



Smoke Detection, CCTV and Remote Monitoring

Dalmarnock Symposium – November 2007

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Agenda

- **Who are Xtralis**
- **Our objectives for supporting Dalmarnock**
- **The setup**
 - Smoke Detection
 - CCTV Surveillance
 - Remote Monitoring
- **The tests**
- **The results**
- **Conclusions**

Who are Xtralis

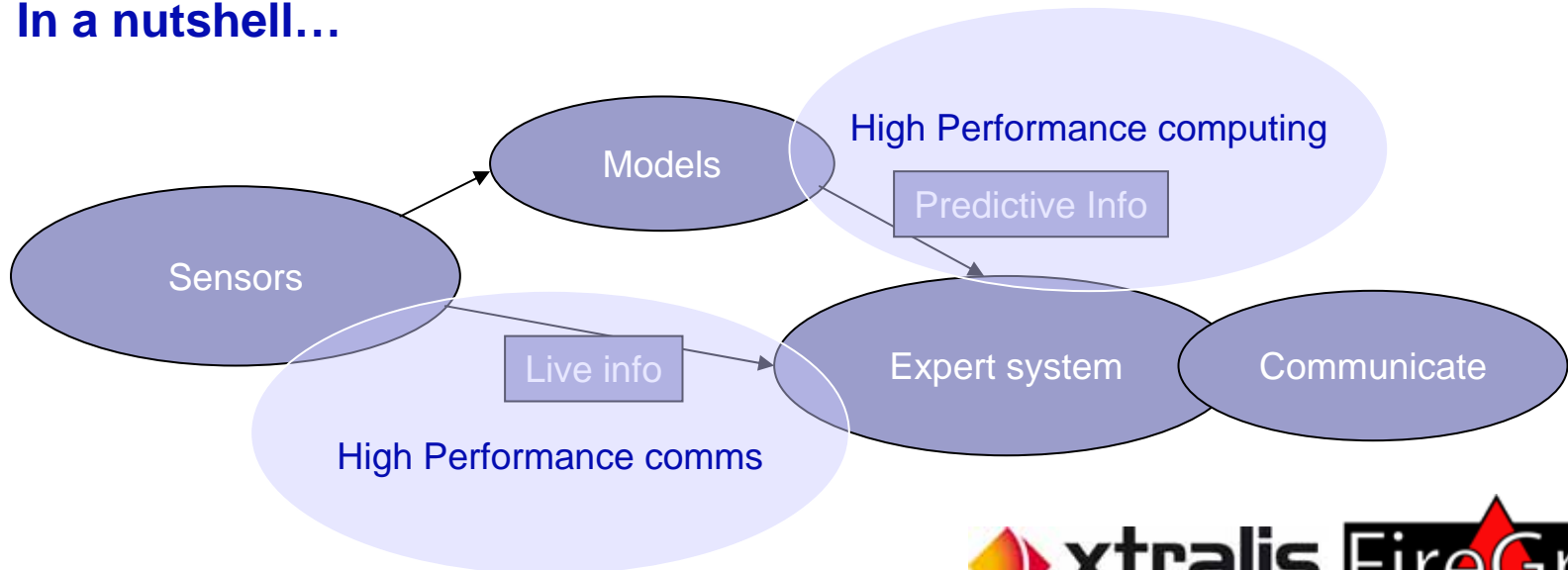
- **Xtralis is a global leader in very early warning aspirating smoke detection, fire protection system monitoring and control, voice alarm solutions, traffic detection and security surveillance systems**
- **We provide life safety and protection of critical assets and business continuity around the world**
- **We operate a global network of companies**
 - in Australia, Asia, Europe and the Americas.
- **Brands include:**
 - ADPRO - Security surveillance systems
 - ASIM - Traffic and intruder detection systems
 - VESDA - Very Early Warning smoke detection
 - MILLBANK - Voice alarm solutions and services
 - PROACTIV - Fire control and management solutions

Firegrid

- **A project for the built environment**

- provide fire fighters with information concerning the likely sequence of events *before* they actually unfold.
- allow the emergency services to execute a more effective response to a fire incident.
- The information supplied will include details of how the fire is expected to spread, how the structural integrity of the building will be affected, and how the building occupants are likely to react in response to the fire.

