

Computational Fire Engineering

BRE is a one stop shop for fire engineering analysis. Fire engineering is now routinely used to provide design solutions that facilitate function and aesthetics, reduce construction and operating costs and ensure safety in complex buildings.

Increasingly, untried and complex computational analysis is being used to 'demonstrate an adequate level of safety' in buildings such as:

- Airports
- Shopping Centres
- Stadia
- Tall buildings
- Stations
- Tunnels
- Museums and Art Galleries
- Healthcare
- Schools
- Industrial
- Ships

Services provided by BRE include:

- Independent review of fire engineering analysis
- Design fire analysis
- Smoke movement modelling and management
- Fire detection and suppression
- Structural fire engineering
- Evacuation modelling and means of escape
- External fire spread modelling
- Fire service intervention modelling
- Probabilistic fire risk analysis
- Cost-benefit analysis
- Drafting of guidance
- Research
- Risk assessment management
- Expert Witness

BRE is at the forefront of computational fire engineering and innovative scientific knowledge and is routinely invited to apply its unique skills and knowledge to analyse or review prestigious construction projects, such as Brussels and Changi Airports and the Eurotunnel offices.





Case Studies

Brussels Airport

BRE was appointed to undertake fire and evacuation modelling using computational fluid dynamics and discrete evacuation modelling (including human behaviour in fire) to the concourse areas of the design to support the fire engineering strategy. This facilitated acceptance of innovative design, which included large compartments, unprotected steel structure and tested smoke control system.

National Physical Laboratory

Roger Preston and Partners appointed BRE to undertake structural modelling of unprotected external steel. This analysis obviated the need for protection whilst demonstrating acceptable fire safety.

Mont Blanc Fire Court Case

The French Judiciary appointed BRE to undertake Computational Fluid Dynamics (CFD) modelling of the Mont Blanc fire and also answer 'what if questions'. The analysis helped clarify which events and factors were critical in contributing to the consequences of the fire.

HMS Victory

To provide long term safety and property protection of this unique piece of historical heritage, a fire risk assessment was completed and computational evacuation modelling is being undertaken. The evacuation model represents the means of escape from the 'nonstandard' egress layout. This modelling will help optimise the number of guides and visitors to the ship.

Heron Tower

BRE Global were appointed by the contractor to investigate the protection details of columns where façade brackets were adjoined. Heat transfer through the unprotected cladding brackets to supporting columns was investigated via a 3D localised finite element model. The modelling conducted confirmed that cladding brackets connecting to façade columns could be unprotected which avoided significant potential impacts on the project's budget and programme.

For help with your fire safety engineering problems please contact us:

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