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## GENERAL NOTICE

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### NOTICE 849 OF 2006

## Safety in Mines Research Advisory Committee (SIMRAC:) on behalf of the Mine Health and Safety Council (the Council)

### *Invitation to submit project proposals*

SIMRAC, a permanent committee of the Mine Health and Safety Council, was established in terms of the Mine Health and Safety Act (2911996) to conduct research and surveys regarding, and for the promotion of, health and safety 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. In soliciting research projects for the 2006/2007-research programme, the Council has the following goals:

- to indicate the current research needs for research to commence in the 2006/2007 cycle;
- to invite research proposals in response to these defined priority areas of research; and
- to invite applications for postgraduate funding for research which will promote health and safety within the South African mining industry.

A consultative process has resulted in the Council formulating a co-ordinated, long-term health and safety research programme and identifying priority areas for research to commence in the 2006/2007 cycle. Researchers and agencies are invited to submit research proposals for the research projects indicated. Proposed research must be well designed with a detailed methods section, be ethical *and* must have the potential to add to existing knowledge, practice or technology, involve the end users and implement/transfer outputs. Research teams must have the specified skills.

### Submission of Proposals

1. Proposals must be submitted in accordance with the prescribed format. Contact Cecile Gomes at telephone 011 358 9180, fax 011 403 1821, e-mail [cgomes@mhsc.org.za](mailto:cgomes@mhsc.org.za) or visit the SIMRAC website [www.simrac.co.za](http://www.simrac.co.za) to download the submission template. PLEASE NOTE THAT THE NEW FORMAT NEEDS TO BE **USED**,
2. Queries regarding the aims and objectives of the thrusts listed in this notice can contact the following persons:  
Technical Queries: Dragan Amidzic at [damidzic@mhsc.org.za](mailto:damidzic@mhsc.org.za) (011 358 9193)  
SIMRAC Chairperson: Tabo Gazi at [thabo.gazi@dme.gov.za](mailto:thabo.gazi@dme.gov.za) (012 317 8461)  
Proposal Submission: Cecile Gomes at [cgomes@mhsc.org.za](mailto:cgomes@mhsc.org.za) (011 358 9190)
3. Proposers are requested to take note of past work in the different thrust areas. (Details are available on website [www.simrac.co.za](http://www.simrac.co.za)).

4. The closing time and date for the receipt of the proposals is **12:00 on Thursday 06 June 2006**. Late entries will not be considered.
5. Two copies of each proposal, in a sealed envelope, in a form suitable for photocopying **plus** a disk or **CD** with the proposal in **MS Word**, should be deposited in the repository labeled "*Proposals*" at the Council's offices<sup>2</sup>.
6. The Council may at its sole discretion, decide to recommend the acceptance, rejection or amendment of any proposal and to commission the team to develop the proposal on the basis of which the contract is awarded. The Council shall not furnish any reasons for its decisions regarding proposals.
7. Every proposal accepted by the Council would be subject to a set of Terms and Conditions, which on acceptance of the final detailed 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 draft standard terms and conditions is available on the SIMRAC website [www.simrac.co.za](http://www.simrac.co.za).
8. In compiling proposals, prospective proposers should provide details of methods, identifiable outputs and estimated costs as indicated.
9. The Council 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 favourably.
10. The Council requires full disclosure regarding all subcontracts included in the proposal.
11. The proposer and any of its affiliates shall be disqualified from providing other goods, works, or services under the project if, in the Council's judgment, such activities constitute a conflict of interest with the services provided under the assignment/project.
12. 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 and phasing the project as indicated.
13. The period for which the proposals should be held valid is 150 days.
14. During this period the proposal must undertake to maintain, without change, the proposed key staff, and must hold to both the rates and total price proposed; in case of extension of the proposal validity period, it is the right of the proposer not to maintain their proposal.
15. The anticipated commencement date of the projects is 1 August 2006.
16. Each proposer have to submit a **TAX** Clearance Certificate with the proposal

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<sup>2</sup>, 2nd Floor, Braamfontein Centre, 23 Jorissen Street, Cnr. Bertha Street, Braamfontein

