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FIRE AND BUILDING REGULATION

A Review by
Bickerdike Allen Partners

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DEPARTMENT OF TRADE AND INDUSTRY

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FIRE AND BUILDING REGULATION

A Review by
Bickerdike Allen Partners
for The Enterprise and Deregulation Unit
in conjunction with the Home Office and
the Department of the Environment

LONDON: HMSO

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FIRE AND BUILDING
REGULATION

This study was commissioned by the Department of Trade & Industry's Enterprise & Deregulation Unit, in conjunction with the Department of Environment, Home Office, Health & Safety Executive and the Treasury.

The views expressed in this Report are those of the authors and should not necessarily be attributed to any Government Department.

LONDON HMSO

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Executive Summary

The Department of Trade and Industry's Enterprise and Deregulation Unit, as part of its initiatives to lighten the burden on industry and commerce, commissioned the Consultants, Bickerdike Allen Partners (BAP) to review the interrelation of the Building Regulations and fire certification requirements and the way they are put into effect.

Although the Review was widely advertised and the survey of opinion was extensive, they have revealed only a moderate level of dissatisfaction on the part of Applicants arising partly from their lack of understanding of the large body of relevant legislation and partly from some confusion by the officers of the building control authorities and the fire authorities of their roles and responsibilities.

Recent and current reviews of the legislation may result in a clearer process and meet some of the complaints voiced, but a number of steps could be taken immediately which would help overcome difficulties in the short term and prepare the way for the further development of the legislation and procedures along the trend towards greater uniformity of the functional requirements of the Regulations applicable to most buildings, together with greater freedom of interpretation of the ways of meeting the requirements.

The Consultants have identified a need for two comprehensive and complementary documents, one a comprehensive national guide to the legislation and procedures, the other a comprehensive design guide to fire safety in building capable of forming a basic educational resource for professionals in the field.

The Consultants also recommend a number of practical steps to ease the process of consultation and approval; these include a proposal for the early determination of design issues between Applicants and BCOs, a revised form of drawing submission at the stage of building control approval and a set of drawings for FPOs at that stage, clearer rules for the engagement of the FPO in the consultation process both with the Applicant and with the BCO, and the issue by the BCO to the Applicant of a Building Regulations Part 2 Compliance Certificate with relevant record drawings and schedules prepared by the Applicant and copied to the FPO.

The levels of knowledge and education of building designers, BCOs and FPOs in matters of fire safety in design are uneven and often inadequate in the light of the many advances in building technology and fire engineering.

This is not only a source of current complaints but could be an obstacle to the further refinement and development of the legislation and procedures. The Consultants recommend that the three parties should continue to develop their professional education in this subject and should also attempt to harmonise their education through the creation of a national network of courses available to members of all three groups.

The Consultants in support of the general thrust of the Stage Two Review of the Building Regulations, recommend the extension of both the scope and application of Part B of the Building Regulations to include most aspects of fire safety and most building types, but only after the necessary educational provisions have been made.

Following this development of the Building Regulations, most local Acts on fire related matters can be amended.

Finally, the Consultants draw attention to the dynamic nature of the technologies of building and fire engineering and the trends in the relevant legislation and recommend that the situation be reviewed again within three to five years.

1. The Review

The Brief

1.1 We reproduce below our Terms of Reference as contained in the Agreement for the Supply of Consultancy Services, 9th January 1989.

1. To examine whether the extent and effect of any 'overlap' between building control legislation and legislation intended to protect occupants from fire or the way the legislation is implemented places burdens on business which are more than are necessary to achieve the appropriate level of health and safety; and specifically to examine:
 - a) any weakness in the links between building control authorities and fire authorities at the planning and construction stages and the extent to which a properly structured consultation procedure and national guidelines would be beneficial;
 - b) whether consultation processes could be simplified (if for example there were a requirement for fire authorities to be provided with their own copies of plans);
 - c) problems (of inconsistency for example) caused by local legislation;
 - d) the scope for improvements in the control procedures with a view to ensuring that they result in a single certificate issued by the building control authority perhaps with separate appendices concerning fire matters;
 - e) means of overcoming the delays that arise while new architectural developments are assessed and the practicability of guidance on the alternatives to structural fire precautions in innovative buildings which cannot comply with appropriate existing regulations or codes of practice;

and in the light of this,

2. undertake an examination of the technical and practical skills required to permit authoritative advice to be given on all fire prevention aspects of building, planning, construction and adaptation for use;
3. consider the training and management requirements necessary to secure their consistent enforcement;
4. on the basis of this examination to make recommendations, in particular, on the most appropriate methods of enforcement, including the forms of authority by which it would best be done, and the scope for the further involvement of the private sector taking account of any implications there would be for existing legislation.

The Scope of the Report

1.2 The scope of the report is defined by these Terms of Reference. Central to these Terms is the question of whether the current legislation places unnecessary burdens on Applicants either by way of the legislation itself or in the way the legislation is implemented. Consequently this issue

and questions to which it gives rise, eg is there overlap, what has caused it and what factors sustain it, have been the focus of the Consultants' enquiries and deliberations and it is the major issue to which this report is addressed and to which all other issues raised by the Terms of Reference dealt with in the review finally relate.

Methods of gathering opinion

1.3 The Respondent: The term, Respondent, refers to any individual, group or organisation which communicated their views to the Consultants in the course of this Review whether at meetings, by correspondence or formal submission and whether by direct invitation or in response to general publicity.

1.4 Potential respondents were structured into 10 categories or target groups reflecting the involvement of a wide variety of groups in Building Regulation assessment and fire legislation. Opinion was obtained either by carrying out face-to-face interviews or by inviting written statements or both. 101 distinct individuals or organisations have been invited to contribute and the Consultants have received 111 replies many in response to the general publicity.

Responses

1.5 The distribution of those who have responded is illustrated in Figure 1 below.

Figure 1

Target Group Name	Target Group No.	Asked	Replied	Unasked But Submitted	Total Received
Building Owners	1A	14	9	0	9
Design Professionals	1B	33	19	4	23
Property Developers	1C	11	4	0	4
Large Builders	1D	3	1	0	1
Small Builders	1E	8	1	0	1
Government Organisations	2	2	2	0	2
Fire Authorities	3	10	10	26	36
Bldg. Control Authorities	4	13	13	14	27
Education for Design	5	4	4	1	5
Education for Enforcement	6	3	3	0	3
TOTAL		101	66	45	111

1.6 Participants in the process of conceiving and regulating the provision of fire safety in buildings during their design, construction and adaptation fall into three broad categories: those who design and build, those who regulate building on behalf of the public and those whose chief concern is fire, including fire in buildings. Each category is made up of several levels of people such as the building owner, developer, builder and architect, the Building Control Officer and district council, the Fire Prevention Officer, Fire Brigade and Fire Authority. To simplify reference to the main participants, this report uses the following general terms.

The Applicant: any person or group who applies for approval under the Building Regulations to build buildings or adapt buildings for use, including any building owner, developer, architect or builder.

BCO: the Building Control Officer, representing the local authority, usually a district council, in its capacity as building control authority, responsible for the enforcement of the Building Act 1984 and the Building Regulations within its area.

FPO: The Fire Prevention Officer, a member of the local Fire Brigade and representing in this context both the Fire Service and Fire Authority, responsible for advising upon enforcing, a wide range of legislation relating to fire safety in general and for enforcing the Fire Precautions Act 1971.

The Form of the Report

1.7 This report is in 7 sections of which Sections 2, 3 and 4 are an assemblage of factual information on the legislative background, the technology and the responses received from the survey of opinion. Section 5 is a general discussion on the positions taken on various issues by the Respondents and in which the legislative and technological aspects outlined in Sections 2 and 3 are considered in the more dynamic sense as trends which could affect the problems real and perceived, raised by the various Respondents. Section 6 is a condensation of the Consultants' conclusions based on the facts and their analysis of the foregoing together with their views on the options and practical steps which might be taken to address the issues identified, and culminating in a series of recommendations.

Section 7 is a brief view on the cost implications to the recommendations.

2. The Legislative Background

2.1 This section of the Report presents a general review of the main pieces of legislation with which an Applicant for Building Regulation approval may have to comply in matters of fire safety, depending on the type of building and its intended use.

The 'Holroyd' Distinction

2.2 In the main, present legislative arrangements for fire precautions were supported by the publication of the Report of the Departmental Committee on the Fire Service, chaired by Sir Ronald Holroyd and presented in May 1970. Commonly known as the Holroyd Report, it recommended that fire precautions legislation should be concentrated in two main branches, one applying to new buildings and the other to occupied premises. It further recommended that responsibility for the former should rest with Building Control Authorities, with Fire Authorities adopting an advisory role, and for the latter with Fire Authorities.

Controlling Building Design and Construction

2.3 Building Regulations are the responsibility of the Department of the Environment and currently govern certain aspects of building design and construction in the interest of public health and safety, conservation of fuel and power, and making buildings accessible to disabled people. The Regulations apply, in general, to most new building, to some types of building alterations and to certain changes of use. It is important to note that they do not otherwise apply to buildings in use.

2.4 The Regulations are administered by the Building Control Officers (BCOs) of local authorities who pass or reject plans, consider applications for relaxation or dispensation of provisions of the Regulations, and make inspections of the work during construction. There is provision for supervision of building to be undertaken by Approved Inspectors instead of by Local Authority Building Control, but to date there is only one Approved Inspector, NHBC Building Control Services who are approved for housing up to four storeys. Local Authority Building Control and Approved Inspectors charge Applicants a fee for assessing proposals for new or materially altered buildings, and ensuring that works carried out are in satisfaction of the Building Regulations. The system is intended to be self-financing. Besides the initial approval (or rejection) many Local Authority Building Control Departments also issue an informal certificate of compliance and some even a Formal Certificate at least for Part B which relates to fire. Approved Inspectors must issue a Certificate for all their projects.

2.5 In 1985, under the provision of the Building Act, 1984, new Building Regulations were introduced in which most of the formerly prescriptive regulations became simple functional requirements, the amount of control, compared with the previous 1976 Regulations, was significantly reduced

and the option was provided for Applicants to give in some cases a simple building notice instead of depositing full plans. Approved Documents issued with the new Regulations give technical guidance on how the requirements of the Regulations can be met. Builders and designers do not have to follow the Approved Documents if they can satisfy the local authority or Approved Inspector that their proposal meets the requirements of the Regulations. This is a more flexible system of control but it is one which calls for the exercise of more judgement by BCOs in its interpretation and application.

2.6 Part B of the Regulations relates to fire. Part B1 covers the provision of means of escape in case of fire and Parts B2, B3 and B4 cover requirements for structural fire protection of buildings, including measures to restrict fire spread within and between buildings, and to prevent premature failure of the structure of the building in a fire. The provisions concerning means of escape in case of fire are, exceptionally, the subject not of an Approved Document but of a set of Mandatory Rules. The designer does not therefore have any discretion in satisfying the requirements of this regulation.

2.7 At present most parts of the Building Regulation 1985 apply with few exceptions to the erection, extension or material alteration of all buildings, sanitary equipment, drainage, heating and energy control systems but, uniquely, Part B1, and its Mandatory Rules for Means of Escape, apply only to offices, shops and dwellings of three or more storeys.

2.8 Consequently there is a particular and direct overlap between the procedures and responsibilities flowing from the Fire Precautions Act 1971 and the Building Act 1984 in the matter of the provisions for means of escape from offices and shops. However, the legislation for fire precautions in buildings in use, has also been reviewed and changed (see paras. 2.14-2.18).

The Stage Two Review

2.9 The review of the Regulations that led up to the publication of the 1985 documents was chiefly concerned with their form, and the technical content, largely unchanged, was transferred into the Approved Documents and presented in a much more readable form. A second stage of the review process is now under way which focuses largely on the technical content. The aim continues to be to simplify and clarify the provisions and ensure that they achieve the objectives of the Regulations without going beyond what is necessary and without restricting designers and builders unnecessarily. On fire aspects, a Fire Advisory Panel has been set up to provide specialist technical advice to the Building Regulations Advisory Committee.

2.10 According to the explanatory letter of 15 December 1986 from the Department of the Environment, and its detailed Annex, on the subject of Stage Two of the Review of the Building Regulations, that activity is expected to simplify and clarify the requirements of the Regulations in a number of important respects.

2.11 In the matter of fire safety, the Review is addressing the following issues:

- increased emphasis on the safety of people rather than the protection of property
- comprehensive codes on means of escape so that requirements could be applied to all buildings
- making a clearer distinction between the control of building work by the Building Regulations and continuing control of the use of a building under other legislation
- provisions in Regulations for assistance to the Fire Service in large buildings which are at present found in some local legislation
- the control of means of escape in all buildings by building regulation rather than by other legislative means which operate after the building has been built
- a number of detailed matters such as compartmentation, reducing periods of fire resistance, fire barriers, trade-offs between active and passive measures for fire protection, non-combustible materials and space separation.

