

REAL-TIME, COMPLETE CONDITION MONITORING OF CONVEYOR BELTS

Bernd Kusel of CBG in Germany states that conveyor belts are the most economical way to move coal over distances of up to several kilometers. It is a mature product, but exposed to high loads and dangers. Countless longitudinal and transverse bending cycles, impact stress from material feeding, injuries from falling conveyor parts or from foreign objects, or just "normal" ageing, contribute more or less to the wear or failure of a conveyor belt.



Such failures can have dramatic and costly consequences. It is essential to detect them immediately when they occur, in order to be able to take appropriate measures before things get worse.

The CBGuard monitoring system, based on radiographic technology, is the only method on the market to detect and process virtually every change of a conveyor belt and its splices.

ECONOMY

Continuous radiographic monitoring obviates the need for time-consuming, insufficient visual inspections and temporary shutdowns of the conveyor system.

The CBGuard is permanently and exactly informing about the severity of injuries and deficits. Examples are corrosion, holes, scratches, edge damage, delaminations, protruding cords and stuck foreign objects.

Fatal deficits, e.g. a belt break, can be avoided. Arising defects, not still visible from the outside, are detected at an early stage and can be repaired in a timely manner.

Repairs can be performed at the optimum point of time. Not

unnecessarily early and not too late, as would happen as the result of visual evaluation.

The CBGuard Life Extender X6 measures the exact belt thickness and yields timely information about the upcoming need for a replacement. Hence, the maximum lifetime can be obtained from the conveyor belt.

SAFETY

Serious damages, for instance broken or corroded steel cords, trigger an alarm, which advises the belt operator to carry out the repair as soon as possible.

The CBGuard is an important part of the preventive maintenance programme.

Extremely critical failures like the imminent opening of a belt splice or the slitting of the belt, automatically stop the belt drive. That way, dramatic consequential damages, for personnel and plant, are avoided.

MODE OF OPERATION

The CBGuard software generates an intelligent analysis of any kind of threat to the belt. The current condition of the belt and of the splices is compared with the target condition. Any deviation triggers a customised action – from a warning to the automatic shutdown of the conveyor system.

The scanner can be operated nonstop 24/7 or once a day, a week, or month.

The programme is intuitive and very easy to use. Remote servicing is possible anytime.

Videos, partly or completely, or photos of any belt spot are available anytime. A complete report of the overall belt condition can be printed at any time.





virtually every cubic millimeter of the belt is captured. That way, the X-ray system can be integrated into the IIoT. A reconciliation with the control units of other conveyor components is enabled. The optimal time of the next maintenance stop can be scheduled.

The condition of the belt can be observed from any place in the world in real-time over the internet.

The scanner is suited for belt widths of up to 3200 mm, a belt thickness of up to 60 mm and a velocity of up to 9 m/s.

INSTALLATION

The device is very compact. It fits in almost all conveyors.

The preferred place is in the bottom part of the conveyor. A concrete foundation and a safety fence have to be provided. The scanner itself is equipped with several safety devices.

At the fence, about 2 m away from the generator, the radiation is approximately equal to the normal environmental radiation. Before work on the device, it is switched off in the control room. When turned off, there is no radiation at all; the system does not contain any radioactive material!

The scanner is almost wear-free, because it neither has moving parts nor contact with the belt. The device signals in good time when the X-ray generator-tube module, which normally has a lifetime of some years, is about to be replaced.

INDUSTRIAL INTERNET OF THINGS (IIOT)

The CBGuard scanner digitises the entire conveyor belt;

MODERNIZATION

The CBGuard can be a substantial component of the modernization process of many coal mines. Holistic thinking to operate successful mines is replacing methodologies of the past. X-ray belt scanners are a central part in this new environment.

The use of a CBGuard is recommended for all long or critical conveyors. Originally, the request for an X-ray system came from underground coal mining, because a visual assessment of the conveyor belt is difficult there. Under the Safety First rules, belts were replaced, because it was assumed they were not reliable anymore. Assets were burned because of lack of information.

The CBGuard scanner is particularly important for steel cord conveyor belts. Damages to such long and expensive belts can have catastrophic consequences.

Meanwhile, there are hundreds of CBGuard X-ray systems operating successfully in underground and surface mining, in cement plants and ports. They have demonstrably prevented fatal accidents and significantly reduced operating costs.



CONCLUSION

The CBGuard monitoring technology is revolutionizing the safety and efficiency of major conveyor belt operations. No other system or technology is capable of providing and processing such a wealth of detailed information of any part of a conveyor belt.

The reduction in operating cost and the increase in safety are most convincing arguments for the implementation of these state-of-the-art scanners.