

Operating smoke control systems automatically in firefighting mode

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When firefighters arrive at a live fire situation, they simply don't have time to deal with complex override controls.

As such, it is our job in the smoke control industry to ensure we are providing systems that do not cause problems for firefighters when they arrive at a challenging, fast-changing situation.

One of the most critical elements of a system is the fireman's switch. These switches are commonly a switch-disconnector/isolator for special applications and you can see these switches on the outside wall of commercial buildings.

They are designed to be easy to spot and are used by firefighters to turn off neon lighting or other hazardous electrical equipment in case of fire.

Manual override controls

In active fire systems – such as fire alarms and smoke control systems – there is often a requirement for manual override controls for firefighters to use to control such systems in an emergency.

Stairwell ventilators, for example, are usually provided with manual controls at the top and bottom of the staircase to allow firefighters to open or close them. In smoke pressurisation systems, it is also common to have a manual switch to increase the speed of the fans from an initial means of escape duty to the higher firefighting speed.

The design, positioning, and precise function of these switches can vary greatly from one supplier to another and also from building to building. There are key switches (often without keys), touch screens and break glass call points of various colours and types. Often they are positioned near fire alarm call points, which may be likely to confuse building occupants during an incident which could lead to erroneous triggering of the system.

The proliferation of high rise buildings in inner cities has coincided with an increase in the use of fire-engineered solutions for smoke control in such buildings, particularly mechanical smoke shafts which fall outside the scope of current Building Regulations and British and European standards.

Unique smoke control systems

As a result of these two factors; many new tall buildings are equipped with unique fire-engineered smoke control systems, placing unrealistic demands on firefighters that may compromise their safety and that of building occupants.

It is impossible for the fire brigade to gain a thorough understanding of the individual fire safety systems of individual buildings, particularly when these are bespoke to the building and not conforming to a common standard or type.

A fireman's override switch for a smoke control system will often look the same, regardless of the type of system it controls, and the attending fire crew will be unlikely to know the detailed functionality of the smoke control system at a particular building. Operating the fireman's switch may, for example:

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- **Open an automatic vent into a natural shaft and a vent at the head of the shaft;**
 - **Switch a pressurisation fan into high speed;**
 - **Switch an extract fan into high speed.**

If this is done out of sequence, for example the extract fans are put into high speed before the stair/lobby door is opened, the system could be rendered ineffective. In the worst case the lobby could become depressurised, making it impossible to open the door to the staircase. If the switch was operated by a member of the public during the evacuation phase this could have serious consequences, with occupants being unable to exit the building.

In an article about the use of manual override switches with a BRE smoke shaft, featured in IFSEC Global (October 2006, <http://www.ifsecglobal.com/the-use-of-manual-override-switches-with-a-bre-smoke-shaft/>), the authors advise: “There does not appear any situation where giving local control to AOVs independently of the control panel is not potentially harmful to the proper functioning of the system.

“Where there is key-operated control of all vents available on the control panel for use by people familiar with the building, we conclude that it is safer not to have local manual control other than via the break-glass option signalling to the control panel.

“This has led us to a more general conclusion, namely that it will often be safer for the only override switches to be on the control panel, and for them to be operated by people familiar with the building.”

There is anecdotal evidence that firefighters do not use the manual controls of active firefighting systems due to the unfamiliarity with the controls and method of operation of individual systems, preferring to rely on more conventional protection measures like breathing apparatus instead.

Keep it simple

Gary Johnson, former Head of Business Fire Safety at South Wales Fire and Rescue Service, said: “Over-complicated smoke control is the last thing firefighters want when dealing with a challenging, dynamic live fire situation... firefighters simply don’t have the time to deal with frequently complex override controls.”

Based on the above, we recommend that for the safety of both the public and firefighters, smoke control systems should be designed to operate automatically in firefighting mode without the need for manual intervention by firefighters or the general public. In most cases it is indeed possible to engineer systems like this – we strongly believe that this should be the default position for smoke control provision.