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Subject **SME annual meeting 2005**

Memorandum

The 2005 SME meeting took place in Salt Lake City from 27 February until 3 March. 3100 participants attended of which 250 students and 250 foreign delegates.

TU Delft has the only SME (student) chapter in Europe with some 40 members. Bart Hogeweg represented the board of the chapter at the meeting. Discussions were held with the executive Director of the SME and it was decided to extend the arrangement between the Resource Engineering section in Delft and the SME. This means that Delft students will get a free SME membership during their study.

Following is a summary of matters concerning education at the meeting.

General

There was a big difference in general atmosphere at the meeting between 2005 and previous years caused by the recovered commodity prices and the expectation for the future. One of the most noticeable matters in discussions was the current and future shortage of graduates in mining engineering, processing/metallurgy and geological engineering.

The roll of MTEC (Australia) and FEMP (Europe) were repeatedly mentioned as examples of good practice and a roll model for developments on a global level. Industry feels a strong commitment to continued and expanded support of these organisations and their universities in the future.

There were three ½ day sessions on education. A CD will be issued with copies of all presentations and further relevant material. It will also include the conclusions at the end of the third session. Following is a summary of each session:

Forum on Education (Sunday 27 February)

Presentations were made by Richard Perry (VP North American operations, Newmont Mining Corp.) and Leigh Freemann (General Manager, Downing Teal Inc.).

The presentation by **Richard Perry** can be downloaded from:
- www.femp.org/sme05/SME05_sustainability_committee.pdf

The presentation gave the background of the SME Minerals Education Sustainability Committee, which was established in 2004.

The committee was set up to promote sustainability of minerals education in North America through improved collaboration between industry, academia, and government by:

- Providing a forum for college administrators and educators to discuss long-term sustainability.
- Attempting to develop a forecast of the minerals engineering and economic geology graduates.
- Exploring what the Mining Industry can do to assist the minerals education programs with recruiting and retention.

The industry realizes that there is a critical sustainability issue with minerals engineering education in the United States. There aren't graduating enough mining and minerals engineers, while at the same time University staff are retiring with no replacements. Mining programs at the State Universities are lost due to decreased enrolment and subsequent shrinking State funding.

A group of industry, government and academics was formed at the last annual SME meeting to propose a path forward on these issues. This group concluded that a minimum of 300 new Mining Engineering graduates are needed each year with at least 10 PhD's each year to replace retiring staff.

At least 10 sustainable mining programs are needed in the USA to maintain a critical mass. Given the constraints on State University budgets and the high cost of educating mining professionals, it is estimated that up to \$20M per year will be needed to supplement State support for a majority of University programs to remain sustainable. These monies would go toward recruiting students, scholarships, and staff salaries where there is no

State support. The committee concluded that the exodus of talent from retirements in the next 5-10 years will result in a unprecedented shortfall in mining professionals.

The two presentation by **Leigh Freemann** can be downloaded from:

- www.femp.org/sme05/SME05_sustainability_education.pdf
- www.femp.org/sme05/SME05_careers_competencies_and_compensation.pdf

More information about the studies by Downing Teal can be found at:
<http://www.downingteal.com/Presentations/>.

The first presentation (sustainability of minerals engineering education) dealt with the supply and demand situation of graduates in the USA. Due to a retirement wave and a long time "no hiring" policy, it is expected that during the next 10 years the shortage in the USA will be in the order of 200 graduates per year. The worldwide situation is very worrisome. As an example the Shell Albion oil sands project in Canada is coming on stream and needs many graduates, who are not available in Canada. Recruitment is a/o done in Australia, but Australian companies are already hiring in North America because of a shortage of graduates. The Albion project by itself has the size of major mining companies like Phelps Dodge or Newmont with a market capitalization of 80 billion dollar and revenues of 2.8 billion dollar. It also appeared that oil companies are now hiring mineral engineers, because they are starting to develop oil shale / sand projects, which are being mined by truck and shovel and processed by flotation.

Another bad development is the shortage of PhD. Students. At this moment there only a few PhD students in the entire USA. This combined with a retirement wave of academic staff (50% is older than 50 years) will result in staffing problems at universities. The number of mining programs in the USA has dropped from around 30 to 13, of which only 4 have an enrolment of 10 or more students. The total enrolment per year is around 100.

