INTRODUCTION OF A NEW MINING COURSE IN NAMIBIA

Status and Challenges
CONTENTS

• Mining in Namibia
• NUST – Namibia’s University of Mining and Technology
• Installation of a new mining course
• Course Content
• Internationalisation
• New Mining Department and GeoCentre
Republic of Namibia

- Area: 825,000 km²
- Population: 2,100,000 (2.3 Persons per km²)
- Parliamentarian Democracy (since 1990: SWAPO)
- GNP 3,045 Mio $US
- GDP 2,884 Mio $US
- Unemployment: 24.8 %
- HIV/AIDS: 21 %
Republic of Namibia

Source: W.H. Barnard
Mining in Namibia

- 17 mines in 2006
  - Uranium
  - Diamonds
  - Copper
  - Lead-Zinc
  - Gold
  - Fluorite
- 4 new mines in 2007 – 2008
  - Tungsten
  - Tin
  - Tantalite
  - Copper
- 8 more to come until 2010
  - Gold
  - Uranium
  - Phosphate
  - …

Prof. Dr.-Ing. Helmut Mischo
Mining in Namibia

Mining fixed investment as % of GDP (includes exploration expenditure)

Source: National accounts, Central Bureau of Statistics
Current Mining Licenses

Current Exploration Licenses
(here: Base and Rare Metals only)

Diamond Mining near Oranjemund

Source: Chamber of Mines Annual Report 2006
Okoruso Fluorspar

Source: Chamber of Mines Annual Report 2006
Rössing Uranium

Source: Chamber of Mines Annual Report 2006
NUST – Namibia’s University of Science and Technology (formerly Polytechnic of Namibia – PoN)

- 1994: Polytechnic Act approved by Parliament
- founded as 2\textsuperscript{nd} higher education institution in Namibia to complement University of Namibia (UNAM)
- 2001: First Bachelor degree awarded
- 2002: First award as best “Higher Education Institution” in Namibia
- 2003: Second award as best “Higher Education Institution” in Namibia
NUST – Namibia’s University of Science and Technology

- 2004: Third award as best “Higher Education Institution” in Namibia; enrolment surpasses 5,000 mark

- 2005: First Master degree programme implemented (Information Technology)

- 2006: Second Master degree programme implemented (International Business Administration); Fourth award as best “Higher Education Institution” in Namibia

- 2007: FIBAA accreditation for Master’s of International Business Trade (first in Africa); International agreement on Master’s Degree in Comparative Local Governance

- 2008: Enrolment surpasses 8,700 mark; First Master students in information technology graduates; Formal recognition as Namibia’s University of Science and Technology (NUST)
NUST – Programme Levels

- Ph.D. 2008
- Master Degree 2005 - 2008
- Bachelor Degrees 2001 - 2008
  - B. Sc. (Hon.), B. Eng., B. Sc., B. Tech.
- National Diploma *
- National Higher Certificate *
- National Certificate *

* partly phasing out as from 2008
NUST – Schools

NUST

Schools

- School of Natural Resources & Tourism
- School of Information Technology
- School of Engineering
- School of Business & Management
- School of Communication, Legal & Secretarial Studies

Departments

- Dep. of Civil Engineering
  M.Sc., B.Eng., B.Tech., N.D.
- Dep. of Mechanical Engineering
  B.Eng., B.Tech., N.D.
- Dep. of Mining Engineering
  (M.Sc.), B.Eng.
- Dep. of Electrical & Electronical Engineering
  B.Eng., B.Tech., N.D.
- Dep. of Health Science & Technology
  B.Eng., B.Tech.,
New Mining Course –
Global Supply of Mining Engineers

Long term trends - Australia, USA, UK, South Africa, Canada

Graduate Numbers

Years


Society of Mining Professors
Annual Meeting Aachen 2008

17 May 2008 – No 16
New Mining Course—
Supply and Demand for Mining Engineers in Namibia

Industry - Mining Engineers

Source: Skills Needs and Supply Analysis of Existing Mines - Chamber of Mines of Namibia 2007
Shortfall of Mining Engineers in Namibia

- Worldwide shortage
- Supply from the current sources far below the needs
- Shortfall will increase in the future, with new mines to be opened. Currently the mines are already “poaching”.
- Namibian mining industry competing worldwide for engineers
Current Status of Mining Engineer Recruitment in Namibia

Mining engineers currently employed in the Namibian mining industry are

• Namibians educated abroad
• Expatriates
New Mining Course – B.Eng. (Mining)

• 4.5 years professional B.Eng (B.Sc.Hon), based on the traditional mining education programme (4 years + internship)
• Focus on operations in Namibia and neighbouring SADC Countries
  – underground mining (hard rock)
  – surface mining (hard rock, diamonds, dimension stone and sand & gravel)
  – marine mining (diamonds, potentially oil and gas)
• Design figures:
  – Enrolled: 80 – 100 students
  – Graduating: 10 – 15 students each year
B.Eng. (Mining) – Current Status (I)

• 70% of the 4.5 years B.Eng. programme already offered within the existing Polytechnic’s engineering programme
• Strongly supported by the Namibian Chamber of Mines and the Namibian mining industry
• Strongly supported by the international mining community
• During development and start-up, all other courses will be covered by our partner universities
  – Clausthal Technical University
  – Colorado School of Mines
  – University of the Witwatersrand
  – RWTH Aachen Technical University
  – Other international Universities
B.Eng. (Mining) – Current Status (II)

