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AIDS HELPL NE 0800-0123-22 Prevention is the cure

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GENERAL NOTICE

NOTICE 2985 OF 2004

Safety in Mines Research Advisory Committee (SIMRAC)

on behalf of

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 2005/2006-research programme, the Council has the following goals:

- to indicate the current research needs for research to commence in the 2005/2006 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 2005/2006 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. **PLEASE NOTE THAT A NEW FORMAT FOR SUBMISSION OF PROPOSALS IS AVAILABLE ON THE SIMRAC WEBSITE** www.simrac.co.za **FOR THE 2005/6 PROGRAMME.**

2. Queries regarding the aims and objectives of the thrusts listed in this notice can contact the following persons:
   Occupational Safety: Duncan Adams at dadams@simpross.co.za (011 358 9184)
   Occupational Health: Mary Ross at mross@simpross.co.za (011 358 9183)
   Organisational issues: Paul vd Heever at pvdheever@simpross.co.za (011 358 9180)
   SIMRAC Chairperson: Piet Botha at pieter.botha@dme.gov.za (012 317 9303)

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@simpross.co.za

4. The closing time and date for the receipt of the proposals is **12:00 on Monday 10 January 2005.** Late entries will not be considered.

5. A proposal in the correct format can be e-mailed to cgomes@simpross.co.za prior to the closing time and date. Alternatively, two copies of each proposal, in a form suitable for photocopying **plus** a disk or CD with the proposal in MS Word or Rich Text Format, should be deposited in the repository labeled "*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 can be obtained from Cecile Gomes at telephone 011 358 9180, fax 011 403 1821, e-mail cgomes@simpross.co.za. **PLEASE NOTE THAT THE RESEARCH CONTRACT IS CURRENTLY UNDER REVISION.**

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. 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.

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 and/or a poster presentation, without additional remuneration or reimbursement of costs.

    These activities must be detailed and costed within the project.

13. 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).

14. 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.

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[2], 2nd Floor, Braamfontein Centre, 23 Jorrisen Street, Cnr. Bertha Street, Braamfontein

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 travelling 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. 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.

18. No unsolicited proposals will be included in the programme for 2005/6.

Objectives of the Council research programme

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 or Rich Text format; and
- Be phased as indicated in the project scope.

Adjudication of proposals

1. A scoring system will be used in compliance with the Preferential Procurement Policy Framework Act and the Broad-Based Black Economic Empowerment Act.

2. The split in the score achieved by the supplier/researcher for technical and price adjudication will be set by SIMRAC and will be reviewed annually.

3. To evaluate the technical aspects of the research proposal Attachment B will be used as a score sheet for the purposes of adjudication by the Council's Technical Advisory Committees.

4. The score achieved by the supplier/researcher for BEE shall be rated using the Balanced Scorecard for Black Economic Empowerment and the Mining Charter.

5. For this purpose a BEE Questionnaire (Attachment A) should be completed by each supplier/researching agency that does not already have a Scorecard that complies with either the BEE Act or the Mining Charter.

6. Please note that the Council will independently verify the BEE credentials of a proposer.

7. Points arrived at using the BEE Component, shall then be added to the points scored for technical functionality and price.

PROPOSED PROJECT SCOPES FOR THE 2005/6 PROGRAMME

SIM 03 06 03

Project title

SIMRAC Silicosis Control Programme – Phase 2

Motivation

SIMRAC is a partner in the WHO/ILO initiative for the global elimination of silicosis. Since its establishment in 1994, SIMRAC has funded projects in dust measurement and control, but silica exposure, with related silicosis and tuberculosis, remains a priority challenge for the mining industry. It is essential to evaluate the existing practice in relation to control requirements, set exposure reduction targets and established best practice to meet these targets for silica exposure. In addition, new technologies for preventing or allaying dust pollution should be reviewed and research conducted, if necessary. This project is to research the containment/elimination of silicosis in the South African mining industry as identified in regional and national workshops.