2.12 Other information received by the Consultants suggests that the Mandatory Rules underpinning B1, means of escape, may be replaced by an Approved Document currently in preparation and which would enable B1 to be applied in a similar manner to other parts of the Regulations and other ADs prepared to cover additional fire matters in Part B.

Regulating Fire Safety in Buildings in Use

2.13 The Fire Precautions Act 1971 introduced provisions for statutory control of fire precautions in certain designated premises through a system of fire certification. The premises designated under the 1971 Act by subsequent related Orders and Regulations as requiring Fire Certificates are larger hotels and boarding houses (1972) and certain factories, offices, shops and railway premises (1976).

2.14 The impact of the Fire Precautions Act 1971 has been regularly monitored by the Home Office. The findings of a major Government study started in 1974, and culminating in the publication of the Review of Fire Policy: an Examination of the Development of Resources to Combat Fire, 1980, revealed the general impression that the Act was in some respects too inflexible, resulting in unacceptably high compliance costs. To deal with this situation proposals were made, in a consultative document issued in 1985 by the Home Secretary and the Secretary of State for Scotland, for a new system of fire precautions aimed at replacing certification with a statutory duty on occupiers of designated premises to achieve and maintain a reasonable level of fire safety. The response to the ensuing consultation exercise, which included comments from a wide range of business interests, indicated that the proposals had little appeal to occupiers of premises requiring Fire Certificates who felt that they would be left unsure of their responsibilities, or to Fire Authorities who feared a drop in standards.

2.15 Modified proposals taking account of these concerns were produced in 1986. These had a more favourable reception and formed the basis for Part 1 of the Fire Safety and Safety at Places of Sport Act 1987. This Act has two main thrusts in respect of fire precautions; first, to refine and streamline the system of certification without substantially extending the definition of premises liable to certification and, second, to enable Fire Authorities to grant exemption from certification to low risk premises in defined categories.

2.16 Fire precautions in exempted premises are achieved primarily through the compliance of occupiers with a voluntary Code of Practice, which are drawn up to enable them to meet their statutory duty to provide adequate means of escape in case of fire and such means for fighting fire as may be required in the circumstances of the case. Failure to comply with the Code of Practice is not itself an offence though it could lead to the serving of an improvement notice. Compliance with the code, in appropriate circumstances, is deemed to satisfy the duty. In what is seen by the Home Office as a major step towards self-regulation, it is also open to occupiers to seek to meet the statutory duty in other ways, provided that the standards achieved are at least equivalent to those laid down in the code.

2.17 The Code of Practice applies to factories, offices, shops and railway premises not required to have a Fire Certificate, which are broadly those where fewer than 20 people work, not more than 10 people working elsewhere than on a ground floor and which do not pose any special risk by containing explosives or highly flammable materials. This document refers to the Fire Precautions (Factories, Offices, Shops and Railway Premises) Order 1989.

2.18 Clearly it is too early to comment here on the ramifications of these more recent developments of the legislation relating to existing premises. It is worth noting, however, that they follow a trend towards exempting more buildings from the need to have a fire certificate with an attendant statutory duty being placed upon the owner or occupier to provide means of escape and means for fighting fires.

The Fire Certificate

2.19 These developments in the legislation draw attention to the Fire Certificate as issued where required by the Fire Precautions Act, 1971, and subsequent amending legislation. The procedures leading up to the issue of a Certificate are involved and not relevant to the Consultants' review, but the purpose of the Certificate and what its issue signifies are important.

2.20 A Fire Certificate, by inspection and where required by improvements prior to its issue, specifies and thereby confirms the reasonableness in the circumstances of the case the following aspects of the building's occupation in respect of fire safety:

- (i) the use of the premises
- (ii) the means of escape
- (iii) that the means of escape can be effective when required

- (iv) the appropriate fire-fighting equipment
- (v) appropriate fire alarms

and in the case of factories,

- (vi) proper storage and use of any explosive or highly flammable materials.

In addition a Fire Authority may require some provisions for maintenance of means of escape and equipment, the training of employees and a limit to the number of people using the building at any one time.

2.21 With the exception of the provision of (ii) and (iii) these are all matters which can be addressed fully only when a building is occupied and in use.

The Statutory Bar

2.22 Means of escape in terms of their physical provision can, and must in the case of buildings covered by Building Regulations, be incorporated at the stage where the building is being constructed or physically altered. Their provision in occupied premises is usually difficult, disruptive and costly and should be necessary only where the building requiring certification has not at any earlier time been subject to Building Regulation control since 1971, or where the use of the building has been changed in a way that has rendered its means of escape inadequate.

2.23 The same with slightly less certainty, but also with much less costly consequences, can be said of fire-fighting equipment and fire alarms, although their basic provision is not as yet covered by Building Regulations.

2.24 The potential burden upon an Applicant of being required for purposes of fire certification to provide in a building already in use some costly alteration, most likely to means of escape, which should have been covered adequately and economically at Building Regulation approval stage, was foreseen and measures in the Fire Precautions Act 1971 are intended to ensure that there is no avoidable conflict between the requirements of the Fire Authority and those of the Building Control Local Authority. These measures include the requirements of consultation between the two Authorities and particularly the requirements that the Local Authority consult the Fire Authority before dispensing with or relaxing any requirement relating to means of escape in the Building Regulations, and before passing plans for a building likely to be put to a designated use.

2.25 The corollary of that requirement to consult is also provided for in the Act which states that the Fire Authority may not, in the course of fire certification procedures, require any change or improvement to means of escape provisions already approved under the Building Regulations, except in very special circumstances. This measure is generally referred to as 'the Statutory Bar'.

Licensing and Registration

2.26 Both licensing and registration are means of achieving some measure of on-going control over occupied premises.

2.27 Licensing applies generally to places of public assembly such as Theatres, Cinemas, Gaming establishments, premises used for music, dancing or similar entertainment open to the public and public houses, off-licences, clubs and restaurants selling alcohol. The keeping and sale of petroleum spirit is also dealt with by the issue of licences by the County Council.

2.28 For most of these uses, the licensing authority consults the Fire Authority, although in the case of theatres it is not obliged to.

2.29 Section 31(1) of the Fire Precautions Act 1971 avoids the duality of enforcement where under any enactment a Licensing Authority is authorised to impose terms, conditions or restrictions in connection with the issue of a licence which relate to fire matters. But the section only applies so long as there is in force with respect to the premises a fire certificate covering the use of the premises by reason of which the licence is required. Neither of the current designating orders covers such a use.

2.30 Registration applies to residential care premises such as old persons' homes, nursing homes of various kinds, children's homes and nurseries for young children. Most registration authorities consult or require applicants for registration to consult the Fire Authority.

The Health and Safety at Work Act 1974

2.31 The main purpose of the Health and Safety at Work Act 1974 (HSWA '74) is to secure the health, safety and welfare of persons at work, or other persons, against the risk to health and safety arising out of or in connection with the activities of persons at work. It is administered by the Health and Safety Commission and its Executive and is generally enforced by inspectors employed by either the Health and Safety Executive or by Local Authorities. It is an enabling Act, whose introduction only partially replaced existing health and safety at work legislation with repeals, amendments, revisions and updatings to continue as necessary over a period of years. Thus it was similar to the FPA '71 in having the aim of ultimately drawing together and rationalising a range of existing legislation.

2.32 In general terms, the responsibility for complying with a broad functional requirement under a statutory duty is placed on the occupier in S2 as 'to ensure as far as is reasonably practicable, the health, safety and welfare at work of all his employees'. For some matters covered by this general requirement Regulations have been issued and where appropriate these have been supplemented by Approved Codes of Practice which, whilst not statutory requirements, may be used in criminal proceedings as evidence that a statutory requirement has been contravened.

2.33 The enforcing officer's role is twofold, first, to act as a catalyst in either assisting the employer in solving his health and safety problems or recommending appropriate sources of guidance or advice and secondly, to enforce the legislation. In this latter role three steps are available to him:

- an improvement notice;
- a prohibition notice, and
- prosecution

2.34 The Fire Precautions Act 1971 with its 1987 amendments, now has codes of practice, improvement notices and prohibition notices available as enforcing tools but it differs greatly from the Health and Safety at Work Act 1974 by its much greater use of certification.

2.35 Other than fire certification under the Fire Certificate (Special Premises) Regulations 1976 (which merely follows the pattern set out in the Fire Precautions Act 1971), little use is made of detail certification or licensing under the Health and Safety at Work Act 1974.

The Fire Services Act 1947

2.36 Although the provisions of this Act are not intended to address specifically the question of fire safety in buildings at the stages of planning and construction, Section 1(1)f of the Act places a duty on the Fire Service to give advice and this in practice has brought the Act very clearly within the scope of this review.

2.37 The NJCC Guidance Note 3, published in December 1987, contained a useful list of 46 separate pieces of legislation relevant to fire safety in the design and use of buildings (Appendix 1).

2.38 It is of interest that 19 of the 21 national Acts and 24 of the 25 local Acts on that list came into force in the last 25 years, and that since the list was drawn up a further two pieces of national legislation, the Fire Safety and Safety at Places of Sport Act, 1987, and the Fire Precautions (Factories, Offices, Shops and Railway Premises) Order, 1988, have been enacted.

2.39 From this very brief review alone it is evident that there is a high rate of change and development of legislation in this field.

2.40 Although the same list indicates that the Local Authority is the enforcing authority under most of these statutes, in many cases it is required that the Fire Authority be given notice or consulted.

2.41 As well as the requirement to consult under the Building Act, there are cases where Local Authority Building Control must consult the Fire Authority under Section 16 of the Fire Precautions Act, 1971. The Fire Services Act, 1947, also obliges the Fire Authority to give advice on request on fire prevention and means of escape from fire.

2.42 The situation, therefore, is one not only of rapid change and development in the laws governing the behaviour of many building occupants and Applicants for Building Regulation approval, but also one in which there is some overlapping of the roles of local government bodies at county level, acting as Fire Authorities, with those at district level, through their building control function.

3. The Technical Background

3.1 The Consultants have drawn on the work and expertise of many experts in fire engineering to prepare this resume of the advances in that discipline, in particular that of Drs. D. Drysdale and E. Marchant of the University of Edinburgh, Professor P.H. Thomas of Lund University, Margaret Law of Arup Research and Development, H.L. Malhotra, Consultant, and Dr. D. Woolley and B. B. Pigott, of the Fire Research Station, Borehamwood.

Fire Fighting and Fire Prevention

3.2 Fire-fighting and fire prevention both play important roles in saving life, the former often in an heroic way, by firemen whose actions are held in high esteem by the public, the latter usually in less demonstrative or visible ways by those who study the theories of fire science as well as those who practice fire-fighting.

3.3 Important differences between these curative and the preventative means have implications for organisation, training and resource allocation, but these differences need not prevent transfer of knowledge between disciplines, and the Home Office Fire Department and the Fire Service College play an active role in ensuring that the knowledge gained from fire fighting is translated into regulatory measures affecting both the design and construction of the building and its use.

3.4 As with structural design, which graduated from early trial and error and many fatal experiments into a reliably predictive specialism, so design for fire, once thought to be commonsense tempered by the experience of fire fighting, is rapidly becoming a field of specialist knowledge. The probability of fire ignition and the subsequent protection from it are now regarded as the outcome of a complex interplay between the construction of the building, its contents and behavioural factors. How fire affects these factors and how these factors affect the igniting of fires can now be simulated, modelled and predicted with increasing confidence.

3.5 This empirically-based knowledge and the quantitative techniques derived from it can play a major part in protecting occupants from fire to the extent that it is absorbed into the methods and application of fire precautions.

The Two Forms of Fire Precautions

3.6 As stated earlier (2.2), the 'Holroyd' distinction recognises that in the main, fire precaution provisions should be divided between those incorporated when a building is constructed or physically adapted and those which are installed or maintained while the building is in use. This legislative distinction reflects the technical realities of building construction and use.

3.7 This distinction between the two forms of fire precautions is reinforced by other differences between the two major phases in the life of a building namely:

- building construction is a relatively short and finite process with a distinct start and finish; the building-in-use phase is lengthy and relatively continuous.
- building design and construction are based on relatively hard technologies and fire protection engineering is also acquiring sound empirical foundations, whereas fire precautions problems of buildings-in-use have more to do with social behaviour, people's reactions in an emergency, an appreciation of what creates a fire hazard, staff training and (as seen recently at Bradford and King's Cross) the approach to facilities management in general and waste in particular.
- the provision of fire precautions during design and construction is, generally speaking, the outcome of an interaction between technical professionals, especially the Building Control Officer and the building professionals acting on behalf of a client; in the building-in-use fire precautions involve much more directly the Fire Prevention Officer and the end-users, ie owner-managers, tenants, residents etc.

Fire Precautions in Building

Structural Fire Protection (SFP)

3.8 Structural fire protection measures are part of the built system and are usually termed passive measures, primarily because once in existence they are present all the time and remain available whenever a fire might occur. Most of the traditional fire safety requirements have been based on structural fire protection measures. The important passive measures are:

- use of non-combustible materials for construction
- linings having slow flame spread characteristics
- escape routes to reach safe areas in a prescribed time
- protection of escape routes by fire-resisting construction
- design of the structure to resist burn-out of contents
- compartments to limit the size of fire
- building separation to prevent conflagration (fire spreading from one building to another)

3.9 Each of these has been traditionally regarded as a separate provision and their specification is related to the expected hazard due to the use of the building. The only exception is the compartment size where some ill-defined relationship exists with the fire resistance requirement.

