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TWO BULK TERMINAL BLASTS LEAVE LESSONS TO BE LEARNED

Two explosions in bulk terminal facilities in the course of a month. The one in Beirut was far more disastrous than the one at a grain store in Tilbury — although the latter is a far more common occurrence. And, of course, in the case of the former, the disaster would never have occurred but for the continued problem of substandard and unsafe shipping that lead to a vessel, together with its crew and dangerous cargo, being abandoned by its owners in the port of a close-to-failed state. But that is another issue.

Two of your Chief Executive's most senior advisors have kindly agreed to give their take on events.

Professor Mike Bradley is Director of the Wolfson Centre for Bulk Solids Handling Technology at the University of Greenwich and sits on the ABTO Members Advisory Panel.

Captain Richard Brough OBE is Head of ICHCA International and Director of Brough Marine Limited. Last October at our Amsterdam Bulk Terminals conference, Richard and I signed an MoU on behalf of our organisations to coordinate efforts on international issues of common concern, safety being high on the list of priorities.

Richard, who was interviewed by the BBC in the aftermath of the Beirut explosion, makes the case for "The need for constant vigilance" where health and safety is concerned. Mike draws parallels between Beirut and Tilbury, the two incidents being predictable and avoidable — appropriately entitling his contribution "An explosive question".

Captain Richard Brough OBE – The need for constant vigilance

The recent terrible incident in Beirut should be a timely reminder to all who operate ports and terminals that the cargoes you handle and store, either routinely or exceptionally — as was the case with this impounded cargo of bagged Ammonium Nitrate (AN) — should be kept under constant review from a health, safety and regulatory perspective.

Even the most innocuous of cargoes can be become a serious issue if the handling and storage methods are not suitable for the environment in which operations are being carried out. It is also no excuse if you are unfamiliar with the product as there is a plethora of guidance and regulatory material, and considerable expertise available from associations such as ABTO and its affiliate organisation ICHCA.

It is not inconceivable that some terminal staff are ignorant of the potential dangers inherent in a cargo such as AN, but as the old adage goes "ignorance is no defence in law". Incidents with AN go back a long way (Texas 1947) and there have been many since. In response to major incidents in Europe, the Sevsco Directive was developed. This not only ensured that the cargo and its storage should be thoroughly risk assessed, but also the impact on the surrounding hinterland. Are there any major industrial installations nearby, urban centres, yacht marinas and leisure facilities and so on?

DP WORLD STICKS WITH ISPEC

Port operator DP World has signed a major multi-year deal to continue its deployment of iSpec, a leading web and mobile-based software procurement solution for buyers of capital-intensive equipment.

DP World, which offers end-to-end supply chain logistics solutions via its 123 business units in 54 countries, is a long-term supporter of iSpec, the core product of lifecycle contract management specialist Remy InfoSource. After signing its first contract for the deployment of iSpec in 2006, the latest contract renewal by DP World takes the partnership through to 2025.

"We are delighted DP World has had so much success deploying the iSpec Lifecycle Contract Management solution for managing its global procurement of strategic equipment and has signed up for another extended collaboration via this contract renewal," says Pieter Boshoff, chief executive of Remy InfoSource.

Online functions for managing procurement in iSpec cover everything from the drafting of contracts and tender publication through to commissioning and final handover, making the switch to remote project management seamless, the company says.

For further information about ABTO

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In the UK, this was transposed into the COMAH Regs (Control of Major Accident Hazard). If you wish to handle and store AN there are rigorous procedures to go through, including a through risk assessment. You have to apply for approval from the HSE and the local authority and lodge a set of your local rules for the handling, amount of cargo to be stored and expected maximum amount of time the cargo will be in transit, beyond that it is classed as storage and the rules are even more stringent.

Many terminals have had their requests turned down because of adjacent risk issues.

Even for in transit AN, the intended storage facility faces precautionary measures, packaged AN (usually in big bags) must be set in 300 tonne lots with a one metre space between parcels, gaps all around the shed walls for access, for extinguishers on each piece of handling equipment, drains, and culverts sealed to prevent cargo getting inside, spills dealt with immediately, appropriate signage, security control (remember AN is an explosive — usually for commercial use — but the favourite ingredient of illicit bomb-making), even matters such as avoiding contamination from oil, grease, sawdust etc must be considered.