Proposals for the tracks are NOT being sought at this stage. SIMRAC is seeking interested institutions and research agencies who will form a team to collaborate with SIMRAC in managing and shaping this important project. An invitation is extended to experienced researches and organisations to attend a site meeting at the MHSC Offices, Braamfontein on 13 January 2005 @ 12:00. Please RSVP to Noeleen Woods (nwoods@simpross.co.za) by 7 January 2005

Part A: Dust Measurements and Reporting

Previous SIMRAC research and the lack of progress in eliminating silicosis highlighted the problem of measurement, analysis and reporting of respirable dust exposures. SIMRAC has prioritised dust measurement and reporting as an area for research in the Silicosis Control Programme.

Primary outputs

- Evaluate the techniques used in South African mines for determination of exposure to respirable crystalline silica. This includes the sampling instrumentation; sampling strategies, sample analysis, quality assurance/control and reporting which will be compared with best practice.
- Review and assess techniques used in South African laboratories for respirable silica analysis on filter samples and the implementation of an international quality control check with standard samples on the laboratory analysis performance.
- Develop standard samples for instrument calibration for quartz analysis.
- Develop a manual of best practice for the assessment of exposure to respirable crystalline silica. Will include but not be limited to appropriate air sampling equipment, air sampling equipment preparation, field survey procedures including filter handling, sampling strategies, gravimetric determination, analytical methodologies for crystalline silica, laboratory quality assurance and reporting.
- Develop a manual of best practice to assess the engineering and other control measures in place to minimise exposure to crystalline silica.
- Review inspection/enforcement around the world with regard to silicosis prevention.
- Develop a manual of best practice for the inspectorate to assess worker exposure to respirable crystalline silica and the verification of mine data.

Year 1 (April 2005 – March 2006)

- Assessment of current practice of measurement and analysis for respirable crystalline silica. (Including collection characteristics of samplers operated according to the JHB criteria and the ISO/CEN criteria)
- Polley Dust Duct Refurbishment and Upgrading to Perform Research on Direct on Filter Analysis (DOF) and most appropriate analytical methodologies to determine crystalline silica content of mine respirable dust filter samples. Duct to include real-time particle size distribution instrumentation.
- Review inspection/enforcement around the world with regard to silicosis prevention.

Year 2 (April 2006 – March 2007)

- Polley Dust Duct Refurbishment (Continued)
- Conduct research to determine most appropriate analytical methodologies for crystalline silica in mine respirable dust samples. Assess the validity of the direct on filter (DOF) analysis for XRD and IR. Determine the abilities of the recommended methods in terms of detection limit, working range, precision and accuracy. Assess effects of particle deposition on filter, particle layers and compare the DOF method with the redispersion method. Assess the effect of movement of sample deposition during transport. Prepare standards using aerosol generation in the Polley Dust Duct. Assess the most appropriate cyclones for optimum filter deposition for DOF analysis, minimal sidewall deposition and minimum effects of air inlet orientation to air movement.
- Characterisation of the particle size of airborne mine dust from various dust sources. Assessment of the crystalline silica content in the various size fractions. *(Link to filtration efficiency and general control techniques in Part B)*

Year 3 (April 2007 – March 2008)

- Implement International quality control testing and standardisation for crystalline silica on filter analysis.
- Piloting of real-time respirable dust measurement instrument (TEOM).
- Comparison of South African practice with international best practice including linkage of exposure and medical surveillance.
- Develop manuals on best practice:
  - to assess exposure to airborne respirable crystalline silica.
  - for the inspectorate to assess the exposure of workers to airborne respirable crystalline silica and to verify mine dust exposure data.

Year 4 (April 2008 – March 2009)

- Develop manuals on best practice with which to assess the engineering and other control measures in place to minimise exposure to crystalline silica. (Linked to project on engineering controls).
- Piloting and evaluation of real-time dust measurement instrument (Continued).
- Technology transfer of best practice materials for dust measurement.

