **experience with rock support requirements** in rockburst conditions.

**Project reference number: GAP 811****PROJECT TITLE**

**Criteria for preconditioning at varying stopping widths in different geotechnical areas**

**MOTIVATION FOR PROJECT**

A considerable amount of work has been undertaken by SIMRAC in the area of pre-conditioning of stope faces (GAP 336). That work focused primarily on narrow stopping widths. There is now a need to establish the best practice and formulate guidelines for wide reefs where face bursting has become a problem in some instances.

**PRIMARY OUTPUTS OF RESEARCH**

Guidelines for preconditioning at different stopping widths and different geotechnical areas. Measures to determine the effectiveness of the technique.

**POTENTIAL IMPACT OF RESEARCH**

Safer more stable faces and hangingwall conditions should result from the correct use of preconditioning. Higher productivity and improved worker morale may also result from the use of this technique.

**SCOPE OF RESEARCH****Focus Areas**

The work will concentrate primarily on wide stopping widths where face bursting is experienced.

**Duration:**

18 months

**Potential for Application:**

This will be a useful technique for any mine with wide reefs that has the potential for face bursting.

**Requirements for Technology Transfer:**

- Clear design of preconditioning blasts, including the direction, length and number of preconditioning holes per square metre of face
- . Training workshops in surface training stope and underground in basic techniques of preconditioning
- . CD based interactive training module for demonstrating preconditioning technique

**Special Skills Required From Project Team:**

- . Rock mechanics experience and underground mining experience
- . Previous experience of preconditioning
- . Training skills with worker levels 1-4
- . Software writing skills

# COAL AND OTHER MINES PROJECTS

Project reference number: COM 801

## PROJECT TITLE

Investigation of the feasibility of applying inert gas injection techniques to sealed areas of coal mines

## MOTIVATION FOR PROJECT

The injection of inert gas into sealed areas of coal mines has been practised in European and other collieries for a number of years. Despite this, the practice is not widely used in South Africa. The purpose of inertisation is to:

- . Prevent the atmosphere from entering the explosive range
- . Minimise the danger of spontaneous combustion
- Where appropriate, to manage the concentration of explosive gases to acceptable levels

Inertisation may also be used for extinguishing of mine fires underground.

## PRIMARY OUTPUTS OF PROJECT

A report that documents current practice and technologies used internationally. The report should also contain the results of an evaluation of each technology and practice in accordance with pre-determined criteria for local application, and make recommendations for best practice.

## POTENTIAL IMPACT

Reduce risk of fires in sealed off areas and leaks of flammable gases into working areas.

## SCOPE

### Focus Areas

- The project is to focus on the potential to inertise sealed off areas in fiery mines
- . Consideration of other health and safety impacts resulting from the above

### Duration

12 Months

### Potential for Application

All underground collieries with a significant OH&S risk of gas explosions and coal dust explosions.

### Requirements for Technology Transfer

User friendly, appropriate recommendations for typical South African conditions.

### Special Skills Required From Project Team

- Competence in respect of South African coal mining conditions
- Research competence
- Competence in respect of inertisation best practise/technology (particularly the use of inert gases)

**Project reference number: COM 802****PROJECT TITLE**

Survey of horizontal stresses in coal mines from available measurements and mapping.

**MOTIVATION FOR PROJECT**

Horizontal stresses are often higher than the vertical stresses in shallow mine workings and this is true for South African coal mines, These horizontal stresses are not uniform across the whole of a coal field and may well attain very high values at some locations. The early detection of high horizontal stresses by observation and mapping may allow proactive action to be taken in new layouts and support designs.

**PRIMARY OUTPUT/S OF RESEARCH**

Improved understanding of the direction and magnitude of horizontal stresses and its variation in SA coal mines.

Factors which cause the horizontal stresses to be increased.

**POTENTIAL IMPACT OF RESEARCH**

Improved understanding of the nature of the stresses and particularly the horizontal stress will allow the risk of rockfalls caused by this factor to be reduced.