3.10 This method of providing fire safety has been the backbone of fire regulations. There is an assumed high degree of reliability with passive measures because they are essentially a part of the construction. Usually, problems with them arise only from lack of maintenance or damage left unrepaired.

3.11 Perhaps the least reliable parts of the passive system are fire doors. However good the design of a door may be, unless it is closed when a fire occurs, there will be no resistance to the passage of that fire. Some surveys from existing buildings show that as many as 20 per cent of fire doors in buildings may be partially or fully open most of the time. Due to lack of proper maintenance some fire doors may not close properly even when required to do so.

Active Fire Protection (AFP)

3.12 Active fire protection systems include those provisions which are present in a building but start to work only when smoke or heat trigger their operation. They include:

- fire detection devices
- some types of smoke control systems
- fire extinguishers
- fire extinguishing systems

3.13 In some cases their action is completely automatic, eg the operation of a fire detection system; in others a further activity has to be performed, such as using a portable extinguisher to put out a fire. The active measure may be linked to perform some other function as well, eg a fire detection system can be linked to door operating mechanism so that on the occurrence of fire certain specified doors which are normally in an open position will automatically close.

3.14 The automatic extinguishing systems, of which a sprinkler installation is a common example, are designed to extinguish a fire of a specified size. If the system is properly designed then a fire can be expected to be extinguished soon after the sprinklers operate. In practice this may not always happen, due to a variety of reasons, and the fire may not be extinguished but only controlled in size. The most common cause of failure is due to the non-operation of sprinklers because the water supply has been turned off or repair work is being carried out. Data on the reliability of sprinkler systems from Australian and American sources suggest a reliability level of 95 to 99 per cent. But it is not clear from these data if this level includes the instances where sprinkler systems are not available for one reason or the other. The limited amount of data from the UK experience has shown a lower level of reliability with published values of around 75 per cent.

Interactions between SFP and AFP

3.15 Interactions are possible between different fire protection measures if the objectives they achieve are interrelated or influence the same phenomenon. For example, means of escape in buildings are designed to allow the occupants to reach a place of safety within a specified time. If another measure such as a detection system affected this time then an inter-action can be seen between the two measures. Similar direct

interactions can be seen to exist between sprinkler installation and fire severity as well as the extent of spread of fire if the sprinkler installation is capable of extinguishing or controlling a fire.

Trade-off

3.16 Trade-off means exchanging one measure or part of a measure for another one which can be shown to provide an equivalent level of protection. Soundly-based trade-off is not possible without establishing positive equivalency. The concept of trade-off is not new and has been in existence for a much longer period in some other countries than the UK. The USA, Canadian, Australian and New Zealand building codes allow concessions when either automatic detection or sprinkler systems are provided. These differ from country to country and the permitted concessions relate to surface lining requirements, travel distances, fire resistance requirements, compartment size and separation requirements for buildings.

3.17 In order to develop a system for trade-off between active and passive measures it is necessary to establish the precise equivalencies between various measures. Two types of relationships are possible. Firstly, a linear relationship in which increases in one measure lead to progressive decreases in the other, this is only possible where the two measures are capable of linear or small step adjustments. But, secondly, where one of the measures has only two states, on or off, there can be only a single step adjustment in the other corresponding to the on-off states. For example, if a sprinkler system operates it will decrease the fire-severity or fire spread by a unique proportion; there are no progressive variations possible.

3.18 Under the changing building regulation system more flexibility is available and consideration is being given to the way in which concessions may be introduced. There may be further developments in the near future as the extent of possible trade-offs is being considered under the Stage Two Review of the Building Regulations.

Fire Research and Fire Science

3.19 Modern methods of fire testing and a mathematical, engineering approach to fire science can be traced from their beginnings in Austria early this century, through work in Japan (Tokyo, 1923), the U.S.A. in the '20s and '30s, the UK war-time experience, post-war Japan and into the American universities from 1979 as an emerging academic discipline.

3.20 With the recent publication of the Society of Fire Prevention Engineers comprehensive Handbook¹ there would seem to be the beginning of international recognition of the needs of this discipline and the scope and content of its field.

3.21 In the UK there have been advances in many important areas of research. For example, the Fire Research Station has a considerable body of research concerning means of escape, not yet fully accepted by the fire establishment, and which would make it possible to specify equipment with low false alarm performance and monitor it both remotely and

¹ The National Fire Protection Association, 'SFPE Handbook of Fire Protection Engineering', September 1988.

cheaply using automatic equipment, at very low cost through maintenance contracts, the Fire Services or both. Also it is possible to show that motivation to escape is predictable and efficient. The expected economic gain would be an increase in usable floor space, through the design of longer safe escape routes.

3.22 The translation of this kind of research into the syllabus of higher education has taken place mainly in the USA and at Lund University in Sweden. A strong attempt to launch a post-graduate course in fire safety engineering at the University of Edinburgh in the late 1970s produced a few graduates and then foundered through lack of funding, although the Unit of Fire Safety Engineering remains as a centre of research and development.

3.23 In spite of these slow beginnings it is clear that this field of study, research and practice will expand to the point where it finally infects all thinking on this subject. No science-based technology has failed for long to penetrate an open society once its capacity for effecting economies and other benefits has been demonstrated.

3.24 This is particularly true where one expanding technology drives another as is the case with contemporary building technology and fire engineering. The new methods, materials and spatial needs of modern buildings are meeting the demands of modern commerce and manufacturing and services industries by providing new building solutions. These in turn create problems beyond the power of old empirical knowledge and codes 'derived from a combination of folklore and intuition collected by committees' to quote Professor Thomas.

3.25 Instead, these new problems are solved by research such as that in analytical modelling theory; discrete phenomena of basic fire processes; simultaneous equations of integrated models of mass and heat transfer; partial differential equations expressing the basic laws of mass, momentum and energy conservation to study smoke in very large volumes interacting with other air movements; risk assessment based on the calculation of probability; the development of performance based standards for components such as those now operational in Sweden, the CIB Design Guide for structural fire safety published some time ago, and the recent publication of a Japanese standard proposal for whole building performance in the design of evacuation routes.

3.26 The application of this new knowledge is held back by the shortage of specialists capable of teaching it or translating it into general practice. Consequently the general solutions and technical standards that would spread economies over the wider field of building will have to await the trickling down of ideas and information from the larger, more innovative building projects and from the slow growth of knowledge in the field in general.

Present Levels of Education and Training

3.27 Currently, there are three main groups involved in the process of designing, advising upon and enforcing measures for fire safety in

building, and whose education and training must therefore be reviewed against the background of the advancing technology described in paragraphs 3.19–3.25 of this report.

The Applicant

3.28 The Applicant sets the process in motion when he first signals an intention to build or alter a building. At that stage his professional team should have or be able to acquire fire safety expert advice on fire safety consistent with the complexity of the design proposed or intended.

3.29 In his Fire Research lecture 'Fire and the Architect'¹, Dr William Allen refers to the process by which architects, uninterested or ignorant about fire in buildings, negotiate with fire officers 'with a mixture of reluctance and gamesmanship'² and learn most of what they know about fire 'by osmosis in arguments with fire officers'³. This relationship is summarized thus,

'... architects soon learn that fire officers have faults like other human beings and are variable in their opinions and prejudices, and that they also carry a big stick. One always keeps one's fingers crossed that one's fire officer won't be changed in the middle of a project. Whatever the cause of the variability it indicates that fire officers and architects are not standing on common educational ground ... in any case some of the ground is not very firm.'⁴

3.30 It is interesting to note here that Dr Allen has assumed that it will usually be the fire officer, not the Building Control Officer or the private fire consultant, with whom this ill-equipped agent of the Applicant will interact in seeking a safe and sensible solution to fire in design. And yet it will usually be the Building Control Officer who will approve or reject his plans and who will inspect the work on site. Any diversity of view between Fire Officer and Building Control Officer or any change of design that has taken place between their respective interventions will have to be resolved at the point of submission of completed plans or even on site, which is rather late in the day if alterations are required.

3.31 But possibly of greater concern is the fact that this misconception by the architect of the Fire Officer's role in the regulatory system and the Fire Officer's willingness to respond to every approach and even to take initiatives in offering advice to Applicants, dampens the tendency for architects to educate themselves properly in the best means of integrating fire safety measures into their building designs. In these circumstances it is hardly surprising to find that, with a few notable exceptions, fire safety hardly appears in their undergraduate curricula or their continuing professional development (CPD).

3.32 If the size or complexity of the building project takes it beyond modest technology of the architect and Fire Officer, the Applicant must then seek the help of a specialist consultant. Of these there are very few in

¹ Dr William Allen CBE LLD RIBA, 'Fire and the Architect – the communication problem', 4 November 1987.

² *ibid.*

³ *ibid.*

⁴ *ibid.*

the UK (estimates given to the Consultants put them at around 200) and apparently no plans to educate more. If, as would appear likely, the demand for their expertise grows and their numbers decline, the options for the Applicant will be reduced. To the extent that these experts are currently active on building design teams they do, of course, generate the need for comparable levels of expertise on the side of Building Control Authorities.

3.33 In summary, the general level of knowledge and competence of many Applicants and their agents in respect of fire development, spread and protection is low. Building Control Officers are critical of Applicants who submit substantial building projects for compliance with fire regulations in the Building Regulations without a grasp of general concepts, sufficient knowledge or specialist advice on the subject of fire safety.

3.34 In the past Fire Brigades have given free advice in such circumstances under S1 (1)(f) of the Fire Services Act 1947 but some Fire Authorities consider that this arrangement is being abused by some Applicants.

Building Control Officers (BCOs)

3.35 Because Building Control has been, traditionally, a Local Authority function, the training of Building Control Officers was originally structured to suit the local government system, but the advent of the Building Act 1984 changed that and now people trained as Building Control Officers may be employed by the private sector and operate in competition with their local authority counterparts. This development has brought about the need to review established training programmes in order to cater for the developing roles of private and local authority Building Control Officers.

3.36 The educational syllabus and curriculum of BCOs is given in detail in Appendix 2 from which it will be seen that entry to this profession is based on polytechnic or equivalent standards, the courses through the three parts of the curriculum total nine years from entry to graduation, the syllabus is necessarily wide and the Institute of Building Control is encouraging colleges and polytechnics to offer diploma courses based on two-year modules to permit deeper study of subject areas. This approach provides an opportunity for the serious expansion of a BCO's education in fire engineering as distinct from basic training in fire precautions. The profession is attracting a growing number of graduates from other disciplines which should have an enriching and broadening effect and provide the student material capable of taking the study of special areas such as fire in buildings to post-graduate levels.

Fire Prevention Officers (FPOs)

3.37 Details of the syllabus and curriculum of an FPO's training is given in Appendix 3. The educational background of the average Fire Prevention Officer does not appear to be generally as high as that of BCOs. This fact, combined with a curriculum that comprises a series of short periods of intensive training on an extremely wide and ambitious syllabus must raise some serious doubts about the depth to which any aspect of these studies

can be taken. Quite apart from laying the educational groundwork to enable FPOs to deal with the increasing volume of information on fire research and engineering, their syllabus would need to be even further expanded in the direction of construction technology if, for example, they are to continue to offer advice on all the fire safety implications of modern building technology. From this it follows that as currently trained FPOs would be even less able than BCOs to deal with problems of fire safety at the leading edge of fire engineering, especially in the context of advanced or innovative design and construction.

3.38 However, the Consultants are impressed by the evidence that the Fire Service College is moving towards revisions of curriculum and syllabus which would enable it to diversify its methods and to fit into a broader network of education and training. In the light of advances in this field this will be an essential development not only for the future mission of the College and the further education of Fire Prevention Officers, but possibly also as an important contribution to raising the level of learning of architects and building control professionals.

3.39 It is also important to note that, from his experience as a fire-fighter, the Fire Prevention Officer may have obtained at first hand a knowledge of how materials behave, how structures react to intense heat and how flames and smoke spread over and through construction. Of equal or greater importance, he will witness the effects of fire on the contents of buildings and the behaviour of people in a fire emergency. Also, he will learn quickly what sort of provision of access to buildings, equipment and extinguishing media can make his fire-fighting more effective and safer.

3.40 Although this valuable, unique and personal knowledge is already collected upwards through the Fire Service and finds its way into codes and guidance, it can still be useful especially in the areas of advising on access and facilities for fire-fighting and inspections of premises in use. However, in offering advice on fire safety provisions generally, it can only augment a sound knowledge of the general principles and practices of fire safety engineering and cannot, of course, be a substitute for such knowledge.

4. The Findings of the Survey: The Respondents' Opinions

Introduction

4.1 In an attempt to facilitate comparisons between the views of Respondents, the Consultants derived from the Terms of Reference, ten principal issues on which they sought opinions.

