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The GB mining industry

Purpose of the paper

1. To provide an overview of the British underground mining sector and the current HSE approach to engagement and intervention. The sector has major hazard potential which is a function of confinement plus the presence of hazards including toxic, flammable or explosive atmospheres, ground collapse etc (see paragraph 7). It is regulated through specific mining health and safety legislation and Hazardous Installations Directorate mines inspectors equipped with specific competencies. The sector is distinct from surface mining (of coal or other minerals) which has a different risk profile (which although significant, has less major hazard potential), has its own specific legislation, is inspected by specialist quarries inspectors, and is not covered by this paper.

Background

2 The attached annex provides more detail, but in the last 30 years, the sector has seen:

- The **privatisation** of British Coal in 1994
- Continuation of **long term contraction** from around 200 to only seven major **deep coal mines** plus around 20 smaller underground coal mines, most of which are micro-businesses employing single figure numbers
- A broadly static number of other **mineral underground mines** (about 23) but the near disappearance of the South West tin-mining industry.
- The emergence and rise in the numbers of **tourist mines** to around 40.
- **Increasing use of deep mines for other purposes** e.g. waste disposal and storage of documents, valuable artefacts and military equipment
- **Increasing foreign ownership and control** of producing mines.

3 The underground mining sector as a whole now employs around 4,500. Coal mining accounts for around 3,500 and the mix of a small number of large employers with a remainder of small and micro-businesses creates challenges both for the industry and for the regulator.

4 The coal sector retains a strategic value to the country as deep mines produce around 15% of the coal burned in Britain's thermal power stations. Energy generators, steel producers and a number of other energy intensive industries are dependant on domestically produced coal. As the data in the Annex indicates, the UK still has significant coal reserves and at current levels of consumption, will significantly outstrip production under any likely scenario. Rises in international prices have increased the interest of UK operators in exploiting more reserves and of

investors in UK coal mining prospects. UK coal producers are therefore likely to be able to sell every tonne that they can produce, provided operators are able to maintain efficient underground activity.

5 The rock salt sector plays a major role in keeping road arteries open during severe winter weather and maintaining sufficient production and stocks is strategically important to the economy. British potash production underpins a large part of the European agricultural fertiliser manufacturing industry. Domestically produce gypsum is important to the country's construction sector. Barytes production supports a number of energy industries, being an important constituent of drilling mud for oil and gas wells and an ingredient in the heavy concrete used for radiation shielding.

6 The number of HSE mines inspectors has also reduced. The Mines Inspectorate within HID comprises 2 electrical engineers, 3 mechanical engineers, 5 mining engineers, plus a Chief Inspector, who is a mining engineer. HSE is currently recruiting another mining engineering inspector to replace a recent retiree. The resource is sufficient for current priority work but the recruitment position is liable to become more difficult due to the diminishing pool of experience within the sector. Most inspectors are over 50 and HID will be undertaking a review of the current recruitment strategy.

The hazards

7 Although the size and structure of the industry has changed dramatically, the major safety hazards in underground mines have not. In spite of the fact that mining technology has improved and greater quantities can be mined more efficiently, the principal hazards are still those of fire, explosion, inrushes of water or gases, rock falls, transport through shafts, mass transport below ground and the use of explosives in very confined spaces. In common with other major hazard sectors, ageing critical plant such as winding systems places a premium on effective asset integrity management. The potential for catastrophic accidents therefore remains. The inrush at Gleision mine in South Wales in September 2011 killed four miners. In future, novel ways of exploiting underground coal reserves – such as underground coal gasification – may result in fewer or no employees underground and a shift in hazard profile towards the handling of large quantities of hydrocarbon gases.

8 There is a relatively low potential for off-site risk. Legislative changes after the 1966 Aberfan disaster have largely eliminated the risks from the failure of spoil heaps and other mines waste disposal facilities.

9 Working conditions have improved greatly over the years, but there is still significant potential for exposure to a range of hazardous dusts, gases and other substances and proper control of exposure to coal dust and respirable crystalline silica remains a priority for the coal sector. Other current occupational health issues include musculoskeletal disorders (arising mainly from the use of vibrating equipment) and uncertainties around the long-term effects of working in hot and humid conditions.

