How do we achieve Fire Engineering best practice?

Easy!

We need:

a) The Right People
b) Good Management Systems
c) Effective Reviews (Internal / External)
d) Clear Guidance and Frameworks
The right people?

**No** protection of the term “Fire Engineer”

Architect protected by the Architects Act 1997
Act requires any person in the UK who practices architecture using the title ‘architect’ to be registered at the Architects Registration Board (ARB)

Up to the **client** (or **enforcing authority**) to ensure “Fire Engineer” has sufficient qualifications and experience.

BS 7974 PD 0 recommends that: “*Suitably qualified and experienced personnel are required to carry out and assess FSE studies*”.

**Common Error 1:** No fire engineer appointed.
**Common Error 2:** Qualifications and experience not checked.
**Common Error 3:** Chartered Fire Engineer not appointed.
Why is the right person so important?

• Berlin Brandenburg Airport
• Planned to be third busiest airport in Germany and one of the fifteen busiest in Europe
• Planned opening 2010 – still not open.
• Delayed due to fire protection faults.
• Fire alarm system
• Smoke ventilation.
• Additional costs will amount to 2.19 billion € (overall cost 5.5bn €)

• German press (Stern) reported: Alfredo di Mauro (52) - the ‘Fire Engineer’ who designed the fire protection systems for 8 years was an engineering draftsman and had no engineering qualifications.
2.19 Billion EUROS!!!!

Germanys “national embarrassment” can and will * happen here in the UK unless we seriously consider the issue.

* In my view and based on my experience

www.hoarelea.com
Registration precedent in the UK?

Structural Engineers Registration Ltd (SER Ltd) Administers Certification of Design (Building Structure) scheme in Scotland under the Building (Scotland) Act 2003.

Individuals register as Approved Certifiers of Design (Building Structures) are required to be of Chartered Engineer (ISE or ICE) for a minimum of 5 years.

Registration of an individual is for a 5 year period initially. Every 5 years: re-registration.

Question: Right approach? Question: Does it set a precedent on what is suitably qualified?
Registration then?

Australia
No mandatory registration (except Queensland). Majority (55,990 of 68,800) of professional engineers not registered on a voluntary register.

NERB report recommended that:
*Mistakes by poorly qualified and/or incompetent engineers have the potential to lead to catastrophic engineering failures but perhaps more frequently “botched” work.*

Over a 20 year period:
*Combining the present value of total costs and total benefits associated with the proposed national registration scheme, the net present value of the scheme is estimated to be $7.4 billion under a seven per cent real discount rate while its benefit-cost ratio is calculated to be 3.14.*
Quality Management

Quality management ensures that an organization, product or service is consistent.

It has four main components:

a) quality planning,  
b) quality control,  
c) quality assurance, and  
d) quality improvement.

BS EN ISO 9001:2008  
(Quality management systems – Requirements)
Reviews - nothing to be scared of!

Essential part of any design process and critical to evaluate work and gain additional insight. Should be done throughout the design process (doesn’t have to be external) but should be documented.


A peer reviewer should be impartial and have the necessary knowledge and fire engineering experience to prepare an acceptable design that is similar in scope to the design being reviewed.

Common error 4: No (documented) peer review process. Ask for ISO 9001.

Common error 5: ‘Peer / design review’ left to building control. Clients should ask questions too!
Clear guidance?

Regulation 38 of the Building Regulations 2010 requires that:

“fire safety information shall be given to the responsible person at the completion of the project or when the building or extension is first occupied.”

Fire safety information can be as simple as:

a) A marked up plan.
b) A full fire strategy report including design assumptions and calculations

Legal requirement to provide fire safety information.

Common Error 6: The most common error – the fire strategy has not been followed!
Why don’t they follow it?

Reason 1: They don’t know it exists.

Solution: PM / Client should ensure it is distributed. Not hidden on a collaboration site.

Reason 2: Assumption “same as it ever was” – Re-using old design solutions.

Solution: Require the fire safety information to be signed off and recorded in a review prior to submission of specifications and design drawings.

Reason 3: Assumption “we thought it would be okay after we spoke to a sales rep / friend / colleague who worked on one before”.

Solution: Collaboration and workshops with the design team. Not all schemes and strategies are the same. Get comments recorded and actioned.
Anything else on fire strategies?

- The fire strategy are the documents that Building Control and the Fire Service approve. They expect the detailed design to be in accordance with the fire strategy.

- Most fire strategies will not generally include lots of ‘nice to hases’ – if it states that sprinklers, smoke control, comprehensive AFD or fire mains are required, then it is required!

- If there are any issues with the fire strategy proposals - raise it at an early stage with the fire engineer / lead consultant – don’t ignore it!
At least the guidance documents are clear!

BS 9999 Section 33.4.2 provides 1 page of guidance on provision of dampers and openings in ductwork systems.

Where a ductwork system serves more than one part of a compartmented or fire separated protected escape route, smoke detector operated fire dampers should be provided where ductwork enters each fire separated or smoke separated section of the escape route.
Service in Fire-fighting shafts.

Only services associated with the fire-fighting shaft should pass through or be contained within the fire-fighting shaft. A fire-fighting shaft should not contain any cupboards or provide access to service shafts serving the remainder of the building.

BS 9999 Section 21.2.7.2 “All other levels” One paragraph hidden amongst 459 pages of document!
This leads to confusion!

Because of this we have a Mechanical Engineers FAQ list on ductwork:

• Whilst there are no restrictions on ductwork runs, I always need to ensure that I have provided a fusible link operated fire damper where my duct passes through a fire resisting walls.

• WRONG! Ducts are not permitted in some areas, and AFD operated fire/smoke dampers or fire rated ducts may be required in others.

• I can identify the requirement for fire or fire/smoke dampers from the fire resistance of the wall.

• WRONG! The requirement for fire/smoke dampers depends on where it is, and is not related to the fire resistance of the wall!
• We have a rigid steel duct, so it is fire resisting.

• WRONG! You can only claim you have a fire resisting duct if it has been designed and tested to demonstrate its fire performance. The duct must then be installed in accordance with the manufacturers requirements.

• I have specified a fire resisting duct, therefore I must be covered.

• DEPENDS! What have you specified? Fire resistance can be from the outside-in or the inside-out. Has any mention been made of the requirement (or otherwise) for insulation? What do the ducts open into?

• Approved Document B doesn’t mention transfer grilles, so presumably I don’t need to do anything.

• WRONG! – The risks are the same (See BS 9999)
Summary

a) Fire Engineering solutions are undertaken by suitably qualified persons and internally peer reviewed by CEng’s (registered with the IFE) with 5 years experience?

b) Ensure the organisation has a proper quality management procedure in place?

c) Make sure the fire strategy is distributed and read!

d) Anyone volunteer to write a guidance document on fire protecting services?
Questions?

While I am here! It is free to join as a chapter supporter and gain access to CPD, networking etc.

Find out more at:

www.SFPE.uk