Attachment 5: National Reports

Australia:

AUSTRALIAN INSTITUTE OF MINE SURVEYORS

Australian Mine and Mine Surveying Report
ISM Presidium Meeting
16th ISM Congress, Brisbane, Australia

12thSeptember 2016

Dear ISM President and Presidium Members

We are honoured to be able to prepare a report on the mining industry and the mine surveying profession in Australia at your Presidium Meeting.

As with previous years, the Australian mining industry is still in a poor position. The continuing low price of resources, high cost of extraction and demand for the country's resources has maintained the unfortunate situation of an industry struggling to maintain its position as a world class supplier of minerals. This continued downturn has seen many mining operations closed, put onto care and maintenance and projects shelved due to the economic climate that still exists.

At an operational level, companies are continuing to review and reassess their expenditure to ensure that current mining operations maintain their viability. The mine's permanent workforce has seen a reduction and the use of contractors reduced, or removed altogether.

From a mine surveying perspective, the profession is becoming more unified with the 3 large mining states, Queensland (QLD), New South Wales (NSW) and Western Australia (WA)slowly aligning their registrations, assessment and renewals. Due to the various mining legislation across the States of Australia, a Memorandum of Understanding between the 3 mining larger States was established in 2015 that enables any registered/authorised surveyor in any State to move freely between States to practice their profession. AIMS was instrumental in establishing the MOU as we were able to speak for all mine surveyors across the country and initiate talks between the States' Surveying administrators.

In Queensland, the regulation of mine surveyors has seen the assessment of competency for the various fields of mine surveying (Open Cut, Underground Coal and Underground Metalliferous) separated, to allow specialisation in one field and allow a simplified approach to competency assessment, especially for those surveyors only working in one mining environment. This approach has been recognised by the other regulated States as an easier way to administer conflicts with mutual recognition of survey registrations, whereby restrictions are required when transferring between States that do not have assessment for certain aspects of mining e.g. WA does not have any operating underground coal mines therefore their survey board does not assess for competency in that field.

New South Wales has recently seen a change in their survey and drafting standards where there has been a harmonisation of metalliferous and coal legislation. An additional change this year has seen the regulation of coal sea gas surveys.

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AUSTRALIAN INSTITUTE OF MINE SURVEYORS

In Western Australia the government is in a process of legislative change for its mining industry. Along with this legislative change, the government is proposing to remove the Mine Survey Board and its requirement to issue certificates of competency for mine surveying.The statutory position of the mine surveyor would still be legislated but the organisation required to administer mine surveyors would no longer be under the control of a government department. AIMS has been focused on helping the Department of Mines and Petroleum to identify the correct actions to take during this period of change and as such has made a submission to the department identifying aspects of the authorisation process which needs to be maintained or added. It is AIMS belief that having a similar situation to QLD and NSW, whereby the States' regulatory surveying board encompasses all surveyors, land, engineering or mining, would have the best result for mine surveyors in WA.

Callum McNaughton
Director

Chris Moy
Director

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China:

National Report from ISM China Committee

1. China bids for the host of the 18th ISM congress in 2022

Congress Time: Around October, 2022

Congress place: Beijing, China

Organizers:

China Coal Technology & Engineering Group,
China University of Mining and Technology (including Beijing),
and more than 10 universities, institutes, and societies.

During the meeting of ISM China Committee in Lianyungang city, Jiangsu province in May 2015, all delegates from China University of mining and Technology (including Beijing), Henan Polytechnic University, Liaoning Technical University, Shandong University of science and technology, and other delegates, has agreed that CCTEG takes the leader to applying for the 18th ISM congress in Beijing in 2022.

China Coal Society greatly supports China ISM to bid for the 18th congress in 2022.

2. Nominations of ISM commission members

ISM China committee recommends Prof.Xu Liangji as the member of ISM commission 6. Prof. Xu Liangji works in Anhui University of Science and Technology. Now he is vice president in Institute of Surveying and mapping of Anhui university of Science and Technology. He is also the member of the professional committee of China Coal Society. He is young, kindly and warmhearted to serve ISM.

3. Work done in 2015

ISM China Committee attended ISM presidium meeting（Part A）and ISM commissions meeting held in Czech Republic in 24-26 June 2015

ISM China Committee（ISM No.4 committee, ISM No.6 committee）China University of mining and Technology (Beijing) and China Coal Technology & Engineering Group co-organized ISM presidium meeting（Part B）and 2015 International academic forum for mine surveying in Beijing in 16-18 October 2015. The key topics are the strata movement control and mine surveying technology. The ISM President and two vice Presidents all attended meeting. The academic forum is very successful.

