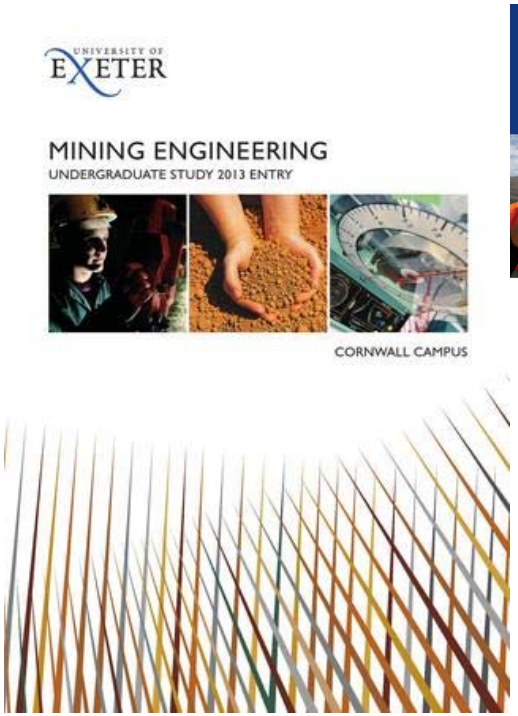

The next generation of mineral industry professionals – industry expectations and how best to train them.

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Structure of Presentation

- Introduction
- Skills Shortages
- Industry skills requirements
- The future employee
- The new employment contract
- Conclusions

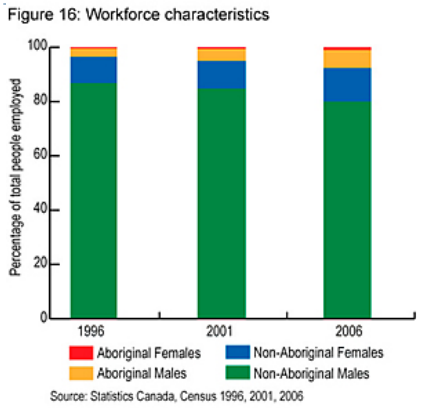
Introduction

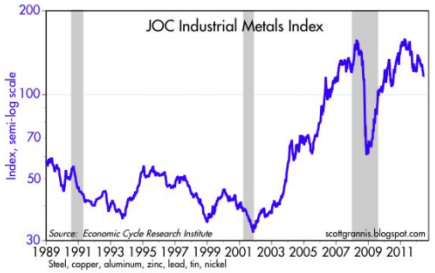
- Mining has historically been a ‘young man’s game’. Male dominated and, due to culture, legislation & practice, and a relatively harsh working environment, a macho preserve.

- The 1990’s was a decade of subdued commodity prices and the public perception grew that, as a result of efficient recycling, and substitution of metals by advanced plastics and ceramics, mining was a dying industry.

- Mining was portrayed as socially and ethically dubious, working in troubled and undesirable locations, and involved environmentally damaging activity laying waste to pristine areas to leave lunar landscapes of tailings and rock.

- Companies were barely recruiting; and bright, enthusiastic young talent was not generally beating its way to their door.



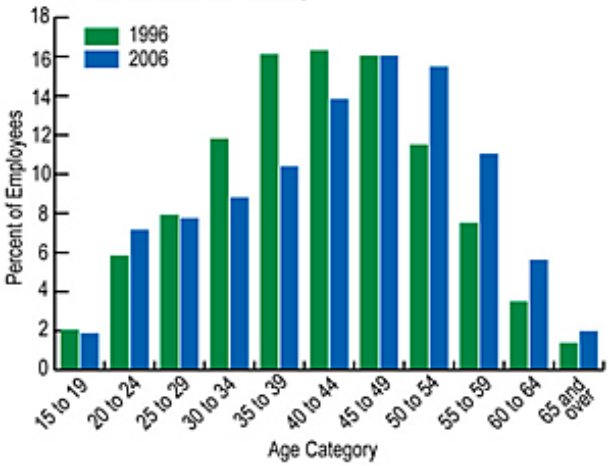


Introduction cont'd

- During this period the industry 'hunkered down'. Existing staff aged with it while the next generation of mining professionals was barely created.