These ten issues were:

1. Overlap in Legislation
2. Weaknesses in the links between BCO and FPO at the Building Regulations approval stage
3. Simplification of the Consultation Process
4. Problems of Local Legislation
5. The Practicability of the Single Certificate
6. Overcoming delays
7. Technical and Practical Skills
8. Training and Management
9. Methods of Enforcement
10. The Private Sector

4.2 Whilst some Respondents adhered closely to this structure, others grouped several issues together, regarding them as a set of characteristics of the same problem; in some cases, such as local legislation, nesting within overlaps in legislation generally. Similarly, few Respondents made clear, structured distinctions between technical and practical skills and training on the one hand, and management on the others.

Overlap in Legislation

4.3 Few Applicants knew the legislative basis for the involvement at the Building Regulation assessment stage of two authorities, but virtually all were irritated by their believing that they had to deal with two authorities, the FPO and the BCO. One design-and-build company actually believed that for new offices, means of escape was the responsibility of the Fire Authority only!

4.4 This misperception of the dual role or overlapping responsibility of the two authorities had in the Applicants' opinions, created a number of difficulties.

- It was not clear to clients which authority carried responsibility. Whilst owners and developers usually left it to their professional advisers to sort matters out, in the words of one major property developer, they clearly preferred 'the firmness of one authority'.

- By dealing with two authorities, Applicants were vulnerable to receiving conflicting advice, and some Respondents had.
- By their early involvement at the design stage, Fire Brigades had, in the opinion of many Respondents, been drawn into interpreting Part B of the Building Regulations, sometimes erroneously.
- In the opinion of some Applicants and BCOs many Fire Brigades did not distinguish what would be requirements under which legislation and what was only advice. Much of the advice given by Fire Brigades was oral.
- Two fire research organisations were concerned that the dual involvement at the design stage was making it difficult to achieve an integrated approach to fire safety design, and had a negative impact on the optimum design of buildings from both technical and financial viewpoints.

4.6 Naturally as the two major protagonists in this legislative overlap, Building Control Officers and Fire Prevention Officers were more able to articulate why consultation had to take place at all though most only cited the relevant sections of the Acts, and the difficulties it presented. Both of these groups also had much more experience than any single Applicant, of the operation of the system on which to base their generalised comment.

4.7 Most Building Control Officers, the RICS, IBC and the ADC highlighted the partial coverage of B1 as a principal cause of the simultaneous involvement of both authorities, although they felt that there had been inadequate explanation to Applicants of the perceived need for consultation.

4.8 In the opinion of many of the Building Control Officers, the RICS, the Institute of Building Control and the Society of Chief Building Control Officers, the dual involvement at the design and construction stages of BCOs and FPOs coupled with the ambiguous and technically ill-defined relationship between them was producing problems for Applicants who felt they had to strive to serve two masters.

4.9 On the issues of dual involvement, consultation and relationship with Local Authority Building Control the responses from the Fire Service were very uniform.

4.10 Fire Brigades saw dual involvement as essential, since they regarded themselves as the experts on *all* fire matters, and many had gone to some length to structure consultation with Building Control Officers. The Consultants have seen draft guidance for consultation which states that:

‘The Building Regulation application must be rejected, if B1 applies, where the Fire Officer has not replied in writing and/or the Applicant has not submitted amended plans to show conformity with the requirements of the Fire Authority.’

Problems of Local Legislation

4.11 Companies operating nationally, particularly in retailing, regarded local legislation as a minor but nevertheless irritating nuisance that was arbitrary and unjustified.

4.12 There was widespread support from BCOs and professional institutes for the reduction if not the abolition of fire matters in local legislation by adding sections to Part B to cover access for and assistance to the fire brigade and additional requirements in buildings of excess cubical extent or height. Many hoped that the Stage 2 Review of the Regulations would effect this change thus rendering most local legislation on fire matters redundant.

Weaknesses in the Links between BCO and FPO at the Design and Construction Stages

4.13 A more substantive issue concerning gaps rather than overlaps may be the concern of FPOs that although means of escape is a principal component of fire safety in all premises the present Part B1 of the Building Regulations covers only a limited range of purpose groups so that certain types of building could be erected without having had to satisfy at the design and construction stage specific means of escape standards. However, no example was given of this having happened.

4.14 Through the sheer dint of personal effort of the participants, and mainly of the FPOs, liaison between some Building Control Officers and FPOs is excellent but the general pattern, confirmed by the evidence from all the professional organisations for Building Control Officers and the ADC, is one where the dual involvement at the design and construction stage has led to a difficult relationship between BCOs and FPOs.

‘...a substantial majority of areas suffer nuisance and inconvenience in administering the Building Regulations which inevitably adversely affects developers.’

4.15 A substantial number of Respondents among BCOs regarded the consultation, whilst legally required, as technically unnecessary except for specialist operational advice and in some cases for Active Fire Detection systems. Many BCOs however checked even these as well as sprinklers upon completion of the building. This view tended to be held primarily but not exclusively, by the London Boroughs (where there has been tradition of enforcement of fire legislation by BCOs) and by BCOs in the larger provincial cities.

4.16 Regardless of its necessity, however, the consultation exercise was seen by the professional institutes to be frequently frustrated by distance, insufficient delegation of decision-making in fire brigades and discontinuity of Fire Brigade personnel.

4.17 The consultation was impaired by distance because although fire stations are numerous and widely distributed, the fire prevention department, and especially the decision takers, are often concentrated in the fire brigade headquarters.

4.18 It was impaired by insufficient delegation of decision making authority within Fire Brigades where, some BCOs told the Consultants, even ADOs defer problems upwards to DOs. This contrasts with the responsibility and independence of BCOs generally on all but the most complex projects, which have been enhanced by both the form of the 1985

Regulations and the bringing of London into line with the rest of the country. This tendency to concentrate decision taking high up the Fire Brigade hierarchy aggravated the problem of distance. Both may contribute to the Respondents' reports of the often belated arrival of Fire Brigade opinion following consultation.

4.19 And finally consultation was impaired by discontinuity, ie a too frequent change of Fire Prevention personnel.

'... there are weaknesses in the link and these include the frequent movement of officers within the Fire Authorities and the consequent lack of continuity in Fire Prevention Officers with whom building control departments consult. This rapid turnover and lack of continuity results in a variation of interpretation and administratively it is time-consuming. It does nothing to assist applicants in obtaining an early decision on their applications.'

4.20 For a sizeable number of BCOs, inviting Fire Brigades to view plans merely opened the gate to unilateral discussions between Applicants and the Fire Brigade which BCOs regarded as undermining their authority and placed Applicants in a quandary.

4.21 This direct consultation, particularly following the start of the BCO's own Consultation, between the Applicant and the Fire Brigade, was a very sore point with BCOs who regarded it as participation by the Fire Authority in an irresponsible way in the enforcement of Regulations for which they have no enforcing authority.

4.22 On the other hand there were a few BCOs who in effect relinquished the responsibility they have for Part B of the Building Regulations and delegated it entirely to the Fire Brigade whose recommendations were subsequently adopted in their entirety.

4.23 Among most of the Building Control Officers who submitted evidence, consultation did not appear to be undertaken very positively or enthusiastically even in those authorities where the Fire Brigade's advice was invariably taken. In many cases, consultation simply took the form of a passive open door policy whereby the Fire Brigade was able to call in weekly and take away projects which interested them (and not necessarily only those which had to be the subject of consultation). Some authorities, however, stressed the importance of, as they put it, 'keeping a tight rein' on the consultation exercise if the Fire Brigade was not to include extraneous comment.

4.24 Most Brigades objected to the power of the Building Control Officer to include or reject or, worst of all, ignore the advice given by Fire Brigades; and a few raise the spectre, but without concrete examples, of buildings whose occupants would be placed at risk because they had been constructed without incorporating the recommendations of the Fire Brigade following consultation.

'... it is strongly felt that the terms and wording of the statutory bar are in need of review so as to ensure that Fire Authorities are not bound by inexperience and error to the issue of a Fire Certificate to an unsafe building.'

4.25 One Fire Authority estimates that about 25–30 per cent of an Inspecting Officer's time is spent on making observations on plans. And in the case of another, because of abortive, speculative work, a backlog of work on existing premises has been created. The Association of County Councils estimates that Fire Brigades' giving advice to architects costs in the order of £15 million per annum.

The Practicability of the Single Certificate

4.26 Many Applicants, including the major building professional institutes (RIBA, RICS, IBCO, IAAS) although aware of the aims of the Fire Certificate regulating on-going use wanted an integrated certificate.

4.27 Many BCOs already issue a final completion certificate, and the Association of District Councils and some professional organisations eg SOCBRO, advocated the introduction of a formal certificate accompanied by record or 'as-built' drawings.

4.28 Many of the BCOs who submitted evidence already check both AFDs and AFPs and are convinced that they are technically able to issue Fire Certificates even if they have at present an insufficient number of staff to cope with the volume of work.

Overcoming Delays in the Building Regulation Assessment Process

4.29 Fire Brigades explained to the Consultants that direct consultation with Applicants was often conducted due to the difficulties of achieving a satisfactory consultation procedure with the Building Control Officer and as many pointed out, the Fire Brigade in any case had a general duty to give advice upon request under 1(1)(f) of Fire Service Act 1947.

4.30 Most Applicants either through their own initiative or at the direct and often very early invitation of the Fire Brigade, were in direct consultation with them.

4.31 The RICS, the ADC, the ACC, several District Councils and Fire Brigades have recommended that Fire Authorities should charge for advice given to Applicants under 1(1)(f) of the Fire Services Act.

'Simplification can only be achieved if BCOs deal exclusively with means of escape and the restriction of the spread of fire.'

4.32 Virtually all the Applicants who submitted evidence, and these included national and multi-national companies in retailing and manufacturing, developers and the building professionals wanted to have to deal with a single authority at the design and construction stages and expressed a clear preference for that one authority to be building control.

4.33 But above all commercial Applicants want a process that has a predictable sequence and a predictable duration. The latter is now relatively predictable even if some Respondents complained that Local Authority Building Control manipulated the system a little to play for time. Making the sequence more predictable will require further modifications.

4.34 Many Building Control Officers and FPOs are highly critical of Applicants who submit substantial building projects without having or obtaining sufficient specialist information on the subject of fire safety.

4.35 BCOs call for better documented submissions from Applicants, a strict limit to be placed on the scope of the compulsory consultation and Applicants to be dissuaded from consulting Fire Brigades by a combination of disincentives including having to pay for advice.

4.36 A number of Building Control Officers including the London District Surveyors Association suggest that the present full plans deposit required for buildings to which B1 applied could be amended so that Applicants need only deposit drawings adequate to explain how the design satisfied Part B of the Building Regulations.

4.37 As with other issues, the views of Fire Brigades and those of their staff associations on improvements in the Building Regulation assessment process were remarkably uniform. Their opinions were largely echoed by the Association of County Councils (ACC) except in one important respect, that the latter considered that Fire Brigade advice to professionals preceding a Building Regulations application or at the design and construction stage should be fully chargeable.

Technical and Practical Skills required for Authoritative Advice

4.38 Whilst there was some criticism from Applicants of the inconsistency of BCOs, their major criticism was reserved for FPOs. Through a better understanding of the nature of design and construction, BCOs are more able to live with an evolving project. FPOs appear to find changes much more disconcerting and are less able to see that, though the project design has evolved, the fundamental principles of fire safety have been maintained.

Training and Management for Consistent Enforcement

4.39 Few Respondents had anything to say about training and management and their comments were limited to factual information on the current system of training (see 3.27-3.40).

Methods of Enforcement and Forms of Authority

4.40 The evidence received by the Consultants indicates that Fire Brigades can and sometimes do put pressures on Applicants to make physical alterations in violation of the Statutory Bar. Letters written at the design and construction stage from Fire Brigades to Applicants indicate that they would be requiring alterations to the design ie well before the use of completed premises requires the issuing of a Fire Certificate.

4.41 The early and unilateral involvement of the Fire Prevention Officer with the Applicant leads frequently to misleading advice being given, especially where advice is not linked closely to the legislation being enforced, and this misleading advice has resulted on occasion to abortive work being carried out.

4.42 Again, with the exception of professional organisations and major firms with in-house fire officers, no Applicants appeared to be aware of the limitations placed upon Fire Authorities by the Statutory Bar.

4.43 Fire Brigades generally, as well as CACFOA and NAFO, want Part B of the Building Regulations either to be enforced by the Fire Brigade on an agency basis, or completely transferred to the Fire Authority.

4.44 Several Brigades went further and wanted Applicants to send their plans first to the Fire Brigade whose stamped approval would be essential before the project could be subject to an assessment of compliance with the Building Regulations.

4.45 Fire Brigades see their involvement both at the design stage and during the Building Regulation assessment process as technically indispensable which is consistent with their unflattering remarks about the competence of BCOs in enforcing the fire precautions aspects of the Building Regulations. This conviction led virtually all of them who submitted evidence to the Consultants to advocate either that Applicants should obtain stamped approval on their project drawings from the Fire Brigade before even making a submission to Building Control or that Fire Brigades would administer Part B of the Building Regulations on an agency basis for Building Control.

