

## **ASFP SUBMISSION OF EVIDENCE TO THE INDEPENDENT REVIEW OF BUILDING REGULATIONS AND FIRE SAFETY**

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**On behalf of:** Membership (150 manufacturers, installation contractors, distributors and other practitioners in Passive Fire Protection)

**Date:** 12-10-2017

### **Responses to Questions**

#### **The overarching legal requirements**

**Q1** To what extent are the current building, housing and fire safety legislation and associated guidance clear and understood by those who need to follow them? In particular:

- What parts are clear and well understood by those who need to follow them? ; and, if appropriate
- Where specifically do you think there are gaps, inconsistencies and/or overlaps (including between different parts of the legislation and guidance)? What changes would be necessary to address these and what are the benefits of doing so?

#### **Answer to Q1**

As is often the case, individual stakeholders often understand quite well the parts of the legislation that apply to them – even if this is only a few pages of one or two documents that they use frequently. However, there are issues with clarity and understanding in AD-B. There is also an issue in that stakeholders often work in silos and only deal with their particular area – partly because fire and building are big subjects and partly because there are so many pieces of guidance and legislation that it is difficult to keep track of it all and the interaction between the various documents.

#### **Answer to Q1 – first bullet point**

The Building Regulations, and in particular Approved Document B, are not as clear as they could or should be. Difficulties in understanding, and even navigating, the documents, with constant and repetitious cross referencing, lead to differences in interpretation between experts and the lay person alike. With particular regard to AD-B, Items that one needs to know about are spread across several different parts of the document.

There are many examples of where professional users, as well as infrequent readers get confused over the meanings of certain words. The use of the term ‘adequate’; the use of ‘etc.’ cause differences of opinion.

#### **Answer to Q1 – second bullet point**

#### **Need to review and consolidate guidance**

The guidance for certain types of buildings e.g. hospitals and schools are spread over several different documents when it would assist greatly if they were all included in one document. It would

help if the guidance to evidence to be submitted under Regulation 38 was included in AD-B. The Fire Sector Federation of which the ASFP is a member has developed documentation on this but in the absence of a review of AD-B for 12 years, this has, of course not been considered or incorporated. It would help if many of the supporting guidance documents from trade associations e.g. the ASFP 'colour books' (<https://is.gd/IZRRLz>) and other bodies were better referenced especially if they contain important information that is needed but is not in itself a 'requirement' and thus not included in the AD. While not guidance, it would also assist greatly if the requirements of Regulation 7 and 38 were included in AD-B.

### **Need for frequent updates to reflect changes in construction**

AD-B needs updating to reflect the changes in construction brought about by the 'green agenda'. AD-B was developed over many years around conventionally constructed (brick, stone steel, glass) buildings. The use of Modern Methods of Construction has produced buildings that are much more susceptible to poor workmanship and are not as robust in fire. Regular and frequent e.g. 2 to 3 year reviews are needed. Chief Fire Officers complain that they are now dealing with buildings on fire as opposed to fire in buildings. Fire fighters need to be confident that buildings constructed in this way have sufficient resilience to enable fire fighting and rescue to be carried out.

### **Need to review and consolidate legislation**

There is a lack of understanding about how all the strands of legislation fit together in addition to distinguishing between legal requirements and guidance. There are differences between the Building Regulations and the Regulatory Reform (Fire Safety) Order (RRO) which causes discontinuities between compliance pre and post completion: these are two different legislative processes, with two different legislative bodies trying to achieve the same aim at different points of the building life. Surely there is some scope for rationalisation and harmonisation here.

Hopefully the outcome of this review will provide an opportunity to consolidate and create a more concise suite of legislation that more clearly sets out the requirements and responsibilities at each stage of the process, from original design and through the life of the building, including changes and refurbishments later in the building's life. Legislation could also be used to mandate the use of codes of practice e.g. for the installation of passive fire protection whether these exist as e.g. British Standards.

### **Consideration of performance based legislation**

With regard to the issue of performance based legislation as opposed to prescriptive based, It is the ASFP's position that this needs a thorough review and possibly some revision. There are benefits in framing regulations this way but it must be undertaken properly, by suitably qualified individuals and the process must be subject to adequate scrutiny and control.