**SCOPE OF RESEARCH****Focus Areas**

- Collate available validated stress measurements
- Carry out stress mapping to best practice methods in a range of coal mines
- Relate findings to structure and topography and regional geology
- Pass on methodology to mine rock engineers

**Duration**

3 months

**Potential for Application**

Applicable to coal mines where high horizontal stresses occur.

**Requirements for Technology Transfer**

Workshops and clear illustrative booklet identifying mapping techniques and indicative features associated with horizontal stress.

**Special Skills Required From Project Team**

Must have stress mapping skills and understand the importance of horizontal stress in causing roof falls.

# OCCUPATIONAL HEALTH PROJECTS

Project Reference Number: HEALTH 712

## PROJECT TITLE

Prevalence of alcohol and substance use and reported knowledge, attitudes and practice regarding its relationship with health and safety on mines in South Africa

## MOTIVATION FOR PROJECT

A causative association between alcohol and substance use and accidents has been found for road users and workers in many industries. The relationship between alcohol and substance use and accidents has led to the introduction of random testing in the mining industry in other countries and in some local diamond mines. Anecdotal evidence indicates widespread use of alcohol and cannabis on South African mines and the likelihood of impaired judgement and an effect on accident incidence. It is important to determine not only the extent of use which may impair judgement at work and cause accidents but also the knowledge, attitudes and practice relevant to occupational accidents in the South African mining industry in order to formulate relevant evidence-based safety programmes.

## PRIMARY OUTPUTS

- Information generation for informed discussion and decision-making within the tripartite structures of the Mine Health and Safety Act as well as Health and Safety Committees, management and labour representatives to take action or implement procedures if indicated
- Generation of information that can be used to educate and obtain group support for required projects in mines
- Knowledge, attitudes and practice (KAP) study regarding alcohol and substance use and mining accidents
- . Prevalence study of alcohol and cannabis use
- . Analysis of the quantity and type of accidents experienced on the study mines
- . Design of a project to investigate the association of alcohol and substance use with accidents in the mining industry

## SCOPE

### Focus Areas

Determination of the prevalence of alcohol and substance use by anonymous, unlinked measurement using non-invasive measurement techniques; and determination, by interview, of knowledge, attitudes and practice (KAP) regarding alcohol and substance use and mining accidents. Data obtained should be representative of different mining sectors and workers at high risk of accidents.

### Duration

12 months

### Potential for Application

High impact: Reliable baseline data for the different mining sectors on the extent of alcohol and substance use and knowledge about the safety effects would provide valuable information for prevention of related accidents.

### Requirements for Technology Transfer

Workshops to communicate the findings of the research to stakeholders in the mining industry.

### Special Skills Required From Project Team

This particular area of research has many ethical, legal and management complexities that must be addressed in the design and planning of the project. **The implications and use of results should be fully considered before any project is formulated and the project should be conducted in a scientifically sound and non-invasive manner. The team will thus require:**

- . **Communication/ adult education skills**
- . **Negotiation skills**
- **Epidemiology expertise**
- **Occupational medicine experience in the mining sector**
- . **Chemical pathological testing expertise**

**Project reference number: HEALTH 801****PROJECT TITLE**

**Analysis of emergency care provided for injured miners in the South African mining industry and recommendations for provision of comprehensive emergency care**

**MOTIVATION FOR PROJECT**

Point of injury or pre-“health service” emergency care plays an important role in limiting the severity of and mortality from injuries. The training and expertise of personnel providing such care and the facilities or equipment provided are therefore vital to the outcome of injured miners. Outcome also depends on the consistent integration of emergency care with subsequent health care. There has been no comprehensive study of the nature and quality of emergency care provided for the different mining operations and sectors within the South African mining industry. It is essential to evaluate the current practice, identify shortcomings and formulate the best means to provide quality emergency care.