- Fast forward to today and the result is that these time-served staff are nearing retirement. Over the last decade many mines found themselves with a restricted pool of experienced staff, a 20-25 year demographic gap, then a small cadre of junior, relatively inexperienced recruits. Senior staff have had to be tempted back from retirement, or poached at big salaries.

Figure 6: Age composition of the Canadian minerals and metals industry



Source: Statistics Canada, Census 1996 and 2006

- The next decade - a further significant net loss of industry experience through retirement. The demographics of current mining professionals demonstrate an urgent need, notwithstanding a recent slowdown in the minerals industry, to continue recruiting, well-trained, young staff.

- There is also a need to *look at how best to attract* talented young men & women into mining.

Skills shortages

- Over the next 10 years a third of all mining engineers in Australia will retire.
- In 2009 the Canadian Mining Industry Human Resources Council stated that 'the combination of an aging workforce, competition for skilled workers and declining enrolment in mining-oriented academic programs is the source of great concern in the mining industry.
- Canada will need to recruit 60-100,000 staff in the next decade.
  (Minerals Industry Human Resources Council 2011).
- Up to 40% of Canada's mine and metals workers are expected to retire by 2014 and… approximately 50% of workers will exit the industry by 2018'.
  (Mining Industry Workforce Information Network 2009).
- 'In Ontario one-third of all mining industry workers are within the 55 to 64 years of age cohort. It is expected that in the coming years, the mining industry will experience a surge in the number of retirees as a greater share of their workforce approaches the average retirement age. This expectation is manifested in the higher retirement rates from 2015 onwards'.
- Around 55,000 new employees need to enter the US mining industry just to maintain numbers (National Mining Association 2012).
- There are many companies developing world class mining projects, in countries with little history of modern mining and a very limited pool of experienced and qualified potential employees e.g. Saudi Arabia.

Skills shortages cont'd

- The lack of skilled, experienced and qualified staff is however cited as one of the main risks to maintaining a sustainable global mining industry (Ernst & Young 2012).

- These trends have, to some extent, been slowed in the last few years by accelerated recruitment on graduate schemes.
- The current downturn is seen by some companies, in certain countries, as a reason to slow down recruitment.
- This will make the long term problem worse. In the future upturn there will be even fewer experienced staff left within the industry to pass on their expertise.

Skills shortages cont'd

- The problem of a global skills shortage is compounded by the accelerating trend towards resource nationalism with governments increasingly demanding that the overwhelming majority of employees in international mining projects, at all levels, should be from the producer country.

- Visa controls are also used in this way to restrict external employment access in many traditional mining countries.

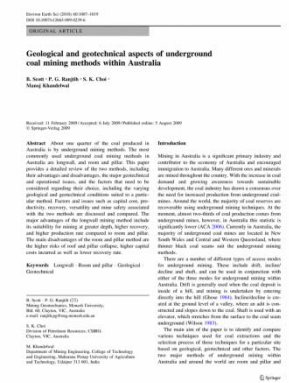
- In some developing countries many of the potential employees have relatively low educational levels, and limited access to mining education.

- Companies generally share this local employment ambition in order to return maximum community benefit from their activities but the local talent pool is frequently even more restricted.

Skills shortages cont'd

The provision of mining education is also challenged by skills shortages.

- During the last 20 years mining schools have shut.
- Universities and individual staff have been forced to focus on academic research agendas for league table, financial and reputational reasons.
- In many Schools industry experienced staff have been lost to be replaced by those who can publish in pure science research areas to the detriment of practical mine education.
- Even if universities seek to appoint such expe[illegible]t compete with industry or
- There is a significant need for investment in mining schools in developing mining countries.



