

**Spring 2025**

## **Chairman's Chat**



Welcome to the Spring edition of the Mining Technology Group (MTG) newsletter. The first quarter of 2025 was a busy one for the leadership team, particularly on events. Several colleagues were involved in organising and/or presenting at our main conference (below) in March, and in IOM3 webinars or affiliated local society events as their traditional lecture season neared its end.

Regular readers will know that recent newsletters featured updates on progress towards the MTG 2025 conference *Advances in Mining Technology and Mineral Supply* in Birmingham. The event has now been and gone, having taken place on 19-20 March 2025. Thanks to all the preparation by the MTG conference subcommittee and IOM3 Events team, the conference was a successful and enjoyable one at a wonderful venue. A few members have already been asking when the

next one might take place! Once again, our sincere gratitude to all the sponsors, exhibitors, presenters and delegates, some of whom travelled from Australia, Canada, Finland, Hong Kong, South Africa and Trinidad, for all their significant and invaluable support. A more detailed review can be found on later pages. In similar vein to the cross-discipline themes we ran at the MTG conference, Andy Birtles CEng FIMMM has written a short outline of the European Bank (EPRB) ESG guidelines for metal smelting and refining.

Speaking of Andy, he has recently decided to step down from MTG editorial duties. I wish to thank him greatly on behalf of the MTG for all his extensive time and efforts on developing and producing the MTG newsletter since its inception in 2016. Without his dedication and perseverance, and a little bit of his inimitable provocation, it wouldn't have become such a key part of the MTG activities for members. Continuing from the previous newsletter, our 'Mining Education Matters' section includes Part 2 of an IOM3 article about mining sector skills, featuring MTG leadership team members Andrew Fulton CEng FIMMM, President of the Mining Association of the UK, and Prof Patrick Foster CEng FIMMM, Head of Camborne School of Mines.

This edition includes another heritage article, this time by David Johnson on the DOSCO company design, manufacture and support of underground mining equipment. 'News and views' focuses largely on developments in the UK mining space, whilst our very active Ground Engineering Subgroup showcases its webinar series in collaboration with Hong Kong members, plus other event activities. The newsletter closes with updates on PERC activities and IOM3 affiliated local society events.

On a more sombre note, it is with great sadness that I share with you the recent news about the passing of Dr Geoffrey Walton (25 October 1939 - 25 February 2025). His funeral took place in Charlbury on 16 April. Having spent his early career as geotechnical engineer for the NCB Opencast Executive, Geoff set up in 1973 what is now named GWP Consultants LLP. He obtained his PhD in mining engineering from Nottingham University and was visiting professor of mining at Leeds University for 20 years from 1995. Whilst there he diversified and in 2004 established the current firm DustScanAQ. A Fellow of IOM3, Geoff continued to forge links between academia, professional bodies and industry. Those who knew him will remember a true entrepreneur with rigorous standards and an irrepressible character. The foregoing is in memoriam of Geoff pending a full obituary to be made available to IOM3 and the MTG. Meanwhile, we express our sincere condolences to his family.

Finally, my usual invitation to get in touch if you need more information, through our dedicated email address [mtg@iom3.org](mailto:mtg@iom3.org).

## Stop Press

### Cononish gold mine - new investment

Acrux Sorting Technology has taken a majority stake in SGZ Cononish Limited, Scotland. The objective is to reopen the mine and return it to commercial production for the longer term. See page 4 for details.

### MTG 2025 conference review

*Advances in Mining Technology & Mineral Supply* took place over two days (19-20 March) in Birmingham. The MTG is pleased to report a successful, enjoyable and well-received event (see page 9).

### Interested in joining the MTG leadership team?

The [MTG leadership team](#) is the spine of activities for members in one of the three largest technical communities within IOM3. If you feel compelled to volunteer your valuable time and input as we evolve, please send an expression of interest to [mtg@iom3.org](mailto:mtg@iom3.org), marked for the attention of the MTG Chair.

## Upcoming events

### UK mining conference in Cornwall

11-12 June 2025, Princess Pavilion, Falmouth, Cornwall

Two-day event with pre- and post-conference activities. More details can be found on the event [website](#).

### Geometallurgy 2025

30 June–2 July 2025, IOM3, 297 Euston Road, London, UK

The [conference](#) is the fifth in a series which started in 2014. It is organised by the Mineral Processing & Extractive Metallurgy Group, which alongside the Mining Technology Group and Applied Earth Science Group is one of three extractive industry groups within IOM3.