Year 5 (April 2009 – March 2010)

- Technology transfer of best practice materials for dust measurement (continued).

Scope

Requires the research team to obtain information on the current practice for the determination of exposure to respirable silica dust through visits to a selected sample of mines and to all laboratories in South Africa conducting quartz on filter analysis.

Assessment of current practice in developed mining countries compared to South African practice. The compilation of best practice manuals, which would guide the mining industry to work towards the elimination of silicosis in the mining industry.

Estimated duration and maximum budget (5 years, R8 000 000)
NB *Includes budget for Health 704 Extension*
Year 1 : R1 500 000
Year 2 : R2 500 000
Year 3 : R2 000 000
Year 4 : R1 000 000
Year 5 : R1 000 000

Potential impact on significant health and safety risks
Very high potential impact by producing implementable best practice manuals for the assessment of respirable silica exposures. Real time monitoring capability.

Requirement for technology transfer
Assessment of effectiveness of legislation and current practices.
Best practice manuals to assess exposure to respirable crystalline silica.

Specialist Skills and Facilities
Occupational Hygiene
Laboratory quality control and crystalline silica on filter analysis techniques
Instrumentation and Electronics Engineering
Aerosol Physics

Part B: Environmental Engineering/ Dust Control

Motivation

The most important intervention for any silicosis control programme is to eliminate or reduce dust at source and to prevent exposure. SIMRAC has targeted feasible or cost-effective environmental control engineering and dust control technology as a research priority area for the silicosis control programme.

Primary outputs
- Risk assessment to identify the priority dust sources and the applicable control technologies.
- Assess the filtration efficiency for respirable dust of the current filter media used for dust control.
- Compile internationally accepted best practice materials, including manuals, for dust control.

Year 1 (April 2005 – March 2006)
- Assess dust sources and determine the contribution of each source to the overall exposure. *(Incorporate use of PIMEX)*

Year 2 (April 2006 – March 2007)
- Assess and prioritise dust sources and determine the contribution of each source to the overall exposure. Includes developing collection of video and PIMEX clips and other visual aid material.
- Review new technologies for breaking and moving rock with regards to potential for dust exposure minimisation.
- Identify and assess the different control technologies (existing and new) used for each identified dust source for a range of commodities and size of mine. *(Link to particle size distribution research in Part A of Phase 2)*
- Develop an industry standard for assessing filtration efficiency. Assess the filtration efficiency for respirable dust of the current filter media used for dust control. *(Link to assessment of crystalline silica content in various size fractions in Part A of Phase 2).*

- Comparison with international experience to determine best practice for controlling the various identified dust sources. (*To include dust control methods evaluation workshop with national and international experts)*

Year 3 (April 2007 – March 2008)

- Assess the filtration efficiency for respirable dust of the current filter media used for dust control (Continued).
- Assess the different control technologies (existing and new).
- Pilot and evaluate potentially cost effective new and existing dust control methods.
- Develop draft best practice manuals for South African mines including design component for new mines. This should be commodity based and include manuals for gold, coal and quarries.

Year 4 (April 2008 – March 2009)

- Finalise best practice materials, including manuals, to control exposures to respirable crystalline silica.
- Design, pilot and evaluate comprehensive dust control programme.

Year 5 (April 2009 – March 2010)

- Determine worker exposures with best practice implemented.
- Technology transfer of best practice materials for dust control.

Scope

Requires the research team to obtain information on current local and international practice for dust control through visits to selected sample of mines and communication with dust control experts. Assessment of current practice in developed mining countries compared to South African practice. Pilot potentially cost effective dust control methods. The implementation of the recommendations of the best practice manuals on pilot mines and the assessment of workers exposures. The compilation of best practice materials, including manuals, which would guide the mining industry to work towards the elimination of silicosis in the mining industry.