Industry skills requirements

- The industry is undergoing rapid & continuous change in the deposits being exploited, mine locations, scale of operations, technological advance, producer country & community expectations, safety and local employment imperatives.
- Global businesses, shareholders and society expect industry best practice wherever a mine is located.
- The skills profiles required to meet these are also changing and training for the modern industry must therefore also continually evolve.

For many companies the government's expectations of local employment means that nationality is at least as important as expertise in staff recruitment.

Industry skills requirements cont'd

So during recruitment initiatives what do companies say about the characteristics of themselves and potential employees ?

- A review has been undertaken of the skills, attitudes and attributes being sought by major mining companies for international direct graduate recruitment or entry into their graduate development programmes.

- **Rio Tinto**
- **Anglo American**
- **Xstrata**
- **BHP Billiton**
- **Freeport McMoRan**
- **Goldcorp**
- **First Quantum Minerals**

These include six of the top nine mining companies by market capitalisation.

Industry skills requirements cont'd

What all the companies say (paraphrased) to prospective recruits:

- **People are our most important asset – 'you make the difference'.**
- **We want bright, curious, self-motivated, creative, confident, problem solvers**
- **We only seek the best**
- **You will be well rewarded**
- **You decide how to shape your career**
- **You will need to share our culture – articulated around communities and integrity**
- **We will provide structured induction & training programmes**
- **We are preparing you to be leaders of the future**
- **We want performance / achievement driven and ambitious people**
- **We will develop your skills and technological expertise**
- **The role will be challenging**
- **You will get early responsibility and varied exposure – real work, tasks & projects**
- **We promise fast career development**
- **You will be assigned a personal mentor**
- **You will be able to create professional networks & learn from experienced, world-leading peers**

- **We have special arrangements / programmes for indigenous / local applicants**

Industry skills requirements cont'd

Individual company's unique 'pitch' to prospective recruits:

- We can offer a career of limitless possibilities
- Our mining careers are a lifestyle not a job
- Our company's geographic distribution of mines and deposit types yield unique mining industry exposure
- Our fast growing company generates exceptional opportunities
- We ensure safety above all else
- Our company's attitude to communities, ethics, quality, environmental performance
- We dare to be different
- We know we have to work hard to retain you
- We have an entrepreneurial culture

Industry skills requirements cont'd

What is generally not mentioned:

- Mines often in very remote locations
- Some less than attractive FIFO rota's
- Work life balance
- Partners and family
- Gender imbalance
- Stability – particularly job security
- Disability - opportunities
- Only two of the companies really articulated need for high mobility and flexibility
- Technical expertise and qualifications only mentioned in passing: 'using everything you have learned to date'
- That, wherever possible, their job roles are likely to be transitioned to local staff within a few years

The future employee

- Pool of potential employees varies in different countries.
- At graduate level mining is competing with other sectors who also want technically-competent, engineering-friendly, flexible people.
- Fewer students are doing the necessary A' levels, costs of university education have risen and school teaching predicated on mining as, at best, an undesirable necessity have turned off many students.
- Outside education the atmosphere of excessive risk avoidance and fear of litigation, combined with technological driven recreation, means children spend less time in outdoor activities, in wild and remote locations and become habituated to the urban and sub-urban environment.

The future employee cont'd

- In many developing countries mining employment, despite occasional campaigning criticism of the industry's activities, is both desirable and attractive due to well-paid jobs, health benefits, and local staff's familiarity with relatively remote locations. The general educational level and availability of training remain the main issues.
- At the same time the expectations of young graduates considering entering the industry are also changing.
- Current school leavers and graduates have grown up in an 'on-line all the time' age with very different aspirations on what a desirable career looks like. Recruits make comparison to other jobs e.g. working in consultancies based in cities, with very different working environments and social lives.

