



Scottish false alarms research project Investigation, findings and next steps

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BRE- Fire Detection

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Part of the BRE Trust

Introduction

- Losses from false fire alarms ~£1 billion/year in the UK
- In the period 2013-2014 for Great Britain the Fire and Rescue Service attended 505,600 event
- 293,100 (58%) were false alarms
- False alarms have consequences:
 - FRS – drain on/diverted resources
 - Businesses – disruptions/loss of productivity
 - Public - reduced confidence/frustration
 - Road traffic accidents

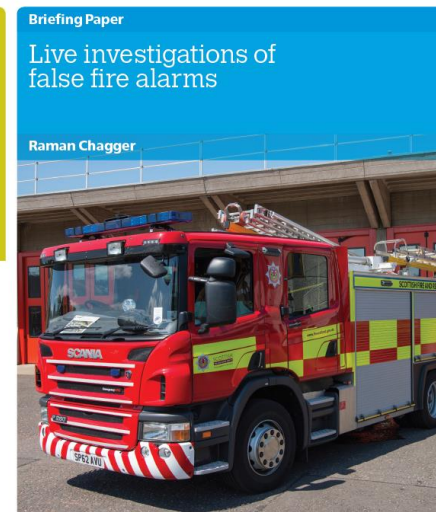


Introduction

- Research group formed in June 2014

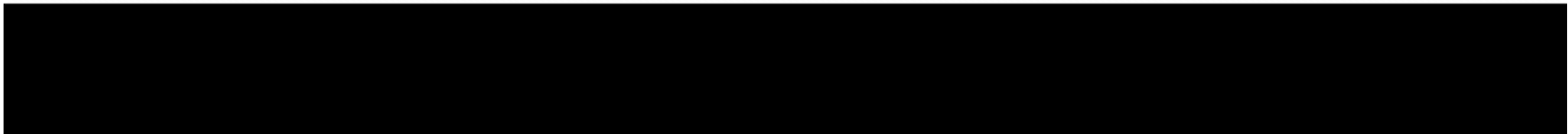
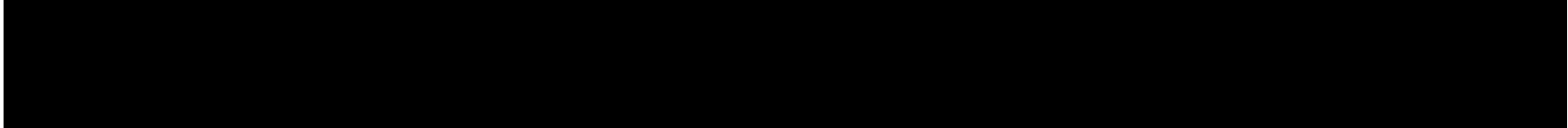


- Data gathered Nov. 2014 - April 2015
 - 1908 UFAS events attended by SFRS
 - 65 complete UFAS investigations
 - 8 qualitative reports
- Review by group May- Oct. 2015
- Briefing paper published in Dec. 2015
 - 35 recommendations
 - For 9 stakeholder groups



Briefing papers available from:
www.bre.co.uk/firedetectionresearch

Video of research work



Weekly tests

- False alarms from not taking system offline during weekly test. Often due to breakdown in communication
 - BMKFA (first briefing paper) - 4.1%
 - SFRS - 6.5%
 - **Average - 5.3%**
- Proposal “caution label” is applied to the fire alarm panel to remind anyone conducting the weekly test if panel is connected to ARC
- BS 5839-1 currently undergoing a revision



BS 5839-1:2013



BSI Standards Publication

Fire detection and fire alarm systems for buildings –

Part 1: Code of practice for design, installation, commissioning and maintenance of systems in non-domestic premises

Manual Call Points

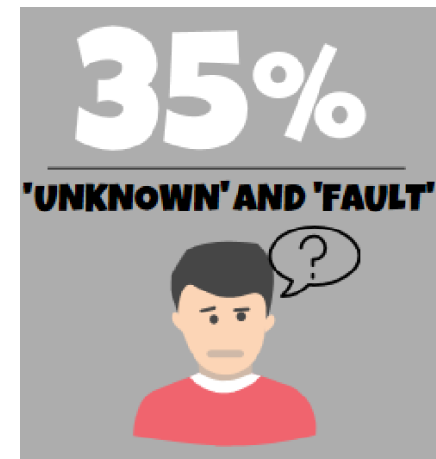
- First BRE False Alarm study reported false alarms could be reduced by up to **16.7%** “with the greater use of protective covers ...”.
- This study: **12.7%** of false alarms due to MCPs, resulting from:
 - physical impacts to the sides of the MCP
 - activations that were by accident
 - malicious or good intent.
- **Average 14.7%** = 43,000 false alarms/year
- Proposal is for the greater use of MCP covers and MCP side impact protection (where needed).



