

# CoalAge®

The Magazine for Coal Mining and Processing Professionals

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**CONSOL Energy's  
Pennsylvania Operations**  
— Building the infrastructure to support  
the Harvey expansion

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**Jury Convicts Blankenship**

**Mine Rescue Software**





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# Coal Age

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## LESSONS LEARNED?



**BY STEVE FISCOR**  
/ EDITOR-IN-CHIEF

The Don Blankenship trial and conviction (see *Blankenship Found Guilty of Conspiracy*, p. 56) captured a lot of attention in Appalachia. Since he rose to prominence in the early 1980s, *Coal Age* has followed Blankenship's career. In those early days, he was an aspiring executive caught up in a highly polarized fight with the United Mine Workers of America (UMWA). With quick wit and a dry sense of humor, he voiced strong support for West Virginia and always seemed to be thinking a couple of moves ahead of the others. He led Massey Energy when the oil companies were exiting the coal business. He took the company public. As CEO, he fought boardroom battles with activist shareholders and publicly debated environmental activists. In most of these situations, he prevailed or at least fought to a draw; he rarely lost.

There was a reason why he was fighting so many battles. Massey Energy had problems — it did not have a solid foundation, and it was beginning to show. The company had a poor safety record, which attracted the attention of regulators and organized labor. They operated mountaintop mining operations, which attracted the attention of environmental regulators and activists. Massey Energy, similar to most coal companies, posted profits and its stock performed well when coal demand and prices were high. Regulators wrote citations and Massey Energy paid them. The deaths of 29 miners in the Upper Big Branch (UBB) mine explosion in April 2010 would be the company's undoing.

A little more than a year ago, Blankenship was indicted by federal prosecutors. The indictment alleged that Blankenship conspired to commit and cause routine violations of federal mine safety standards at the UBB mine. He was accused of impeding the Mine Safety and Health Administration (MSHA) and making false statements to the U.S. Securities and Exchange Commission. When the trial finally began, it didn't take too long for the jury to reach a conviction, albeit on a much lesser charge than the prosecution had hoped.

This would be the first time a CEO for a major coal company would stand trial for charges related to fatalities at an operation. The case evoked strong feelings. The widows and surviving family members wanted closure. Many people in coal country, including his lawyer, who will be appealing the decision, thought he would be acquitted.

The prosecution called 27 witnesses to testify and the defense called none. While we did not have access to the courtroom during the trial, *Coal Age* has published much of the testimony as reported by *WV Metro News*, a regional media outlet that covered the trial extensively. The prosecutors kept their distance from the explosion and the possible causes. What readers will discover is that Blankenship, in a way, was his own worst enemy. He recorded phone calls of himself, which were used as evidence. When anyone could have looked at the number of citations and compared it with industry standards, he hired a safety consultant to evaluate the company's safety performance and refused to take his advice. It was surprising that Blankenship did not take the stand, or moreover, that his attorneys prevented him from taking the stand.

For the prosecution, a win is a win...until the appeal. U.S. Attorney Booth Goodwin has built a strong reputation in the region for bringing criminals to justice and he quickly highlighted the prosecution's success. Sentencing is scheduled for March.

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# FORMER MASSEY CEO BLANKENSHIP CONVICTED



Former Massey Energy CEO Don Blankenship and his lead attorney William Taylor leave the federal court in Charleston, West Virginia. (Photo: Associated Press)

Don Blankenship, the ex-executive of Massey Energy charged with one conspiracy and two securities charges stemming from the 2010 Upper Big Branch mine explosion in West Virginia, was found guilty of one misdemeanor charge of conspiracy on December 3. After deliberating for nearly 10 days, a 12-member federal jury returned a split verdict: guilty of conspiracy for federal safety regulation violations, and two decisions of not guilty for charges of making false statements to securities officials and company shareholders.

The trial was wrapped relatively quickly; jury selection began on October 1 and the jury heard evidence from 27 witnesses in the following several weeks. The group's decision came the morning of December 3 (see *Blankenship Found Guilty of Conspiracy*, p. 56).

Sentencing for Blankenship is tentatively scheduled for March 23. He faces up to one year in federal prison as well as a fine of up to twice the gain or loss that resulted from his conduct. As the two left the courthouse, Blankenship's attorney William Taylor said the trial never should have been brought and they will appeal.

## Bowie Acquires Twentymile, El Segundo Mines

Bowie Resource Partners plans to purchase the El Segundo and Lee Ranch mining complexes in New Mexico and the Twentymile mining complex in Colorado from Peabody Energy for \$358 million in cash plus the assumption of \$105 million in liabilities. This acquisition will nearly double the size of Bowie's production output to 25 million tons per year (tpy), making it the largest bituminous coal producer in the western United States. This will also generate top line revenues of \$1 billion annually.

Bowie will operate five mining complexes in Colorado, New Mexico and Utah, employing more than 1,700 people.

"These acquisitions fit the vision and model that were the genesis of Bowie Resource Partners, as we continue to buck the industry trend with long-term contractual partnerships with our customers and secure margins in our niche," said John Siegel, executive chairman for Bowie Resource Partners. "The El Segundo and Twentymile mining complexes have exemplary safety and productivity records, long-term relationships with domestic customers, and superior reserve quality that combine to render this an accretive and synergistic acquisition for us that will create economies of scale and lower cost."

In 2014, the El Segundo and Twentymile mining complexes produced 8.4 million tons and 6.7 million tons of high-Btu, low-sulfur coal, respectively. The Twentymile longwall mine is capable



## BREAKING NEWS

### Deer Run at Standstill Following Worker Evacuation

A Foresight Energy (FELP) spokesman has indicated that it is still in a holding pattern at the Deer Run operation in Illinois after withdrawing its underground staff last week when elevated gas readings were discovered. Gary Broadbent said the mine is still in the same status as of December 2, when the operator confirmed a November 25 evacuation of the mine when crews reported high carbon monoxide readings.

Foresight said a plan was immediately put into place to suppress the event, including the injection of nitrogen and foam from the surface. Once the readings have dropped and have been stabilized, the company will develop a plan, alongside regulators, to re-enter the mine. Work had been ongoing to extract the mine's longwall equipment from the current panel and to seal the district. Foresight officials noted on December 2 that if the issue were to extend for a prolonged period, it may see a negative impact on sales commitments.

In related FELP news, the company confirmed December 7 that it was holding discussions with its bondholders and secured credit facili-

ty lenders following a default. "In light of the current conditions and uncertainties, including continuing operational and market challenges and uncertainties regarding the outcome of the litigation and its impact on our liquidity, we are pursuing options to preserve liquidity and it is likely that we will suspend the distribution on our common units, commencing with the quarter ending December 31, 2015," the company said that day.

"Absent the acceleration of indebtedness and assuming continued lending from our revolving credit facility lenders, we believe we will be able to meet our obligations as they come due. If discussions with the bondholders are unsuccessful, it could result in an adverse judgment being rendered."

Murray Energy Corp. (MEC) has confirmed that it is not a party to the Foresight litigation. "This opinion does not impact any of MEC's credit agreements in any way," Broadbent said. "MEC has very strong relationships with its lenders, and will continue to foster those relationships."



## TOP 10 COAL-PRODUCING STATES

(in Thousand Short Tons)			
Week Ending (11/28/15)			
	YTD '15	YTD '14	% Change
Wyoming	335,570	358,261	-6.3
West Virginia	91,158	102,644	-11.2
Kentucky	58,976	70,915	-16.8
Illinois	55,304	52,480	5.4
Pennsylvania	48,036	56,348	-14.8
Montana	39,757	39,962	-0.5
Indiana	32,254	35,689	-9.6
Texas	29,708	39,685	-25.1
North Dakota	24,758	26,464	-6.4
Colorado	18,903	21,977	-14.0
U.S. Total	823,215	908,782	-9.4

of producing 8 million tpy or more. The Lee Ranch mine was idled in 2013. Production at these mines is fully committed for the next several years and, like Bowie, also supported by other contracts that run into the next decade, Siegel explained. After the transaction, the workforces of El Segundo and Twentymile are all expected to remain in place and become Bowie employees.

The transaction, which includes coal reserves of approximately 330 million tons, has been approved by the Peabody Board of Directors and is expected to be completed in the first quarter of 2016. This will increase Bowie's reserves to more than 500 million tons and expand its reserve life to more than 20 years.

Bowie currently operates three underground coal mines in Utah's Uinta Basin capable of producing 12.6 million tpy. The majority of the company's current coal sales are to domestic customers, pursuant to long-term, high-volume coal supply agreements with fixed pricing.

### Cloud Peak Enters Amendment to Transportation Agreement With BNSF

Cloud Peak Energy, one of the largest U.S. coal producers and the only pure-play Powder River Basin (PRB) coal company, announced that Cloud Peak Energy Logistics entered into an amended transportation agreement with BNSF Railway to eliminate both parties' volume obligations for the period 2016 through 2018 in exchange for a series of payments.

Under the amended agreement, Cloud Peak Energy made an upfront payment to BNSF and has the right to make payments from 2016 through 2018 replacing the previous take-or-pay commitments during this three-year period. The aggregate reduction in potential payments if they do not ship any export tons during this three-year period is substantially comparable to the reduction under the export terminal throughput amendment announced in October by Cloud Peak Energy. Except as amended, the original transportation agreement remains in place through the end of 2024.

The parties will continue to meet regularly going forward to discuss market conditions and any potential shipments and the terms for any shipments. If export shipments do not occur, it is expected that Spring Creek mine production volumes will be reduced accordingly.

## WORLD NEWS



### OECD to Reduce Coal Export Credits

Members of the Organization of Economic Cooperation and Development (OECD) struck a deal just before the Paris climate talks to restrict subsidies used to export technology for coal-fired power plants, according to *Reuters*. Representatives of the world's richest countries agreed on a deal to end export credits for coal-fired power plant technology to take effect January 1, 2017, with a review in 2019 that could allow the deal to be strengthened. OECD countries have reportedly financed more than \$35 billion worth of coal plants over the past seven years.

### China Offers Fractional Carbon Cuts

At the climate change summit in Paris, China's President Xi Jinping repeated China's pledge that emissions would peak by "around 2030." In the near term, China will reduce the discharge of pollutants by 60% before 2020 through a major upgrade of its coal-fired power plants, officials said, as major climate talks were under way in Paris. The move, according to the *Xinhua News Agency*, will save around 100 million metric tons per year (mtpy) of raw coal and cut carbon dioxide emissions by 180 million mt annually. China burns 4,000 million mtpy of coal, so that would represent 2.5%. Ironically, Beijing ordered hundreds of factories to shut down and allowed children to skip school one day during the Paris talks as choking smog reached over 25 times safe levels. China is estimated to have emitted nearly twice as much carbon dioxide as the U.S. in 2013, and around two and a half times the European Union's total.

### WCA Calls for Policy Parity for CCS

The World Coal Association (WCA) published a new report highlighting the importance of carbon capture and storage (CCS) technology to an effective climate agreement at COP21 in Paris. The report "Carbon Capture and Storage — The Vital Role of CCS in an Effective COP21 Agreement" provides an overview of the road so far and calls for key policy initiatives to support the greater global deployment of CCS technology.

The WCA believes CCS should receive the same policy support that has benefitted renewable technologies in recent decades. This is vital to facilitate the lowest cost pathway to decarbonization. Governments must articulate how they plan to drive CCS deployment beyond the demonstration phase toward commercialization. Just as solutions to reducing emissions will require global action, WCA said CCS deployment requires international incentives.

### CIL Plans to Commission 3 Prep Plants in 2016

To improve the quality of coal, Coal India Ltd. (CIL) will set up 15 new washeries for both coking and noncoking coals and three are likely to be commissioned next year, according to *The Economic Times*. "Tenders have so far been invited for 12 washeries, including six non-coking coal washeries," Coal and Power Minister Piyush Goyal said in a written reply to the Rajya Sabha. The government previously said that the challenge was not quantity but quality of the fossil fuel. The three washeries likely to be commissioned next year are located at Madhuband, Patherdih and Dahibari in Jharkhand.

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### **Hassyan Power Plant Remains on Track in Dubai**

According to *TradeArabia News Service*, the first phase of the Hassyan coal-fired power plant project, which consists of two 600-megawatt units, will be operational by March 2020, said Saeed Mohammed Al Tayer, MD and CEO of Dubai Electricity and Water Authority (Dewa). The Hassyan Clean Coal project, which is an ambitious and strategic project for Dubai and the UAE, based on the Independent Power Producer model (IPP), reflects our efforts to diversify Dubai's energy mix and supports the Dubai Clean Energy Strategy to include 61% from gas, 25% from solar power, 7% from clean coal, and 7% from nuclear power by 2030, and to increase the share of clean energy to 75% by 2050.

### **Grande Cache Mine to Idle**

December 24 has been set as the closing day for one of Canada's underground operations, the Grande Cache met mine west of Edmonton, Alberta. About 220 have already received termination notices; GCC President and CEO Max Wang cited "uncertainties of the continuously deteriorating global coal market" for its decision to cut costs and, thus, staff. He also called the idling a "temporary suspension," citing "unfavorable construction timing" for the company's new mine, though no timelines were outlined.

### **Britain Intends to Close Coal Plants by 2025**

Prior to the COP-21 talks in Paris, the British government announced plans to close all coal-fired power plants by 2025 and restrict their use by 2023. "It cannot be satisfactory for an advanced economy like the U.K. to be relying on polluting, carbon intensive 50-year-old coal-fired power stations," said Secretary of State for Energy and Climate Change Amber Rudd. "Let me be clear, this is not the future. We need to build a new energy infrastructure, fit for the 21<sup>st</sup> century."

Coal still accounts for 30% of U.K.'s electricity, Rudd said. "If we take this step, we will be one of the first developed countries to deliver on a commitment to take coal off the system," Rudd said. The idea is to replace the coal-fired plants with gas-fired plants, increase renewables over the next five years, and build new nuclear power stations in the longer term.

### **Eskom Terminates Supply Deal With Exxaro**

After two years of talks and disagreements on its 40-year-long coal supply agreement, Eskom has confirmed that the pair's longtime coal deal will not be renewed. The existing contract was due to expire this month, and Eskom confirmed that it would no longer take coal as of December 31. Earlier this year, Eskom told Exxaro that the price for its coal, which Eskom used to fuel its Arnot power plant, was too high. Despite entering into a memorandum of understanding (MoU), negotiations dissolved; subsequently, Eskom advised Exxaro to commence closing the Arnot mine.

Eskom, which is also in a dispute with Glencore's Optimum division in South Africa for a similar reason, will bid out a new contract, though officials did not provide a plan for timing.

### **Alberta Government Completes Review of Tailings Dams**

The Alberta Energy Regulator has wrapped up an investigation of

Continued on p. 10...

### **Blackhawk Lays Off 200 Miners**

Worker Adjustment and Retraining Notification Act (WARN Act) notices were issued by Blackhawk Mining to about 200 of its eastern Kentucky miners. Company president Jesse Parrish told local news station WYMT-TV that the Blue Diamond Buckeye prep plant in Perry County had been idled, along with two of the mines that feed it. The Blue Diamond complex is spread across Perry, Knott and Leslie counties, and includes both surface and underground operations. Its sales include PCI, thermal, stoker and specialty coals.

### **Walter Energy Requests End to Union Deals**

Alabama-based miner Walter Energy, currently wading through a Chapter 11 bankruptcy case, is seeking approval from the U.S. Bankruptcy Court to cut ties to its employment agreements with worker unions so that it can move forward to divest its Alabama coal assets. The producer filed documentation on November 23 asking a judge to approve a plan that would end the deals as well as retiree benefit payments. According to the filing, it is seeking to sell its assets out of the bankruptcy, but that hinges upon its rejection of the collective bargaining agreements for several hundred workers and another 3,000 or so retirees, both union and non-union.

A *Reuters* report said that Walter's lenders have already indicated that they will acquire the mines, but that they will not be tied into the agreements with the unions, which include the United Mine Workers of America (UMWA) and United Steelworkers (USW). In the documentation, Walter officials said the lenders' mission is "no surprise" given the CBA's terms, which it reportedly called "onerous."

"The debtors suffer from crippling legacy labor obligations, principally in the form of medical benefits and pension obligations, as well as insupportable hourly labor cost," the company said in the papers.

USW spokesperson Wayne Ranick told *Reuters* that the union will tackle the issues at the bargaining table and that it would fight the company's request. "This is unfortunately the classic case of a bankrupt company trying to take advantage of temporary issues in the steel and coal markets to avoid pension and retiree insurance obligations and slash wages and benefits," he said.

UMWA officials concurred. "If successful, Walter Energy will force many retirees into making life or death decisions about getting needed health care or buying food; about getting the prescription drugs they need to stay alive or pay the mortgage," President Cecil Roberts said.

"We will fight this. We will fight it in court, we will fight it in the streets and we will fight it on the picket lines if we have to. Our members and retirees did nothing wrong. They are not responsible for Walter Energy's bankruptcy. If Walter thinks it is going to solve its self-inflicted corporate woes solely on the backs of our members, it needs to think again," he added.

Walter spokesperson William Stanhouse told *Reuters* that Walter Energy is in a tough position. "As a result of the market conditions we face today, the choice is between taking these steps or no longer operating," he said.

### **Judge Fines MEC, Orders Murray to Read Notices at Mines**

In a decision handed down November 18, Administrative Law Judge Margaret A. Miller fined Murray Energy Corp. (MEC)



# J.H. Fletcher & Co.



In underground mining, it is necessary to support the roof to prevent areas that have already been mined from collapsing. Since the 1950's the primary method for supporting the roof has been the installation of roof bolts. Roof bolting is one of the most basic and necessary functions in an underground mining operation. Founded in 1937, J.H. Fletcher & Co.'s product line has long reflected a great interest in the growth and expansion of roof control equipment since its introduction. Fletcher was a major player in the development of current methods used today.

Today, Fletcher machine designs are predominantly dictated by mine conditions and individual customer desires. This explains why when a Midwestern U.S. operation needed a custom piece of equipment, they consulted Fletcher. They tasked the engineering department of J. H. Fletcher & Company to design and manufacture a new roof bolting machine with six independent drilling apparatus onboard capable of drilling and bolting the mine roof and side walls (rib) simultaneously. The machine was also to be equipped with material handling.

This would be the first Fletcher® six head machine to be designed and built for mine use in the United States, intended to work in the Illinois Basin. The mining method used at this particular mine is room and pillar with coal being extracted by way of a continuous miner, followed by a dual boom CHDDR style bolter which would install mesh and rib bolts. The entry width of their operation is 18'-20' (5.49-6.1m), with a mining height of 8'-14' (2.44-4.27m).

The objective was to produce a machine capable of drilling and installing six bolts simultaneously, with a limited number of operators. The goal of the mine was to decrease the time to bolt a cut, which in turn would improve the safety level of their current roof bolting method. They also hoped to improve efficiency and the bottom line cost of entry development. The customer wanted the capability to install rib bolts, thus making the customer's request: a machine with four drillheads at the front of the machine for installing roof bolts and two separate drillheads dedicated to rib bolts.

With the customer's necessity for a semi-automatic drilling system, Fletcher was able to utilize the existing four head roof bolter design and expand it into a six head roof and rib bolter to meet the customer's needs. With two more drilling apparatus for rib drilling, the four head machine design would have to be enlarged. This would include the need for a new and larger crawler drive system, designed to handle a machine of this size. Therefore a twenty inch wide crawler pad assembly was developed.

The final design included mounting the rib drills at the rear of the lifting platform. By mounting them there it reduced the functions required to manipulate them as well as reduced the number of hoses required. Thus all six drilling devices are located on the front lifting and extending platform. The platform is designed to lift sixty inches (1,524mm) and each side platform has the capability of extending thirty-eight inches (966mm).

The four roof drills are located at the front of the platform. All the roof drills have the ability to tilt forward and backwards. The outer roof drills also have the ability of tilting side to side.

The two rib drills are mounted on rotary actuators on the rear of the lifting platform, which allows them to rotate toward the mines side wall (rib). They are mounted on the platform's center assembly therefore they do not move when the side platforms are extended. The drill controls are mounted on the platform to keep the operator under the drill canopy. The platform is equipped with three driller canopies; one center driller canopy to cover the two inner roof drill controls and one driller canopy on each outer extending platform to cover the outer roof and rib drill controls. The platform is also equipped with an Automated Temporary Roof Support (ATRS) and two drill trays for storage.

The use of multiple drillheads dictated the requirement for latched controls. Latched drilling is not the same as detented controls, which do not reset unless manually done so. The latched drilling system allows for hands off drilling to be performed. This allows the operator to start drilling one hole and then latch the controls to be able to move on to the next. To accomplish this, a unique hydraulic latch circuit was developed to maintain operator safety. The latched drilling system does not replace the normal drilling controls; however it is an enhancement to the exist-

ing system. To utilize latched drilling, the hole must be collared before the latch system is engaged. Without feed and rotation pressure the latched drilling circuit cannot be engaged, this ensures that the drill must be in material and not free air to operate. Guarding is added to prevent an operator from coming into accidental contact with a latched drill.

This design allows fewer operators to drill and install roof and rib bolts, which in turn lowers the miners' exposure per cut. The machine was designed to reduce the operator's exposure to inherent pinch points and rotary hazards once he has engaged the latched drilling. Therefore the machine will help to decrease the time to bolt a cut, improving productivity while enhancing the ability to operate the machine safely.

During the development of this machine it was determined that the machine design must prevent the operators contact (as much as possible) with moving and/or rotating components when the operator is not operating the controls for the drill rigs. Therefore, the platform has been equipped with railings and guards between the operator and drill rig. Nevertheless, a small opening had to be left to allow the operator access to install and remove drill steels and bolts. The openings are small enough to aid in preventing from an operator from falling through and adjacent to each opening is a hydraulic disconnect as well as a machine stop strip switch.

Due to the magnitude of the 6-head bolter and the quick turnover in supplies, it was essential to have the ability to stock various bolting supplies on hand. This dictated the need for a storage system, called a "Material Handling System," which provides the operator immediate access to large varieties of roof bolt plates, steel straps, and steel screen or mesh to be installed in the roof to prevent falling of small rock and debris. Materials can be loaded onto separate trays and stored on the rear of the machine. This system incorporates the use of a hydraulic winch and material pods to load heavy materials onto the rear of the machine. The mechanized screen tray can then be maneuvered up, down, side to side and/or tilted to a position that is comfortable for operators when positioning sheets of screen for installation.

The Material Handling System also addresses risks associated with manually loading materials. Bolt plates, steel straps, mesh and other implements used in bolting are often heavy and awkward to carry from place to place, and carrying these materials manually increases an operator's risk of back, shoulder, knee and other physical injuries. The design enables stacks or bundles of screen to be loaded onto the machine at one time without the operator needing to lift them. Materials can also be loaded onto trays by the vendor outside of the mine. The trays then may be taken underground by supply cars and then lifted to a proper location on the rear of the roof bolting machine by the material handling system. This promotes reduced occurrences of injuries associated with repetitive tasks such as lifting the roof bolting materials onto the machine.



The final result is a machine with a single platform and six independent masts and drillheads; four masts strictly for drilling and installing roof bolts on the front of the platform and then two masts on the back of the platform for rib bolts. The feed and rotation controls at each operator's station include a latch control for drilling. The rear of the machine is equipped with material handling. There are two material pods with winch controls as well as a mesh rack that includes mesh lift, mesh tilt and mesh sump.

The machine is currently successfully installing all roof support for one cut in a little over an hour. Through careful observation and operator input, additional efficiencies are being realized; which will result in better times (under an hour). Three additional machines are to be delivered within the year.





*Continued from p. 6...*

nearly three dozen coal mine water structures across the province and has found them all to be without significant deficiencies except for one. "One structure, owned by Coal Valley Resources, was found to be significantly deficient," AER Executive Vice President of Operations Kirk Bailey said.

"Inspectors found erosion within the structure, which was causing a free flow of water from a partially reclaimed pit, which is a contravention of several Environmental Protection and Enhancement Act approval conditions." The mine pond, which is located near Edson, is now under investigation. Bailey said the AER will release the probe's results when complete.

