BRE

BRE Cabin Simulator and Research

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FRS LPC

BRE

BRE …

… a multidisciplinary research-based consulting and testing organisation.

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People …

… at the heart of our business

BRE

Expertise …

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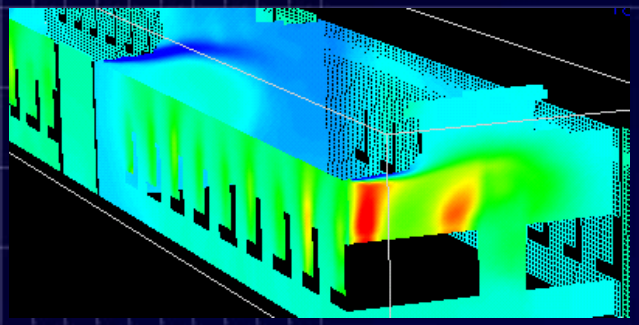
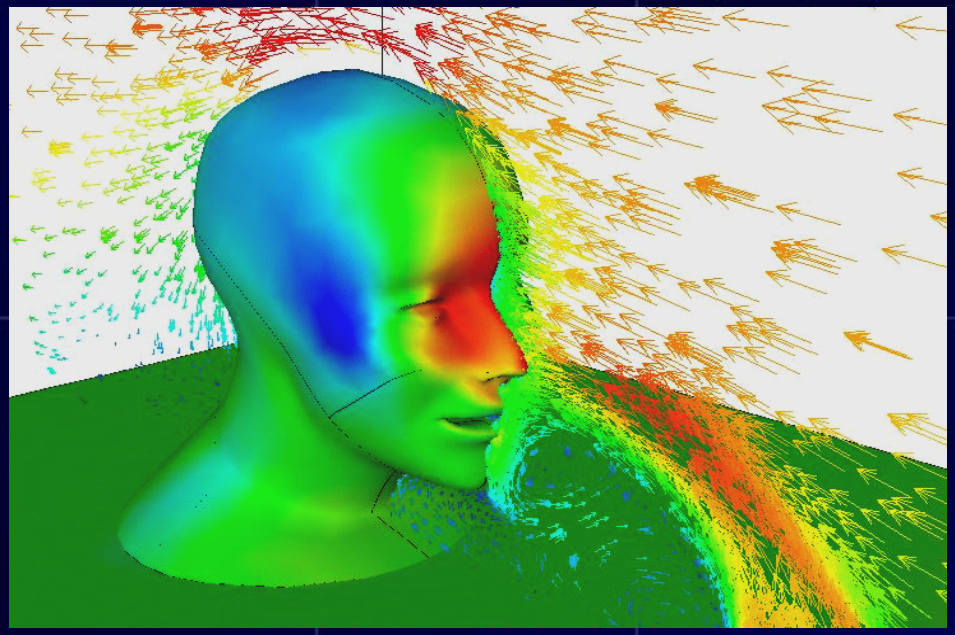
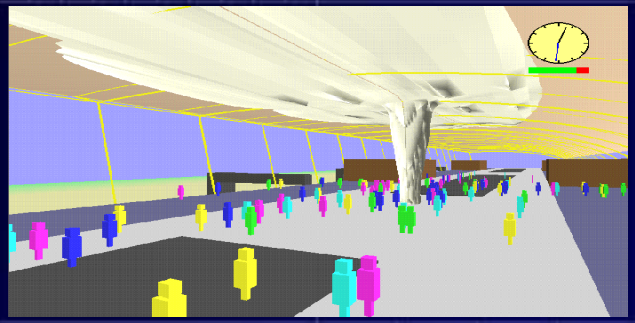
Transport …