The future employee cont'd

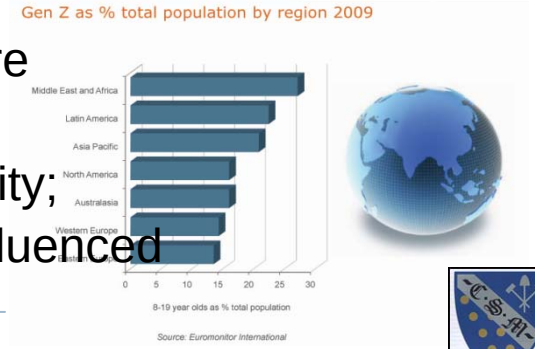
- The industry still unfortunately has a reputation amongst potential recruits as having low loyalty (on both sides), high pay, and a 'hire and fire' mentality. Entering mining involves putting life on hold for a lucrative few years before moving on rather than necessarily as a long term career.
- Most graduates have to seek well paid positions with career security to allow them to start adult life.

The future employee cont'd

- Mining industry recruiters are conscious of the need to use new messaging for their Generation Y & Z targets but universities and some companies are slow to realise the profound changes needed in training, attracting & recruiting staff for a career which demands social, relationship, and family deprivations.

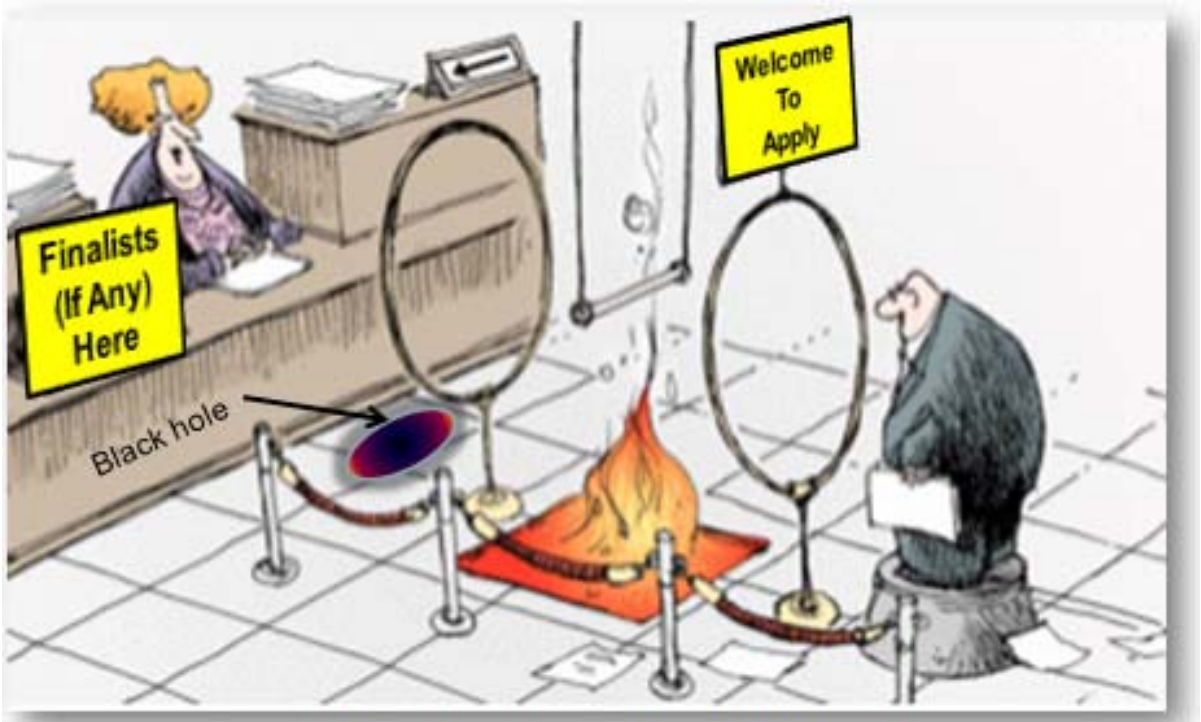
Many graduates seeking entry to the industry now have so-called Generation Z attributes. They are:

- technologically savvy, live life on-line, Facebook & Twit
- expect tailored individualised services and education,
- learn by YouTube in bite size video's on mobile phones
- are entrepreneurial, career orientated,
- comfortable with portfolio careers,
- used to short term contracts, renting, debt,
- less concerned by economic decline and financial failure
- expect multi-tasking or become rapidly bored,
- share, collaborate – indeed are suspicious of individuality;
- are independent, self-absorbed, fashion & celebrity-influenced
- and used to being in protected environments.