Argument

Sector health and safety performance

10 Recent reported accident statistics are shown below. The relatively low number of major injury accidents in this small sector makes statistical analysis difficult but there have been 15 fatalities in GB mines since 2006, most recently the 4 deaths at Gleision, and a fatality at the UK Coal Kellingley Colliery in Yorkshire nine days later. These locations of these incidents illustrate the range of size of mining businesses. Gleision was a micro-business and the entire workforce of seven was underground at the time of the inrush. Kellingley is one of the few remaining large deep coal mines and directly employs 650 plus about 150 contractors. Investigations into these recent accidents continue, but HSE conclusions from completed investigations over this period confirm that the root causes lie consistently in poor management of major hazard risks and in safety leadership.

	06/07	07/08	08/09	09/10	10/11	11/12
Fatal	4	2	1	2	1	5
Major	37	40	40	36	38	29
Over 3 day	227	246	229	221	197	187
Dangerous occurrences	34	23	48	25	31	43

11 The prevalence rates for occupational respiratory diseases have fallen but due to the long latency periods, new cases continue to emerge - mainly among retired miners. Legislation introduced in 2007 tightened the controls on inhalable dusts in coal mines and should bear down further on pneumoconiosis rates in the long term. Engineering controls on diesel exhaust emissions and mineral cutting machines are widely used but have probably reached the limit of what is practicable in terms of better control. Further exposure reductions may be achieved by modifying working practices.

HSE intervention approach

12 The Mines Inspectorate uses a range of intervention techniques with the industry. The focus of planned interventions is the control of major hazard risks at producing mines through effective safety management systems. The mining sector generally lags behind other major hazard sectors in the sophistication of its approach to risk analysis and the ability to identify and monitor major hazard precursor events. In common with HID approaches in other major hazard sectors, therefore, current efforts are targeted on better analysis of the underlying system weaknesses, the importance of proper safety leadership and better performance measures - particularly leading indicators. Mines inspectors use the risk ranking approach common in other parts of HID both to compare dutyholder performance and to target intervention priorities.

13 A separate paper updates the Board on proposals for consolidating mining-specific health and safety legislation. However, the industry has been accustomed to a regulatory approach relying heavily on prescription coupled with, in some circumstances, a high level of permissioning from the regulator. HSE has begun to shift this emphasis towards a more goal-setting approach familiar in other major hazards work, particularly in the area of risk analysis. This focus is a major strand of

the current intervention effort. In other parts of the world, such as Australia, where the mining industry is more buoyant, there are signs of an increasing move towards a risk-management approach to oversight of the industry.

14 In the last 12 months, inspectors have served 30 notices at mines (the split between improvement and prohibition notices is around 2:1) mainly covering major hazard issues such as provision and maintenance of roof supports, control of spontaneous combustion risks and controlling risks of inrush and ground movements. In 2011, HSE prosecuted a mining company owner for the deaths of four people in four separate incidents yielding £1.2m in fines and costs. Several more prosecutions are pending.

15 The Mines Sector Strategy was drawn up in close collaboration with a wide range of industry stakeholders. The strategy addresses the key topics of improving leadership, developing and reinforcing competencies, management of major hazard and health risks, and safety performance measurements. HSE senior management input was a key factor in supporting employers and the various trades unions working collectively on the development of the strategy.

16 HSE has worked closely with key industry stakeholders to develop a tripartite successor to the Mining Industry Committee. The Mining Industry Safety Leadership Group (MISLG) was established at the beginning of 2011 and is intended to be more strategic than the MIC and the main mechanism for engagement between HSE and the industry. Many of its members were closely involved in shaping the Sector Strategy, which it has adopted in full. This is still a relatively new body, however, and it is still too early to gauge its effectiveness, though it has prepared an implementation programme to deliver some of the key objectives in the Strategy.

17 Separately, inspectors are influencing the Boards and senior executives of the larger mining companies directly and have met representatives of most of them in the last year, some of them several times. Inspectors also engage directly with the Trade Unions to help them identify what more they can do to play their part. There are a number of interventions planned to look at the effectiveness of the safety representative function at mines.

Action

18 The Board is invited to note:

- The description of the underground mining sector
- The current intervention approach.