We must not have the situation we have in the cladding in Grenfell tower whereby the government/DCLG insists that cladding and insulation must be of limited combustibility (Euroclass A2) despite a lack of clarity in AD-B, while the use of desk top studies and/or third party documents allowed the use of both insulation and cladding of Class 0 (Euroclass B) performance. Such a lowering of the 'requirements' may well have been the biggest single factor in the Grenfell fire and the ASFP is aware of other situations where the 'requirements' of AD-B are watered down for cost reasons. If performance-based standards are implemented and enforced properly then we have no issue with it. Such standards work well in structural engineering, so why shouldn't they work in fire?

We are very concerned at the widespread removal or downgrading of fire protection (both passive & active) from buildings when it is possible that the rationale for doing so is not sound.

## **Roles & Responsibilities**

Q2 Are the roles, responsibilities & accountabilities of different individuals (in relation to adhering to fire safety<sup>1</sup> requirements or assessing compliance) at each key stage of the building process<sup>2</sup> clear, effective and timely? In particular:

- Where are responsibilities clear, effective and timely and well understood by those who need to adhere to them/assess them?; and, if appropriate
- Where specifically do you think the regime is not effective?
- What changes would be necessary to address these and what are the benefits of doing so?

Q3 Does the current system place a clear over-arching responsibility on named parties for maintaining / ensuring fire safety requirements are met in a high-rise multi-occupancy building? Where could this be made clearer? What would be the benefits of doing so?

Note 1 References to 'fire safety' requirements in Q2 & 3 should be taken to cover the range of requirements set out across Building Regulations, the Fire Safety Order etc.

Note 2 In other words the planning, design, procurement and construction of new builds and the refurbishment of existing buildings and the on-going management and maintenance of those buildings

## **Answers to question 2**

There are numerous stakeholders involved in the design, commissioning, installation and approval of fire protection measures in buildings. The ASFP is working with RIBA on a RIBA Plan of Works for fire and we have identified over 20 different groups, each of which has a role in being consulting, or designing, or installing or approving. The fact that there are so many groups makes it difficult to apportion responsibility. This is partly why in developing the Plan of Works for fire we are looking at a 'sign off' process for all stakeholders to get them to be aware of and take their responsibilities seriously. In this regard we are using – as a model – the Building Control Amendment Regulations 2014 which were introduced in the Republic of Ireland to address very similar issues there after numerous buildings were discovered to have little or no fire protection as a result of poor design, installation and inspection.

In answer to the question of where we think the regime is not effective, then the answer is 'across the piste'. Buildings are not well designed, the designs are modified badly, products and solutions are modified to cut costs, the wrong/poor products are specified, they are installed incorrectly (if even installed at all) and then they are not inspected or any inspection is inadequate.

The ASFP considers that the use of some sort of mandatory certification sign off developed from the principles used in the Irish BCAR regulations would greatly assist stakeholders' consideration of their duties and would increase compliance. In Ireland BCAR has created a tremendous demand for training and certification for installers and inspection of completed works. One wonders why they didn't do it before when need for it was there before.

### Answers to question 3

Once the building is occupied then it should be the Responsible Person under the Fire Safety Order, but frequently the RP is difficult to ascertain, he/she may be unaware of their responsibilities, they may lack the skills and knowledge or even know where to look to get help to fulfil them. Sometimes this falls on the Facilities Manager to manage this, but the same issues arise.

### Competencies of key players

Q4 What evidence is there that those<sup>3</sup> with responsibility for:

- Demonstrating compliance (with Building Regulations, housing & fire safety requirements) at various stages in the life cycle of a building;
- Assessing compliance with those requirements

are appropriately trained and accredited and are adequately resourced to perform their role effectively (including whether there are enough qualified professionals in each key area)? If gaps exist, how can they be addressed and what would be the benefits of doing so?

Note 3: For example, architects, those with responsibility for installing products, those undertaking Building Control sign-off or fire protection and enforcement work.

### Answer to Q4

From an ASFP perspective the expertise of Building Control professionals is possibly not the main issue with Building Control; it's the lack of activity in terms of e.g. inspection that is our major concern. We know that this is due to a lack of resources to undertake sufficient inspection and that many want to do more than they can now – this is not a blame game. We are also aware of intense competition between Building Control Bodies and Approved Inspectors which lowers standards further.

We also have some concerns over the expertise of some professionals including some Building Control professionals to be able to adequately check some passive fire protection solutions because some products e.g. reactive (intumescent) coatings to structural steel and smoke control dampers and ductwork, are complex products and the solutions put forward by various manufacturers and consultants can be confusing. We believe that this could be alleviated by some specialisation within the Building Control Body. To be fair to the profession, ASFP is aware of many excellent practitioners within Building Control Bodies, so this issue is patchy and is not our major concern.