17. A BEE Questionnaire has to be completed by each proposer. The questionnaire can be obtained from Cecile Gomes at [cgomes@mhsc.org.za](mailto:cgomes@mhsc.org.za)
18. 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 and/or a poster presentation, without additional remuneration or reimbursement of costs.
- These activities must be detailed and costed within the project.
14. Where relevant, proposers may obtain copies of earlier project reports and other information from the website address or from contacts listed (See paragraph 1 and 2).
15. Proposers are advised that all Council projects should be submitted to language editing and may be subjected to technical and financial audits. Funding for editing and audits should be included in the proposal budget.
16. 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 travelling and subsistence.
17. All proposed project costs must be expressed in South African Rands and the total price must be VAT inclusive. Fluctuations in the exchange rate and purchase of forward cover should be considered when costing the proposal.
18. The Council will take all reasonable steps to ensure that confidentiality of proposals is maintained during the adjudication process. If a proposal is not accepted within the programme, the Council may invite additional proposals on the topic.
19. No unsolicited proposals will be included in the programme for 2006/7.
20. The following three-stage evaluation procedure will be followed:
- a. A technical evaluation of the proposal that will consist of the following items and weight allocations:

1.	<b>Capability and capacity of the project team</b>	
1.1	Relevant formal qualifications	5
1.2	Knowledge of relevant OHS issues in mining industry	5
1.3	Experience in conducting research in this area	5
1.4	Balance of team composition and competencies	5
1.5	Resources and facilities available	5
1.6	Track record: quality, on-time and within budget	5
2.	<b>Research design and methods</b>	

2.1	Appropriate study design and proptocol	5
2.2	Representivity, sample, strategy and size	5
2.3	Technical methods (tests etc)	5
2.4	Intended analysis of results	5
2.5	Ethics, risks and limitations	5
3.	<b>Research outputs</b>	
3.1	Appropriate format	5
3.2	Usefulness	5
3.3	Potential impact	5
3.4	Technology transfer	5
	<b>Total Score – Technical</b>	<b>75</b>

b. A price evaluation that will be calculated as follows:

$$Ps = (Pmin/Pt) * Ap$$

Where

Ps = % scored for price by proposal being evaluated

Pmin = price of lowest bidder

Pt = price of proposal being evaluated

Ap = % allocated for price aspect of proposal (15%)

c. A preferential procurement purposes using the following criteria and weightings:

- The proposals will each be given a score out of 100 that will be converted to a score out of 10 for the SIMRAC evaluation process
- Commercial Entities will be evaluated against the following criteria and weightings:
  - Ownership - 20%
  - Management - 10%
  - Employment Equity & Skills development – 30%
  - Preferential Procurement – 30%
  - SMME Status – 10%
- National Institutions and Public Entities will be evaluated against the following criteria and weightings:
  - Ownership - 0%
  - Management - 30%
  - Employment Equity & Skills development – 40%
  - Preferential Procurement – 30%

The **objectives** of the Council in commissioning health and safety research, for both general and commodity-based projects, are to:

- Obtain and evaluate information to establish evidence-based risk assessment, standard setting and health and safety performance measurement;
- Develop techniques or guidelines to prevent, reduce, control or eliminate risks;
- Develop and pilot innovative ideas and procedures, where appropriate, to eliminate, reduce or control risk;
- Obtain information on the extent of work-related ill health;
- Identify, develop and improve sampling and measurement techniques to detect environmental hazards and assess personal exposure;
- Understand the aetiology and identify and evaluate best-practice screening, diagnostic and treatment interventions to reduce the impact of occupational disease;
- Evaluate the effectiveness of control interventions;
- Understand risk perception, attitudes and behaviour related to health and safety and promote best practices in hazard recognition and procedural conformance;
- Empower its statutory committees to formulate policy, expedite research aimed at improving the health and safety in the South African mining industry; and
- Collaborate with national and international initiatives and research to promote health and safety in the mining industry.

The **criteria** by which proposals will be evaluated include:

- **Added value and impact** – the Council supports research which can contribute significantly to the improvement in the health and safety of South African miners;
- **Value for money** – the Council supports cost-effective research;
- **innovation** – the Council welcomes new approaches or new areas of focus for research leading to technologies or best practices to improve health and safety;
- **Excellence** – the Council demands excellence, particularly in the methods employed to conduct research, be it quantitative or qualitative, and hence will consider the track record of the proposer/s for expertise and delivery (quality, time and to budget);
- **Use and development of research skills** – the Council requires research teams to possess the skills relevant to the success of the project and also favours projects which assist in developing research capacity, particularly in previously disadvantaged groups;
- **Collaboration** - the Council places a high priority on collaboration between researchers and the "teams of excellence" approach. Thus, the means of soliciting research proposals is intended to stimulate collaboration between centres of excellence and individual experts in order to optimise the use of the Council funding and the research outcomes.
- **Development of key indicators** – the Council recognises the challenge in assessing performance and improvement in health, as opposed to safety, in the mining industry. There is a lack of suitable occupational health (OH) indicators and baseline data. Thus innovative and robust research to develop relevant OH indicators and baseline values will be favourably considered.

