Report on the ISRM activities in the Africa region
June 2007 to August 2008

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1. Introduction

The report below summarises the ISRM activities for the Africa region for the period June 2007 to August 2008. With mining such an important component of the economic activity in Africa, it is expected that rock engineering activities will feature prominently on the continent. Most of the ISRM members on the continent are mainly involved in the mining sector as relatively few large civil engineering projects are being undertaken. The worldwide shortage of geotechnical skills unfortunately also affects Africa detrimentally and the required rock engineering expertise in many African countries is imported on a temporary basis as required. The South African National Group (SANIRE) nevertheless remains very active and for the period of reporting, one local and one international symposium was successfully organized by this group.

2. Possible future growth of the ISRM in Africa

An important challenge for the ISRM would be an attempt to increase its membership base in Africa and to encourage the development of local rock engineering skills on the continent. The opportunity presents itself mainly in the mineral sector as it is estimated that Africa hosts 30% of global mineral reserves, including 40% of gold, 60% cobalt and 90% of platinum group metal reserves (source – Mbendi). South Africa, Ghana, Zimbabwe, Tanzania, Zambia and the DRC dominate the African mining industry, whilst countries such as Angola, Sierra Leone, Namibia, Zambia and Botswana rely heavily on exports from their respective mining industries. Major new mines recently opened or are under development in South Africa, Namibia, Botswana, Tanzania and Gabon.

Some years ago attempts were made to establish national groups of the ISRM in Zambia and Ghana, but sustaining these groups became problematic. As a number of resident geotechnical engineers are active in Zimbabwe, Angola and Botswana, these countries are perceived to have the biggest potential in terms of establishing national groups and this will be explored in future. Innovative ideas, such as establishing a new multi-national group across boundaries of countries, will also be investigated.

3. Activities of SANIRE

The largest concentration of rock engineering skills is found in South Africa. Unfortunately this country has also been affected in recent years by the emigration of skilled rock engineering personnel to other continents, especially Australia. The current membership of SANIRE comprises 320 members and 18 company affiliates. This membership has shown a slight decline in recent years, mainly due to the abovementioned emigration of members.

SANIRE currently consists of 6 branches namely the:
1. North West Branch
2. Free State Branch
3. Coalfields Branch
4. Western Bushveld Branch
5. Eastern Bushveld Branch
6. Gauteng Branch

An important recent development was the creation of the Eastern Bushveld Branch to cater for the growth in mining activity in the eastern limb of the Bushveld Complex. This system of branches in various parts of the country work very well as it encourages and enables active participation from a large number of the members. Each branch typically organizes a quarterly technical meeting and these meetings are well attended. Speakers are invited to give technical presentations and recent examples of these presentations were “Seismic Hazard Assessment in Deep level Mining” and “The Gautrain Project”.

A key function of SANIRE is to oversee the examinations for the Chamber of Mines Rock Engineering Certificates. As this certificate is a legal requirement in South Africa for rock engineers practicing on mines, a significant amount of SANIRE’s resources is allocated to this function. A recent development was the updating of the syllabus and recommended study material. Historically, only metalliferous and a coal certificates were awarded. The syllabus and recommended study material has now been expanded to give candidates the option of a massive and an opencast mining certificate. Of interest is that SANIRE receives many inquiries from candidates in Africa to write this examination. The future of these examinations are not clear, however, as new legislation is being drafted whereby all engineers conducting design work on the mines will be required to be registered with the Engineering Council of South Africa (ECSA). It is therefore not clear what the minimum required qualifications of mine rock engineers will be in future.

Regarding communication, the SANIRE website (http://sanire.co.za) has recently been redesigned and it serves as an important communication channel to members. Efforts are also being directed towards publishing a hardcopy of the SANIRE newsletter once per annum.

4. Conferences and symposia

For the period of reporting, two rock engineering symposia were held in South Africa. These were:

4.1 SANIRE 2007 Symposium

This symposium was held at the Maccouvlei conference centre in Vereening, about 80 km south of Johannesburg, on 30 and 31 August 2007. The Free State branch of SANIRE was responsible for organizing this symposium. It is customary for the various branches of SANIRE to organize these symposia on a rotational basis, thereby providing a large number of members with experience to organizing these events. It also provides an excellent platform for younger members to obtain some experience in preparing and presenting papers before being exposed to high level international symposia. The symposium attracted 140 delegates.

The key themes at the symposium were mine support, pillars and pillar extraction and seismic hazard. Some of the papers of interest presented were:

- The Real in-situ Performance of Pre-stressed Elongates
- The rapid loading of packs
- Guidelines, Standards and Best Practice for Seismic Hazard Assessment and Rockburst Risk Management
- Coulomb Stress Triggering for Seismic Hazard Assessment of Geological Structures in Underground Mines
- Extraction of the Kloof Main Shaft Pillar Complex
As part of the symposium, an excursion was organized to the Vredefort Dome. This is an ancient meteorite impact site that was recently declared a World Heritage Site. At 300 km across, it is one of the biggest impact sites in the world.

4.2 2008 Ground Support Symposium

This ISRM regional symposium was jointly organized by the South African Institute of Mining and Metallurgy (SAIMM) and the South African National Institute of Rock Engineering (SANIRE). It was hosted in Cape Town during the period 30 March to 3 April 2008. Previous symposia on this specialist subject have been held in:

- 1983 in Luleå, Sweden
- 1992 in Sudbury, Canada
- 1997 in Lillehammer, Norway
- 1999 in Kalgoorlie, Australia
- 2004 in Perth, Australia

The venue for the Cape Town symposium was the Table Bay Hotel in the V&A Waterfront. Cape Town was chosen as a venue as it is an historical area with considerable natural beauty and there are many steep natural slopes and cuttings involving rock support in the area.

![The venue of the 2008 Ground Support Symposium was the Table Bay Hotel (bottom right) in Cape Town.](image)

![Entrance of the Table Bay Hotel (left) and some of the delegates who attended the symposium (left to right: Dr John Napier, Prof. Dick Stacey and Mr Gary Dukes).](image)
A total of 48 papers were presented during 3 days with 117 local and international delegates attending the symposium. Keynote speakers were Dr P. Pells from Australia presenting “What happened to ‘mechanics’ in rock mechanics and ‘geology’ in engineering geology”, Mr I. Northcroft presenting “Computerised control for robotically applied thin sprayed liners” and Mr J. Chapman presenting “Tunnelling under Johannesburg – An overview of the Gautrain Project”. A key aspect of the symposium was the good cross-pollination between mining and civil rock engineering practitioners as excellent papers from both fields were presented. Following the symposium, technical visits were arranged to Chapman’s Peak Drive in Cape Town, illustrating the slope stabilization measures that have been implemented along this road, as well as a visit to the 4 km long Huguenot Road Tunnel. Visits were also arranged to the Mponeng deep level gold mine near Johannesburg and the Gautrain project currently under construction in the Johannesburg-Pretoria area.

One of the parallel sessions at the symposium (left) and the exhibitor area at the symposium (right). On the left of this photograph is Mr Rod Pickering, current president of the SAIMM.

A post-symposium tour was undertaken to one of the construction sites of the Gautrain project in the Johannesburg area.