**PRIMARY OUTPUTS**

- . **Critical literature review of emergency care provision in the global mining industry**
  - **Review of current status of emergency care and the outcome of injuries in gold, platinum, coal and other mines**
- . **Identification of best practice guidelines for structures, systems, personnel and equipment to provide comprehensive emergency care in differing mining sectors**
- . **Development of content area and curricula necessary for adequate training and recommendations to address any gaps between current and required status**

**IMPACT ON HEALTH AND SAFETY**

**High impact with improved emergency care and subsequent reduction in morbidity and mortality.**

**SCOPE****Focus Areas**

Evaluation should include structures, systems, quantity and training of personnel, equipment and, if quantifiable, the outcomes of injuries related to the quality of care provided. Recommendations should include the training and qualification needs of personnel providing emergency care.

Duration

**Researcher to propose****Potential for Application**

Mine management, labour and medical personnel would benefit from outputs from this project. In addition, results of this research **would inform the** MQA and DME on emergency care requirements and training.

**Requirements for Technology Transfer**

Workshops to **develop consensus with stakeholders and share research findings.**

**Special Skills Required From Project Team**

- **Mining emergency experience and content knowledge of emergency training curricula**
- **Epidemiological expertise**



**Project reference number: HEALTH 802****PROJECT TITLE**

Feasibility of using oto-acoustic emission methods for screening early hearing impairment in South African mineworkers

**MOTIVATION FOR PROJECT**

Noise induced hearing loss is a major occupational disease in the mining industry. Exposure to noise requires baseline, periodical and exit examinations to be conducted on mineworkers. Hearing screening techniques should be rapid, non-invasive, inexpensive and independent of the influence of the subject tested. Screening audiograms are time-consuming, require fixed testing facilities and the subject may manipulate results. Oto-acoustic emissions screening could provide a useful tool to assess inner ear damage at recruitment and following noise exposure, if this were an objective and feasible screening technology.

**PRIMARY OUTPUTS**

- . Critical review of existing information on the use of oto-acoustic screening methods for detection of early hearing impairment in adult subjects
- Study in the South African mining industry to validate existing information and to assess the costs of oto-acoustic screening
- **Report on information review, study results and recommendations on the use of oto-acoustic screening for new recruits**

**IMPACT ON HEALTH AND SAFETY**

High - identification of rapid, cost-effective hearing screening methods that cannot be influenced by the subject tested would have an impact **in the surveillance system for noise induced hearing loss (NIHL)**.

**SCOPE****Focus Areas**

Both published and unpublished evidence should be analysed and the sensitivity and specificity of oto-acoustic screening method/s assessed. A study should be conducted to assess the feasibility of using the technology in the South African mining industry.

**Duration**

Researcher to propose

**Potential for Application**

All health practitioners and health and safety personnel.

**Requirements for Technology Transfer**

Report, scientific paper and seminar on critical analysis of evidence for and application of oto-acoustic techniques for hearing screening.

**Special Skills Required From Project Team**

- Expertise in hearing assessment methods and interpretation of results
- Epidemiological expertise

**Project reference number: HEALTH 803****PROJECT TITLE**

Development and evaluation of guidelines and materials for the technology transfer of x-ray reading skills to clinicians in the mining industry

**MOTIVATION FOR PROJECT**

Pneumoconiosis and tuberculosis identification and prevention are a priority in the mining industry. SIMRAC projects have identified a vital need for proficiency in x-ray diagnosis of respiratory disease for appropriate prevention, screening, diagnosis and management. It is important for future research and in implementing research findings for sustained technology transfer of x-ray reading skills to be developed and evaluated. With the turnover of health practitioners in the mining industry, it is necessary to develop and evaluate a sustained method of technology transfer for new clinicians to acquire appropriate skills for assessing mine-related respiratory disease. Successful technology and methods could later be extended to other clinical skills training.