### IOM3 Annual General Meeting 2025

4 September 2025, IOM3, 297 Euston Road, London, UK

Details to be confirmed.

### IOM3 - M3P3 - Materials, Minerals & Mining for People, Places, Planet

11-12 November 2025, Millennium Point, Birmingham, UK

Get ready for [M3P3](#)! The new, flagship IOM3 event, where our community unites to drive sustainable transformation and celebrate innovation in an engaging, collaborative atmosphere. #WeAreIOM3

### ABMEC Annual Conference

26-27 November 2025, Doncaster Racecourse and Exhibition Centre, UK

Two-day conference in association with MAUK - The Mining Association of the UK. Details to be confirmed - check the ABMEC [website](#) for updates.

### Resourcing Tomorrow 2025

2-4 December 2025, The Business Design Centre, London, UK.

Claimed to be Europe's largest mining event, [Resourcing Tomorrow](#) will this year centre on the main theme of 'Securing Metals & Minerals, Empowering the Future'.



Source: IOM3

## IOM3 contacts

A question often asked is where to find a list of IOM3 management/staff with contact details. [It's here!](#)

## Editorial team

Colin Comberbach, Andy Birtles and Darron Dixon  
IOM3 contact - David Arthur ([david.arthur@iom3.org](mailto:david.arthur@iom3.org))

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## News and Views

### MTG Leadership

#### Cononish gold mine - a new dawn

Having closed in late 2023 for operational and financial reasons, Cononish gold mine at Tyndrum, Scotland has the prospect of a brighter future. In March 2025, the following [press release](#) was announced by Acrux Sorting Technology, which has offices in Johannesburg, South Africa and London, UK:

#### **Acrux Sorting Technology Announces Long-Term Investment**

Acrux Sorting Technology ('AST') is proud to announce a strategic investment in SGZ Cononish Limited ('Cononish'), the only commercial gold mine in Scotland, located within the Loch Lomond and The Trossachs National Park. This investment, which will place AST subsidiary, Acrux Gold Limited as an 80% majority owner of Cononish, marks a significant step in AST's commitment to expand into the mining of high-value commodities while it continues to develop innovative and integrated business solutions that deliver long-term benefits for the environment, local communities, and the mining sector.

Gold has stood the test of time, proving throughout history to be a resilient and valuable investment. Today, its relevance and appeal are stronger than ever. With this broad perspective and as the global demand for gold continues to grow, Scotland presents a unique opportunity for sustainable and prosperous development in the sector. AST's investment in Cononish reflects its confidence in the future of gold mining in Scotland and its commitment to strengthening the sector through responsible and sustainable operations. 'This is a transformative opportunity for both AST, Cononish and surrounding communities. The growing value of gold presents an exciting investment landscape, and we are committed to ensuring long-term success while adhering to the highest environmental and social economic standards,' said Sean Browne, CEO of AST.



Source: Unsplash – Niklass Weiss

#### **Commitment to Economic Growth and Environmental Responsibility**

AST is determined to be judged by how it treats the environment and measures its success by the positive impact it has on the local economy.

This partnership will see Cononish recapitalised and returned to operation, and the final restoration complete rather than the site being abandoned. The investment will bring new jobs and stimulate economic activity in this remote Scottish region.

#### **Strong Engagement with Regulators and Local Authorities**

Acrux Sorting Technology extends its gratitude to Crown Estate Scotland and Loch Lomond & The Trossachs National Park Authority for their willingness to engage and give clear advice in making this venture possible. Their expertise and guidance have been invaluable in ensuring that this investment aligns with both environmental and community interests.

'We're honoured to work alongside the local governing bodies. Our shared vision for sustainable growth gives us confidence in a bright future for both Cononish and the Scottish gold sector, creating long-term value and setting a benchmark for responsible mining,' concludes Sean Browne.

#### Methane explosion at Polish coal mine

A methane fire broke out in KWK Knurów-Szczygłowie, Ruch Szczygłowie, in the morning on Wednesday 22 January. There were 44 workers in the affected area, all of whom were withdrawn and transported to the surface. As a result of the incident, 16 people were injured and given medical

attention.

The most injured workers were transported to specialised hospitals in Siemianowice Śląskie, Gliwice, Rybnik, Knurów and Kraków, among others, to accurately diagnose their injuries. The causes of the incident are being investigated by the State Mining Authority, the District Mining Authority, the State Labour Inspectorate and the employer's services. The incident occurred in longwall XVII, seam 405/1, below the 850m level.

