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AIDS HELPLINE: 0800-123-22 Prevention is the cure

GENERAL NOTICE

NOTICE 1824 OF 2002

Safety in Mines Research Advisory Committee

Invitation to submit project proposals

SIMRAC was established in terms of the Mine Health and Safety Act (29/1996) to conduct research and surveys regarding, and for the promotion of, health and safety 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 2003/2004 SIMRAC research programme, SIMRAC has the following goals:

- to indicate the current SIMRAC research interests and the areas prioritised for research support to commence in the 2003/2004 cycle;
- to invite research ideas 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 SIMRAC formulating a co-ordinated, long-term health and safety research programme and identifying priority areas for research to commence in the 2003/2004 cycle. The intention is to conduct *fewer but more comprehensive and longer-term projects that may extend over several research cycles*. 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, 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 format available from SIMRAC Project Support Services (SIMPROSS). Contact C Gomes at telephone 011 358 9190, fax 011 403 1821, e-mail cgomes@simpross.co.za or visit the SIMRAC website http://www.simrac.co.za to download the submission template.

2. Anyone who has queries regarding the aims and objectives of the thrusts listed in this notice can contact the following persons:
   Rock Engineering: Duncan Adams at dadams@simpross.co.za (011 358 9184)
   Machinery Engineering: Alec Gumbie at agumbie@simpross.co.za (011 358 9186)
   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 ptapbo@mepta.pwv.gov.za (012 317 9303)

3. Proposers are requested to take note of past work sponsored by SIMRAC in the different thrust areas. (Details are available on website http://www.simrac.co.za)

4. The closing time and date for the receipt of the proposals is **12:00 on Monday 28 October 2002.** Late entries will NOT be accepted.

[1] Guidelines for SIMRAC postgraduate research and Ethics Guidelines are obtainable from nwoods@simpross.co.za

5. A proposal in the correct SIMRAC 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 "*SIMRAC proposals*" at the SIMPROSS Offices[2].

6. SIMRAC 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. SIMRAC shall not furnish any reasons for its decisions regarding proposals.

7. Every proposal accepted by SIMRAC 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 standard terms and conditions is attached to this Notice.

8. In compiling proposals, prospective proposers should provide details of methods, identifiable outputs and estimated costs as indicated.

9. SIMRAC will endeavour to solicit the services of South African organisations to undertake projects, but will consider proposals from overseas-based organisations if expertise, cost considerations and local capacity building components compare favourably.

10. SIMRAC requires full disclosure regarding all subcontracts included in the proposal.

11. Where an output includes a device, mechanism, procedure, or system capable of being applied in the mining environment, a prospective proposer shall include in the proposal an output which suggests how the outputs in question might best be applied in practice. In drafting proposals, all prospective proposers should bear in mind the potential for technology transfer 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 in the SIMRAC Symposia proceedings and 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 SIMRAC Project Support Services (SIMPROSS) at the website address or from contacts listed (See paragraph 1 and 2).

14. Proposers are advised that all SIMRAC projects may be subjected to technical and financial audits and all relevant information and expenditures should be recorded.

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[2] SIMPROSS Offices, 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. SIMRAC 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, SIMRAC may invite additional proposals on the topic.

18. No unsolisited proposals will be included in the programme for 2003/4.

Objectives of the SIMRAC research programme

The **objectives** of SIMRAC 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;
- Support the Mine Health and Safety Council and its statutory committees to formulate policy and improve 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** – SIMRAC supports research which can contribute significantly to the improvement in the health and safety of South African miners;
- **Value for money** – SIMRAC supports cost-effective research;
- **Innovation** – SIMRAC welcomes new approaches or new areas of focus for research leading to technologies or best practices to improve health and safety;
- **Excellence** – SIMRAC 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** – SIMRAC 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** - SIMRAC 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 SIMRAC funding and the research outcomes.

- **Development of key indicators** – SIMRAC 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.

SIMRAC Health and Safety research programme for 2003

The SIMRAC research and implementation programme consists of occupational health and safety, addresses occupational medicine and hygiene, rock engineering, engineering and machinery, behavioral issues and technology transfer processes.

Each proposal must:

- Address only one research topic which 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.

Safety in Mines Research Advisory Committee

Project reference number:.....

Memorandum of agreement entered into by and between:

The Government of the Republic of South Africa in its
Department of Minerals and Energy
(hereinafter referred to as the 'Department')

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

and

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

Identity or registration number:.....hereby represented by
.....
identity number: .....duly authorised thereto

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

Now therefore the parties agree as follows:

1. The terms and conditions set out herein apply to the Proposal, dated ..... and entitled .....form part of the agreement.

2. The persons signing the Proposal on behalf of their respective principals, warrant their authority. (Attach resolution of authorisation, if the contractor is not a natural person.)