The future employee cont'd

- Personal experience suggests that, despite the skills shortages, good graduates with the right attitudes, who wishing to join the industry are currently unable to gain suitable direct entry or graduate programme places,.
- Perhaps the industry expectations are in some cases too restrictive.



Source (and apologies to): Non Sequitur, Wiley Miller 8/28/10

The new employment contract

- In the longer term the industry must consider how to create new working life models for its staff.
- New graduate recruits have a much better ‘deal’ than previous intakes.
- They are typically provided with mentors, structured training & development programmes; companies try to let staff decide their career route, provide flexible FIFO or residential options, on-going training, early responsibility, and fast track development.
- **The career model is however fundamentally the same and remote mine locations still put strains on parents, family, partners and children especially as more female staff are recruited.**

The new employment contract

- For locally recruited staff location may be less of an issue as they have family ties and geographic familiarity however there can also be strains in local family, tribal, community and cultural structures and employees.
- They often have the added pressure of supporting large extended families and suddenly have high incomes beyond that of local leaders and elders.

- In order to promote more family friendly careers the industry could embrace joint employment of couples and families members. Mines are a special environment and need to create opportunities for both partners to pursue fulfilling careers.
- In the past (female) partners have seen the only option to use this time to start a family. However this often sets in process the very issues that cause staff to eventually leave; e.g. access to medical care, child care, lack of wider family support, aging parents, early and critical exam stage schooling, need for boarding schools etc.
- The industry is making inroads but still has a way to go on to achieve a gender balance. This however involves issues around school subject choices, and degree level recruitment leading to in imbalances which persist through into employment.
- In the short term mines can consider job design that blurs the boundaries between mine and city-based office work.
- Technology could be used even more widely to create careers around remote access to mines and reduce the percentage of time on-site.

The new employment contract

- Mines are still being built the same way but in the future may need to re-engineered to address some of the issues described above.
- At least for larger mines or in mining districts radical ideas are needed around the development of ‘mining cities’.
- This is the antithesis of the FIFO / DIDO approach which has led to reduced mining community investment, local industry development and diversification.
- This would involve increased capital expenditure costs but should be undertaken by joint industry – government initiatives.
- Governments increasingly see large mines as a vehicle for national, regional & local development and should spend more of the income on developing the infrastructure assets.
- Companies need to increase partnering with development agencies and Governments to undertake a type of ‘community & economic terra-forming’ in terms of new economic environments, skills clusters, and infrastructure to establish more rounded economic activities.

Conclusion

So how to attract and train the next generation of mining industry professionals?

- Market forces too slow. The tangible benefits of studying mining are well known - it is more about industry attractiveness.
- The ambition to address the industry demographic imbalance by graduate recruitment alone is being only partially effective - early career staff are also continually being lost.
- The industry still has a huge perception problem and needs a sustained multi- national public relations initiative to drive home its essential role in underpinning our quality of life, and the exciting career realities. The industry is crying out for articulate high profile spokespersons with a media profile to attract young people.
- The division between work and education will blur for future students. The way in which technical aspects are taught and delivered is of secondary importance to the personal attributes being sought by companies to ensure new recruits can function in the current mining environment.

Conclusion

- What is certain is that industry and academia need to look hard at what the mines of the future will be like and then together develop the people to make them happen.

- Anglo American have been doing this from the view of technical innovation (2030 Vision) and similar projects are underway elsewhere for the social structures that mines will generate and the human capital required to support them.

So the title of this presentation was deliberate ambiguous – when I talked about training them… it is as much what industry may need to learn as it is about what we might teach potential future employees