



Commercial Opportunity

Pre-Fire Detector

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THE CHALLENGE

Early-warning fire detectors often rely on the detection of smoke particles to trigger an alarm. At this stage fire is imminent, if not already underway, and so it is generally too late for preventative action. In such situations assets may have already been damaged beyond repair and, in the case of electronic systems, information may be permanently lost. For critical systems this type of detection may not provide sufficient flexibility or protection.

Existing chemical sensing technologies can provide advanced warning of an imminent fire by vapour detection based on chemical coatings. However, these technologies lack versatility and specificity as they usually require considerable signal processing effort. Consequently alternative methods of vapour detection are highly sought after. Overheated and failing components are one of the most common causes of electrical fires; these components emit volatile compounds which could be detected before the fire starts.

THE DSTL INNOVATION

The UK MoD's Defence Science & Technology Laboratory (Dstl) has developed a cost-effective method for detecting gases or vapours emitted from overheating materials, such as electrical components, which precedes the onset of fire. Detecting the characteristic "high-risk" volatile features of thermal degradation minimises false positives. The detection system described in the patent, an ion mobility spectrometer (IMS), is currently employed by the MoD for the detection of chemical warfare agents. Such detectors are becoming ever smaller and handheld devices are under evaluation by numerous organisations.

The technology provides rapid detection with high sensitivity and high selectivity to minimise false alarms. The signal from the detector can be used to determine a fire risk and trigger either alarms or automatic shutdown procedures.

THE OPPORTUNITY

Preliminary estimates of market size suggest that the fire detection systems for critical electrical infrastructure exceed several hundreds of millions. The diversity in critical electrical systems range from ICT type installations (e.g. server farms, telecommunication and banking infrastructure) through to power-intensive electrical systems such as radar installations. The Dstl technology allows the detection of high probability zones where electrical/electronic components are failing. The ability to detect a potential electrical fire provides a window of opportunity to initiate preventative action in advance of an actual fire, or other loss of system integrity. Such action may be the shutdown of the equipment in that particular zone for emergency maintenance, thus preventing data and asset loss.

Ploughshare Innovations, the technology transfer company for Dstl, is seeking suitable licensees to develop existing IMS detectors and apply them to the fire detection market. Such development is expected to include integration of wireless communication allowing installation into existing facilities.