4. Work arrangement in 2017

ISM China Committee plans to host International academic forum for mine surveying in Huainan City, Anhui Province, in October 2017. We sincerely invite Dr. Andrew Jarosz, Professor Axel Preusse, Professor Anatoly Okhotin, and ISM members to attend the meeting. Huainan City is near famous Mount Huang, and attendees can visit her scenery.

ISM China Committee

6 September,2016

Hungary:

NATIONAL REPORT OF HUNGARY, 2016

44TH ISM PRESIDIUM MEETING (Dr István HAVASI)

Brisbane, Australia, 12-16 September 2016

In the frame of the ***Hungarian National Report*** the following topics will be discussed shortly:

1. **Training at the Department of Geodesy and Mine Surveying (Faculty of Earth Science and Engineering, University of Miskolc).**
2. **Present situation referring to mine surveying/mine surveyors in Hungary.**
3. **Professional event(s) which can be connected to home mine surveying and matters of legal regulation.**
4. **Production of mineral raw materials in 2015.**

1.

1. My department works in training structure of the Faculty of Earth Science and Engineering. At present all the students study in Bologna (BSc, MSc) multi-cycle linear training system either full time or part time schedule. The training time is, in general, 3.5 years for BSc students and 2 years for MSc ones. As far as ***my Department*** is concerned our teaching activity (***1st term of 2015/2016 /bold/*** *and 2nd term of 2015/2016*) can be seen in Table 1.

Table 1. Bologna training at the ***Department of Geodesy and Mine Surveying*** in the last year

BSC TRAINING		
Subject	**Branch**	**Term/Number of students**
Geodesy (2 l + 2 p, 4 credits)	Earth Science and Engineering	autumn (1st term) ***73***
Mine Surveying (1 l + 2p, 3 credits)	Earth Science and Engineering, Mining and Geotechnical Specialization	autumn (5th term) ***9***
Basic knowledge in GIS (2 l + 2 p, 4 credits)	Earth Science and Engineering	spring (2nd term) *42 + 9*
Geodetic basics in GIS (2 l + 2 p, 4 credits)	Environmental Engineering	autumn (1st term) ***9***
Mapping (2 l + 2 p, 4 credits)	Geography	spring (2nd term) *10 + 7*
Geodesy and GIS (2 l + 2 p, 4 credits)	Geography	autumn (5th term) ***14***
Digital mapping (2 p, 2 credits)	Geography	spring (6th term) *12*
MSC TRAINING		

Subject	Branch	Term Number of students
GIS (2 l + 2 p, 3 credits)	Petroleum and Natural Gas Engineering; Mining and Geotechnical	autumn (1st term) ***8 + 7*** *(part time)*
Geodesy and GIS (2 l + 2 p, 4 credits)	Earth Science	autumn (1st term) ***6***
Geodesy and GIS (English) (2 l + 2 p, 4 credits)	Earth Science and Hydro-geological Engineering	autumn (1st term) ***9 + 14***
Mine Surveying (part time, 3 credits)	Mining and Geotechnical Engineering	autumn (3st term) ***11*** *(part time)*

2.

- **On** July 27th, 2016 **there were** 175 **chartered mine surveyors in Hungary.**
- The certificates of **57** chartered mine surveyors are valid for both ***surface and underground mining***.
- There are **5** ***new*** certificates for ***hydrocarbon special field*** (including the establishment and operation of petroleum, petroleum products, and other hydrocarbon pipe systems with the exception of natural gas as well).
- The number of chartered mine surveyor's certificates for ***surface mining*** issued by the ***Hungarian Mining Bureau*** is: **112**.
- There is **1** certificate for **both surface mining and hydrocarbon special fields**.

3.

- **The** *LV. Jubilee Conference on Mine Surveying* **was organized** *in Budapest* **on** *June 8-10th, 2016***. The main topic was "*** *The 50-year-old Mine Surveying Group of Hungarian Mining and Metallurgical Society and the 25-year-old Foundation of Hungarian Mine Surveyors* **". In the frame of a technical tour the Company 'Baumit' producing various constructional primary materials and its limestone mine were visited by the specialists and guests in Dorog. At this conference there were about** *90 participants***, and** *12* **presentations (9 oral and 3 poster ones) were delivered. Of course, there were other professional, traditional and cultural programmes as well.**
- *XVI Forum on Mine Surveying* **was hold in Budapest on** *November 10th, 2016***. There were more than** *60 participants***. At the forum actual professional and legal questions which refer to measuring, mapping and entrepreneurial activities of chartered mine surveyors were discussed in a circle of the concerned specialists. The participants were also informed about the problems and consequences related to** *reorganizing mining authorities and planning a new credit system for licensing chartered mine surveyors***.**

- *A professional day* **(consultation one) was organized about "***Producing mining maps***" by the Hungarian Geological and Mining Bureau in Budapest on February 1st, 2016. The result of that was a proposal for layer division and structure of mining maps in the future.**
- **The** *legal regulations* **referring to mine surveying has been** *modified* **at the beginning of 2013.**

2. It relied on the governmental decrees as follows (prevailing from 5 January 2013):

3.

