False fire alarms cost lives – and students are often the worst offenders because of their less than silky cooking skills. *HAC* reveals how an 'allergy' to washing up liquid led to an innovative demand ventilation solution at Nottingham Trent University.

The mystery of

False alarms account for 34% of all calls and currently cost the UK fire service and the tax payer millions of pounds a year. The Government wants the fire brigade to reduce false call outs by 10% over the next three years and student accommodation kitchens are notorious black spots.

The Nottinghamshire Service alone had over 4,000 false alarms last year, of which over 700 were attributed to a group of 20 worst offenders. This 'top 20' included eight student accommodations and three nurses quarters. Some student accommodation accounts for three to seven false call outs per day!

Local trouble-shooting design consultant Phil West of West Project Management Services was called in by Nottingham Trent University three years ago to help solve a problem, summed up by Karen Firth, senior residence manager at the university.

"Students come from all over the country," she said, "and they can't cook. They're also allergic to washing up liquid so the grill pans get dirty and when they do cook the grill pans start to smoke. Sometimes the students even forget they've left anything under the grill!

"We have an extractor fan over the cooker, but it makes too much noise so they either turn it off or open a window, or worse still, open the kitchen door onto the corridor which sets off the smoke detector and the fire alarm. The fire brigade was getting a bit cheesed off, to say the least."

The control of fans in kitchen areas is notoriously difficult in student, nurses' and sheltered accommodation and other places of housing in multiple occupancy (HiMO). The problems are varied, but are due to both misuse of ventilation equipment and lack of discipline by the occupiers. Also it is not uncommon for the occupants to change on a regular basis, leaving the 'landlord' the difficult task of re-educating the kitchen users into a safe and proper way of operating, e.g., using the ventilation system properly, keeping doors closed etc.

It has also been very difficult to come up with a solution that caters for both the absent minded and the poorly educated kitchen user.

In essence, if the occupier simply fails to manually operate the fan when required or the fan's own integral controls are inadequate for the purpose for which they are intended, you have a problem. Humidistats for instance will not detect toast burning, and PIR sensors are open to physical abuse and can be by-passed easily by covering with masking tape or tea towels, as one site survey revealed.

Current legislation and British Standards insist that the fire alarm system should be the most effective means of protecting the building and occupants in the event of a fire. This usually means that a thermal detector is installed in the kitchen and a more sensitive ionisation type unit is used in the corridor approach and escape routes. Ionisation detectors are sensitive to smoke, aerosol and cooking fumes which incidentally contain fine fat particles that coat the sensing element over a prolonged period so becoming another cause of false alarms.

Some smoke/fire alarm systems have pre-alarm status built in. Pre-alarms are designed to give the user an advanced warning before a possible full alarm. This allows the occupi-

the burnt toast

er to quickly check out the area reporting the pre-alarm signal. Often this may be due to light smoke created by toasting, grilling etc. and not a real fire, thus saving the unnecessary and wasteful visit by the fire brigade. Over extended periods, however, the smoke detector may become coated in fat particles and will give a constant pre-alarm warning rendering it almost totally ineffective. At this stage, replacement of the detector head will be needed at a cost of around £200.

Over a three year period, as a result of consultation between Phil West, ventilation system supplier NuAire, Nottingham Trent University Estates Department and last but not least, the students themselves, a solution evolved. This culminated in the production of a simple, yet effective control device called the 'Cooker Miser', which is currently going through its final stages of patent application.

With Cooker Miser, the fan works only when the cooking appliance is switched on – this could be a conventional cooker, toaster, sandwich maker or whatever. The fan powers on or off according to the cooking process and a run-on facility ensures that any residual smoke and fumes are extracted.

The unit, with volt free contacts, is activated only when power is drawn through the Miser control. This must exceed 100W and so will not be affected by a cooker clock. The fan unit must have either switched live 230V or a Safe Extra Low Voltage Miser control circuit.

Existing fan units may be controlled from the Cooker Miser. Units without a built in run-on timer may be controlled using a 230RTIM or preferably a 230SELV-RTIM unit. The 230RTIM unit needs a 230V feed which is not suitable for kitchens, but a SELV version is available.

Cooker Miser overcomes two other serious problems. One is that a PIR activates even when the occupants are simply sat around in the kitchen (which is often used as a meeting room) and this may cause a nuisance. Secondly, many accommodations take advantage of low tariff electricity and use this as a form of heating. Cooker Miser drastically reduces energy loss by switching off the ventilation plant once the cooking process has finished. Phil West points out something else:

"The Cooker Miser is able to greatly reduce the number of false alarms in kitchens due to accidental and improper use of kitchen appliances, but only if the ventilation system is sufficiently effective when in use. Undersized fans will still be incapable of exhausting fumes produced by the cooking process no matter how it is controlled."

Two prototypes were installed in Flat 1 at The Maltings halls of residence and subsequently Nottinghamshire Fire Service sub officer Garry Swinn has advised that there has been a dramatic reduction in false alarms.

Ms Firth confirmed that there had not been a single call out from these two units. "We are now well into our second batch of students with these units and I'm very impressed. If we had the funds, I'd have them installed in every student kitchen."

Steve Jenkins of Nottingham F&R Services said: "Early indications look good. However the trial has been done outside our control and it's our policy never to officially endorse specific products."

But he added that: "From our experience we know that a lot of fake alarm calls are caused by fumes from cooking. But many students tend not to use the cooker hoods and extractor fans because they find it a nuisance. Also, the fans operate at a fixed speed so they're not as effective as they could be. Even if they do use the fans they tend to switch them off as soon as they've finished cooking, whereas the NuAire device has a run-on facility.

"Another useful spin-off is that the Cooker Miser encourages students to turn the grill pan off after use because they can hear that the fan has not stopped running."

He added that the current trials would have to run for a full academic year to provide enough data for a detailed analysis.

Enquiry No 201