3. Before the Contractor commences work on the project, he/she must inform SIMRAC in writing timeously of the date on which he/she proposes to start work and provide details of the Project Schedule, and (if applicable) provide details of any proposed changes in the initial Project Schedule submitted and must submit a clearance certificate from an ethics committee acceptable to SIMRAC, if required, to conduct the project.

4. The contract price shall be paid as follows:

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

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

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

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

Payment schedule:

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

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

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

Year 1 and subsequent years

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

Payment schedule

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

Final year:

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

Payment schedule

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

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

6. The Contractor shall maintain a complete set of accounts relating to the contract, which shall include full details of all disbursements made in connection with the contract. All such documentation shall be made available for inspection on request during normal business hours to authorised representatives of the Department and/or SIMRAC, and shall be summarised in financial statements accompanying quarterly and final project reports.

7. In the event of the total cost of the project exceeding the contract price, the Contractor shall be responsible for any additional costs.

8. Where project proposals are submitted by persons, agencies or sub-contractors domiciled outside the Southern Africa Common Monetary Area, all monetary amounts recorded in financial statements and progress reports must be expressed in both the foreign currency and its equivalence in South African Rand. All payments shall be made in South African Rand and the Department will not be responsible for changes in costs attributable to changes in exchange rates or other external factors and the Contractor shall without limiting the generality hereof be liable for any costs of forward cover.

9. Within 2 (two) weeks of the end of each successive quarter the Contractor shall submit to SIMRAC a quarterly progress report recording work completed and progress with the project in the preceding quarter, providing sufficient detail to allow a quantitative assessment by SIMRAC of actual progress made by the Contractor. Each such quarterly report must be accompanied by a financial statement detailing all expenditures and costs incurred in connection with the project in the preceding quarter. SIMRAC may specify the format of the reports, and the Contractor shall submit his reports in the specified form.

10. Within 6 (six) weeks of the completion of the project the Contractor shall submit a final project report, containing an overall review of the project and conclusions based on the entire project, for consideration by SIMRAC; such final report must be accompanied by a comprehensive and detailed financial statement covering the entire project, together with a copy of the project asset register referred to in Clause 18 hereof. Reasons for delays in completion of projects and submission of final reports must be communicated to SIMRAC. Extensions will only be considered under exceptional circumstances, which must be fully justified in a timeous, formal application for extension, in writing, to the relevant committee. In the event of unsubstantiated delays and partial completion of projects, SIMRAC will undertake a contractual audit to determine the degree of completion and assess the value and currentness of the outputs and revise the payment schedule (Clause 4), accordingly. Each case will be assessed on merit but, if no further extensions are granted, the following actions will be initiated:

    10.1 A registered letter from SIMPROSS, on behalf of the relevant committee, will be forwarded to the project leader demanding that the contractual project deliverables be reported on within 30 days of receipt of the letter.

    10.2 The project leader will be given the opportunity to present the case to the committee.

10.3 If no response is received, the DME legal department will forward a Final Demand notification with a further 30-day extension period to the contracting organisation.

10.4 If this demand is not met, notification of Project Cancellation will be forwarded from the Chief Inspector of Mines to the CEO of the contracting organisation.

10.5 Legal proceedings will be instituted against the contracting organisation for reimbursement of funds, based on the degree of contractual compliance of project deliverables and past payments.

10.6 No further outstanding payments will be made until the project deliverables have been accepted by the responsible committee.

10.7 No new projects may be awarded to defaulting project leaders and/or organisations.

10.8 SIMRAC shall be entitled to impose, in its discretion, a penalty for late delivery in accordance with the following scale:

3 to 6 months delay: 5 per cent of the amount outstanding

6 to 12 months delay: 15 per cent of the amount outstanding

More than 12 months delay: 25 per cent of the amount outstanding

10.9 Decisions and actions and discussions concerning late delivery will be fully documented and forwarded to project leaders.

11. All reports, asset registers and invoices submitted to SIMRAC in terms of this contract shall where applicable comply as regards content and format with the requirements of SIMRAC as formulated from time to time.

12. At any time during the contract period, or within a reasonable period after termination of the contract, the Contractor shall on request by SIMRAC prepare a formal paper on the subject matter of the contract and provide a knowledgeable and competent speaker to present the paper, if appropriate, with audio-visual aids, to an invited audience of persons employed in or associated with the South African mining industry.

13. At any time during the Contract period, authorised SIMRAC representatives shall be entitled, by prior arrangement with the Contractor, to inspect work in progress on the project, and to request up-to-date reports on the project or on specific aspects of the project.