Was this considered when the AN cargo was stored in Beirut? We should not speculate, but given the length of time the cargo was stored and the resulting explosion, probably not.

AN is an internationally regulated cargo, either the IMDG Code for packaged cargo and the IMSBC Code for bulk product, and we all remember the disaster on the MV Cheshire off Las Palmas a few years ago.

However, the IMO, who are responsible for these provisions do not legislate ashore. There are no international regulations covering shore-side facilities (apart from the ISPS Code). Ports and terminals are not regulated that way. A recent symposium at IMO suggested that they should be. It would, however be inherently difficult.

It is therefore up to individual nation states to develop their own port regulations (and ports their own bylaws) for such matters. IMO helps by developing recommendations, and it have one on handling and storing dangerous cargoes, but it is a high-level treatise advising governments on what they should include, or consider, in any national legislation.

Many nations follow this — the UK and EU (which has collective rules) are an example. But what about other nations? What have they done? Even if they have, do they police the regulations and audit companies to ensure they are being followed? In the case of Beirut, the jury will be out for a long time, but the answers, when they come, will reveal some shortcomings, beyond a doubt.

All the more tragic then, so much loss of life, so much devastation and a country already on its knees, brought further down because of lack of adherence to established principles for handling cargo.

ICHCA has seen many examples of such practices around the world, so Lebanon is not unique. That is why, along with our partners, we are developing a "dummies guide for DG in ports". The idea has been around for a while; it now has a greater sense of urgency.

Professor Mike Bradley – An Explosive Question

A large bang at a port. Severe damage to a grain terminal. Not once, but twice in the past few weeks. A reminder that handling of bulk solids in ports brings substantial safety hazards that need to be controlled with care.

Tilbury Grain Terminal was built in 1969 and operated without major incident other than the odd fire, until 3 July this year, when an explosion ripped through one half of the silo block, destroying conveyors, elevators and head house. Fires were still breaking out two days later. Plans are in hand for emptying and demolition of the damaged silos. Tilbury is one of the UK's busiest grain terminals and the operators have had to work hard to find alternative ways to keep the nation's food flowing.

The explosion in Beirut was a much bigger affair, of course — 2,750 tonnes of AN in a downtown area was by any measures a catastrophe waiting to happen. It seems there was a whole story as to how the material came to be there and nobody got to move it to a safer location. Political corruption has been labelled as the cause, but this is probably a rather simplistic view — the Lebanese state has been in chaos for years and I suspect concern about enforcing port safety regulations was a very long way down the list of the many pressing matters that politicians and civil servants have been struggling with. The destruction of the adjacent grain terminal is also a major blow to the country as nearly all Lebanon's grain supply went through it.

We'll have to wait for the official investigation into the grain dust explosion at Tilbury, but don't hold your breath — the last high-profile multiple-fatality dust explosion we had in the UK was at Bosley Mill in Derbyshire five years ago and the UK government's Health and Safety Executive still hasn't issued its report. It's not only in failed states that government agencies fail to get on top of things in a timely and efficient manner.

Dust explosions, not just from grain, are much more common than AN incidents, but they don't usually make the headlines because they typically involve a handful of people rather than hundreds. Yet the accumulated death toll is probably higher than for AN incidents. We have a very good, well thought-out system of regulation to avoid them (ATEX or IECEx), which is easy to use and mostly effective if used properly, yet incidents continue. Our investigations frequently reveal that incidents occur because people didn't do things that the organisation knew should be done, yet the actions fell through the cracks.

One thing in common between Tilbury and Beirut was that both these hazards where there slumbering for years, without any outward sign of the danger lurking. There's a tendency for people to get complacent when they walk past a hazard day after day and nothing goes wrong — why should today be any different from yesterday? Neither of these hazards were unknown — over the past 100 years,

there have been on average one AN explosion every three years. Its handling and storage have been regulated ever since the Texas City disaster of 1947 claimed nearly 600 lives, yet again incidents continue.

What message should we take away? The need for constant awareness and vigilance. Just because you haven't had an accident doesn't mean there's not one waiting just around the corner. Go and look at the systems you have in place for controlling explosion hazards, both for dust and (if you handle them) explosive materials. Are your safety systems robust? Do you regularly review the hazards and the methods you use to control them, and account for the changes in the cargoes you're handling?

