Human Resources for Radiation Safety in Uranium Mining

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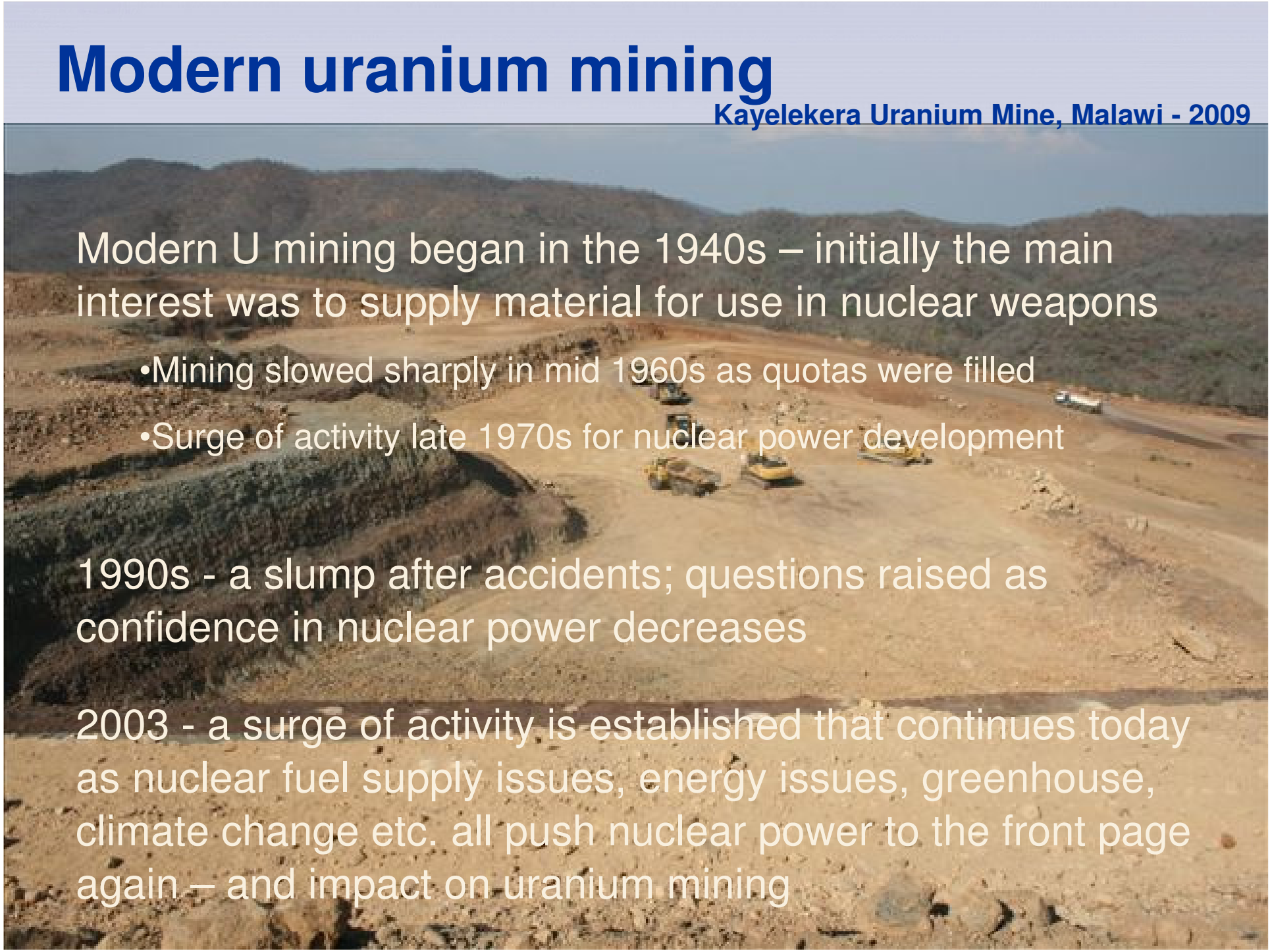
Modern uranium mining



Kayelekera Uranium Mine, Malawi - 2009

Modern U mining began in the 1940s – initially the main interest was to supply material for use in nuclear weapons

- Mining slowed sharply in mid 1960s as quotas were filled
- Surge of activity late 1970s for nuclear power development

1990s - a slump after accidents; questions raised as confidence in nuclear power decreases

2003 - a surge of activity is established that continues today as nuclear fuel supply issues, energy issues, greenhouse, climate change etc. all push nuclear power to the front page again – and impact on uranium mining

Radiation protection in mining

- Really began in the 1970s with the publication of “health codes” etc
- E.g. Australian code published in 1975; last updated in 2005
- Basic Safety Standard published by IAEA in 1994 sets exposure standards that are more or less universally observed- BSS is under revision
- Standards & good supporting documentation are available

Uranium crushing plant worker, Caetite, Brazil

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Documentation

Modern Radiation Safety (RS)

SO..... we have

- Good codes and regulations
- Good radiological safety record
- Experienced staff in most of today's older mines

BUT..... Why then are we concerned?