- **In a nutshell...**

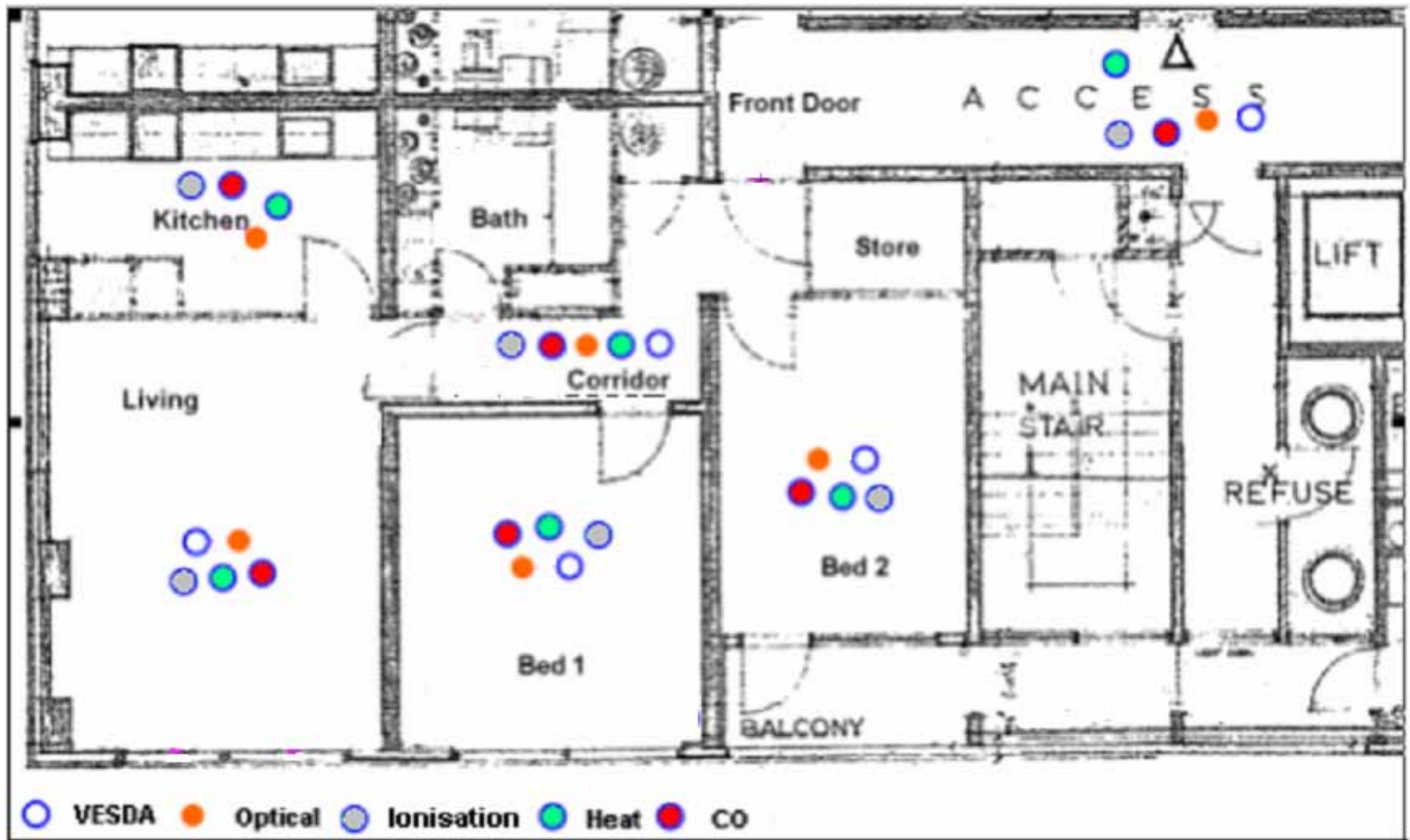


Our Goals for Dalmarnock

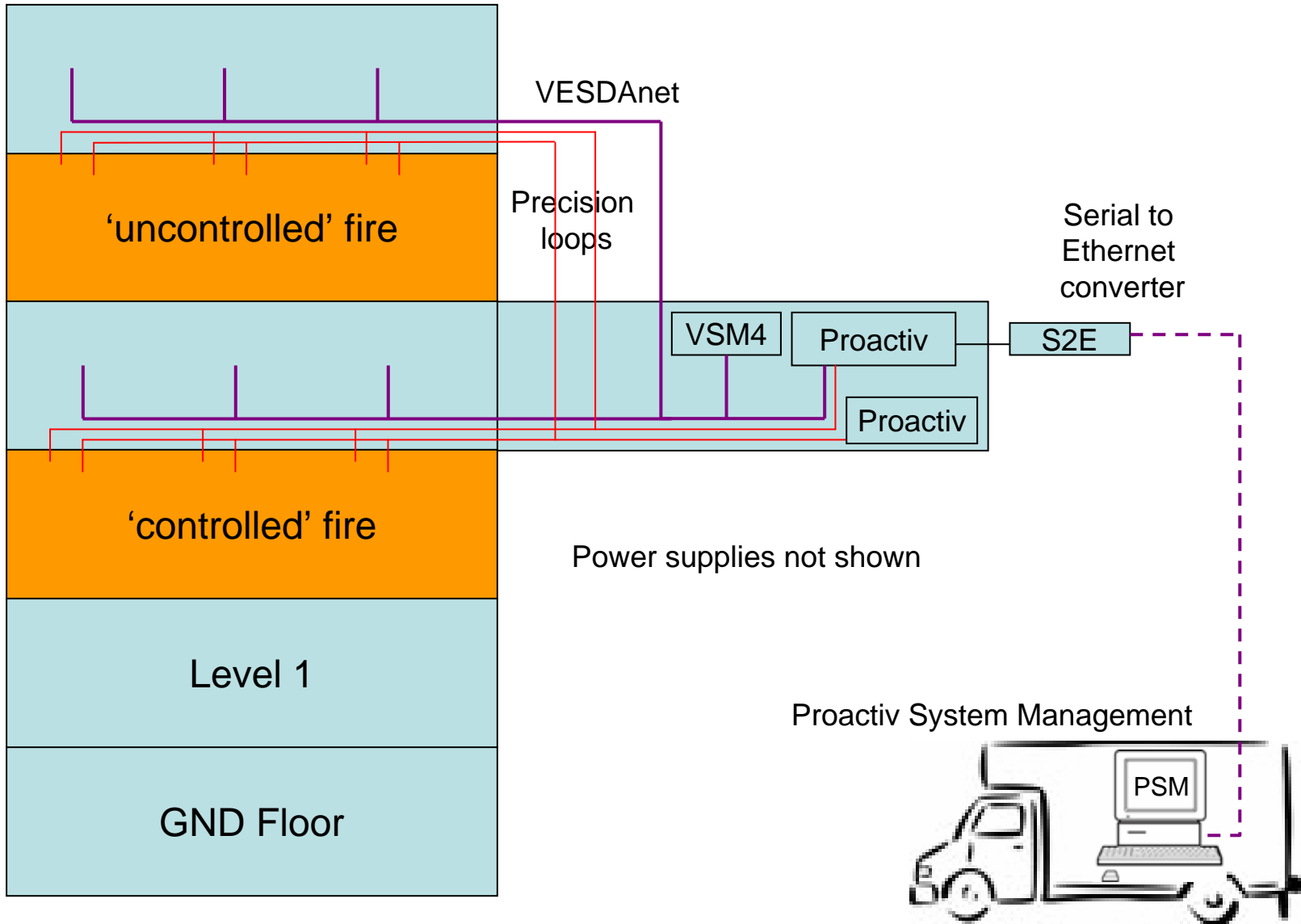
- **Gather real life fire sensor data to support FireGrid...**
 - Assess the predictions in the light of the real life data
 - Ensure data is collected from most than just the fire compartment
- **An opportunity to demonstrate...**
 - Value of early warning
 - Our sensor capability
 - Our remote monitoring capability
- **Equipment installed...**
 - 12 VESDA detectors & 2 PROACTIV Fire Panels
 - 50 PRECISION Smoke, Heat and CO detectors
 - 12 ADPRO cameras
 - 2 ADPRO Fastrace Video Surveillance Systems
 - Remote Monitoring packages:
 - Precision System Management (PSM)
 - Video Central Gold (VCG)