Estimated duration and maximum budget (5 years, R10 500 000)

Year 1: R2 000 000
Year 2: R2 000 000
Year 3: R2 500 000
Year 4: R2 000 000
Year 5: R2 000 000

Potential impact on significant health and safety risks

Extremely high potential impact by producing implementable best practice for the control of exposure to respirable crystalline silica.

Requirement for technology transfer

Assessment of effectiveness of legislation and current practices.
Best practice manuals specific to mining commodities for the control of exposure to respirable crystalline silica, covering surface and underground mines and mineral processing plants.

Specialist Skills and Facilities

Occupational Hygiene, Mechanical and Mining Engineering
Aerosol Physics and Dust Control Expertise
International Collaboration

Part C: Human Resources Training and Management

Motivation

In the 1960's the South African mining industry held a leading position in research on dust exposure and control and also in education and training about dust. This needs to be re-established using current educational methods and technology, which have developed in the intervening years, to raise awareness about dust exposure and health effects. SIMRAC has targeted the area of human resources training/ technology transfer as one of the priority areas for the Silicosis control programme.

Close collaboration is required with the dust measurement and dust control projects on silicosis elimination.

Primary outputs

- Development and the evaluation of a range of training and educational material to promote the elimination of silicosis in the mining industry.
- Technology transfer using material of such a standard that it could be adopted internationally.

Year 1 (April 2005 – March 2006)

- Develop silicosis prevention programme slogan, logo and strategy to promote programme.
- Review and evaluation of existing training and educational material, on airborne dust, locally and internationally.
- Publish interim silicosis prevention material.

Year 2 (April 2006 – March 2007)

- Review and evaluation of existing training and educational material, on airborne dust, locally and internationally (Continued).
- Assessment of end user awareness and solicit input.
- Compilation/Development of targeted training materials for:
  - Management
  - Trade unions / health and safety representatives.
  - Workers
  - Workplace teams.

Year 3 (April 2007 – March 2008)

- Development targeted of training materials (Continued).
- 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 dust 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 dust and airborne silica 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 4 (April 2008 – March 2009)

- *Use feedback to update and finalise technology transfer material including material from the two parallel projects on dust measurement and control.*
- Conduct regional technology transfer sessions.

Year 5 (April 2009 – March 2010)

- Conduct regional technology transfer sessions (Continued).

Scope

Requires the research group to obtain and evaluate current local and international practice for dust minimisation campaigns. The development of the appropriate training and educational material for dust minimisation for a range of personnel. The training material will include booklets, manuals, posters, and multimedia software (such as PIMEX) which will illustrate *inter alia* the health effects, dust measurement and control.

Estimated duration and maximum budget (5 years, R7 500 000)

Year 1: R1 500 000
Year 2: R1 500 000
Year 3: R1 500 000
Year 4: R1 500 000
Year 5: R1 500 000

Potential impact on significant health and safety risks

Very high potential impact by producing implementable training and educational best practice for the minimisation of exposure to respirable silica.

Requirement for technology transfer

Assessment of effectiveness of legislation and current practices.
Best practice resources to control exposure to respirable crystalline silica, covering surface and underground mines and mineral processing plants.

Specialist Skills and Facilities

Occupational Hygiene and Engineering
International Collaboration
Adult Education Expertise
Multimedia Developers

Phase 2: Parts A, B and C:

- Annual National Feedback/Progress Workshops.
- Attend international workshops as appropriate to keep abreast of international developments.