False alarms reported as “fault” or “unknown”

- Causes of false alarms remain unknown.
- SFRS investigation, the top causes of false alarms were reported as ‘Unknown’ (374/2017) and ‘Fault’ (325/2017)
- BMKFA reported 34% of false alarms were also from these causes.
- **35% of 2013/14 false alarms = 102,500**
- Recommendation to investigate false alarms reported as ‘Unknown’ or ‘Fault’?
- Some of these are due to staff cover-ups.

False Alarm Cause	Frequency
Unknown	374
Fault	325
Dust	216
Cooking	169
Weekly testing	116
Accidental activations	116
Steam	98
Aerosol	73



Multi-sensor detectors

- Multi-sensors utilise a number of sensors to provide more reliable detection
- The work has identified that no false alarms were caused from multi-sensor detectors
- Recommendation for further research to identify multi-sensors performance variabilities and capabilities.
- Data reviewed from KCL (first briefing paper) indicated that up to 69% of false alarm causes could be reduced with the use of multi-sensors.

Heat
Optical smoke
Carbon Monoxide



Multi-sensor detectors

SFRS false alarm causes Dec '14 – Mar. '15

False Alarm Cause	Frequency	% of total
Dust	216	11.3
Cooking fumes	169	8.9
Steam	98	5.1
Aerosol	73	3.8
Smoke from toast	46	2.4
Smoke from smoking	41	2.1
Contractors performing works and triggering detection	15	0.8
Artificial smoke (e.g. smoke machines)	13	0.7
Hot works	10	0.5
Others (6%)	74/114	3.9
Total	1908	39.5%

Optical/heat multi-sensor detector research

- The BRE Trust, 12 manufacturers and the FIA started a 3 phase research project.
- Phase 1: Review of multi-sensor capabilities and variabilities
- Phase 2: Performing a broad range of test fires (compare with optical)
- Phase 3: Performing false alarm tests to identify multi-sensor immunity.
- 36 multi-sensors, 10 test fires and 7 false alarm tests = 612 tests!
- Expected completion Jan 2017
- Firex 2017



Multi-sensor detector false alarm tests

– Which tests?

- Steam
- Condensation
- Dust
- Aerosol from sprays
- Synthetic smoke
- Toast
- Cooking smoke



BRE False Alarms Active Workshop

- On 8th February 2016 BRE hosted an event to promote the research work and take it forwards
- Representatives from the following organisations:
 - SFRS
 - FIA
 - DCLG
 - CFOA
 - Universities
 - NHS
 - Hotels
 - Transport
 - Fire Consultants
- Reviewed the 35 recommendations



BRE False Alarms Active Workshop

- Things being considered:
 - FIA reviewing the recommendations in their working groups to take them forward
 - Reviewing (BRE/FIA) how to take forward research on performance of old detectors
 - CFOA false alarms working group is taking forward some of the findings
 - Proposed changes to BS 5839-1:2013
 - Produce guidance to enhance awareness
 - Updating training to fire risk assessors/fire alarm contractors
 - Changes to fire detection standards
- No proposal for investigating faults/unknown



SFRS update

Unwanted Fire Alarm Signals			
Year	Scotland	Glasgow	%
2014	27291	5489	20.1
2015	27750	5484	19.9

- UFAS recording system went live in April 2016
- Allows SFRS to gain greater detailed information on UFAS incidents
- Targeted approach to reducing numbers.

UFAS INCIDENT PROCEDURE
UFAS Incident Investigation Form

SCOTTISH
FIRE AND RESCUE SERVICE
Working together for a safer Scotland

INCIDENT DETAILS

Incident No: Date: Station Area:

Name & Address of Premises:

Are the premises 'Relevant' within the scope of The Fire (Scotland) Act 2005 Yes No Premises Type Domestic Non Domestic

Use of Premises Time of Alarm

SOURCE OF ALARM

Heat Detector Smoke Detector Multi-Sensor System Sprinkler Carbon Monoxide Fire Detector
 Beam Detector Flame Detector Aspirating Detector Duct Detector Video Detection Manual Call Point

EXACT ALARM LOCATION

IT IS IMPORTANT, DURING THE UFAS INCIDENT INVESTIGATION, TO IDENTIFY WHY A DETECTOR OR CALL POINT HAS BEEN THE SOURCE OF A UFAS INCIDENT.