## Cornwall Mining and Geo-Resources Alliance

The [Cornwall Mining & Geo-Resources Alliance](#) (CMGA) was launched on 14 March 2025 at the Eden Project, Bodelva, Cornwall. The success of the event was marked by bringing together over 80 people from those working in the sector and key supporters, including MP Perran Moon, Cornwall Trade & Investment and the Cornish Chamber of Mines and Minerals. Industry speakers from Cornwall's geo-resources sector shared valuable insights on the future of mining and resource management in the region.

Building on the foundations of the former Cornwall Mining Alliance the CMGA describes itself as 'a dynamic new platform that connects businesses and organisations across the Geo-Resources value chain, with a focus on promotion, collaboration and innovation with a global outlook'.

## The Disused Mine and Quarry Tips (Wales) Bill - Update

In the last newsletter, it was outlined that on 9 December 2024 the Welsh Government had introduced [The Disused Mine and Quarry Tips \(Wales\) Bill](#). Described as the first of its type in the UK, it proposes to establish a Disused Tips Authority for Wales to manage disused coal and non-coal tips. The Bill proposes:

- to establish the Disused Tips Authority for Wales to ensure that disused tips do not threaten human welfare by reason of their instability;
- to make provision for the assessment, registration and monitoring of disused tips;
- to contain provisions that enable the Authority to deal with tip instability and threats to tip instability e.g. powers to require a landowner to carry out operations and provisions in respect of payments
- to contain supplementary provisions including powers of entry for the Authority, information sharing provisions and powers to require information; and
- to create related offences to support the enforcement of the regime.



Source: Unsplash – Elisabeth Jurenka

The Bill was referred to the Welsh Parliament Climate Change, Environment and Infrastructure Committee for Stage 1 scrutiny. The Committee agreed the following terms of reference:

- The general principles of the Bill and the need for legislation to deliver the stated policy intention.
- The Bill's provisions, including whether they are workable and will deliver the stated policy intention.
- The appropriateness of the powers in the Bill for Welsh Ministers to make subordinate legislation.
- Whether there are any unintended consequences arising from the Bill.
- The financial implications of the Bill

The Committee undertook a public consultation between 10 December 2024 and 17 January 2025. It received 28 responses from organisations (25) and individuals (3). Notable respondents included [IOM3](#) and the Health and Safety Executive (HSE). A series of oral evidence sessions with external witnesses included legal experts, representatives from public authorities (some being disused tip owners), the environmental sector, and the mining and quarrying sector.

The Committee published its [Stage 1 report](#) on 4 April 2025, with thirty recommendations. Details of those and written consultation submissions and oral evidence sessions can be found in the report.

The Welsh Government Deputy First Minister and Cabinet Secretary for Climate Change and Rural Affairs [responded](#) to the recommendations on 24 April 2025.

## Early days of Dosco

### David Johnson

A significant period of the past and prosperity of Tuxford owes much to coal. Located centrally to many coal mines in the North Notts and South Yorkshire Coalfield and Several Trent Valley coals fired power stations. Tuxford was the home of Dosco Overseas Engineering Ltd. from 1963 to 2014. The UK coal industry has almost disappeared but should not be forgotten!

### Salient points

- A Hawker Siddeley Company intrinsically linked to the UK coal industry
- Design, manufacture and support of underground mining equipment
- Major employer in North Nottinghamshire
- Exporter to 45 Countries around the world

Total number of machines produced	2,760
At the peak, employee complement	1,000+ employees and several 100s of sub- contractors.

### Origins

In the early 1950s, a Hawker Siddeley Group Company, Dominion Steel and Coal Company (DOSCO), based in Nova Scotia, Canada developed the Dosco Miner, a coal mining machine. The machine was designed for use in its own coal mines in Canada but with the potential to be used elsewhere in the world. Dosco Overseas Engineering Ltd. was established in 1956 to market and support the Dosco Miner in Europe.

Colonel Ivan Elmer Leek, an experienced UK Mining Engineer was appointed as Director, and a Head Office opened in Beaconsfield, Buckinghamshire, along with a Field Office in North Nottinghamshire, the centre of the UK mining industry at the time.

During the early 1960s it was agreed that Dosco should have its own facilities rather than rely upon the use of sub-contractors. Land and buildings became available at

Tuxford at a former World War II army camp earlier purchased by Walkers Transport. Dosco acquired a significant part of the site. Traditional wooden barracks were converted into office space. The rifle range became the first workshop.

