

## NOTICE 1715 OF 2007

**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 (29/1996) 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 2008/2009 research programme, the Council has the following goals:

- to indicate the current research needs for research to commence in the 2008/2009 cycle;
- to invite research proposals in response to these defined priority areas of research; and
- to invite applications for postgraduate funding<sup>□</sup> 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 2008/2009 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 Cheryl Jones at telephone 011 358 9182, fax 011 403 1821, e-mail [cjones@mhsc.org.za](mailto:cjones@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:  
Engineering and Machinery: Dragan Amidzic at [damidzic@mhsc.org.za](mailto:damidzic@mhsc.org.za) (011 358 9109)  
Rock Engineering: Dragan Amidzic at [damidzic@mhsc.org.za](mailto:damidzic@mhsc.org.za) (011 358 9109)  
Occupational Health: Audrey Banyini at [abanyini@mhsc.org.za](mailto:abanyini@mhsc.org.za) (011 358 9183)  
SIMRAC Chairperson: Vijay Nundlall at [vijay.nundlall@dme.gov.za](mailto:vijay.nundlall@dme.gov.za) (012 317 8456)  
Proposal Submission: Cheryl Jones at [cjones@mhsc.org.za](mailto:cjones@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)).

<sup>□</sup> Guidelines for the Council postgraduate research and Ethics Guidelines are obtainable from [nwoods@mhsc.org.za](mailto:nwoods@mhsc.org.za)

4. The closing time and date for the receipt of the proposals is **12:00 on Friday 11 January 2008**. 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 labelled "*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. **Charge-out rates have to be in accordance with the rates specified by the Science Council, ACSA and SACNAPS**
9. **Preference will be given to proposals that composes of a project team with HDI's.**
10. In compiling proposals, prospective proposers should provide details of methods, identifiable outputs and estimated costs as indicated.
11. 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.
12. The Council requires full disclosure regarding all subcontracts included in the proposal.
13. 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.
14. 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.
15. The period for which the proposals should be held valid is 150 days.
16. 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
17. The anticipated commencement date of the projects is 1 April 2008.

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

18. Each proposer have to submit a TAX Clearance Certificate with the proposal
19. A BEE Questionnaire has to be completed by each proposer. The questionnaire can be obtained from Cheryl Jones at [cjones@mhsc.org.za](mailto:cjones@mhsc.org.za)
20. 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 2008/9.
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.

**Thrust 1****Title**

SIM xxxxxx An Investigation on elements of occupational health and safety behavioural and cultural issues in the South African mining industry (gold, coal, platinum and quarries)

**Phase 1:**

- document on key safety and cultural issues and analysis of the root causes
- development of the BS program for each sector

**Motivation**

At the MHSC mini-indaba and the 5<sup>th</sup> MHSC biennial summit in 2007 a need with regards to human factors through a research programme under thrust 1 was emphasised. The South African mining industry is unique in its operations and the diversity of culture of employees and employers. Evaluative research on of BBS and the majority of previous research done on BBS research concentrated on work environments that are conducive to work colleagues systematically monitoring one another's safety related actions (peer review). In the South African mining culture environment as in many other occupational settings, this may not be conducive safe, efficient and effective work practices. One of the reasons may be suspicion of providing information on fellow workers' bad habits which may be perceived as 'spying' on colleagues. It is also recognised that most of the published BBS research done has been in Europe and very little if any in the South African mining industry. SIMRAC 030101 was able to pave some direction and should be included as part of the literature review.

**Statement:**

In a myth of the careless worker Walker<sup>1</sup> asserts that worker behaviour is about management control, the reasons behaviour safety systems are increasingly popular today is that is because some governments are getting tough on health and safety enforcement and different understanding of due diligence. Anam et al<sup>2</sup> states that whilst BBS has been identified as a possible tool to break through accident plateau of the minerals industry, there is a lack of research into effectiveness within industry and moreover he argues, such initiative appear incompatible with the industry's organisational characteristics and culture. At an organisational level, that have been brave and honest enough to conduct genuine assessments of the continuing safety performance are recognising that the early gains made through BBS are slowing and in many cases, reached plateau due to amongst others limitations of the theoretical foundations of BBS, namely behaviourism<sup>3</sup>

**Primary Outputs****Phase 1:**

- Document on key safety and cultural issues and analysis of the root causes
- Development of the BS program for each sector

**Scope**

The survey a statically representative sample of mining industry employees to highlight behavioural and cultural issues common to these sectors in order to identify the root causes of such behaviours and to develop BBS processes applicable to these sectors. This must cover representative sample of gold, coal, diamond and quarry mining industries. Some of the data collection tools to be used should include but not limited to identification of key safety behaviour and key cultural issues. The survey design, target population and details of the data collection tools are to be ratified by HTAC prior to implementation

**Duration**

Phase 1: 12 months from the commencement date.