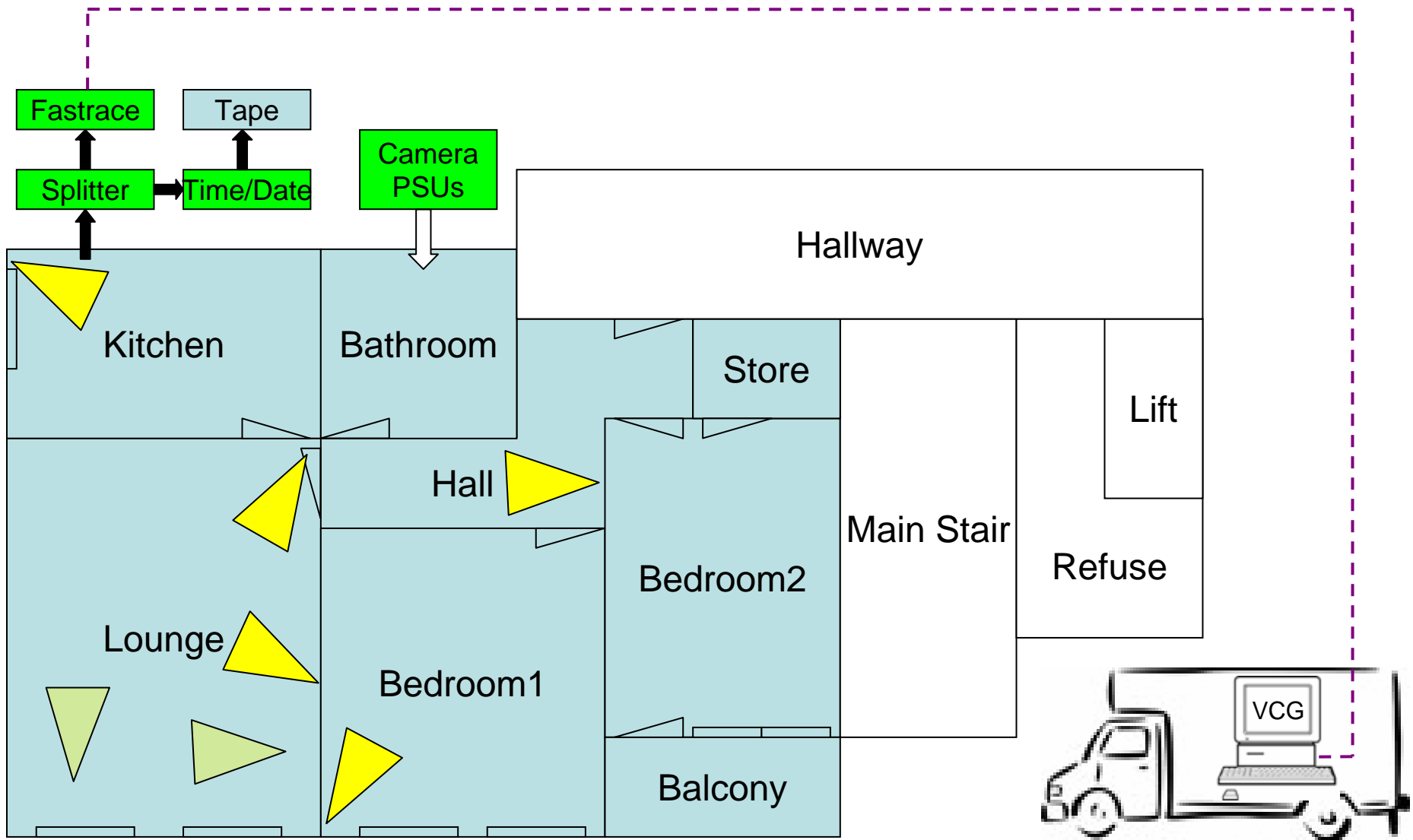
VESDA equipment



VESDA equipment

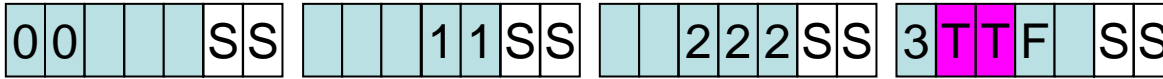


ADPRO Equipment



The schedule (VFS)

- 4 weeks tight schedule...

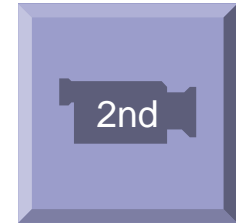
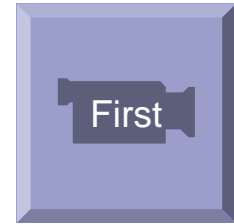


Planning and camera positioning

"First install"
– positioning, cabling and the holes!

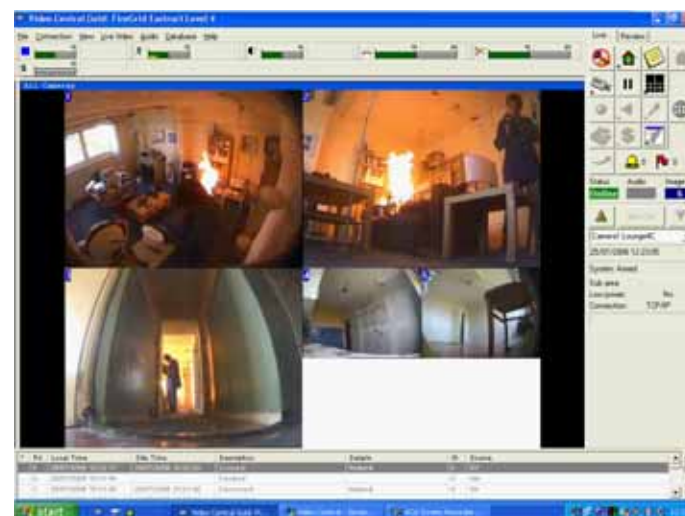
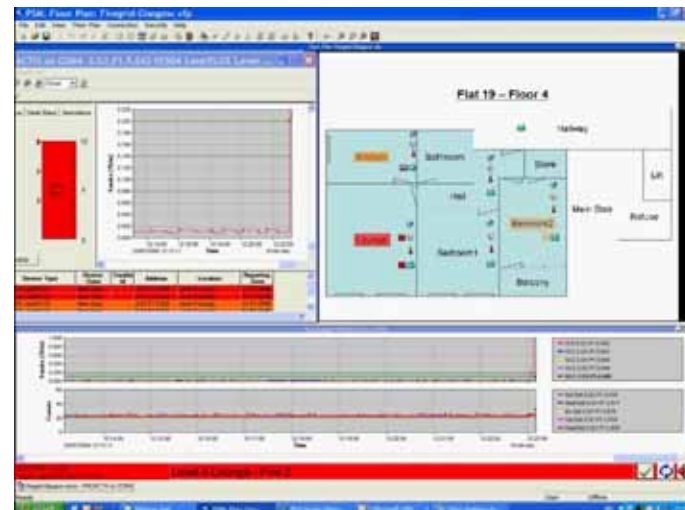
"Second install" & commissioning