Staff were recruited from several sources:

- Dosco HQ personnel who had since moved to Planar House, Aylesbury
- The main sub-contractor, George Moxon Mining of Doncaster
- Employees of other sub-contractors
- Very importantly, seeking to employ local residents

The 1960s saw a huge surge in the mechanisation of underground coal mines globally. The introduction of hydraulic roof supports onto longwall coal faces resulted in the demise of coal winning machines such as the Dosco Miner. An opportunity existed to mechanise the drivage of roadways eliminating the traditional drill and blast methods.

A modified Russian PK3 Machine at Ellington Colliery prior to field trials Dosco was invited to partner with the National Coal Board (NCB) in modifying two Russian PK3 roadheaders to become acceptable in UK coal mines. The machines proved successful on field trials and Dosco pursued the development of an upgraded British designed and manufactured Roadheader, the Dosco Roadway Cutter Loader (DRCL). The first machine shipped out of Tuxford was a DRCL to Snibston Colliery in 1964, and was the first of 270 such machines over the following 14 years until superseded by the Dosco MK2A.



First roadheader 1964  
Source: David Johnson



NCB inspection of the first DRCL  
Source: David Johnson

# Mining Education Matters

## Critical period for mining skills (Part 2)

**Alex Brinded**

This is the second part of an article written by Alex Brinded, reproduced from *Materials World* in January 2025. The full article is accessible on the [IOM3 website](#).

### In the detail

The apprenticeship required an industry specification and approval by the Institute for Apprenticeships and Technical Education, before sign-off from government.

An Occupational Standard details the knowledge, skills and behaviours needed to perform an occupation competently, and an independent End Point Assessment Plan is required for the programme.

The trailblazer group developing the specification consisted of Foster, Fulton and Mines Rescue Service Limited CEO Stuart Hoult FIMMM, led by Neil Battison FIMMM – Principal Inspector of Electrical Engineering in Mines at the Health and Safety Executive. They considered the future of mines and their management domestically and internationally, consulting with MAUK members and operators.

After a wider consultation with the UK's Mines Qualifications Committee, the specification was signed off in October 2022, with the process taking a record 18 months.

The group identified 28 knowledge requirements, 20 skills and eight behaviours (KSBs) in the standard, upon which Camborne built a programme and syllabus.



Source: A Birtles

Given the distance to Exeter University, industry called for a blended learning model with online delivery, along with two-week Camborne residentials and site visits.

Topics include digital automation; environmental, social and governance; as well as business skills. The programme developers believe the site-based activities are a unique aspect of the apprenticeship, using UK mines as classrooms, with all the apprentices undertaking their assessments through vocational activity. This provides an opportunity for them to see and work in other operations.

The apprentices also carry out a Mine Challenge Project, by studying

the reopening of a small fluorspar mine in a national park. There are bi-yearly meetings with employers and an experienced academic mentor visits the apprentices every couple of months.

'We wanted people to go and see the industry, what everything else was all about, and share experiences and get together as a group. And I think that's worked really well,' Foster reflects.

'The Degree Apprenticeship is the pinnacle of the industry's well-formed and well-rounded vocational route to qualifications and competence. Ready built for those wishing to take the lead in an exciting sector managing hazards and technical challenges in an innovative and responsible manner. The operators mutually support it, public perceptions are changing, careers are available... There is no reason not to be positive.'

The first 14 students on the Degree Apprenticeship, who started in September 2023, bring a range of experiences – from mine surveyor, rockbolt coordinator, shift supervisor to a mine manager from a small bathstone mine.



Source: © Minerals Matter

### In the shadow of your headgear

With the size of the UK industry, Foster says the course would run two-or-three times if it only trained experienced mining professionals.

'You've got to be responsible for your own talent pipeline,' Foster tells industry. 'You can't rely on Camborne. You've got to recruit in the shadow of your headgear, look for local talent, 18-year-old school leavers, and then if you like them, send them on the Degree Apprenticeship.'

There are two 18-year-olds in this year's cohort, one from Cornish Metals and another from British Gypsum. 'And if this course is going to sustain in the long term, I need those companies to carry on identifying and recruiting talent themselves and sending them to Camborne.'

Foster also has three international students on an equivalent pathway run in parallel to the apprenticeship, a benefit of the blended learning model.

Foster says the skill shortage and the very high age profile of the mining industry is worrying people, and companies have been aware of it for a while, although the boom-bust nature of the sector has exacerbated the problem.