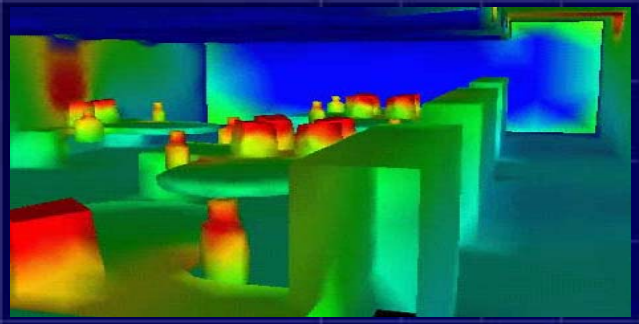
BRE

Comprehensive computer modelling …









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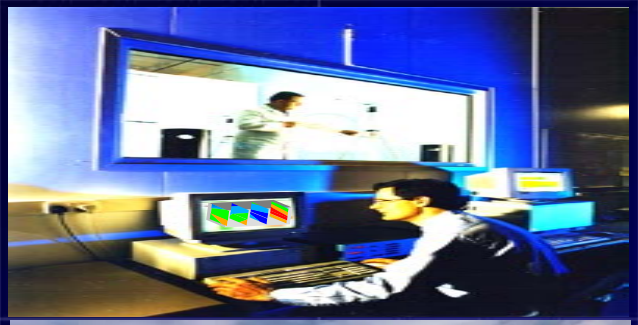
World class test facilities …



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ACE facility …

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ACE facility …

- Built on an Airbus 300 - capacity for 50 passengers, flight and cabin crew
- Designed to simulate most aspects of the cabin environmental parameters from ascent, through cruise, to descent
- Simulate and measures vibration spectrum, noise levels, temperature, humidity and ventilation
- Testing of both passengers and crew for both physiological and psychological responses

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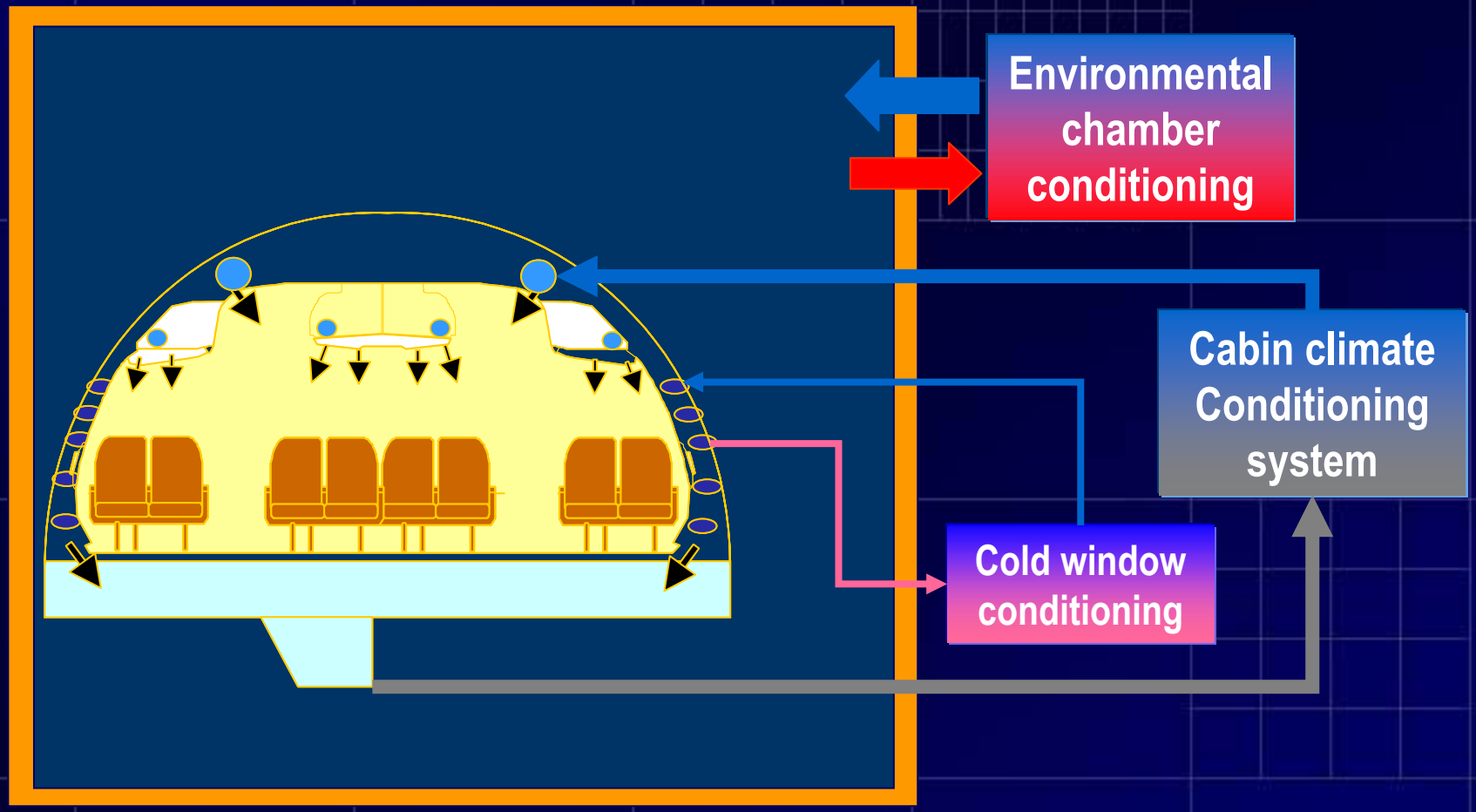
Climate control system …