SIM 03-06-03 SIMRAC Silicosis Control Programme – Phase 2 Summary			
	Part A **Dust Measurements and Reporting**	**Part B** **Environmental Engineering/ Dust Control**	**Part C** **Human Resources Training and Management**
Year 1 Apr 05 to Mar 06	Assessment of current measurement practice and recommendations for improvement	Assess dust sources and determine the contribution of each source to the overall exposure. Includes developing collection of video and PIMEX clips and other visual aid material.	Develop silicosis prevention programme slogan, logo and strategy to promote programme
	Polley Dust Duct Refurbishment plus addition of real time particle size distribution measurement instrumentation		Review and evaluation of existing training and educational material
	Review inspection/enforcement around the world		Publish interim silicosis prevention material
Year 2 Apr 06 to Mar 07	Assessment of current measurement practice and recommendations for improvement (Continued)	Assess and prioritise dust sources and determine the contribution of each source to the overall exposure (Continued)	Review and evaluation of existing training and educational material (Continued)
	Polley Dust Duct Refurbishment (Continued)		
	Determine most appropriate analytical methods. Assess the validity of the direct on filter (DOF) analysis for XRD and IR. Assess effects of particle deposition on filter. Assess the effect of movement of sample deposition during transport. Prepare DOF standards. Assess the most appropriate cyclones for use with DOF analysis.	Review new technologies for breaking and moving rock with regards to potential for minimisation of dust exposure	Assessment of end user awareness and solicit input
		Identify the different control technologies (existing and new)	Compilation/Development of targeted training materials for: Management, Trade unions/ health and safety representatives, Workers, Workplace teams
		Develop an industry standard for assessing filtration efficiency. Assess filtration efficiency of current filter media	
	Characterisation of the particle size of airborne mine dust	Comparison with International experience. Workshop with national and International experts.	
Year 3 Apr 07 to Mar 08	Implement International quality control testing for labs conducting crystalline silica on filter analysis	Assess filtration efficiency of current filter media (Continued)	Development of targeted training materials (Continued). To include library of video clips of dust sources and controls.
	Piloting of real-time respirable dust measurement instrument (TEOM)	Assess the different control technologies (existing and new)	Create virtual mines and minerals processing plants
	Comparison of SA practice with international best practice including linkage of exposure and medical surveillance and recommendations for improvement	Pilot and evaluate potentially cost effective new and existing dust control methods	Use pilot mines to evaluate training and educational material
	Develop manuals on best practice to assess exposure and for use by the Inspectorate	Develop draft best practice manuals for dust control	Plan comprehensive commodity specific technology transfer programme
Year 4 Apr 08 to Mar 09	Develop manuals on best practice with which to assess the engineering and other control measures	Finalise best practice materials, including manuals for dust control	Update and finalise technology transfer material
	Piloting and evaluation of real-time dust measurement instrument (Continued)	Design, pilot and evaluate comprehensive dust control programme	Conduct regional technology transfer sessions
	Technology transfer of best practice materials for dust measurement		
Year 5 Apr 09 to Mar 10	Technology transfer of best practice materials for dust measurement (Continued)	Determine worker exposures with best practice implemented	Conduct regional technology transfer sessions (Continued)
		Technology transfer of best practice materials for dust control	

SIM 02 02 05b

DESCRIPTION OF RISK
Rockfall

TITLE OF RESEARCH TOPIC
Optimisation of Support in Collieries (continuation of SIM 02 02 05)

PRIMARY OUTPUT/S OF RESEARCH

1. Specifications for roofbolt support systems in a variety of conditions on South African collieries
2. An improved roof bolt installation technique
3. Resin quality control procedures

MOTIVATION

The present SIMRAC project SIM 02 02 05 has yielded significant results in terms of the parameters that contribute to the correct and safe installation of tendon support in coal mines. The project has shown that the condition of the drilling equipment to perform determines whether the tendons are well or poorly installed. Further issues that have emerged out of the project are the effects of wet and dry drilling, the size and profile of the hole, the profile of the bolt and the drill bit itself. All these factors should be considered in determining specification for roof bolt support for different conditions in South African collieries.

SIM 02 02 05 also highlighted two important shortcomings in current support systems, which determine the quality of installed support. These are: 1) an improved roof bolt installation procedure to minimise the human error in installation of support 2) a quality control procedure for resin used in collieries. These two important factors will also be investigated as part of this project.