## Perception problem

Foster adds, 'I don't think people know enough about the industry and where the critical metals that make up their phone, computers and Xboxes come from.'

'We need to move away from mining being imaged by flat caps and whippets to artificial intelligence and drones, or virtual reality and automation,' says Fulton. 'The mining industry is hugely different in the UK to what it was 20 years ago when we were built around the coal industry.'

A working group, involving IOM3, the Mineral Products Association, the Critical Minerals Association (UK), MAUK, Mineral Products Qualifications and the Institute of Quarrying, wrote an open letter to UK university leaders setting out the essential role of materials, minerals and mining in modern society. This was after some universities blocked mining companies from attending their careers fairs. The letter signatories 'collectively aim to combat misinformation and decision-making that is inconsistent with the need to increase sustainability and address the climate crisis'.

Meanwhile, the UK Mining Education Forum wants to equip museums with a future perspective of mining and minerals, as well as a historical one.

## Showcasing the possibilities

Also, mining can be a gateway into lots of other industries, notes Foster, with many employees historically ending up in oil and gas, but also banking, the food sector and teaching.

He himself only became interested in the sector after a Royal School of Mines representative came to his school. 'I didn't think about it at all until that. [For me] mining takes the best bits of every type of engineering degree – of civil, mechanical and electrical.'

Competence in all those engineering aspects opens up possibilities. Many graduates working at mines may become mine managers or company executives, while others might be in service companies and consultancies.

Indeed, the revamped Mining Engineering undergraduate course involves first-year students studying engineering with undergraduates on other degree programmes. Foster is then hoping an inspiring group of friendly CEOs and others from the industry will promote mining careers.

He is also 'trying to raise a massive scholarship war chest at the moment', so that all graduates could be offered scholarships and guaranteed mentoring.

What's on Foster's wish list for boosting uptake of students? 'In an ideal world, somebody like IOM3 should be taking the lead in coordinating industry, academia, alumni and professional associations to try and promote our industry. We can't all compete against each other. We've got to work together and try and promote our industry better. That's my wish.'

Foster says that while the focus on critical minerals might irk some of those in the industry that sees all mining as crucial, he notes the topic is well-defined in highlighting supply issues. 'We have just got to get on the back of it if it helps sell our industry and helps us all do better.'

The time is now he asserts. 'We work for the world's most essential industry that has probably never been as essential as it is now with the green transition. We now have a once-in-a-generational opportunity to try and make mining attractive to young people. If we can't do it now, we never will – use the energy transition as a motivator.'



Source: A Birtles

## Conference round up

### MTG Leadership Team

### Titanium circular production webinar



Source: IOM3

This event was organised by Cheryll Pit and the IOM3 team for the 2 April. As part of an MTG collaboration with the IOM3 Non-ferrous and Light Metals Group, our own Andy Birtles gave a presentation relating to the mining of mineral sands with a focus on Africa. Unfortunately, the paid work got in the way and Andy was in Poland undertaking insurance risk surveys on several mines in the Upper Silesian Coal Basin! The presentation was [recorded](#), with assistance by the IOM3's James Lee, who had broken his ankle while playing rugby! It all goes to show the commitment to the IOM3 by salaried members and volunteers alike!

### MTG 2025 Conference Report

The Advances in Mining Technology and Mineral Supply conference, hosted by the Mining Technology Group (MTG) and organised by IOM3 Events, took place from 19–20 March 2025 at IET Austin Court, Birmingham. The two-day event of over 100 registered delegates from the extractive industries brought together a diverse group of stakeholders including mine developers, academic researchers and



Keynote panel

Source: IOM3 Events

technology providers to explore how cutting-edge innovations are reshaping the mining sector.

Opened by IOM3 President, Christine Blackmore, the conference featured eight core themes, including UK mineral supply for mining, mine surveying/exploration, mine design/operations, AI applications, big data and 3D modelling, mine safety, mineral processing, and downstream materials and rehabilitation. Presentations were given by a range of operating companies, including Cornish Metals, Imerys British Lithium and Tarmac in association

with and GEARS who highlighted innovations such as optimised ore sorting, directional diamond drilling, advanced mine planning, lithium extraction and AI-driven fragmentation analysis. Geokinetic's muon tomography for subsurface imaging was a fascinating comparison to British Gypsum's advanced mine surveying. Another standout presentation by Archie Mining Services from Hong Kong introduced Electro Power Impactor (EPI) technology, offering a low-impact alternative to explosives in urban environments.