The Council's research and implementation programme consists of occupational health and safety, addresses occupational medicine and hygiene, rock engineering, engineering and machinery, behavioural issues and technology transfer processes.

**Each proposal must:**

- Address only the research topic advertised and this must be specified;
- Be in the format indicated and the template specified using Word format; and
- Be phased as indicated in the project scope.

**SIM 05 04 03****Title**

Fire toxicity, burnability, depression and suppression systems that could be used on tyres, conveyor belts, self-propelled machines etc. to prevent continuous combustion – Phase 2

**Motivation**

The South African mining industry has experienced many multiple-fatality fire incidents over the years. The Kinross disaster of 1986, where 177 persons lost their lives, and the Gloria mine fire of 1994, during which 16 people were killed, represent the most deadly mine fire incidents in South African history. The latest incident in 2004 at Northam platinum mine which left 9 people dead (only 9 because it happened on Sunday night before the morning shift started), again, highlights the fire hazards associated with the underground mining environment.

The increased mechanisation of mining in South Africa, in particular the platinum mining industry, requires a new approach towards fire safety in underground mines to specifically incorporate the risk presented by rubber conveyor belting and self-propelled machines.

Phase 1 of the project assisted with the objective to gather all available knowledge on the subject and to formulate a scope for the research work,

**Primary output**

Comprehensive risk assessment done on prevention and protection components of fire management using probabilistic approach. (For each alternative an event tree can be established, where every event is occurring with a certain probability and every final event is represented by a probability of component failure).

**Scope**

1. Review Phase 1 document, the list of fire hazards in particular and group these hazards into few logical hazard categories;
2. Review international standards for fire hazard assessment;
3. Review DME statistical records on fire incidents;
4. Based on information gathered in points 2 and 3 develop models describing probability density (or specific values in case of discrete model) that those hazardous events can occur;
5. Assess workers exposure vs. number of casualties, in other words: what is a probability of a number of casualties in case of occurrence of particular hazardous event;
6. Discuss level of confidence of those probabilities against available statistics;
7. Perform probabilistic Risk assessment (using Monte Carlo simulation, Latin Cube or similar tools);
8. Prioritize the risk according significance (number of casualties)
9. Compare results with international records;
10. Draft a report with practical examples and references which meets the primary output requirements and include discussion as well as action plan.

**SIM 05 05 01****NIHL Prevention Program**

## Motivation

Noise induced hearing loss continues to deprive victims of a quality life and it costs industry some R 100 million annually, in compensation. The MHSC has invested over R4 million over the past 7 years to find a solution. A substantial amount has been spent in the assessment and quantification of noise and its sources. GEN 420 quantified the noise sources in the mining industry as well as ranking the machines in order of level of noise they emitted. Rock drills were among the highest producers of noise. GEN 207 and GEN 311 initiated the development of a quiet self-thrusting drilling system. GAP 642 took the development further.

**GAP 801** succeeded in bringing the noise level down to below 90 dB, achieved the "self-thrusting" action without compromising penetration rates, while **SIM 060501** intended to conduct further testing, the size and weight of the prototype were concerns that still require some attention.

Health 806 resulted in the "Guide to best practice for the implementation and management of Mine hearing conservation programmes", while **SIM 030902** developed Internet-based mining industry database for audiograms.

Recently completed **SIM 050501** attempted to review and summarize past work for low-noise drilling, review current technological advances in the suppression of noise and select the most promising and practical new method.

## Primary output

- Critically review recent developments in Noise source / exposure database (**SIM 030902**), perform international benchmarking and ensure appropriate statistical analysis for different mining occupations;
- Bring current development of Quiet Rock Drill to a successful implementation phase, including the choice of industry partner and long term selection of the operational test site;
- Reassess all other major noise sources and implement noise reduction strategy;
- Develop new system (using new technologies) to make mining blast (and support) holes at noise levels less than 90 dB. It should be self-thrusting, non-pollutant and ergonomically friendly; develop an experimental model for surface tests and proceed to a prototype stage. Following successful surface and underground tests, a pilot system should be run at two mines;
- Investigate and monitor all existing and future health related exposures (noise, vibration...);
- Establish review-panel of experts;
- Select industry partners for new technologies, align IP requirements as well as investigate into culture changes required for implementation phases;
- Review, draft and implement noise reduction strategy for Coal mines,
- Since engineering noise controls rely on employers and workers to properly implement, use and maintain them, develop effective educational and promotional strategy that would reach all levels within the industry;

- Combine efforts and available data from local hearing protectors testing with relevant international institutions (NIOSH) in order to develop an improved hearing protector selection tool.

