Improving Fire Safety

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Collaborative fire research work at BRE

- Process for collaborative research with BRE Trust
- Overview of past research
  - Why? What resulted?
  - What impacts?
- Current - Causes of Fire Fatalities in Scotland
- Looking to the future
  - What research work?
  - Express your interest
Process for collaborative research at BRE

breTRUST

Partner 1

Partner 2

Partner 3

Research

New Knowledge

Public guidance

Improve processes

New/update standards/codes

Improve products

Develop services

More research

Videos

Briefing papers

Trade Press
Past projects - False Alarms

- 2 studies identifying ways to reduce false alarm
- Utilised a fire alarm investigator that assisted Fire and Rescue Services
- Study proposed 35 recommendations to reduce false alarms
  - Adopted in codes of practice
  - Provided guidance
  - BRE service to reduce false alarms
  - Helped reduce false alarms
  - Further research (multi-sensors)

http://www.bregroup.com/firesafetyresearch briefing paper and video
Past projects- Fire Detection

- **Optical/heat** multi-sensor study:
  - 35 smoke alarms and detectors;
  - 5 false alarm tests;
  - 10 different test fires.
- Identified:
  - Smoke detectors and multi-sensors have similar performance to fire;
  - Multi-sensors demonstrated more resistance to false alarm sources;
- Impacts:
  - Manufacturers to improve products;
  - Supporting development of LPS.

http://www.bregroup.com/firesafetyresearch briefing paper and video
Past projects- Fire Warning

- Visual Alarm Devices
- Privately funded study
  - How can LED warning devices provide effective visual warning;
  - Identified that shorter (faster) pulse durations were as effective as Xenons;
  - Briefing paper;
  - Codes updated.
- Led to another research project (in progress):
  - Comprehensively researching the warning effectiveness;
  - Investigating different colours, illumination levels, direct viewing etc.

http://www.bregroup.com/firesafetyresearch briefing paper and video
Current project- Introduction

- Decrease in fire fatalities in UK.
  - Increased use of smoke alarms;
  - Furniture and Furnishings Regulations 1988 (as amended);
  - Preventive measures such as Home Fire Risk Checks (HFRC).

- Aim of research work was to:
  - **Identify conditions under which fire fatalities and serious fire injuries (near misses) occur in Scotland,**
  - **Using this data propose ways in which these could be reduced.**
The research programme

- A phase research programme was agreed to review data (19,645 incidents) over the period April 2013 to March 2017:
  - First phase - to review SFRS accidental dwelling fire (ADF) fatalities data (126) from the Incident Recording System (IRS) database and the serious injuries data (147);
  - Second phase - to review Fatal Fire Investigation reports.

**Question 9.24 – What is your understanding of the severity of the injury?**

<table>
<thead>
<tr>
<th>Code</th>
<th>Severity of (non-fatal) injury</th>
<th>Includes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Victim went to hospital, injuries appear to be Serious</td>
<td>Serious</td>
</tr>
<tr>
<td>2</td>
<td>Victim went to hospital, injuries appear to be Slight</td>
<td>Slight</td>
</tr>
<tr>
<td>3</td>
<td>First aid given at scene</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Precautionary check recommended</td>
<td></td>
</tr>
</tbody>
</table>
Methodology

– 38 key questions from IRS were reviewed including:
  • Type of property;
  • Detail around the fire discovery;
  • Alarm systems present;
  • Cause of fire;
  • Ignition source;
  • Impairments;
  • Movement of victim during the fire;
  • Cause of fatality.
Fatalities are more likely in vulnerable people that:
- are aged 60 or above are involved;
- are falling asleep or asleep;
- have an underlying medical condition;
- smoke;
- have excessive and dangerous storage;
- have a physical mobility;
- live alone;
- are suspected to have impairments due to drugs or alcohol.

Smoke detection alone is not effective to protect vulnerable people.

More interactive solutions proposed
Recommendations

Fourteen recommendations proposed, including:

- warnings from smoke alarms to smartphones;
- increase the sensitivity of smoke alarms at night;
- link domestic premises to an ARC (high risk);
- extend the LPS 1655 watermist system to provide greater personal protection;
- use video analytics technology for zone monitoring to enhance security, fire detection and safety as well as informing FRSs;
- research the underlying causes of electrical fires and any signatures they may give off prior to a fire being present;
Next steps

- Briefing paper was published in Dec. 2019 (link below);
- Review 126 Fire Investigation reports of fatalities to focus on finer details;
- Identify practical measures that may help;
- Assess the potential effectiveness of proposed recommendations in each case.

http://www.bregroup.com/firesafetyresearch
Future projects

Seeking collaboration for a number of proposed research projects including:

• Heat alarms in domestic kitchens;
• Dangers of Carbon Monoxide (CO) in the home;
• Optimum smoke and CO detector spacings in commercial;
• Capabilities of more complex multi-sensor technologies;
• Causes of fire fatalities and ways to reduce them (internationally);
• Investigating the mechanisms/signature characteristics of white goods appliances catching fire.

Please let us know if you are interested in participating in any of these.
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