NOTICE 1722 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[1] 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 or visit the SIMRAC website 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 (011 358 9109)
   Rock Engineering: Dragan Amidzic at damidzic@mhsc.org.za (011 358 9109)
   Occupational Health: Audrey Banyini at abanyini@mhsc.org.za (011 358 9183)
   SIMRAC Chairperson: Vijay Nundlull at vijay.nundlull@dme.gov.za (012 317 8456)
   Proposal Submission: Cheryl Jones at 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).

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[1] Guidelines for the Council postgraduate research and Ethics Guidelines are obtainable from 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[2].

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.

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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[2], 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

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.	**Capability and capacity of the project team**	
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.	**Research design and methods**	

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.	**Research outputs**	
3.1	Appropriate format	5
3.2	Usefulness	5
3.3	Potential impact	5
3.4	Technology transfer	5
	Total Score – Technical	75

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 5

Project title

Drum winders: Rope terminations at the drum, dead turns, and doubling-down procedures

Problem Statement / Research Question

No guidance on rope termination

GAP Analysis (Statistics/ Previous Research/Best Practice / Benchmarking

Very little previous work

Expected Impact on OHS / Value Added

Standardization and avoidance of accidents

Motivation

A recent failure of the rope termination at the drum of a drum winder while the rope was doubled down raised the following issues:

- How strong should the rope termination be
- What is type of termination should be used
- What is the actual strength of a specific termination Why do we have dead turns
- Why do we have to tension the dead turns
- How does the hawse hole and the shape of the hawse hole affect the static strength of the rope and the deterioration during operation.

Primary outputs

Report with recommendations which include outputs outlined in the scope

Scope

The following project parts are proposed:

- Gather information from the industry and analyze the information in terms of the above issues.
- Prepare equipment for laboratory tests on various types of terminations.
- Carry out laboratory tests.
- Report with recommendations (also for SABSO294) Full scale laboratory tests on rope diameters greater than 40 mm may be problematic. The tests will have to be scaled down to smaller size ropes.

Estimated duration

six month

Typical recipients of the Report/Main Outputs

All mines

Requirement for technology transfer

Report

Special skills and facilities required by project team

Rope testing, rope technology

Thrust 5

Discard Criteria

Problem Statement / Research Question

The discard criteria for triangular strand ropes may be too conservative. The scatter in the breaking strengths of laboratory prepared samples (with broken wires) were used to determine the statistical distribution with which the current discard criteria were established.

GAP Analysis (Statistics/ Previous Research/Best Practice / Benchmarking

Gap 324, Gap 502

Expected Impact on OHS / Value Added

Apart from being a safety issue, the discard criteria (especially for different types of rope construction) determine the service life of a rope, and therefore the economics of using a specific rope

Project title

Discard criteria for mine winder ropes

Motivation

Between 1994 and 2000, various SIMRAC projects were carried out to verify and refine the discard criteria of SABSO293: The South African Bureau of Standards Code of Practice for the Condition Assessment of Steel Wire Ropes on Mine Winders (1996). Because the code was already issued for the first time in 1996, only one recommendation from one of the earlier research projects was included in the code.

Since the code was first published, a vast amount of experience was gained into the condition assessment of steel wire rope and the remaining strength of ropes with defects (especially with broken wires).

Some of the findings to date are:

The discard criteria for triangular strand ropes may be too conservative. The scatter in the breaking strengths of laboratory prepared samples (with broken wires) were used to determine the statistical distribution with which the current discard criteria were established. The method of preparation of these samples could have had an effect on the scatter of the results obtained. The discard criteria can only be adjusted by repeating some of the earlier work, and by re-investigating the statistical distribution used and the premise of when a rope has lost (not more than) 10% of its strength.

Comprehensive discard criteria for non-spin ropes (ribbon strand and fishback strand) (for broken wires) have been a problem, and this problem has now been expanded by the introduction of other types of winding ropes (e.g. Casar ropes).

Although it is realized that the detection of internal broken wires with magnetic instruments is not conclusive for the multi-layer rope constructions, it is now evident that the initial discard criteria for all of these ropes have to be written in terms of the number of broken wires that will be allowed. The actual discard criteria can then be adjusted to take into account the anticipated success with which broken wires can be determined.

The discard criteria for rope diameter reduction and the specification of the reduction need urgent reviewing (for both plastic deformation and abrasive wear). The code of practice also needs to distinguish between "normal" ropes and ropes with "compacted" strands.

Apart from being a safety issue, the discard criteria (especially for different types of rope construction) determine the service life of a rope, and therefore the economics of using a specific rope.

The code of practice for rope condition assessment is currently being reviewed (SANSI 0293) and the above issues need to be resolved before a meaningful revision of the code can be made, backed by properly motivated and documented recommendations.

Primary outputs

Broken wire discard criteria for triangular strand ropes Project tasks:
- o Plan and test laboratory prepared rope specimens.
- o Compare results with that of previous investigations.
- o Report.

Scope, estimated duration and cost

1. The following projects or project parts are proposed:
   - o Broken wire discard criteria for triangular strand ropes
   - o Broken wire discard criteria for non-spin ropes and other multi-layer ropes
   - o Allowable diameter reductions for winder ropes

   duration: six months
2. Broken wire discard criteria for non-spin and other multi-layer ropes Project tasks:
   - o Plan and test laboratory prepared rope specimens.
   - o Construct discard criteria
   - o Determine effectiveness of broken wire detection Adjust discard criteria Report.

   duration: six months
3. Allowable diameter reduction for winder ropes Project tasks:
   - o Plan and test laboratory prepared rope specimens.
   - o Construct appropriate discard criteria.
   - o Report.

   duration: six months

Typical recipients of the Report/Main Outputs

All mines and Working group for 0393 standard

Requirement for technology transfer

Report

Special skills and facilities required by project team

Dynamic rope load analysis, rope safety, rope selection