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Research projects …

- Work Package leader in EC HEACE project
  - € 6 million, 3 year programme
  - 8 partners
  - Scientific knowledge, assessment tools for more ‘friendly’ aircraft design
- Work Package leader in EC FACE project
  - € 48 million, 4 year programme
  - Industry led partnership
  - Selection and integration of improved technology concepts

European Commission

BRE

HEACE … Health Effects of Aircraft Cabin Environment

- Investigates the aircraft cabin and flight deck as a working environment
- Develops a **Human Response Model** for cabin and flight crew
- This model will predict health, comfort and performance of crew for given environmental parameters

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FACE … Friendly Aircraft Cabin Environment

- Improves cabin comfort for passengers
- Investigates innovations in airframe and multimedia design, with particular emphasis on noise and vibration reduction, air quality and thermal comfort improvement
- BRE's main focus is the development of an **Environmental Comfort Index** for passengers, to be used for the assessment/certification of the cabin environmental impact of new technologies

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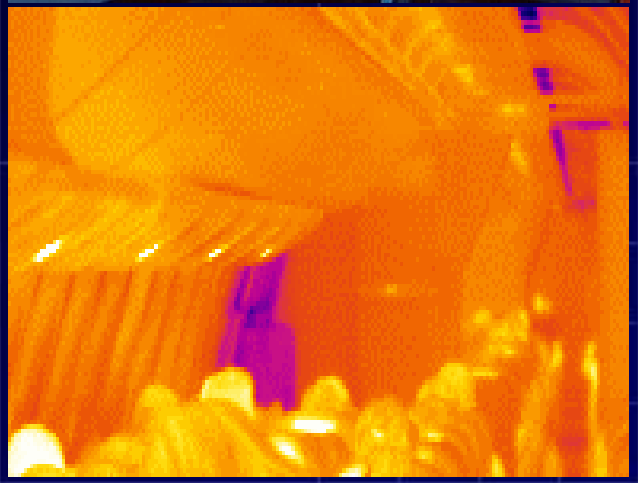
Experiment …

Design and Methodology

- ACE bridges a gap between laboratory-based experiments and in-flight measurements
- Provides a realistic flight experience with environmental control
- Makes experimental and modelling works more transferable to the real environment



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CBRN, Anthrax, SARS…

- BRE uses computational modelling techniques to simulate the dispersion of chemical spices within enclosures, including aircraft
- ACE and computer models may be used to develop protocols – say following an anthrax incident on-board
- The aim of such a protocol would be to negate or minimise the impact of the release of anthrax to the passengers, cabin and flight crew

