

# Protecting rail passengers and infrastructure from fire

Ensure safe evacuations by increasing the available time

Avoid major asset loss

Reduce false alarms

Lower maintenance costs

Yield improved service continuity and efficiency



In 2006 a subway fire started in stored wood ties (wooden sleepers for rail tracks) in Brooklyn, NY, requiring 4000 passengers to be evacuated, injuring at least 25 people, and causing delays to thousands of peak hour commuters.

The consequences of smoke or fire in a crowded rail facility are dangerous and possibly fatal. The feeling of panic spreads quickly and hampers any chance of a safe and orderly evacuation.

Exit from a railway station is often along the same path as smoke will travel. Escalators and stairways act like chimneys for smoke – and smoke kills!

Trying to evacuate a train is difficult and dangerous. Even evacuation does not guarantee escape from the smoke trapped in a tunnel or an underground station.

Service interruption can impact thousands of commuters, and service level obligations and profitability will be threatened.

#### What are the risks?

Fires in rail facilities result from:

- High current electrical faults.
- Friction caused by mechanical faults, fueled by a build-up of oil, dirt and lint.
- Arson, which commonly occurs in unsupervised areas, and may be started using discarded litter.
- Unauthorized cigarette smoking.

# What makes a fire spread?

In rail facilities, the growth and spread of fire is fueled by:

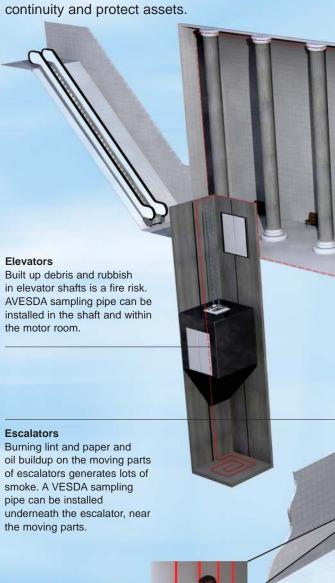
- Dirt and lint, which builds up on the moving parts of mechanical equipment and acts like a wick.
- High airflow, resulting from Heating Ventilation and Air Conditioning (HVAC) systems and the motion of trains.
- Litter, in the form of newspapers and other rubbish.

# **Detection challenges:**

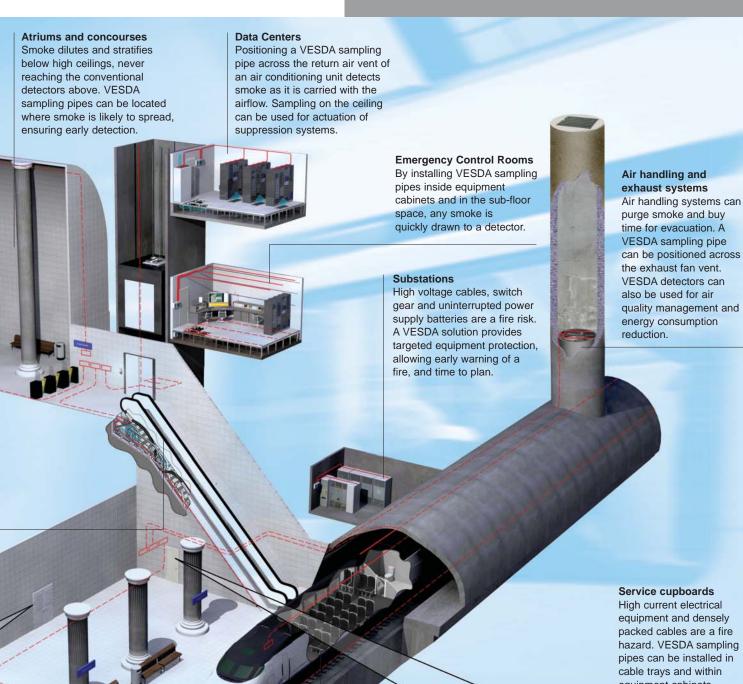
- Air movement from drafts, air-conditioning and train motion interferes with the normal dispersion of smoke; often drawing it away from conventional detectors.
- Smoke from small or smouldering fires lacks sufficient thermal energy to rise to conventional detectors located on the high ceilings of atriums and concourses.
- Within escalators and other concealed mechanical equipment, fires tend to smoulder for a long time.
  This delays detection by conventional detectors.

# How can you protect lives and rail services?

A specialized design approach and the early detection of smoke will save lives, maintain business continuity and protect assets.



In 2003, over 100 people were killed by a fire that started in an underground station in South Korea.



**Service Ducts and Tunnels** 

Dusty service ducts and tunnels can be protected with VESDA detectors - without false alarms or excessive maintenance costs. **Trains** 

High voltage electrical systems and the fuel loads brought aboard (e.g. newspapers) increase the risk of fire. High airflow within and around the train makes the detection of smoke difficult. VESDA can detect invisible, incipient smoke.

High current electrical equipment and densely packed cables are a fire hazard. VESDA sampling pipes can be installed in cable trays and within equipment cabinets.

31 people died in the tragic 1987 escalator fire in Kings Cross, London, when the presence of smoke caused panic.

#### The VESDA Solution

A VESDA aspirating smoke detector works by continually drawing air into a series of pipes attached to a detector unit. Air is moved through a laser detection chamber where it is analyzed for smoke. The detector can be positioned in an area that allows easy access for maintenance.

VESDA detectors can be connected to a standard fire alarm control panel, a building management system or a software-based monitoring system. They are ideally suited to the diverse environments found in a rail facility. The key advantage they offer is detecting smoke at the earliest stages of a fire. This allows:

- Investigation of what caused the alarm.
- Preventative action to stop the spread of fire or toxic smoke.
- · Safe and orderly evacuation.
- · Prevention of damage to expensive and vital equipment.
- The avoidance of service disruption and breaches of service level obligations.

### Rail facilities and fleets that have a VESDA system installed

London UndergroundMadrid MetroChina Star ExpressMoscow MetroQueensland Tilt TrainRailCorp Hunter DMUHong Kong KCRCPerth Urban RailCity Rail Explorer

Shanghai South Station XPT High Speed Express

# **Global Approvals**



















#### Need more information?

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