**PRIMARY OUTPUTS**

- Survey of current categories and training of x-ray reading health practitioners in the mining industry and the development of manpower guidelines
- Identification of requirements from SIMRAC projects and other relevant sources for inclusion in training materials and suitable media for in-service training
- Development of training materials
- Pilot materials and methods by training and evaluating a group of health practitioners
- Revise and develop technology transfer guidelines and training materials which will be accredited by the MQA, SAQA, SA Pulmonology Society, SASOM and ILO

**IMPACT ON HEALTH AND SAFETY**

High - improved screening, diagnosis and management of respiratory disease could have a major impact on reducing the morbidity and mortality in the mining industry.

**SCOPE****Focus Areas**

The project must involve the stakeholders and end users at all stages of development through extensive consultation. The choice of media for technology transfer should involve assessing user requirements and may include CD, paper-based manuals for instruction or distance-based learning (DBL) or a combination of these methods. The materials should be evaluated by a training intervention study, with, before and after evaluation of knowledge and skills.

**Duration**

Researcher to specify

**Potential for Application**

Health practitioners in the mining industry, health service managers and training institutions will benefit from this work.

**Special Skills Required From Project Team**

- Respiratory medicine and radiology
- Epidemiology
- Media/ adult education

# GENERIC PROJECTS

Project reference number: GEN 801

## PROJECT TITLE

Investigate a possible system for “making safe”

## MOTIVATION FOR PROJECT

A significant proportion of rockfall accidents occurs during inspections and operations to stabilize the rock before work in an area begins. The reasons range from individual carelessness to inherent limitations of current equipment. The operator often is unable to work at a safe distance and is sometimes directly underneath unstable rock when attempting to “make safe”. There is a need to devise a simple system to enable operators to stabilize the rock effectively and efficiently from a safe distance before work begins in an area.

## PRIMARY OUTPUTS OF PROJECT

Phase 1: A list of alternate designs that may be considered by the SIMGAP committee.

Phase 2: A working prototype device for testing in underground field trials with the aim of developing a device for commercialisation.

## POTENTIAL IMPACT

Reduced exposure to fall of unsupported ground hazards, and therefore saving life and limb.

## SCOPE

### Focus Areas

Research to be in two phases:

Phase 1: international literature survey to determine safe practices elsewhere in this area

. A list of devices available, with or without modification, or new ideas which may have potential

• Solutions to the problem of dangerous “making safe” operations

Phase 2: Concentrate on the device/s selected by SIMRAC for development to prototype stage

### Duration

9 months

### Potential for Application

Very applicable throughout the mining industry.

### Requirements for Technology Transfer

Robust equipment, simple to operate, able to perform *on* par or better than current hangingwall stabilization techniques. Will fit into the production cycle and not interfere with other equipment.

### Special Skills Required from Project Team

Mechanical engineering and rock engineering skills.

**Project reference number: GEN 803****PROJECT TITLE**

**Application of indirect stress measurement techniques (non strain gauge based technology) to quantify stress environment in mines**

**MOTIVATION FOR PROJECT**

**Stress measurements close to mined openings are possible by means of various strain gauged based techniques and more recently research undertaken by SIMRAC promises to provide a method that is *not* dependent on strain gauges. Stress measurements further from mined openings in greenfield and brownfield sites are not as easy to achieve. Methods for achieving this (Kaiser Effect/ Anelastic Strain Recovery/ P-Wave Velocity Anisotropy etc) which are non-strain gauged based have been well researched and are offered as techniques by some contracting companies. However, the results may not always be accurate and reliable. Such techniques if proved successful may allow stress measurements close to mine openings as well.**

**PRIMARY OUTPUT/S OF RESEARCH**

**Assessment of existing indirect measurement techniques (non strain gauge based) to quantify stresses in mines and the rating of the various techniques in terms of likely success.**

**POTENTIAL IMPACT OF RESEARCH**

**Improved knowledge of the in situ and mining induced stresses in the rock surrounding a mine will assist in identifying potential rock related hazards and thereby reduce unsuspected rock failures. If successful this project will make it possible to gather large amounts of stress information at low cost at a mine.**