Paper clearance

19 At SMT 6 June

ANNEX

GB mining industry

1 The GB mining industry is now relatively small and comprises around 100 mainly small and medium-sized mines. Only five mine owners employ more than 500 people (four of these are part of larger companies whose deep mining interest are not their main business). It has complex stakeholder and employment relationships, and employs around 6,000 people in total, of whom no more than 4,500 work below ground. Employment levels are currently stable

2 In the past, mining was viewed as an attractive graduate career. However, with the sustained contraction of the sector, this is no longer the case, and the majority of the workforce is established, ageing and almost exclusively male. In recent years, the industry has experienced a significant influx of foreign workers, predominantly from within the European Union and in some mines they account for more than 10% of the workforce below ground.

Coal mining

3 In the early part of the 20th century, all coal produced in the UK was from underground mines – and peaked at nearly 300m tonnes per year. Around this time there were about 600 mines in Wales alone. The industry has contracted dramatically since then and particularly over the last few decades.

4 There are currently 12 operational underground coal mines in Great Britain. UK-registered companies run them all, but several are funded by significant overseas money. The largest company, UK Coal, owns mines at Daw Mill in Warwickshire (the UK's largest but currently subject to potential closure by early 2014), Kellingley in Yorkshire, Thoresby in Nottinghamshire and Harworth near Doncaster (currently mothballed). Peel Holdings (British) holds about a fifth of the shares.

5 Hatfield Colliery near Doncaster is 90% owned by the owned by Entero BV, a Dutch holding company. Aberpergwm mine in South Wales is US-owned. Maltby colliery is part of the British-owned Hargreaves Group, which also owns the other 10% of Hatfield Colliery and provides the management competence. Chinese companies are apparently looking to acquire coal licences in South Wales, and Tata Industries (India) are looking at developing a significant coal mine at Margam, near Port Talbot.

6 Coal Authority statistics indicate that in 2010 underground coal mines employed around 3,500 workers and produced around 7-8 million tonnes from around seven large and about 20 smaller mines. The large mines are in Yorkshire, Nottinghamshire, Warwickshire and South Wales. Most small mines are in South Wales and the Forest of Dean. For comparison, from the 1940s to the late 1950s around 700,000 miners were working; in 1975 around 250,000 miners were employed in more than 250 collieries in the public sector alone but by 2000, this had fallen to around 15,000 miners. See figure 3 below for recent figures.

7 Total coal production is shown in figure 1 below – about half of this is from underground mines. The economic viability of accessing Britain’s remaining coal reserves these is difficult to assess and varies with the price of coal. But the market for coal in this country has been strong in recent years averaging 60m tonnes, with consumption at power stations accounting for some 50m tonnes (see figure 2).