Our concern over competency of key players is not with Building Control Bodies but with other important players in the process. To answer this question, we first have to ask one:

Q: What have a fire engineer; a fire risk assessor and an installer of fire protection have in common?

A: None of them are required to be trained, have their competency evaluated, be included on any register, or be licensed in any way. For such individuals who are responsible for the design, installation and assessment of life safety systems, this is a scandalous omission and is an issue that the ASFP and others have raised many times before.

At the professional end of the spectrum, doctors lawyers and others have to spend years of study and exams to achieve a qualification to be able to practice. Many have to be on registers such as that

run by the General Medical Council and the Law Society. At the lower end of the scale, plumbers, electricians and gas fitters are required to pass exams and have some competency evaluated. Why is there nothing for fire? A system of training, competency evaluation and qualification of all the major players is long overdue. ASFP is working with the Institute of Fire Engineers to provide training and competency evaluation for all stakeholders to obtain an IFE qualification in passive fire protection to specifically address the qualification issue.

## **Enforcement & Sanctions**

Q5 Is the current checking and inspection regime adequately backed up through enforcement and sanctions? In particular

- Where does the regime already adequately drive compliance or ensure remedial action is always taken in a timely manner where needed?
- Where does the system fail to do so? Are changes required to address this and what would be the benefits of doing so?

### **Answer to question 5**

The regime regularly fails to drive compliance. We believe that this is not due to concerns with enforcement or sanctions, but with the lack of adequate scrutiny of proposed solutions and lack of inspections of finished works meaning that many ‘perpetrators’ never get caught and so the sanctions are irrelevant.

## **Tenants’ & Residents’ Voice in the current system**

Q6 Is there an effective means for tenants and other residents to raise concerns about the fire safety of their buildings and to receive feedback? Where might changes be required to ensure tenants’/residents’ voices on fire safety can be heard in the future?

### **Answer to question 6**

Concerns over fire safety should be raised with the landlord or management company. After that it makes sense to consult the Fire Authority. None of this is very satisfactory. A single national agency with a whistleblowing function would allow people to contact someone independent and have issues reviewed independently. This could cover issues raised at any point in a building’s lifecycle.

## **Quality Assurance and Testing of Materials**

Q7 Does the way building components are safety checked, certified and marketed in relation to building regulations requirements need to change? In particular:

- Where is the system sufficiently robust and reliable in maximising fire safety and, if appropriate
- Where specifically do you think there are weaknesses / gaps? What changes would be necessary to address these, and what would be the benefits of doing so?

## **Answer to Question 7**

The way in which building products and installations are tested, certificated (these are two different processes) and the documentation used to support products in the market is confusing to the lay person and this gives rise to confusion and inappropriate specification, procurement and approval.

AD-B 'requires' that products are tested to a variety of British or European fire test standard to determine their suitability for use in the building. For a simple wall covering or a simple fire door a fire test report is all that is required. Unfortunately, the situation is far more technically complex than most stakeholders understand and this gives rise to the ignorant and/or unscrupulous to obtain 'approval' for a product, system or installation on the basis of incorrect supporting information. It also means that those specifying and those approving systems and products make mistakes based on an inability to relate the supporting documentation to the end use application. Consider the following:

### **Fire test reports**

The results of these are only applicable to the item tested – no variation is allowed; so e.g. in the case of the reaction to fire performance of a wall or ceiling lining, panels of different density or thickness from those tested are not covered. In the case of fire resisting construction, a fire test on a simple single swing, single leaf fire door hung on hinges, does not cover a double swing, double door hung on pivots. The same is true of cladding systems which comprise a wide variety of cladding panels, fixings, fire stopping materials and insulation; change one component and the fire performance can change significantly.

It soon becomes apparent that the combinations and permutations are numerous and if regulatory authorities were to insist on a fire test on every combination and permutation of building product, there are simply not enough fire test laboratories in the World to cope with the demand even disregarding the timing and economic aspects. In some cases, where the tests are relatively cheap e.g. those for upholstered furniture (not a building product, but the principle holds) or for some of the smaller reaction to fire tests that only cost up to a few hundred pounds, there is widespread testing of variations. However, as one moves from relatively inexpensive reaction to fire tests to more expensive fire resistance tests, then the pressure to do something other than a fire test increases. To take the fire door example cited earlier; a fire resistance test on a fire door costs in the region of £5,000 to 6,000; so with the numerous combinations and permutations of hardware, inclusion of glazing, method of hanging etc. it is easy to come up with a huge number of tests and a wholly unsustainable cost of testing. For products that are manufactured in the hundreds of thousands, this cost is not an issue, but many fire doors are of semi bespoke design and the cost of four or five fire resistance tests on a project with <100 fire doors make it uneconomic. If one considers a test such as BS 8414 when the cost of the test is in the order of tens of thousands, the pressure is even greater. This is where the role of assessments comes in; to cover the many combinations and permutations of products and end-use application that cannot all be tested.