Final preparation
TESTING – only one opportunity
Additional filming



The tests

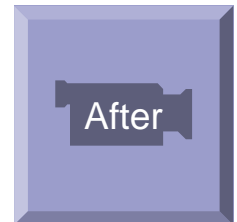
- “Control room” set up in two Luton Vans
 - UoE
 - Several PC’s for recording Webcams
 - Also some control and logging systems
 - Xtralis
 - PSM
 - Shows exactly when alarm occur
 - Floor plans and Text-to-speech for clarity
 - Smoke trends enabled logging of all the data
 - Video Central Gold
 - Showed all video images simultaneously
 - Reported and captured the critical VESDA alarms on video
 - Immediate review of the video footage was advantageous
 - Lion Television
 - Monitors for two TV cameras



The tests

- **Uncontrolled Fire**

- PSM
 - Lounge VESDA detects in 9 seconds
 - Kitchen VESDA reports Alert 9 seconds later
 - Lounge Ionisation reports alarm next
- Video Central Gold
 - Ignition at 12:23:02
 - Bookcase catches fire 12:27:50
 - Window broken 12:37:02



The tests

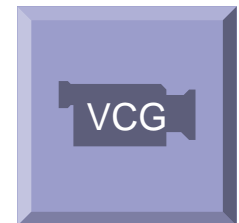
- **Controlled Fire**

- PSM

- Lounge VESDA detects in 12 seconds
- Lounge Ionisation reports alarm 2 seconds later
- Kitchen Alert 7 seconds later

- Video Central Gold

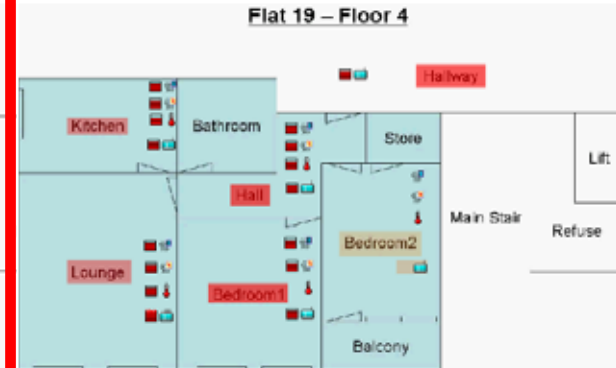
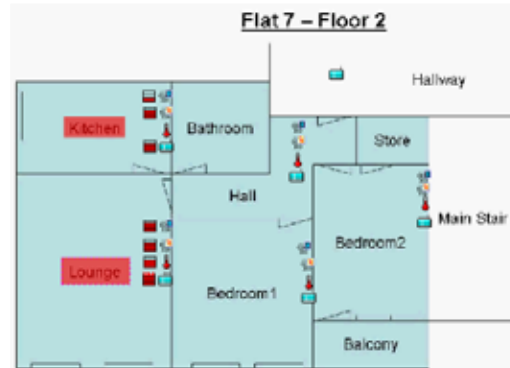
- Ignition at 11:54:18
- Bookcase catches fire 11:59:30
- Water applied 11:59:49



Key result – after about 90 seconds

Controlled Fire

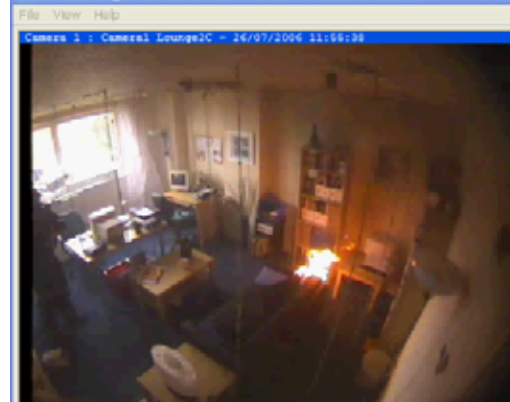
- Floor 2
- Left-hand images
- Slower growth
- Less smoke
 - in 2 rooms only
- Lower temps



Uncontrolled Fire

- Floor 4
- Right-hand images
- Faster growth
- More smoke
 - in nearly all rooms
- Higher temps

Site Firegrid level 2 : 26/07/2006 11:50:00 - Secure View



Site firegrid level 4 : 25/07/2006 12:18:30 - Secure View



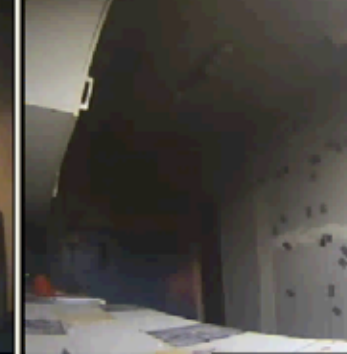
Camera 2: Camera2 Lounge2F - 26/07/2006 11:55:28