Maybe the most important and often overlooked thing in my experience, is training and awareness of people on the ground — stevedores, maintenance, contractors — are they aware of the hazards? Do they always work according to the regulations? Do they know where the hazard zones are and what they are allowed to do or not do? Do you get them to use their eyes to see things that aren't right and call them out? There's a tendency to think that safety is the job of management, but if you can engage people on the ground then you have dozens of extra eyes helping to keep you safe.

But you also need a system that allows them to "speak truth to power" and be respected for whistle-blowing, not get labelled as troublemakers. Dozens of people must have known about 2,750 tonnes of AN, you can't step over it without seeing it, yet nobody got the problem called out to a high enough level to have it dealt with. What's the culture at your port? Do you encourage vigilance and calling out?

One final thought from Tilbury — where's your control centre? I often used to visit the control room at Tilbury and it always gave me an uneasy feeling — the control room nestles right in the middle of the silo block, the access stairwell being adjacent to the elevators. It gives a great view of the conveyors, wharves and machines, but not a place to be if there's a major incident. July's blast didn't travel as far as the control room, but that was pure luck. You have to question the wisdom of placing all your key people, who could take control in the event of a disaster, right in the heart of the zone most likely to be affected. Where are your critical personnel located? Are they going to be wiped out if you have an explosion?

Learn from what we've seen — remember those who died and honour them by looking after your own people. Accidents are bad business, as well as tragedies.

For more information on bulk solids handling, safety and training visit The Wolfson Centre for Bulk Solids Handling Technology www.**bulksolids.com** and The Solids Handling and Processing Association (SHAPA) www.**shapa.co.uk** Just to remind ABTO members that The Wolfson Centre offers you a discount on any short course.

Thank you both Mike and Richard for these contributions. As well as the offerings from The Wolfson Centre and SHAPA that Mike mentions and what Richard informs us is in preparation at ICHCA, there are other initiatives. One such as the Port Worker Development Programme in Bulk Terminals from the ILO.

In view of Beirut and Tilbury ABTO is considering — in collaboration with our partners —introducing a new short course on Fire and Explosions and also more generally on Port and Terminal Safety, if we can contribute to the options available to create awareness and best practice. Do let me know if either of these would be of interest to your organisation.

For the foreseeable future, any short courses will be offered online, like the popular **Port and Terminal Operations for Bulk Cargoes** This will be repeated again online in the second week of March, 2021.

Keep safe

Simon Gutteridge
Chief Executive, ABTO

SAFEEN SIGNS UP ROCKTREE

Singapore-based Rocktree, a one-stop solutions provider for turnkey projects, has been appointed by Abu Dhabi Ports' maritime services arm, SAFEEN, to design and manage the conversion of a post-panamax bulk carrier into a transshipment vessel.

Rocktree will also be managing technical management and crewing services for the vessel. Work to convert the 101,648dwt Niki is currently in progress at China's Cosco Guangzhou shipyard and is scheduled for completion during the fourth quarter of 2020. When delivered, the vessel will provide a vital link in the supply of iron ore for Abu Dhabi-based Emirates Steel.

From January 2021, the 253m Hafeet will transship iron ore from bulkers up to Newcastlemax size (210,000dwt) in deep water anchorage on to 12,000dwt self-propelled, self-discharging barges (shuttle feeders), which will feed the Emirates Steel plant at Musaffah Port. Hafeet will also have capacity to store iron ore pellets inside seven cargo holds while waiting for the shuttle feeders.

The Rocktree and SAFEEN technical teams are working with the shipyard and equipment suppliers on the design, which will feature a new cargo handling facility and ancillary equipment consisting of four 32t SWL grab cranes, two double hoppers, a 3,000t/h conveyor system and one luffing/slewing barge-loader. The vessel will also be fitted out with three new diesel generators and additional mooring and fender systems. Additional steel work will add 2,328t to the vessel's lightweight.

BIFA URGES POST-BREXIT CLARITY

As discussion of movement of goods across borders post Brexit moves back up the agenda, the British International Freight Association (BIFA) has been calling for more clarity on certain aspects of the UK's future cross-border international trade.

BIFA has said that, as always, the "devil will be in the detail" and director general Robert Keen says that he UK government needs to puts some "meat on the bones" of the various announcements it has made recently regarding cross border trading.

"With less than 100 days to go before the end of the transition period, we share the concerns of our members whether there will be sufficient time to make the necessary preparations to facilitate and implement the revised arrangements," Keen says.