**SCOPE****Focus Areas**

**The project will focus on assessing non strain gauged based stress measuring techniques first from the literature and by way of limited actual underground measurements. These measurements may be compared to measurements obtained from other stress measuring methods and a recommendation made to use one technique which meets the criterion of being low cost, easy to undertake and reasonably accurate.**

**Duration**

**6 months**

**Potential for Application**

**Every mine would benefit from an improved knowledge of the stresses in rock around the mine. This project will suggest a technique that will make this affordable, particularly for brownfield and greenfield sites.**

**Requirements for Technology Transfer**

**Technology will be transferred to rock engineers at the mines.**

**Special Skills Required From Project Team**

- . Mining, instrumentation, geology and rock mechanics knowledge**
- . A track record of having been involved in stress measurement in in-situ rock**

**Project reference number: GEN 804****PROJECT TITLE**

Identify the presence of materials in muckpiles that may cause mudrushes in all types of mining operations.

**MOTIVATION FOR PROJECT**

The project OTH601 entitled "Methods of combating mudrushes in diamond and base metal mines" identified the conditions for the formation of material that had the potential to result in mudrushes. Once such material is accumulated it would be helpful to be able to measure its presence and extent. The scope of the project should also attempt to give indications of conditions that will be present in and around the muckpile which transform it from a potential hazard to an actual mudrush.

**PRIMARY OUTPUT/S OF RESEARCH**

- A methodology and/or instrument to clearly indicate the presence of material that is likely to cause mudrushes
- Factors which may cause an identified muckpile to mobilise

**POTENTIAL IMPACT OF RESEARCH**

Early warning of the presence of mud will allow action to be taken to avoid catastrophic failure of muckpiles that may cause multiple fatal incidents and injuries to personnel.

**SCOPE****Focus Areas**

The research should look at all cases in the mining industry where muckpiles occur, whether on surface or underground. The presence of material (type, volume) that may cause a mudrush should be identified. The conditions that will change the situation from a potential to an actual problem should be determined.

**Duration**

12 months

**Potential for Application**

All mines will find the output useful and will want to use it

**Requirements for Technology Transfer**

Simple, inexpensive method of determining the development of mudrush materials in muckpiles. Instrument/methodology should be applicable to any muckpile and should cope with the variations in mining. The instrument/methodology should be safe to apply.

**Special Skills Required From Project Team**

Mining, instrumentation, electronics, geology and rock mechanics knowledge

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**Project reference number: GEN 805****PROJECT TITLE**

Long term stability of shallow hard rock pillar workings required to protect surface structures.

**MOTIVATION FOR PROJECT**

Much work has been done on pillars in both coal and non-coal mines. In the case of coal mines the effect of pillar mining on surface subsidence, has been well researched and is understood, and strategies exist to cope with this phenomenon. In shallow, hard rock, dipping ore bodies less work has been done and the long term stability of pillars in these circumstances needs to be evaluated. Work needs to first take place to assess if there is a problem in South African mines and what is the risk to mine and public property.

**PRIMARY OUTPUTS OF RESEARCH**

- An assessment of the magnitude of the problem derived from literature and mine experience
- A risk assessment of the hazard presented by the under-design of shallow hard rock pillars

**POTENTIAL IMPACT OF RESEARCH**

Improved surface and underground safety.

**SCOPE****Focus Areas**

The project will concentrate on establishing the magnitude of the problem and the risk that such hazards pose. The literature review will cover local and international experience. The project will examine local mine experience related to the problem with a view to determining the magnitude of the problem in South African mines. Special attention will be paid to previous work undertaken by SIMRAC in projects OTH 002, GAP 027, OTH501 and OTH 603 ensuring that this work is not duplicated but where necessary enhanced. The gaps that exist in previous SIMRAC research that pertain to long term surface stability will be identified in order to focus on any necessary future research.

