



Ma'aden Phosphate Conveyor Monitoring Kingdom of Saudi Arabia

Project Overview

A fire can have detrimental effects on a company's operations and reputation, risking employee safety and valuable assets. MA'ADEN (Saudi Arabian Mining Co.) is the largest multi-commodity mining and metals company in the Middle East, as well as one of the fastest growing mining companies in the world. It sought out a solution to protect one of its conveyor belts, and AP Sensing's fiber optic Linear Heat Detection (LHD) solution was selected.

For this project, AP Sensing's solution provides quick and reliable fire detection by identifying hot spots and potential fires along the belt and hot rollers of the conveyor belt. Our modern LHD technology provides an ideal solution for continuous conveyor belt monitoring, as the system is unaffected by the extreme conditions that are commonplace with conveyor belts or mining environments. AP Sensing's LHD offers maximum reliability and accuracy, even in harsh environments involving dirt, dust, wind, corrosion, high humidity, extreme temperature changes, and explosive environments (ATEX / IECEx) due to gas or dust. The system also offers dynamic fire detection techniques utilizing rate of rise alarming, difference to zone average, freedom of relay assignment and the remote reset of alarms.

Solution

The entire MA'ADEN conveyor belt is approximately 1.3 km long, divided into two sections: half underground and half aboveground. Two AP Sensing N4387B LHD interrogator units were installed to monitor the entirety of the conveyor belt, which is quite complex as half of the conveyor belt is tilted, while the other half is not.

Background

- MA'ADEN required a solution for monitoring the temperature of a 1.3 km phosphate conveyor belt, located both underground and aboveground
- Customer requirements include early indication of small fires and intelligent detection of fires that grow rapidly

Solution & Benefits

- Two N4387B Linear Heat Detection (LHD) units with S2002A passive and armoured sensor cable
- Built-in dry contacts to connect the system with the local FACP
- Accurate system that is resilient even under harsh environmental conditions



AP Sensing's S2002A passive and armoured sensor cable was installed, configured in a class A fashion to provide fiber break tolerance. Our sensor cable has been installed due to its ruggedness and immunity in dusty, harsh environments and is installed in two loops: the first close to the roller and the second on top of the belt to enable optimal coverage of the entire belt route.

When beginning the project, the customer requirements included the need for a sensitive detection system that can enable early warning of small fires and provide intelligent detection of fires that grow quickly. AP Sensing's system fulfills this requirement, while built-in relay contacts are used to connect the system with the local fire alarm control panel (FACP).

Both LHD interrogator units and the sensor cable are exposed to an abundance of phosphate dust but function properly as proven by our certifications (VdS EN 54-22, UL 521, ULC S530, FM) and the use of our IP66-protected outdoor housing.

Benefits

AP Sensing's LHD solution is engineered for high reliability, with the most certifications and lowest failure rates in the industry, as well as a MTBF of 33 years. The system is certified and tested to withstand 750 °C flame temperature for up to 2 hours (as per IEC 60331-25) and is extremely robust, with tensile strength of 1500 N and crush resistance of 960 N/cm.

Additionally, the system is easy to install with no maintenance. It meets the class 1 M laser certification,

and with its unique code correlation technique results in an average laser output power of just 17 mW. A successful project commissioning took place under the supervision of AP Sensing's Middle Eastern support team, providing greater peace of mind to the end client. The client expressed satisfaction and enthusiasm about introducing a system that intelligently monitors the conveyor belt in real time over thousands of points and can report fires instantaneously.