Scope for the Private Sector

4.46 Several major Fire Brigades particularly in areas of development pressure in the South East and the Association of County Councils want to be able to recover their costs when giving professional advice to architects seeking advice about structural fire precautions.

4.47 Most Respondents amongst Applicants were unenthusiastic about further expansion of the Approved Inspector arrangements, beyond limited categories of housing. Virtually no-one mentioned it in connection with fire certification. Many regarded the insurance problem as insuperable.

4.48 One Respondent from the property services arm of a large national insurance company offered to discuss the possibility of privatising all building control staff and responsibility for the administration building control throughout England and Wales by directly transferring them to his company.

4.49 More cautiously the ACC drew a distinction between client and contractor and stated that the Fire Authority must retain overall responsibility for fire prevention and enforcement but that the delivery of the service could be by either in-house or qualified private personnel, thereby leaving the door open to privatisation of the FPO function.

5. General Discussion

The Extent of the Burden on Business

5.1 This review was widely advertised and in addition more than 100 interested parties were invited by the Consultants to respond to the issues raised by the Terms of Reference.

5.2 Since the main purpose of the survey was to assess the extent of the burden being placed on business a majority (69) of those asked to contribute were representative of Applicants. Of these only about half (34) replied, some only after a repeated invitation, and only four unsolicited responses in this category were received in response to the general publicity. (1.4)

5.3 In the context of more than half-a-million Building Regulation applications per annum in England and Wales this low level of response makes it very difficult to gauge the extent to which the problems addressed by the review can be considered to be in any sense generally perceived by Applicants.

5.4 However, the review did reveal two issues which have a bearing on the ease or difficulty experienced by Applicants. One is the result of the Applicant's own lack of understanding of the legislative framework; the other was the unsatisfactory relationships which sometimes exist between the representatives of the building control authorities and the Fire Authorities. These two matters are to a degree interrelated and together they account for most of the Respondents' complaints about the legislation and the approval process.

A Single Authority

5.5 The complaints most often voiced by Applicants derive from their belief that, regardless of the type or intended use of the building, they have to deal with two authorities who do not always agree. They therefore ask for a single authority both at the design and construction stage and at the later stage of the building in use.

5.6 According to their responses both Fire Authorities and Building Control Authorities want to exercise an exclusive role in fire precautions at the design and construction stage. A clear majority of the Applicants who addressed this point (and they included a sizeable number of the national chains) favoured the Building Control Authority in that role.

5.7 The Consultants are of the view that the distinction in legislative arrangements enunciated by the Holroyd Report, is basically correct (see 2.2). Given the prevailing and now well-established general trends in legislation and enforcement they consider it impractical for any one local authority organisation, whether Local Authority Building Control or Fire

Authority to exercise responsibility for both the control of most new building and the continuous monitoring of large sectors of the existing building stock.

Guidance to the Legislation and its Implementation

5.8 The current legislation is voluminous, frequently developed in response to a disaster, and although different laws are intended to apply primarily to two distinctly different phases of a building's life, the two branches have cross-linkages in their application to the various aspects of fire safety, most particularly in the matter of means of escape. These cross-linkages together with the variety of building types, classes and uses subject variously to building control, fire certification, licensing or registration under different acts makes for a regulatory system that is extremely difficult to understand or to explain (Appendix 1).

5.9 This complexity of the law in itself places a burden upon any Applicant seeking Building Regulation approval for his project and the burden becomes especially onerous if what he is designing or building is for a designated use under the Fire Precautions Act 1971 and therefore subject subsequently to the approval of the Fire Authority who may or may not hold the same views as the Building Control Officer on some aspects of fire safety as to, for example, what constitutes an adequate standard and how best it can be achieved. Similar problems can arise in relation to licensing or registration of premises.

5.10 A comprehensive national guidance document is needed to explain in the clearest lay terms the scope of all relevant legislation, regulations, the procedures to be followed by Applicants and the roles and responsibilities of all the agencies, public and private, involved at the various stages from design concept to building completion, together with a clear exposition on the Applicant's rights and the processes of appeal and provision for the determination of issues between parties (Recommendation 1, para. 6.12).

5.11 This document should be prepared jointly by the Department of Trade and Industry, The Department of Environment and the Home Office as best representative of the interests of the Applicant, the Building Control Officer and the Fire Prevention Officer respectively, and its publication should be widely publicised.

5.12 As the background legislation continues to change this national guidance document should be kept under review and its publication kept up to date.

5.13 In addition to general guidance it is important to ensure that secondary legislation under the two principle acts, the Fire Precautions Act 1971 and those based on the Building Act 1984, are developing in such a way as to lessen the Applicant's difficulties.

5.14 The trend towards exemption of smaller office and factory buildings from Fire Certification through self-regulation in Part 1 of the Fire Safety and Safety at Places of Sport Act 1987 (see 2.15 to 2.21) is modest, but it should reduce the problems of some small businesses. It should be noted, however, that in confirming the occupant's statutory duty regarding fire

safety it is moving in the direction of self-certification though on a much simpler scale than that already practiced for other fire matters in some of the larger fire-sensitive industries and which some advocates of advanced fire safety management consider to be the most promising way ahead. It would certainly seem to herald a much more active and knowledgeable role in fire safety by Applicants, building owners and managers generally.

5.15 The trend in Building Regulations, towards the general application of Part B1, means of escape, to most buildings and to their covering other aspects of fire safety currently covered diversely in other, chiefly local, Acts (see 2.9-2.12) will pave the way for greater clarity of legislation although in the short term it could place a greater strain on the building control system by increasing the volume of work for Building Control Officers and on the process of consultation between Building Authority and Fire Authority by increasing the extent of the overlap of Building Regulations with designated use premises. While the building control system is to an extent self-financing (see 2.4) this additional workload could become a problem if appropriately educated and properly trained recruits to building control are not available in sufficient numbers, a factor which lends urgency to the Consultants' views on education and training as expressed later (paras. 5.58-5.72).

5.16 The trends evident in the reviews and in the development of the two main branches of legislation governing respectively fire safety in building design and fire safety in buildings in use will, if they continue, lead ultimately to a clear division of responsibilities which will resolve many of the difficulties of misunderstanding the legislation. However, before these developments can be implemented there will need to be more comprehensive technical documentation for those matters not yet covered.

The process of enforcement of Building Regulations

5.17 It is interesting to note that, in spite of the wide publicity given to this Review, there was little response from small developers or builders who probably only engage in the building control process in relation to small or simple building. But property developers and architects working nationwide or in the larger urban areas were more aware of problems with the process as were BCOs and FPOs, many of whom responded fully to invitations and to the general publicity. (para. 1.5).

5.18 Fire Authorities complain of not receiving information early enough and BCOs complain that they are unable to impose a deadline on the Fire Authority despite having to adhere to one themselves. As a consequence, a BCO can receive the opinion from an FPO too late to influence the BCO's decision.

5.20 Many enforcing authorities believe that under the present arrangements, supplying the Fire Authority with one set of the relevant drawings which accompanied the Building Regulations application would be a considerable help in reducing delays when the Building Control Authority consults under Section 16 of the Fire Precautions Act 1971.

5.21 A summary of the contradictory and conflicting criticism received would read as follows:

- early advice from an FPO leading to measures for fire safety being rejected by the BCO at Building Regulations submission stage (Applicants)
- the Fire Service not being consulted early enough in the process (the Fire Service)
- the Fire Service offering advice too early in the process (BCO)
- The BCO not following the FPO's advice after consultation (the Fire Service)
- FPOs not being available during ordinary business hours (Applicants and BCOs)
- FPOs not remaining in post long enough to see the job through with resulting inconsistency in advice from different FPOs (Applicants)
- the ignorance of Applicants' architects leading to designs which in respect of fire safety do not provide an adequate basis for either advice or approval (BCOs and FPOs).
- FPOs not being given a proper opportunity or enough time to consult on fire matters at building stage (FPOs)
- free advice by FPOs constituting a drain on Fire Service Resources (Fire Authorities).

5.22 The evolution of a large building project from design concept to Building Regulation control and on to completed construction is a lengthy process involving continuing change, whereas the consultation with the FPO and the submission of plans to a BCO for approval are two events separated in time from each other and also from the completion of the building. So it is quite possible for an FPO to give advice on the design at one point, a BCO to approve a changed design at another point and a completed building to a further changed design to be inspected for a Fire Certificate.

5.23 Given such a sequence it is quite possible for a BCO to object to some aspect of the design which an Applicant says and thinks is based upon a FPO's earlier advice with the result that both BCO and Applicant feel frustrated by the FPO's intervention and blame him for any delay or expense at the stage of building control. Again at submission for Building Regulations approval the FPO may be consulted upon another version of the plan and, if the building requires a Fire Certificate, he will encounter it again after completion possibly changed again, will assume the BCO did not accept his earlier advice but may be prevented by the Statutory Bar from requiring any further changes he might feel are necessary. Although from the Consultants' survey, it appears that he may still seek redress by making his requirements a condition of the issuing of a Fire Certificate.

5.24 So the same series of difficulties has been perceived as having different causes, different frequency, and is felt with different intensity, by different groups of Respondents.

5.25 Fortunately, this sequence of change and frustration appears to happen in only a minority of cases, and then usually to a less dramatic

extent than the scenario described above. To the degree it occurs, however, it clearly upsets some Applicants more than others. FPOs and BCOs, on the other hand, will each deal with more cases like this than most individual Applicants and accordingly will be more often upset by them.

5.26 The trends in legislation and the provision of a clear guidance document will go a long way to overcoming some of these difficulties but the Consultants are of the view that the procedures and their implementation would benefit from the introduction of some more definitive arrangements at the beginning and at the end of the process, such as a better opportunity to resolve differences between the Applicant and the BCO early in the process and a clearer definition of the approved status of the project at the stage of completion of construction.

Early Determination of an Issue

5.27 There is widespread favourable appreciation of the 1985 Building Regulations as having effectively lifted some burdens from business. However, difficulties arise when there is a difference of opinion between Applicants and the Building Control Authority as to whether a proposal complies with the Functional Requirements. In such cases although the Building Control Authority may make its views clear to the Applicant at an early stage, the Applicant has no redress until the Building Regulation application has been made and the Building Control Authority has either refused a relaxation or a dispensation or rejected the plans. At that stage the Applicant can appeal to or seek a determination from the Secretary of State.

5.28 The procedure causes a delay which leads to a period of uncertainty and results in all but the most persistent taking the least disruptive route commercially, heavily conditioned by financial imperatives, which is to accept grudgingly the BCO's view.

5.29 Some Applicants have requested an earlier appeal procedure when they are unable to convince the Building Control Officer that their project meets the requirements of Regulation B.

5.30 If, for example, it becomes evident at pre-Building Regulation application discussions that the Building Control Officer does not consider that the proposal meets the requirements of Regulation B, and the Applicant is determined to stand by the proposal he will have to wait until a refusal is obtained to a Building Regulations application before a determination can be sought from the Secretary of State.

5.31 The time from first identifying an insurmountable difference of view between BCO and the Applicant to the BCO's refusal of the Application could be over 12 months. During this period the Applicant has to develop the project plagued with uncertainty.

5.32 The provision of the main features of fire safety, notably the means of escape, are part of the concept which should be fully integrated into the other major aspects of the design at a relatively early stage, certainly some considerable time before a submission for Building Regulation assessment

by the BCO would be appropriate. It seems reasonable to suggest that, where it appears that such concepts of fire safety may not fall clearly within the normal accepted solutions of Building Regulations it should be possible for the Applicant to request a view on the proposal by the BCO and, where that view is substantially at odds with the Applicants, to be able to have the issue defined and determined at a sufficiently early stage to avoid the delay and expense of abortive work and later radical changes of design. This is particularly the case where commercial penalties for delay are high. It would also seem appropriate that the FPO should be informed in such circumstances of the issue and its resolution so that a Fire Authority view can be taken into account.

A Certificate of Compliance

5.33 The present informal practice of many BCOs issuing a Certificate of Compliance is popular with Applicants as it gives them tangible evidence of having met the requirements of the Building Regulations.

5.34 Without such a certificate Applicants are burdened by the uncertain boundary between successful compliance with the Building Regulations and the beginning of a need for occupiers to comply with legislation regarding the building in use. Developers and owners have to deduce that they have constructed in satisfaction with the Building Regulations from there being no refusal or Notice to the contrary from the Building Control Officer although many BCOs now give a Certificate of Compliance.

5.35 The Consultants are persuaded that for new and materially altered buildings constructed in conformity with the Building Regulations, there is a case for putting all the constructional aspects of fire safety into a Final Certificate of Compliance issued by the Building Control Officer. The Fire Certificate can then be improved by focusing it more sharply on on-going matters including fire safety management. In that form, it constitutes a more meaningful baseline document setting functional requirements for the continued use of the building.