Camera 3: Camera3 Lounge1F - 25/07/2006 12:24:25



Camera 6: Camera6 KitchenC - 26/07/2006 11:55:28

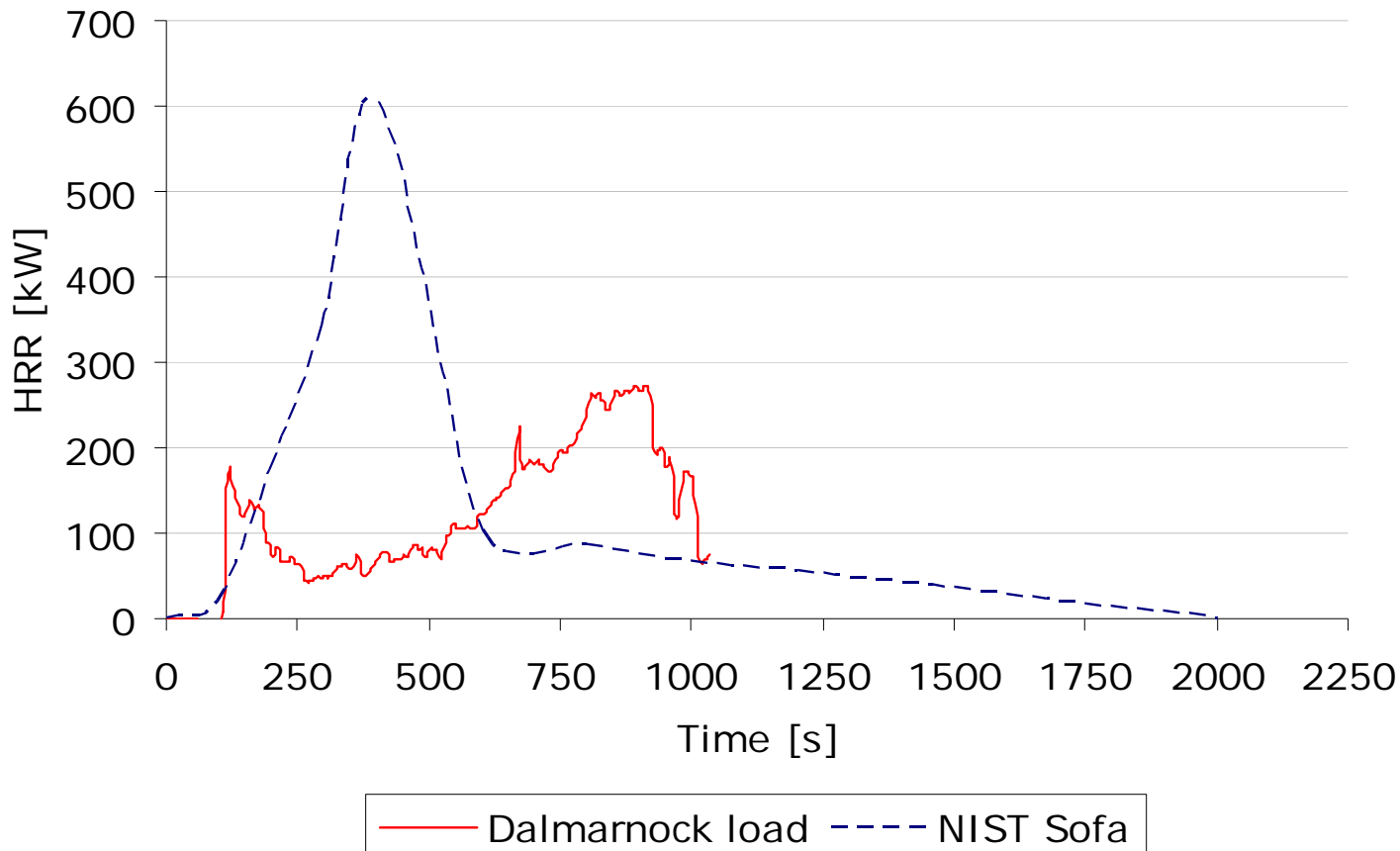


Post fire analysis

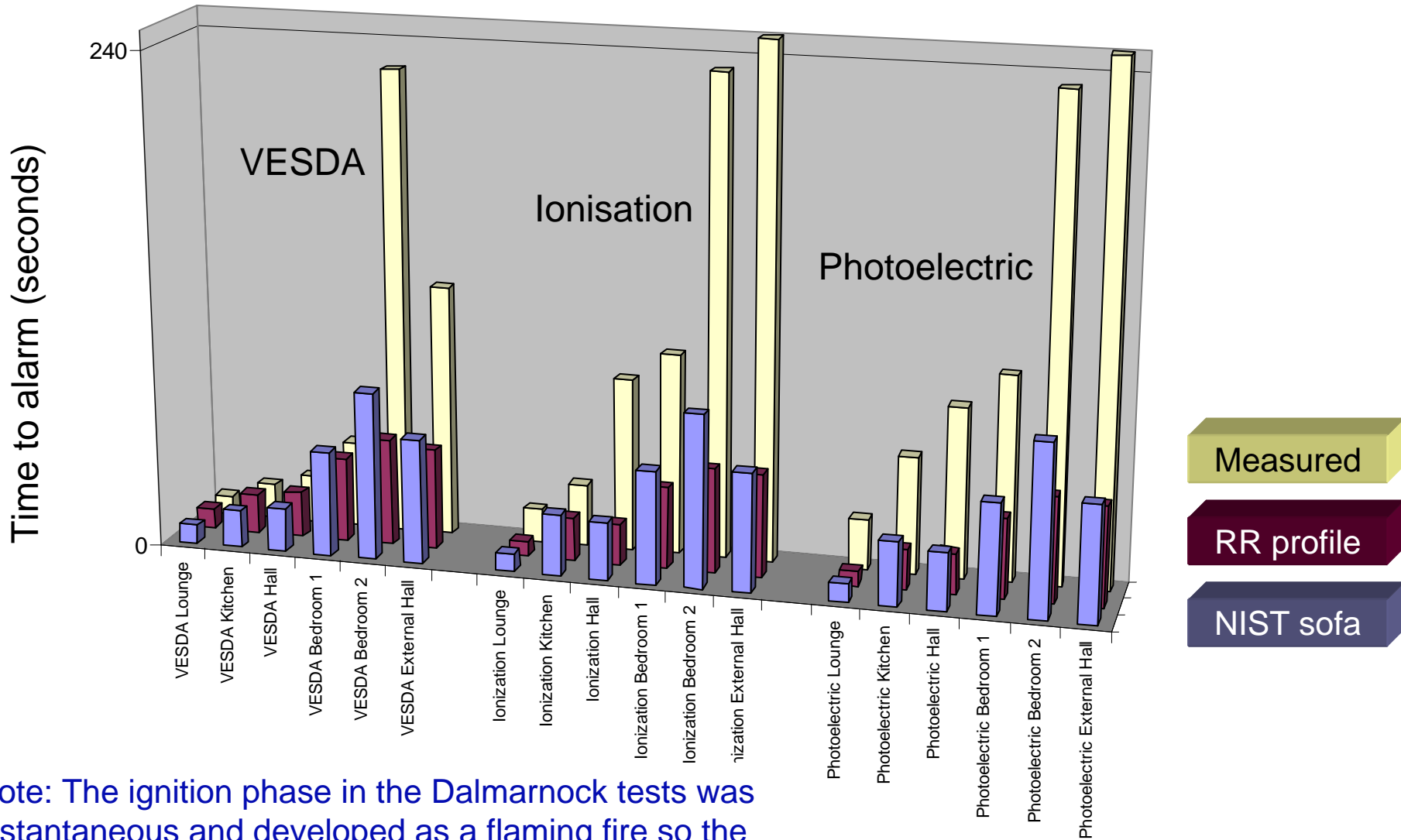
- **Xtralis use FDS to predict detector response**
- **For Dalmarnock we have**
 - Run simulations using standard NIST fire characteristics for a sofa
 - Also run simulations using the specific fire characteristics as communicated during the Round Robin initiative
 - Use the simulations to predict when the VESDA detectors and the point detectors will respond
 - Compared these predictions with the times observed in the tests
- Following slides show a potted summary of the findings

Post fire analysis

- Simulations of detector response have been done using two heat release profiles



Dalmarnock - Detector response times



Note: The ignition phase in the Dalmarnock tests was instantaneous and developed as a flaming fire so the VESDA response was not predicted to be significantly better than point detectors – even in the adjacent rooms. However the measure results show otherwise...