POTENTIAL IMPACT OF RESEARCH

The quality of installed support will be improved leading to increased stability of coal roof, thus contributing to improved safety.

SCOPE OF RESEARCH

Focus areas:

Phase 1

1. Design the final project scope with industry experts

Phase 2

Specifications for roof bolt support in collieries

1. Set up the programme for observation and measurement with participating mines
2. Carry out the field and laboratory tests
3. Compile the data and complete first pass analysis and recommended specification

Improved support installation

1. Investigate different installation procedures currently being used in the industry
2. Develop a prototype method
3. Run an industry workshop to discuss and modify the method
4. Carry out the laboratory and field tests

Resin quality control procedure

1. Conduct a review of available systems
2. Identify the parameters that effect the resin quality
3. Conduct field tests with pre-tested resin

Phase 3

1. Carry out further monitoring and measurement on any missing parameters needed in determining the specification if required
2. Write up final report and produce guidebook on the findings for use by industry

Duration

Phase 1	1 month
Phase 2	9 months
Phase 3	2 months

Maximum available budget

R650 000

Potential for application

The determination of specifications for roof support in collieries will assist the coal mines to design their support optimally and thus it will be in their interest to apply the findings of the research.

Requirements for Technology Transfer

Workshops with the coal experts and coal industry.
The production of a comprehensive, comprehensible final report with an accompanying handbook with minimal text and illustrative graphics.

Special skills required from project team

The current team responsible for SIM 02 02 05 should participate in the project.
Coal rock engineering, instrumentation and research experience.

SIM 05 05 02

Project title

Review and consolidate the Hazard identification risk assessment (HIRA) relating to trackless mobile equipment and compile a list of significant OHS related risks associated with the design, selection and use of trackless mobile equipment.

Motivation

It is increasingly evident that the use of mining equipment accounts for the largest proportion of occupational fatalities, injuries and health ailments, outside rock related problems. To date, SIMRAC has rightly spent over R15 million on research in this area. However, the research has been focussed on individual machinery, in isolation, i.e., not connecting the machine to the environment/process and the persons around it. What is required is a holistic approach in the assessment of the main groups of mine equipment, addressing the following questions: Is the machine designed appropriately for safe operation for the intended process within the prevailing conditions? Is the operator appropriately suited to operate the machine safely, under the given machinery and environmental conditions? Are conditions appropriate for the safe operation of said machine by said operator? What are the shortcomings in each case? What are the possible solutions that could be considered? This project aims to attempt to answer some of the above questions, starting with Trackless Mobile Equipment as a pilot for this approach.

Primary outputs

A report, giving a supported list of OHS risks due to the design, operation and environmental conditions under which trackless mobile equipment is subjected.

Scope

The study is to be confined to coal and platinum mines. The collieries are a major user of such equipment, traditionally, while platinum mines are starting to deploy trackless mining increasingly. An international literature study should be embarked on, as a benchmarking exercise, as well as an opportunity to see what could be incorporated into the local industry for improvement. The study will involve mine visits, where the equipment will be observed working, and problems noted. The equipment manufacturers or suppliers should be visited and their input solicited on all aspects of the scope. Two workshops should be scheduled, one for the coal mines and "other mines", while the second will target platinum mines, as they deploy different types of equipment from the other sectors.

Estimated duration and maximum budget available

R1 500 000 over 18 months

Special skills and facilities required by project team

Mechanical engineer with a lot of mining experience on mobile equipment, an ergonomics expert and an environmental engineer.

SIM 05 09 03

Project title
Design and develop a personal safety device for underground use.