14. All intellectual property rights arising out of, or derived from, the project contemplated in the Proposal shall vest in the Department; provided that the Department may, upon written application by the Contractor and acting on the advice of SIMRAC, grant permission in writing for the said intellectual property rights to be published, utilised or exploited commercially by the Contractor, or others, subject to such terms and conditions as the Department may in its sole discretion specify.

15. The contractor shall on request in writing by the Department or SIMRAC make available to the Department or SIMRAC, as the case may be, all information, including but not confined to, raw data, statistical analyses, formulae, plans, photographs, internal and external reports, and the like obtained, devised or developed by the Contractor or a sub-contractor in the course of performing the project in question, and shall furthermore assist the Department to the best of its ability, if the Department should, in its sole discretion, apply for the registration of a patent or design based on studies undertaken in terms of the contract.

16. All physical equipment, instrumentation, and the like purchased by the Contractor for use in connection with, or as part of the project, and/or charged to the Department, shall at all times remain the property of SIMRAC. The Contractor may make an offer to purchase such goods

for his own use. SIMRAC, may sell or dispose of such goods to the Contractor, or others, subject to specific terms and conditions.

17. The provisions contained in Clause 16 above shall also apply, subject to the necessary changes having been made, to intellectual property, such as computer programs and software, patents, and designs purchased by the Contractor for use in connection with the project.

18. All assets with an initial value of more than R10 000 purchased by the Contractor in connection with or forming part of the contract, and/or charged to SIMRAC, shall be recorded in a project asset register which shall at all relevant times be available for inspection by SIMRAC or its representative. All such assets shall be kept secure, insured and maintained in good order and condition by the Contractor until such time as a decision is made by the Department concerning the disposal of such assets.

19. Full details of any contractual relationship between the Contractor and a sub-contractor shall be supplied to SIMRAC, and the sub-contractor shall be required to maintain, make available and submit financial statements to the Contractor for inclusion with the quarterly and final project reports and financial statements submitted to SIMRAC.

20. The Contractor shall not be entitled to cede nor transfer the rights in terms hereof without the written consent of SIMRAC, and the Contractor shall not replace strategic personnel nor strategic subcontractors as recorded in the Proposal without first consulting SIMRAC and amending the agreement and proposal in accordance with Clause 25 hereof.

21. The parties agree that on the default of either party, the other party may call upon the defaulting party in writing to remedy the default within a reasonable time, failing which the aggrieved party shall be entitled to terminate the contract or apply for specific contractual performance, without exercising such party's right to claim damages.

22. Disputes concerning the performance of the project shall in the first instance be referred to a referee agreed upon by the parties. If the parties fail to agree on a referee, the President of the South African Institute of Mining and Metallurgy shall be asked to nominate a referee, who shall operate as an expert outside any arbitration legislation.

23. In the event of any party incurring legal costs to enforce its rights in terms hereof, the successful party to the resolution of the dispute, shall be entitled to recover all costs from the other party on an attorney and own client scale.

24. The Proposal, the Department's letter of acceptance, and the terms and conditions set out herein shall, for purposes of interpretation, constitute a single contract, and replaces any other agreement relating to this project.

25. On acceptance of this agreement and the Proposal, no changes or amendments shall have any force or effect unless recorded in writing and signed by, or on behalf of, the parties.

26. The contract shall remain in force until such time as both parties have performed their respective obligations under the contract; provided however that the Department's rights in respect of intellectual property rights and physical assets held by, or under the control of the Contractor, shall not be affected by the termination of the contract.

27. While engaged in the performance of the contract the Contractor shall comply with all relevant provisions of South African common law and statute law, including, but not confined to, measures prescribed in the Employment Equity Act, Act No. 55 of 1998.

28. Notwithstanding Clause 27 above (compliance with SA law), the Contractor shall endeavour to promote, to the best of its ability, the employment of previously disadvantaged persons, and, without being limited thereto, specifically by employing post graduate students to enhance the abilities of such persons at all levels while performing the contract.

29. The Contractor herewith guarantees to the Department that the execution of the Project will be of the highest professional standards and expertise, and that any strategic or key personnel or experts named in the proposal shall at all times be committed to the proposal and the project.

30. The parties choose and herewith accept the following addresses for all purposes and notices in connection with the project and the contract -

30.1 The Department:

of: 2nd Floor
Braamfontein Centre
23 Jorissen Street
Braamfontein
E-Mail: cjones@simpross.co.za

Private Bag X 63
Braamfontein
2017
Tel no: (011) 358 9180
Fax no.(011) 403 1821

30.2 The Contractor:

of: _____
_____
_____

e-mail _____
Tel no _____
Fax no. _____

Thus done and signed at .....on this.....day of.....2003.

