

Railway Rockfall and Landslide Detection

Fibre-optic monitoring system

Falling rocks and landslide events pose a substantial safety threat and cause significant problems for railways, including risk of derailment and operational delays. Existing mitigation measures such as electrical slide fences have many operational limitations. They are prone to missed events and false alarms. Their requirement for on-site intervention to reconfigure the equipment after each alarm event often results in the operator having to unnecessarily stop or slow traffic even after the track integrity has been restored or verified by passing vehicles. Additionally, slide fences and similar systems carry a significant cost overhead due to the need for on-site repair, maintenance and overhaul.



The OptaSense® Rockfall and Landslide Detection solution converts a standard single mode telecoms fibre-optic cable into an array of distributed sensors capable of detecting rockfall, landslide and significant ground movement events. With this insight, rail owners and operators can increase the safety and efficiency of their operations through rapid, informed decision-making while reducing the high cost overhead associated with existing systems and mitigation measures.

The OptaSense Rockfall and Landslide Detection solution:

- Accurately detects rockfall, landslide and ground movement events likely to cause derailments and operational disruptions
- Offers a performance upgrade with proven rates of detection and location accuracy
- Enables rapid and remote reset without the need for any on-site activity
- Allows seamless integration with existing systems and operational procedures
- Permits continuous improvement through operational experience to enhance performance
- Requires near zero routine or periodic trackside maintenance



Operational value

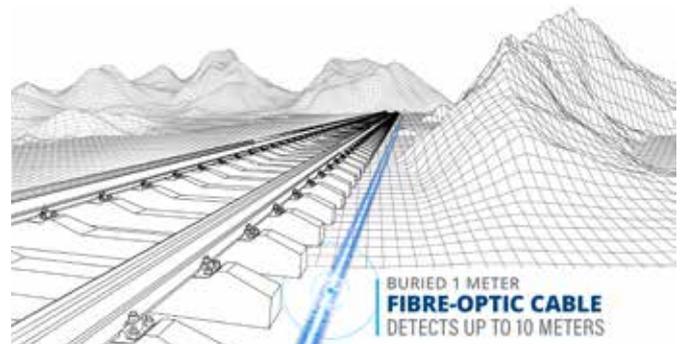
The OptaSense Rockfall and Landslide Detection solution provides unrivalled operational value over existing measures. Typical issues associated with existing detection and prevention solutions such as slide fences include;

- Missed events leading to derailments and near misses
- False alarms caused by small rocks or intrusion by animals
- Extended train delays caused by alarms which require a manual on-site intervention to clear
- Exposure to rockfall and landslide risks during system downtime caused by false alarms or maintenance
- Planning and operational impact of periodic and post incident maintenance and overhaul
- Risk to employees engaged in on-site reset, maintenance and overhaul activities

These issues are significantly reduced or eliminated using the OptaSense Rockfall and Landslide Detection solution. The fibre optic monitoring system can be tuned to capture meaningful events with a high degree of reliability. Nuisance alarms are reduced to acceptable levels and remote reset of the solution is easily achieved once the track integrity is restored limiting the impact of unnecessary train delays. Furthermore, the solution can be implemented rapidly, integrated into existing systems and processes, and continually improved over time with operational experience. A reduced lifecycle cost enables a more economic coverage of areas prone to rockfall.

Solution Capabilities and Deployment Options

When the fibre-optic cable is positioned adjacent to the rail track, the solution is capable of reliably detecting falling rocks and rolling rock events along with landslip and other significant ground movement events with location accuracy up to 10 meters.



Each OptaSense solution is capable of protecting up to 40 kilometers of track. Multiple systems can be linked to provide extended route coverage. The solution can be deployed on dedicated or existing fibre-optic cable. A site survey is required to confirm the viability of existing fiber-optic cable for rockfall and landslide detection.

To learn how the OptaSense Rockfall and Landslide Detection solution can improve the safety and efficiency of your railway operations, contact an OptaSense representative.