The main keynote paper was presented by Dr S Walker (of Redpath Deilmann UK and President, Midland Institute of Mining Engineers) on



Keynote speaker - Dr S Walker

Source: IOM3 Events

Innovative Approaches to Rapid Shaft Sinking in Diverse Geological Conditions, with a preamble about the Mining Leadership Group.

AI was a recurring theme, with firms like ERG Industrial, New Gradient, Intellisense.io, and Absolute Geotechnics demonstrating how machine learning and real-time data optimization are transforming blasting, crushing, and resource modelling. Mining One and Maptek illustrated the uses of big data in mine design and development.

A series of presentations on mineral processing, metals recovery from mine water/waste and steelmaking technology completed the conference mining lifecycle approach.



Student group

Source: IOM3 Events

A highlight of the conference was the panel discussion 'Powering Future Mining Education & Practice with Technology'; speakers emphasised the importance of innovation as part of outreach and STEM engagement. One memorable anecdote involved schoolchildren visiting a quarry to see how classroom subjects connect to real-world mining technology—an initiative praised for inspiring future talent.

By extension, it was encouraging to see a cohort of student delegates attend the conference, all of whom seemed to enjoy the learning experience and expressed their appreciation for the support of their sponsors (in particular the Mining Institute of Scotland Trust) to enable them to attend.

The event included a conference evening dinner at the historic Birmingham Council House, a Victorian-era building completed in 1879. Known for its grand architecture and civic significance, the Council House provided a fitting backdrop for networking and celebration and befitting of the UK and global mining industry added a touch of heritage to the forward-looking conference.

The conference sold out of all available gold, dinner and lanyard sponsorships and exhibitor places. We are extremely grateful to all the sponsors, exhibitors, presenters and delegates, some of whom travelled from Australia, Canada, Finland, Hong Kong, South Africa and Trinidad, for all their significant and invaluable support.



Conference dinner  
Source: IOM3 Events

### Gold Sponsors



### Dinner Sponsor



### Lanyard Sponsor



### Event Supporters



### Exhibitors

Transmin Metallurgical Consultants • Maelgwyn Mineral Services Limited • Zeiss • Mining One Consultants • SLR Consulting Limited • GEARS • Cornish Metals • Maptek • Bam Ritchies • Land and Minerals Consulting Limited

Overall, the event was praised for its strong organisation, diverse participation, and valuable networking opportunities. It underscored the mining sector's pivotal role in the green transition and the need for continued innovation and collaboration.

All delegates who attended will be entitled to receive a digital copy of the proceedings and can opt in for a printed hard copy book for a nominal fee.

## MIMinE 18<sup>th</sup> Safety Seminar

This excellent annual event was held on the 11 April and was hosted by the Midland Institute of Mining Engineers (MIMinE) at the Crowne Plaza hotel, Sheffield. Overall, the event was very successful, building on the learnings from 2024. It was attended by a large audience (238 registered delegates), with a wide range of ages, experience and disciplines. Over 60 organisations were represented and noticeably the attendance of young engineers was in excess of 30. They included James Stokes and Thomas Burford, who compiled and presented an excellent paper 'Ensuring Safety in a Deep Shaft sinking operation - Tubbing Lining at Woodsmith Mine'. The MTG will be featuring excerpts from the paper in future newsletters. Talks and discussions were also held by our very own IOM3 and MTG leadership team members, namely Christine Blackmore, Jim Shields and Andrew Fulton.



Source: Thebusinessdesk.com

# Metal Smelting and Refining

**Andy Birtles**



Source: EBRD

The European Bank for Reconstruction and Development has issued, as part of its Sub-sectoral Environmental and Social Guidelines series, guidelines for Metal Smelting and Refining. As mining engineers, we are not usually 'into' this sort of thing, but the 'savvy' mining engineer of the 21<sup>st</sup> Century does need to understand what other disciplines need to consider in the development or expansion of a mining project or operation.

The guideline covers the production of non-ferrous metals from mineral concentrate. (The production of this concentrate is covered in the Mineral Processing guidelines). The processes used for smelting and refining of most metals are similar and illustrated in the diagram below. Aluminium refining is covered separately. Not all processes will be used for each metal. The production of concentrated mineral is covered in the Guideline on Mineral Processing.