4. 10/2010.(III.4)KHEM

5. about the scale and content of mining maps and

6.

7. 12/2010.(III.4)KHEM

8. about the chartered mine surveyor.

9.

10. As a result of these modifications *usage of digital data bases and digital maps is compulsory***. There were** *alterations* **in connection with the** decree about the *chartered mine surveyor* **that is to say** *12/2010.(III.4)KHEM* **was modified again this year.**

11. The introduced *new decree* **is:** *5/2016. (III.17.)NMF* **in which in the process of being a chartered mine surveyor the earlier necessary special qualification exam was cancelled. At present the required academic qualification and the special mine surveying practice (4 years) for the requested field are compulsory for an applicant.**

4.

As far as the production of various mineral raw materials is concerned, data of the last two years can be found in Table 2. Changes in percentage of each material are involved in the last column of Table 2. In connection with ***solid mineral raw materials*** you can see that there was a decrease of ***9.81%*** in ***total production***. You can see a significant large decrease of ***88.2%*** in ***production of coals***, and more than **3%** (**3.2%**) increase in case of ***lignite***. The production of ***ores*** also decreased very significantly with ***42.5%***. A ***pretty large increase*** is characteristic for ***peat*** (***76.8%***), and a very low increase for ***clay*** (***1.2%***). A significant decrease can be seen in case of ***other materials (21.3)***, and the production of ***construction materials*** also decreased (for sand and gravel with ***18.7%***). **7.8%** increase is characteristic for stones. The production of ***crude oil*** increased with ***6.8%***, and it

is decreased with ***2.1%*** for the ***natural gas***. A nearly ***8%*** (***7.7%***) increase can be seen in case of ***carbon dioxide***. The production of raw materials for a ***period of 2004 and 2015*** are illustrated in Figures 1 and 2.

Table 2. Comparing the production of mineral raw materials in Hungary considering the last two years

Mineral raw materials	**2014 [m^3]**	**2015 [m^3]**
Coals	195218	**23026** (***-88.2%***)
Lignite	7216868	**7449876** (*+3.2%*)
Ores	6035	**3471** (***-42.5%***)
Peat	168740	**298339** (***+76.8%***)
Clay	1921742	**1945704** (*+1.2%*)
Sand and gravel	21690706	**17625282** (*-18.7%*)
Stones	6638608	**7159140** (*+7.8%*)
Other	3333403	**2623075** (*-21.3%*)
Total [Mm^3]	*41.17*	***37.13 (-9.81%)***
Crude oil [Mt]	0.59	**0.63** (*+6.8%*)
Natural gas [Gm^3]	1.93	**1.89** (*-2.1%*)
Carbon dioxide [Gm^3]	0.13	**0.14** (*+7.7%*)