### **Nova Scotia Will Continue to Burn Coal**

An energy plan released in November by Nova Scotia Energy Minister Michael Samson touted the increased development of renewable energy resources such as hydropower and wind energy along with greater energy efficiency to gradually wean the Canadian province off its heavy coal dependence. Coal still produces more than 70% of Nova Scotia's electricity. But regardless of the province's goals to lower greenhouse gas emissions significantly by 2030, coal is not going away anytime soon, the report acknowledged.

Coal "will likely play a role in the Nova Scotian electricity system until at least 2042," when the last coal unit at Nova Scotia Power's (NSP) 325-megawatt Point Aconi generating station in Cape Breton is scheduled to end its normal economic life, the report said.

"During this period, other, older coal units will likely be used on a seasonal basis," the report added. "Therefore, there is a window of opportunity for some amount of domestic coal — from Donkin or other mines — to be used in the province for the next 25 years if the economics of burning domestic coal are in the best interest of ratepayers."

NSP, also based in Halifax and the dominant electric utility in the province, has expressed an interest in burning Donkin coal. The utility is expected to conduct a test burn of Donkin coal sometime in early 2016. Cline/Kameron also are eyeing overseas markets.

In addition to Point Aconi, NSP operates the 620-megawatt Lingan and 154-megawatt Point Tupper coal plants in Cape Breton and the 308-megawatt Trenton coal plant in Trenton, Nova Scotia. Lingan, northeast of Glace Bay and within an easy 25 miles or so truck haul from Donkin, is thought to be the most likely domestic destination for the mine's coal. At least some of Lingan's four coal units are scheduled to run until 2029. The lone Point Aconi unit, meanwhile, should operate until around 2042.

The reality, the report said, "is that Nova Scotia's coal plants still exist. Their life can be extended well into the future, and even as they run less often, they play a key role in system operations. At a minimum, ratepayers are committed to pay for NSP generating systems until those systems reach the end of their current economic life. In some cases that date is near, but in other cases it is decades away."



\$150,000 for interfering with a miner's right to make a complaint to the Mine Safety and Health Administration (MSHA). In addition to the fine, Judge Miller ordered Robert E. Murray, CEO, MEC, to read a prepared statement at the five mines involved in the case.

The decision was related to cases that were brought before the Federal Mine Safety and Health Review Commission by a number of miners at five mines owned and operated by MEC pursuant to section 103(g) of the Federal Mine Safety and Health Act of 1977, which gives miners the right to file an anonymously complaint, and the interference provisions of section 105(c). According to the case file, the issue in each of the cases was a mandatory "awareness meeting" that was held at each of the mines where Murray discussed complaints that had been made by the miners to MSHA.

The five mines involved are large West Virginia longwall mines MEC acquired from CONSOL Energy, including the Marshall County mine, Ohio County mine, Harrison County mine, Monongalia County mine and Marion County mine. Shortly after MEC acquired the mines, a number of 103(g) complaints were filed regarding alleged safety hazards and violations. From December 2013 to July 2014, MSHA conducted inspections to investigate the complaints and issued 42 citations.

According to the judge's decision, beginning in April 2014, Murray held a series of awareness meetings where he gave a speech along with a PowerPoint presentation at all three shifts of all five mines. A recording of one of the speeches was offered as evidence. During the speech, "Murray asks the miners to 'take a moment to think about your job being suddenly gone' and reminds them that 'there are no jobs in this area that pay anywhere close to what is paid' at the mine," the document stated.

Having established that the miners had a protected right to make anonymous complaints to MSHA regarding health and safety violations, the question before the judge was whether Murray Energy and its CEO interfered with that right. Murray's tone as evidenced in the recording was serious and at times threatening, Judge Miller wrote in her decision. "Throughout the two-hour presentation, miners were repeatedly reminded that their jobs, futures and family livelihoods were at risk," Miller said. A reasonable miner, Miller said, would have concluded that management at the mine was hostile to the 103(g) complaint process, especially as it was currently being used at the mine.

Miller ordered MEC to cease and desist from violating section 105(c)(1). MEC was further ordered to rescind the rule announced at the awareness meetings requiring miners to give notice to management of the 103(g) complaints. She also ruled that any discipline resulting from that rule be rescinded immediately.

The court ordered Murray to hold a meeting at each mine in which he shall read a prepared and approved statement notifying miners that they are not required to contact management when making a complaint to MSHA. She assessed a \$30,000 penalty for each of the violations at the five mines, totaling \$150,000.

### **Alpha Ex-CEO Quillen Objects to Benefit Cuts**

Former Alpha Natural Resources CEO Michael Quillen, who founded the company more than a decade ago, has reportedly objected to the producer's bankruptcy plan that includes dropping benefits for thousands of miners and their families. Quillen





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underground construction industries.

**KMS (Keystone Mining Services)**—KMS (Keystone Mining Services) is JENNMAR's engineering affiliate that provides advanced engineering services such as structural analysis, numerical and 3-D modeling, as well as conducting research and development of new products.

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told *Reuters* that eliminating health benefits for more than 4,500 workers and dependents “goes against the values the company was built upon.” Quillen established Alpha in 2002. He stepped down from his chairman position in 2012.

“We made a pledge to our employees to provide a safe place to work and benefits that would extend beyond their years of employment,” he said. “It’s imperative for the company to honor that pledge.”

The former executive, along with several other former officials, have reportedly filed court filings requesting the formation of a committee to represent retirees during Alpha’s Chapter 11 reorganization. Alpha first filed its voluntary petition with the U.S. Bankruptcy Court in Virginia in August.

Eliminating benefits could save the Virginia-based miner more than \$125 million, the *Reuters* report noted; in addition to health benefits, life insurance would also be lost. Alpha had already filed

its own request asking for benefits to be dropped at the end of the year.

### Armstrong Completes Development at Survant; Midway Could Close

Armstrong Energy completed development of the new Survant underground steam coal mine operated by its Armstrong Coal subsidiary in western Kentucky during the third quarter of 2015. However, the St. Louis-based company could curtail two existing mines and their respective prep plants in the Illinois Basin by the end of December, unless market conditions improve.

Survant, part of the company’s Parkway mining complex near Central City in Muhlenberg County, was using a single continuous miner section to produce high-sulfur western Kentucky No. 8 seam coal in late fall, Marty Wilson, Armstrong president and CEO, told analysts during a mid-November conference call.



## PEOPLE IN THE NEWS



Paul Vining

The **Cline Group** appointed *Paul Vining* as its CEO. Vining assumed the leadership of Cline Group affiliate, Cutlass Collieries, in February as its CEO and has spent the balance of the year leading acquisitions and potential acquisitions of coal operations in North America and Australia. Vining will remain CEO of Cutlass Collieries. Vining was also appointed president of Foresight Reserves.

**Westmoreland Coal Co.** announced that *Brian Blackman* has joined the company as director of investor relations.



Robert Bell

**Atrium Coal NL** appointed *Robert W. “Bob” Bell* executive director and chairman of the company. He currently serves on the boards of the Western Canadian Shippers Coalition and the Western Canadian Coal Society.



Brian Blackman



Colin Boyd

*Colin Boyd*, former chief information officer at Johnson Controls Inc., has joined **Joy Global Inc.** as vice president and CIO. He started in early November and reports to CFO *James Sullivan*. He replaces *Mark Shaver*, who will eventually move to a position within Joy’s underground product services division.

**TerraSource Global** has appointed *Jason Burlage* as president of the company, succeeding *Mark Kohler*, who retired December 1. Burlage joined TerraSource Global as vice president of service and strategy in 2014 after 14 years at another Hillenbrand business.

**Baldor Electric Co.** appointed *Myla Petree* to the newly created position of director of strategic program management. Petree joined Baldor in 2011 as the company’s director of quality.



Myla Petree

**The National Mining Association (NMA)** named numerous officers to its board of director for 2016: Chairman *Kevin Crutchfield*, chairman and CEO, Alpha Natural Resources; Vice Chairman *Phillips Baker*, president and CEO, Hecla Mining Co.; President *Hal Quinn*, president and CEO of NMA; Secretary *Bruce Watzman*, NMA senior vice president for regulatory affairs; Treasurer *Roger Roberts*, NMA senior vice president for administration; and Asst. Secretary *Katie Sweeney*, senior vice president and general counsel.



Kevin Crutchfield



Phillips Baker



Hal Quinn



Bruce Watzman



Roger Roberts



Katie Sweeney



Sekhar Bhattacharyya

**New Mexico Tech** welcomed *Dr. Sekhar Bhattacharyya* as associate professor of mineral engineering. Prior to this appointment, Sekhar had an accomplished career in the industry for 21 years. He worked at various operations, engineering, and management positions at CONSOL Energy and Norwest Corp. in the U.S., and at Joy Global and CESC Ltd. in India.

*Brady West* passed away on August 8, 2015. He was the general mine manager for **Kiewit** at the San Miguel mine at the time of his passing, and worked for the Kiewit Mining Co. for 35 years.

*Jim Cooper* passed away on November 16, 2015. He was the former president of **Oxbow Mining** in Somerset, Colorado.



Mark Collett

*Mark Collett* passed away on August 10, 2015. He had a distinguished career as an engineer, during which he served as president of the **Rocky Mountain Coal Mining Institute**, president of Instrumentation Society of America, and on various industry and academic advisory boards.



Robin Campbell

**Coal Association of Canada** appointed *Robin Campbell* as its new president. Campbell was a member of the Alberta Legislative Assembly for the riding of West Yellowhead from 2008-2015. During that time, he also held government ministerial appointments in several portfolios of importance to the coal industry, including environment and sustainable resource development and aboriginal relations.



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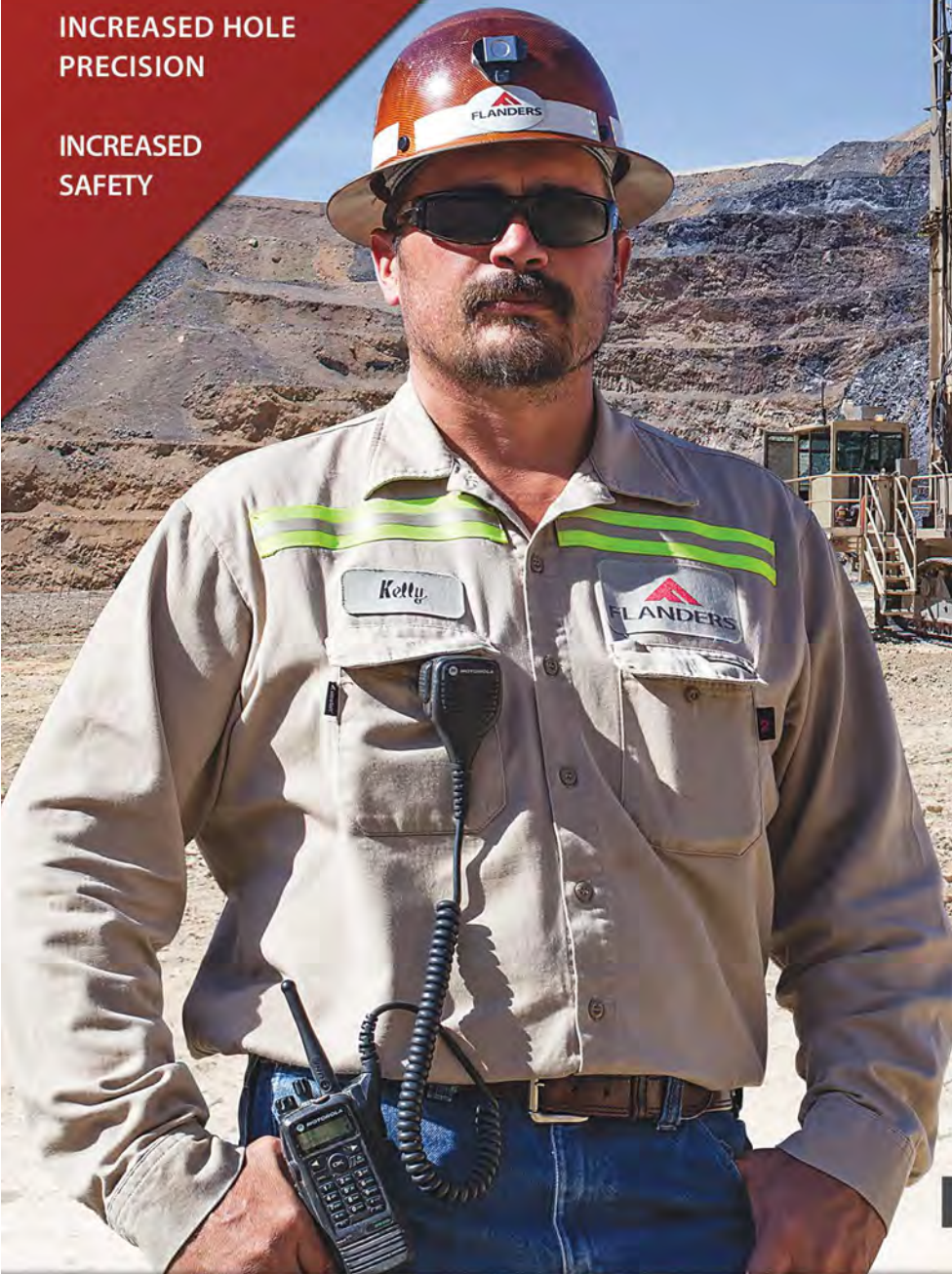
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"We hope to increase the production at Survant in the future if market conditions warrant," Wilson said. Eventually, Survant could become one of Armstrong's most productive mines, extracting about 2.4 million tons of coal annually.

Survant cost approximately \$25.2 million to develop, according to an Armstrong filing with the federal Securities and Exchange Commission. The outlook was less optimistic for Armstrong's Parkway underground mine and Midway surface mine in Muhlenberg and Ohio counties, respectively. Both faced cutbacks and/or closings by year's end because of the continued market downturn. Wilson described Midway as one of the company's highest-cost surface mines.

"This will allow us to leverage our lower-cost operations," he said. "Our priorities moving forward will be to preserve liquidity

and control costs." Armstrong had about \$94 million of liquidity as of September 30, he noted.

Wilson disclosed that Armstrong agreed to defer "a few hundred thousand tons" from 2015 into 2016 at the request of a couple of unidentified utility customers. As a result, the company expects to ship 7.9 to 8.1 million tons of coal in 2015, even though it is contractually committed to sell 8.4 million tons this year. "We don't want to overcommit and underachieve," Wilson said.

Armstrong, which posted record production of 9.4 million tons in 2014, has at least 4.7 million tons of committed sales for 2016. Although Wilson said the company had "sold some more tons" in recent months for next year, he declined to reveal specific amounts.



## DATELINE WASHINGTON

# CLIMATE CHANGE — THE NEW PAY-TO-PLAY GAME

BY LUKE POPOVICH



Here's a twist on conventional logic. In the empire of capitalism, where the market is supposed to rule, the Barack Obama Administration is regulating another 41 gigawatts of coal-based capacity out of existence. What began as a plan to euthanize old coal plants has become a brazen plan to kill them all. Meanwhile, in autocratic China, where the Communist party spurns free-market dogma and democracy, the government

is offering bonuses to any coal power plant that increases efficiency.

So, while Obama was in Paris pushing his Clean Power Plan designed to rid his country's consumers of a major source of affordable energy, China's leaders were there negotiating in the interest of the Chinese people. Since the president's plan achieves no meaningful environmental benefit, it's little more than a hate crime against coal. And this from the country with more coal than any other. "Encroyable," the French might say.

That difference dramatizes the Gulf dividing countries and their views toward coal as the U.N. climate conference wrapped up in Paris in early December. China is protecting consumers, but all the while trying to grab headlines with soothing commitments to curb its rampant emissions. Its pledge to curb CO<sub>2</sub> emissions by 2030 is no different than its prior position that growth comes first. Just last month, it admitted under-reporting coal consumption by 17%. The only difference now is that China's leadership has learned the value of words like "transparency," "reporting" and "monitoring" to lard its aspirations with "commitments" that mollify global greens and governments.

Of course, China will spend more to scrub emissions of particulate matter, SO<sub>2</sub> and NO<sub>x</sub> — much as we have done since 1990. Why not? After all, it is those pollutants, and not CO<sub>2</sub>, that are responsible for pictures in your newspaper of gasping Beijing residents enveloped in a brown haze. Readers don't appreciate that distinction any more than they distinguish bad weather from El Niño. No matter. From Washington to Paris, it's all about climate change. The White House wants to turn the page from ISIS and the priority threat it poses. If you "deny" climate change is the world's top priority, you're a cretin. So shut up.

The other CO<sub>2</sub> emitting power house, India, has been less accommodating to the Obama Administration's desperate bid for a climate deal. The Modi government cares little about our president's legacy, and like China more about a swelling population of peasants who lack access to electricity. Coal, said India's energy minister, will "remain the backbone" of its economy. The developing world will either continue to use coal, demand to be paid for using less of it — or both.

That brings us to that clever U.N. term of art, buried in its climate pledge, "shared but differentiated responsibilities." Meaning, nations that got rich using fossil fuels must do more to reduce future CO<sub>2</sub> emissions than poor countries "emerging" from darkness. The chief means by which this will be accomplished, said the U.N., is to transfer wealth from the haves to the have nots. That makes climate change a global pay-to-play operation, as African, Latin American, Asian and Island nations line up, hands extended, for their take from the U.N. climate fund.

Our president has generously offered your tax dollars to pay these countries for various climate mitigation projects. Secretary of State John Kerry pledged an \$800 million down payment on the \$3 billion the president promised. We're sure ministers from Benin to Burkina Faso will be cheered on by this generosity as they contemplate how best to spend that lucre. We're less sure how they'll spend it since audit reports on these expenditures show that, to date, both the money and the projects are missing.

One place where more money could help to arrest a warming planet would be on low-emissions technologies. World Coal Association Chief Executive Benjamin Sporton told Paris negotiators that carbon capture and other low-emission technologies are needed for all fossil fuels, not just coal, to reach the U.N. emissions targets. That sensible argument, endorsed in findings by the U.N.'s own Intergovernmental Panel on Climate Change, doubtless fell on deaf ears in the White House. Until that crowd is driven from office, regulation, not technology, will be the hammer for all our nails.

*Luke Popovich is a spokesperson for the National Mining Association, the industry's trade group based in Washington, D.C.*





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Today the Eickhoff Group consists of five major business units- mining technology, foundry, gear transmissions, Schalke locomotives and wind power. The Group has more than 1,800 employees throughout the world. While global headquarters has always been in Bochum, Germany, the company is represented on five continents having offices/subsidiaries and workshops in the United States, South Africa, Poland, Australia, Belorussia, Russia and China. As one of the oldest continuous working

examples in the world, the renowned in-house foundry at Bochum allows us to maintain very close controls on the high metallurgical quality components used in our products. With this foundation, Eickhoff produces gearing and shafting that is unequalled. Our manufacturing facility is ISO 9001 certified.

The many uses of high quality Eickhoff gearing, well known in the mining and material handling industries, extend well beyond the coal industry where it all started. In addition to continued success in the coal industry, these products are also used in soft rock mining, power plants, quarries, steel mills, tunneling projects and more recently in the wind turbine industry.

The mining machinery division is the largest with a worldwide population of well over 300 shearers and countless gearcases of different types in various industries. Eickhoff has also expanded into the traditional room and pillar market with its own continuous miner in South Africa, Belorussia, China and Russia.

## PRECISION RELIABILITY FLEXIBILITY

Eickhoff manufactures several shearer loaders annually. The SL 900 is our newest machine weighing about 115 tons. Installed power is 3,400 HP and the machine is suitable for seams up to 18 ft.(5.5m) high. Aside from the development of high seam shearers, other focal points within Eickhoff R&D are improved shearer diagnostics and system automation. Cutting edge advances in automation technology have led to the development of EiControl and EiControl SB software packages. Eickhoff provides 24/7 service and life-cycle management.

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Tailored products for various seam thickness.**

SL 1000

SL 900

SL 300

SL 750





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With unparalleled gearing, high availability and powerful compact design, Eickhoff shearers are relied upon worldwide for higher productivity. Our continued engineering innovations contribute to development of better and better machines with ever-increasing efficiency. We're the only shearer manufacturer that offers interchangeability of components across the entire Eickhoff SL family. From mines in Alabama, Pennsylvania,

Australia, Inner Mongolia, Workuta and across China, Eickhoff shearers continue to set production records.

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*The Cutting Edge*

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[sales@eickhoff.us](mailto:sales@eickhoff.us)



SL-750

**Empowering Energy Producers™**



In the third quarter, Armstrong's coal sales decreased to 1.9 million tons from 2.3 million tons in the same period of 2014. For the first nine months of 2015, the company sold 5.9 million tons, down from 7.1 million tons a year earlier.

Hord Armstrong, the company's executive chairman, said U.S. steam coal production is forecast to be lower in 2016 than in 2015. "In addition, we believe utility demand for coal will be down roughly 35 million tons in 2016, mainly due to the excess of natural gas and closure of some coal-fired [power] plants."

Because of fierce competition among coal companies for short-term sales, "we don't see pricing improving in the short term," he said. Meanwhile, coal inventory levels at utilities are still high and are expected to remain so into the early part of 2016, he added.

"This has created a situation where utilities are reluctant to commit to longer-term contracts, preferring to commit to smaller amounts and leaving more open positions," Armstrong said. "Utilities still have significant open positions for coal in 2017 and beyond."

### A&G to Reclaim Virginia Sites

Southern Coal Corp.'s A&G Coal will soon begin \$252,000 in work on three separate projects to reclaim two of its inactive coal handling sites in southwestern Virginia. A mining sediment pond will also be converted for public fishing, and a former coal tippie site will be reclaimed near Blackwood and Pennington Gap.

The plan is currently awaiting court approval, as it is tied in with a citizen's suit filed by a group of environmentalists that

include the Sierra Club. The group claims that toxic selenium pollution was found at the company's Kelly Branch surface mine in Wise County in 2014.

### Arch Coal Warns of Possible Bankruptcy

As part of its third quarter earnings report, in which it reported a widened year-over-year loss of \$2 billion, Arch Coal indicated it could potentially be headed for U.S. Bankruptcy Court in the "near term." While the St. Louis-based company is currently in discussions with creditors to restructure its balance sheets, a *Reuters* report November 9 said that an out-of-court restructure is unlikely and that Chapter 11 could be in its future even if a deal is struck.

"If an agreement [with creditors] is reached and we pursue a restructuring, it may be necessary for us to file a voluntary petition for relief under Chapter 11 of the United States Bankruptcy Code," Arch officials said in a U.S. Securities and Exchange Commission (SEC) filing, adding that it may have issues servicing its current \$5.1 billion in debt considering the current economic environment. Unnamed sources with knowledge of the deal told the news service that Arch could seek out Chapter 11 protection as early as December.

For now, the key date is December 15, when Arch — which acquired International Coal Group in 2011 — has \$90 million in coupons due. Another \$14 million are due on January 15. If Arch Coal does not file for Chapter 11 protection by the former of the two dates, the *Reuters* report said, it can choose to miss its next bond payment. That will then spur a 30-day grace period.

Arch Coal canceled its third-quarter earnings conference call, saying only that the difficult market would continue through next year.

### Peabody Backtracks on Federal Expansion Plan

Peabody Energy has reportedly recently withdrawn an application for additional federal coal reserves for one of its Powder River Basin operations. According to *Wyoming Public Media*, the company called back its lease by application (LBA) for the Antelope Ridge tracts — which contain about one billion tons of coal — last month. They first filed the documents in 2011. The report said the St. Louis-based miner wasn't the first to change its mind in 2015; Arch Coal did the same in the state earlier this year. The last federal lease auction in Wyoming was held in 2012.

### Production, Jobs Cut at Alliance Mines

Alliance Resource Partners (ARLP) recently confirmed that it will reduce production and staff at three of its operations in Kentucky and southern Indiana, citing ongoing market uncertainty. The Oklahoma-based producer, which called the three "higher-cost mines," said that it will reduce its operating units at the Hopkins County Coal Elk Creek mine. No job losses are slated there, as the mine is expected to cease operating during the first quarter of next year and the company said positions were available elsewhere in its portfolio.

To-date in 2015, Elk Creek has sales and production volumes of about 2,537,000 tons and 2,648,000 tons, respectively.