OPERATIONS CONTROL MOBILISING PROCESS MAP: CALL RECEIVED VIA 999/112

Cause of Alarm Signal

<input type="checkbox"/> Fumes from cooking processes (including toasting of bread)	<input type="checkbox"/> Incurse
<input type="checkbox"/> Steam (from bathrooms, shower rooms and industrial processes)	<input type="checkbox"/> Candles
<input type="checkbox"/> Tobacco smoke	<input type="checkbox"/> Electromagnetic interference
<input type="checkbox"/> Dust (whether built up over a period of time or released from an industrial process)	<input type="checkbox"/> High humidity
<input type="checkbox"/> Insect	<input type="checkbox"/> Water ingress
<input type="checkbox"/> Aerosol spray (e.g. deodorants and cleaning fluids)	<input type="checkbox"/> Substantial fluctuation in temperature
<input type="checkbox"/> High air velocities	<input type="checkbox"/> Accidental damage (particularly to call points)
<input type="checkbox"/> Smoke from sources other than a fire in the building (e.g. from an external bonfire)	<input type="checkbox"/> Testing or maintenance of the system, without appropriate disablement of the system or warning to the building occupants and/or alarm receiving centre
<input type="checkbox"/> Cutting, welding or similar "hot work"	<input type="checkbox"/> Pressure surges on water mains serving automatic sprinkler systems that are interfaced with the fire alarm system
<input type="checkbox"/> Processes that have produced smoke or flame (e.g. flambéing of food)	<input type="checkbox"/> Equipment false alarm
<input type="checkbox"/> Cosmetic smoke (e.g. in night club and theatres)	<input type="checkbox"/> Malicious false alarm
	<input type="checkbox"/> Other cause (please expand in box below)

Other cause details:

FIRE ALARM MAINTENANCE PROVIDER **FIRE ALARM MAINTENANCE PROVIDER INFORMED** Yes No

UFAS INCIDENT LEAFLET ISSUED TO RESPONSIBLE PERSON Yes No

Incident Commander:

Conclusion

- False alarms research was successful, it has led to:
 - Greater understanding
 - Further research into multi-sensors
 - Potential research into old detectors
 - Changes in codes/standards
 - UFAS recording system
 - Greater awareness of causes

- *FIA guidance on false alarm reduction available from: <http://www.fia.uk.com/cut-false-alarm-costs.html>*

- *BRE briefing papers (+video) are available for free from: <http://www.bre.co.uk/fire-detection-research>*

The screenshot shows the FIA website's 'Cut false alarm costs' page. At the top, there is a navigation bar with links for HOME, NEWS, TRAINING, MEMBERSHIP, EVENTS, RESOURCES, ABOUT US, and FIND A MEMBER. The main content area features a heading 'Cut false alarm costs' and a sub-heading 'HOMEPAGE > CUT FALSE ALARM COSTS'. Below this, there is a list of bullet points detailing the costs of false alarms, such as 'Lost production', 'Disruption due to staff evacuation', and 'Increased insurance premiums'. A graphic on the right side of the page reads 'CUT FALSE ALARM COSTS'. At the bottom of the page, there is a table of services provided by BRE and BFD Global Ltd, including 'Certification & Approvals', 'Testing', 'BREEAM', 'Accreditation', 'Research & Innovation', 'Sustainability', 'Events', and 'BRE Academy'.

The screenshot shows the BRE website's 'Fire detection' page. The page features a large, abstract image of fire and smoke in shades of blue and green. The text 'Fire detection' is prominently displayed at the top. Below the image, there is a breadcrumb trail: 'You are here: Home > BRE Group services (a-z) > Fire consultancy'. The page content includes a section titled 'Fire detection' with a sub-heading 'Our experts cover all aspects of fire detection and fire alarm systems including fire detectors, fire warning devices/components and fire systems used in industrial, commercial and domestic environments to protect people and property.' Below this, there are several links to research projects and guidance documents, such as 'Live investigations of false fire alarms (free)', 'Visual Alarm Devices - their effectiveness in warning of fire (free)', and 'Causes of false fire alarms in buildings (free)'.

The screenshot shows the BRE website's contact and publications section. On the left, there is a 'Contact' box with the text 'BRE Group services (a-z)' and 'Fire detection'. On the right, there is a 'Contact' box with the text 'BRE Customer Service T: +44 (0)333 321 8811 Full contact details'. Below the contact information, there is a 'Share' button with social media icons for Twitter, LinkedIn, Facebook, and YouTube. At the bottom, there is a 'BRE publications' section with a list of publications, including 'Smoke detection in high ceiling spaces (2-part part) PDF Download' and 'Visual alarm devices for fire: an introduction and guide to BS EN 54-23 PDF Download'.

Thanks



redefining / standards



UBM

Thanks to UBM and Tyco Fire Protection Products for use of images in this presentation

tyco
Fire Protection Products