**Typical recipients of the Report**

- Mine Health and Safety Council, its committees and stakeholders
- Occupational health and safety practitioners and representatives, employers, management and workers

**Requirements for technology transfer**

- A word document as stipulated by the MHSC research site including a CD with hyperlinks for easy reference
- Workshop/launch with the various stakeholders to communicate the findings

**Special skills and facilities required by project team**

- Academic setting and non academic settings required
  - Statistical
  - Behavioural scientist
  - Sociologist
  - Psychologist
1. Walker C, 2003. Myth of the careless worker. Canadian autoworkers IAPA/WHSC Session in Behaviour based safety programs or if it's rat psychology, who is pied Piper and who are the rats?
  2. Parand, A & Foster, P. Behavioural-based safety in the minerals industry: a research based methodology carried in quarries
  3. Tindale,R & Elridge, L. ZIP- The road to total safety culture at Norwich Park mine

**Thrust Area 6****Project Title**

SIM xxxxxx Determination of a possible correlation between direct-on-filter X-ray Diffraction (XRD), direct-on-filter Infrared (IR) and re-deposition IR reported silica content results

**Motivation**

SIM 03 06 03 (B) conducted a parallel study, during Year 2 of the project, between independent laboratories for gravimetric-dust sampling results and silica analysis for quality assurance purposes for current Mine Health and Safety Council (MHSC) research (projects SIM 03 06 03 and SIM 06 06 01).

It was reported the parallel study that from the respirable-silica analysis results for X-ray Diffraction (XRD) and Infrared (IR) that the IR results in both instances were lower than the XRD analysis results. The percentage differences between the XRD and IR analysis results varied from 11.9 per cent to 22 per cent. However, the findings of this research are limited as only ten gravimetric dust-sampling filters were utilised to conduct the study.

The findings of the study results suggest that current respirable-silica-dust-exposure concentrations are being underestimated, as a result of utilising the IR analysis methodology to conduct silica analysis. It was therefore recommended that the study be expanded to determine the correlation (if any) between direct-on-filter XRD analysis, direct-on-filter IR analysis and re-deposition IR analysis reported silica content results.

**Scope:**

Determine the correlation (if any) between direct-on-filter XRD analysis, direct-on-filter IR analysis and re-deposition IR analysis reported silica content results. This must be done for different respirable dust loads, silica content and mineralogical compositions. The correlation (if obtainable) can then be utilised to repair historical exposure data, in an attempt to establish the correct respirable-silica personal-exposure concentrations. A literature search and compilation on the pros and cons analysis of the literature prior to embarking on this should be done to help target the specific unknown question that needs answered in the correlation study. The study should consider utilizing Gravimetric dust filters collected during the SIM 03 06 03 and SIM 06 06 01 projects where applicable and possible.

**Primary outputs**

A report on the correlation between direct-on-filter X-ray Diffraction (XRD), direct-on-filter IR and re-deposition IR reported silica content results, for different respirable dust loads, silica content and mineralogical compositions.

**Estimated Duration**

12 months

**Required technology transfer**

A detailed report that will form part of the silicosis elimination program

**Special skill and facilities required by project**

Team comprising of amongst others Occupational hygienist and project management with research experience,

**References**

- SIM 030603 Phases 1 and 2 reports
- SIM 060601 year 1 reports



**Thrust 8:**

Title: SIM xxxxx: Development of the best practice document on management standards on whole body vibration in the South African mining industry.

**Motivation**

Mining involves usage of heavy machinery that can result to vibration and shocks, and the South African mining industry is not unique in having to manage these challenges. Health 703 provided guidelines for seat selection for whole body vibration control in industrial settings. Despite the complexity and ambiguity of standards, Whole-body vibration (WBV) can be managed.

