CASE STUDY

Hidden Valley Gold Mine: overseas project expansion of DTS fire detection capability



PROJECT OVERVIEW

Advanced Photonics Australia's Distributed Temperature Sensing (DTS) fire detection system was recently expanded at the Hidden Valley Mine, owned by Harmony Gold. The gold and silver mine is located in the Morobe Province of Papua New Guinea on elevations of 2,800 metres above sea level, in our first overseas project.

The project expansion included the design, supply, testing and commissioning of the overland tubular conveyor fire detection system. A milestone achieved in this project was the completion of remote commissioning due to COVID-19 travel restrictions with exceptional results. The project included a total of 6 conveyors with more than 7 km of monitored area.

REQUIREMENTS

An internal risk review process identified the need for conveyor fire detection that would provide:

- Fire detection coverage of the crushing plant and overland conveyor (OLC), including drive head areas;
- Early warning centralised alarming with localisation of abnormal heat build-up areas, before a fire starts;
- Activation of 4 separate deluge systems along the conveyors, conveyor shut down, fire alarms, control system monitoring of temperature data along the fibre cable run;
- Interface not only to the fire alarm system but also fully integrated with the site DCS system;
- Exact localisation of the abnormal heat or fire to within a metre;
- Full history of the fire initiation point, its movement, temperatures, date/time stamping for any eventual reporting or investigation.



Highlights

- The project encompassed the monitoring of 6 conveyors, including the crusher, refinery and overland conveyor areas;
- Successfully designed and commissioned remotely (due to COVID-19 travel restrictions) thanks to our experienced staff;
- Suitable for mountain terrains and harsh environments with extreme weather conditions;
- Total fire detection coverage and compliance wherever the fibre cable is located;
- Full data integration into the plant's operation system.





Core 1 to channel 1

Core 1 to channel 2

DTS Unit 2 channel, 1 km range, with Modbus TCP/IP at the Crushing Plant & OLC conveyor





THE SOLUTION

Phase 2 of the project was implemented to provide more comprehensive monitoring including in hazardous areas such as the crushing station, overland conveyor (OLC) and the refinery on the mountain slope. A dual ended loop with 2 DTS channels was installed to offer the highest possible reliability.

The project is increasing the mine's overall safety by detecting and preventing accidents, ensuring productivity and safeguarding both staff and operations in this remote area.

Our technology is accredited for fire detection use and is immune to Electro Magnetic Interference (EMI). It does not require any maintenance after installed, which is a critical aspect in areas of difficult access such as the mine's mountainous location. The comprehensive 24x7 remote monitoring allows the client to safeguard its operations in a reliable and efficient way, responding quickly in case of an emergency.







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TECHNOLOGY BENEFITS