**Duration**

3 months

**Potential for Application**

Findings would be relatively simple to apply in mine design and all shallow hard rock mines would benefit from the findings of this research.

**Requirements for Technology Transfer**

Workshops, presentations and publications.

**Special Skills Required From Project Team**

Experience with shallow hard rock mining, pillar design and general rock engineering.

# Safety in Mines Research Advisory Committee

Project reference number: .....

## Memorandum of agreement entered into by and between :

The Department of *Minerals and Energy*  
(hereinafter referred to as the 'Department')

for the execution of a project under the aegis of the Mine Health and Safety Council through its permanent committee the Safety in Mines Research Advisory Committee (SIMRAC) herein represented by the Chief Inspector of Mines duly authorised thereto

and

*Name of contractor/organisation*  
(hereinafter referred to as the 'Contractor')

Identity or registration number: ..... hereby represented by

identity number: ..... duly authorised thereto

Whereas the Contractor herewith submits to the Department the Project proposal ('the Proposal'), of which the original is initialed and attached marked Schedule A hereto, to be executed under the aegis of SIMRAC;

Now therefore the parties agree as follows:

1. The terms and conditions set out herein apply to the proposal, dated ..... and entitled ..... form part of the agreement.
2. The persons signing the Proposal on behalf of their respective principals, warrant their authority. (Attach resolution of authorisation, if the contractor is not a natural person.)
3. Before the Contractor commences work on the project, he/she must inform SIMRAC timeously of the date on which he/she proposes to start work and provide details of the Project Schedule, and (if applicable) provide details of any proposed changes in the initial Project Schedule submitted and must submit a clearance certificate from an ethics committee acceptable to SIMRAC, if required, to conduct the project.

4. The contract price shall be paid as follows:

**4.1 Projects which extend over a period of up to three months**

Payment for Projects which extend over a period of up to three months will be negotiable. All payments will be subject to acceptance by SIMRAC of progress reports. Thirty per cent of the total contract amount will be retained until acceptance by SIMRAC of all project deliverables.

**4.2 Projects which extend over a period of up to one year**

- . Ten per cent of the total contract amount on the commencement date
- . Fifteen per cent of the total contract amount upon receipt of the Final Report
- Fifteen per cent of the total contract amount on acceptance by the Chief Inspector of all Project deliverables
- The remainder of moneys will be paid in equal amounts, at quarterly intervals of the Project duration, upon acceptance by SIMRAC as referred to in Clause 9 and Clause 10 hereof.

Payment schedule:

10% (start-up); 4 times 15% (quarterly progress); 15% +15% (final report)

**4.3 Projects which extend over a period of longer than one year**

The annual contract amount shall be paid over the duration of the Project as follows:

Year 1 and subsequent years

- . Ten per cent of the total annual contract amount on approval (or continuation) of the project
- The remainder of the total annual contract amount will be paid in equal quarterly amounts upon acceptance by SIMRAC of progress reports as referred to in Clause 9 hereof.

Payment schedule

10% (acceptance or continuation); 4 times 22.5% (quarterly progress)

Final year:

- Ten per cent of the total annual contract amount on approval of continuation of the project
- Sixty per cent of the total annual contract amount will be paid in equal quarterly amounts, upon acceptance by SIMRAC of progress reports as referred to in Clause 9 hereof
- Fifteen per cent of the total annual contract amount on receipt of the Final Report
- Fifteen per cent of the total annual contract amount on acceptance by SIMRAC of all Project deliverables

Payment schedule

10% (start-up); 4 times 15% (quarterly progress); 15% +15% (final report)

5. The Department shall effect payment in respect of invoices submitted in terms of Clause 4 within 14 days of approval by SIMRAC of the quarterly progress reports and financial statements referred to in Clause 4 hereof. SIMRAC shall inform the Contractor if payment has not been approved and shall supply reasons therefore. Payments will only be made by the Department against the submission to the Department of detailed invoices by the Contractor and on verification and approval thereof by SIMRAC.