Motivation
A personal safety device (PSD) is an electronic device built into a new design of a cap lamp. The device may carry modules to enable the following functions (but may not be limited to only these functions):

- Methane detection
- Warning of proximity to mobile equipment
- Toxic gas detection
- Tracking of personnel

The underground environment remains highly hazardous, and most of these hazards are exacerbated by poor visibility and confined space. Transportation accidents are second only to falls of ground. A significant portion of transportation accidents are due to by-standers and passers-by being run over by mobile machinery, such as LHD's, dump trucks and shuttle cars because the victim happened to be in the blind area therefore the operator, or driver could not see him. The working area can also be quite noisy due to ventilation fans, etc, thus masking the noise of the vehicle, and the worker not realising the danger.

Other hazards are due to flammable gas as well as toxic gas. Today's miner, like his predecessor, finds himself carrying a cap lamp, a self-rescuer, a CO detector as well as a methanometer. All these safety and health requirements add weight that the miner must endure. Tracking of personnel has the advantage of positively ensuring that the mining area has been cleared before blasting.

This project aims to develop such a device, which will be small and light enough to be carried on the hard hat, but without the ergonomics issues of weight and the umbilical cord. It is envisaged that it will operate from a dry cell battery, and thus phasing out the battery charging racks as we know them today. The lamp will offer better luminance for longer periods than the current lamp.

The project is proposed in three phases. The first phase will design and develop the device. The second will produce prototypes for testing underground. Phase 3 will further develop and aim to commercialise the product, if pilot testing proved successful.

Primary outputs
Phase 1
Produce a laboratory test prototype

Phase 2

Produce prototype system for testing underground
Phase 3
Commercialisation of system

Scope
The scope and cost estimate for phases 2 and 3 will be determined and finalized upon the successful completion of phase 1.
Phase 1:
This phase aims to design and develop a laboratory model of a personal safety device, incorporating a new design of a cap lamp, carrying modules of at least the following functions:

- Methane detection

- Warning of proximity to mobile equipment
- Toxic gas detection
- Tracking of personnel

Estimated duration and maximum available budget
12 months
R600 000

Potential impact on significant health and safety risks
Reduction in flammable gas and accidents involving people run over by heavy vehicles due to poor ergonomics, including visibility

SIM 05 04 03

DESCRIPTION OF RISK
Fire and generation of toxic fumes

TITLE OF RESEARCH TOPIC
Fire toxicity, burnability, depression and suppression systems that could be used on tyres, conveyor belts, self-propelled machines *etc* to prevent continuous combustion.

PRIMARY OUTPUT/S OF RESEARCH

1. Specifications of fire suppression systems for different machines on South African mines.
2. An improved fire suppression technique

MOTIVATION

From time to time South African mining industry experience multiple fatalities as a result of burning of rubber based components of machines. This is particularly dangerous in case of underground mining when toxic gases are inhaled by people.

POTENTIAL IMPACT OF RESEARCH

The research can reduce the existing risk of fatal accidents as a result of fire of underground machines.

SCOPE OF RESEARCH

Focus areas:
Phase 1
Market search for possible solutions
Desktop survey of available literature, including past SIMRAC work e.g. GEN601 and GEN701.

Phase 2
Tests of the most promising solutions

Phase 3
Implementation process study

Duration and available budget

Phase 1	10 man-days – R40 000
Phase 2	to be determined during phase 1
Phase 3	to be determined during phase 1

Potential for application
At all South African underground mines

REQUIREMENTS FOR TECHNOLOGY TRANSFER
Workshops with the industry experts and MRAC in order to reflect findings in legislative system.

Special skills required from project team
Knowledge of fire suppression systems at underground mines and research experience.

Attachment A

MINE HEALTH AND SAFETY COUNCIL

Established in terms of Section 41(1) of the Mine Health and Safety Act, 1996 (Act 29 of 1996)

Private Bag x63
Braamfontein, 2017
2nd Floor, Braamfontein Centre
23 Jorrisen Str, Braamfontein

REGISTRATION OF SUPPLIERS ON MHSC's DATABASE

VENDOR REGISTRATION FORM (DTI BASED).