*Proposals for each of the tracks are sought and should be submitted as separate proposals.*

#### Scope

#### **TRACK A – Noise source / exposure database**

**Year ■ (April 2006 - March 2007)**

- Review end combine the effort of past research (SIM 030902) with current worker noise exposure;
- Establish typical exposure patterns for different mining occupations and relate to exposures to sources;
- Establish prediction patterns of early hearing loss as part of database
- Contextualise and analyse data
- Review inspection / enforcement strategies internationally with regard to noise exposure prevention
- Draft report.

#### **T R A M B – Noise controls**

***Phase 1a - (April 2006 - Dec. 2007) – Current technologies***

- Select, negotiate and secure test site;
- Perform Quiet Rock Drill underground testing;
- Drill rig integration
- Agreement with industry partner, including IP clarification and technology transfer;
  - Note developments of Electric Drill;
  - Drill steel noise reduction further analysis and recommendation;
- Investigation into required culture change including development of the related programme;
  - Technology transfer of the Quiet Rock Drill to the industry;
  - Initiate drafting of national “Minimum Standards Requirements for Drilling Noise”
  - Reassess all other major noise sources and implement noise reduction strategy
  - Draft report.

***Phase 1b - (April 2006 - Dec. 2006) – Future technologies***

- Business case for new technologies required to ensure duplication of R&D does not take place
- Visit new technology sites (Microwave, Plasma, Ultrasonic) to do feasibility study;
- Review current status and compile feasibility study;
- Investigate possible health effects;



- Draft position paper on **ANC & ASAC** (must include all commodities).

**Phase 2 - (Jan. 2007 - Dec. 2008)**

- Depending on the outcome of the Phase 1, development of an experimental model for laboratory and surface tests.

**Phase 3 - (Jan. 2009 - March 2010)**

- Establish and secure longer term underground experimental site;
- Choose industry partner;
- Development of a prototype for underground tests, refinement and piloting on two mines;
- Assess culture impact;
- Assess exposure to noise, dust, vibration and pollution.

**TRACK C - Education / Training / Promotion**

**Year 1 (April 2006 - March 2007)**

- Review and evaluation of existing training (MQA), awareness and educational material, on Noise prevention, locally and internationally.
- Develop NIHL prevention programme strategy to promote programme.
- Publish interim NIHL prevention material.
- Year-one report
- Workshop on results.

**Year 2 (April 2007 - March 2008)**

- Assessment of end user awareness and solicit input.
- Compilation/Development of targeted engineering/health promotion (noise) materials for:
  - Management
  - Trade unions / health and safety representatives.
  - Workers
  - Workplace teams
- Year-two report
- Workshop on results.

**Year 3 (April 2008 - March 2009)**

- Development targeted of training materials (Continued).
- Based on Silicosis project - Create virtual mines for gold, coal (surface and underground) and quarries to indicate by video clips general mining activities and also by video clips and PIMEX clips Noise sources and controls. Will consist of simple mine layout graphics with links or hot spots to activate spoken voice, video clips, PIMEX clips and further info through launching PDF or Word docs. Similarly virtual Mineral Processing Plants to be created to indicate Noise sources. Include links or hot spots to activate video clips, PIMEX clips, PDF and/or Word doc information.
- Use pilot mines to evaluate training and educational material.
- Plan comprehensive commodity specific technology transfer programme.
- Year-three report
- Workshop on results.

**Year 4 (April 2009 – March 2010)**

- Use feedback to update and finalise technology transfer material
- Conduct regional technology transfer sessions.
- Conduct regional technology transfer sessions.

**TRACK D – Hearing protection****Phase 1 - (April 2006 - Mar 2007)**

- Review HEALTH 806 as well as other local hearing protection data (SABS testing)
- Review lab-testing of approx. 400 hearing protectors at NIOSH
- Data to be used to develop an improved hearing protector selection tool
- Review OHTAC "best practice PPE" document
- Communicate results, draft report.

**SIM 06 09 02**

The **Mine Health and Safety Council**, a major R&D facilitator in the mining industry, is interested to upgrade current document management **system** as well as to develop easy internet-based access to all relevant research **documents** and publications.

## Primary Outputs:

- Complete document management system (electronic formats, bookmarks and links)
- Conversion of old documents into electronic format
- Security settings
- Web-based office management system
- Web-site design additions / necessary links.

Estimated duration: 6 – 12 months.

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