When the Border Operating Model was revealed, BIFA welcomed the fact that the information contained in the documentation suggests a more cohesive approach to managing the UK's trade flows and regulatory procedures with the EU. Details were released on the timing of increased controls and the overall processes that need to be followed, investment in infrastructure; as well as grants for training and new IT infrastructure.

However, Keen adds: "Set within the overall Border Operating Model, a pattern is emerging of announcements with attention-grabbing headlines, but minimal detail that doesn't appear to have been thought through."

"BIFA remains concerned that many of the details concerning the new systems still appear to be at the conceptual stage. We urge the government to provide urgent clarification as many questions remain unanswered for businesses in the UK and, in particular, in Northern Ireland, where both the EU and UK customs rules will be applied, depending on the final destination of the goods."

OT CYBER ATTACKS ON THE UP

Cyber attacks on the maritime industry's operational technology (OT) systems have increased by 900% over the past three years, with the number of reported incidents set to reach record volumes by year end.

Addressing port and terminal operators during a recent online forum, Robert Rizika, security company Naval Dome's head of North American operations, explained that in 2017 there were 50 significant OT hacks reported, increasing to 120 in 2018 and more than 310 last year. He said this year is looking like it will end with more than 500 major cyber security breaches, with substantially more going unreported.

Speaking during the 2020 Port Security Seminar & Expo, Rizika said that since NotPetya — the virus that resulted in a US$300m loss for Maersk — "attacks are increasing at an alarming rate".

He told delegates that in 2018 the first ports were affected, with Barcelona, then San Diego falling under attack. Australian shipbuilder Austal was hit, while the attack on COSCO took down half of the shipowner's US network.

One recent example saw the OT systems at Iran's Shahid Rajee port hacked, restricting all infrastructure movements and creating a massive backlog. The attack raised public awareness of the potential wider impact of cyber threats on ports around the world, and intelligence from Iran, along with digital satellite imagery, showed the Iranian port in a state of flux for several days. Dozens of cargo ships and oil tankers had to wait to offload, while the long queues of trucks formed at the entrance to the port stretched for miles, according to Naval Dome.

Emphasising the economic impact and ripple effect of a cyber attack on port infrastructures, Rizika revealed that a report published by Lloyd's of London indicated that if 15 Asian ports were hacked, financial losses would be more than $110bn. A significant amount of this would not be recovered through insurance policies as OT system hacks are not covered.

When asked which parts of the OT system — the network connecting RTGs, STS cranes, traffic control and vessel berthing systems, cargo handling, safety and security systems, and so on — are under threat, Rizika said all of them.

"What is interesting is that many operators believe they have this protected with traditional cyber security, but the firewalls and software protecting the IT side do not protect individual systems on the OT network," he said.

Where OT networks are thought to be protected, Rizika said they are often inadequate and based on an industrial computerised system, operating in a permanent state of disconnection from the network or, alternatively, connected to port systems and the equipment manufacturer's offices overseas via RF radio communication (wi-fi) or a cellular network (via SIM).

"Hackers can access the cranes, they can access the storage systems and they can penetrate the core operational systems either through cellular connections, wi-fi or USB sticks. They can penetrate these systems directly."

GUIDE PUTS "JUST IN TIME" IN SPOTLIGHT

A new guide aims to provide both port and shipping sectors with practical guidance on how to facilitate Just In Time (JIT) arrivals.

It has been developed by the Global Industry Alliance to support low carbon shipping as the successful implementation of JIT arrivals can have a significant environmental impact. The concept is based on the ship maintaining an optimal operating speed, to arrive at the pilot boarding place when the availability of a berth, fairway and nautical services including pilotage and tugs will be assured. It is estimated that ships spend up to 9% of their time waiting at anchorage, which could be reduced through the implementation of JIT arrivals.

The guide considers the contractual and operational aspects of JIT and aims to act as a useful toolkit for all parties to the movement of goods.

AUTONOMOUS TRANSPORT COMES UNDER SCRUTINY

The use of drones and autonomous transport was the topic for discussion at a recent webinar organised by the TT Club, which examined the benefits and limitations of the technologies as well as the accelerating use resulting from the coronavirus pandemic.