**Statement:**

Whole-body vibration (WBV) is experienced through standing or sitting on a vibrating surface which causes the whole body to vibrate. The most common exposure is through driving or riding vehicles. Many vehicles and types of equipment such as trucks, loaders, dumpers, locomotives, shuttle cars and draglines are in use in the mining industry and operators of such equipment are exposed to whole-body vibration. An ISO-standard for the measurement and evaluation of WBV was published in 1993 as ISO 2631. The South African National Standards (SANS), previously known as the South African Bureau of Standards (SABS), has adopted ISO 2631 as SANS 2631-1 as the standard for measuring whole body vibration. There are currently no South African standards governing exposure limits to WBV and there is no defined limit for vibration for vehicle operators. WBV is not specifically mentioned in the COID Act (Act 130 of 1993). As a safety precaution, no instruments or equipment are allowed in a fiery mine that is not intrinsically safe (IS) and suitable to the South African mining industry, which would include instruments for measuring whole-body vibration levels.

Vibration levels for various vehicles from several studies, however, most values do not take into account the maintenance levels, age of the machinery/vehicle and other contributing factors, rendering standards development more complex.

**Scope**

Review available literature locally and internationally including relevant completed SIMRAC work on WBV and availability of intrinsically safe measuring instruments suitable for South African Mining. Review and critically analysed available standards on WBV both locally and internationally. Develop WBV standards to be used as best practice for the management of WBV in the SA mining industry.

**Primary outputs**

Best practice document on standards for managing WBV in the SA mining industry.

**ESTIMATED PERIOD**

12 MONTHS

**Typical recipients of the Report**

- Mine Health and Safety Council, its committees and stakeholders

Occupational health and safety practitioners and representatives, employers, management and workers

**Requirements for technology transfer**

- A word document as stipulated by the MHSC research site including a CD with hyperlinks for easy reference
- Workshop/launch with the various stakeholders to communicate the findings

**Thrust 8**

**Title : SIM xxxxxx** Exploratory survey of women in mining in the South African mining industry with specific regards to but not limited to Occupational health and safety issues that will enable the MHSC to develop an industry agenda specific to women in mining.

**Motivation**

The concept of women working in the mining industry is relatively new in South Africa and is supported by the mining charter of 2004 which requires that 10% of the workforce in the mining industry will be woman by the year 2009. The expected target has been set, yet the challenges with regards to the work itself and the occupational health and safety issues have not been well researched by the MHSC.

**Statement:**

The numbers of woman joining the mining industry is increasing drastically in all job categories such as Onsetters, Hoist drivers, Loco drivers, Stopping and Development crew members only to mention a few. Not much research had been done in terms of women in the mining industry and the impact on occupational health and safety is not known. The MHSA is meant to protect all employees including women, however, the biological and cultural issues specific to women that may impact on an occupational environment e.g. balance between work and family commitments had not fully researched in this sector. Anecdotal information indicate that the industry target is difficult to achieve, especially in lower categories of mining occupations.

**Primary outputs**

A document with hyperlinks detailing indicators for women on environmental and occupational factors that contributes to occupational health and safety.

**SCOPE:**

Review of literature locally and internationally with regards to women in mining highlighting amongst other the enablers and barriers to long term employment, occupational health and safety issues, organisational and cultural issues. A Survey of representative sample of women in mining of all categories is also required to identify risk factors in the mining operational environment that could adversely impact on the health and safety of woman in mining and the data collection tool should be ratified by OHTAC prior to implementation. The final document should contain amongst others recommendations on strategies to be addressed in the research agenda.

**Typical recipients of the Report**

- Mine Health and Safety Council, its committees and stakeholders
- Occupational health and safety practitioners and representatives, employers, management and workers

**Requirements for technology transfer**

- A word document as stipulated by the MHSC research site including a CD with hyperlinks for easy reference
- Workshop/launch with the various stakeholders to communicate the findings

**Estimated period 18 months****Special skills and facilities required by project team with research expertise to include at least the following**

- i) Occupational Medical practitioner
- ii) Occupational Hygienist
- iii) Statistician
- iv) Epidemiologist
- v) Project management skills required
- vi) Bio-kinetic specialist