

Innovation results

AN R&D CASE STUDY

#023

Saving lives and property

FireGrid is being developed to give the emergency services vital advanced knowledge about the fire they are attending, how it will progress and where victims may be trapped.

The need

Hindsight would be very useful to avert tragedy in major incidents. Rescue services would make enlightened decisions if they knew how to tackle particular emergencies from the outset. This has been tragically illustrated on numerous occasions including; the Mont Blanc Tunnel fire in 1999 and on 9:11 when emergency crews continued operations oblivious to the impending collapse of the south tower of the World Trade Center.

As well as the obvious human cost of fires, according to the Association of British Insurers there was a 16% increase in the insured cost of fires in 2008. The total insured cost of fires in the UK in 2008 was £1.3bn with commercial fire damage costing £865m, and fire damage to homes costing £408m.

The results

FireGrid will save lives and property by providing emergency responders with predictions of the likely sequence of events following the outbreak of fire in a building. For example, how the fire will spread, the probable locations of people trapped by the fire and if and when a structural collapse or a 'flashover' (a rapid escalation in the intensity of a fire) may occur.

An experimental FireGrid system has been successfully demonstrated.

In the demonstration a fire started in a large-scale, multi-room structure equipped with a variety of sensors was modelled and its behaviour predicted by the FireGrid system.

The demonstration showcased results of the three year project including:

- a system for the collection, communication and utilisation of data from a wide range of sensor technologies

- the application and coupling of established fire, egress and structural response computer modelling packages modified for use with high performance computers
- on-demand call-up of remote high performance computer resources performing faster-than-real-time computer modelling and generating predictions of fire and structure behaviour
- the use of real-time sensor data to update computer modelling and improve the accuracy of predictions
- an easy to understand building command and control interface for incident commanders that facilitates rapid assessment of the incident

The project also investigated the behaviour of wireless communication systems in fire situations.

Over 35 publications were generated throughout the project and FireGrid was featured in the BBC Horizon documentary 'Skyscraper Fire Fighters'.