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Deep Vein Thrombosis (DVT) …

- ACE facility provides an excellent opportunity to investigate DVT
- Both the cabin interior and environment are realistic
- A large series of controlled experiments can be undertaken
- The sensitivity to pressure can be assessed by other ground-based facilities or in-flight measurements

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Investigation of effectiveness of on board water mist suppression systems

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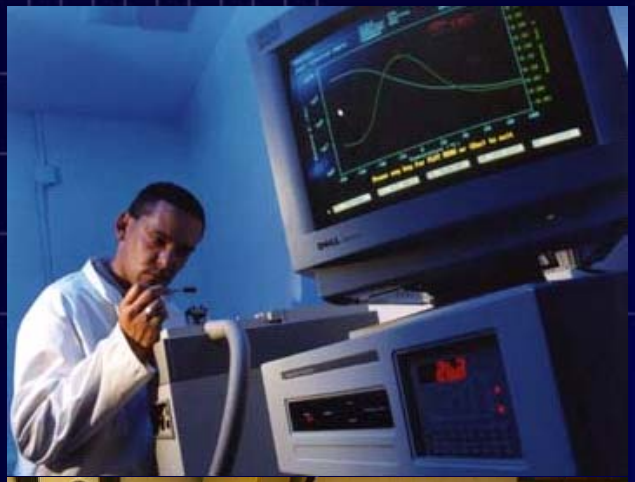
Analytical studies of fire gases



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Hot smoke test … used to investigate performance of as installed fire protection measures

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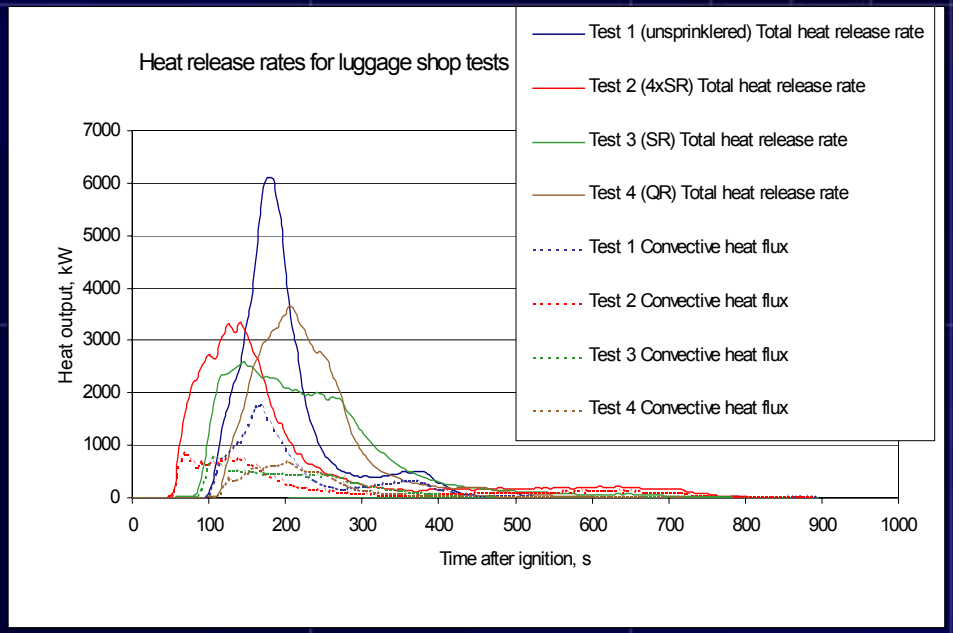
Design fire characterisation …. retail luggage



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Fire performance testing of materials and products