In addition, a Certificate of Compliance at least for Part B of the Building Regulations would also strengthen the protection contained in the FP Act 1971 whereby the Fire Authority for the purposes of a Fire Certificate, may not require alterations to be made to a building which has already been subject to the provisions of the Building Regulations relating to means of escape. A formal equivalent is already required from Approved Inspectors.

Clarity and Simplification in Submissions for Assessment

5.36 Clients expect their professional agents or their in-house building team to handle compliance with Building Regulations and where relevant to smooth the path for a Fire Certificate.

5.37 The survey showed that building designers are generally not conversant with the legislation intended to protect occupants from fire and especially with the provisions of the Fire Precautions Act 1971 (4.3).

5.38 This relative ignorance is due, in part, to:

- an under-emphasis on fire matters during the initial training of architects and other building designers;

- relatively few Continuing Professional Development (CPD) courses on compliance with fire legislation;
- the complexity of the Fire Precautions Act 1971 and the absence of an authoritative plain English guide to the legislation.

5.39 For other than simple schemes drawings which are clearly marked-up showing compartmentation, the values of fire resistance, protected shafts, final exits, arcs of direct distances, fire fighting shafts and access for fire fighting etc, greatly assist the Building Control Officer to understand the Applicant's intentions. Through preparing such drawings the Applicant too will gain a clearer understanding of how he has complied.

5.40 In any case, if as a result of the Stage Two Review B1 becomes a Functional Requirement, Applicants will have to document clearly how they propose satisfying the Functional Requirement if they depart from the Approved Document (2.5 & 2.12).

5.41 This clear presentation of information will facilitate a project's progress through the Building Regulation assessment process and should lead to savings of time and expense for both Applicant and the Building Control Officer.

Consultation

5.42 Regarding the problems experienced by BCOs and FPOs in conducting the consultation required of them by legislation, the Consultants are of the opinion that such problems are clearly not universal and are largely the product of firstly, the pressures upon BCOs caused by the combination of insufficient staff and a specified deadline (regardless of the size of the project); secondly, the recourse to varying and often unpublished criteria by the two authorities; and finally a lack of mutual respect due to a certain scepticism about the level of each other's training in fire precautions in building. With BCOs in over 400 Local Authority Building Control departments in consultation with the FPOs from more than 50 Fire Authorities it is probably unrealistic to expect that some unevenness of personal interaction will not remain a feature of the system and devising ways of minimising it lies partly in the field of social psychology which is beyond the expertise of the Consultants. However, a number of practical steps can be taken to reduce the causes of, and opportunities for, friction.

5.43 It is clear from the survey of responses that many misconceptions exist in the minds of Applicants regarding the best procedures to be followed to obtain approval for the fire safety provision in their buildings at the design and construction stages. This situation is not helped by the fact that some FPOs and, to a lesser extent some BCOs, do nothing to correct Applicants' misunderstanding of their different roles and responsibilities. In spite of its avowed good intentions in this respect NJCC Guidance Note 3 'Fire Officers Recommendations' has apparently done nothing to relieve this problem.

5.44 By all accounts it is common for the three main participants to consult each other in pairs; the Applicant consults the FPO at an early stage, he may also approach the BCO for advice, and finally the BCO is

required to consult the FPO when dealing with an application for a building the use of which is to be designated or where he is considering a relaxation of any aspect of the Building Regulations relating to fire safety (see 2.40 and 2.41).

5.45 There is a widely held belief among Applicants and the Fire Service that it is not only advisable but necessary for Applicants to seek the advice of the local FPO at an early stage in the design of a new building or adaptation of an existing building, regardless of whether or not the building's use will be designated as requiring a Fire Certificate. This early approach automatically invokes Section 1(1)f of the Fire Services Act 1947, under which the Fire Brigade is required to give advice on request on any aspect of fire safety, a duty which generally FPOs appear to perform with great willingness (3.29-3.31).

5.46 This practice has become so common, and both Applicants and FPOs consider it so normal, that when it leads to problems with the BCO at the stage of Building Regulation approval all three parties find cause for complaint. Applicants feel they are required, unfairly, to try to satisfy two masters who may not be in agreement. BCOs resent their authority being undermined by the early intervention of the FPOs who in turn resent the implication that they should not be fully involved in issues they consider to be very much in their domain.

5.47 It would appear that this situation can provide a very unhappy background to the consultation which is required by law between BCOs and FPOs at the stage of Building Regulation approval and probably accounts for many of the adverse comments made by them about the process in general and the consultation process in particular.

5.48 It is obviously important that some consistency of approach should exist, especially between the BCO and FPO as otherwise the Applicant may suffer delays and expense. Partly this may be achieved by education and training but a better understanding of roles and responsibilities by all three parties is also essential.

5.49 Many BCOs and most Applicants in the survey said that FPOs after having been consulted, responded in a way which did not make clear to which parts of the legislation or even which legislation the FPOs comments applied.

5.50 A considerable amount of on-site consultation takes place in the case of buildings requiring a Fire Certificate towards the end of their construction and as a result much Fire Brigade opinion is oral, informal and fails to make the important distinction between what the Fire Precautions Act 1971 requires and what may be desirable but is optional.

5.51 Clear, written communication from the Fire Brigade is required as an explicit distinction between requirements and goodwill advice will enable the Applicant clearly to assess the cost of compliance besides adding to the Applicant's comprehension of the legislation.

5.52 This written distinction will in itself lighten the burden on business as the Applicant will no longer have to attempt to confirm in writing to the

Fire Brigade the outcome of his encounters with the FPO. The written statement should unambiguously indicate with which sections of which Act an Applicant's project does not comply. Recommendations and so-called goodwill advice should be documented quite separately.

5.53 The Applicants' tendency to consider FPOs as free advisers to be engaged in early consultation has the effect of encouraging FPOs to exceed their knowledge and skills while simultaneously discouraging Applicants, and particularly their architects, from extending theirs.

5.54 The Consultants believe that this dispensing of free advice under Section 1(1)f of the Fire Services Act frustrates the proper course of consultation before, during and after the submission of plans for Building Regulation approval, and places an organisational burden on the management of FPOs within the Fire Service which to date the Service has apparently often found itself unable to overcome despite previous expressions of its intention to do so.

5.55 Furthermore, it would appear that this free advisory service by FPOs is not necessarily or always based on the best or most advanced knowledge in the field of fire safety engineering and that the existence of the free service robs Applicants, and particularly their architects, of the incentive to acquire for themselves or from within the private sector the knowledge with which to devise the most economical and advanced fire safety measures at an early stage in their designs.

5.56 As Section 1(1)f has other important purposes outside the context of the building control process it is not advisable to amend the Act, however it should be possible, within the existing provisions to ensure that any advice given by FPOs to Applicants on matters of fire safety covered by the Building Regulations should be given only within the context of the consultation with the BCO. In all such cases, FPOs in discharge of their duty under Section 1(1)f should in the first instance refer Applicants to the BCO as the enforcing authority.

Education and Training

5.57 It is difficult to assess in any precise way, the impact of the growth of knowledge on the day-to-day business of enforcing fire regulations and legislation. Of the hundreds of thousands of Building Regulation applications dealt with each year by Building Control Officers, relatively few are likely to raise fire safety issues that would call for the application of advanced knowledge of fire science and engineering, but the number is growing, is no longer confined to the larger urban areas and includes most of the largest and most significant building developments.

5.58 It is to be expected, therefore, that there will be increasing pressure on all parties involved in fire safety in building to consider how best to ensure that they are keeping abreast of this expansion of knowledge.

5.59 The review of on-going developments in fire safety design and of the current levels of education and training conducted in Section 3 shows that there is an increasing gap between the upper levels of learning and the

level of practical applications which is that at which most architects, BCOs and FPOs, should be operating if they are to fulfil their respective responsibilities and use the best knowledge available in providing the most efficient and economical means of fire safety in buildings. The curricula of all three groups need to be developed in this subject and current moves in this direction need to be encouraged.

5.60 Whilst 19 years ago, the Holroyd Report felt that alternating fire prevention work with operational work was beneficial, many circumstances have changed. The Consultants believe that the interaction which is now desirable is between private sector fire consultants and specialist fire prevention sections of the Fire Service, (if they choose to develop professional fire protection engineering services) rather like town planners sharing a common professional orientation and training and able to move relatively easily between public and private sectors.

5.61 It appears that no single educational institution in the UK can attract the critical mass needed to run a professionally-orientated course in fire protection engineering. The relevant professional institutes are in an embryonic state and there is no formal way of comparing technical professional competence between the public and private sectors. In the light of the trends in legislation and technology, both of which will place increasing demands upon the organisation of building control, fire authorities and private sector advisers this lack of provisions in education will, if it is allowed to persist, become increasingly an obstacle to development. The widely diverging views of each other held by fire consultants and Fire Prevention Officers which the survey revealed, flourish in the absence of a recognised professional standard, and the Consultants take the view that an undergraduate degree in a relevant discipline is probably the starting point for this specialisation.

5.62 On the larger, more important projects, professional advisers on structural fire precautions have to be able to live with a rapidly evolving design, hastily called project team meetings and the constructive interaction between architects, structural engineers, services engineers and cost consultants in the production of a design to satisfy a business or commercial client. If, besides their essential rescue and fire-fighting roles, Fire Brigades want also to act as structural fire protection engineers at the building design and construction stages, then they must have an adequate professional background probably at graduate level which they do not have.

5.63 Whether or not, Fire Brigades choose to enter on a professional basis the growing market for fire safety design advice at the design stage as a prelude to a Building Regulations application, the Consultants believe that there is a case for reducing in the FPOs courses the extent of the overlap in training in the Building Regulations and redirecting the emphasis on to systematic fire prevention and not on fire precautions achievable during the design and construction stages. For example the Fire Service College claims that upon completing the Specialised Fire Prevention course that the FPO will be able to,

‘advise District Councils regarding their statutory responsibilities under the Building Regulations relating to fire, including fire prevention and fire protection in proposed buildings and extension to existing buildings.’

5.64 This seems redundant as District Councils employ Building Control Officers to advise them on the Building Regulations.

5.65 Since the duration of the Specialised Fire Prevention Course is short, the broad coverage is achieved at the expense of a deeper understanding of the individual topics (Appendix 3).

5.66 However, the Fire Service College is actively exploring ways to raise the level of learning, as distinct from training, in the area of fire engineering and the Consultants recommend that as a matter of urgency it be given every encouragement and the resources necessary to do so and that it should become an important part of a national network of education in this field available to all the interested groups.

5.67 If Part B1 of the Building Regulations becomes non-mandatory, like the other parts, then Building Control Officers will have to be able assess rigorously submissions from Applicants who choose to satisfy the Building Regulations other than by the Approved Document. To enable them to do so, courses for Building Control Officers will have to shift somewhat towards a better understanding of the principles of means of escape, to enable them to assess the scientific validity of proposed solutions, and somewhat away from an intimate knowledge of the minutiae of what were formerly mandatory rules.

5.68 As for dealing with the more advanced knowledge emanating from fire research and developments in advanced fire science and engineering, these would require to be treated as post-graduate studies open to some graduates in pursuit of further qualifications but which, for the majority of BCOs would constitute a specialism beyond their immediate discipline of which they would need to know only enough to determine the limits of their own competence and when, therefore, to seek the specialist's advice.

5.69 The curriculum of professional studies in building control provides already for study in depth of special topics. Within this context it is still necessary to ensure that standards are maintained by the usual methods of internal and external assessment. Given those safeguards and the continued development of fire studies in depth within the context of construction technology in general it should be possible for the building control profession to deal successfully with most matters normally encountered in the course of enforcing part B of the Building Regulations even if as a result of the Stage Two Review it is expanded to cover most building types and other aspects not currently covered such as access for and assistance to Fire Brigades. But new graduates from these special courses of study will not appear immediately and no time should be lost in encouraging this educational development.

5.70 For the building designers the RIBA proposes that their continuing professional development (CPD) programme will become compulsory for practicing members in 1992, and they should be encouraged to place fire safety higher on the list of priorities. But it is important also that a better foundation in fire safety by design becomes a common part of teaching in all schools of architecture on the lines of that currently taught at the Department of Architecture, University of Edinburgh. Also, of course,

design education would benefit greatly from the publication of the comprehensive design guide to fire safety in design which, together with the Approved Documents, should form the basic text in the subject.

Enforcement and Private Sector Involvement

5.71 The role of the private sector in improving fire precautions at the design and construction stages is part of the wider issue of whether there is a broader role than at present for the Approved Inspectors for the Building Regulations. An enlarged role depends on the removal of the insurance related obstacles. In this respect, it is significant that the most audacious proposals regarding private sector involvement in the Building Regulations came from an insurance company which offered to take over the whole process of enforcement nationally.

5.72 With regard to fire precautions, private inspectors already have a well defined and relatively straightforward role in periodic checking and approving AFD and AFP systems. This checking and approving is done, along the lines of lift inspections, for insurance companies for property protection purposes.

5.73 The issue of on-going enforcement becomes, however, a more subtle one where AFDs and AFPs form part of a 'total fire solution' as not only do the mechanical and electrical systems have to be checked but the agreed interactions and trade-offs have to be examined to see if they are still valid given the current use of the building.

