



The Committee Secretary
Standing Committee on Education and Training
PO Box 6021
House of Representatives
Parliament House
CANBERRA ACT 2600
AUSTRALIA

29 October 2008

Dear Secretary,

Re: - Review of the Department of Education, Science and Training's
Annual Report 2006-07

The following submission is forwarded by the Australasian Institute of Mining and Metallurgy, (AusIMM), Illawarra Branch for the inquiry into the 2006-07 Annual Report of the Department of Education, Science and Training.

The AusIMM represents the interests of all facets of the minerals sector, from exploration through to metal production. As such, the AusIMM has a strong interest in ensuring that there is a sufficient supply of quality minerals related courses available at all levels, to meet the skills needs of these industries.

The Illawarra Branch of the AusIMM has taken a leading role in supporting minerals industry education and training programs as well as the on-going continuing development of those engaged in the industry. This leadership in minerals industry education is demonstrated by the Illawarra Branch having the highest percentage of student members of all AusIMM Branches throughout Australia and overseas. Similarly, the Illawarra Branch has hosted the Annual Australian Coal Operators Conference each year since 1999, to provide skills development for the nation's largest export industry. The Illawarra Branch also has the most representative membership with students, staff and industry members from both the University and VET/TAFE sectors, across the geology, mining, metallurgy/materials and environmental engineering disciplines.

The comments in this submission particularly relate to Chapter 4 of the DEST 2006-07 Annual Report, Outcome 2: Post-School Education and Training. Similar comments have also been forwarded earlier this year, to the Review of Higher Education.

In summary, the Illawarra Branch wishes to forward two key recommendations:-

1. Increase Mining, Metallurgy/Materials Engineering degree courses delivered in regional centres to the same funding cluster as Agriculture, due to their similar impact on the development of regional/rural and isolated areas.
2. A national review of mining, metallurgy/materials engineering programmes across tertiary education both VET and Higher Education, to ensure that key government strategies can be achieved.

Increase Mining, Metallurgy/Materials Engineering degree courses delivered in regional centres to the same funding cluster as Agriculture, due to their similar impact on the development of regional/isolated areas.

- Australasian Institute of Mining and Metallurgy, (AusIMM) submissions to previous national governments have outlined the need and importance of placing mining and metallurgy/materials engineering programs into the same funding cluster as agriculture. Refer to the Submission to the Review of Higher Education, (July 2008); Emerging Skills Summit, (November 2005); Feedback to the National Strategies for Higher Education, (October 2005); DEST Science and Technology Skills Audit, (June 2005); and Letter to Dr Nelson, (December 2004).
- Leaving mining and metallurgy/materials engineering programs in the same cluster group as other engineering programs significantly reduces the incentive for universities to support these programs that contribute in a major way to Australia's wealth creation.
- The past decade has seen the elimination and reduction of mining and metallurgy /materials engineering programs from Australian universities. In some cases, where the elimination/reduction hasn't happened, the programs have been placed under review and/or these disciplines combined with other sections.
- Examples include the closure of mining and metallurgy/materials at the University of South Australia, the closure of metallurgy at the University of Ballarat, absorption of metallurgy into chemical engineering at RMIT, metallurgy becoming a major within the Bachelor of Chemical Engineering, rather than a full degree and Curtin University in WA no longer running years 1 and 2 of mining and metallurgy/materials engineering degrees at Kalgoorlie. See Feedback to the National Strategies for Higher Education, (October 2005); and DEST Science and Technology Skills Audit, (June 2005)
- To establish and maintain high quality mining and metallurgy/materials engineering programs is more costly than most other parallel university program areas, due to the wide range of topics that need to be covered, including hazard identification, risk and OHS and legislative requirements.
- Many production mining professional positions require statutory licences and it greatly assists the industry and students if preparation and the underpinning skills and knowledge are gained during degree studies. To provide the experiences required for this is more costly than most other engineering disciplines.
- Extensive previous research has demonstrated that where higher education students gain their degree whilst studying in a regional university, they are far more likely to be employed long term in regional areas. This has been one of the major reasons why medical faculties have been established recently in regional universities, to increase the numbers of rural and regional doctors.

- Similarly, within the mining and metallurgical/materials industries, a far higher percentage of regional graduates remain in regional/rural mining industries, whereas graduates from capital city programs have a greater tendency to do combined commerce/engineering degrees and move into capital city-based financial/investment banking, consultancy or equipment supplier positions.
- The impact of the lack of professionals and related skill shortage on the mining and metallurgy industry can be demonstrated through the increased unit cost of production at most sites over recent years, coupled with a lowering in recovery rates. This means that if mineral resources and metal prices don't increase at faster than the inflation rate, then the margins between revenue and costs decrease and some mine sites will become uneconomic and other planned operations will not be commissioned, impacting significantly on national revenue.
- Thus, it is in the national interest for universities to be encouraged to not only maintain, but to improve the quality of mining and metallurgy/materials programs, especially those in regional centres where almost all graduates go into production sites.
- The cost of moving mining and metallurgy/materials engineering programs from their current cluster to the same as agriculture would be \$ 3,946 per full-time student in 2009. The number of full-time equivalent students at the regional universities that conduct these programs, Central Queensland, Wollongong, Ballarat and Curtin's Kalgoorlie campus is approximately 500, so that the annual cost would be estimated at \$ 1.97 million annually.
- This additional funding per student would encourage these universities to provide greater promotion for the programs and ensure that greater resources are available to improve program effectiveness.
- Whilst it would be ideal to extend the funding cluster to the metropolitan universities as well, Queensland, NSW, Adelaide, Curtin's Bentley Campus and the University of Western Australia and to other graduate programs recommended nationally, this would more than triple the cost and the effectiveness would be lowered due to the smaller percentage of graduates going into regional/remote production sites. The modest arrangement of supporting mining and metallurgy/materials engineering at regional universities, as proposed, would enable a cost-benefit analysis to be carried out at a minimal expenditure, to determine the value of a possible extension to all mineral industry disciplines at all locations at some stage in the future..