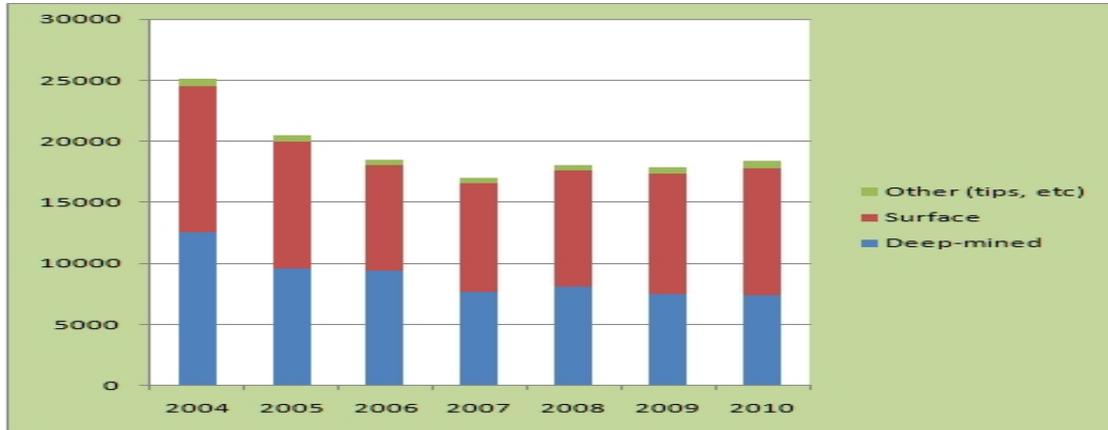


Fig 1 coal mining output (x1000 tonnes) 2004-10

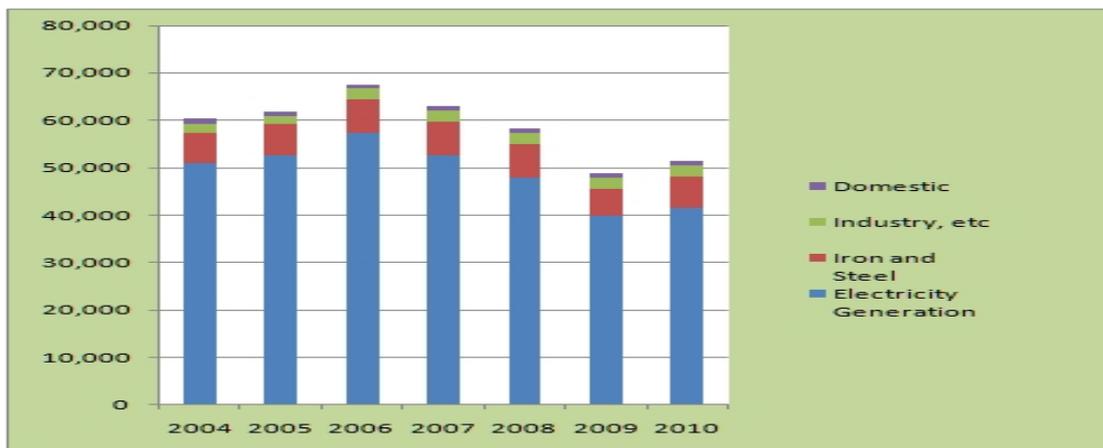


Fig 2 coal consumption (x1000 tonnes) 2004-10

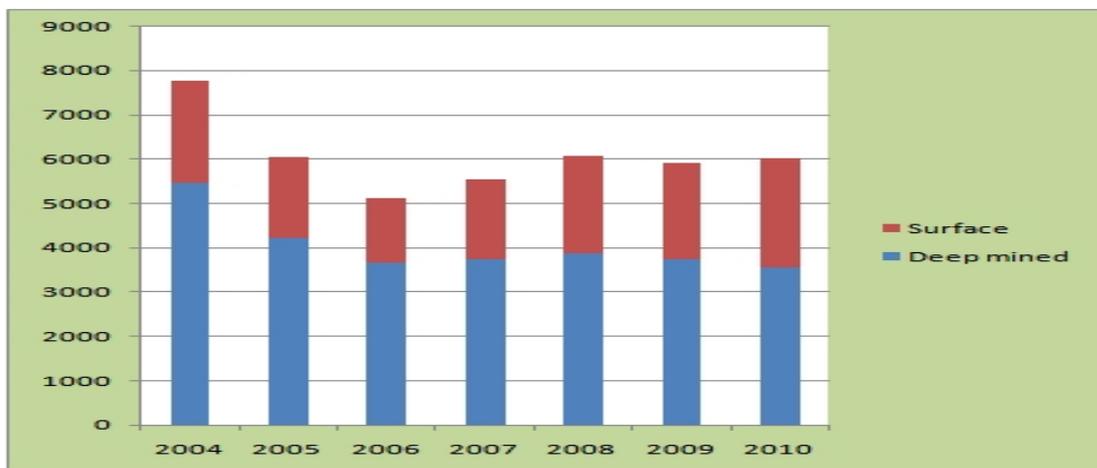


Fig 3 coal mining employment 2004-10

Non-coal mines

8 At present there are 23 underground mines working other minerals. They are geographically more evenly spread than coal mines and employ around 1300 people. Britain's largest, deepest and highest-output mine at Boulby on Teesside is a potash and rock salt mine employing over 700 below ground. One company operates a group of five gypsum mines and there is another large rock salt mine.

9 The rock salt sector is significant as it plays a major role in keeping the roads open during winter months, and maintaining sufficient production and stocks is strategically important to the economy. British potash production underpins a large part of the European agricultural fertiliser manufacturing industry.

10 Much of the larger segment of the non-coal sector is also backed by foreign investment. The Boulby mine is owned by a subsidiary of The Israeli Chemicals Group. British Gypsum is part of the French St Gobain Group. Foss Mine (where barites are mined) is part of a US conglomerate. Winsford Salt Mine is also US owned. Currently there is a large borehole exploration programme close to Whitby, North Yorkshire, which is assessing the prospects for a second large potash, rock salt and polyhalite mine. If this goes ahead then it will be some ten years before full production is achieved from what will become one of Britain's largest and deepest mines.

11 There are also around 40 mines used for tourism, storage, training and adventure activities, while one active mine is also used for the long-term disposal of special wastes.