As Witnesses :

1. _____

2. _____

for and on behalf of the Contractor

Acceptance of Tender and Contract

This contract relating to the proposal attached herewith, is hereby accepted by the Chief Inspector of Mines. Thus done and signed at .....on this..... day of.....2003

As Witnesses:

1. _____

2. _____

for and on behalf of the Chief Inspector of Mines

SIM 03-04-01

Project title

Detection and control of flammable gases in hard rock mines

Motivation

The SAMRASS data (1998 to 2001) indicates that flammable gas accidents account for 7,3% fatalities in the mining industry as a whole. Nearly 97% of these occur in mines other than collieries. SIMRAC research concentrated its effort to address this problem in the collieries thus far. Out of the 33 projects that have been completed in this thrust, only one was aimed at hard rock mines. To further emphasize the need to address the hard rock mines needs in this thrust, five out of the last 6 devastating events (killing 4 or more people) have taken place in hard rock mines. The aim of this study is to investigate the location in the mine, of such accidents and provide some guidance for further research or amelioration programmes.

Primary outputs

Phase 1

1. A list of areas of a mine where these accidents take place, in order of significance. This information to be presented in a concise report that provides the statistical base and any other criteria used for the final ranking.

Phase 2

1. Specification and guide for current technology application and new procedures for effective detection systems and control measures in the areas of highest risk;
2. Specification on design and installation guide for an active suppression system in the affected area(s)

Phase 3

1. In a selected sample of research mines, install and evaluate a system so identified, report the results;
2. Evaluate Phase 2 specification and update with feedback from field trials and
3. Report on the effectiveness of system and offer recommendations to ensure sustainability.

Scope

Phase 1: This phase must include review of major devastations, with emphasis on area (in the mine) of occurrence. The review must be conducted at 7 gold and 3 platinum mines.

Phase 2: This phase is a desktop study to come up with appropriate technologies, how they may be designed or adopted to what machinery (if any) and installed. Also the solicitation of a mine champion to install a pilot system

Phase 3: Finalise arrangements with champion mine. Acquisition, installation, testing, monitoring and evaluation of pilot system. Submission of final report.

Estimated duration

Phase 1:	6	months
Phase 2:	6	months
Phase 3:	1	year

Potential impact on significant health and safety risks

Minimize the risk of an underground flammable gas ignition from occurring and effective containment of such an ignition if it is required, hence saving lives.

Requirement for technology transfer

Entire project is involved with establishing, monitoring and evaluating sustained technology transfer of product.

Special skills and facilities required by project team

- Occupational /environmental engineering with strong experience in flammable gas in hard rock mines

SIM 03-05-01

Project title

Investigate causes of accidents on scraper systems in the platinum and gold sectors

Motivation

The SAMRASS data shows that scraper systems account for 9% fatalities and 26% injuries in the transportation and machinery thrust area, which itself accounts for 25% fatalities and 22% injuries in the whole mining industry. Scrapers rank third highest in risk prevalence, (behind locomotives and trackless mobile equipment) within this thrust, yet no SIMRAC research has transpired, focussing on scrapers. It is not very clear where on the scrapers accidents occur, or during which activities do people have accidents. The aim of this study is to investigate the major causes of accidents on scraper systems, where they are more prevalent, and provide some risk profile to facilitate further research, if any.

Statistics show that scraper system fatalities are evenly distributed in the gold and platinum sector, with the fatality and injury rates showing more prominence in the platinum areas than gold. The study would involve more platinum mines than gold, and would attempt to draw similarities, (if any), in accident characteristics between the two commodities. It is envisaged that the outcome will indicate specific areas of research, (if any), in order to ameliorate the risk due to this element.

Primary outputs

1. A risk profile for scraper systems, indicating areas or sub-elements of the system where risk is significant, in order of significance. This information to be presented in a concise report that provides the statistical base and any other criteria used for the final ranking.

Scope

This work must include a review of the SAMRASS database, to determine relationship between accident, activity and designation of persons involved. On-mine studies on the design, installation and operation of scrapers must be conducted at 4 gold and 6 platinum mines. Interviews must be held with operators of the equipment to establish the "users' perspective" of problem areas

Estimated duration

1 year

Potential impact on significant health and safety risks

High potential impact in the long-term by sustained transfer of comprehensive best practice (expected from subsequent phases) in the design installation and operation of scraper systems, to reduce fatalities and injuries in this thrust.

Requirement for technology transfer

Project forms fundamental research into the causes of accidents on scraper systems, therefore will not necessarily yield transferable outcomes.

Special skills and facilities required by project team

- Mechanical or mining engineering expertise, with hands-on mining experience on scraper systems is absolutely essential. Working knowledge in risk assessment procedures is also a requirement.