At Gibson County Coal's Gibson North and Gibson South operations, Alliance said it will eliminate a total of 1.5 production units and, by December 31, it will increase Gibson South to four production units and idle Gibson North. As it relates to that plan, Worker

1

## CALENDAR OF EVENTS

**January 27-29, 2016:** *WVCA Mining Symposium*, Charleston Civic Center, Charleston, West Virginia. Contact: Web: [www.wvcoal.com](http://www.wvcoal.com).

**January 28-29, 2016:** *16<sup>th</sup> Coaltrans USA, The Four Seasons Miami*, Miami, Florida. Contact: Web: [www.coaltrans.com](http://www.coaltrans.com).

**January 31-February 3, 2016:** *42<sup>nd</sup> Annual Conference on Explosives and Blasting Technique*, Las Vegas, Nevada. Contact: ISEE; Email: [meetings@isee.org](mailto:meetings@isee.org); Web: [www.isee.org](http://www.isee.org).

**February 21-24, 2016:** *SME Annual Conference and Expo*, Phoenix Convention Center, Phoenix, Arizona. Contact: Web: [www.smenet.org](http://www.smenet.org).

**March 6-9, 2016:** *Prospectors and Developer Annual Conference*, Toronto, Ontario, Canada. Contact: Web: [www.pdac.ca/convention](http://www.pdac.ca/convention).

**March 21-24, 2016:** *National Western Mining Conference and Expo*, Colorado Convention Center, Denver, Colorado. Contact: Web: [www.coloradomining.org](http://www.coloradomining.org).

**April 11-17, 2016:** *bauma*, Messe Munchen, Munich, Germany. Contact: Web: [www.bauma.de](http://www.bauma.de).

**April 25-27, 2016:** *Coal Prep 2016*, Kentucky Exposition Center, Louisville, Kentucky. Contact: Web: [www.coalprepshow.com](http://www.coalprepshow.com).

**May 1-4, 2016:** *Canadian Institute of Mining*, Vancouver, British Columbia, Canada. Contact: Web: [www.cim.org](http://www.cim.org).

**September 26-28, 2016:** *MINExpo INTERNATIONAL 2016*, Las Vegas Convention Center, Las Vegas, Nevada. Contact: Web: [www.minexpo.com](http://www.minexpo.com).



Adjustment and Retraining Notification (WARN) Act notices were issued to 120 workers on November 6.

Gibson North has generated 2015 year-to-date coal sales and production volumes of approximately 1,939,000 tons and 1,983,000 tons, respectively.

On the same day, Alliance issued WARNs to another group of workers at Sebree Mining's Onton room-and-pillar operation. Production at Onton has stopped. The company said about 140 will be affected by the move, when employment opportunities at

other ARLP mines are considered. Onton No. 9 has generated sales and production of 1,861,000 tons and 1,869,000 tons, respectively, year-to-date.

"Unfortunately, prolonged weak market conditions made this production response necessary," said Joe Craft, president and CEO, ARLP. "We deeply regret the impact of these decisions on our employees, their families and their communities. While we were hopeful that conditions would improve, an oversupplied market combined with weak pricing forced us to take these



## LETTERS TO THE EDITOR

### Dear *Coal Age*:

In reference to the article "Innovative Rock-Dusting System to Assist with Respirable Dust Compliance" published in the October edition of *Coal Age*, I would like to clarify the appropriate use of wet rock dust, and specifically, foam rock dust, to treat an underground coal mine. While I acknowledge that foam rock dust could be an "innovative" tool to address the respirable dust rule, it is not an innovative method to mitigate an explosion in an underground coal mine. Furthermore, foam rock dust is not currently allowed by MSHA as the primary method of dusting a mine, as it must be used in combination with dry rock dust.

My concern is that the readers of *Coal Age* could misinterpret statements in the article as an opportunity to use foam-based rock dust to replace dry rock dusting, which would be incorrect. Despite all the test data generated on foam rock dust, it is still not recognized by the National Institute for Occupational Health (NIOSH) or the Mine Safety and Health Administration (MSHA) as an acceptable alternative to dry rock dusting.

While wet rock dusting has been around for decades, foam rock dust has been around for at least 11 years (see U.S. Patent # 6,726,894, Gay et al, dated 4/27/04). Foam rock dust as an alternative to dry rock dusting was revisited in 2010, as a result of the UBB disaster. DSI, in cooperation with MSHA, conducted application trials of foam rock dust in actual coal mines, and MSHA subsequently asked NIOSH to verify the efficacy of foam rock dust as a primary rock dusting method. Unfortunately, NIOSH refused to recommend foam rock dust prior to seeing test results from a controlled explosion in an underground mine. Due to the closing of NIOSH's Lake Lynn experimental mine in 2013, such an underground test explosion, with foam rock dust replacing dry rock dust as the primary inerting agent, has not taken place.

The Final Rule in 30 CFR Part 75 states that the use of wet dusting technology (re: foam) has limitations, particularly forming a "coating" on

mine surfaces on top of which new coal dust can accumulate. "This coating will not provide as effective inerting capability in the event of an explosion as dry rock dust<sup>1</sup>."

Specifically related to the limitations of foam rock dusting, MSHA's program policy manual, updated July 2015 Release V-51 states "wet dusting, such as foam rock dust is limited to rib and roof surfaces in the face areas and shall not be used for redusting mine surfaces. In such applications, only limestone or marble dust which meets the specification contained in Section 75.2(d) shall be used. After the wet rock dust dries, additional dry rock dust shall be applied to all surfaces to meet applicable standards. Wet rock-dusting of ribs and roof does not eliminate the necessity for dry rock-dusting the floor<sup>2</sup>."

I applaud DSI's efforts to improve rock dusting technology. Recognizing its limitations, foam rock dust should continue to be another tool in a coal company's toolbox to prevent underground disasters.

*Sincerely,*  
David Berg, market manager  
Carmeuse Lime & Stone

### References:

- <sup>1</sup> 30 CFR Part 75, RIN 1219-AB76, *Maintenance of Incombustible Content of Rock Dust in Underground Coal Mines*  
AGENCY: Mine Safety and Health Administration, Labor. ACTION: Final rule.  
[www.msha.gov/REGS/FEDREG/FINAL/2011fin/2011-15247.asp#rule](http://www.msha.gov/REGS/FEDREG/FINAL/2011fin/2011-15247.asp#rule)
- <sup>2</sup> MSHA Program Policy Manual, VOLUME V - COAL MINES, Subpart E, *Combustible Materials and Rock Dusting*  
75.403 *Maintenance of Incombustible Content of Rock Dust*.  
[www.msha.gov/REGS/COMPLIAN/PPM/PMVOL5E.HTM](http://www.msha.gov/REGS/COMPLIAN/PPM/PMVOL5E.HTM)

### Dear *Coal Age*:

DSI appreciates Mr. Berg's discussion reinforcing the use of dry rock dust and clarifying the MSHA Policy Manual and application of rock dust for the coal mining industry. As noted in the DSI literature and stated in the original *Coal Age* article, "The allowance in 30 CFR is for an application of foam rock dust followed by a dry dust application." DSI supports compliance with the MSHA rock dusting policy.

Foam rock dust is indeed currently allowed by MSHA (per Policy Manual reference) as an approved method (tool) to apply rock dust to rib and roof surfaces in the mine face areas and, as stipulated in the MSHA policy manual, followed by an application of dry dusting to "meet applicable standards." DSI feels that the use of the DYWI Dust foam rock dust application technology will make the application of the wet dust more effective and consistent, and enhance the rock dust application process in general. Customers (mine operators) and regulatory authorities will determine the future applications of foam rock dust.

DSI Underground Systems is proud of the work of our team in conjunction with government and university research, and regulatory groups on this foam rock dust technology. Currently, DSI is the only company to complete the NIOSH foam rock dust protocol and complete the inerting tests in the 30-liter blast canister at 8 bar of over pressure with mine-scale-equipment-prepared samples. DSI Underground Systems welcomes the opportunity to complete a full scale magnitude inerting test at 15 bar should another explosion test facility become available.

DSI is currently working with U.S. underground coal mining operators, in compliance with the current MSHA Policy allowance language, to apply the patented DYWI Dust rock dusting technology.

*Sincerely,*  
Jim Pinkley, president and general manager  
DSI Underground Systems



# You're there. We're there.



For more than a century, the Drägerman has been synonymous with mine rescue. The first documented application of oxygen rebreathers, the Dräger breathing apparatus, was during a 1906 mine disaster in Courrières, France. The technologies offered by Dräger's breathing apparatus paved the way for the emergence of an entirely new profession: mine rescue. All over the world, mine rescuers are called "Drägermen", even today, and for generations, miners have relied on Dräger for quality products to protect their lives. The Drägerman always stands guard

## Emergency response that's always ready

Dräger's portfolio of emergency response products offers mine operators more options for keeping the mine running and their people safe than any other company. Innovations include the Oxy series of self-contained self rescuers, Dräger PSS BG 4 plus closed circuit breathing apparatus in equipped with a Dräger FPS 7000 RP full face mask with an integrated hydration system.

We continually develop our products to offer increasing levels of safety and ease of use. Around the globe, miners want the peace of mind of knowing that in the event of an emergency, they will be rescued quickly. That means that the rescuers' equipment must be reliable and proven. Conditions are unpredictable and can be life-threatening, so only the best and most trusted equipment will do the job and send miners home safe. Today, the

Dräger PSS BG 4 plus closed-circuit breathing apparatus is the industry standard for mine rescue operations. It allows rescue teams to enter and work in mines for a prolonged period of time.

## Ensuring that everyone goes home at the end of the day

It's not just about rescue, though. It is imperative that mines keep running so they can harvest the materials today's world needs. In the course of everyday operations, there are hazardous gases and dangerous work environments. Today's miners need to know they're always protected, even though it's "business as usual". When it comes to mining operations, you want to identify hazards sooner, work safer and minimize downtime. That's where Dräger's X-am® series of personal gas monitors and X-dock® calibration system can help you. We've made them durable and easy to use. All to keep things simple and efficient. Just how you want them.

## Supplying the complete spectrum of safety equipment

Dräger's technology encompasses an integrated safety concept that improves mine safety – from respiratory protection and gas detection for daily operational safety, to self-contained self rescuers and refuge shelters for emergency situations. Our portfolio for general mining operations includes a comprehensive line of gas detection products that detect hazardous levels of methane, oxygen deficiency, and toxic gases. Whether you need personal area monitors to continually evaluate oxygen levels or take spot measurements for combustible gases, Dräger's single and multiple gas monitors are fast, accurate, and reliable.

### Gas detection

Potential hazards can only be identified in time through the measurement and control of the environment to prevent the occurrence of mine fires, unplanned explosions, and occupational illnesses or injuries. Our products for detection include:

- Personal air monitors
- Confined space entry monitors
- Spot measurement
- Diesel exhaust detection

### Respiratory protection for daily use

Protection against dust remains the most commonly needed respiratory protection because of the dust generated by mechanized mining including blasting, drilling and cutting in both surface and

underground mines. Our products for protection include:

- Particle filtering facepieces
- Air purifying respirators

## Dedicated device maintenance and holistic service support

In view of the unpredictability of mine incidents, a mine's safety equipment must be fully operational and mine personnel adequately trained at all times. Our services include:

- Functional testing and data management
- Workshop systems
- Rental program
- Dräger service packages
- Trainings and seminars

## From individual self escape device to group shelter system

Mine incidents continue to cause great concern among the mining community and the public at large. The primary need for the development of an effective mine-specific emergency escape strategy is becoming even more prominent within the industry. Our rescue products include:

- Self-contained self rescuer
- Self-contained breathing apparatus in combination with refill station
- Refuge chamber
- Carbon dioxide scrubber
- Oxygen generator

## The confidence of knowing you're protected

Dräger offers peace of mind with SCBA caches and refill stations, SCSRs, rescue shelters, and full-face masks. No matter what the mine throws your way, you can do the job knowing your people are always protected.

## Reliable protection against all elements

Dräger's mining operations portfolio includes a comprehensive line of gas detection products which enable you to detect hazardous levels of methane, oxygen deficiency, and toxic gases. Dräger also offers a variety of filtered respirators, which protect miners against airborne dust and particles common in mining operations.

# Dräger



# You're there. We're there.

## AIR PURIFICATION

Respiratory protection coupled with clear vision make your work safer.

## GAS DETECTION

The Dräger X-am® series of personal gas monitors identify hazards quickly and accurately.



## We have you covered.

When it comes to mining operations, you want to identify hazards sooner, work safer and minimize downtime. That's where Dräger's X-am® series of personal gas monitors and X-dock® calibration system can help you. We've made them durable and easy to use. All to keep things simple and efficient. Just how you want them.

VIEW OUR COMPLETE MINING OPERATIONS PORTFOLIO AT [DRAEGER.COM/MINE-OPERATIONS](http://DRAEGER.COM/MINE-OPERATIONS)

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actions and shift production to our lowest-cost mines. These steps are consistent with our current projected production and sales volumes for 2015 and beyond.”



## 2015 AWARDS

### **Kentucky DNR and the KCA Recognize Coal Operators**

The Kentucky Department of Natural Resources (DNR) and the Kentucky Coal Association (KCA) recently recognized Alliance Resource (ARLP) and Armstrong Coal for reclamation work and safety achievements. The awards for exceptional mine safety in the Division of Mine Reclamation and Enforcement’s Madisonville district went to ARLP’s River View underground mine and Armstrong’s Equality surface mining operation.

At River View, annual production totaled more than 9.34 million tons last year with 643 miners working three shifts. In a total of 1,471,568 man hours, 11 reportable accidents were logged. At Equality, 3,909,816 tons were produced last year with 145 miners working three shifts. In all, crews recorded 369,209 man hours with two reportable accidents.

The Excellence in Reclamation for the Division of Mine Reclamation and Enforcement’s Madisonville regional area was presented to Armstrong’s Centertown 1,218-acre surface operation in Ohio County. The site under permit 892-0105 is being reclaimed to multiple post-mining land uses including cropland, forestland and pastureland, also providing restoration of old pre-law mining areas with significant off-site environmental impacts because prior reclamation work had not been reclaimed to higher modern standards.

Late last month, the DNR and the KCA presented awards to several other operations including Premier Elkhorn Coal, Blue Diamond Mining, B&W Resources, Eagle Coal and Blackhawk Mining.

### **ARIES Award Winners Announced**

The Appalachian Research Initiative for Environmental Science (ARIES), a university consortium, managed at the Virginia Center for Coal and Energy Research, affiliated with Virginia Tech, presented its inaugural ARIES award to Leigh-Anne Krometis of the department of biological systems engineering and Emily Sarver of the department of mining and minerals engineering. Sarver and Krometis received the award due to the exemplary quality of their research and their research partnership, said John Craynon, Appalachian Research Initiative for Environmental Science project director.

Over the course of their grants, Sarver and Krometis grew their initial single subject investigations into transdisciplinary projects, meeting the demand of complex issues with a depth of understanding provided by multilevel multidisciplinary research, Craynon said.

Since 2011, Appalachian Research Initiative for Environmental Science has supported more than 60 academic researchers in energy and the environment and over 75 student researchers at Virginia Tech, Pennsylvania State University, the University of Pittsburgh, West Virginia University, the University of Kentucky, Ohio State University, Marshall University, St. Francis University, the Edward Via College of Osteopathic Medicine, and consultants at Johns Hopkins and Georgetown.

The research initiative has sponsored several investigations by Sarver and Krometis, including research reviewing corporate social responsibility in Appalachia and research regarding bacterial and biological impairments in Central Appalachia, sustainability and water quality, and bacterial impairments in surface waters as an obstacle to sustainable water quality solutions.

Some of the lost production will be made up by some of Alliance’s lower-cost mines; moreover, officials said in the company’s recent earnings released that its 2015 full-year ranges for coal production will range between 41.1 to 41.7 million tons and coal sales volumes will total between 40.9 to 41.5 million tons. In 2016, full-year ranges for coal production and sales volumes are projected to be 40 to 45 million tons.

### **Hallador Revises Forecasts Downward**

Illinois Basin steam coal producer Hallador Energy Co. has revised downward its contracted coal sales position for 2016 to reflect ongoing negotiations with a U.S. electric utility customer that told the Denver, Colorado-based company in November it wanted to “substantially modify” their existing sales agreement.

At the request of the unidentified customer earlier this year, Hallador agreed to defer 571,000 tons produced by its Sunrise Coal subsidiary from 2015 to 2016. As an incentive to revise the accord, the customer offered to award an unspecified amount of additional tons to Hallador in the 2016-2020 time frame.

As a result, Hallador previously reported it had a maximum of 6.4 million tons priced for 2016. But after the customer again contacted Hallador on November 16, Hallador reduced the amount of coal it has priced for next year to about 5.8 million tons.

“Negotiations are still ongoing,” Hallador said in a late November filing with the federal Securities and Exchange Commission. “Until a contract is finalized, we feel it is prudent to revise our contracted sales position.”

Brent Bilsland, Hallador president and CEO, told analysts in early November that Sunrise expects to produce about 7.5 million tons and sell at least 6.5 million of steam coal in 2016. Sales in 2017 are estimated to total about 7.5 million tons. Hallador expects to sell about 7.6 million tons in 2015.

Over the next five years, Bilsland said, Hallador has a minimum of 22 million tons and a maximum of 30 million tons already contracted.

In recent months, Hallador has consolidated most of its production at Sunrise’s two Oaktown underground mines in Knox County, Indiana. The continuous miner operations were opened a few years ago by Vectren Fuels Corp., a subsidiary of Evansville, Indiana-based Vectren Corp. Hallador acquired the two mines in 2014.

Because they are newer and more modern mines, Hallador said the Oaktown complex can produce coal at a lower cost — less than \$30/ton — than its original Carlisle deep mine in Sullivan County, Indiana, that opened nearly a decade ago. Once a consistent 3-million-tons-per-year producer, Carlisle has been drastically downsized and is expected to turn out only about 150,000 tons in 2016.

Sunrise continues to produce lower-sulfur coal at its Ace in the Hole surface mine in Clay County, Indiana. The company blends coal from Ace with higher-sulfur coal from Oaktown to meet the demands of several Florida utilities.

### **Kentucky Coal Production Continues to Decline**

The amount of coal produced in Kentucky mines continued an overall decline in the third quarter, although the drop in eastern Kentucky’s Central Appalachia region was not as steep, and western Kentucky, part of the high-sulfur Illinois Basin, managed a

News Continued on Page 62

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## **Find answers to the most pressing questions in the US coal industry**

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# SOMERSET COAL INTERNATIONAL



Founded by individuals with decades of experience in the mining and mineral industries, Somerset Coal International is leading the way in fine coal recovery. Using an innovative centrifugal technology, the company's proprietary Sub325™ fine coal recovery system is installed in coal wash plants to capture the very small or fine (sub-325 mesh) coal particles that have previously been considered unobtainable.

By recovering the fine coal particles at an as-received moisture consistently in the 17-21% range, each unit produces an additional 10 - 15 tons of saleable coal per hour, depending on the size of the plant. This breakthrough system enables mines to increase yield and profitability, decrease per-unit costs and waste-related costs, and reduce waste.

## Sub 325™ Fine Coal Recovery System

Somerset Coal's Sub325 System is a powerful solid bowl centrifuge technology that separates the clean coal from the water. Somerset Coal partnered with Centrisys Corporation — a proven leader in centrifuge technology—to crack the code to solid bowl technology. This achievement was the result of three key improvements: redesigning the internal geometries of the decanter centrifuge, achieving the optimum G-force and torque and accomplishing the ideal rotational differential between the bowl and the scroll.

## The Sub325 System:

- Uses programmable logic controller (PLC) to continuously monitor input into the unit, make adjustments and provide critical operational data based on a custom program.
- Uses hydraulic variable speed drive to control the speed of the machinery, ensuring maximum results, maximum centrifugal force and ideal water-particle separation
- Seamlessly integrates into your operation with no downtime —“tie-in” time is all that is needed.

## Added Value with No Costs

Somerset Coal is committed to establishing lasting partnerships with the world's leading coal producers. The company offers its breakthrough Sub325™ fine coal recovery system to the mining industry without any required capital expenditures. Understanding the economic pressures that many mines are facing today, Somerset Coal provides the Sub325 system at no cost. The company covers installation costs (in most cases), as well as all ongoing costs related to operation, maintenance and repairs — and will generate substantial value and increased revenue for its customers. Somerset Coal is paid via a revenue sharing agreement and shares in the value of the incremental coal produced by their proprietary equipment.

## Field-Proven Results

An independent coal industry consultant, WEIR International Inc., conducted an extensive 18-day testing procedure over the trial period at a Northern App coal mine. They determined that Somerset's Sub325™ fine coal recovery system is “effective in dewatering the fine coal slurry and producing a saleable dewatered fine coal product.”

During WEIR's study, the Sub325 system operated in a prep plant with a raw feed of 500 tons per hour. The machine ran for approximately 500 hours, at an average processing rate of approximately 14.1 TPH and produced 7,500 tons of sub-20% moisture fine coal product. Over the course of the trial, WEIR was able to positively validate the performance of the Sub325 system.

## Environmental and Operational Benefits

While the primary benefit of the Sub325 system is increased revenue at no cost, it also provides coal producers with a more environmentally-friendly and efficient operation. With the system, less chemicals are needed at the thickener, reducing both costs and environmental impact. The system also decreases the volume going to refuse because the fine coal does not report to the thickener, slurry pond or combined refuse stream. Additionally, the Sub325 system increases efficiency throughout the fine circuit through reducing the fine coal recirculation loads.

## See for Yourself

Somerset Coal provides a free on-site equipment test period. The company will demonstrate actual results on your site utilizing their full-scale truck test unit, at zero cost for your company.



To learn more about Somerset Coal International and its breakthrough Sub325 system, or to set up a free consultation, visit [SomersetCoal.com](http://SomersetCoal.com) or call (412) 576-4000.



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Before now, traditional coal recovery processes could not capture coal that is smaller than 325 mesh (44 µm), causing valuable clean coal to report to the recirculation stream or out to the refuse pond. Our field-proven centrifuge technology, the Sub325 system, delivers this previously unattainable ultra-fine coal to your clean coal belt.

The Sub325 system may add up to 5% total clean coal recovery, directly increasing your bottom line. And the best part — there's no capital expenditure, no cost and no risk for you.

Visit [Somersetcoal.com/Calculator](https://www.somersetcoal.com/Calculator) to discover how much additional revenue you could generate.



**SOMERSET**  
COAL INTERNATIONAL

# SUB325



# U.S. COAL MARKETS HIT BOTTOM

BY ANDREW MOORE

This year will likely be remembered as the year the U.S. coal market hit bottom. Low demand led to low prices, which yielded production cutbacks, mine closures and some bankruptcies. As a result, U.S. coal production in 2015 is on target to slip to 908 million short tons, the lowest annual amount since 1986.

The market wasn't helped by a raft of new environmental regulations, such as the Clean Power Plan (CPP), that threaten coal's standing as the nation's primary fuel for electricity generation. "From a producer's standpoint, this is a year to forget," said Seth Schwartz, a principal at Energy Ventures Analysis, an Arlington, Virginia-based energy consultancy. "You simply can't add up how bad this year is."

One only has to look at prices to see why. In Central Appalachia, the price for rail-delivered 12,500 Btu/lb coal in the over-the-counter spot market has declined from an average of \$57.79/ton in 2014 to an average of \$43.28/ton through November 19 of this year. The price peaked at \$160.60/ton in 2008.

In the Powder River Basin, the nation's largest coal production region, the price for rail-delivered 8,800 Btu/lb in the OTC spot market has declined from an average of \$11.97/ton in 2014 to an average of

\$10.53/ton through November 19 of this year. The price peaked at \$22.65/ton in 2006.

Many factors led to the coal market's decline in 2015. One has been the decline in exports. In 2012, the U.S. exported a record 126 million tons. The figure was largely driven by an increase in thermal coal exports, as cheap natural gas pushed excess coal overseas.

The exports were supported by higher seaborne pricing, but global oversupply has since pushed prices down. In January 2012, Platts assessed the price for thermal coal delivered into northern Europe, the CIF ARA marker, at \$110.65 per metric ton (mt). As of November 19, the price has fallen to \$55/mt, a 50.3% drop. Due to lower seaborne pricing, the Energy Information Administration (EIA) expects U.S. coal exports to total just 79.2 million tons in 2015, the majority being metallurgical coal. Exports have also been impacted by the strong U.S. dollar, which has made both U.S. thermal and met coal uncompetitive overseas.