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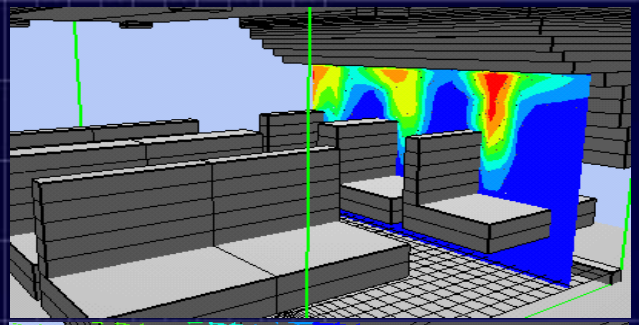
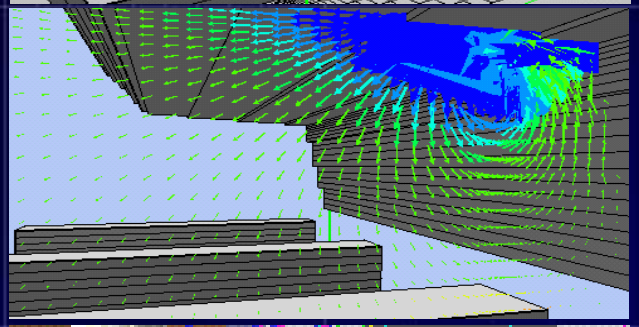
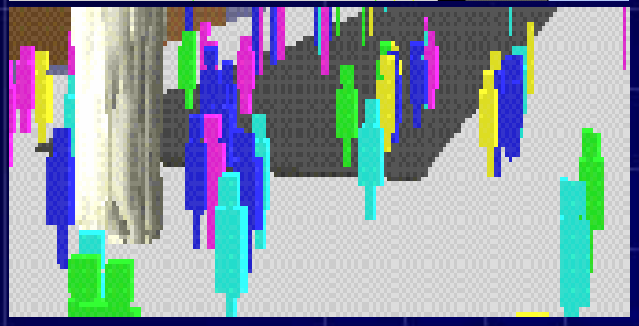
Modelling air movement, temperature and contaminant distribution, smoke movement and evacuation …







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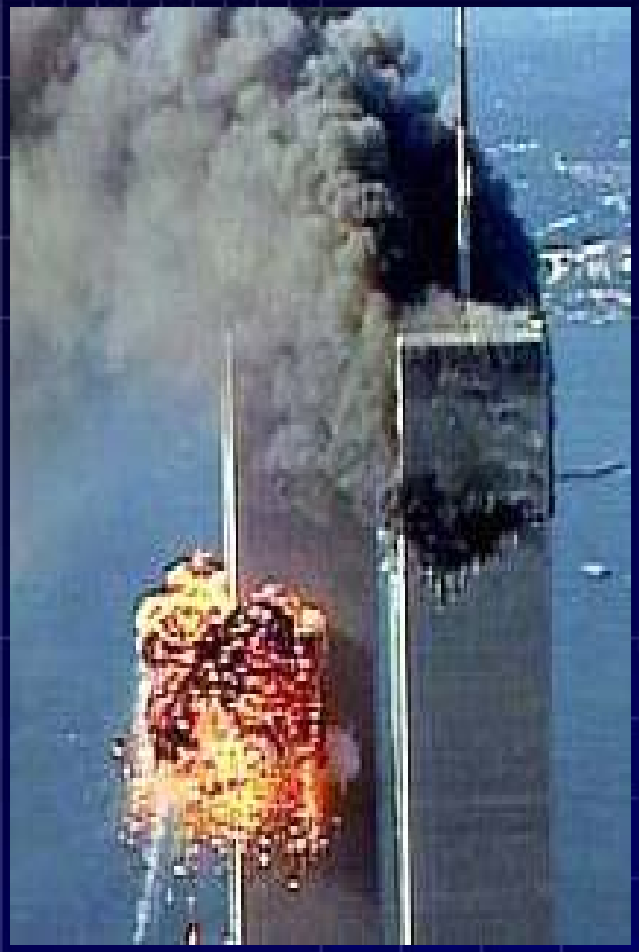
Fire and terrorism