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Caterpillar to Supply Longwall Systems to Four CONSOL Mines

CONSOL Energy Inc., the largest producer of coal from underground mines in North America, has placed orders for Cat® longwall equipment including more than 1,100 roof supports and totaling nearly \$300 million US. In addition to roof supports, the four northern Appalachia mines—Bailey, Bailey Mine Extension (BMX), Robinson Run and Shoemaker—will get two armored face conveyors, a shearer and three shield haulers. CONSOL also is equipping all four longwall systems with the Cat PMC®-R electro-hydraulic control system for advanced automation and Cat Detect Personnel, a personnel proximity detection system designed to enhance the safety of miners working around longwall systems. Delivery of equipment started in the fall of 2012 and will be completed in summer 2013.

In addition to the four mines receiving complete roof support systems from the Caterpillar facilities in Lünen, Germany, CONSOL's McElroy Mine will receive 60 roof supports to be used in extending the longwall face. Also, the Enlow Fork Mine as well as Shoemaker will upgrade to Cat PMC-R electro-hydraulic control systems. After retrofit of the old systems, CONSOL will operate a total of nine faces with PMC-R control systems. Of these, CONSOL will equip seven longwalls with Cat Detect Personnel. CONSOL plans to make the use of PMC-R controls standard in all its mines.

Mining the Pittsburgh 8 Seam

All of the CONSOL mines getting new equipment are mining the Pittsburgh 8 Coal Seam in southwestern Pennsylvania and northern West Virginia. The Bailey and BMX mines in Pennsylvania will take delivery of 25.4-tonne roof supports with 380-mm diameter props. The roof supports will operate on 1750-mm centers and have an operating range of 1.295 to 2.743 meters. The Shoemaker and Robinson Run mines in West Virginia will operate 22.9-tonne roof

supports with 345-mm diameter props, with an operating range of 1.245 to 2.743 meters. All four mines will have identical face end supports weighing 29.8-tonnes and having an operating range of 1.295 to 3.048 meters.

Monitoring and automation

The PMC-R electro-hydraulic control system operating each longwall has sufficient computing power and data transfer speed to allow adding remote and semi-autonomous face operation. All roof supports will be readied for the retrofit installation of the Cat MotionMonitor system. MotionMonitor employs the use of several strategically placed inclinometers that supply angularity data to the PMC-R system. With this data the system can calculate the geometric attitude (pitch, roll and yaw) of each roof support. That information is needed to steer the face when operating in a semi-autonomous or autonomous mode.

By monitoring the angular rate-of-change during times when the roof support has not been given a command to move, the system also can be used to detect unexpected movement of roof supports as well as roof convergence. The detection of unexpected movements helps in preventing equipment collisions and enhances prediction of impending geologic activity such as rockbursts.

All roof supports will be equipped with Cat Detect Personnel, part of the Detect capability set of Cat MineStar™ System. The system has the ability to accurately and reliably identify the presence of personnel and to transmit this information in real time to the local roof support control system to allow appropriate action to be taken to prevent injury.

Face conveyors

The BMX Mine will be supplied with two complete 470-meter-long PF6 armored face conveyor (AFC) systems equipped with P-65 Controlled Start Transmissions (CSTs) and KP-65 CST AFC drive with installed power of 3 x 1200 kW. These PF6 AFCs have a width of 1.142 meters and can convey a maximum of 3,500 tonnes of coal per hour.

The PF6 design separates wear parts from structural parts. The combination of welded and cast pans achieves an anticipated three-fold increase in the life of structural plates. The replaceable top race is made of extremely hard, wear-resistant materials while the supporting structural parts are made of high-strength steels. Robot welders attach the top race with standard welds that can be removed automatically for trough replacement. The innovative design combined with precision engineering and smooth rolled steel surfaces results in a substantial reduction of friction and wear, making the PF6 ideal for ultra-long panels.

For more information about Cat longwall products, go to:
mining.cat.com/products/underground-mining/longwall

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About CONSOL

CONSOL, the largest producer of coal from underground mines in the US, currently operates 11 mines across five states. The company has 4.4 billion tons of proven recoverable coal reserves, of which more than 65% is owned by the company rather than leased. The Bailey Enlow Fork Complex operates the longest faces, with four faces longer than 450 meters. The Bailey Mine Extension will add a fifth longwall to what is already the largest underground complex in the US.

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