Winter-Proof

State-of-the-Art Building Materials Supplier with SmartWire-DT™ and PKE

The Lorüns crusher and screening plant (BSL) used the winter break over 2010/11 to upgrade the existing sand and gravel plant with state-of-the-art technology. In addition to changing over to a state-of-the-art process control system and replacing the entire power section, Eaton’s new SmartWire-DT communication and connection technology was also implemented in combination with the PKE electronic motor-protective circuit-breaker. The sector professionals at Keckeis, an Austrian company based in Rankweil, who were the contractors for the project, had quickly recognized the benefits of SmartWire-DT with operating current measuring, and the clients at BSL also gave their unreserved consent to the new solution.

Experts in the field know the problem of starting iced up elevating conveyors in the morning in freezing temperatures all too well: The stiffness of the empty conveyor belts due to frozen water in the belt pockets causes the motor currents to increase right up to the operating limits. When material is then added, the drive enters the overload range and the motor protection shuts down the conveyor. A restart is then mostly only possible after the conveyor line has been emptied by tediously shovelling off the conveyed material by hand.

**Plant optimization, preventative maintenance, energy saving**

After upgrading the sand and gravel plant with SmartWire-DT, the iced up belt can be automated to “run warm” until the operating current has dropped to “idle running”, and only then is material conveying enabled. Any accidental material conveying and likewise any excessive warm running are prevented. A far greater benefit for BSL is the controlled operation of the plant close to its maximum output limit, i.e. optimized and safe plant operation. This is because varying total weights are transported at the Lorüns crusher and screening plant, due to the humidity and grain size of the transported material.
The outstanding benefit is the enhanced drive monitoring functions: The actual motor current can be displayed and evaluated continuously without the need for any expensive analog I/O technology. With conventional motor control using the motorprotective circuit-breakers and contactors, the switching states of both components (ON) are interrogated to make an indirect evaluation of the operating state and the detection of a standstill. A hardware solution such as a speed sensor, load shedding relay etc. is required for a real and reliable feedback signal. When the set current value of the drive is exceeded in the event of an overload, the drive is shut down immediately in order to protect the motor from being destroyed and a fault is indicated. This results in several unplanned breaks in operation that can take a lot of time to rectify and often involve high downtime costs.

It is in this particular aspect that SmartWire-DT shows its tremendous benefits: The evaluation of the actual operating current makes it possible to distinguish between the following six operating states at BSL (according to the drive task):

- Motor switched off
- Motor underload
- Motor idling
- Motor operation
- Motor overload
- Motor fault

The individual load limits as well as the time characteristics can be programmed as required for the particular drive application at hand. This enables the plant operator to detect imminent faults early on and enables interventions in the production process before an unscheduled interruption occurs.

The use of the PKE motor-protective circuit-breaker in connection with SmartWire DT enables central monitoring of all the drive motors of the conveyor belts and considerably increases the system’s availability.