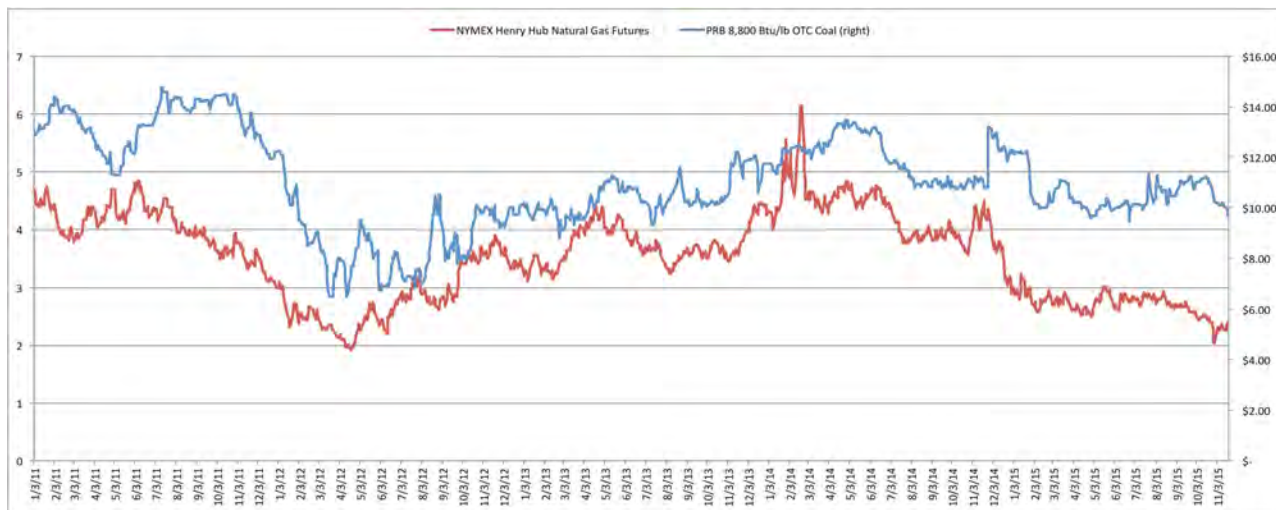
But chief among the reasons for the coal market's decline in 2012 has been cheap natural gas. The average 2015 price of the NYMEX Henry Hub natural gas futures contract through November

19 totaled \$2.695/MMBtu, down 36.7% from the 2014 average price of \$4.263/MMBtu. In many parts of the country, the actual gas is even cheaper. Daily prices at Dominion South, a trading hub in southwestern Pennsylvania, in the heart of Appalachian coal country, are averaging \$1.506/MMBtu so far this year, compared with \$3.255/MMBtu in 2014. For comparison, the average price through August of this year — the most recent data available — for delivered coal mined in Northern and Central Appalachia is \$2.866/MMBtu, according to the EIA.

Blame lower natural prices on increased natural gas production. In January 2011, U.S. drillers produced roughly 57.5 billion cubic feet per day (Bcf/d). This year, production is hovering around 72 Bcf/d, according to Platts Analytics. The resulting glut of gas has made a serious dent in coal generation. The average capacity factor — the amount of time a plant is running — for the U.S. coal fleet has fallen from 67% in 2010 to 54% in 2015, according to Platts Analytics.

In sum, the EIA estimates coal will total 34.7% of total U.S. electricity generation in 2015 compared with 42.4% in 2011. The total was as high as 49.6% in 2005.

## PRB 8,800 Btu/lb OTC Coal vs. NYMEX Henry Hub Natural Gas Futures





The lower utilization rates are driving the decline in generation more than coal-fired plant retirements, but retirements are a source of concern for producers. In 2015, some 13.6 GW of coal-fired generation shut down or will be shuttered by year's end, largely due to stringent new mercury emissions standards that took effect in April 2015.

Proposed in 2011 by the Environmental Protection Agency, the Mercury and Air Toxics Standards rule was remanded back to the agency this summer by the Supreme Court, but it was too little too late, as utilities moved to retire older, less efficient units rather than spend on expensive emissions controls.

The U.S. coal fleet will total roughly 300 GW by the end of the year, but looming is the CPP. While the rule aims to start cutting carbon dioxide emissions by 2022, it faces an uncertain future due to staunch opposition from industry groups and at least 26 states, which have banded together in court to stop it. There's also been condemnation from Congress, and a new administration in 2017 could alter the plan.

But as it stands, the CPP could result in the closure of 40-50 GW of coal-fired generation, according to Paul Bailey, a senior vice president for policy and affairs at the Washington, D.C.-based American Coalition for Clean Coal Electricity (ACCE). "The [CPP] turned out to be worse than we thought it would be," said Bailey.

And with regards to production, the U.S. EPA's regulatory impact analysis for the plan estimates U.S. thermal coal production could drop to 729 million tons by 2025 in its base case review, and as low as 606 million tons under a more stringent scenario.

In the near term, what is more certain is continued pressure from natural gas. Natural gas production is expected to stay flat in 2016 before increasing to 75 Bcf/d in 2017 and roughly 90 Bcf/d by 2020, according to Platts Analytics.

Increased natural gas generation will add demand, as will LNG exports, which are slated to begin in January from Cheniere Energy's Sabine Pass terminal at a rate of roughly 0.6 Bcf/d. But, LNG exports are not likely to impact supply until further terminals come online in the next few years. By

2020, Platts Analytics forecasts U.S. LNG exports will reach nearly 8 Bcf/d. "Exports will help balance the market," said Jeff Moore, an analyst with Platts Analytics. "I don't think I'm willing to say prices will rebound back up to [\$4/MMBtu], but I certainly think that it should help to move the price floor up a bit, and definitely tighten the market up a bit."

Moore said his current forecast for the average Henry Hub futures price is \$2.72/MMBtu in 2016, while the EIA forecasts an average price of \$2.69/MMBtu.

For coal producers, 2016 could be a replay of 2015, although most of the drivers will be out of their control. "Certainly everybody assumes there will be rationalization of supply, because obviously there are lot of producers who can't keep producing at this prices," said Schwartz. "So really you hope for some kind of demand recovery, either higher gas prices or a weaker U.S. dollar...but you can't count on either one of them."

*Based in Houston, Texas, Andrew Moore is the managing editor for Platts Coal Trader ; he can be reached at andrew.moore@platts.com.*



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# GATEWAY PACIFIC TERMINAL

BY DAVE GAMBREL

The U.S. coal exporting community could not imagine a more perfect place than Cherry Point from which to export America’s cleanest coal, coal produced in the Powder River Basin (PRB) of Montana and Wyoming. Over the last 10 years, some six or eight project developers took a shot at building a coal terminal in the Pacific Northwest. Of the two that are left, Millennium and Gateway Pacific Terminal (GPT), GPT was the only one standing when the race began, and may be the only one left standing when built.

In the 1980s, nearly 30 years before China imported its first coal, Whatcom County, Washington, set aside a large industrial complex at a county site called Cherry Point. Initially occupied by petroleum refining and primary metals manufacturing, the site was large enough to also accommodate additional heavy industry, and was ideal for exporting coal in large, economically competitive vessels. It had:

- Deep water, which is essential for docking and loading Panamax and Capesize vessels;
- Proximity to Asian countries enabling lowest possible shipping costs;
- Excellent labor pool. SSA Marine is a fully unionized shop and has full union support; and
- Uniqueness. An ability to replace the world’s dirtiest coal with world’s cleanest coal.

Pacific International Terminals (PIT), a subsidiary of SSA Marine, has proposed building a deep-water marine terminal at Cherry Point in Whatcom County. In a related project, BNSF Railway has proposed adding rail facilities adjacent to the terminal site and installing a second track along the six-mile Custer Spur. Track intended for GPT usage would be heavy-duty CWR (continuous welded rail), which is extremely quiet.

One of the primary attractions of the site is its relative closeness to Asia (see Table 1).

Both Norfolk and New Orleans, the main significant sources of low sulfur U.S. coals, are about the same distance from the three Chinese ports, and all are clearly twice as far as competing world sources in Australia and Indonesia.

GPT would be designed to handle up to 54 million metric tons per year (mtpy) of dry

Table 1 — Distance to Chinese Ports (nautical miles)

Ports	Guangzhou	Shanghai	Qinhuangdao	Via
Cherry Point, WA	5,823	5,094	5,246	Direct
Norfolk, VA	10,721	10,013	10,175	Panama Canal
Newcastle, AUST	4,522	4,573	5,000	Direct
Balkpapan, INDO	1,736	2,186	2,688	Direct

bulk commodities. Commodities would be transferred to the terminal by rail on the BNSF Railway’s Custer Spur. Modern material handling equipment would be installed and effective practices would be implemented to protect the safety of terminal employees and to protect the environment during terminal operations. The project area is zoned for heavy-impact industrial use and is located in the Cherry Point Industrial Zone that provides 2,100-2,200 jobs for Whatcom County and 11% of its total income. GPT would add another 1,230 jobs to a county deeply in need of more work.

GPT announced July 15, 2014, that it submitted a new layout for the proposed terminal at Cherry Point. The new site plan incorporates an adjacent 350-acre parcel acquired by SSA Marine. With more land to work with, GPT was able to offer an alternative layout that reduces the footprint of the terminal infrastructure by 14% and reduces wetland impacts by 49%, according to SSA Marine Senior Vice President Bob Watters.

The property is located between the BP Refinery to the north and the INTALCO facility to the south. The property is also designated as part of the Cherry Point Management Area, under the Whatcom County’s Shoreline Management Program. The facility is located within the Cherry Point State Aquatic Reserve south of Birch Bay. The purpose of the Cherry Point Industrial District is to implement the

policies of the Cherry Point Major Industrial Urban Growth Area (UGA) section by establishing a range of land uses and types of development appropriate for the area and to encourage large scale master planning of industrial sites to preserve sites of sufficient size to accommodate major port and industrial development.

### The Terminal

The terminal would consist of three basic components: the loop tracks for unit trains, the coal handling and storage facilities, and the ship-loading facilities. Nothing would be done using untried methods or unusual equipment. Methods for dust and spillage control would be similar to or identical to successful methods used elsewhere in the United States. Terminal construction would be completed in two development stages. Construction of stage 1 is expected to commence when all required federal, state, and local permits and authorizations have been obtained and environmental reviews have been completed.

### Rail

BNSF Railway would provide rail service via the Custer Spur, the only existing rail line serving the Cherry Point Industrial Zone. The Custer Spur branches west from the BNSF Railway’s Bellingham Subdivision main line at Custer, then travels west, then south

Table 2 — The Businesses Currently Served by Cherry Point Industrial Zone

COMPANY	INDUSTRY SECTOR	NO. OF EMPLOYEES
Alcoa / Intalco*	Primary metals manufacturing	570*
Barleans Organic Oils	Food manufacturing	150
BP Refinery	Petroleum manufacturing	900
Phillips Refinery	Petroleum manufacturing	425
All others (7)	Various	55-155
	<i>Sub-Total</i>	<i>2100-2200*</i>
Gateway Pacific Terminal (Est.)	Bulk storage and handling	1230
	<i>Total</i>	<i>3330-3430*</i>

*Alcoa will be idling aluminum-smelting operations at Intalco Works in Ferndale and at its Wenatchee plant, the company announced Monday, November 2. The announcement said the operations will be curtailed in the coming weeks to reduce costs and supply at a time when the price of aluminum is at six-year lows. The Ferndale facility has 583 employees, said Josh Wilund, communications director for Alcoa. Not all of Intalco will be idled. The company said it would keep the casthouse in operation. The company expects to retain more than 100 employees.*

another 6.2 miles. The width of the BNSF Railway's existing right-of-way ranges from 70 feet to more than 150 ft. BNSF expects to acquire approximately 43 additional acres of contiguous rights-of-way adjacent to the currently owned rights-of-way. The additional land would be used for rail improvements required to support the terminal and for compensatory mitigation. The estimated area of acquisition is based on an average 40-ft linear embankment along the Custer Spur, additional width for an access road parallel to the Spur between Ham Road (BNSF Railway Milepost 1.86) and Brown Road (BNSF Railway Milepost 4.95), and extra width for construction of additional receiving and departure trackage.

BNSF is an industry leader in dust control, and imposes dust mitigation requirements under its Item 100 of BNSF Price List 6041. In addition to its load point specs, BNSF has built new facilities for re-spraying surfactant on coal in transit. The railroad's new re-spraying facility at Pasco, Washington, would be ready for operations this year. Constructed for current coal shipments to Canada, the facility should also be available for coal shipments into Washington state.

### Comment

To the outside observer, SSA Marine has patiently endured the attacks of bussed-in out-of-state protestors and highly organized write-in campaigns, but is still steadfastly committed to revitalizing the struggling economy of Whatcom County. Some have argued that the company stands to make a fortune on the terminal, but those people are apparently not aware of the coal industry bankruptcies that have occurred in recent years. One could not justify any argument that a fortune could be made, and certainly not in the foreseeable future.

The majority shareholders of SSA Marine are natives of Bellingham, and are determined to replenish and grow the job base in their hometown and county. The difference is that GPT wants to provide jobs and economic opportunities to friends and to people that desperately need jobs, and they want to be able to make that happen. One must understand the company's history to understand its dedication to this project. In 1949, Fred Smith formed Bellingham Stevedoring Co., the beginning of cargo handling operations for what would become Stevedoring Services of

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Gateway Pacific Terminal conceptual site plan.

America (SSA) in 1984, and SSA Marine in 2003. Even though the company's headquarters has moved south to Seattle, it still owns Bellingham Stevedoring Co., and has deep roots in the community.

Coal producer Cloud Peak Energy has purchased a 49% stake in GPT. Cloud Peak paid \$2 million up front and will pay

up to \$30 million in future permitting costs. The Crow Tribe will have an option to secure 5% from Cloud Peak Energy. In the short term, SSA Marine gets an infusion and some relief from what has already been an expensive permitting process. Watters said cost relief was not the reason for the deal, however. "The

real benefit for us is now we get a strategic partner on the coal side of the business," he said. "It brings a strategic partner into the project that understands and helps us understand the end users."

### New Chinese Environmental Rules Favor PRB Coals

To existing users of PRB coal, many claims of fearful "Chicken Littles" are humorous. One such claim is that burning U.S. coal in China will feed the boilers of power plants that will in turn pollute the air that will travel back to North America in the air currents. The silliness of such a worry is that everyone knows China would not stop burning its own highly polluting coals just because someone in the U.S. was worried.

In 2007, a U.S. environmental group met with Chinese environmental officials to discuss air pollution. One result of those meetings was that three main population centers, Beijing, Shanghai and Guangzhou could no longer import coals that exceeded 1% sulfur. One of the characteristics of PRB coals is most of them are much lower in sulfur than 1%. This factor greatly promotes the desir-

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ability of PRB coals to Chinese utility customers.

**History and Status**

In 1992, PIT applied for permits from Whatcom County, Washington, and the U.S. Army Corps of Engineers to construct a deep-water multimodal ship-loading terminal at Cherry Point. PIT withdrew the application prior to initiation of NEPA environmental review.

Later that year, Whatcom County issued a determination of significance under the State Environmental Policy Act (SEPA) and initiated scoping. At that point, the process was delayed. Whatcom County updated the determination of significance and scoping notice in 1995, beginning the environmental review process, and issued draft and final environmental impact statements in 1996 and 1997. Whatcom County issued project permits following a series of legal proceedings and a settlement agreement in 1999.

In 2011, PIT proposed changes and updates to the GPT proposal; the 2011 proposal included revisions to the shoreline substantial development permit issued in 1999. Whatcom County determined the requested

revision to the shoreline substantial development permit did not meet the applicable revision criteria and that a new shoreline substantial development permit would be required. This SEPA process will include review of the revised proposal in light of the shoreline substantial development permit criteria. Whatcom County will use information developed through the SEPA process to inform the county's decision, including their decision on the shoreline permit.

As a deep-water, multimodal marine terminal for the export and import of dry bulk commodities, the terminal has been designed to meet the operational needs of PIT and to service dynamic international bulk commodity markets successfully over the long term. The terminal design provides maximum flexibility to handle a wide range of commodities as market needs and customer demands change over time. The deep-draft wharf and storage and handling areas allow the terminal to load large, oceangoing vessels efficiently for shipment of commodities to Asian and other international markets. The ship-loading conveyor would depart the east-west reclaiming conveyor and run a

half-mile to the dock, the first half over land and the latter half over water.

Because the terminal would handle a broad range of dry bulk commodities during its functional life, it will be designed so that only minor changes in infrastructure would be required to accommodate different commodities, or to change from export to import. A large land area is needed to provide sufficient space to store cargo temporarily at the terminal and to support the required rail infrastructure. In addition, a deep-draft wharf is necessary to accommodate the large Panamax and Capesize vessels that currently service the import/export commodity trade.

**Additional Information**

The purpose in providing this brief report has been to acquaint the reader with the GPT project in general. Details of the project can be accessed at [www.whatcomcounty.us/993/Gateway-Pacific-Terminal-Proposed-Project](http://www.whatcomcounty.us/993/Gateway-Pacific-Terminal-Proposed-Project) and [www.nws.usace.army.mil](http://www.nws.usace.army.mil).


*Dave Gambrel obtained his master's degree in electrical engineering in Seattle, and lived in Mercer Island, Washington, for eight years. He is a consultant/writer in the coal transportation industry.*

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# Longwall Mining Services



Longwall Mining Services (LMS) is a privately held company that supplies an extensive range of reliable mining equipment, designed specifically for longwall mining systems.

The company has provided solutions for some of the biggest names in the industry, from Longwall cable handling products to mine-wide communications and tracking systems. LMS also supplies longwall cable handling systems, including the Tiger Top loading twin pull, the Tiger 2 and a proven side pull cable handler with the highest towing capacity in the industry.

The company prides itself on its ongoing product development and collaborates effectively with its partners to improve sector wide solutions. Longstanding relationships with leading industry manufacturers enables the company to offer a portfolio of proven mining equipment, including mining drive solutions, communication and control systems, long haul idlers and leg pocket fillers.

LMS can also offer its clients access to industry leading experts who offer support, from navigating through the complex and cumbersome regulatory schemes, to ensuring that clients work more safely and efficiently.

LMS's superior products, services and relationships are matched only by the quality of its management and customer support. John Whitfield, owner of LMS, has been deeply involved in the coal industry since 1982, acquiring an abundance of mining-related expertise over this period. Additionally, John has a strong reputation for assisting companies, both domestic and overseas, to identify and penetrate markets throughout North America.

LMS has been heavily involved in the development of Comtrol International's new Longwall Communications systems. They

have combined some modern technologies with some simple proven methods of operation. Increased resistance to ambient moisture and simple maintenance practices.

LMS recently promoted the launch of its VFD solution for mining applications, engineered in the UK by the esteemed British motor manufacturers ATB Morley.

ATB Morley motors utilize a unique and supremely reliable 'Barlok' rotor construction, which allows for the expansion and contraction of the rotor bars whilst they are mechanically secured in position, preventing the vibration and cyclic bending associated with stress fractures. Since the introduction of the Barlok concept in 1980, there have been zero rotor failures, testament to the quality and innovative design of Morley motors.

LMS-Alliance with Dayjon offers a range of conveyor and material handling products blended with new state of the art manufacturing facilities in Alabama.

President John Taylor founded Dayjon, Inc. with a vision of providing the highest quality products with honest, reliable service.



His commitment to not cutting corners led to another of Dayjon's most fundamental values: innovation. From the smallest of beginnings in the basement of the Taylor home to the current 44,000 square foot manufacturing facility on Powder Plant Road, innovation and ingenuity have propelled Dayjon forward and across the world, while still allowing the company to provide the focused care and dedication expected of a homegrown business.

## Center Loading Tail Pieces

Center Loading is Dayjon's answer to an age-old conveying problem—shifting belts at loading points, causing stress, strain, and material spillage. Attempts to train or control the belt can be futile, and in most cases, damaging.

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**Longwall Mining Services**



## THE ATB MORLEY VFD SOLUTION

We are pleased to announce that Longwall Mining Services has teamed up with UK-based motor specialist ATB Morley to supply a Variable Frequency Drive (VFD) mining solution to the US market.

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For more information on ATB Morley motors, contact John Whitfield of Longwall Mining Services at **724 816 7871**, via e-mail at [jwhitfield@lmsgroup.us](mailto:jwhitfield@lmsgroup.us) or get in touch with the company directly via the contact details provided below.

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# HARVEY MINE: THE ROAD TO TODAY

*The evolution of CONSOL Energy's Harvey complex has been long and winding, but with a successful integration now complete, a favorable future awaits*

BY DONNA SCHMIDT, FIELD EDITOR



CONSOL Energy has a 30-year future still remaining at the Bailey/Enlow Fork/Harvey complex; recent company figures estimate remaining reserves top 785 million tons.

CONSOL Energy has historically been known to the industry as a colossus, owner of a massive collection of reserves locked within one of the nation's most lush coal seams. It was a longwall leader. However, goals change, paths divert, ideas evolve, and — especially true in the coal scene — the market ebbs and flows. Change means adjustment, but it also can mean growth for the better. Such is the case with what is now known as the Harvey mine, at the heart of CONSOL's Pennsylvania operations in the extreme southwestern corner of the state.

## HARVEY MINE: JUST THE FACTS

- Continuous miner development began: 2009
- Longwall operations began: 2014
- Current production via: 1 longwall, 4 CM sections
- 2014 production: 3.2 million tons
- Annual production capacity (ave.): 5.5 million tons

In 1984 and 1990, respectively, two of the company's flagship mines — sister operations Bailey and Enlow Fork — began producing coal from their respective sections and, ultimately, their longwalls. Time passed, more areas were mined out and sealed, and operations continued. Today, both are considered among the top producing U.S. mines.

But original plans years ago didn't call for the Harvey mine, or anything like it, really. How did it come to be and why? CONSOL Energy Senior Vice President of Pennsylvania operations Chuck Shaynak recently revealed the history and development that have brought the mine to where it is now.

### History: Evolution of Bailey, Enlow Fork, and Harvey

Tucked into the area between Waynesburg and Washington, Pennsylvania, and Morgantown and Wheeling, West Virginia, sits a far-reaching complex amidst what exemplifies Northern Appalachia — moun-

tain foothills with four distinct seasons (sometimes more than one in the same day) and a population that has been toiling in the region's coal mines for generations.

Before Bailey and Enlow came to be in their current forms, CONSOL collected numerous reserves in the area as far back as 1965, when the company bought 262 million clean tons within the Nineveh reserve. By 1977, it had added 209 million tons from the Manor reserve as well. They were followed by Alexander, with 93 million tons, just across the state line in West Virginia's panhandle (1981), and then it went north into Washington County, Pennsylvania, with the acquisition of the 174-million-ton Berkshire reserve (1985).

Chevron and Penn Central, with 92 million tons, was acquired by the company in 1993, and two years later, it would take over the Greene Hill reserve to the west of Waynesburg. Between 1996 and 2015, it finished its series of contiguous takeovers with 57 million tons from the Mine 84 reserve and the 151-million-ton Drummond reserve. The enviable portfolio totaled 1.25 billion clean tons, and CONSOL has so far mined less than half of it at 472 million tons.

According to Shaynak, today's Bailey/Enlow Fork/Harvey campus is not what engineers anticipated all of those decades ago; originally, there were to be five short-lived operations with a new mine coming online every several years. That was 1980, and construction began at Bailey the following year; by 1982, crews were constructing a shaft, slope and railroad spur to ready for a connection of the shaft and slope bottom in 1984. The first longwall panel started in 1985, measuring 600 feet in width and 7,000 ft in length; a second longwall began in 1986, and the 1A panel clocked in at 750 ft wide and 8,700 ft long.

At the same time, Enlow Fork was also being shaped. Work on the shaft and slope began in 1983, though due to the market the mine was put on hold for about seven

years. Fast forward to 1990, and three entries were developed off of the Bailey slope bottom. Its first longwall panel, at 750 ft wide and 9,000 ft long, cut first coal in 1991, and a second longwall began the following year with a similar-sized panel.