The guideline covers the following:

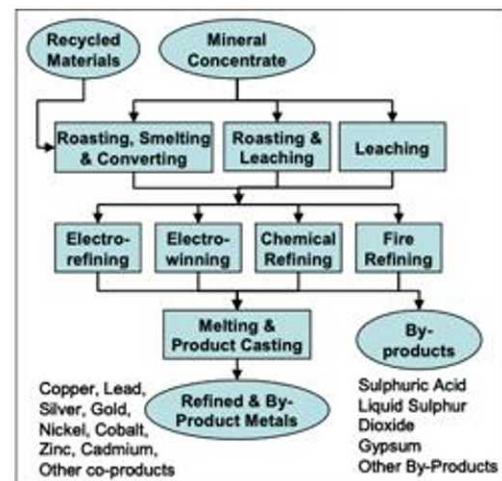
- Roasting
- Smelting
- Converting
- Leaching
- Electrowinning
- Electrorefining
- Chemical Refining
- Fire or Anode Refining
- Casting
- Aluminium
- Recycled metals

The document then covers the following key topics:

- Key Environmental, Health and Safety Risk/ Liability Issues
- Other Environmental, Health and Safety Risk/ Liability Issues
- Key Social, Labour and Community Risk/ Liability Issues
- Other Social, Labour and Community Risk/ Liability Issues
- Financial Implications
- Improvements

The document then offers some guidance on what to inspect during initial due diligence site visits. It also contains some references which some readers of the guidelines might find useful.

The document then finishes with some guidance as to Action Plans that should be developed for achieving appropriate improvements.



Source: EBRD



Source: riotinto.com

## PERC News

**Andy Birtles**

### PERC AGM

This year's PERC (Pan European Reserves and Resources Reporting Committee) AGM was held on 26 April in Karlsruhe, Germany where it was hosted by the Karlsruhe Institute of Technology. The meeting was a hybrid event and was attended by some 10 persons in Karlsruhe including IOM3 PERC representative Fiona Cessford, and some 20 persons virtually including IOM3 representative and deputy chair, Andy Birtles.

### Update on PERC members, officers and committees

Ed Sides stepped down as Chairperson at the PERC AGM in April, as he has now been elected Chairperson of CRIRSCO, and is unable to continue in both roles. Antonio Maldonado, the current Secretary, has indicated that he is willing to take up the role of Chairperson with continued support from the Deputy Chair, Andy Birtles. The position of Secretary then becomes vacant. If any members would be interested in taking on this role, please contact Ed or Antonio to find out more.

Further, there are several sub-committees, including the Communications Sub-committee and the Finance and Regulatory Sub-committee who would welcome people who can actively participate and develop appropriate strategies for the present day.

### Considerations regarding Public Reporting

The committee that is probably the most active is the PERC Standard Update Sub-committee, and a lot of initiatives have been considered, including the development of the following documents:

- Competent Person's Report (CPR)
- CPR Contributors
- PERC 'An Integrated Approach' 2025
- PERC Update 2027

These initiatives are summarised below:

The context of a Competent Person's Report is that it is prepared as a Public Report using a PERC Mineral Project Evaluation Report (MPER) and compiled cognizant of the assessment criteria of PERC Table 1 and which fulfils the requirements of the PERC Reporting Standard 2021 as supporting documentation.

CPR Contributors are proposed to be as follows:

- A Lead Competent Person is a Competent Person who is appointed to lead a team of specialists
- A Technical Specialist is a specialist in the Minerals Industry
- A Registered Professional is an expert who is not a specialist in the Minerals Industry
- A Responsible Person is a person employed or nominated by a Mineral Company

As an aside, these specialists registered with the IOM3 would probably need to hold the Qualified for Minerals Reporting (QMR) accreditation.

An Integrated Approach to Public Reporting and Non-Public Reporting under the PERC Reporting Standard is in draft form, and is being developed to provide a logical, consistent and systematic approach to the estimation, assessment, evaluation, classification and reporting for all Mineral Deposit Types

The objective of the PERC Update 2027 is to expand the scope of the PERC Reporting Standard 2021 beyond its current focus on Public Reporting only, to include more detailed guidance for PERC users on Non-Public Reporting of all Mineralised Material



Source: PERC

## Ground Engineering Subgroup (GES) Activities

### Emily Wood

The [Ground Engineering Subgroup](#) would like to take this chance to advertise a few upcoming events in 2025.

### Webinars

The following webinars are open to all who wish to participate, and have a distinctive Hong Kong theme.

More information will be posted on the [IOM3 website](#) and to our email group closer to the time of the events listed below.