The development of drones, autonomous road vehicles and unmanned ships has been rapid in recent years, the club pointed out. However, despite the benefits, which include sustainability, cost reduction, environmental protection and resistance to disruption, there has been some resistance to new developments due to concerns over safety, security, levels of investment and variable regulatory regimes.

"To provide a forum at which the pros and cons can be explained and debated was our primary aim," said TT Club's managing director for loss prevention, Mike Yarwood. "Some of the concerns about widespread use of autonomous transport methods, safety and security for instance, can in fact be improved in certain circumstances through the technology."

Pranav Manpuria, chief executive of autonomous truck developer Flux Auto, suggested that driverless trucks could be in a transport system that also features automated warehouses, ports and freight terminals. Computer-guided inventory selection, product picking and packing and lift-truck operations can be integrated with optimum road vehicle scheduling to improve supply chain efficiency.

"The medium-term benefits of reduced crew are expected to impact coastal cargo vessels the most, where crew expense forms a higher percentage of operating costs and where enhanced situational awareness and precise manoeuvrability is at a premium," TT Club said.

Although the pandemic has accelerated the development of an autonomous solution, there are still barriers to be overcome. These include a lack of uniform regulation across national governments — even within countries, there can be a major block to autonomous vehicle and drone deployment. This is an incidence of regulation and international authorities not keeping pace with commercially driven technological advancement, the club said.

Environmental hazards such as bad weather, winds and high seas affecting drone operation and autonomous ships, and icy and rain-effected roads are seen as challenges that technology can cope with and the avoidance of human error is generally seen as an asset in improving safety. However, a vulnerability to cyber-attack that is perceived to increase with the use of computer-controlled vehicles is a strong disincentive to adoption, the forum concluded.

"This particular threat is of critical concern across the supply chain in general," said Yarwood. "Autonomous transport with all its environmentally sound and economically tempting characteristics will continue to progress."

BSM SETS UP LIQUID CARGO SIMULATOR

Bernhard Schulte Shipmanagement (BSM) has launched a new liquid cargo training facility at its maritime training centre in Cyprus.

This, combined with a structured career progression model, will ensure BSM's LNG crews are highly trained and competent to support its growing global LNG shipping operations, the company explains.

The new simulator has been designed and developed by BSM's in-house technical team and uses GTT training software. It offers realistic training on a wide range of vessel types: LNG fuelled ships and LNG gas carriers with a combination of cargo containment systems and different propulsion systems (including steam turbine, DFDE, DF 2-stroke diesel) with various options for LNG fuelled ship and LNG fuel supplier configurations.

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TASPORTS GEARS UP FOR EXPORT DRIVE

TasPorts has announced details of a major initiative to develop a critical export gateway at the port of Burnie, which will lay the foundation for growth in Tasmanian mineral exports to global markets.

TasPorts chief executive Anthony Donald says that the Burnie Export Gateway initiative will bring significant trade and economic benefits to Tasmania.

"This initiative will lay the foundation for exponential growth in Tasmanian mineral exports to global markets, enabling capacity for larger vessels to berth and ensuring fit-for-purpose terminal infrastructure," he says.

In August 2018, TasPorts released its port master plan for the future of Tasmania's multi-port system. The Port of Burnie was identified as a key component, with significant opportunity identified to enable growth in bulk mineral exports.

The port authority has advanced its planning, culminating in the release of the Burnie Export Gateway Initiative.

"Importantly, this initiative will enable exponential growth across multiple mineral exports, dry bulk cargo, forestry products and international containers to global markets, over a 30-year horizon," Donald says.

"TasPorts understands that working alongside industry is critical in ensuring this infrastructure is aligned to market demand, both in terms of volume growth and timing."

U-FREIGHT GIVES LIFT TO CHINA-EUROPE RAIL

With increasing volumes of Less Than Container Load (LCL) cargo being experienced on its LCL and Full Container Load (FCL) rail freight services between China and Europe, the U-Freight Group has added a second consolidation centre in the People's Republic.

The company started its regular service in 2014, consolidating cargo in Zhengzhou and using the daily service that operates from that railhead to and from Malaszewicze in Poland, Hamburg in Germany and Liege in Belgium.

A spike in LCL traffic as a greater number of shippers switch from air and ocean to overland has led U-Freight to establish a consolidation centre at its logistics hub in Shanghai.

Simon Wong, chief executive officer of U-Freight Group, comments: "As an early adopter of this routing option, we have developed a strong position in the market.