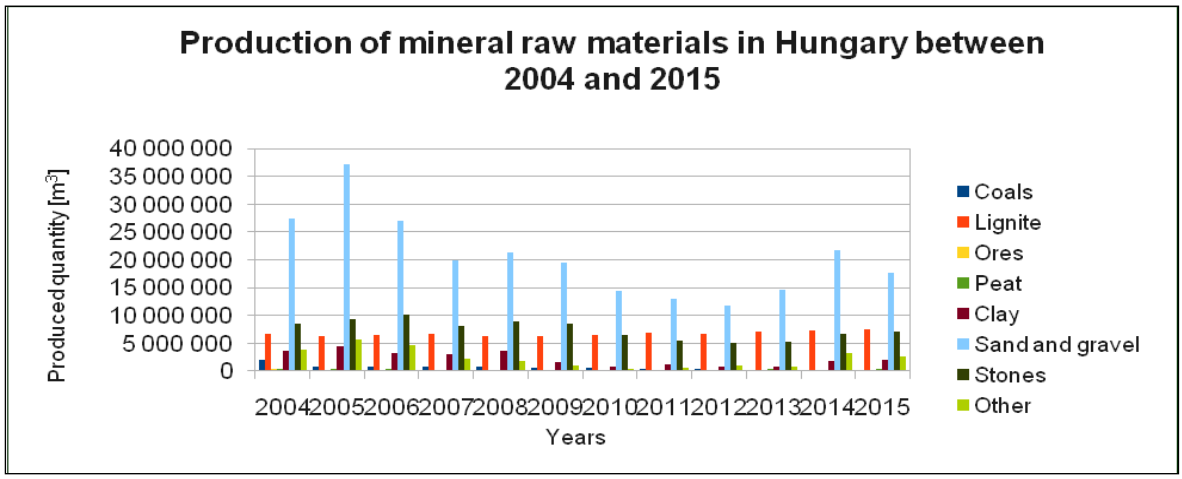


Figure 1. Production of solid raw materials

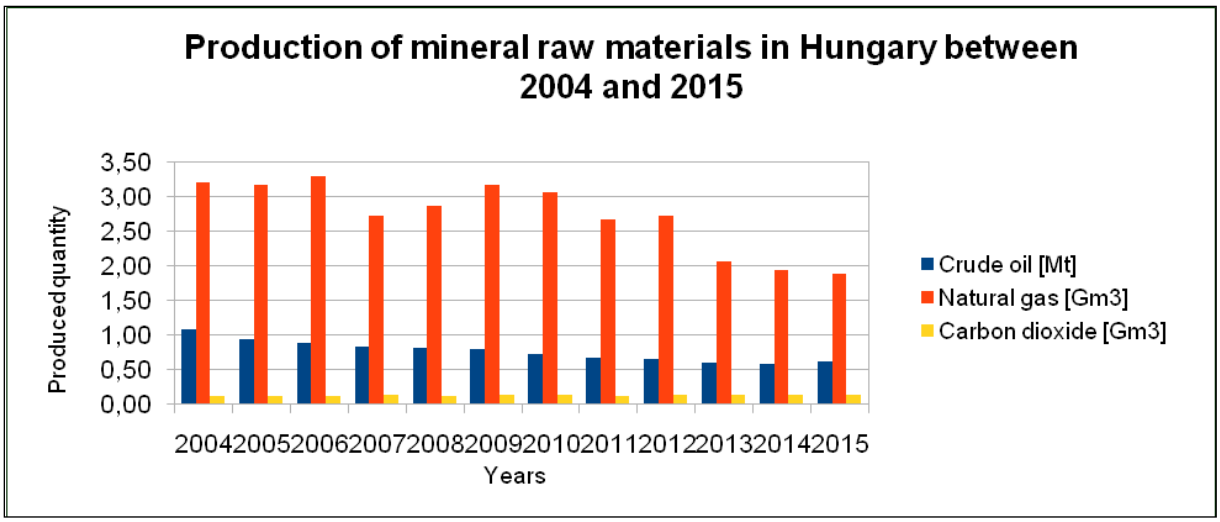


Figure 2. Petroleum and gas production

Poland:

An extensive National Report from Poland is provided as a separate document.

United Kingdom:

United Kingdom's Mineral Report
ISM Congress 2016
Brisbane

This report covers the current position for which statistics are available regarding the mineral industry in the UK. These are available for the period leading up to the summer of 2013. The facts and figures contained within are as derived from the UK Agg-Net, The Coal Authority, The Minerals Products Association, the Office for National Statistics and the British Geological Survey.

Construction Materials

According to the Mineral Products Association, UK mineral products industry makes the following contribution to the economy:

1. Annual production is 250mt with an industry turnover of £9bn
2. Turnover for industries that are supplied comes to £400bn employing 2.5 million.
3. The construction industry itself is worth £120bn and employs 70,000 individuals.

According to the MPA quarterly report of July 2016, Even though there had been a contraction in the construction industry from May 2015 to May 2016 of 4.5% there was an improvement in the sales of aggregates, ready mixed concrete and asphalt in the second quarter. Following a poor first quarter, second quarter sales volumes increased by 3.5% for crushed rock aggregates, 3-4% for ready-mixed concrete and 11.5% for asphalt, all compared with the same period of January 2016.

According to the 2014 Minerals Products Association (MPA) report "The Mineral Products Industry key Facts at a Glance", aggregates production for 2013 is made up of the following**:**

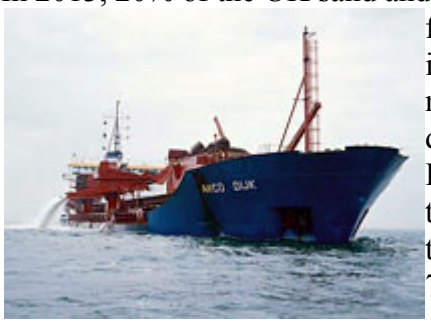
Crushed rock	90m tonnes
Land won sand and gravel	44m tonnes
Marine won sand and gravel	10m tonnes
Recycled	56 m tonnes

Other mineral products such as agricultural lime, cement, asphalt, dimension stone, totalled sales of 70 million tonnes.