### **Assessments**

Assessments are the opinion of the fire performance of a product or system were it to be fire tested. These range from the simple substitution of e.g. a non-essential item of hardware on a door right up to a 'global assessment' of a wide variety of parameters. Such assessments were initially conducted almost exclusively undertaken by staff working in fire test laboratories and AD-B still recognises their ability to do this. In more recent times fire consultants have also undertaken assessments and more

recently still, manufacturers have undertaken assessments or 'engineering judgments' on their own products. Despite the obvious conflict of interest issues with this last group these are accepted widely by those specifying passive fire protection and those approving in building control. To be fair, many of the manufacturers are very knowledgeable and ethical and it is alleged this practice is needed to prevent delays

Like fire risk assessors, there are no requirements upon who can undertake assessments apart from the statement in AD-B for staff of fire test laboratories mentioned earlier. Partly in response to this and partly in response to issues surrounding poor assessments (not cladding) the fire testing laboratories got together under the umbrella of the Fire Test Study Group and drafted a code of practice for undertaking assessments in lieu of fire tests. This document was published under the banner of the Passive Fire Protection Federation (a grouping of trade associations plus the fire laboratories, some consultants and others) in 2000. This document is included in our submission.

The aim of the document is to give confidence to end-users that assessments in the UK market produced by organisations that subscribe to this document are of a satisfactory standard to be used in lieu of fire tests for building control and other purposes. Subscribing organisations are required to employ individuals that subscribe to professional principles and to have a nationally recognised quality system accredited to EN ISO 9000 or EN 45000.

The guide defines the levels of complexity for different kinds of assessment, the levels of expertise for assessors & reviewers and controls the levels of assessor & reviewer who are permitted to undertake/review each kind of assessment. A procedure for undertaking assessments is included as is a code of conduct for assessors & reviewers.

This document is widely used by the fire test laboratories and some fire consultants who undertake the bulk of assessments of passive fire protection products used in buildings such as doors, fire protection to steel, fire-stopping etc. However, use outside of these organisations and areas is patchy.

### **Desktop studies**

A desk top study is an assessment by another name. The term has become somewhat controversial post Grenfell. Building Control Guidance Note 18 - Use of Combustible Cladding Materials on Buildings Exceeding 18m in Height allows as a third option to satisfy AD-B by the use of 'desktop studies' viz:

"If no actual fire test data exists for a particular system, the client may instead submit a desktop study report from a suitably qualified fire specialist stating whether, in their opinion, BR135 criteria would be met with the proposed system. The report should be supported by test data from a suitable independent UKAS accredited testing body (BRE, Chiltern Fire or Warrington Fire) and so this option may not be of benefit if the products have not already been tested in multiple situations / arrangements. The report should also specifically reference the tests which have been carried out on the product."

This wording is very lax and allows unscrupulous or ignorant to produce, or persuade a consultant to produce a desktop study that may not be adequate in its evaluation of the safety of the construction considered. Consider the following:

- There is no definition or requirement on who is 'a suitably qualified fire specialist'

- There is no direct specification as to the testing required – merely a reference to BRE 135 criteria which would indicate BS8414 testing, but an unscrupulous or ignorant assessor might use other fire test evidence to put something together.
- It mentions BRE, Warringtonfire (now Exova) and Chiltern Fire (now also Exova) as sources of test data. Only one of these laboratories (BRE) has a BS8414 test apparatus. Is it the intent that by citing the other laboratories that they use different test evidence or is it an error?
- There are none of the checks and balances included in the PFPF Guide to Undertaking Assessments in lieu of Fire Tests. There is no requirement for any quality system, for an assessor and a reviewer, for an evaluation of the type of assessment needed (simple v. complex), no code of ethics, no manufacturer's or sponsor's declaration that if they become aware of the product or system under consideration being tested.