SIM 03-08-01

Project title

Dermatitis in the SA mining industry

Motivation

The SIMRAC Handbook on Occupational Health Practice chapter on occupational skin disorders in the mining industry reviewed all the available information regarding the SA mining industry. The review indicated that occupational skin disorders have been largely unrecognised and underreported, much less researched. The little available evidence indicates that dermatitis is the commonest occupational skin disease in SA miners, accounting for over 60% of skin conditions referred to a dermatologist and that gold, platinum and coal mining (underground and surface) are represented. The diversity of mining and processing operations and exposures to known skin irritants and allergens make occupational dermatitis a priority area for SIMRAC research.

Primary outputs

Phase 1

1. Review of dermatitis in mining and processing, priority exposures, assessment and management programmes and tools, and cases submitted for compensation;
2. Survey of occupational health practitioners in the mining industry to identify current practice in dermatology;
3. Incidence and prevalence studies of dermatitis in a representative sample of mines;
4. Analysis of tasks of symptomatic individuals and to identify and prioritise exposures;
5. Occupational engineering assessment of potential exposures to create a task/ exposure matrix;
6. Health and engineering guidelines and tools to prevent, assess and manage occupational dermatitis; and
7. Report on Phase 1 and detailed proposal for Phase 2.

Phase 2

1. Development of CD based occupational skin disease control programme for the mining industry; Development of a clinical performance review programme for occupational skin diseases;
2. Regional seminars to launch the training products and programme and obtain participants for Phase 3; Establish an on line CPD submission, consultant advisory service and accreditation for participating mine occupational health practitioners and an advisory service for engineers; and
3. Report on Phase 2 process, problems and planned solutions with detailed proposal for Phase 3.

Phase 3

1. In a selected sample of research mines, evaluate the post-intervention identification and reporting of occupational dermatitis;
2. Evaluate the health and engineering case problem submissions and the training products produced in Phase 2 and update with feedback from clinical review programme and engineering participants; and
3. Monitor CPD programme, identify and rectify problems and transfer operation of programme to the Department of Medicine at the relevant educational institution/organisation undertaking the research
4. Report on the evaluation of the intervention and recommendations to ensure sustainability.

Scope

Phase 1: This phase must include review of submission rates to RMA and COID commissioner. The surveys must be conducted to represent all major commodities, geographical position and underground/ surface operations (10 mines). Surveys should be conducted at the time of routine medical examination/ screening of miners.

Phase 2: The CD programme must include clinical and engineering components;

Estimated duration

Phase 1: 1.5 years
Phase 2: 1 year
Phase 3: 6 months

Potential impact on significant health and safety risks

High potential impact by sustained transfer of comprehensive health and engineering programme to prevent and manage occupational dermatitis in the mining industry and so reduce morbidity.

Requirement for technology transfer

Entire project is involved with establishing, monitoring and evaluating sustained technology transfer of products.

Special skills and facilities required by project team

- Occupational dermatology,
- Occupational /environmental engineering
- Postgraduate medical learning assessment experience and CPD accreditation link to HPCSA

SIM 03-08-02

Project title

Development of sensitive tools for active case finding of tuberculosis

Motivation

Tuberculosis is the major occupational disease affecting mortality and morbidity in the South African mining industry. SIMRAC research has focussed on practical ways of controlling the TB epidemic fuelled by the HIV epidemic and innovative methods of improving clinical practice and case detection have and are been explored. In spite of extensive resources being allocated to tuberculosis services in the mining industry, the incidence of new TB cases increases and most cases are detected when they report ill and have been infectious for some period (passive case finding). A priority in control of TB is early detection of tuberculosis disease and hence active case finding or screening. Health 705 evaluated the sensitivity and economy of some methods of active case-finding. SIMRAC research needs to focus on development of sensitive and economic screening tools for active case-finding.

Primary outputs

Phase 1

1. Review of sensitivity and costs of existing and novel methods for active case finding;
2. Analysis of any existing, unpublished data and comparison of new and old tools;
3. Systematic review or meta-analysis of data, if appropriate;
4. Industry stakeholder workshop to discuss potential recommendations;
5. Report on review and workshop; and
6. Proposal for Phase 2 further evaluation of tool(s) if indicated.

Scope

The review must include local and international work, both published and unpublished, since there have been various studies (eg hostel questionnaires) which could contribute. Should there be sufficient research findings available, a systematic review should be carried out. Methods, target groups and periodicity of screening must be evaluated. The research team must investigate novel methods and relook at old methods (e.g. weighing and questionnaires). The report should include evidence-based recommendations about potential and also prioritisation for investigating identified markers (if any).

Estimated duration

Phase 1: 1 year

Potential impact on significant health and safety risks

High potential impact if a promising means of early detection of tuberculosis and hence inexpensive, active case finding can be achieved.