"We chose the service from Zhengzhou as it is the only one that offers a daily frequency, although for FCL shipments our large Chinese presence enables us to arrange container pickup from across the country and select a service from the rail freight gateway that is nearest to our customers.

"While other transport modes still face significant capacity and schedule issues, our overland rail freight service is clearly demonstrating that it offers a competitive alternative to air freight in regards to price and considerably faster transit times compared to the ocean freight alternative."

BRITISH STEEL BOOST IN IMMINGHAM

British Steel has completed a deal with Associated British Ports (ABP) to resume operational control of Immingham Bulk Terminal in Lincolnshire.

The facility, an integral part of British Steel's operations, was operated by the manufacturer up until 2018 when its then owners agreed to pass control to ABP. Now that British Steel is under the ownership of the Jingye Group, it has agreed to take back running of the terminal, which handles millions of tonnes of its raw materials each year.

British Steel CEO Ron Deelen says: "The return to British Steel of an important strategic asset like Immingham Bulk Terminal is another significant step forward for our new business.

"IBT handles iron ore, coke and coal en route to our manufacturing headquarters in Scunthorpe so this deal strengthens our control over this vital part of our supply chain."

The terminal can handle up to nine million tonnes of raw materials a year to support steel production. Deelen says: "Our new owners have strengthened our global reach, while domestically we're ready to play a significant role in major infrastructure projects such as HS2, which requires large quantities of high-quality products such as our rail and constructional steel.

Simon Bird, ABP Humber director, says: "The port of Immingham plays a vital role in the work of steel manufacturing in the Scunthorpe facility. As British Steel takes over the running of the Immingham bulk terminal, which handles the raw materials for the manufacturing process, it is good to know the port will continue to be involved in what we hope will be a bright outlook for growth in steel manufacturing in the Humber for many years to come."

PERFECT FOR COAL STORAGE

Hard coal is temporarily stored in stockpiles and then continuously fed to be processed, as needed. The design of the depositories must ensure constant filling and reliable emptying. The required capacity is determined based on the incoming and outgoing conveying flow. Different stacking and reclaiming options as well as various layouts for the stockpiles are also needed. BEUMER Group provides the engineering for handling stockpiles and offers the required components to coal mine operators, such as stackers and reclaimers.

BEUMER Group offers a comprehensive product and system solutions portfolio to customers from the coal mining industry. Conveying technology includes closed Pipe Conveyors and open troughed belt conveyors that can be adjusted to the respective situation. As a system supplier, BEUMER Group also provides extensive know-how and the necessary components for storing hard coal, e.g. stackers and bridge reclaimers. "We support our customers immediately from the design phase," says Andrea Prevedello, system technology global sales director, BEUMER Group, Germany. Drone technology is used more and more frequently during project planning, implementation and documentation to optimise the design phase. The recorded aerial photos are rectified with regard to their perspective and evaluated photogrammetrically. The software calculates a point cloud in order to generate 3D models from the two-dimensional views, i.e. digital terrain models. Stockpiles can now be greenfield and brownfield developments.

"We have some major customers with very interesting projects in this sector," explains Prevedello. This most certainly includes Prairie Eagle Mine in Illinois, the largest coal mine of Knight Hawk Coal. This is one of the most efficient underground mining plants in the US. It produces approximately five million tons of coal annually, of which more than 80% is processed and delivered in Prairie Eagle.

Management was looking for a more sustainable operating solution. "We provided an overland conveyor that transports the coal from the mine to the main processing plant," says Prevedello. "Our conveyor helps the company to considerably reduce its ecological footprint. With this technology, Knight Hawk can significantly reduce its long-term environmental impact compared to using truck transportation." BEUMER Group not only supplied the conveying solution. As a system supplier, the company also supported the mining group in building a stockpile for hard coal. "The requirements for storing coal are obviously very different from other materials," explains Prevedello. Some of the important requirements are changing if the stockpile is covered and if explosion-proof specific equipment is needed. Hard coal is very susceptible to spontaneous combustion, which is why the height of the stockpile must be in certain cases limited.

The Prairie Eagle Mine in Illinois is the largest coal mine of Knight Hawk Coal. It produces approximately five million tons of coal annually, of which more than 80 % is processed and delivered in Prairie Eagle. Photo credit: BEUMER Group GmbH & Co. KG