

Digitalize Conveyor Belt Roller Monitoring

Reduce Production Loss and Ensure the Operational Continuity

Distributed Temperature Sensor

Current Situation and Issues

The Throughput in a Mining Operation Is Directly Proportional to the Conveyor Belt Systems Performance

Sometimes, the roller has the difficulty to rotate (mainly due to a bearing failure), which result in a fire occurrences. In that case, the plant has to stop production in long term, which causes catastrophic damage to the management. Hence, continuous monitoring of all rollers temperature is required to prevent fire and minimize downtime.

Typical reactive conveyor belt monitoring models



Manual/route-based monitoring with IR thermal inspections



Install wireless point sensors at given points



Conventional linear heat detector

Drawbacks

The onset of temperature spikes cannot be predicted. It could happen after the route has been completed. Also, some areas of the conveyor belt maybe in unsafe places.

Only a partial health status visibility of the assets within the plant. Initial cost and running cost increase when a number of wireless point sensors are installed.

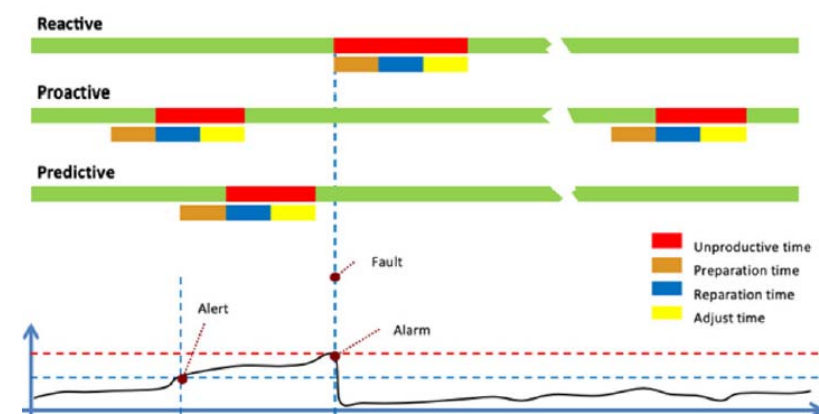
It can detect when fire-accident actually happens by the short circuit of twisted pair metal wire with melted outer. It can't prevent fire and locate the location of fire.

tion and maintenance processes.

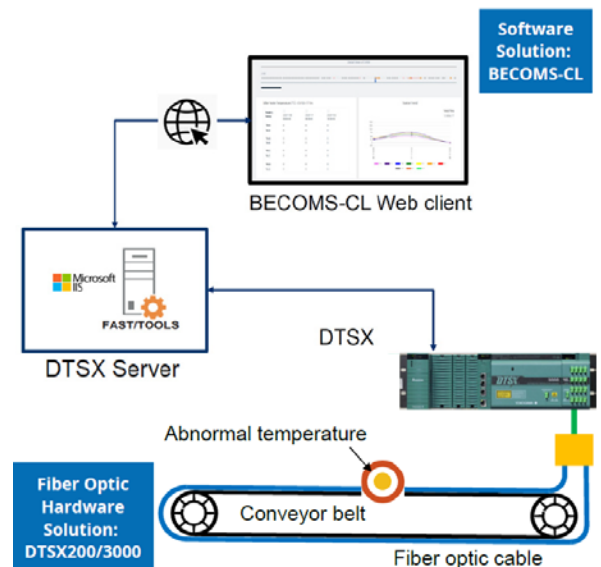
YOKOGAWA's DTSX Solution and Benefits

An Integrated Offering That Can Predict Fires

- Ability to monitor long and wide conveyor belts in real-time.
- HMI graphical drawings enable excellent visibility for operators.
- Centralized monitoring and diagnostics permits failure prediction.
- 7-10x lower downtime and 70% OPEX savings compared to reactive and proactive monitoring models.



The Integrated Conveyor Belt Monitoring Solution



* Some graphs and images are quoted from the eBook ("Digitalize Conveyor Belt Monitoring") created by Frost & Sullivan.

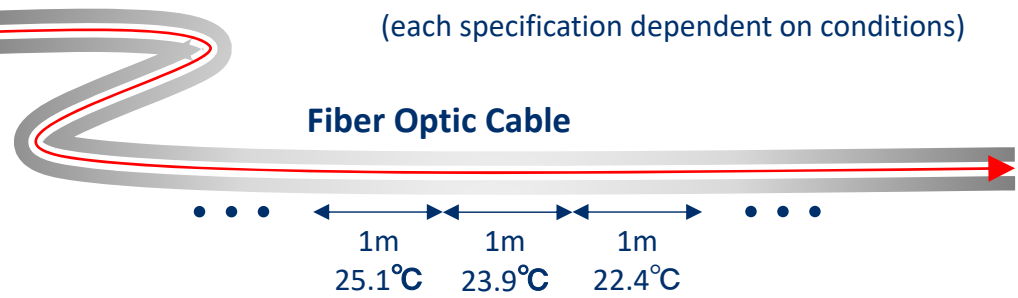
Features of Optical Fiber Sensing in DTSX System

The Fiber Optic Cable Is the Temperature Sensor



DTSX200 / DTSX3000
Distributed Temperature
Sensor

- Monitoring Distance: to 50 km
- Monitoring Temperature: - 200 to 300 °C
- Shortest Monitoring Cycle: Approx. 5 seconds
- Temperature Resolution : 0.03 °C
(each specification dependent on conditions)



* Temperature distribution monitored every 1 m

Main Features

- ✓ 24 hours, 365 days monitoring even in wide areas and ordinarily non-manned areas
- ✓ Power supply not required, explosion-proof, not affected by electromagnetic noise
- ✓ Flexible installation
- ✓ High compatibility with DCS and other host systems (Modbus/TCP)

Customer Case Studies

✓ Quick Implementation of New Conveyor Belt Fire Detection System

The customer had implemented a Linear Heat Detector (LHD) to detect fires, however the maximum coverage length was 3km and was furthermore unable to precisely locate the position of fire.

Eventually, the customer came across an unexpected fire accident and needed to implement a new fire detection system very quickly.

Yokogawa performed a quick site feasibility study, delivered the DTSX solution with no lead time, and acquired the customer's firm trust.



✓ Realize Managing Bioleaching in Vast Copper Mines

Bioleaching is a popular organic process to extract metal from low-grade ores.

The organic process involves the application of bacteria, which loses its effectiveness at very high and low temperature extremes. The challenge was to measure the thermal profile of phreatic level over a vast area. As it was difficult to measure temperature over a long distance using traditional electronic based measurement, The customer selected Yokogawa's DTSX. The solution provided a high resolution temperature profile with no need of specialized knowledge.

24/7 access to temperature data from a HMI panel allowed the customer to take necessary actions to adjust temperature levels.



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