

APPLICATION STORY

New thermal fire detection system from FLIR promises a safer Krohnstiegtunnel

The Krohnstiegtunnel, running under the runway of the Hamburg Airport, has been equipped with advanced automatic incident detection and fire detection technology from FLIR. Tunnel operators can now monitor the safety inside the Krohnstiegtunnel 24/7 and make well-founded decisions using real-time thermal video from FLIR ITS-Series AID cameras installed along the entire length of the tunnel. The FLIR detection system proved its worth shortly after installation began. It identified a burning vehicle inside the tunnel only seconds after ignition and approximately ten minutes before the existing linear heat detection system alarmed.

The Krohnstiegtunnel is a road tunnel along the course of Hamburg's federal road 433 and ring 3 under the runway 15/33 of the Hamburg Airport. Due to the extension of the airport runway over the state border with Schleswig-Holstein in the 1960s, the connecting road from Niendorf to Garstedt was interrupted. The Krohnstiegtunnel was built as a replacement. The Krohnstiegtunnel is 419 meters long and offers passage for vehicles, pedestrians, and cyclists.

ENHANCING SAFETY IN THE TUNNEL

The Hamburg tunnel officials understand that tunnel incidents and fires can have devastating effects on people and infrastructure. Not only can a fire result in human casualties, but also in severe material damage and in the disruption of important infrastructure lines.

It was clear to the Hamburg authorities that the fire detection system could be improved. The fire detection system in the Krohnstiegtunnel

was by means of a linear heat detection system. This is a cable system commonly used for fire detection inside tunnels. It detects fire when it is activated by heat anywhere along the length of the cable. Linear heat detection systems rely on proximity or direct contact with flames or heated gasses, meaning that fire detection can take upwards of minutes.

"Effective incident management completely depends on fast detection and fast incident verification," says Steffen De Muijnck, product manager at FLIR Systems. "Every minute lost heightens the risk of an incident escalating into something worse and drastically increasing the time it takes to clear the accident. Linear heat detection requires heat to build up quite intensively, which can take the system a very long time to detect a problem. Often tunnel ventilation systems blow the hot air away from the linear heat detection system, hindering detection performance even further."

The FLIR ITS-Series AID is a thermal imaging camera with onboard video analytics for automatic incident detection and early fire detection.



Hamburg authorities turned to FLIR to provide an alternative to traditional fire detection systems, seeking a better, faster, state-of-the-art fire detection solution.

FAST FIRE DETECTION

To make the Krohnstiegtunnel safer using today's state-of-the-art in fire detection systems, the Hamburg authorities turned to FLIR to provide an alternative to the linear heat detection cables installed in the Krohnstiegtunnel. Seeking a faster fire detection solution with expanded capabilities to increase safety within the tunnel, they selected FLIR's automatic incident detection and fire detection technology.

"FLIR Systems has been driving the technology and the market for automatic incident detection in tunnels and on highways for years," says Steffen De Muijnck. "We recently added the





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FLIR ITS-Series AID camera to our range of automatic incident detection solutions.”

The FLIR ITS-Series AID is a thermal imaging camera with onboard video analytics for automatic incident detection and early fire detection. The camera can measure the temperature of any object in its field of view, enabling it to detect fires at an early stage over the full detection range. The ITS-Series AID camera has a 640 x 512-pixel resolution, allowing the onboard video analytics to evaluate the source of the hotspot in greater depth. The result is fast, reliable fire detection with a low unwanted or false alarm rate.

THERMAL IMAGING DETECTS AT THE SOURCE

Thermal imaging cameras outperform other fire detection technologies. They detect the heat energy given off by everything in their field of view. Unlike other fire detection technologies, no contact is required with flames or heated gases, nor is any smoke propagation needed for the camera to pick up an initiating incident or fire generated by a vehicle malfunction. As a result, a thermal camera with appropriate fire detection analytics can detect fire within seconds of ignition, long before any traditional fire detection system can trigger an alarm.

AUTOMATIC INCIDENT DETECTION

In addition to fire detection, the FLIR ITS-Series AID camera also provides critical traffic information, supporting traffic operators with alerts on stopped vehicles, wrong-way drivers, pedestrians, lost cargo, traffic flow data and much more. In the situation in the Krohnstiegtunnel, the FLIR camera immediately detected the stopped vehicle.

Because they see heat, not visible light, FLIR ITS-Series AID cameras are not impacted or blinded by sun glare, darkness, headlights, shadows, wet streets, snow or fog. Unlike conventional video cameras, thermal cameras can easily see through the smoke of a burning vehicle, enabling Krohnstiegtunnel operators to better control evacuation inside the tunnel and assist the fire department in locating and extinguishing fires.

FIRE INCIDENT, HOURS AFTER INSTALLATION

Shortly after the installation of fourteen ITS-Series AID cameras in the Krohnstiegtunnel and only hours after upgrading the detection system to the latest firmware, a fire broke out in a vehicle in the tunnel. The fire, caused by a brake failure, was detected by the FLIR camera’s early fire detection algorithm just 20 seconds after ignition.

The linear heat detection system took over ten minutes to detect the fire. This resulted in a situation where danger was escalated as vehicles continued driving beside the burning vehicle. Eventually the tunnel was closed off. Human casualties were avoided, but due to the late response the vehicle burned out completely.

“Unfortunately, this particular incident occurred before the new FLIR system installation was completed and before the camera feeds were linked to the control room. That is why the operator did not receive the fire detection ten minutes earlier,” says Steffen De Muynck. “The new FLIR detection system did detect the incident much earlier than any other detection system out there. This is very promising for the future safety inside the Krohnstiegtunnel.”



For more information about thermal imaging cameras or about this application, please visit:

www.flir.com/traffic

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