Both Bailey and Enlow Fork, as part of that initial growth plan, grew older, and as the years passed officials started to see deterioration in belts and tracks so discussions began on how to progress in mining the remaining reserves. Initial plans in 1984 included connecting the two mines, which were now running at prime production with their longwall pairs, to make for what would be a literal combined future.

It was then that CONSOL opted to move forward with both Bailey and Enlow Fork and bring on a third mine at some point in the future. That would be done by putting in slopes for both mines with new overland conveyor infrastructure to what would become a combined capacity plant (see more on the plant history and operations on page 36).

“We couldn’t keep going with same infrastructure because of the age of the entries,” Shaynak said. “We hadn’t planned for it,” adding that high costs meant the initial plan was “out of the question” when there was a mine already in existence.

“The original plan for the third mine was an Enlow Fork expansion, extend to the north, move out to the east,” he said. “That would have required a new refuse plant, rail spur, and a lot of additional costs.”

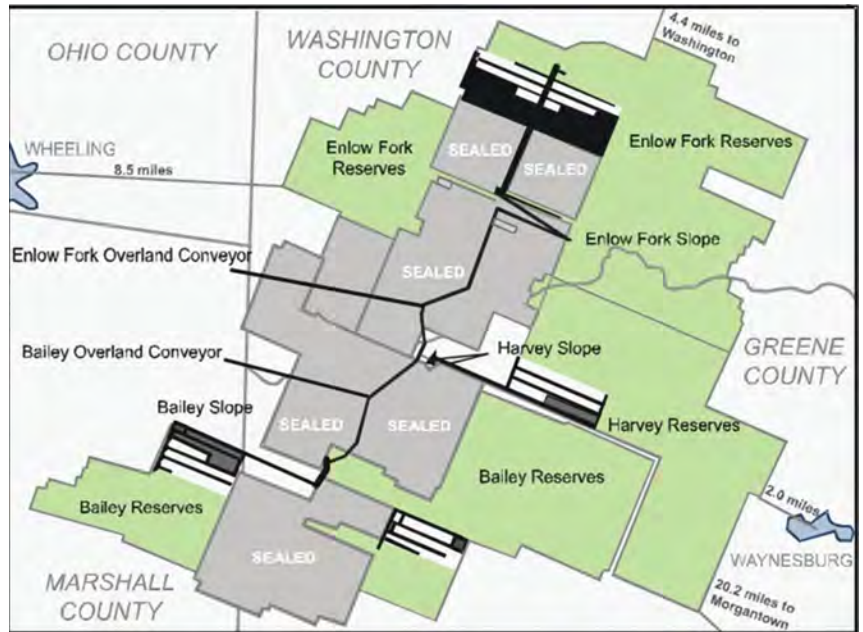
Because there was room to increase that capacity on the Bailey side, CONSOL again adapted to the situation by progressing with a plan to expand with a new mine off the bottom of Enlow Fork’s reserves.

The main area of concern then became timing — with a vastly changed outlook for the mines’ future, the timelines for slopes and other crucial components became priority.

“Obviously, to get to the reserve the quickest, most productive [way] was to do development off of Bailey’s bottom. Our final decision was to keep Enlow mining to the north [and] bring Harvey off Bailey’s bottom to get eastern reserves. It was the quickest and lowest cost and best for timing,” he said.

**The 30-year Project**

With a new and very long-term future in its sights, CONSOL began looking at how



A map of the footprint made by Bailey, Enlow Fork and Harvey in the southwestern Pennsylvania foothills.

to grow the complex along with the big plans it had ahead of it. Work began in 2008 on those steps toward adding Harvey, then called the BMX mine, beginning with a sealing project to separate the Bailey mine from the new operation. A total of 34 seals of various types were installed, including five solid block layers and three Micon block layers with an overall thickness of 7.2 ft. Crews overcame some areas of cave as well as a need to keep Bailey’s south section open where coal was still being cut. The west area, while abandoned, was also left open for a time as examinations were still required and ven-

tilation was still in place. Other changes included 30,000 ft (5.8 miles) of main line haulage ground control and development to the portal and floor-to-roof supports in main line haulage cross cuts on the Harvey side using 40-ton RocProps.

Additionally, mesh was added to roof and ribs, and a 15-ft-wide channel was installed on the roof for support with five bolts across, cable bolts in the center and two bolts on the outside of either side.

Continuous miner development commenced in January 2009, and crews had their work cut out for them in terms of development, particularly with planned



Inside the underground training academy, located just off the original portal bottom of Bailey.



average longwall panel dimensions of 1,500 ft wide by 15,000 ft long, supported by 262 shields.

"It was developed with one crew, three shifts per day," Shaynak said. "When they got out to the bleeder system, we added more crews: crews to drive the tailgate, crews to drive the headgate. One unique thing...because of distance and to get 7 North developed and running quick, we

mined it in a reverse direction. At same time, we continued to develop 7 North for the long haul."

In the meantime, work began on the surface for Harvey's future as well, beginning with needed upgrades for storage and transport. CONSOL was able to store 135,000 tons of clean (165,000 raw tons), or about two days of production, on-site with all enclosed storage. Additionally,

changes to a 14.7-mile rail spur from Waynesburg to the plant (owned by the company, maintained by CSX) was outlined in the plan, including a new dual-batch train loadout facility with a 9,000-ton-per-hour (tph) capacity and 8,000 ft of new rail siding.

"With the new side track, they would have the ability to have one train loading and another two staged and ready.

Perhaps the biggest needed improvement to the surface facilities was the preparation plant, which required increased capacity to manage all three operations. When the initial plan was in place and Bailey was producing, coal was stockpiled on-site for six months as its supporting prep plant was erected.

### Harvey Mine of Today — and Tomorrow

Before the operation was officially dedicated on June 24, 2014, at the Patterson Creek portal and its name changed to the Harvey mine, both underground and surface crews were getting into a production rhythm and ramping up to full production. The 1A East longwall panel was mined while the mains development was still ongoing, and the panel was completed just three weeks before the ceremony. The 2A longwall commenced work two weeks later.

Once the Patterson Creek portal was finally complete, the mine was ready for its unveiling, and the Bailey BMX expansion became formally known as the Harvey mine for longtime CONSOL executive J. Brett Harvey. "He was really instrumental in everything seen here today," Shaynak said of the complex. "Safety for the industry and the company. His legacy will be able to live on for a long time."

The longwall dimensions had the distinction of being the longest in company history, a record the operation still holds. It mines the 5-ft main seam bench with a Cat armored face conveyor and stageloader and a Joy shearer.

### Underground Training Center

One of the additions made to Harvey and the overall complex for its long-term future is also a first for the industry — an underground miner training academy within the underground workings. Located just off Bailey's bottom reserves, where crews first began to create today's

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the brightest minds in business and engineering from around the world." This strength, combined with its continuous improvement of quality and processes, has U.S. Tsubaki poised for lasting growth now, and well into the future.

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## RESERVES FOR THE PENNSYLVANIA OPERATIONS

CONSOL Energy's current Pittsburgh No. 8 coal reserves.

Mine	Remaining Clean Tons
Bailey	254.5 million tons
Enlow Fork	322.8 million tons
Harvey	208.3 million tons
<b>TOTAL:</b>	<b>785.6 million tons</b>

Harvey mine, the center is the only truly underground facility of its kind in the nation where miners can train on an actual section and with real equipment, not simulators.

The academy has a staff of five, including two foremen and three hourly trainers. It contains two classrooms as well as the CM action center that encompasses an entire equipment fleet. Some of the education held to date has included roof bolting, rerailing, shivving and foreman training. More classes are currently being developed.

### Centralized Plant

Another major change needed to bring the entire complex to where it is now, and where it is headed over the coming decades, was a centralized preparation plant. A one-circuit facility began operations in 1984, and became two circuits once a second plant came online with the start of the Enlow Fork mine in 1991. Eight years later in 1999, following the growth of longwall faces, equipment upgrades and other efficiency improvements, there was a need to increase the capacity; that would happen again in 2004, but for a decade after, it remained the same.

Along came Harvey, and the game would once again change for CONSOL officials. Two final upgrades would bring the plant (which now includes, in chronological order, Modules 1A, 2A, 2B, 1B and 2C) from 940 tph in 1984 to a staggering 8,200 tph by 2013 when the upgrades were completed. Today, there are two separate plants, each with its own feed belt. Plant 1 has two circuits, and Plant 2 has three, allowing for all to be run together or for progress without bottlenecking in the event any one circuit needs repairs or maintenance.

“Coal is drawn from the silos from each mine and blended by sulfur by each mine. As it comes out, it is put into separate clean coal silos,” Shaynak noted. “As drawn out from there, can be blended again for sulfur. All we blend for is sulfur — as little as possible [as], at times, it can reduce efficiencies.”

There are a total of six raw coal silos surrounding the plants, including two

each for Enlow Fork and Bailey and the newest for Harvey. A project currently under way by CONSOL crews is the disassembling and replacement of the plant's original refuse belts.

*Note: This is an adaptation of a presentation given at the Longwall USA event held during June by CONSOL Energy Senior Vice President of Pennsylvania operations Chuck Shaynak.*



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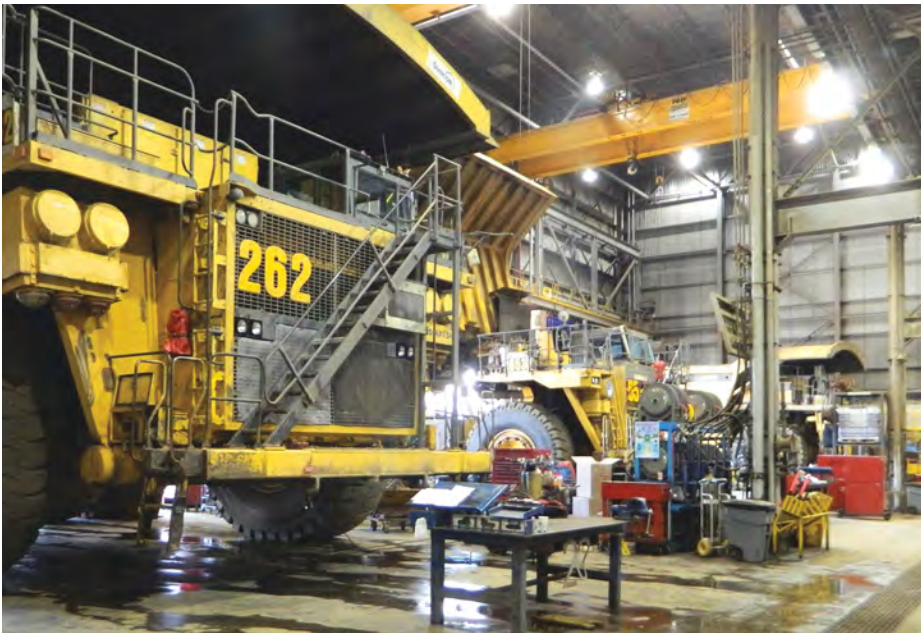
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# ACHIEVING WORLD-CLASS MINING MAINTENANCE: STEP 1 — IDENTIFYING NEEDS AND PRIORITIES

*In a six-part series starting this month, the author provides a detailed road map for developing and sustaining a top-notch mine maintenance program*

BY PAUL TOMLINGSON



Successful mining maintenance isn't exclusively a maintenance department effort. World-class maintenance status is only achieved when 'world class' is the performance norm for an entire mine.

A mining enterprise supported by a maintenance organization performing at the world-class level stands to reap many benefits. Sustained, continuing productivity will be realized and the operation can compete favorably with the best, most profitable mining organizations in the world.

But what does world-class mean, and how is it achieved? It is not the label "world class" that is important. Rather, it is the accomplishments realized that yield the benefits described as world class. Over the course of this article, the actions needed to achieve world-class mining maintenance status are explained in six consecutive steps that lead to recognition as a first-rate organization with productive employees per-

forming quality work, and consistently reliable equipment to meet production and quality goals. The six steps are:

- Identify improvement needs and priorities. Start by conducting an evaluation to identify improvement needs and priorities. Evaluations should include all mine departments as well as management so that all actions and policies that affect maintenance can be examined. No improvement action can occur nor will it be successful unless the situations that preclude effective performance are identified and actions taken to correct them.
- Ensure support for maintenance. Create a positive mine-wide maintenance working environment by attaining the full cooperation and support from all mining

departments and assuring mine management reinforcement. There are no world-class maintenance organizations. Rather, there are world-class mining organizations that include a world-class maintenance organization. Maintenance, by itself, is a service provider. Successful mining maintenance is not a stand-alone maintenance effort. World-class maintenance status is only achieved when world class is the required status of the total mine.

- Establish an efficient program. Develop, document, test, and implement a quality maintenance program to spell out how work is requested, identified, classified, planned, scheduled, assigned, controlled, measured, and assessed to ensure continuous improvement and sustained, effective performance. Ensure the entire mining operation understands what maintenance does, who does what, how and why, so they will see their supporting and cooperative maintenance-related roles clearly and contribute more effectively to the success of the total operation.
- Ensure effective use of information. A quality information system is the shared communications network system that controls execution of the mine's maintenance program. It also controls other essential mining activities such as inventory control and purchasing. The use of a common integrated system implies the cooperative use and interchange of information. Its proper utilization enhances maintenance performance and guides the progressive steps toward the mine's world-class objective.
- Organize properly. The maintenance program identifies what maintenance

does, who does what, how and why. Program details can help to identify the best maintenance organization and specify the duties and responsibilities for carrying out the program. In addition, the program spells out the maintenance-related interactions between mining departments by advising the best ways in which their personnel can support maintenance.

- Re-evaluate and confirm. By reapplying the evaluation process established in step 1, achievement of the improvement needs established in the initial evaluation can be confirmed and verification made that the revised and improved total mining organization can meet and sustain world-class performance.

### Taking the First Step

Evaluations bookend the steps involved in the journey to world-class maintenance. An initial evaluation establishes the as-is status of the overall mining organization relative to maintenance and yields an improvement plan of prioritized actions. The plan aims at securing a supportive working environment; developing an effective maintenance program; utilizing a quality information system; and arranging the best maintenance organization to support the program. As each step is carried out, evaluations are repeated to ensure that the current step is accomplished before the next step is attempted. When all steps are completed, the evaluation is reapplied to verify attainments and assure they can be sustained. The evaluation process then becomes an ongoing measure of the mine’s continuous improvement effort (see Figure 1).

### Characteristics

World-class maintenance is the pinnacle of achievement for maintenance organizations. It results when the organization carries out an effective program, utilizes quality information and organizes properly to help ensure a profitable mining operation. These operations will be characterized, for example, by a cooperative production group and supportive staff organizations like warehousing. They will be led by visionary mine managers who have created an environment for success with a sound business plan embodying clear departmental objectives and policies that guarantee harmonious departmental interaction.

### Performance Standards and Evaluations

Standards should be established as goals for organizations seeking improvement. Once established, an evaluation procedure should be applied to measure a candidate organization’s performance against the standards. Minimum levels of achievement should be set in order to gain necessary improvements. Unfortunately, no body currently exists to administer such evaluations as does ISO (the International Organization for Standardization) and their certification requirements. Therefore, emphasis should be given to developing suitable standards and the organization can apply any evaluation technique providing it yields information on how well standards are being met and whether performance progress is being made. Many mining organizations utilize evaluation teams made up of personnel within their organizations who possess suitable skills and backgrounds. Often, such teams come from sister mines in which there are reciprocal evaluation arrangements.

### How are Standards Developed?

Standards can be developed from a number of sources: Existing KPIs (key performance indicators), the study of ISO 55000 (asset management and asset management systems), the principles of maintenance management, benchmarking and

highly successful in-house operations are potential sources. But standards must satisfy the special, unique operating environment of the mining industry. The development and acceptance of performance standards must be the byproduct of successful maintenance operations in which procedures are established that consistently produce outstanding results.

For example, preventive maintenance (PM) procedures that reduce emergency repairs and extend equipment life might be considered. But when PM procedures enhanced with predictive techniques always find equipment problems far in advance of equipment failure to ensure that the majority of maintenance work can be planned and scheduled, those procedures could be seriously considered as standards. Standards for maintenance goals reach far beyond internal procedures like the conduct of preventive maintenance, planning and scheduling.

Standards must also embrace the working relationships between departments to result in harmonious professional interactions. Operations, for example, must apply and adhere to standards, which cause them to utilize maintenance services effectively. Similarly, warehousing, purchasing or accounting must recognize and adhere to standards. Even the mine manager’s actions must be included in the standards. Has he, for example, taken adequate steps to ensure that all

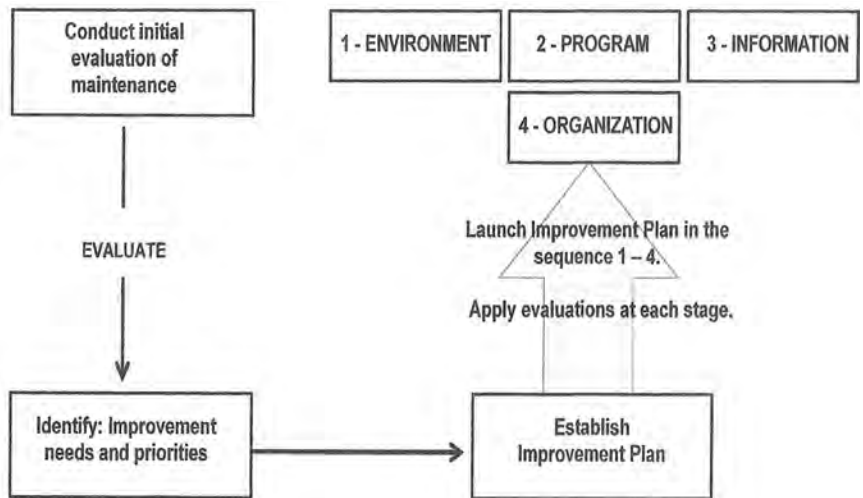


Figure 1—The journey to world-class maintenance begins with an evaluation to establish an improvement plan. The plan then (1) aligns the maintenance working environment; (2) develops an effective maintenance program; (3) adds a quality information system; and (4) adapts the organization to carry out the program. Evaluations are repeated as each phase is accomplished and at the conclusion to verify achievement of world-class status and the ability to sustain it.





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## PREVENTATIVE MAINTENANCE (PM) STANDARD

The PM program should successfully avoid premature equipment failures and extend equipment life, and through timely inspection, condition monitoring, testing, lubrication, cleaning, adjustment and minor component replacements. As a result, there should be fewer emergency repairs and more planned work so that personnel will work more productively, yielding higher quality results, less downtime and reduced costs. The major elements of a valid standard follow:

- There is a well-defined and publicized PM program understood by maintenance personnel, all departments and management.
- Management understands and strongly supports PM by requiring proof of compliance and its effectiveness.
- The PM program is detection-oriented to identify deficiencies in advance of potential equipment failures.
- PM emphasizes the careful inspection and testing of safety equipment and conditions.
- PM emphasizes preserving equipment functions and avoiding consequences of failure.
- PM has reduced the amount and severity of emergency repairs.
- PM has increased the amount of planned work.
- Manpower needs for each PM service and the entire program have been established.
- Completion of PM services is verified and management advised of exceptions.
- New equipment is added to the program and equipment modifications requiring program service changes are made without delay.
- The overall PM program is reviewed regularly to ensure its adequacy.
- PM services are carried out diligently by maintenance personnel and, as required, equipment operators.
- Supervisors ensure services are complied with and completed on time.
- Operations cooperate with the program in making equipment available for schedules.
- Equipment operators perform PM-related tasks completely, efficiently and correctly, when required.
- Condition-monitoring using predictive techniques (PdM) are properly integrated into the PM program and skillfully used. Maintenance personnel interpret and utilize diagnostic information effectively.
- Each service has a checklist describing required services and how the service is carried out.
- PM services are properly identified with the work order system to ensure proper scheduling and control.

departments are properly supporting maintenance?

If for example, a KPI requiring 85% PM schedule compliance is the only standard for PM, it is inadequate. An illustrative PM

standard is illustrated in the accompanying sidebar above.

Once standards have been established, tested and accepted, the organization can determine the most effective way to evalu-

ate compliance with the standards or assess progress in meeting them.

### Evaluation Strategy

No improvement can be initiated unless

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the current situation is known. Improvement is only possible when one learns whether maintenance is a good organization only needing a decent program to follow or an organization besieged with unreasonable demands placed on an inadequate workforce. Evaluations answer this by providing the as-is status of current performance then utilizing the results to develop an improvement plan. Regardless of how standards are created, an evaluation procedure is required to discover necessary improvement actions and measure progress toward their achievement.

It is not unusual to witness resistance to being evaluated. This is especially true when worker performance can be adversely affected by activities over which they have little control such as warehousing failing to deliver needed materials on time. An evaluation strategy such as that presented below can overcome such resistance, particularly when every department is equally evaluated. Consider:

*Developing a policy for evaluations*—A management policy requiring that all departments be evaluated on a regular, con-

tinuing basis will preclude any doubt as to its value and redirect the energy of resistance into efforts to prepare for evaluations.

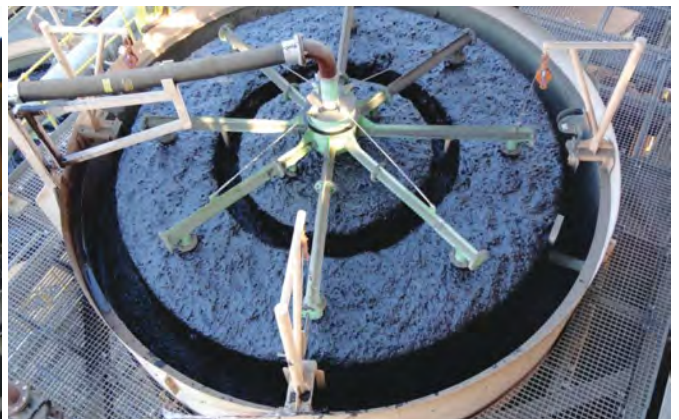
*Providing advance notification*—Advise personnel about the evaluation and make a preliminary statement about its content, purpose and use of the results. This will eliminate surprises and emphasize the policy of regular, continuing evaluations.

*Educating personnel*—Explain that the evaluation is a checklist describing what should be done. Results describe how well they did and provide a basis for improvement. The evaluation will identify what is done well and what was done poorly. It is an opportunity to help all departments account for their contribution to mine objectives. Emphasize the positive aspects of the evaluation through education.

Change unfavorable misconceptions of evaluations by telling personnel that the evaluation is a means of finding out how they can do better. Avoid comparing evaluation results with other mining organizations unless there is a clear benchmark accepted by all. The sponsor of multiple mining operations evaluations, usually a

general manager, must convey a supportive attitude. He should provide encouragement to conduct the evaluation and follow up to see that something constructive is done with the results. If help beyond the resources of a single operation is necessary for improvement, the sponsor can help cement good relations by providing it.

Education continues through the evaluation process and into the results. In individual mining operations, for example, local managers will want to know how well their policies are understood and how effectively the procedures based on those policies are being carried out. Let them know. Although they are concerned with the quality of the maintenance program, they will be equally interested in learning how well, for example, production cooperates with the program. Therefore, in a multimine environment, they will be less concerned with what others may think and get on with the evaluation. They should assume that every other plant is interested and concerned but, also ready to help them rather than compete with them.



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**Scheduling the evaluation**—Schedule the evaluation carefully to avoid conflicts. Peak vacation periods may find key personnel away from the mine. Similarly, recent personnel changes could limit knowledge of evaluation points, and personnel cutbacks or staff reductions might affect attitudes. In general, the evaluation should be carried out in a stabilized situation with few distracting conditions. With suitable advance notice, the organization can prepare for the evaluation and look forward to learning how they are doing. When evaluations are conducted on a regular, continuing basis, people will be constantly preparing thus, performing better. In addition, they will look forward to the evaluation as an opportunity to demonstrate their progress. Generally, if maintenance personnel feel that the evaluation is constructive, they will prepare for it without hesitation. In subsequent evaluations, if they have accepted the evaluations and are convinced of their value, they will make a conscious effort to improve on previous results. Soon the concept of evaluations permeates the entire organization and their outlook is transformed from one

of fearing evaluations to welcoming them and their potential benefits.

**Publicizing the content of the evaluation**—By publicizing evaluation content, personnel can prepare in advance. This is unlikely to constitute a dramatic shift in performance. Reports will be ready and personnel scheduled for interviews will be prepared.