- Much new activity in exploration and mine development in many countries
- New operators and host countries have perhaps only limited awareness of radiation safety
- Ageing population of experts and staff…….

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The RS workforce

None of these lead professionals is under 35

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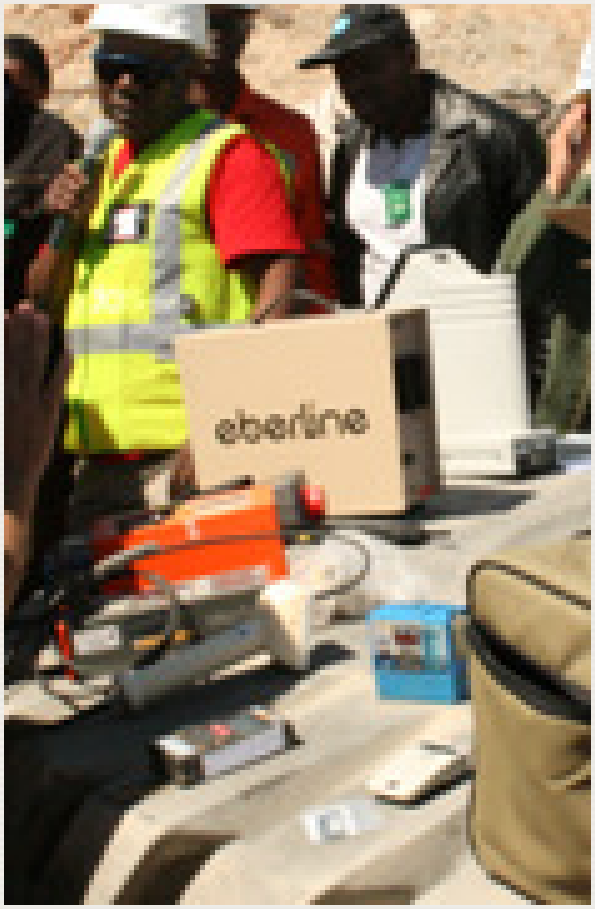
Radiation Safety Resources

- Today's mining radiation safety workforce is a shrinking, ageing, and retiring population
- Since the quiet times of the mid-late 1980s fewer recruits have come into the RS business

Why is it happening……..?

- Young professionals saw little future in what many regarded as a moribund/dying industry
- Also there are impacts arising from changes in education patterns – fewer "hard scientists" ....



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Mining related activities requiring RS staff

- Regulators
  - Same shortages, in direct competition with operators
- Exploration companies
  - Few have in-house dedicated expertise
  - Many share the few consultants around

  ……*if they can find consultants who are available*
  - Training difficulties – resources & facilities are rare
- Global situation
  - Companies & countries – past, present and future

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Future stressors for RS staff supply

1. Uranium production cycle activity is increasing:
   - **Exploration**
   - **New mines:**
     - **maybe 3 to 6 in 5 years (3 in 2009; more planned for 2010/11)**
     - **maybe 10-15 in 10-12 years**
     - **ISL operations expanding fastest - but RS still needed**
   - **Expansion of existing mines & re-opening old mines**
   - **Probable expansion in use of unconventional resources and/or by-product mining**
   - **Some production estimates are for up to 80K t U by 2015**

2. Competition in staffing demands from other sectors:
   - **Mineral sands & NORM industries**
   - **Metal mines & Oil and Gas**
   - **Medicine**
   - **Other industries, e.g. Materials testing, production engineering, etc**

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Solution Options [1]

- Training
  - Scheme in USA aims to provide ~200 techs in 2-3 years
  - Suggestion that IAEA try to do something similar e.g. through regional TC projects
  - RSO training in conjunction with universities – getting more students to do science, including physics, in schools
- Develop universal training courses
  - Address courses for both RSO and Technician
  - Validation and accreditation of academic awards through educational authorities and industry linkages
  - Seek to improve global transferability of skills

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Solution Options [2]

- Encourage interchange of staff between industry operators and regulatory authorities to improve training effectiveness - and the understanding of each side for the other's situation

- Increase public education and outreach schemes in schools to raise awareness of the need for RS personnel, especially in U mining

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Summary [1]

- RS staff are in short supply globally and the demand is growing, especially in U mining
- An ageing population means the situation will deteriorate as the present workforce retires
- Need to encourage more young people into ‘hard’ science at school and then move them on to RP studies at university
- New staff have to be attracted into uranium mining

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Summary [2]

- Mining companies will always be the financially more attractive employers - but regulators need staff too!
- Follow up joint regulator/operator initiatives (e.g. IAEA/WNA) to introduce and maintain “good practice” standards
- Society has to accept that U mining is here to stay for some time

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Conclusions

Radiation Safety is essential to the safe, secure and profitable development of the resource that is now seen as having a significant part to play in campaigns against climate change and for energy security

We need to train and develop more RP personnel to meet the demand - *NOW*

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