5.74 This form of on-going control, is in effect, a fire safety audit which will vary widely from the simple to the elaborate depending on the nature of the building and its occupiers. For these audits a type and quality of training will be required different from that at present employed in fire certification.

5.75 Just as designers of mechanical and electrical systems are able to assess the continuing adequacy of existing installed systems, it is now perfectly feasible for fire protection engineers or designers of fire safety systems to re-assess periodically whether the systems are still as effective as when first approved, having regard to changes in the use of the building, its occupancy or its fabric.

5.76 Although only one respondent referred to difficulties in respect of licensing, the Consultants are aware of weaknesses in the system which should be addressed.

5.77 The proliferation of requirements for licensing and registration of premises which is required under legislation which, whilst not its primary purpose, has a fire content is such that Applicants are unsure of:

- the relationship between the various statutes applicable to their premises eg the Building Act 1985, the Fire Precautions Act 1971 and the relevant licensing or registration statute, and
- the role of the Fire Authority or Building Control Officer when consulted by the authority responsible for licensing or registration.

5.78 The Consultants were unable to find definitive guidance to licensing and registration authorities on what technical advice they should seek in determining the adequacy of such premises for their intended purpose. When advice is needed but not sought on a particular facet of fire safety potential dangers can arise.

5.79 The national guidance document recommended later in this report (6.12) should include guidance to licensing and registration authorities to ensure that this aspect of fire safety is adequately dealt with and that authorities appreciate the fire matters that they should address in determining the suitability of premises for their intended purpose.

6. Conclusions and Recommendations

6.1 The responses from Applicants and the Consultants' own experience do not indicate a level of distress in the system that would justify radical change. However, as is clear from the developments in the legislation over the last 20 years, change is a constant feature of the system and this review, and the concurrent Stage Two Review of the Building Regulations, must be seen as further steps in transformation from the origins of the system in the introduction of fire matters into the Building Regulations the Holroyd Report, the Fire Precautions Act 1971.

6.2 It seems reasonable in reviewing the trends to assume that their direction is towards a system in which; (a) the same body of regulation will govern most if not all types of building and most if not all aspects of fire safety (2.9-2.12); (b) there will be ever clearer distinction between the problems of buildings under design and construction and those of premises in use (5.14 & 5.15); (c) non-prescriptive principles will allow for the advancement of the relevant technologies 2.9-2.12 and (d) the system will be clearly understood and applied by all those involved in fire safety provisions in the design and control of construction of buildings.

6.3 Since the volume of building is so large and the resources for dealing with its control are already stretched, care is needed to ensure that moves to improve the operation of the system do not increase difficulties in the short term.

6.4 For example, although it would simplify the system greatly if the provision of means of escape in all buildings were to be controlled by building regulation based on an approved document and applied in a similar manner to the other parts of the Building Regulations, such a change has to be preceded by the publication of Advisory Documents already in preparation (2.12) and by steps to ensure that a sufficient number of properly educated and trained BCOs are available to deal with the additional building types under their control (5.17).

6.5 Similarly, if it is to be the case that all three participants are to continue to consult and co-operate in the provision of fire safety measures in buildings of innovative design and using the advancing technologies of building and fire engineering, then it is a pre-requisite of their successful collaboration that they share a common understanding of the body of knowledge and have a mutual respect for each others skills, and it would seem that the only way to achieve that would be by co-ordinating the standards of education in fire safety, in design of architects, BCOs and FPOs (6.20).

6.6 Furthermore, it is clearly essential to have from the outset a good guide through the current complexities of the system, and that the guide should itself take account of the process of change and should be kept up to date with developments (6.12).

6.7 On the difficult matter of consultation between the three parties, the Consultants do not believe that this process can be legislated to work better since all cases are different and that whatever difficulties exist it is not reasonable to limit or deny the possibility of consultation where parties are agreed on its need or benefits. However, recommendations of this report should help to resolve difficulties with consultation in a number of ways, viz

- by requiring FPOs to refer Applicants in the first instance to the BCO for initial advice
- by providing clear guidance on the best procedures to be followed by all parties
- by providing FPOs with their own set of drawings
- by requiring Applicants to provide fire safety drawings prepared using agreed conventions and showing clearly their fire safety provisions
- by providing for early determination of issues between Applicants and BCOs
- by Applicants providing record 'as-built' drawings to BCOs showing how they have satisfied Part B in return for a Certificate of Compliance with Part B. The provision of record drawings is part of the basic service under the RIBA Architect's Appointment
- by taking steps to enable all three parties by education to obtain a similar level of knowledge and understanding of the principles of fire safety design and their practical achievement in building.

6.8 From all this it would appear that what is needed is a sequence of steps, some legislative, some practical, aimed at moving the system, and the understanding of those involved in it, forward in an incremental way that will not increase the current difficulties.

6.9 A number of practical steps should be taken immediately.

- 1) a good guidance document to the system as it exists should be produced (6.12).
- 2) a comprehensive advisory document on means of escape applicable to all building types should be published (6.21).
- 3) clear definitive guidance should be laid down regarding
 - (a) the early determination of issue between Applicants and BCOs
 - (b) the form of drawings submitted for approval of fire safety provisions
 - (c) the involvement of FPOs in the approval process
 - (d) the issuing of a Certificate of Compliance by BCOs(6.12)
- 4) an agreed national professional standard should be defined for education in fire safety by design related to the Approved Document on part B of the Building Regulations and by the preparation of a comprehensive design guide to fire safety in

building which together will form the basis of the syllabus in this subject in the continued professional development of building designers, BCOs and FPOs.

6.10 Once these steps have been taken it will be possible to develop the Building Regulations in respect of fire safety in the ways under consideration by the Stage Two Review, including the extension of the Regulations to cover most types of building and most aspects of fire safety in buildings, including those matters currently covered by Local Acts.

6.11 With these objectives and this sequence in mind the Consultants make the following formal recommendations.

Recommendation No. 1

6.12 A comprehensive national guidance document on the achieving of approvals of fire safety provisions in the design, construction and adaptation of buildings should be published whose primary purpose would be the clarification for Building Regulations Applicants of all relevant legislative and procedural matters and particularly of the protocols of consultation between the parties. The document, published under the joint imprimatur of the DTI, DoFE and the Home Office, should be widely publicised and kept under review and up to date with changes and developments in the legislation and technology.

Recommendation No. 2

6.13 A comprehensive design guide covering all aspects of fire safety in most types of buildings should be prepared as a basic text for professional development in this subject.

Recommendation No. 3

6.14 An arrangement should be introduced whereby as soon as the BCO and Applicant identify an issue of fire safety on which they appear to be heading for an irreconcilable disagreement, they should be able in advance of a Building Regulations application to make an early formal approach to the Department of the Environment to have the issue determined.

Recommendation No. 4

6.15 Applicants submitting plans for other than simple buildings for approval under the Building Regulations should demonstrate compliance with Part B of the Regulations on specifically marked-up drawings and provide to the BCO an additional set of these drawings for the use of the FPO.

Recommendation No. 5

6.16 Building Regulation 11(2) should be amended to limit the plans required under this section to the specially marked-up drawings referred to in Recommendation 4.

Recommendation No. 6

6.17 FPOs should observe the protocols for consultation set out in the national guidance document which will require that they refer Applicants in the first instance to BCOs, that they confirm their advice to Applicants in writing and that, in doing so, they distinguish clearly between the requirements of legislation and recommendations which the Applicant is free to follow or disregard.

Recommendation No. 7

6.18 Where, on completion of construction or adaptation of a building the Applicant submits to the BCO defined 'as-built' record drawings showing compliance with Part B of the Regulations, and a schedule of active fire protection systems, the Local Authority should issue a Building Regulations Part B Compliance Certificate which should include these drawings and schedule.

Recommendation No. 8

6.19 A copy of the Building Regulations Part B Compliance Certificate including drawings and schedule should be forwarded by the BCO to the Fire Authority.

Recommendation No. 9

6.20 The educational development of building designers, BCOs and FPOs should be encouraged by the early establishment of a national network of professional development courses in colleges and polytechnics in which the Fire Service College, being a unique national institution concerned exclusively with fire matters, should form a core institution with new and strengthened links with the Fire Research Station and other educational and training establishments in the preparation and running of modular courses in all aspects of fire, adding depth to its present breadth of course coverage and targetted at various groups concerned with fire precautions such as Fire Prevention Officers, Building Control Officers, architects, fire protection engineers and fire safety managers.

Recommendation No. 10

6.21 As soon as possible, and accompanied by new, additional Approved Documents, Part B of the Building Regulations should be extended to cover most building types and most aspects of fire safety which can be provided during the design, construction and adaptation of buildings.

Recommendation No. 11

6.22 As soon as the Building Regulations have been extended to cover most building and aspects of fire safety, local legislation should be amended to avoid duplication.

Recommendation No. 12

6.23 Since the fire precautions field continues to change in terms of regulation, scientific research, management and applied technology, and

especially to monitor the impact of implementing the proposals of the Stage Two Review of the Building Regulations and the phasing in of the various stages of the Fire Safety and Safety of Places of Sport Act 1987, the situation should be reviewed again within a period of three to five years.

At this point it is necessary to consider the implications of the proposals for the various stages of the Fire Safety and Safety of Places of Sport Act 1987, the situation should be reviewed again within a period of three to five years.

2.2. Of the various proposals which have been put forward, the most important are those which relate to the phasing in of the various stages of the Fire Safety and Safety of Places of Sport Act 1987, the situation should be reviewed again within a period of three to five years.

2.3. The proposals which have been put forward in connection with the phasing in of the various stages of the Fire Safety and Safety of Places of Sport Act 1987, the situation should be reviewed again within a period of three to five years.

2.4. Generally, it must be recognised that the proposals for the phasing in of the various stages of the Fire Safety and Safety of Places of Sport Act 1987, the situation should be reviewed again within a period of three to five years.

2.5. It is clear that the proposals for the phasing in of the various stages of the Fire Safety and Safety of Places of Sport Act 1987, the situation should be reviewed again within a period of three to five years.

2.6. The proposals for the phasing in of the various stages of the Fire Safety and Safety of Places of Sport Act 1987, the situation should be reviewed again within a period of three to five years.

2.7. The proposals for the phasing in of the various stages of the Fire Safety and Safety of Places of Sport Act 1987, the situation should be reviewed again within a period of three to five years.

7. Cost Implications of the Recommendations

7.1 The Consultants are of the view that the comprehensive national guidance document and the comprehensive design guide should be published at a cost-recovering price to Applicants. How and at what cost they are made available to BCOs and FPOs is a matter for internal accountancy between these levels of local government and the central government department charged with the production of the document.

7.2 Of the guidance governing some aspects of the enforcement process, that dealing with the form and number of sets of drawings submitted bears a small additional cost to the Applicant which the Consultants consider a reasonable price for the benefits of an improved system. The cost of preparing the drawings and schedule required for the issue of a Building Regulations Part B Compliance Certificate is an optional charge offset by the benefit to the Applicant of obtaining the Certificate.

7.3 The improvements required in the educational system to level up the professional base of each of the three groups of participant will call for some investment by Applicants' designers in their continued professional development, by Local Authorities in improved or additional college courses for BCOs and by Government in an expansion of both the syllabus and curriculum of the Fire Service College to enable it to fulfil an expanded role in the education of FPOs and others.

7.4 Generally, it must be recognised that innovation in building designs and their attendant fire safety methods are aimed at achieving economies for Applicants in the construction, adaptation and use of their buildings. These gains have some consequential costs, among which are the extra time and effort needed to enable all the participants to ensure that fire safety and other practical considerations are not being sacrificed.

Appendix 1

Legislation of Relevance to Fire Precautions in Building from the National Joint Consultative Fire Officers' Recommendations

AI Approved Inspector
BCO Building Control Officer
FPO Fire Prevention Officer
HSE Health & Safety Executive
LA Local Authority
LJ Licensing Justices

1. BUILDING ACT 1984
S.24 Provision of exits, etc. LA/
S.72 (1)-(6) Means of escape in case of fire. BCO

2. THE BUILDING REGULATIONS 1985
(S1 1985 No. 1065) LA/
BCO

Schedule 1-Requirements

Part B FIRE

Para. B1: Means of escape:
(includes provision that requirement
may be met only by complying with the
relevant requirements of the publication
entitled
*The Building Regulations 1985
Mandatory rules for means of escape in
case of fire*)

Para. B2: Internal fire spread (surfaces)

Para. B3: Internal fire spread (structure)

Para. B4: External fire spread

Approved document: B2/3/4 Fire Spread

PART M DISABLED PEOPLE

3. THE BUILDING (APPROVED INSPECTORS
ETC) REGULATIONS 1985 AI
(these set out the duties of Approved
Inspectors to consult the fire authority)

4. CINEMAS ACT 1985 LA
Applicants for licences must give
notice to the fire authority.

5. EDUCATION ACT 1944

LA

THE EDUCATION (SCHOOL PREMISES) REGULATIONS 1981 (SI 1981 No. 909)
Made under S.10 of the Act, includes, inter alia, requirements for fire precautions. Building Bulletin No. 7 'Fire in the Design of Schools' an important reference. See also Design Note 18(1984) – Access for Disabled People to Educational Buildings.