The second presentation dealt with the required competencies for engineers. Four basic competencies were distinguished: Technical, Business, internal social and external social skills. During a career the need for social skills increases (people are hired on their technical competencies and fired on their (lack of) social skills. Several thousands careers were analysed and various interesting graphs are included in the presentation. One conclusion is that the retirement of upper management will move middle management into these positions. Due to the low hiring during the past 15 years there will not be sufficient adequately trained staff to fill the middle management positions.

Global Minerals Education - Issues, Trends and "Best Practices" (Monday 28 February)

This session was chaired by Mike Karmis (Virginia Tech) and Richard Perry (Newmont Mining Corp.). It addressed the major issues in minerals education, including recruiting, funding and supply-demand trends. However, the session also emphasized experiences and "best practices" in minerals education from recruiting, to curriculum reform, partnerships, joint programs, continuous education, distance learning, research centres, funding, etc. The aim was to provide a better insight to representatives from the academia and from the industry. The focus was on positive developments and initiatives rather than just rehashing old problems.

The session included the following presentations:

GENERAL PRESENTATIONS		
1	Review of the Work and Recommendations of the Minerals Education Committee	Perry (USA)
2	The Global Demand for Mining Engineers	Freeman (USA)
3	Attraction and Retention of Professional Staff - An Australian Perspective	Tuckwell (Australia)
4	Global Minerals Education and the Society of Mining Professors	Karmis (USA)/de Ruiter (Netherlands)/Shaw (UK)
PRESENTATIONS AND PANEL DISCUSSION ON BEST PRACTICES		
5	Educational Programs and Partnerships in Mineral Engineering	de Ruiter/Dalmijn (Netherlands)
6	MTEC Mining Engineering Education Initiatives in Australia	Hebblewhite (Australia)
7	Distance Education and Lifelong Learning Recruitment	Scoble (Canada)
8	Initiatives and Opportunities in South America	Cedron (Peru)

The conclusions were that the worldwide situation is an extrapolation of the situation in the USA, Australia and Europe. The shortage of graduates worldwide is estimated at some 500 per year. It was also concluded that co-operation among the universities and between the universities and the industry are essential for the long term survival. Organisations like FEMP (Europe) and MTEC (Australia) are prime examples of good practices and will be the basis for a global structure. North America will have to develop similar models. Distant education and lifelong learning will take an important roll.

International mineral education workshop (Tuesday 1 March)

This workshop (www.femp.org/sme05/SME05_workshop.pdf) was led by Bruce Hebblewhite (University of New South Wales, Australia). The participants came from Australia (MTEC), Canada, USA, Peru (representing South America) and the Netherlands (representing Europe/FEMP).

The aim was to gather interested international mining engineering educators and supporting industry personnel together to discuss current problems and issues facing them; and to explore opportunities for a greater degree of international collaboration through some form of educational network – such as the “International Mining Education Network” (IMEN) – amongst English-speaking educational providers.

The workshop’s action was:

- to identify and review a range of collaboration options and the opportunities that they present;
- to determine the practicalities and limitations of the various options;
- to determine which parties/institutions might be interested in each option – assemble a project team;
- to commence developing strategies and action plans for each option (both during workshop and plans for actions beyond today);
- to discuss the levels and types of resources required for each collaborative option – both between institutions and amongst the mining industry;
- to agree on an overall way forward in developing a business plan for these new initiatives, including development of a collaborative approach to industry for strategic support.

One of the conclusions was that it is essential that initiatives are developed in close co-operation with the industry. Besides financial support it is also very important to raise the issue of future research topics.

A detailed report of the workshop will be included in the CD. The main action was to form a global steering group on education to follow up on the conclusions of the workshop and prepare the follow-up session at next year’s SME annual meeting. One of the actions is a meeting with a number of CEO’s of the major mineral companies in the fall of 2005.

The (preliminary) list of steering committee members is:

USA (Michael Karmis, + representative other university)
Australia (Bruce Hebblewhite + Kevin Tuckwell)
South America (Mario Cedron)
Europe (Wijnand Dalmijn + Hans de Ruiter)

Conclusions

It is clear from all studies and from the discussions at the meeting that the Industry is realising the thread of the lack of graduates. They also take clearly responsibility in co-operating and supporting organisations like FEMP and MTEC and other universities.

Experience at TU delft with job-offers to graduates (sometimes 4-6 months prior to graduation) show that the supply is completely out of balance. This is very positive for recruiting high school students to study Applied Earth Sciences.