



Live investigations of false alarms in buildings

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Part of the BRE Trust

Introduction

- Loses 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 callouts
- 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

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Video of research work





Weekly tests

- False alarms from not taking system offline during weekly test. Often due to breakdown in communication
 - BMKFA (first study) - 4.1%
 - Scottish FRS - 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



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 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
- Savings £147,000,000/year



False alarms reported as “fault” or “unknown”

- Some 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**
- 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
- “Further research is required to identify multi-sensors performance variabilities and capabilities”.
- Data reviewed from KCL (first study) indicated that up to 69% of false alarm causes could be reduced with the use of multi-sensors.

**Thermal
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 manufacturer's 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 a broad range of common false alarm tests to identify multi-sensor immunity.
- Expected completion Jan 2017
- BRE Fire Conference 2017



Multi-sensor detector false alarm tests

– Which tests?

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





BRE False Alarms Active Workshop

- On 8th February 2016 BRE hosted an active workshop to promote and take forward the research work
- 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
 - BRE/FIA discussing how to take forward the 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
 - 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

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 Detector Sprinkler System Carbon Monoxide Fire Detector

Beam Detector Flare Detector Aspirating Detector Duct Detector Video Detector 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/BUSSING PROCESS MAP: CALL RECEIVED VIA 999/112

Cause of Alarm Signal

Failure fire-protective process (including freezing of heat)

Steam (from bath showers, of water source and industrial processes)

Tobacco smoke

Dust (whether built up over a period of time or released from an industrial process)

Frost

Alarm triggered by (or) disturbance and/or tampering

High air velocity

Smoke from source other than a fire in the building (e.g. train or external bonfire)

Calling, switching or while "in test"

Personnel (e.g. new installed smoke or flame loss, tampering of tool)

Corrosion (e.g. in heat duct and treated)

Insects

Candles

Electronic interference

High humidity

Water ingress

Sudden fall in barometric pressure

Accidental damage (particularly to call point)

Lack of maintenance of the system, without appropriate disconnection of the system or warning to the building occupants and/or alarm receiving centre

Pressurisation or over-pressurisation automatic or other systems (linked in series with the fire alarm system)

Equipment failure

Misuse/Non-use

Other cause (please specify 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

Insurer Reference:

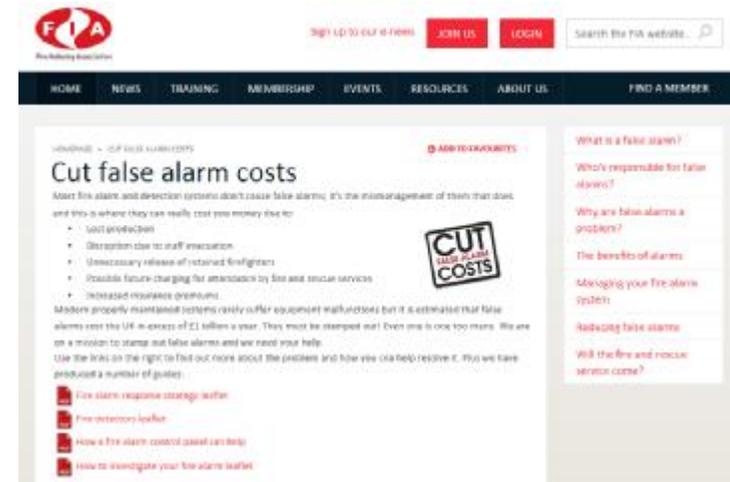


Conclusion

- 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>*



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Thanks



SCOTTISH
FIRE AND RESCUE SERVICE
Working together for a safer Scotland



CBRE



redefining / standards



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





Thank you

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