• Preparation of entering students met by bridging courses (year 0 studies)
• Polytechnic has successful B.Eng. programmes in Civil-, Mechanical-, Electrical- and Electronical Engineering, providing science and engineering core courses required for Mining Engineering
• Partner universities are assisting in developing the mining programme
• Course development, laboratory establishment, training and teaching under progress
• Clausthal and Colorado School of Mines are already on board, with Aachen and WITS negotiations have been started, other universities are invited to participate
B.Eng. (Mining) – Current Status (III)

- The mining programme is designed to meet the requirements of National Qualification Agency (NQA) and Engineering Council of Namibia (ECN)
- The mining programme will be accredited by international accreditation institutions – Bologna Process and ABET / Washington Accord
- In collaboration with partner universities, Polytechnic will eventually offer the complete range of mining engineering qualifications, with highly specialised courses on Master’s level
## B.Eng. (Mining) – Curriculum (I)

### Comparison of available mining engineering courses

<table>
<thead>
<tr>
<th>B.Sc. (Hon) Mining Engineering Degree</th>
<th>International</th>
<th>NUST</th>
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<tbody>
<tr>
<td></td>
<td>B.Sc. Mining Engineering</td>
<td>Existing Courses</td>
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<td>VENTILATION AND CLIMATISATION OF UNDERGROUND MINES</td>
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<td>HEALTH AND SAFETY PROTECTION IN MINING</td>
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<td>59</td>
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<tr>
<td>MINING ENGINEERING PRACTICE (BSc Hons)</td>
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<tr>
<td>Minimum of 30 weeks in industry</td>
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<tr>
<td>TOTAL Number of courses BSc Hons Degree as available today</td>
<td>39</td>
<td>19</td>
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<tr>
<td>TOTAL Number of courses</td>
<td>47</td>
<td>57</td>
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</table>
B.Eng. (Mining) – Major Challenges (I)

• Concerns with Entrance Level of Students
  – Unsatisfactory secondary education
  – Entrance tests in English, Maths and Sciences mandatory
  – Most students to pass a bridging year (failure rate 40%)

• Developing Internship Culture in Local Industry
  – No internship offered to young students (years 0 – 2)
B.Eng. (Mining) – Major Challenges (II)

• Staff Recruitment
  – Locally no experienced lecturers available
  – Complicated work permit procedure for expatriates
  – Low academic income level at university (high staff turnover)

• Staff Qualification Programme
  – Training abroad to qualify local lecturing staff

• Programme Funding
  – Start-up funding allocated, but funds for annual running costs still under negotiation with industry
B.Eng. (Mining) – Time Frame

- Bridging Course (year “0”) is already in place
- Now providing information on the Mining Engineering programme
- January 2009: Starting mining engineering education
- 2014: Graduation of the first class of mining engineers

- New mines coming into production within the next few years will need mining engineers
International Collaboration – Outlook

Clausthal Technical University

Colorado School of Mines

Namibia’s University of Science and Technology

Society of Mining Professors

Global Mining Education

University of the Witwatersrand

Other International Universities
Structure of the Department of Mining

MINING ENGINEERING

Underground Mining  Surface Mining  Marine Mining  Mineral Processing  Mining Machinery  Mine Surveying  Laws, Management, Environmental etc.  Geology by UNAM

Basic Science & Engineering Education at the Namibia’s University of Science and Technology
Geo-Centre at NUST

- 1st Floor: Classrooms and Mining Laboratories
- 2nd Floor: Department of Mining Engineering
- 3rd Floor: Geo-Centre

Laying of the Foundation Stone planned for 09/2008
Engineering Services & Consultancy

• Fully equipped GEO-CENTRE at Polytechnic, funded by German mining company
• Competence and services for the Namibian mining community
  – Mineral Processing
  – Rock Mechanics
  – Mine Ventilation
  – Mining Methods
  – Mine Planning
  – Environmental Engineering
SWOT: NUST, SoE & DoMin

**Strengths**
- no competitors (in Namibia)
- international staff (at NUST)
- excellent reputation in Namibia
- close "industry" ties, bursaries, many projects
- strongly supported by CoM & mining industry
- donor support (CIM + others)
- excellent senior management
- charismatic, visionary Rector
- poor student entrance quality !!!
- research (quantity + quality)
- staff recruitment (at DoMin)
- staff number
- staff qualification

**Opportunities**
- easy acquisition of donor funds
- projects, projects, projects
- international cooperation
- partner in a World Mining Course
- more foreign student recruitments
- insufficient + decreasing GoN funding
- growing competition by RSA universities
  - high staff turnover
  - complicated work permit procedure

**Weaknesses**

**Threats**
Conclusion

• Namibian mining industry needs a Namibian mining engineering programme
• Namibia will benefit from a mining engineering programme
• NUST is committed to meeting Namibia’s economic development needs
• NUST is committed to developing a mining engineering programme
• NUST is well positioned to start-up and operate a mining engineering programme
Additional Motivation

- Namibia is the best place in Southern Africa for an additional mining engineering department
- Political stability, accessibility, a functioning COM, existing University of Science and Technology (formerly PoN)
- Mining engineering department in Namibia will benefit the mining industry in the region
- Mining engineering department is important in developing local support for new mining projects in Namibia
- Other Namibian organisations need mining engineers
- Ministry of Mines and Energy is already short on mining engineers
THANK YOU

&

GLÜCK AUF!