### Third party product certification

Third party certification is a process whereby a manufacturer uses a third party certification body to assess his products suitability for a range of end use applications. This involves the certification body:

- Visiting the manufacturer for an initial surveillance visit and examining their factory production controls systems
- Sampling products from the production line for fire testing
- Organising/witnessing the fire testing
- Drafting a certificate which includes the fire performance of the product and the applicability of that fire performance (test result (s)) to variations of the product thus incorporating assessments as well
- Undertaking regular audit activities such as further testing
- Ensuring that the product is individually labelled for traceability

Third party schemes are run by certification bodies, many of which are offshoots of the fire test laboratories mentioned earlier, but there are several others as well, The ASFP support third party certification because it gives piece of mind as to the quality of the product and its applicability to end use situations. The use of the certificate to cover product variations negates the need for assessment and gives those specifying and approving products the relevant knowledge in an accessible format.

Third party certification schemes for products are encouraged by AD-B and in certain product areas e.g. fire doors and hardware and fire protection to steelwork there is widespread take up.

So in answer to the question:

**Q7** Does the way building components are safety checked, certified and marketed in relation to building regulations requirements need to change? In particular:

- Where is the system sufficiently robust and reliable in maximising fire safety and, if appropriate

Yes, it does, the system is not robust or reliable because:

- It relies upon claims made in a morass of fire test reports, assessments and certification, often all on the same product

- Those specifying or approving products don't have the skills or knowledge or the time in examining the supporting documentation in sufficient rigor. Sometimes they are bamboozled by the rash of claim and counter claim
- There is pressure to 'avoid' large scale expensive testing such as the more expensive fire resistance testing and even more expensive large scale tests such as BS 8414.

Fire testing/assessment etc. is complicated. Designers, specifiers and sometimes those approving products need appropriate knowledge in the performances and limitation of PFP products and their installation.

Assessments or desktop studies if carried out competently are a perfectly acceptable means of demonstrating compliance but consideration should be given to mandating some type of code of practice such as the PFPF guide to undertaking assessments in lieu of fire tests to ensure that those undertaking assessments have sufficient knowledge, skills, experience and where appropriate qualifications to do so.

Third Party Certification provides the relevant information in a much more accessible way and consequently makes the evaluation of the performance for all stakeholders easier. Consideration should be given to making it mandatory.

### Trading Standards

There could be a role for Trading Standards to better enforce that products should not be sold unless they are specifically appropriate for what they are being used for. However experience over the last 20 years shows that Trading Standards are disinterested, do not have the experience or expertise to evaluate claims of performance of passive fire protection and do not have any budget for any fire testing. Even when the industry offers, under supervision of Trading Standards, to undertake the relevant testing to prove or disprove a particular claim, Trading Standards are unwilling to act. We refer you to the report from Royal Borough of Hammersmith and Fulham on their attempts to get several hundred poorly installed fire doors remedied and the lack of any meaningful Trading Standards response.

In answer to the question:

- [Where specifically do you think there are weaknesses / gaps? What changes would be necessary to address these, and what would be the benefits of doing so?](#)

The whole of this question and the answers above relate to the suitability and quality of **products** and how they are supported in the market and approved by Building Control Authorities. And in the context of Grenfell, which was a failing of product/specification/building approval that is understandable. However, for construction in general, far greater by an order of magnitude is the issue of poor **installation**. By and large passive fire protection products are of reasonable to good quality, whereas installation of passive fire protection products can be of very poor quality and sometimes non-existent.

This is a construction industry problem, not a fire issue and we would refer you to the report from the Edinburgh Schools inquiry on Oxbgangs Primary school where 9 tonnes of masonry fell onto an area where children store their bicycles during a storm in the middle of a night in January 2016. The issue is insufficient inspection of products that are hidden once installed – in this case wall ties between inner and outer masonry leaves – but when the inquiry started looking at fire-stopping, they found failures in a number of schools and 19 were closed for remedial works and inspection.

The installation of PFP is critical in maintaining fire safety and e.g. the 'stay put' policy. It should be mandatory for:

- all installers to be trained
- have their competence evaluated
- be on a register and/or
- be qualified in some way. (The ASFP is working with the Institute of Fire Engineers to provide training for IFE to offer Ofqual recognised qualifications to all involved in the installation of passive fire protection).

Then their work should be inspected at a frequency and coverage to pick up defects before it is too late and the relevant work closed up. There are several third party certification schemes for installers which cover most of the above, but they could all do with more rigor (e.g. more inspection and the requirement to have all operatives trained, not just supervisors) because the market currently won't pay for adequate schemes. Consideration should be given making them mandatory and give them more teeth.

As a society we require plumbers, gas fitters and electricians to pass exams, be on registers and be competent. Why not for installers of life safety products?