**Using the most appropriate evaluation technique**—Evaluation techniques should be considered based on the mining situation. Some operations may require an evaluation in which every detail must be scrutinized. Other operations, having established the essential pattern of evaluations, may simply check progress by measuring only a few critical areas. Other mines utilize forms of self-evaluations made possible by the existence of standards they have set for themselves.

**Announcing evaluation results**—By sharing evaluation results, the good and the bad are acknowledged with an expectation of a commitment to help attain improvements. Discussion is encouraged often resulting in the best way to accomplish improvements. Conversely, keeping

the results a secret will decrease credibility and make improvement actions more difficult.

**Taking immediate action on evaluation results**—The most convincing way to demonstrate that the evaluation was a constructive step is to organize an improvement effort immediately. Obtain commitment to the constructive use of the results by converting them into an improvement plan and immediately organizing the improvement effort. This is the main objective of the evaluation. If the evaluation is one of a series, results should be compared with the previous evaluation. This demonstrates progress as well as the identification of areas that need more work.

Separate the good from the bad. Offer congratulations on the good performances and organize the activities requiring improvement into priorities. Actively solicit help from anyone capable of providing it. If there are corrective actions beyond the capability of maintenance, don't hesitate to seek help. Mine managers are usually pleased to be asked to help. It is also gratifying to learn that

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The IWT Mine Rescue System uses small, lightweight Portable Mesh Nodes (PMN) that are dropped at intervals to create an all-in-one wireless communication and tracking network. The PMNs are quickly activated by the advancing team with the push of a button. Rapid deployment allows response teams to cover distances inside the mine quickly without spools of trailing wire.

The system delivers real-time communications between the Command Center, forward team and

fresh air base ensuring accurate information is used to manage the operation, eliminating time-consuming and costly communication errors. The system also provides ongoing automatic sampling and transmission of gas readings to ensure accurate air quality information from the forward team. The intrinsically safe gas detector interface monitors atmospheric conditions in previously-explored areas to detect changing environments.

**For a demonstration or to learn more about IWT’s Mine Rescue System, visit [www.iwtwireless.com](http://www.iwtwireless.com).**



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corporate managers, particularly those responsible for multiple operations, are eager to help as well.

Set up an advisory group and let them determine why certain ratings were poor. Then seek their recommendations for improvement. Change the members of the advisory group frequently to encourage different views. As recommendations are made, try them in test areas before attempting mine-wide implementation.

**Announcing gains from the maintenance evaluation**—As soon as any gains that can be attributed to the evaluation can be identified, announce them and give credit to the appropriate personnel. People like to know how they did. Tell them. In the process, candor will invariably encourage a greater effort in future evaluations.

**Specifying the dates of the next maintenance evaluation**—Announce the dates of the next evaluation immediately to reinforce the policy of continuing evaluations. Identify any additional activities that will be evaluated. As necessary, establish new, higher performance targets for the next evaluation.

### Look at the Big Picture First

World-class maintenance is an objective that requires a total mine effort. It cannot be achieved through maintenance efforts alone. By starting the journey toward world-class status with an evaluation of the total mining operation, all of the factors that impact maintenance performance are assessed.

The initial evaluation defines and prioritizes overall mine improvement needs as they relate to maintenance. Once these needs have been identified and prioritized the maintenance working environment must be aligned so that maintenance can work harmoniously with all departments.

Next, the maintenance program must be developed, documented, implemented and explained, mine-wide, so that internal maintenance activities and interdepartmental actions can be carried out in an atmosphere of full cooperation and support. Then, quality, timely and accurate information must be applied so that the program can be controlled and managed effectively. Then, a suitable maintenance organization based on the

details of the maintenance program can be determined and implemented.

With these elements in place, the organization can carry out the maintenance program effectively. Finally, evaluations are utilized to ensure that each phase of the journey to world-class maintenance has been satisfactorily accomplished and when that goal has been achieved all of its gains are able to be sustained.

*Next month: Step 2—How to ensure mine-wide support for maintenance.*

### About the Author

Paul D. Tomlingson ([pdtmtc@msn.com](mailto:pdtmtc@msn.com)) is a Denver-based maintenance management consultant. His latest book, "Maintenance in Transition—The Journey to World-class Maintenance," contains the detailed performance standards on which evaluations discussed in this series of articles can be conducted. Copies of the book (ISBN 978-1-4675-9069-3, 395 pp.) can be purchased from the author. He welcomes inquiries concerning these articles.

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## PICKING UP THE PACE

*Always seeking a better way to do things, OEMs are listening to mines' feedback and upping the efficiency ante*

BY DONNA SCHMIDT, FIELD EDITOR

As a crucial component of any mine's fleet, mines are consistently pushing their continuous miners (CMs); greater uptime, longer spaces between maintenance, and greater capabilities at the ready on a moment's notice are just a few.

Operators aren't shy when letting equipment manufacturers know what they need their CMs to do; with hundreds of mechanized mining units (MMUs) active at any one time across the nation, keeping the machines running, and running well, is no small issue for original equipment makers (OEMs).

Fortunately, these companies are equally willing to think big inside the research and design room.

*Coal Age* has devoted several columns this year to doing more with less, as the idea is imperative in the current market. This month, it examines the issue with two CM manufacturers, Joy Global and Sandvik, which are both making strides in the efficiency game: the former with efforts tied to its JoySmart Solutions to improve productivity and the latter building upon its expertise in longwall development.

### Joy Global: Optimizing Production

Finding the method that results in an improvement — no matter how small — is a victory for any mine, particularly when that improvement can be sustained long-term. What about seeing a productivity jump of more than 66,000 tons in one year with a relatively small adjustment to daily operations? Joy Global recently did just that with a Midwestern coal operation that was using its 14CM27-11EX.



Last year, Joy Global was able to help a midwestern U.S. coal operation increase their production by more than 66,000 tons on an annual basis by finding an optimized load time process.

“One of the biggest inefficiencies in the continuous mining process is waiting for a batch haulage unit to arrive and get into position [and] any reduction in this wait time is time spent cutting and loading material,” Joy Global smart services manager for underground mining Lawrence Kabat said of the challenge it had ahead. “Understanding these delays is key to a successful mining operation, and is seldom obvious.”

While the problem was one the mine had realized on its own, finding a solution

was much like fixing the metaphorical hole in the bucket, with another separate problem emerging when the focus was still on the previous one. As a result, the operation was getting nowhere.

The CM studied was a standard model machine, with a 950-volt AC, 44-in. diameter solid-head cutter drum and the cutter width was 11 ft 6 in. With Joy brought in as a partner on the project, data was pulled for analysis by JoySmart Solutions experts and the direction was found: an important tie between wait time and feeder location.

“One of the biggest inefficiencies in the continuous mining process is waiting for a batch haulage unit to arrive and get into position [and] any reduction in this wait time is spent cutting and loading material.”

With a benchmark average of 44.2 seconds of wait time marked between cars, the pair got to work.

“Through the use of comparison data between units, the optimum feeder location was determined,” Kabat said, adding that the mine’s production rates were used to pace the units’ rate of advance and also to determine an optimum move schedule.

Now armed with the needed feeder location, JoySmart crews were able to choreograph haulage routes for the operator, and a refinement of the CMs’ cutting patterns resulted in a track that crews could depend on as predictable and repeatable.

“By using data to identify inconsistent production rates, Joy Global was able to help pinpoint the true restraint and develop a solution that would improve productivity,” Kabat said.

Results from the project, which was examined over the 2014 calendar year, were worth the wait. According to Joy, by the end of last year, their collected comparison data showed an improvement in wait times of nearly two seconds, from 44.2 seconds on average to 42.7 seconds.

While that may sound insignificant, it must be noted that the miner had eight continuous miners running on a daily basis. Eight units, with time reductions on every shift of every day, the scope of the results became clear, with an additional 66,150 tons produced for the year.

Joy officials said the mine has considered the productivity gain only the beginning and is working to keep the improvement going. With the machines now in stride, the OEM and operator are targeting another 1.5-second time reduction this year.

The achievement was made using JoySmart Solutions suite of smart, connected products, technology, and smart services to help increase productivity and reduce costs. Many projects are driven by operational and financial goals, which are examined alongside data from connected products by the Joy Global JoySmart team to provide direction and a proactive view of service needs and increase in productivity with the mine’s machines.

Previous studies have already been conducted both underground and at the surface with longwall systems and electric rope shovels.



The latest in Sandvik’s miner-bolter equipment line, the MB670-1.

In this case study, the JoySmart evaluated the mine’s time between haulers, tracking the time from when the conveyor on the continuous miner was turned off until the time it was again turned on in order to determine a wait time.

JoySmart services centers can be found worldwide, including South Africa, Australia, China and Brazil. Its three U.S. facilities include Mount Vernon, Illinois; Gillette, Wyoming; and Mesa, Arizona.

### Sandvik: Development of the Future

The epitome of asking a machine to “do it all,” as it were, is in the area of longwall development, and the development of the bolter-miner has been a new era for coal mining. Sandvik, which produces both hydraulic and electric-powered units, has a long line of solutions, including the MB250/MB270 FLP, designed ideally for roadway development, and the MB370, at home in roadway development seams between 8.5 and 11.8 ft. Since the invention of the bolter-miner 25 years ago, Sandvik’s progress in technological developments for the machine has been substantial.

The company has continued its work in the longwall development area with the introduction of the next-generation Sandvik MB670-1 bolter miner, which has increased safety and ergonomics for operators in addition to the hard-line benefits of increasing productivity and reducing ownership costs.

The miner was developed from the framework of its existing Sandvik MB670 and has been purpose-built for longwall mining with fully automatic cutting cycles giving mines constant, faster advances.

The result, again, is one that can quickly compound into a large-scale advantage for the operation, including shortening panel development times in stable ground conditions by up to 30%. It can also help to ensure a smoother mine floor. From a maintenance perspective, Sandvik said, the MB670-1 experiences less wear and tear.

“[The] MB670-1 bolter miner has an innovative sump frame mechanism that incorporates cutting and bolting, allowing coal cutting and ground support installation simultaneously,” according to Bruno Reumueller, who serves as product line manager for Sandvik’s underground coal and minerals division.

“While the machine is stabilized for installing the ground support, the sump frame mechanism continues to move forward to cut out the next cycle. This enables our customers to get more out of their mine.”

The OEM now has nearly 300 bolter miners currently working in mines, which Reumueller said stems from its commitment to give operations everything needed for longwall development, from excavation, support, and loading products to transportation and logistics.



# BG 4 BENCHING TRAINING SOFTWARE

*Investigating the use of virtual environments, NIOSH researchers have developed software to train mine rescue benchmen and other team members to inspect, assemble and test a BG 4 mine rescue breathing apparatus*

BY JASON NAVOYSKI, MICHAEL J. BRNICH, JR., CMSP, AND TIMOTHY BAUERLE, MA

Researchers at the National Institute for Occupational Safety and Health (NIOSH) Office of Mine Safety and Health Research (OMSHR) have been conducting research aimed at assessing the utility of virtual environments for teaching critical mine emergency response skills. As part of this, researchers developed the Draeger BG 4 Benchling Trainer software. The software allows mine rescue benchmen and other team members to inspect, assemble and test a BG 4 mine rescue breathing apparatus in a virtual environment. The software is ideal for benchmen and other mine rescue team members to use to mentally practice benching the apparatus during or between regular training sessions. Mine rescue instructors can also use the BG 4 Benchling Trainer software as a supplemental method to introduce new team members to the apparatus, and to provide targeted training to team members who may have difficulty with one or more segments of the BG 4 benching process.

NIOSH chose to develop this proof of concept training tool around the Draeger BG 4 apparatus because it is the most commonly used mine rescue breathing apparatus in the United States. Data from the Mine Safety and Health Administration (MSHA) published in 2014 reported there were 382 underground mine rescue teams in the United States. Of these, 185 served metal/nonmetal mines and 197 served coal operations. Across all underground teams, there were 2,692 mine rescue breathing apparatus in use. Of this number, 1,947, or 72.3%, of the apparatus were the Draeger BG 4 (MSHA, 2014).

## Serious Games

The BG 4 Benchling Trainer is an example of a “serious game” that builds on previous NIOSH simulation research, as well as the latest developments in serious game technologies. Serious games use

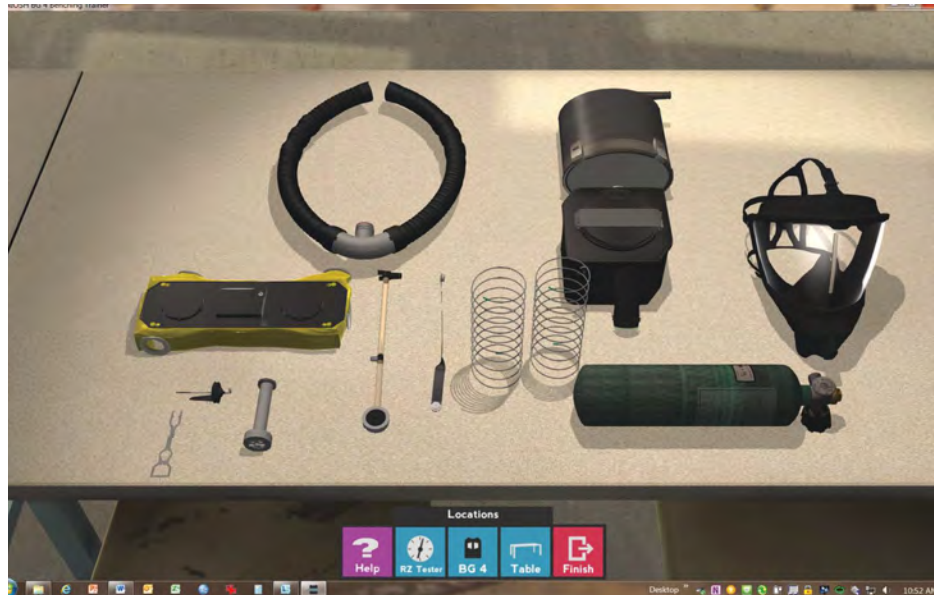


Figure 1: BG 4 parts on a virtual benching table.

computer game technologies and game-play principles for purposes beyond entertainment, such as training, assessment or marketing. As one example, in 2008, “FoldIt,” a protein folding serious game developed by the University of Washington’s Center for Game Science, challenged its users to design better proteins using the in-game tools. In 2011, players of the game created an enzyme that scientists had not been able to replicate during 15 years of using traditional research methods (Khatib et al., 2011). More recently, studies have been conducted looking at the use of serious games for medical applications including teaching patients limb movement following stroke (Ma and Bechkoum, 2008) and for enhancing technical surgical quality for new surgeons (Crochet et al., 2011).

The military, emergency response planners and the mining industry currently use serious games for a variety of purposes. In 2009, NIOSH released the Underground Coal Mine Map Reading

Training, a serious game that teaches and tests mine map reading skills (Mallett et al., 2009). Trainees learn terminology and concepts needed to read and understand an underground mine map. Trainees then navigate within a virtual mine environment while at the same time learning about different mining concepts and terminology. This training module has been used to introduce new employees to the underground mining environment without them having ever been in an actual mine.

## The Role of Benchmen

The benchman is a mine rescue team member whose responsibility is to inspect, prepare and test the team’s closed-circuit breathing apparatus. Federal law requires a person to have training in the use and care of the breathing apparatus used by a mine rescue team. This is to inspect and test the apparatus no less than every 30 days (30 CFR 49). Most mine rescue teams have a

member designated as their benchman. Using a procedural systematic method, the benchman visually inspects the parts of the apparatus before reassembling them into the housing. Once assembled, the benchman tests the reassembled device for leaks, positive air pressure and other functions before a rescue team member uses the apparatus. Team members are also expected to know the basics about the care and functioning of their apparatus because they may be required to use it in potentially life-threatening environments. They rely on the expertise of their benchman to ensure their apparatus are fully functional should that time arise.

Currently, turnover of mine rescue team members is common as a result of members retiring from the workforce, leaving the team to take another job at a mine, or being unable to commit to the training time requirements. There are also a number of composite mine rescue teams, made up of members who commonly work for different companies. Generally, these members travel to a designated mine rescue station for regular training. Whether their apparatus are stored at their mine site or at some central station, benchmen and other team members often do not have ready access to an apparatus for benching practice. Therefore, it is important that all rescue team members, not just the designated benchman, have training on benching their BG 4 apparatus. Composite mine rescue team members can use the BG 4 Benching Trainer software between hands-on training sessions to help maintain their benching skills. The module is also an ideal supplemental training tool that can be used to train new apparatus benchmen and team members.

### Benching Training

Training mine rescue personnel to properly check the working condition of their breathing apparatus helps ensure their safety and well-being when responding to an emergency. Federal regulations require each mine rescue team member to complete an initial 20 hours of instruction on the use and care of the breathing apparatus used by their team. After initial training, team members must wear their apparatus under oxygen for at least two hours every two months. Actually wear-

ing the apparatus is important to understand their use and function. Hands-on training and practice with actual devices is also critical to becoming proficient in benching that apparatus.

Hands-on training is the main method used to train team members to bench apparatus, including the Draeger BG 4. PowerPoint presentations and training videos demonstrating the benching process can supplement team training. Often, teams spend time training for apparatus benching as part of mine rescue competitions to reinforce skills. During timed competition benching, judges may place one or more flaws, or “bugs,” in the apparatus. A flaw can range from a tear in a breathing air bag to a missing O-ring. The benchman working on the unit must find the flaws by visually inspecting the parts of the unit and testing it to determine what the flaw may be. They must also assemble the unit, with no flaws remaining, in the correct sequence. Like live hands-on maintenance training and competition training, the BG 4 Benching Trainer software’s scenario builder feature permits trainers to insert one or more flaws that trainees must find and correct before testing the apparatus on the virtual Draeger RZ Tester.

### Skills Maintenance

Draeger BG 4 benching makes use of motor skills for completing the task. Motor skills are those used by trainees to disassemble, manipulate and replace various BG 4 components. Regardless of the task, a person’s motor skills degrade over

time if they do not use them regularly. Mental practice has been shown to reinforce motor skill retention and lead to improved task performance. Research conducted by the U.S. Bureau of Mines looked at using mental practice for helping miners remember the self-contained self-rescuer (SCSR) donning sequence. Trainees who regularly used a mental practice aid showing a “3+3” SCSR donning sequence performed more proficiently 90 days after initial training than did trainees who did not have the mental practice aid (Vaught et al., 1993). More recently, mental practice has been used in other settings to improve motor skills including learning and retaining sequencing skills (Wohldman et al., 2007), neurological rehabilitation of patients following stroke (Mulder, 2007) and enhancement of surgical skills (Arona et al., 2011).

BG 4 benching also involves the use of cognitive skills. Cognitive skills are those that make it possible for individuals to process information for a variety of reasons including performing tasks. Cognitive skills are made up of declarative knowledge or factual information (Driscoll, 2000). In the case of the BG 4, declarative knowledge includes understanding of apparatus components, how they function and flaws that can exist within each component. Cognitive skills also include procedural knowledge — that is knowing how to do something and being able to demonstrate how to do it (Driscoll, 2000). Knowing how and in what order the BG 4 components fit into

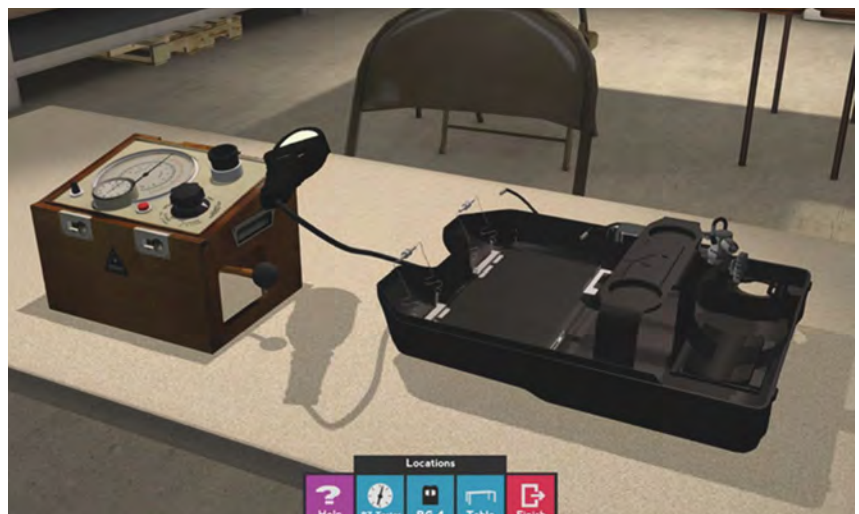


Figure 2: An empty BG 4 and an RZ-Tester.



the case and how the breathing circuit is tested are examples of procedural knowledge. Utilizing both declarative and procedural knowledge, trainees practice the task of benching a BG 4. As they continue to practice, trainees' ability to bench the apparatus correctly continues to improve. With sufficient practice, trainees potentially can seamlessly and autonomously bench the apparatus.

The BG 4 Benching Trainer software supplements hands-on training in maintaining cognitive skills by giving trainees the opportunity to use procedural knowledge to tear down an apparatus, test it, and put it back together along with declarative knowledge used in examining components for flaws and assembling it in the correct sequence. The BG 4 Benching Trainer software also helps trainees sharpen and maintain motor skills by mentally practicing benching the apparatus.

### How the Software Works

NIOSH developed the BG 4 Benching Trainer software by integrating realistic 3-D models of the apparatus with a

robust user interface into the Unity game development platform. Service and training representatives from Draeger acted as subject matter experts and provided a working BG 4 apparatus for software developers to use as a reference as they created the 3D image content. The system requirements to run the software are: Microsoft Windows 7 or Windows 8, dual core processor or equivalent, at least 4 GB of RAM, a non-integrated graphics card, and 500 MB of free disc space.

### Functions

After launching the software, the trainee enters a virtual training room by a table with all the BG 4 parts on it (Figure 1). There is an empty BG 4 case to the right of an RZ tester unit (Figure 2).

Using the computer mouse, the trainee can select BG 4 parts from the table. The selected part will slide into view, allowing the trainee to rotate it and inspect it at different angles. Trainees can "explode" the view of a part to see the subcomponents or a larger surface area of the part. They can "swap" parts if a flaw is found and then place the part in the

correct location in the case. If the trainee is new to benching the BG 4, there are animation videos showing how the part correctly fits in the case. After examining and assembling the BG 4 parts, the trainee can test the apparatus on a virtual RZ Tester, which allows them to complete all the tests needed to bench the unit.

### Training Modes

The software includes different modes of operation to help the trainee learning how to bench an apparatus as well as to help the trainer who is using the software to teach. There is a tutorial mode that explains how to navigate through the software and use its tools. The intro to BG 4 mode is useful to new trainees since they are able to work at their own pace while practicing benching. The quick bench mode randomly places flaws into parts and functions much like a real-life benching competition. The scenarios mode is useful to trainers who wish to create custom scenarios for their trainees. This allows trainers to pick specific flaws for their customized training session. An instructor's guide designed

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for use by the trainers is also included with the software.

**Performance/Scoring**

The BG 4 Benching Trainer software has a scoring feature that allows trainers and trainees to assess performance. After a benching session is completed, the software presents a printable score sheet that includes the name of the trainee, the time it took to complete the exercise, and a tally of the total score that may include discounts if the user failed to find a flaw or complete a test. This can be useful for a trainer to assess the competency of trainees when learning how to bench by using the software.

**Tips for the Training Setting**

The BG 4 Benching Trainer software is adaptable in different training settings to meet the needs of trainees (Figure 3). Ideally, each trainee should run the software on his or her own PC or laptop. However, two or three trainees can work together at a single PC or laptop and help each other while benching the virtual appa-



Figure 3 - Trainees benching apparatus.

ratus. In a larger group setting, trainers can use a video projector to display the screen from a single computer. This approach is

useful for introducing the BG 4 apparatus to new mine rescue team trainees who have never worked with the apparatus.