Requirement for technology transfer

This pilot phase will cover acquisition and transfer of knowledge to health service planners.

Special skills and facilities required by project team

- Tuberculosis epidemiology

SIM 03-08-03

Project title

Markers for prediction and early detection of pneumoconiosis

Motivation

The South African mining industry has a legacy of high levels of silicosis and recent SIMRAC research indicates that with an ageing workforce, the prevalence may be 18% in the gold mining industry and 2% in coal mining industry. Silicosis has become an even greater priority in occupational health since the advent of the HIV epidemic since the two conditions interact multicaplicatively on the risk of contracting tuberculosis. Methods of prediction of susceptibility to and early detection of silicosis are inadequate. Clinical detection is currently dependent on radiological and lung function abnormalities, both late manifestations of disease. They also are unable to plan and budget appropriately for the health care needs of workers infected with HIV since the stage of the illness is not known. Where interventions are introduced these cannot be properly evaluated.

Primary outputs

Phase 1

1. Literature review of biological, chemical and immunological markers for prediction and/ or early detection of pneumoconiosis;
2. Systematic review or meta-analysis of data, if appropriate;
3. Workshop of international experts;
4. Report on review and workshop; and
5. Proposal for Phase 2 evaluation of any potential marker(s) identified.

Scope

The literature search must be comprehensive and access all English and non-English published scientific literature plus "grey" literature acquired by making personal contact with relevant researchers and institutes worldwide. Should there be sufficient research findings available on any marker, a systematic review or meta-analysis should be carried out. The report should include evidence-based recommendations about potential markers and also prioritisation for investigating identified markers (if any).

Estimated duration

Phase 1: 9 months

Potential impact on significant health and safety risks

High potential impact if a promising means of early detection of pneumoconiosis can be identified.

Requirement for technology transfer

This pilot phase will cover acquisition and transfer of knowledge to health service planners.

Special skills and facilities required by project team

- Occupational respiratory medicine
- Biochemistry/ immunology
- Epidemiology and biostatistics

SIM 03-08-06

Project title

Respiratory disease in the SA platinum mining industry

Motivation

SIMRAC research on respiratory disease and exposure in living miners has been mainly conducted in the gold mining sector. Post mortem evidence suggests that active tuberculosis is as common in platinum miners coming to autopsy (147 per 1000) as in gold miners (122 per 1000). However, the prevalence of silicosis in platinum miners is less than 20% that of gold miners and exposure data indicate a much lower exposure level to silica in the platinum industry. Research is needed to provide an overview of respiratory disease in the platinum industry and to investigate exposure so that appropriate management and allocation of risk for occupational respiratory disease can take place. The current project, SIM 02-08-03, includes a cross-sectional analysis of lung function and x-ray data in the platinum sector and will explore the association between prevalence of indicator diseases and exposures to dust and silica. Data from MBOD would provide valuable additional information on both living and post mortem cases submitted for compensation and the development of a matrix of dust exposure would facilitate investigation of exposure-outcome associations.

Primary outputs

Phase 1

1. Review of available information on the prevalence and incidence of occupational respiratory disease in the platinum mining and processing sector including cases submitted for compensation;
2. Establish a data base of workers from the platinum industry whose cases have been submitted for in life or post mortem compensation for occupational respiratory disease;
3. Retrospective analysis of a stratified random sample of cases for exposure and disease;
4. Collection and tabulation of the historical exposure levels for dust and silica across the platinum industry to include all mining groups and variations in ore bodies and geology;
5. Report an overview of occupational lung disease identified in the platinum mining industry, the allocation of risk by workplace, recommendations on future management and allocation of risk, recommendations and protocol for any additional prospective research (Phase 2) that is necessary.

Scope

Phase 1: The sample of cases must be of sufficient size to enable full analysis. The cases must be drawn from all three major platinum mining groups and geographical areas. The cases should be researched for complete work history (and exposure if available) in the platinum, other mining and other industries with particular note of exposure to risk work where silica dust is a problem. The tuberculosis cases should be carefully investigated for risk exposure – silica dust and also time period since exposure to developing tuberculosis. A time and mine-based silica level exposure matrix should be constructed within the context of differing ore bodies and geology found across the platinum mining industry and the major platinum mining groups, including newly identified sites.

Estimated duration

Phase 1: 1 year

Potential impact on significant health and safety risks

Potential impact in clarifying the risk exposure for occupational respiratory diseases in the platinum mining sector for future management and allocation of risk.

Requirement for technology transfer

Entire project is involved with establishing, monitoring and evaluating sustained technology transfer of products and complementing SIM 02-08-03 on lung function and x-ray data.

