

# VESDA Customer Success Story

## Conveyor Belt Protection

One of the world's largest coal exporters installs an Xtralis VESDA solution to prevent fire and address the hazardous environmental conditions within their terminals.



### The Challenge

In early 2005 a fire at Dry Bulk Terminal (DBT) damaged conveyor systems and put the company's operations at risk of interruption. Repairs were conducted and business continued, but it took months to complete and cost over R13 million (Approx US\$ 1.8 mil) in damages. The company needed a solution to protect their business and reputation and to prevent a similar, or more severe, fire incident from occurring.

It was discovered that the harsh environmental conditions within DBT posed many challenges to traditional fire detection systems. Materials such as woodchips and coal travel via conveyors to their destination. Along the way they produce large levels of highly combustible dust and dirt that contaminate the area and clogs machinery. Traditional systems cannot distinguish smoke from pollution or dust. This results in false alarms and reduced sensitivity.

Fire risks in the storage bays and conveyor tunnels required a solution that provided very early warning of smoke or fire in spite of challenges such as:

- Highly combustible stored coal piles or accumulated coal dust could self-ignite and smoulder for hours before developing into a flaming fire.
- Friction caused by the build up of material around a roller or between the belt could result in a heat source sufficient to ignite nearby fuel.
- Electrical and mechanical faults could initiate a smouldering fire within the conveyor's mechanism or housing.
- The fire risk from hot or burning material, such as coal, travelling along the conveyor belt at fast speed.

There was a need for a detector sensitive enough to enable very early warning of small smouldering fires and to provide a rapid response to fast growth fires while performing reliably and effectively with low maintenance.

### The Solution

After initial consultation with the client, Firehouse's Kevin Clarke approached the Xtralis channel partner, GE Security, to assist with a fire risk assessment and site audit. Smoke detection was deemed the most difficult along the coal and woodchip carrying conveyors throughout the terminal because,

**Dry Bulk Terminal** is one of the largest export terminals in the world with a reputation for operating efficiently and reliably 24 hours a day.

**Employees:** over 500 employees

**Location:** Richards Bay, South Africa

**Industry:** Coal

**Products used:**  
Xtralis VESDA VLP  
Xtralis VESDA VLF-250

**Software used:**  
Xtralis VSM4 monitoring software



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accessibility to tunnels was a problem and, the speed of the conveyors made any smoke or heat detection more challenging. Initially, flame and ember detection had been installed but proved to be slow and ineffective in detecting incipient fires. These forms of detection were also hampered by continued maintenance problems. Linear heat cable was also considered but, again, the reaction time was too slow to detect heat or flame - increasing the risk of damage before an alarm was initiated.

It was determined that an Xtralis VESDA very early warning smoke detection system would best suit Dry Bulk Terminal's unique environment. This decision was based on Kevin Clarke's research and experience in the capabilities of the VESDA system in other similar installations combined with the Xtralis reputation and proven track record. The wide sensitivity range of a VESDA detector ensures the earliest possible warning of a fire and provides multiple, configurable alarms to alert authorities and initiate suppression systems. After extensive smoke testing was undertaken by GE and Xtralis personnel, Fire House had a unique system designed whereby purpose designed heads sampled along conveyor tunnels. Carefully positioned sampling holes enabled early detection of smoke anywhere along the conveyor tunnels, while detectors were located in positions easily accessible for maintenance.

VESDA VLP units are installed inside conveyor tunnels and also provide detection for the drive heads. The facility is used to offload a variety of products for surrounding industries including alumina, sulphur, zinc and fertilizers which may contaminate detection systems. Thus, filters were installed on the VESDA pipework to remove these corrosive chemicals from the sampled air while not adversely affecting the detection of smoke, and ensuring a long reliable service. VESDA VLF units were installed in all substations. The VESDA units interface to and form part of a two stage trigger for activation of the sprinkler (water spray) systems. Xtralis VSM4 management system is installed to provide centralised monitoring and control of the 50 VESDA devices across the entire network.

In addition to smoke detection the VESDA system is being used as a management tool to accurately measure background smoke levels, providing an indication of equipment wear and therefore assisting in equipment maintenance scheduling.

## The Result

It was the Xtralis reputation and proven track record in challenging environments that convinced DBT that VESDA was the only suitable choice. During the 12 month Phase IV installation, additional fires were detected and successfully suppressed by early intervention of deluge systems activated by the VESDA detectors.

**Kevin Clarke**  
Installation contractor  
and system  
designer  
Firehouse,  
South Africa



“In my 12 years of installing VESDA systems, I have seen a significant number of fires either prevented or successfully suppressed through the early intervention of VESDA smoke detectors.”



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