### **Differentiation within the current Regulatory System**

Q8 What would be the advantages / disadvantages of creating a greater degree of differentiation in the regulatory system between high-rise multi-occupancy residential buildings and other less complex types of residential / non-residential buildings<sup>4</sup>?

Where specifically do you think further differentiation might assist in ensuring adequate fire safety and what would be the benefits of such changes?

Note 4: For example in terms of higher competency requirements, pro-activity/frequency of safety sign-off.

### **Answer to question 8**

In providing differentiation in the regulatory system, defining a high-risk building is more useful than defining a high-rise building although it could be said that high rise tends towards high risk. There are other elements – including the presence of vulnerable occupants e.g. in care homes – that would make a building high-risk. There are also types of buildings e.g. hospitals, where the time taken to evacuate may cause that building type to be defined as high risk.

One approach to differentiation in the regulatory system may be that for buildings deemed to be in the higher risk category, more of the requirements should be prescriptive rather than performance-based. Those requirements deemed to be life-critical could be more prescriptive, and this would reduce ambiguities in interpretations of compliance and non-compliance.

## **International Comparisons and Other Sectors**

Q9 What examples exist from outside England of good practice in regulatory systems that aim to ensure fire safety in similar buildings? What aspects should be specifically considered and why?

### **Answer to question 9**

The Building Regulations and Building Control in England was held in high regard by professionals in much of the rest of the world. Discussions with professional peers in other countries since the Grenfell incident suggest that there is surprise that it has happened here. We would suggest that this is because of their ignorance of what goes on here.

There are countries that use prescriptive approaches (most of 'old' Europe France, Germany, and Belgium) and the US. They have similar or greater rates of fire deaths to the UK but there are a huge number of other factors that influence this. Polyethylene cored ACM cladding panels cannot be used in most of not all these countries on high rise buildings.

There are countries that use performance based codes e.g. Australia, but they too have had 'cladding issues'. Following the Lacrosse fire, Australia has been considering the combustibility of materials used on the external faces of buildings. A review of requirements was initiated, and revised regulations are at draft for public comment. Australia reviews its building codes much more frequently than England.

There have been similar fires in other countries e.g. in the Middle and Far East, including those with ACM cladding, that have not resulted in fatalities. It is important to note that the external construction of the building must be considered in conjunction with other measures. Even with equivalent construction elements, differences in compartmentation, evacuation strategy, fire lifts, fire fighting access and procedures, control of refuse, car parking, and installation of sprinklers will affect fire safety. However, it is notable that where this type of fire occurs, the fire often burns until it burns out i.e. cannot be extinguished.

### **Republic of Ireland**

Ireland has a lot of the problems of the UK in respect of: poor construction culture, lack of training inspection, qualification, competency evaluation etc. Their Technical Guidance document B is modelled on an older version of AD-B.

The boom years in the mid-2000s led to a rash of hastily built blocks of flats of very poor quality. Fire protection measures were poor or non-existent. The celebrated case of Priory Hall where over 250 residents were decanted by the Dublin High Court while remedial work was undertaken and the developer having his passports and assets seized is well known and was the subject of an RTE documentary. <https://www.rte.ie/news/2011/1014/307467-prioryhall/>.

This led indirectly to the passing of the Building Control Amendment Regulations (BCAR) 2014 which required a degree of sign off of all stakeholders from design professionals (design certifiers) right down to those installing fire protection (ancillary certifiers). Whilst not perfect, BCAR had led to a huge demand in training of installers and inspection of their work. We believe that consideration should be given to taking the best parts of BCAR – such as the sign off parts – and including them in any review of regulation. We include the BCAR code of practice in our submission.

Q10 What examples of good practice from regulatory regimes in other industries / sectors that are dependent on high quality safety environments are there that we could learn from? What key lessons are there for enhancing fire safety?

**Answer to Question 10**

The oil industry offers parallels, and is dependent on high quality safety environments. It uses a performance based regime with the need for consultants to generate a 'safety case' for their proposals. However, it is not subject to the intense cost cutting mind-set and dominance by main contractors in onshore construction. The industry is not as fragmented with multiple subcontracting, the whole of the design process is much more joined up with fewer stakeholders and there is a much better culture of quality and compliance.

The aerospace/airline industry has a great safety record and this is underpinned by a highly prescriptive regime for materials and products used on aircraft, with effective traceability of every component i.e. effectively third party certification. Quality of installation is also high with only certain organisations/individuals allowed to work on aircraft. We could learn a lot here but it would come at a cost.

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