Special skills and facilities required by project team

- Occupational medicine
- Occupational hygiene
- Epidemiology and Biostatistics
- Knowledge of MBOD information systems and review process

SIM 03-09-02

Project title

Development of web-based mining industry data base for audiograms

Motivation

Noise induced hearing loss (NIHL) is a major occupational disease in the mining industry and is costly in both social and financial terms with large numbers of miners affected and significant compensation payments made annually. New noise regulations aimed at preventing and managing noise induced hearing loss in the mining industry require baseline, pre-employment, periodical and exit evaluation of miners exposed to noise. The implementation of these regulations will generate an enormous quantity of data in the form of audiograms. There is a dire need to capture the data on an electronic database in order that individuals can tracked and the morbidity within and across each commodity can be analysed. The database will provide an essential repository for baseline data and much needed information on the incidence and prevalence of NIHL that will assist in targeted interventions to reduce morbidity.

Primary outputs

Phase 1

1. Review local and international data bases for audiograms and other comparable health data;
2. Industry stakeholder workshop to discuss potential recommendations and select system;
3. Development of electronic data base;
4. Pilot data base with submission of baseline data from representative sample of mines;
5. National and regional stakeholder workshops to promote the use of database; and
6. Guidelines for users and final report on process of database development and product.

Scope

The data base should be developed at Rand Mutual Assurance as it must be part of the compensation data collection system. It must be a user-friendly system compatible with systems used on the mines and at RMA and DME. Phase 2: After establishment and population of the database with baseline audiograms and surveillance audiograms from the pilot mines, the data will be analysed and the system introduced throughout the mining industry in Phase 2.

Estimated duration

Phase 1: 2 years

Potential impact on significant health and safety risks

Very high potential impact since tracking of hearing loss in individuals and across the industry, early intervention, identification of high risk places and individuals and targeted intervention will be possible.

Requirement for technology transfer

The database must be fully functional and implemented in pilot mines by completion of Phase 1. It must have the capacity and flexibility to store all baseline and subsequent audiograms for the mining industry

Special skills and facilities required by project team

- Electronic engineering/ computer programing
- Audiometry
- Occupational epidemiology

SIM 03-09-03

Project title
Compendium of SIMRAC research reports and evaluation of penetration into industry

Motivation
Reviews of past SIMRAC research and the planning of future SIMRAC research are dependent upon identifying the degree to which past projects have met the research needs, critical outcomes and successful implementation for each thrust. Currently the status of many SIMRAC research projects with regard to technology transfer is unknown. Recent changes to the SIMRAC research mission and thrusts require a critical reanalysis of the contribution of previous research. This exercise would also produce a user-friendly output in a similar format to the NIOSH compendium to complement the current SIMRAC web summaries.

Primary outputs
Phase 1
1. Stakeholder input to confirm health and safety programme thrusts and sub-thrusts;
2. Prepare index to SIMRAC research by Thrust and Sub-thrusts with all research reports listed by short title;
3. Prepare one-page summaries of all SIMRAC research reports with common formatting and layout;
4. Publish compendium documents by thrust and sub-thrusts with Table of Contents and one-page summaries (CD and hard copy).

Phase 2
1. Stakeholder input to confirm thrust research needs, objectives and procedures for rating technology transfer status of SIMRAC research reports;
2. Evaluate each project against thrust and sub-thrust research needs and objectives and technology transfer status;
3. Prepare status information report; and
4. Establish system to continually update analysis as further research is published.

Scope
All SIMRAC research and the technology transfer status of research

Estimated duration
1 year

Potential impact on significant health and safety risks
Provide a simple index and summaries of all SIMRAC research in a uniform and goal oriented format. Assist in assessment of past, current and future research and in planning future research. Provide information on technology transfer status of SIMRAC research.

Requirement for technology transfer
Entire project is to assist with technology transfer and to understand status of technology transfer of all SIMRAC research.

Special skills and facilities required by project team
- Occupational health and safety, engineering, rock engineering
- Research evaluation (objectives, process, outcome and impact or market penetration)
- Compendium reports, layout and publishing

SIM 03-09-04

Project title
Cost, appropriate use and effectiveness of personal protective equipment including improved footwear for the mining industry

Motivation
Although personal protective equipment (PPE) is regarded as a last resort in prevention of exposure and disease, it remains an essential component of worker protection in the mining industry. In many work places, several hazardous conditions may occur in conjunction with each other, and the protection system chosen has to withstand several hazard conditions. The wide variety of environmental conditions, needs for PPE, models of PPE and anthropometric differences make best practice extremely challenging in the mining industry. Although Health 612 provided some guidelines for use of PPE in Chapter 15 of the Handbook of Occupational Health Practice in the mining industry and other SIMRAC research has focussed on particular items of PPE (GEN 103 dealing with protective footwear, for example), there is a need for research into the cost, effectiveness and appropriate use of PPE. This will be focussed on producing guidelines appropriate to the use of PPE in relation to the risk of exposure.