According to Agg-Net in August 2016 around 500 companies operate in the UK concrete products industry which has a total value of £1,800 million with the aggregate building block industry worth £400 million.

Marine aggregates

In 2013, 20% of the UK sand and gravel needs in England and Wales were derived from marine sources. The MPA report for 2012 indicates that licensed dredging areas are around six miles offshore and are in water more than 20 metres deep, so avoiding any possibility of coastal erosion. In 2014 the Crown estates indicated that 16.94 m tonnes of sand and aggregates were dredged from their licensed areas. The total licensed areas total 726 km^2 and dredging took place within 85.66km^2.



Recycled and Secondary Aggregates

Materials suitable for use as recycled or secondary aggregates fall into two broad groups:

1. Demolition and construction materials - 60 per cent are already used as aggregates and fill
2. Industrial by-products such as:

    - colliery spoil - widely used for bulk fill
    - china clay waste - used in some areas as mortar and concreting sands
    - power station ash (PFA) - used as a cement substitute within Ready Mixed concrete and for block making
    - blast furnace slag from the iron and steel industries - used as aggregates and when ground to form Ground Granulated Blast-furnace Slag as cementitious materials
    - used railway ballast
    - iron and steel slag
    - slate

The use of recycled aggregates in the UK has stabilised, with the share of 28% of aggregate supply, being more or less constant over the last 5 years. The MPA report of 2014 indicates that this share is 8% higher than the next highest share in Europe which is from the Netherlands. The average share across Europe is 10%. This high percentage reflects well on the industry and the development of appropriate protocols governing standards for recycled aggregates. The constant share of the last 5years also indicates that the use of recycled and secondary materials in Britain is close to full potential.

Energy Minerals

In 2015, UK oil production was 13.4% higher (49.5 million tonnes; 598 billion barrels of oil equivalent (boe)) and natural gas 7.8% (39.7 million tonnes) higher than in 2014, which reversed recent declines. Total energy production across oil, gas coal and primary electricity stood at 123.9 million tonnes of oil equivalent. There are potential recoverable reserves of 8.8billion boe and sanctioned reserves of 6.3 boe.

UK indicates that there has been record investment in 2015 of £11.6bn and for 2014-15 paid £2.2bn in production taxes. UK Government statistics indicate that for 2016, just over 330,000 jobs in the UK will be delivered through or supported by oil and gas production. In 2008 the UK ranked 14th in the list of major oil- and gas-producing countries. Today it now ranks 25th (indexmundi figures 2016).

Metalliferous Minerals

At a cost of £130 million, Britain's first metal mine in 40 years has open at Hemerdon near Plymouth, Devon. Owned by Wolf Minerals it aims to produce 3,000 tonnes of tungsten and tin annually.

Hemerdon mine; courtesy of Wolfminerals.com.au

Coal

The UK still depends heavily on coal as a source of fuel for power stations where 2015 figures indicate that it supplies 30% of electricity generation; down from 36% in 2014. However 2015 also saw the last large deep underground coal mine (Kellingley) in the UK close in December of that year. UK Government figures indicate that domestic coal production in 2015 is now only 8.6 million tonnes while imports stand at 24 million tonnes, with Russia the largest supplier with a share of 38%. (Imports also come from the USA and Columbia). From 2014 to 2015, demand for coal reduced from 48 million tonnes to 37 million tonnes.

Total employment in the coal sector for 2015 was 1,975. The following table is based on UK Government statistics for 2015.

Year	Underground	Opencast	Total UK	Underground mines	Opencast sites
2015	**2,784,000 t**	**5,814,000 t**	**8,598,000 t**	**5**	**17**

Education

Mine surveying education in the UK is focussed on MSc awards in minerals surveying at Northumbria University and at Cambourne School of Mines, Exeter University. The Northumbria course is a part time distant learning award, while the Cambourne course is a full time award. Both awards are accredited by the Royal Institution of Chartered Surveyors and enable graduates to obtained their professional qualification and membership of the Minerals and Waste Management Faculty of the RICS. In total, both awards have around 20 students currently enrolled. Employability for both awards is excellent with most graduates entering the Minerals surveying and land surveying industry, both in the UK and abroad.