6. The Contractor shall maintain a complete set of accounts relating to the contract, **which shall include full details of all disbursements made in connection with the contract. All such documentation shall be made available for inspection on request during normal business hours to authorised representatives of the Department and/or SIMRAC, and shall be summarised in financial statements accompanying quarterly and final project reports.**
7. **In the event of the total cost of the project exceeding the contract price, the Contractor shall be responsible for any excess,**
8. **Where project proposals are submitted by persons, agencies or sub-contractors domiciled outside the Southern Africa Common Monetary Area, all monetary amounts recorded in financial statements and progress reports must be expressed in both the foreign currency and its equivalence in South African Rand. All payments shall be made in South African Rand and the Department will not be responsible for changes in costs attributable to changes in exchange rates or other external factors and the Contractor shall without limiting the generality hereof be liable for any costs of forward cover.**
9. **Within 2 (two) weeks of the end of each successive quarter the Contractor shall submit to SIMRAC a quarterly progress report recording work completed and progress with the project in the preceding quarter, providing sufficient detail to allow a quantitative assessment by SIMRAC of actual progress made by the Contractor. Each such quarterly report must be accompanied by a financial statement detailing all expenditures and costs incurred in connection with the project in the preceding quarter. SIMRAC may specify the format of the reports, and the Contractor shall submit his reports in the specified form.**
10. **Within 6 (six) weeks of the completion of the project the Contractor shall submit a final project report, containing an overall review of the project and conclusions based on the entire project, for consideration by SIMRAC; such final report must be accompanied by a comprehensive and detailed financial statement covering the entire project, together with a copy of the project asset register referred to in Clause 18 hereof. Reasons for delays in completion of projects and submission of final reports must be communicated to SIMRAC. In the event of unsubstantiated delays and partial completion of projects, SIMRAC will undertake a contractual audit to determine the degree of completion and assess the value and currentness of the outputs and revise the payment schedule (Clause 4), accordingly.**
11. **All reports, asset registers and invoices submitted to SIMRAC in terms of this contract shall where applicable comply as regards content and format with the requirements of SIMRAC as formulated from time to time.**
12. **At any time during the contract period, or within a reasonable period after termination of the contract, the Contractor shall on request by SIMRAC prepare a formal paper on the subject matter of the contract and provide a knowledgeable and competent speaker to present the paper, if appropriate, with audio-visual aids, to an invited audience of persons employed in or associated with the South African mining industry.**
13. **At any time during the Contract period, authorised SIMRAC representatives shall be entitled, by prior arrangement with the Contractor, to inspect work in progress on the project, and to request up-to-date reports on the project on specific aspects of the project.**
14. **All intellectual property rights arising out of, or derived from, the project contemplated in the Proposal shall vest in the Department; provided that the Department may, upon written application by the Contractor and acting on the advice of SIMRAC, grant permission in writing for the said intellectual property rights to be published, utilised or exploited commercially by the Contractor, or others, subject to such terms and conditions as the Department may in its sole discretion specify.**