Supplier Registered Name:	
Business Registration No:	
Trading Name:	
Nature of business:	
Types of products/services provided:	

1. OWNERSHIP

1.1 Is there equity ownership by BEE? Yes | No

1.2 Is this a Joint Venture entity? Yes | No

1.3 If 1.1 or 1.2 is yes, provide names of Black partners hereunder and % shareholding/ holding company:

	%		%
	%		%

1.4 What is HDI ownership percentage? %

2. EXECUTIVE MANAGEMENT & BOARD MEMBERS' INVOLVEMENT

2.1 List All Black Directors/Board Members:

Name	Position	Name	Position

What is HDI directorship percentage? %

2.2 What percentage does Black Senior Management constitute? %

NB: Please provide an organigram from Directors to Junior Management, indicating racial classification

3. HUMAN RESOURCES

3.1 Is there an Employment Equity plan in your organization? | Yes | No |

3.1.1 If yes, indicate the DOL status with regards to the plan and **attach certificate**:

_____

_____

3.2 Please complete the following Employment Equity statistics:

Occupational Levels	Male				Female				Total
	African	Coloured	Indian	White	African	Coloured	Indian	White	
Top management									
Senior management									
Professionally qualified experienced specialists & mid-management									
Skilled technical & academically qualified workers, junior management, supervisors, superintendents									
Semi-skilled & and discretionary decision making									
Unskilled and defined decision making									
TOTAL									

3.3 Skills development expenditure as a proportion of total payroll:

3.3.1 What is your total payroll per annum? | R |

3.3.2 What is your total training expenditure for the past financial year? | R |

3.3.3 What percentage of training expenditure was allocated to HDI's? | % |

4. INDIRECT EMPOWERMENT

4.1 Does your company have a Preferential Procurement Policy? and if so do you have scorecard to measure that? | Yes | No |

4.2 What percentage of goods/ services were sourced from Black suppliers with a DTI weighted average of 20% and above in the past twelve months? | % |

4.3 Have you invested or offered business & non-business related support to BEE companies?

Yes	No

If yes, state:

Company	Total Assets	Nature of Investment/Support

5. SMME STATUS

Total full-time paid employees	Total annual turnover	Total gross asset value (fixed property excluded)	**REMARKS (for office use)**

6. TRADE REFERENCES

Please provide at least three trade references:

Client	Contact Person	Contact Number	Account Number
1)			
2)			
3)			

I hereby declare the information provided is true and correct.

FOR AND ON BEHALF OF THE COMPANY **DATE**

CAPACITY OF SIGNATORY (POSITION HELD IN COMPANY)

Physical address: _____

_____

_____

_____

Telephone Number: _____

Attachment B

Safety in Mines Research Advisory Committee

Project proposal evaluation score sheet

Project number: _____

Project title: _____

Research agency/ Researcher: _____

Date of evaluation: _____

Evaluated by: _____

Affiliation/position: _____

Criterion	Max. score	Criteria Weight	Actual score	Remarks
Capability and capacity of the project team				
Relevant formal qualifications	5			
Knowledge of relevant OHS issues in mining industry	5			
Experience in conducting research in this area	5			
Balance of team composition and competencies	5			
Resources and facilities available	5			
Track record: quality, on-time and within budget	5			
Research design and methods				
Appropriate study design and protocol	5			
Representivity, sample, strategy and size	5			
Technical methods (tests etc)	5			
Intended analysis of results	5			
Ethics, risks and limitations	5			
Research outputs				
Appropriate format	5			
Usefulness	5			
Potential impact	5			
Technology transfer	5			
Capacity building				
Development or enhancement of research capacity	5			
Training for sustained application of relevant techniques	5			
Involvement /opportunities for PDIs)	5			
Costing				
Realistic budget	5			
Value-for-cost	5			
Total score	100			

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