#### June Webinar - Natural Terrain Hazard Assessment



Source: ResearchGate

Dr Carlos Lam from GEO

18 June 2025 at 12:00 GMT - [free registration online](#).

Natural terrain covers over 60% of Hong Kong's land area. As urban expansion continues, development is steadily encroaching upon the steep natural hillsides that border the urban areas. The close proximity of these slopes to urban areas, combined with seasonal torrential rainfall, inevitably increases the risk of landslide-related casualties. Since its establishment in 1977, the Geotechnical Engineering Office (GEO) has been conducting studies and implementing measures to reduce landslide risk in Hong Kong. This presentation highlights the latest advancements in natural terrain hazard assessment and engineering, including the selection of hillside catchments for study, numerical modelling of landslide debris, mitigation

strategies, design of mitigation measures, landslip investigations, and the adoption of innovative technologies such as Building Information Modelling (BIM) in the design of mitigation measures.

#### September Webinar - AI in Geotechnical Engineering

Angus Maxwell

17 September 2025 at 12:00 GMT in association with Hong Kong GES members.

### In case you missed it!

One of our esteemed Ground Engineering Subgroup committee - Jim Shields - did an excellent presentation for the 18th Annual Safety Seminar organised by the MIMinE in Sheffield. The main key points being the benefits of being a member of IOM3, professional recognition, the importance of registration and highlighting the peer review of competence.

The presentation also focussed on the key requirement of keeping your CPD valid and up to date. Remember there is a IOM3 workshop available on CPD.



Source: IOM3

### Contacts

With our collective efforts and determination, we are striving to make 2025 a successful and fulfilling year. Please continue to 'spread the word'. If you wish to hear more or get involved please contact:

- David Waring (Chair) [david.waring@uk.bp.com](mailto:david.waring@uk.bp.com)
- Iain McKechnie (Vice Chair) [iain.mckechnie@bam.com](mailto:iain.mckechnie@bam.com)
- Emily Wood (Secretary) [emily.wood@bam.com](mailto:emily.wood@bam.com)

## Affiliated Local Societies' news and events

### MTG Leadership

Most of the seasonal meetings will have been completed by the time this newsletter is published. The details of each local society are repeated for anyone who wants to join in, attend or contribute. Additional information relating to Affiliated Local Societies can also be accessed from the [IOM3 website](#).

### CorIE

Meetings are generally held at the Chapel Lecture Theatre, Penryn Campus, Penryn, Cornwall, commencing at 6:00 pm. Additional information can be accessed on the [IOM3 website](#) or from [secretary@thecornishinstituteofengineers.com](mailto:secretary@thecornishinstituteofengineers.com)

### MIMinE

Meetings are generally held on the second Thursday of the month at Knottingley or Mansfield Mines Rescue Stations, with video conference facilities for those who cannot attend in person at the MRSs at Rhondda and Fife, usually commencing at 4:00 pm. Additional information can be accessed at [www.themime.org.uk/events/](http://www.themime.org.uk/events/). **Please check for venue details prior to attendance.**

### MIS

Meetings are generally held on the second Tuesday of the month, with video conference facilities for those who cannot attend available, commencing at 7:00 pm. Additional information can be accessed on the [IOM3 website](#).

### MinSouth

Meetings are generally held on the second Thursday of the month at various venues, usually commencing at 7:00 pm. Registration prior to the event is required. Additional information can be accessed at [minsouth.org.uk/](http://minsouth.org.uk/). The last event for the first half of this year is as follows:  
12 June 2025 2025 MinSouth Quiz: Test Your Knowledge! Doggett's Coat and Badge, London

### NEIMME

Meetings are generally held on the second Thursday of the month at Neville Hall in Newcastle upon Tyne, with video conference facilities available for those who cannot attend, commencing at 6:00 pm. Additional information can be accessed at [mininginstitute.org.uk/](http://mininginstitute.org.uk/).

Our colleagues at the North East Coast Joint Branch NECJB of IMarEST and RINA welcome all NEIMME members to their events in 2024-25. Their events programme is available on the [NEIMME website](#). Please contact [office@mininginstitute.org.uk](mailto:office@mininginstitute.org.uk) stating an interest in getting involved with:

- Arranging professional training events
- Helping to run NEIMME's lecture series and lecture recordings
- Judging the institute's prizes
- Writing or editing NEIMME's publications and quarterly newsletter
- History and science fair volunteers

### WIMM

Meetings are generally held on the first Monday of the month at the William Smith Building of Keele University, usually commencing at 7:00 pm. The meetings/ lectures can also be attended using the Zoom application. Additional information can be accessed from the [IOM3 website](#).