6. FIRE CERTIFICATES (SPECIAL PREMISES) REGULATIONS (SI 1976 NO. 2003)
Makes provisions for the issue of a fire certificate by the Health & Safety Executive and details its content and the conditions which it may impose. Covers premises with large scale storage or process hazard, eg LPG storage exceeding 100 tonnes.

HSE

7. FIRE PRECAUTIONS ACT 1971: Chapter 40

FPO

Applies to premises which are put to a designated use under Section 1 of the Act. These are at present certain hotels and boarding houses and places of work.

Principal method of control is the fire certificate, issued and enforced by the fire authority. Certificate will specify means of escape in case of fire, means for securing that the means of escape can be safely and effectively used at all material times, the means for fighting fire and the means for giving warning in case of fire.

S.13 provides and where building regulations on means of escape apply, the fire authority shall not normally make requirements beyond those contained in the building regulations.

S.16 provides that where it is proposed to erect a building or to alter or extend a building which will be subject to the issue of a fire certificate, the local authority has to consult the fire authority before passing the plans.

S.17 requires a fire authority to consult the local authority before requiring alterations to be made to a building in connection with a fire certificate

8. FIRE PRECAUTIONS (HOTELS AND BOARDING HOUSES) ORDER (SI 1972 No. 238)

9. FIRE SERVICES ACT 1947
 FPO
 Details obligations of fire authorities for giving advice on request as to fire prevention measures and means of escape from fire.
10. GAMING ACT 1968
 LA/LJ
 Commercial gaming premises subject to issue of licence which may be refused if layout and access not suitable.
11. LICENSING ACT 1964
 LJ
 For premises where intoxicating liquor is sold, a licence is required which is subject to the submission of plans, etc. The fire authority is consulted.
12. LOCAL GOVERNMENT (MISCELLANEOUS PROVISIONS) ACT 1982
 LA
 Provides for the licensing of places used for public entertainments outside Greater London. Applicants must give notice to the fire authority.
13. NURSING HOMES ACT 1975
 Covers registration of private nursing homes.
14. PRIVATE PLACES OF ENTERTAINMENT (LICENSING) ACT 1967
 LA
 A licence is required for music/dancing. (See also 16).
15. SAFETY OF SPORTS GROUNDS ACT 1975
 Certificate required for large sports stadia with accommodation for more than 10,000 people.
16. THEATRES ACT 1968
 LA
 The Statutory Instrument under this Act allows licensing authority to impose any term, condition or restriction in the interests of physical safety or health. Where the licensing authority is not the fire authority, an authorised officer of the fire authority has the right to enter premises.

LOCAL ACTS

Acts of Parliament, of local application, which extend, or amend, the scope of national building regulations. List of requirements of particular relevance.

- B Access of fire brigade
- C Fire precautions in certain large buildings
- D Fire and safety precautions in public and other buildings.
- E Further precautions against fire in high buildings
- F Provision of means of escape from fire in certain buildings.

ACT

Berkshire County Council Act 1986
Bournemouth Borough Council Act 1985
Cheshire County Council Act 1980
Clwyd County Council Act 1985
County of Cleveland Act 1987
Cumbria County Council Act 1982
Derbyshire County Council Act 1981
Dyfed County Council Act 1987
East Sussex County Council Act 1981
Essex County Council Act 1987
Greater Manchester Act 1981
Hampshire County Council Act 1983
Hereford City Council Act 1985
Humberside County Council Act 1982
Isle of Wight Act 1980
Kent County Council Act 1981
Lancashire County Council Act 1984
The Leicestershire Act 1985
London Building Acts 1939
Mid Glamorgan County Council Act 1987
County of Merseyside Act 1980
Poole Corporation Act 1986
Plymouth City Council Act 1987
County of South Glamorgan Act 1976
South Yorkshire Act 1980
Staffordshire Act 1983
Surrey County Council Act 1985
Tyne & Wear Act 1980
West Glamorgan County Council Act 1987
Worcester City Council Act 1985

SUBJECT

BCF
BCEF
BDEF
BCDEF

BF
BC

B

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BCEF

BCDEF
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BF

Appendix 2

The Curriculum and Syllabus of Education and Training in Building Control

Persons recruited into Building Control as students or trainees are expected to have obtained at least one of the following standards;

1. GCE pass in five subjects, including mathematics, a science subject and a subject requiring the use of descriptive English;
2. An approved OND or ONC;
3. An approved City and Guilds Final or Technical Certificate Parts I and II.

A person possessing one of the foregoing qualifications would be expected to pursue further qualifications of a professional body established to serve the needs of Building Control education and to advance public education in the science and law of Building Control. Persons entering Building Control directly from school can expect to undertake at least seven years of study before achieving corporate member status.

During the training period trainees will be expected to attend either a Polytechnic or a College of Technology in preparation for examinations that will eventually lead to a full professional qualification.

A typical professional route for students of Building Control is through the examinations of the Institute of Building Control which are in three parts.

Generally, the Institute's Part 1 examinations can be taken after four years preparation, Part II after a further two years and Part III after a further year. Most trainees pursue their base qualifications by way of the Ordinary and Higher National Certificate route in a building related subject. The Part II examination is perhaps recognised as the most difficult hurdle of the three parts.

Part I is at HNC level but the majority of candidates are exempt from the examination as they hold this or an equivalent qualification.

Trainee Building Control Officers work to a defined training programme which involves secondment to the Fire Prevention Section of the Local Fire Brigade for a period of up to one month.

The Part II examination is set at first degree level and includes a three hour examination in Fire Studies. The syllabus for the examination is set out in the Institute's publication 'Professional Examinations'. Candidates prepare for the examination through courses at colleges of higher education.

As an alternative to taking the Institute's Part II examination candidates may take an exempting diploma in Building Control/Building Surveying.

The diplomas all comprise a module relating to Fire Studies involving some 50-60 hours of tuition. The final examination is set by the college awarding the diploma but all examination papers and results are moderated by the Institute.

There is an increasing trend for graduates to enter Building Control. The possession of an appropriate degree attracts exemption from the Institute's Part I and II examinations and the possession of an Honours Degree will also attract exemption from the Part III Dissertation.

The Part III examination also includes a three hour paper on Fire Studies. The syllabus is similar to that for Part II but the questions require candidates to display a higher level of professional judgement. Candidates again prepare by way of courses at colleges of higher education or by attending the Institute's own Part III residential course at the University of Warwick.

Graduates in Building are required to take the Institute's Part III examination, including the Fire Studies paper.

The Institute encourages continuing professional development (CPD) through its annual Weekend School and Conference.

Provincial Councils for Local Authorities provide training opportunities at regional level. Each year, for example, the South West Provincial Council holds a five day residential course for Building Control officers on means of escape at which the lecturing is shared by Fire Service and Local Authority personnel. Other Provincial Councils take similar initiatives.

Graduates entering Building Control without any previous experience in that field are discouraged from taken the Part III examinations until they have acquired at least three years experience in Building Control. During that three year period graduates should be encouraged to participate in continuing professional development in order to broaden and extend their understanding of the Building Control profession.

During the latter part of the three year period trainees are introduced to management techniques. Many organisations already have developed their own in-service training and Building Control personnel are required to attend such sessions.

During this period additionally more emphasis should be place on:

1. Report and letter writing.
2. Development of skills to express original thinking.
3. Opportunities to put new ideas into practice.
4. Trainees should be given guidance in making building regulation decisions with an explanation of the issues of criteria which influenced the final decision.

5. Developing public relations and how to deal with people at all levels.

Obviously, some individuals will wish to go further than others and undertake greater responsibilities. In order to cope with increased responsibility and operate in a managerial capacity considerable special skills and knowledge are required.

Numerous courses are available, nationally, for persons seeking the necessary skills and training and where in-service training is impracticable endeavours should be made to all those who so wish to attend external courses at colleges and polytechnics. Training in management technique should be introduced during the fifth and sixth years of the training programme and be developed through to and beyond completion of the final professional examinations.

Appendix 3

The Training of Fire Prevention Officers

Training to Sub-Officer rank is provided by individual brigades but the great majority of leading fire fighters qualified for promotion to Sub Officer also take part in the Fire Service College's (FSC) Junior Officers Course. This course aims primarily at practical skills but contains a brief introduction to fire prevention concentrating on specific instruction on science and engineering in relation to fire investigation.

The great majority of Sub-Officers qualified for promotion to Station Officer take part in the FSC's Junior Officers Advancement course. This includes a considerable area of fire precautionary work. Other Sub-Officers, including those unlikely to qualify for promotion to Station Officer, who will be engaged in fire prevention duties are catered for by FSC's Basic Fire Prevention Course, the content of which is almost the same as the fire prevention element of both the Junior Officers and the Junior Advancement Course.

FSC provides further progressive training for fire prevention to officers, normally of Station Officer rank and above, through its Specialist Fire Prevention Course, which over a fourteen week period deals with the full range of fire inspection duties.

The College provides continuation training through a Fire Prevention Refresher Course and Fire Prevention Seminars intended for senior officers. Brigades also undertake a wide range of in-house training from refresher courses at central training establishments to regular meetings at which staff are updated on current trends, new codes and changes in legislation and procedures.

The Specialist Fire Prevention Course is of fourteen weeks' duration. It consists of two phases of six and four weeks duration respectively, spent at the Fire Service College, separated by a four or sometimes five week interval during which the student undertakes practical assignments at his Brigade. The Specialist Fire Prevention Course content is a continuation and development of the fire prevention teaching contained in the JO and JOA Courses.

The course contains seven areas of study:

- (a) Fire Prevention Legislation
- (b) Building Regulations
- (c) Fire Prevention Inspection of Industrial, Commercial, Residential and Public Entertainment Premises.
- (d) Petroleum and Explosives Legislation and Administration.
- (e) Science and Fire Engineering

- (f) Brigade Organisation.
- (g) General Fire Prevention Studies.

At the end of the course the student will be able to:

- (a) carry out the inspection and certification of premises as required by the Fire Precautions Act 1971
- (b) give advice in respect of buildings and other property relating to fire prevention, fire spread restriction, and means of escape in case of fire.
- (c) perform effectively the duties of a Petroleum and Explosives Officer on behalf of the Licensing Authority.
- (d) advise District Councils regarding their statutory responsibilities under the Building Regulations relating to fire, including fire prevention and fire protection in proposed buildings, and extension to existing buildings.
- (e) advise District Councils regarding their responsibilities relating to fire prevention and fire protection of various premises subject to licensing controls of one kind or another.
- (f) understand the principles relating to such factors as construction, layout, contents and occupancy of buildings, which underlie the recommendations in Home Office guides and other similar codes: recognise that these factors will vary in importance from case to case, and be able to make value judgements on reasonable and practical levels of fire precautions suitable to individual circumstances.

At the end of the instruction the student will have demonstrated by means of continuous assessment a thorough working knowledge of, and an ability to apply the relevant sections of the following Acts of Parliament and Regulations:

- (a) Fire Precautions Act 1971 and related Regulations
- (b) Highly Flammable Liquid and Liquefied Petroleum Gas Regulations 1972.
- (c) Building Act 1984.
- (d) Housing Act 1985
- (e) Licensing Act 1964
- (f) Gaming Act 1968
- (g) Cinemas Act 1985 and Related Regulations
- (h) Theatres Act 1968
- (i) Local Government (Miscellaneous Provisions) Act 1982.
- (j) The Private Places of Entertainment (Licensing) Act 1967.
- (k) Miscellaneous Acts and Regulations all imposing fire precautions controls relating to the elderly, infirm, children and animals.

Building Regulations

At the end of the instruction the student will be able to:

- (a) understand the current system of building control.
- (b) state in what circumstances the Building Regulations apply and in what circumstances buildings are exempt from Building Regulations.
- (c) understand the current system of Building Regulations and the application of its Functional Requirements.
- (d) state in what circumstances certain Regulations may be dispensed with or relaxed.
- (e) classify buildings or compartments with regard to their stated purpose
- (f) apply the recommendations of the Approved Documents, and recognise the full implications of 'compartmentation' to various building designs.
- (g) demonstrate the correct application of the appropriate Approved Documents regarding fire resistance.
- (h) apply the Approved Documents to external wall elevations.
- (i) apply the recommendations of the appropriate Approved Documents in regard to the provision of fire doors.
- (j) demonstrate the application of the Approved Documents for stairways, cavity barriers and surface spread of flame requirements.
- (k) state the requirements of the Approved Documents for roof coverings and be able to recognise the standards contained in BS 476 Part 3 1958 and BS 476 Part 3 1975.
- (l) demonstrate the correct interpretation of Building Regulations for Means of Escape in Case of Fire.
- (m) state the basic requirements of the Building Regulations with regard to staircase design and apply the recommendations of the appropriate Approved Document.



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