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**Field Test Statistics**

As part of the NIOSH training evaluation process, researchers administered surveys to the 30 rescue team members who tested the BG 4 Benching Trainer as a way of getting a sense for the different levels of experience represented among mine rescue team members and whether or not they thought the training was worthwhile and relevant. About one-third of trainees had prior virtual reality experience, and about one-third had real emergency experience as a

ways to think about benching, trainees who had more benching experience were more likely to say that they would recommend the training to other mine rescue team members and benchmen. This group also said that when it comes to benching training, instruction in a virtual environment is a good supplement to training in a real-life environment. Additionally, compared to those that had not experienced a real mine emergency, trainees who had the real-world mine rescue experience were even

a real mine emergency. These findings suggest that the BG 4 Benching Training module is a viable training product and has strong potential as a supplemental training tool for future generations of mine rescue team members.

**Conclusion**

The BG 4 Benching Trainer Software allows mine rescue team members of all levels of experience to practice benching a virtual BG 4 on a laptop or PC. Field testing of the software with 30 mine res-

“ NIOSH developed the BG 4 Benching Trainer software by integrating realistic 3-D models of the apparatus with a robust user interface into the Unity game development ”

mine rescue team member. Additionally, around half had at least one year of apparatus benching experience.

Researchers found that while nearly everyone thought the training included relevant content and gave them new

more likely to think that the training covered knowledge and skills needed during a real mine emergency. This group felt that the training made them better prepared and more confident that they could correctly bench a BG 4 during

cue team members revealed that trainees judged the module to be useful for teaching BG 4 benching skills and that the module helped them learn new ways to think about apparatus benching. The BG 4 Benching Trainer cannot replace actual

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hands-on training, but can serve as a high-fidelity, cost-effective training supplement to aid mine rescue team benchmen and other team members in maintaining and improving their knowledge, skills and abilities in benching an apparatus. This software is downloadable from the NIOSH mining website at [www.cdc.gov/niosh/mining/Works/coversheet1877.html](http://www.cdc.gov/niosh/mining/Works/coversheet1877.html).

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# BLANKENSHIP FOUND GUILTY OF CONSPIRACY

*For the first time, federal court tries and a jury convicts a CEO on charges related to the death of miners*

BY JENNIFER JENSEN



Lead Defense Attorney Bill Taylor and his client Don Blankenship during the reading of the verdict on December 3. (Artwork courtesy of Jeff Pierson)

On December 3, after two months and hearing testimony from 27 witnesses, a jury of 12 found former Massey Energy CEO Don Blankenship guilty of one misdemeanor charge of conspiracy to violate federal safety violations. He was also found not guilty of making false statements to the U.S. Securities and Exchange Commission (SEC) and securities fraud for allegedly lying to investors. The charges are related to the Upper Big Branch (UBB) mine in West Virginia where an explosion in April 2010 claimed the lives of 29 coal miners. UBB was owned and operated by Massey Energy, a now defunct Appalachia coal company. Blankenship was not charged with causing the explosion, but the charges were related to events leading up to the explosion and statements made following the tragedy.

“The jury’s verdict sends a clear and powerful message: It doesn’t matter who you are, how rich you are, or how powerful you are, if you gamble with the safety of the people who work for you, you will be held accountable,” U.S. Attorney Booth Goodwin said. “The evidence overwhelmingly showed an enterprise that embraced safety crimes as a business strategy. It was reprehensible, and the jury saw it for what it was. Time and time again the defendant chose to put profits

over safety. He got rich and the coal miners who worked for him paid the price.”

Blankenship will be sentenced on March 23 and could face up to a year in prison, as well as a fine of up to twice the gain or loss that resulted from his conduct.

Defense attorney Bill Taylor said the case against Blankenship, should never have been brought forward and he plans to appeal. “There was never enough evidence to justify convicting Mr. Blankenship of any of these offenses,” he said. “I’m confident we’ll prevail on appeal.” The appeal will be based on numerous aspects, Taylor told reporters outside the courthouse following the verdict, including “insufficiency” of the indictment, which he called “defective on its face.”

Blankenship was not the only former Massey official charged as part of a federal investigation into the company following the UBB disaster. Former Green Valley Coal Group President David Hughart was sentenced to 42 months in prison; the security director at UBB, Hughie Stover, was sentenced to three years in prison for making false statements during the investigation; and former UBB Superintendent Gary May was sentenced to 21 months in prison for violating mine safety regulations.

After being delayed four times, the trial began October 1 with jury selection. The prosecution and defense rested their case within minutes of each other, with the defense not calling a single witness. Blankenship’s fate was then in the hands of the jury, and on the seventh day of deliberation, the jury was still unable to come to a consensus. U.S. District Court Judge Irene Berger then issued an Allen charge to the jury, which is an instruction to encourage a deadlocked jury to continue deliberations to reach a verdict. Shortly after, the jury reached a split decision.

In opening statements, Assistant U.S. Attorney Steven Ruby described Blankenship as “the man in charge of the daily operations of the company,” and that handwritten notes and memos from Blankenship, as well as recorded phone calls, would show that he micromanaged mine President Chris Blanchard. Even as he learned about the hefty amount of safety violations occurring at UBB, he “pushed the mine harder and harder, the evidence will show, for more coal production, for more coal tonnage,” Ruby added.

Over the course of the trial, Ruby told the jury they would hear from numerous witnesses, including miners, who would testify that safety violations could have been prevented and were basic principles of mine safety. “More broadly, they’ll tell you that at UBB it was understood that breaking the safety laws was not just permitted,” Ruby said. “It was expected.” Ruby said miners would also describe a system that was in place to tip off areas of the mine before safety inspectors got there, and also about faking coal dust samples.

Taylor contested that “this call-ahead system at UBB had been in effect long before 2008, which was the beginning date of this so-called conspiracy. And I dare say that it would exist if Donald Blankenship had never been born.”

## Prosecution Builds Case Based on Greed

Ruby insisted that Blankenship’s main motivation behind his push was money

for more production, because “a quarter of more of the defendant’s wealth was tied up in Massey stock.” He pointed out that UBB was the biggest producing mine and part of the group of mines with Massey Energy’s highest revenue, shipping more than \$300 million worth of coal in 2009. “So when the stock went up, the defendant got richer,” Ruby said. “And the more profits Massey made, the more the stock went up.”

After the explosion on April 5, 2010, UBB’s safety violations were brought into the forefront and Massey’s stock started to fall, and according to Ruby, Blankenship lost about \$3 million from his net worth in about two days after the explosion.

According to Ruby, at the end of 2009, Blankenship received a daily violation report that showed UBB was among the worst performers in the company with 466 safety violations. The top category of violations was for allowing combustible materials to accumulate in the mine.

Ruby also spoke to the statement to shareholders that was released following the disaster, which said, “we do not condone any violation of MSHA regulations.” He claimed Blankenship’s secretary would testify that he edited and approved it personally. For the defense, Taylor insisted that Blankenship did not pen the statement himself, but did see it. “But can you imagine the number of people who are convening to draft a public statement in the wake of...this disaster,” Taylor said.

Ruby said the jury would also hear recordings of Blankenship’s phone calls that were recorded by Blankenship himself. At the beginning of 2009, he had a recording system attached to his office telephone and he started taping many of his phone calls, Ruby added.

He also told the jury they would hear from a “whistle blower” named Bill Ross, a former MSHA employee who was hired by Massey shortly after he retired from MSHA. In June 2009, Ross sat down with a Massey lawyer and board member to go over his safety concerns at the mine. In his memo, he said, “Sooner or later, we will pay the price, especially if there is a serious injury or fatality.” Taylor insisted that calling Ross a whistle blower “may not be entirely accurate” because he was asked to give his candid opinion about the issues at the mine.

However, Ruby mentioned a recorded phone call from June 2009, where Blankenship referenced the Ross memo and said, “It’s highly confidential because I don’t know, I don’t know really what to do with it because I meant to keep it privileged and confidential but, Bill, his interview on our performance regarding MSHA’s safety is worse than a *Charleston Gazette* article.” [Editor’s Note: The *Charleston Gazette* is reviled by the coal industry in West Virginia for its relentless attacks over the years].

He then went to say, “It’s bad because like, for example, if that was a fatal today, or if we have one, it would be a terrible document to be in discovery.”

### Blankenship’s Defense Strategy

When defense attorney Bill Taylor started his opening statement, he acknowledged the fact that Blankenship was a tough boss and “wouldn’t win any popularity contests in the state of West Virginia.” He then also reiterated what the judge already told the jury that Blankenship was not on trial for causing the explosion at UBB.

In response to the Ruby’s argument that Blankenship’s micromanaged his employees and criticized their work, Taylor said, “Don Blankenship managed to make the people who worked for him accountable. That doesn’t establish that he told them to violate the safety regulations.”

To counteract the prosecution’s claim that Blankenship was only concerned about production, Taylor said Blankenship took on

a company-wide campaign in 2009 to cut citations in all of its mines. “No one understood better than Don Blankenship that production and safety were linked,” he said. “So during the very period of time when the government said Mr. Blankenship is in a conspiracy to deliberately violate safety regulations, the evidence is going to instead show he imposed a program to do exactly the opposite, a program that involved spending a lot of money and putting a lot of people to work trying to fix this problem.”

However, Ruby claimed that the miners who would testify never heard of the hazard elimination program and the Safety First program “was a joke.”

Taylor contended that Blankenship was being singled out for “practices common in this coal mine.” He ended his opening statement by telling the jury that the trial was about truth. “This trial is about the truth, what you will find in the evidence in this courtroom and in the lack of evidence.”

### Prosecution Calls Witnesses, Enters Evidence

The 27 witnesses called during the prosecution phase included former UBB miner Bobbie Pauley; former Blankenship Secretary Sandra Davis; Hughart, who is serving time for his role in the events; Stanley “Goose” Stewart, a former continuous miner operator at the UBB mine; ex-Marfork Coal President Blanchard; and former Massey Chief Administrative Officer John Poma. Others that were called to testify included former UBB section foreman Rick “Smurf” Hutchens and Ross, as well as Tracy Stumbo, Tyler Childress, Brent Stanze, Gary Young, Karen Hanretty, Michael Smith, Brent Racer, Charles Justice, Clifton Stover, Rick Hodge, Larry Adams, Sean Ellison, Keith McElroy, Scott Halstead, Lisa Williams, Harold Hayhurst, Charles Lilly, Frank Torchio, and Jim Lafferty.

Pauley was one of the first witnesses called on October 8, and according to *WV MetroNews*, she testified that, at times, she was instructed to do things she had learned not to do during training and that Massey’s safety program S1-P2 (Safety first, Production second) was a “joke” to miners. *WV MetroNews* reported Pauley as saying, “We said it was P-1, S-2. I had no knowledge of what the whole program was about.”



Don Blankenship looks on during opening arguments on October 7. (Artwork courtesy of Jeff Pierson)



She was also a dispatcher at UBB at one point and testified, as reported by *WV MetroNews*, that she would hear from security personnel when inspectors arrived and was told to contact those mining coal. Former UBB Superintendent Gary May told her “don’t let him hear you do that,” she said. However, under cross-examination she also admitted that she would radio when company officials arrived as well.

Numerous personal recordings of Blankenship were also heard during the trial, and his former secretary, Davis, was called to help authenticate them and testified that Blankenship put the equipment in place so that he could record all phone calls, according to *WV MetroNews*.

The jury heard 18 audio recordings during Blankenship’s trial. In one particular recording, Blankenship talked about the running of coal in a call with Chris Adkins, former Massey COO, and issues with the Mine Safety and Health Administration, according to *WV MetroNews*. In the recording, Blankenship said, “We do some dumb things.” And he also said that he thought if it weren’t for MSHA, “we’d blow ourselves up.”

The prosecution’s third witness, Tyler Childress, an MSHA program analyst, testified that between January 2008 and April 9, 2010, MSHA issued 836 total orders and citations and of those, 311 were considered substantial and 284 dealt specifically with ventilation, according to *WV MetroNews*.

According to a chart presented to the jury, UBB had 59 unwarrantable failure orders during that time period. MSHA stated that these occur if an operator has

engaged in “aggravated conduct constituting more than ordinary negligence.” According to these documents, Childress compared that number to eight mines of similar production; the nearest mine on the list recorded 13, and several had zero.

Former miner Brent Racer, who began working at UBB in 2007 and remained there until the April 2010 explosion, testified that Blanchard would tell his boss to run more coal, including in an area that had been shut down because of air problems, as reported by *WV MetroNews*. This testimony connected with the prosecution’s argument that running coal was more important than safety to Blankenship.

Other miners testified as to not having the needed equipment and time to do their job and that codes were used to alert those underground when a mine inspector or higher-up was coming, according to the local news agency.

Early on in the trial, in an effort to counteract the prosecution’s argument that Blankenship was more concerned about production than safety, the defense fought to have 10 safety memos from Blankenship admitted into evidence and won. In one of the memos to Adkins dated October 23, 2009, Blankenship expressed his disappointment in the lack of structure and progress that had been made in regards to the company’s efforts on violations. “We need to be very serious about these violations because they’re going to come back to haunt us. We can’t be talking about what we’re going to do; we have to be talking about what we have done and how much improvement we’ve made.”

To further build its case that Blankenship put more emphasis on production, the prosecution’s 12<sup>th</sup> witness, Hughart, testified that if there was a choice between safety and production at Massey, production would win, *WV MetroNews* reported.

The jury also heard from a former UBB section foreman, former UBB superintendent and former UBB fire boss who testified that they could not meet coal production goals and didn’t have enough workers to do the job, according to testimony reported by *WV MetroNews*. One of these men, Halstead, a former UBB fire boss, also testified that he saw Blankenship at UBB in the early 2000s, which contradicts Taylor’s comment during opening statements that Blankenship had never been to UBB.

In Goodwin’s closing statements, he quoted Stewart as testifying that, “My experience there, the attitude was, the laws don’t apply to us. We don’t care.” He also spoke about the system of being tipped off when inspectors would be coming underground. “We knew they were coming and we would dress things up, make it pretty, make it as legal as we could,” Stewart was quoted as saying during Goodwin’s closing remarks.

McElroy, who was part of the MSHA team that investigated the UBB explosion, testified during the trial that eight of the 43 water sprays on the longwall shearer used at UBB were missing and several others were clogged up and not working properly at the time of the blast, according to *WV MetroNews*.

Another witness called by the prosecution was Blanchard, the former president of Performance Coal, which managed the UBB mine. He was on the stand for a week. In his testimony, he backed up the prosecution’s argument that Blankenship micro-managed the group presidents and those who worked under him. He told the jury that Blankenship was sent reports every half hour from UBB on the progress of its longwall mining, *WV MetroNews* reported.

According to Goodwin, in his closing statements, he pointed out that Blanchard also testified to there being an “understanding” to just run coal, break the law and then pay the fines. However, according to his testimony as reported by *WV MetroNews*, Blanchard said although Blankenship was demanding about production, he never told him directly to break any laws.

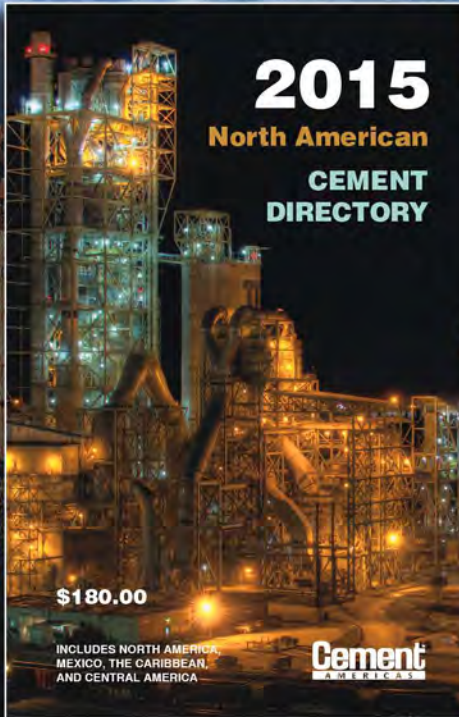


Gary and Patty Quarrels, family members of the fallen miners, watch the trial of Don Blankenship from the front row of the courtroom of Judge Irene Berger. (Artwork courtesy of Jeff Pierson)



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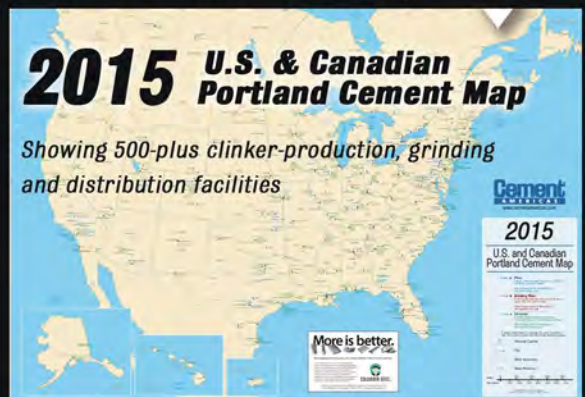
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## Ross Testimony and Memo

Ross was the 24<sup>th</sup> witness called by the prosecutor and testified that during a meeting with Blankenship in the summer of 2009, he told Blankenship that some of Massey's problems could be solved by adding an extra miner to each mining section, according to *WV MetroNews*.

During his testimony, Ross reportedly said, "When the meeting was over and I was ready to leave I said, 'One thing you can't afford to happen, sir, is a disaster — because most mines can't survive a disaster.'"

In June 2009, Ross was asked to give his opinion about Massey's violations and penalties, as well as its relationship with MSHA. The memo was confidential, and so was a report from a meeting Ross had with former Massey board member Stan Suboleski and legal counsel Stephanie Ojeda. It was sent to Blankenship and several other upper-level executives in the company.

In the memo, Ross said, "the attitude at many Massey operations is, if you can get the footage, we can pay the fines." Ross claimed that the biggest complaint was lack of manpower. "He is told that the people in production at Massey are multitaskers. They are given four or five jobs to do, but they are never given the time to do any of them well. Most say that if they had the opportunity, they would leave because of the long hours and because they are given more to do than they can reasonably get done," the memo said.

"The biggest complaint of the foreman is that they are continually forced to operate with skeleton crews. In addition to

being a boss and an examiner, they are forced to also act as a worker. If they need nine men, they are given five and are still expected to produce big footage," the memo continued. He added that Massey suffered from four big violations: ventilation, clean up, roof control and electrical.

According to Ross, mine workers said, "We are like robots. Everything is laid out for us, but we aren't given the manpower to actually do it." And "we are told to run, run, run until we get caught; when we get caught, then we will fix it."

In the memo, Ross also said Massey was clearly cheating on dust samples. "Sampling is run by the face foreman, many or most of whom do not even know what is in the ventilation plan. They are told to run dust samples today, and to do whatever is needed to come into compliance." He said MSHA sent out letters in 2006 stating dust was a problem and in 2007, follow-up letters went out and still nothing was done.

In speaking to the relationship with MSHA, the memo said Ross said MSHA was frustrated with Massey because "it doesn't appear that Massey takes them seriously, as evidenced by presidents and upper managers never coming to the inspection close-out meetings."

The memo stated that Ross believed the company presidents or mine superintendents could change things, but "he feels that people at the mines don't believe that Don Blankenship or Chris Adkins really are serious about following the law."

According to *WV MetroNews*, in June 2009, following the memo, Ross said he was optimistic and he thought positive steps

would be taken. He added that if any of the suggested reforms to enhance training, add more personnel and improve the relationship with MSHA were put in place on a bigger scale, he was not aware of it.

## Shareholders, SEC and Untrue Statements

One of the last witnesses for the prosecution, former Massey CAO John Poma, was there to speak mainly about the statement released to shareholders and filed with the SEC following the UBB disaster. Blankenship was charged with lying to the SEC in the statement. The prosecution focused on the portion that said, "We do not condone any violations of MSHA regulations and we strive to be in compliance at all times with all regulations." The prosecution claimed that he knew the statement was untrue.

According to *WV MetroNews*, Poma testified that he was in charge of putting out the official company response following the disaster. He also said that Blankenship knew how the company operated more than anyone else and the process of putting the statement together was done to get Blankenship's approval.

The prosecution's last witness was FBI Special Agent James Lafferty, who started investigating the UBB disaster four days after it happened. He told the jury, according to *WV MetroNews*, that in August 2009, Blankenship started receiving daily violation reports, including those for UBB. From that time until April 2010, he testified that 587 specific citations were issued for UBB, including ones related to its ventilation plan, rock dusting and clearing of combustible materials.

## The Prosecution Rests

Prior to the prosecution resting its case on November 16, defense attorney Eric Delinsky filed a motion for acquittal, arguing that the prosecution had not presented enough evidence to convict Blankenship. Shortly after, the prosecution rested its case and surprising many, the defense rested its case just minutes later without calling a single witness.

During closing statements, Goodwin painted Blankenship as the "drug kingpin" of the "criminal conspiracy" happening at Massey Energy and whose only concern was to "run coal" and make money. He said Massey didn't need to know the details



Former Massey Energy official Bill Ross testifies on November 7 at the trial of Don Blankenship. (Artwork courtesy of Jeff Pierson)





moderate increase, according to a state Energy and Environment Cabinet report released in November.

Statewide, a downward production trend unbroken since the third quarter of 2014 persisted in the July-September period. Output slowed by 0.8% to 15.6 million tons, leaving Kentucky on track to produce less than 64 million tons in 2015, which would be its lowest total in decades.

Fueled by a number of daunting factors, including low natural gas prices, ever-stricter government pollution controls rules, lower demand by electric utilities faced with stagnant load growth, and higher production costs, especially in the case of eastern Kentucky, production has fallen by almost 50% in less than a decade. In 2008, for instance, the commonwealth produced 121.1 million tons of coal.

While state coal officials were not cheering, they were hoping, at least, the protracted production decline may be stabilizing in eastern Kentucky. That region produced less than 7 million tons in the third quarter, a 5.8% decrease. Still, the decline was modest compared to much sharper losses during the past several years that saw eastern Kentucky finally passed by its cross-state neighbor.

Indeed, western Kentucky mined more than 8.7 million tons for a 3.7% gain in the latest quarter, reversing a loss earlier this year. Much of the region's increase can be attributed to Alliance Resource Partners' River View underground mine near Waverly in Union County. River View, a continuous miner operation, is the largest mine in the state. It turned out more than 7 million tons in the first three quarters of 2015 and is on pace to reach last year's total of 9.3 million tons.

During the third quarter, underground mines in Kentucky produced 11 million tons, a 1.4% increase from the second quarter of 2015. However, production at surface mines decreased by 5.8% in the quarter and accounted for only 29% of total production.

As it has for years, Pike County remained the top producer in eastern Kentucky at 1.67 million tons in the quarter. But that represented a 17% decline for the mountain county where coal long has been king.

Harlan County was the only other eastern Kentucky county to produce more than a million tons in the third quarter.

Union County again led the way in western Kentucky with 2.3 million tons, the highest in the state and a 6.3% increase. Three other counties in the region — Hopkins, Ohio and Webster — also produced more than 1 million tons.

Muhlenberg County, a traditional coal powerhouse in western Kentucky, produced nearly 870,000 tons in the quarter.

Total state mine employment continued to slide, although, once again, by a smaller margin than in previous quarters.

As of October 1, the report said, an estimated 9,356 people were working in Kentucky coal mines, a decline of 318 employees, or 3.3%, from the second quarter this year. There were 207 lost underground mining jobs, seven lost surface mining jobs and 62 coal preparation jobs that were lost. Another 20 office employees lost their jobs.

During the third quarter, there were 5,835 people employed in eastern Kentucky mines, a decrease of 2.1% from the second quarter. Coal mines in western Kentucky decreased total employment by 195 jobs, or 5.2%.

Most of Kentucky's coal — about 80% — is used to generate electricity at 82 power plants in 14 states in the U.S., primarily in the Southeast. Nearly 21% of the coal was shipped to power plants that are scheduled to curtail coal-burning generating capacity before 2020, the report said.

### Michigan City Installs Scrubbers

Northern Indiana Public Service Co. (NIPSCO) planned to begin operating a new \$255 million scrubber by the end of December at its 580-megawatt Michigan City coal-burning power plant on the shores of Lake Michigan. The scrubber is expected to reduce Michigan City's sulfur dioxide and mercury emissions, allowing the facility to comply with the federal Environmental Protection Agency's new Mercury and Air Toxics Standards (MATS) rule. Although MATS was struck down by the U.S. Supreme Court in June, the rule remains in effect after it was remanded to a lower court for additional proceedings consistent with the high court's ruling.

NIPSCO, a NiSource Inc. subsidiary, told the Indiana Utility Regulatory Commission in November the scrubber project "improves air quality and helps ensure its generation fleet remains in compliance with current environmental regulations."