Primary outputs
1. Review of local and international information on the efficacy and cost of PPE available for eye and face protection, respiratory protection, torso protection, arm and hand protection, and leg and foot protection, in relation to the exposure risks;
2. Identification of mining related exposures requiring use of PPE identified in Primary Output 1;
3. Evaluation of the wearability (including ergonomics based design) and suitability of PPE (identified in Primary Output 1) currently used in the South African mining industry;
4. Identification of suitable PPE (including footwear) for use in South African mining conditions;
5. Development of an exposure/ task/ worker/ PPE matrix for efficacious, appropriate and cost effective personal protection;
6. Compilation of detailed, user-friendly guidelines for use of matrix;
7. Workshop to transfer guidelines to industry;
8. Proposal for Phase 2 evaluation of implementation of Phase 1 product(s)

Scope
The project should include the forms of PPE referred to in Enabling Output 1 and all exposures (excluding thermal exposure) requiring the use of PPE throughout the SA mining industry (all commodities, tasks and environmental conditions). Comprehensive guidelines usable by all mining operations should be transferred to the industry and a proposal submitted for post implementation evaluation of PPE use.

Estimated duration
18 months

Potential impact on significant health and safety risks
High potential impact for all mining operations for which PPE is indicated and reduction of exposure with minimal discomfort for workers.

Requirement for technology transfer
Implementation of recommendations on use of PPE

Special skills and facilities required by project team
- Occupational hygiene
- Ergonomics
- Occupational medicine

SIM 03-09-05

Project Title
Effects of HIV/AIDS on occupational health and safety.

Motivation
The HIV epidemic is possibly the greatest health challenge to the mining industry in South Africa. HIV and AIDS have become a serious burden for the mining industry and contribute significantly to the burden of occupational disease. Although some *ad hoc* research has been conducted, the infection rates, prevalence of risk factors, health-seeking behaviour, impact on health and status of intervention programmes for HIV infection are unknown for most of the mining industry. Excellent research, including SIMRAC projects, on the association of HIV with tuberculosis and silicosis is ongoing but the clinical component has been largely limited to the gold mining sector. Existing data on the extent and spread of the disease in different geographical areas and commodities are thus lacking and unreliable. However, data from some mines suggest that the infection rate may be increasing and the effect of HIV on diseases other than tuberculosis has been postulated. It is therefore important to acquire accurate and comprehensive data regarding the distribution and spread of HIV/AIDS as well as its association with health and safety, as this will enable the industry to measure the extent and impact of the epidemic and any interventions. The limited information available necessitates research into these factors in order to develop, implement and evaluate integrated control strategies.

Primary outputs
Phase 1
1. Workshop for stakeholders to discuss research scope
2. Interim report on analysis of the data from mines that have conducted studies
3. Identify areas (geographical, commodities, outputs) requiring research
4. Develop study tools for Phase 2
5. Workshop with Stakeholders to discuss results, tools and Phase 2
6. Interim report on development and application of monitoring tools and guidelines for measuring HIV prevalence, incidence and severity/ stage.
7. Review and report of evidence regarding association of occupational diseases and injuries with HIV; and
8. Detailed proposal for Phase 2

Phase 2
1. Report on prevalence, incidence and severity of HIV/AIDS and association with occupational diseases and injuries at study mines.
2. Report on knowledge, attitudes and practices of employers, employees and health care givers regarding HIV/AIDS

Scope:
In Phase 1, all existing research and other data should be obtained to identify the research focus for the second phase. The measuring tools should include valid (accurate and reliable) instruments to assess the prevalence, incidence and staging or severity of HIV infection and to evaluate the impact of HIV and intervention programmes.
In Phase 2, the situation analysis should include employers' knowledge and attitudes about HIV; structures, policy and programmes in place to manage HIV; knowledge, training, attitudes and practices of health care givers; and the knowledge, attitudes, practices and health-seeking behaviour of mineworkers. Clinical data should be collected such that the association of HIV with occupational diseases (other than tuberculosis and silicosis which are being researched) and injuries can be investigated. The research would be conducted on pilot mines selected by deliberative sampling by the Stakeholders to represent the sectors of the mining industry where data are lacking.

Estimated Duration

Phase 1 6 months
Phase 2 2 years

Potential impact on health and safety risks

The situation analysis, development of assessment tools and measurement of the impact of HIV/AIDS on occupational diseases will contribute to the prevention and control of morbidity and mortality.

Required technology transfer

Workshops and consultation with all stakeholders and industry champions will ensure technology transfer.

Special skill and facilities required by project

- Occupational medicine
- Social science
- Epidemiology of HIV