The need for a national review and co-ordination of tertiary mining and metallurgy/materials engineering programs.

- Earlier this year, in March, the Prime Minister announced that one of the priority industries for the additional Skills Australia training places would be the mineral industries. The largest part of this program is for up-skilling of existing workers at the Supervisor and Management levels, Certificate IV, Diploma and Advanced Diploma levels.
- However, data from the National Training Information Service, (NTIS) demonstrates that there are relatively few training providers of these programs.
- For example, the only Registered Training Organisations, (RTO's) for the Advanced Diploma of Metalliferous Mining are Central Queensland TAFE, (Qld, NSW and NT only), Sunraysia TAFE, (Vic only) and two private RTO's with national coverage. There is one other private RTO that delivers partial training at this level in Qld. With the Advanced Diploma of Coal Management, (the VET qualification to become a coal mine manager), there is only one TAFE provider, Central Queensland TAFE, one private provider and two partial deliverers. At the Diploma level, for Surface Mining and Underground Mining there is no TAFE Institute providing training in South Australia or Tasmania. For Mineral Processing and Metal Production there is no TAFE provider in Queensland, South Australia or Tasmania
- Similarly data from the National Centre for Vocational Educational Research, (NCVER) demonstrates that for 2003-07, enrolments in mining and processing qualifications at the Certificate IV, Diploma and Advanced Diploma levels are low and the qualification completion rates very low, both in absolute numbers and in percentages compared to other training package qualifications. The completion rate for metalliferous qualifications is about half the overall average and for coal qualifications the figure is even smaller.
(<http://www.ncver.edu.au/statistic/publications/2019.html>)

Enrolments, ('000)

	Metalliferous	Coal	Quarry	Total	All Training Package quals.
2003	2.0	4.5	0.9	7.4	790.9
2004	3.0	4.5	0.7	8.2	813.9
2005	2.1	3.7	0.9	6.7	866.6
2006	3.3	4.1	0.9	8.3	956.2
2007	5.5	3.5	0.7	9.7	985.7

Completions, ('000)

	Metalliferous	Coal	Quarry	Total	All Training Package quals.
2003	0.3	0.1	0.2	0.6	205.9
2004	0.3	0.1	0.2	0.6	211.7
2005	0.2	0.1	0.2	0.5	237.8
2006	0.3	0.2	0.4	0.9	237.0

Completion Rate %, ('000)

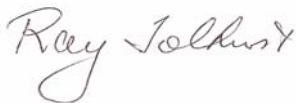
	Metalliferous	Coal	Quarry	Total	All Training Package quals.
2003	12.9	1.2	19.1	8.1	26.0
2004	11.5	1.4	23.9	7.3	26.0
2005	7.8	2.6	23.8	7.5	27.5
2006	10.1	5.8	39.3	10.8	24.8

- Within the existing providers, both at the higher Education and VET levels, mining and processing programs are often regarded as having commercial opportunities and this has led to a great deal of harmful internal competition, so that promotion and marketing is dominated by spin.
- Both the Higher Education and VET sector, institutions often see these programs as high cost, small student number, scattered, difficult to deliver programs. Thus they are often only interested as commercial activities, rather than using mainstream government-funded resources that are used to support most other industries.
- To minimise delivery costs, there has been a tendency to use technology such as videoconference presentations and computer simulations. These techniques are valuable as enhancements and support services, but a poor replacement for face-to-face learning. There is also the danger of creating Game Boy, or X-Box or Nintendo engineers who are skilled at computer manipulation, but have only a shallow underpinning knowledge to be adaptable in industry situations.
- Educational staff, especially in VET are unlikely to have colleagues and face difficulties in building economies of scale, recovering the costs of developing quality resources. This has led to the repetition of easy to develop, low-cost competencies and no resources or delivery of many core mining and metallurgy/materials skills.

- In recent years almost all of the focus from governments, Skills Australia and Industry Skills Council has been on demand and what industries want, rather than also considering supply and whether providers have the willingness and capacity to deliver.
- For these reasons there would be considerable benefit in conducting a specific review, to develop a comprehensive, national approach across the entire range of mining and processing education and training, including both Higher Education and VET.
- Such an approach could lead to the sharing of program development and delivery costs, provide far better professional support for those responsible for implementing programs and engender goodwill that isn't promoted with the current piecemeal approach.
- It is recommended that the review is conducted by a small group, chaired by an experienced education faculty academic, representatives of DEEWR, AusIMM, (the professional body), TAFE Directors Association, (the major VET provider) and a minerals industry educator who is experienced across both the Higher Education and VET sectors.

Should the Committee require additional information, or wish to discuss these issues further, please advise.

Yours sincerely,



Ray Tolhurst
Deputy Chair,
On behalf of the Illawarra Branch
Australasian Institute of Mining and Metallurgy