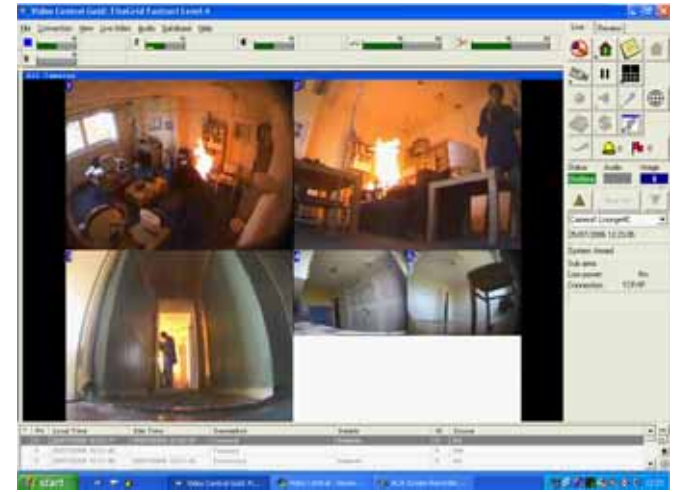
Additional Dalmarnock tests

- **In addition to the 2 main tests**

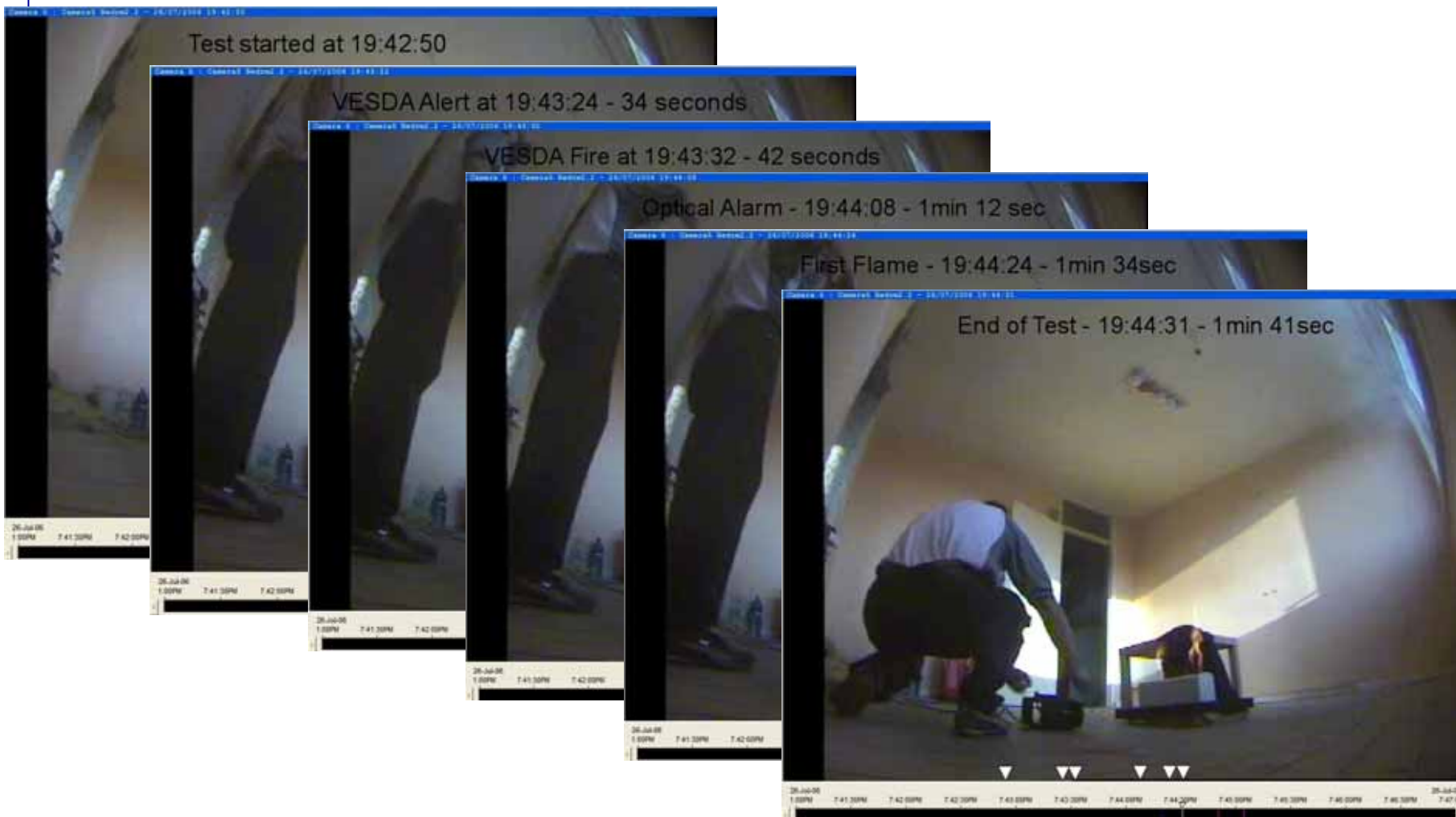
- Stairwell tests
- and...

- **Ignition Phase demonstration**

- Slower ignition phase
- To demonstrate the value of early warning
- Domestic toaster with draped towel
 - Power on at 19:42:50 – flaming within 2 minutes – Not 4 sec!



Incipient tests



Incipient tests

- **VESDA Alert 1min before flaming occurs**
- **Optical detection only 22 seconds warning**



Note: This is still a relatively fast ignition phase as the towel was deliberately draped into the toaster to ensure that an ignition occurred. Even in this scenario 40 seconds is a significant advantage and would, most likely, provide sufficient time to attract attention and turn off the power *before* flaming occurred.

Summary

- **VESDA, ADPRO and PROACTIVE systems installed by Xtralis**
 - Live remote monitoring of these systems provided instant feedback on the progress of the fire during the tests
 - ADPRO images were used extensively in the Horizon documentary and have been a valuable source of data for subsequent analysis.
 - Measurements from VESDA & PRECISION detectors were successfully recorded and made available to FireGrid partners
 - Xtralis data has been particularly useful as it is the *only* data collected across multiple rooms within the apartments
- **Predictions of the detector response have been shown to be more accurate with VESDA detection than with point detection due to the complexities of smoke entry characteristics**
- **A demonstration of the ignition phase of a realistic scenario successfully illustrated the benefits of early warning smoke detection**