15. The contractor shall on request in writing by the Department or SIMRAC make available to the Department or SIMRAC, as the case may be, all information, including but not confined to, raw data, statistical analyses, formulae, plans, photographs, internal and external reports, and the like obtained, devised or developed by the Contractor or a sub-contractor in the course of performing the project in question, and shall furthermore assist the Department to the best of its ability, if the Department should, in its sole discretion, apply for the registration of a patent or design based on studies undertaken in terms of the contract.
16. All physical equipment, instrumentation, and the like purchased by the Contractor for use in connection with, or as part of the project, and/or charged to the Department, shall at all times remain the property of SIMRAC. The Contractor may make an offer to purchase such goods for his own use. SIMRAC, may sell or dispose of such goods to the Contractor. or others, subject to specific terms and conditions.
17. The provisions contained in Clause 16 above shall also apply, subject to the necessary changes having been made, to intellectual property, such as computer programs and software, patents, and designs purchased by the Contractor for use in connection with the project.
18. All assets with an initial value of more than R10 000 purchased by the Contractor in connection with or forming part of the contract, and/or charged to SIMRAC, shall be recorded in a project asset register which shall at all relevant times be available for inspection by SIMRAC or its representative. All such assets shall be kept secure, insured and maintained in good order and condition by the Contractor until such time as a decision is made by the Department concerning the disposal of such assets.
19. Full details of any contractual relationship between the Contractor and a sub-contractor shall be supplied to SIMRAC, and the sub-contractor shall be required to maintain, make available and submit financial statements to the Contractor for inclusion with the quarterly and final project reports and financial statements submitted to SIMRAC.
20. The Contractor shall not be entitled to cede nor transfer the rights in terms hereof without the written consent of SIMRAC, and the Contractor shall not replace strategic personnel nor strategic subcontractors as recorded in the Proposal without first consulting SIMRAC and amending the agreement and proposal in accordance with Clause 25 hereof,
21. The parties agree that on the default of either party, the other party may call upon the defaulting party in writing to remedy the default within a reasonable time, failing which the aggrieved party shall be entitled to terminate the contract or apply for specific contractual performance, without exercising such party's right to claim damages.
22. Disputes concerning the performance of the project shall in the first instance be referred to a referee agreed upon by the parties. If the parties fail to agree on a referee, the President of the South African Institute of Mining and Metallurgy shall be asked to nominate a referee, who shall operate as an expert outside any arbitration legislation.
23. In the event of any party incurring legal costs to enforce its rights in terms hereof, the successful party to the resolution of the dispute, shall be entitled to recover all costs from the other party on an attorney and own client scale.
24. The Proposal, the Department's letter of acceptance, and the terms and conditions set out herein shall, for purposes of interpretation, constitute a single contract, and replaces any other agreement relating to this project.

- 25. On acceptance of this agreement and the Proposal, no changes or amendments shall have any force or effect unless recorded in writing and signed by, or on behalf of, the parties.**
- 26. The contract shall remain in force until such time as both parties have performed their respective obligations under the contract; provided however that the Department's rights in respect of intellectual property rights and physical assets held by, or under the control of the Contractor, shall not be affected by the termination of the contract.**
- 27. While engaged in the performance of the contract the Contractor shall comply with all relevant provisions of South African common law and statute law, including, but not confined to, measures prescribed in the Employment Equity Act, Act No. 55 of 1998.**
- 28. Notwithstanding Clause 27 above (compliance with SA law), the Contractor shall endeavour to promote, to the best of its ability, the employment of previously disadvantaged persons, and, without being limited thereto, specifically by employing post graduate students to enhance the abilities of such persons at all levels while performing the contract.**
- 29. The Contractor herewith guarantees to the Department that the execution of the Project will be of the highest professional standards and expertise, and that any strategic or key personnel or experts named in the proposal shall at all times be committed to the proposal and the project.**
- 30. The parties choose and herewith accept the following addresses for all purposes and notices in connection with the project and the contract -**

**30.1 The Department:**

of 2nd Floor  
Braamfontein Centre  
23 Jorissen Street  
Braamfontein  
E-Mail: mwabak@mepta.pwv.gov.za

Private Bag X 63  
Braamfontein  
2017  
Tel no: (01 1) 3589180  
Fax no.(011) 4031821

**30.2 The Contractor:**

of: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
e-mail: \_\_\_\_\_  
Tel no. \_\_\_\_\_  
Fax no. \_\_\_\_\_

Thus done and signed at

.....on this ..... day of .....2001

**As Witnesses :**

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_

\_\_\_\_\_  
for and on behalf of the Contractor

**Acceptance of Tender and Contract**

This contract relating to the proposal attached herewith, is hereby accepted by the Acting Chief Inspector of Mines. Thus done and signed at

.....on this ..... day of .....2001

**As Witnesses:**

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_

\_\_\_\_\_  
the Chief Inspector of Mines