Unlike some utilities in the Midwest, Merrillville-based NIPSCO has not announced the retirement of any of its baseload coal plants. In addition to Michigan City, they include the 1,780-megawatt R.M. Schahfer generating station near Wheatfield, Indiana, and the 604-megawatt Bailly plant near Chesterton, Indiana.

NIPSCO burns about 7 million tons of low-sulfur Powder River Basin and high-sulfur Illinois Basin steam coal annually.

### Rhino Sells Deane Complex in Kentucky

Rhino Resource Partners LP has agreed to sell its Deane steam coal mining complex in eastern Kentucky to an unidentified buyer as the Lexington, Kentucky-based company follows a strategy of divesting certain Central Appalachian (CAPP) mining operations while retaining their mineral rights in hopes of generating future tonnage royalties.

Deane, in Letcher County, consists of the currently idled Access Energy underground mine, a prep plant and a unit train loadout facility. Under a binding "letter of intent" executed between Rhino and the buyer in November, Rhino would hold onto Deane's estimated 39.3 million tons of proven and probable reserves and collect royalty payments on coal sold from Deane.

Rhino said in a filing with the federal Securities and Exchange Commission the Deane sale would relieve it of "significant reclamation liabilities and bonding requirements." Rhino recorded an approximately \$2.3 million third-quarter impairment charge in connection with the impending transaction, which should close by early 2016.

During the second quarter of 2015, Rhino completed the transfer of its Bevins Branch surface mine in Pike County, Kentucky, to Kentucky Fuel Corp., a move also aimed at relieving Rhino's reclamation liabilities and bonding requirements related to that operation.

"We have continued to proactively manage the partnership's cash flow and liquidity during these challenging market condi-

tions,” Rhino president and CEO Joe Funk said in a statement. “We believe our focus on cost and productivity improvements at our ongoing core operations will provide us the flexibility to continue exploring non-coal investments, which we believe will enhance the long-term value of the partnership.”

For the past couple of years, Rhino has pursued a strategy of reducing its financial and operational exposure in CAPP while focusing more on its new Pennyrile underground mine in western Kentucky, located in the Illinois Basin, and existing Hopedale and Sands Hill mines in Ohio’s Northern Appalachia, as well as its Castle Valley underground operation in Utah.

Pennyrile, in particular, remains a key to Rhino’s future. The McLean County mine, also known as Riveredge, has boosted productivity since its startup in mid-2014. Pennyrile now has two long-term sales contracts, with Kentucky’s Louisville Gas & Electric Co. and Big Rivers Electric Corp., for a total of 1.2 million tons of high-sulfur coal in 2016 and 1.35 million tons in 2017. The mine has a projected capacity of 2 million tons a year.

Recently, Rhino received regulatory approval for its deep cut mining plan at Pennyrile, which is contributing to higher productivity at the location. In the fourth quarter of 2015, the company intends to increase the processing capability at Pennyrile’s prep plant, which Rhino said should lead to future cost improvements.

Rhino said it has committed coal sales of 836,752 tons in the fourth quarter of 2015 at an average price of \$49.16/ton. In 2016, it has committed sales so far of 2.65 million tons at an average price of \$46.54/ton. The company sold 2.8 million tons in the first three quarters of 2015, up from 2.6 million tons in the same

period of 2014, with Pennyrile largely responsible for the increase.

### Wyodak Posts Solid Numbers

Black Hills Corp.’s Wyodak steam coal surface mine in Campbell County, Wyoming, continues to be an ace in the hole for the Rapid City, South Dakota-based company, contributing millions of dollars of profits to its bottom line. While some mines are closing in the U.S. and others struggle to turn a profit in a bearish coal market, Wyodak is one of the exceptions. In the third quarter of 2015, for example, the mine generated more than \$3 million in earnings for Black Hills, an increase of \$400,000 over the same period a year ago.

In the first nine months of 2015, Wyodak added \$9 million to Black Hills’ coffers, up from \$7 million a year earlier.

Wyodak turned in a glowing quarterly performance despite the fact sales were down slightly — from 1,082,000 tons in the third quarter of 2014 to 1,041,000 tons in the latest quarter, according to Rich Kinzley, the company’s chief financial officer.

Kinsley told analysts during a November conference call to discuss quarterly earnings that Wyodak’s realized prices were 13% higher during the July-September period — \$16.30/ton — than the comparable period of 2014.

Part of the reason for the price increase was a contract reopener last year with PacifiCorp, an Oregon-based utility that operates a mine-mouth power plant served by Wyodak.

Wyodak produced and sold about 3.1 million tons of coal in the first nine months of 2015, leaving the mine on track to approach last year’s output of about 4.3 million tons. Wyodak is Black Hills’ only coal mine.

## GIVING MINE RESCUE A BOOST



MSHA Assistant Secretary of Labor for Mine Safety and Health Joseph Main, flanked by other representatives from across the industry, marks the opening of the Madisonville, Kentucky, mine rescue station in September.

On September 18, officials from the Mine Safety and Health Administration (MSHA) cut the ceremonial ribbon on its newest mine rescue station, the agency’s fourth, in Madisonville, Kentucky.

The Illinois Basin (ILB) facility joins similar locations in Beckley, West Virginia; Price, Utah; and Pittsburgh, Pennsylvania, and will include a emergency unit team truck, surface communication system, a first response underground communication system, infrared gas monitoring and a mobile gas chromatograph laboratory.

The station is housed at Madisonville Community College’s Coal Mine Academy, where Assistant Secretary of Labor for Mine Safety and Health Joseph Main hosted an open house this fall.

He spoke at length with those in attendance about MSHA’s mission to enhance the nation’s mine rescue capabilities. Main said that his push for betterment began almost six years ago when he took his current role as the agency’s leader.

“I determined we needed an analysis of mine rescue preparedness to identify gaps in the nation’s mine emergency capabilities, [and] along with the mine rescue community, we began to make improvements to fill those gaps,” Main said, adding that it has considered all of the feedback it has received from the stakeholder meetings held in the time since at MSHA’s Mine Academy in southern West Virginia.

Some of the results of that initiative are already in place, including the formation of the Holmes Mine Rescue Association, the updating of national mine rescue contest outlines and the deployment of mine rescue technology with the help of industry partners.

“Following input from the mine rescue community, we updated mine rescue team certification criteria by revising the IG 7 — Advanced Mine Rescue Training (Coal Mines),” Main noted. “We also developed IG 7a — Advanced Skills Training (AST) Activities also for coal mine rescue teams. These added new skills training components to better prepare our mine rescue teams.” The new ILB station is part of a greater vision, Main said, to establish facilities nationwide — all equipped with the technological capabilities needed for teams to respond more quickly — as well as keeping on the cutting edge of technology.



## TECK ANNOUNCES LNG HAUL TRUCK PILOT PROJECT



An LNG-powered haul truck heads back to the loading area.

Teck Resources is piloting the use of liquefied natural gas (LNG) as a fuel source in six haul trucks at its Fording River coking coal operation in southeast British Columbia — marking the first use of LNG as a haul truck fuel at a Canadian mine site.

The use of blended LNG/diesel fueled haul trucks has the potential for significant environmental benefits and cost savings. LNG produces virtually no particulate or sulfur dioxide (SO<sub>2</sub>) emissions and reduces greenhouse gas (GHG) emissions by up to 20% in comparison to diesel alone. There is the potential to eliminate approximately 35,000 metric tons (mt) of CO<sub>2</sub> emissions annually at Teck's coking coal operations and potentially reduce fuel costs by more than \$20 million annually by adopting LNG and diesel hybrid fuel across the operations. FortisBC is transporting and supplying LNG to the mine site and is making a financial contribution towards the pilot.

The pilot is one of the steps Teck is taking to achieve its long-term target to reduce annual GHG emissions by 450,000 mt at its operations by 2030. To date, Teck has reduced annual emissions by 170,000 mt as the result of initiatives implemented since 2011.

"LNG is a fuel source that has the potential to lower costs, significantly reduce emissions and improve environmental performance at our operations," said Don Lindsay, president and CEO, Teck. "We are committed to minimizing our own carbon footprint while at the same time continuing to provide the mining products that are essential to building a modern, low-carbon society."

Teck, with support from FortisBC, has upgraded the Fording River Operations truck maintenance shop, provided engine conversion kits, installed fueling facilities and implemented a comprehensive safety program in advance of the pilot.

The pilot is expected to run until midyear 2016 and it will provide more information about the potential for using LNG more broadly across Teck's haul truck fleet, creating the opportunity for further fleet conversions to LNG in the future.

### LaFayette Purchases an Interest in ECSI

The Lafayette Cumberland Group (LCG) purchased Ecology & Environment Inc.'s (E&E) majority interest in ECSI, LLC (ECSI) in Lexington, Kentucky. E&E is a publicly traded consulting firm (NASDAQ: EEE) headquartered in Buffalo, New York and LCG is a closely held private company also based in Lexington.

ECSI President and CEO Steve Gardner sees tremendous opportunity in the new ownership structure. "This is a business arrangement that closely matches the character and culture we have built at ECSI over the past 30 years or more," Gardner said. "It means better service for our existing clients and the opportunity for us to help serve additional clients worldwide. We expect to begin expanding our business in the near future."

While known for its mining and energy development capabilities, ECSI also has significant experience in civil and environmental engineering services providing site development, hydrology, construction, storm water, planning, surveying, and design services for government and private clients. The company's mining, oil and gas experience and capabilities provide a suite of services from exploration and resource estimation to planning and design through permitting, reclamation and closure, as well as due diligence and litigation support.

### Solenis Named One of America's Safest Companies

Solenis, a leading producer of specialty chemicals, has been named one of America's safest companies by *EHS Today*, a publication covering safety leadership, risk management, industrial hygiene, sustainability and corporate social responsibility. Solenis was recognized for its excellence in creating a world-class safety culture.

"Being named one of America's safest companies truly describes the culture our teams have created and validates the



Representing Solenis as one of America's safest companies are (left to right): Kyle Cutsail, North America EHS manager; Everett Bingham, North America safety specialist; and Wes Midden, North America safety engineer.



Employees at Lincoln Contracting were each given shirts marking their one-year safety accomplishment.

hard work and commitment to world-class safety and responsible care that is carried out at every level of Solenis,” said Kyle Cutsail, Solenis North America EHS manager.

“Our focus on safety not only makes good business sense, but we also see it as a key part of how we do business with customers,” he said. “With more than 500 technical sales representatives visiting customer industrial sites every day, our zero-injury goal not only motivates our own people to be safe, but we have a unique opportunity to share safety principles and help address risk at customer locations where they may be trying to improve their own programs.”

### Rema Tip Top Acquires Cobra/Depreux

Rema Tip Top AG has acquired a significant interest in Cobra Group/Depreux, a specialist in the manufacture of conveyor belts and accessories. The acquisition brings new perspectives for cross-industry growth in the field of conveying equipment for both companies. The financial details were not disclosed. A French company, Cobra is one of the larger belting suppliers for the the mining business. In addition to the company’s headquarters in Luxeuil-de-Bains, Cobra has production facilities in France, Poland and China.

“The acquisition of Cobra/Depreux is an important step in the strategic alignment of our company toward becoming a full-range service provider” said Patric Scheungraber, Rema Tip Top board member. “Both companies will in the future cooperate closely and profit from the jointly existing service, application and product knowledge, but will continue to operate independently on the market with regards to their product and portfolio policies.”

Miners will profit from an expanded and comprehensive single-source solutions portfolio.

### Lincoln Marks 1 Year Without Reportable Injury

Lincoln Contracting & Equipment announced that its Somerset and Boswell, Pennsylvania, welding and fabrication shops recently celebrated one year of safety with no recordable incidents. Currently, there are 15 men who work in the Somerset plant and 21 in the Boswell location. This represents a combined total of more than 108,000 incident-free man hours.

“Every employee has made a commitment to safety for themselves, their co-workers, and their families. They worked hard to reach this milestone and should be proud of their accomplishment,” said Jim Summers, safety manager, Lincoln Contracting.

Established in 1974, Lincoln Contracting has two locations. The company is a full-service, hands-on contractor specializing in plant design and layout, engineering, electrical, piping, metal and steel fabrication, complete turnkey construction of preparation plants, and bulk material handling systems.

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# HYDRAULIC TENSIONERS PROVE EFFECTIVE FOR STUD REMOVAL ON RECLAIMER



Technicians use a custom hydraulic tensioner (inset) to remove 3-m-long studs in a confined space.

Port Waratah Coal Services (PWCS), located in Newcastle, New South Wales, Australia receives, stockpiles, blends and loads coal for the Port of Newcastle, exporting an estimated 145 million metric tons per year. The company needed to remove 16, 3-m-long studs on a bucket-wheel drive output on a stacker-reclaimer. The studs were tightened to 8,700 nanometers apiece in a confined space of 114 mm on one side and 254 mm on the other.

Removing the studs was not only a difficult process, but also proved to be very lengthy as it required a lot of manpower. Further, the severe operating conditions corroded the studs. Given the confined location of the studs, PWCS discovered that they could not remove the studs with traditional removal equipment.

In previous stud-removal operations with traditional removal equipment, the company dedicated more than 20 hours to remove each stud and used up to 120 tons of force to push and pull a total of 16 studs. This process took more than 320 hours of labor to complete one job.

PWCS turned to Enerpac and the company designed a custom GT4 hydraulic tensioner for removing the studs in a safe and timely manner. Featuring six load cells and detachable and rotational bridges, the GT4

hydraulic tensioner simplifies bolting applications. Enerpac modified the height and puller sleeve of the tensioner to fit the confined space of the studs.

The custom GT4 hydraulic tensioner uses a ZUTP-Series hydraulic electric tensioning pump, which draws lower amps, making it optimal for use in remote locations. It also offers an adjustable valve to allow for safe and process pressure control. To accommodate the confined location of the studs, the electric tensioning pump features a compact, lightweight design to easily fit through tight openings.

The compact GT4 hydraulic tensioner expands vertically with hydraulic force to produce pulling power, which is applied to draw the studs through bushings. Prior to using the hydraulic tensioner, this process was extremely difficult and time-consuming.

Enerpac's said its tensioner technology is ideal for applications requiring critical tolerances and multiple bolting and pulling tasks on heavy industrial equipment in a variety of industries. For large bolting applications, tensioners not only increase the accuracy of pulling forces, but can also simultaneously decrease the overall time required for the job, the company explained.

The hydraulic tensioner and pump allowed PWCS to pull each stud out in about

30 minutes, saving a significant amount of time for the maintenance team. In addition to time savings, Enerpac's solution allowed the team to reduce labor and complete the job more efficiently and successfully.

[www.enerpac.com](http://www.enerpac.com)

## Rotary Blasthole Bits

The Sandvik RR221 series of drill bits runs on a patented, modularized air bearing platform, minimizing spalling during sustained loads and delivering 10-25% longer bearing hours and life increase of up to 30% compared with the previous generation, the Sandvik RR220 range. The result is significantly lower drilling costs, according to Sandvik.

"Our latest tools feature application-focused cutting structures and are more effective and hard wearing than their predecessors," said Simon Mitchell, vice president rotary tools at Sandvik Mining. They have better longevity thanks to multiple design improvements, where we have matched our proprietary Sandvik cemented carbide shapes and grades to specific drilling conditions. This will help to reduce wear and breakage, further increasing bit life and improving penetration rates."

Sandvik RR221 sizes range from 159 to 311 mm (6 1/4 to 12 1/4 in.) and rock hardness capability from 10 MPa to more than 500 MPa. Now equipped with the patented Sandvik RR221 bearing, these bits offer high bearing hours and a low cost per drilled meter in a wide range of applications.

[www.mining.sandvik.com](http://www.mining.sandvik.com)



### Bluetooth-enabled Dosimeter

The Casella dBadge2 is a shoulder-mounted, cable-free dosimeter with Bluetooth connectivity. Available in three models, the dBadge2 captures every metric needed for noise exposure regulatory requirements, reducing the time and costs typically associated with personal noise monitoring and increasing quality assurance of noise exposure data. Exposure data can be emailed wirelessly at any time from a handheld device protected from the elements inside a rugged, tamper-proof and sealed housing.

[www.casellausa.com](http://www.casellausa.com)



### Belt Conveyor Product Guide

Following the announcement that a new CEMA standard for belt cleaners had been developed, Flexco updated its Belt Conveyor Product (BCP) Overview Guide with ratings on all of its heavy-duty belt cleaners.

"You obviously don't want to under-specify your cleaner because you need it to get the job done, but you also don't want to install a cleaner that is more than you need from a cost perspective," said Flexco Chief Engineer Brett DeVries, who was a part of the team who wrote the CEMA standard.

"The new standard provides clarity for the person who is specifying or asking for a system." Flexco made the decision to publish ratings for all of their heavy-duty cleaners to provide clarity and guidance to the end-user in accordance with the new industry standard.

[www.flexco.com](http://www.flexco.com)



### Abrasion Resistant Compound

Reinforced with various grade sizes of high purity alumina ceramic beads and silicon carbide flakes, ARC MX1 takes wear abrasion and impact resistance to a new level, according to A.W. Chesterton Co. To improve the

impact resistance of such a highly reinforced lining, the company used a novel hybrid polymer matrix to increase ductility and toughness, while retaining the critical cohesive properties required for reliable performance in these aggressive application areas. MX1 can be applied at a nominal 6 mm (240 mil) and up, with film thickness after grit blasting to a minimum of Sa 2.5/ SP10 (near white) cleanliness with a 75-125 µm (3-5 mil) angular profile. The new and improved MX1 can resist more than 68 NM (50 ft.-lbs.) of force, has tensile pull-off adhesion values of 4200 psi (295 kg/cm<sup>2</sup>) per ASTM D4541, and slurry abrasion response number of 1778 per ASTM G75, surpassing other conventional ceramic modified epoxy linings by 25% or more, according to Chesterton. [www.arc-epc.com](http://www.arc-epc.com)



### Device Simplifies Water Level Measurements

Data logger supplier Onset recently announced the release of the Hobo MX2001, claimed to be the first water level data logger designed for convenient wireless setup and download from mobile devices via Bluetooth Low Energy. The MX2001 simplifies and lowers the cost of field data collection by providing wireless access to high-accuracy water level and temperature measurements directly from a mobile phone or tablet.

The Hobo MX2001 offers a number of additional features to streamline water level data collection: It features a non-vented design for convenient and hassle-free deployment, an integrated barometric pressure sensor that eliminates the need to post-process data, and user-replaceable double-A batteries that last up to a year in the field. It also has a durable ceramic pressure sensor that can withstand harsh underwater environments.

The free HOB0 mobile app makes it simple to configure Hobo MX2001 water level loggers and manage the collected data in the field. Using a mobile phone or tablet,



users can enter reference water levels, view level data, check logger status, share data files for analysis in spreadsheets, and store data in the cloud. Users can also select alternate logging modes, such as multiple-rate sampling, which allows faster sampling at critical times, like when pumping starts or stops. [www.onsetcomp.com](http://www.onsetcomp.com)

### Pilotless Mechanical Power Take-off

WPT Power Corp. has expanded its power take-off line with the introduction of the Pilotless Mechanical PTO. Tier 4 standards have made fitment of pilot bearings increasingly difficult. This new mechanical PTO design eliminates the pilot bearing and increases side load capacity up to 74% over previous generations of mechanical PTO products. They come standard with ball-bearing engagement collars and feature a dual spherical roller main bearing design. The WPT Pilotless Mechanical PTO will optimize costs by reducing inventory, increasing uptime and engine life, and simplifying installation time.

"The previous standard in mechanical PTO design has remained relatively unchanged for 75 years. However, industrial engine applications are more demanding than ever and customers needed a design rugged enough to meet those demands," said Jeremy Bodine, applications engineer at WPT Power. "We have engineered that solution with the WPT Pilotless Mechanical Power Take-off." [www.WPTpower.com](http://www.WPTpower.com)





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## IMAGE MATTERS

BY R. BRIAN HENDRIX



Every mine operator knows (or should know) the image the Mine Safety and Health Administration (MSHA) has of an operator matters when it comes to enforcement, at least in terms of day-to-day enforcement. In other words, if MSHA's perception or view of a particular mine operator — you, for example — is that it is trying to do the right thing and is playing it straight or honest with it,

then it will be less likely to spend extra time at your mines and will be more likely to give you the benefit of the doubt when it comes to compliance issues, plan approvals and the like. How you respond to MSHA on a daily basis — particularly how you respond to enforcement actions — also matters.

I am not saying that MSHA will cut a “good operator” a break or shirk its statutory enforcement duties to favor one operator over another. I am also not saying that MSHA's opinion of an operator is always well-formed or correct. I am saying MSHA's effectiveness depends, in part, on its willingness and ability to focus more on the mines and the issues that have the greatest impact on miners' safety and health. We can debate how well MSHA does that. However, MSHA has an opinion about you and your operation, and that opinion factors in its enforcement decisions.

MSHA bases its opinion of an operator on all sorts of information. Compliance history and injury and illness rates partially shape MSHA's view of an operator, i.e., an operator's image. However, MSHA's opinion of you isn't just based on data. How your people interact with inspectors during regular inspections and your response to MSHA enforcement actions also shapes its opinion of you.

I want to focus on how your people interact with MSHA during regular inspections and how you respond to the “good paper” MSHA issues, i.e., citations and orders that properly identify and characterize violations. In coal, last year, MSHA issued more than 60,000 citations and orders and assessed more than \$60 million in penalties.

What do you do with “good paper”? The obvious starting point is to abate the violation as soon as possible and pay the assessed penalty in a timely fashion. That's just the starting point though. To get the most value out of each citation and order MSHA issues, do you make sure that:

(1) supervisors and rank-and-file miners responsible for the area where MSHA discovered a cited condition or practice are familiar with the violation MSHA cited? Do they actually review every violation? Do you discuss why the violation occurred? How similar violations will be avoided in the future? Do you make sure that MSHA sees what you're doing to learn from mistakes? A discussion and review of every violation need not take much time, and it is one of the best ways to demonstrate that you are trying to improve.

(2) supervisors and rank-and-file miners are familiar with the standard that MSHA cited and what it requires? All miners (not just supervisors) should be familiar with MSHA's standards. I would not expect every miner to be able to quote MSHA standards chapter and verse. However, every miner

should have a good, solid understanding of the standards MSHA cites most frequently and those that are most likely to have an impact on safety and health. If your people aren't well versed on MSHA's ventilation, coal accumulation, electrical and roof control standards, it will show. You can bet it will be readily apparent to MSHA inspectors, and MSHA may assume that their ignorance of the law is evidence that you do not value compliance.

(3) supervisors and rank-and-file miners are familiar with a mine's MSHA-approved plans, particularly as changes are made (and approved)? If your people aren't familiar with the plans and can't explain the basics of those plans to MSHA inspectors, MSHA isn't likely to view your people as well-informed.

(4) supervisors know how much each violation costs the company? The penalty MSHA assesses for each violation is just the starting point. Your people should also know the true cost of MSHA penalties to the company. Generally speaking, MSHA penalties are not deductible as business expenses. Do your supervisors know how many tons of coal you need to produce in order to cover the cost of MSHA penalties? If MSHA understands that your people know what MSHA penalties really mean to the company's finances, MSHA will understand that you appreciate the impact MSHA penalties have and do not simply treat penalties as the cost of doing business.

(5) supervisors and rank-and-file miners listen to MSHA inspectors and go out of their way to treat inspectors with professional courtesy and respect? If your people know their jobs, know their rights and are (relatively) comfortable interacting with inspectors, you are well ahead of the game. To be sure, it's hard to maintain your composure during an inspection conducted by a difficult inspector. Not all inspectors act professionally, and some lack the experience, training and/or expertise necessary for the job. However, most do act professionally, and those inspectors, the good inspectors, will know how you dealt with the difficult inspectors. MSHA will also notice if senior managers do not attend opening and closing conferences or otherwise do not pay much attention to MSHA when inspectors are on the property. Make sure your senior managers attend opening and closing conferences and demonstrate that they are engaged on compliance issues.

As I said above, MSHA bases its opinion of an operator on many different types of information. How you interact with MSHA during regular inspections and, particularly, how you respond to “good paper” will have a significant impact on MSHA's opinion of you. With a little work, you can ensure that impact will be a positive one.

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