Session **1999-2000**
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House of Commons

# Environment, Transport and Regional Affairs - First Report

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Select Committee on Environment, Transport and Regional Affairs First Report

# FIRST REPORT

**The Environment, Transport and Regional Affairs Committee has agreed to the following Report:—**

## POTENTIAL RISK OF FIRE SPREAD IN BUILDINGS VIA EXTERNAL CLADDING SYSTEMS

1. A fire which occurred in a multi-storey block of flats in Irvine, Ayrshire on 11th June 1999 drew the Committee's attention to the potential risk which could be posed by fire spread involving external cladding systems.

2. The necessity of ensuring that steps be taken to minimise this risk should it prove a serious danger to life and/or property prompted us to undertake a brief inquiry, with the following terms of reference:

- whether a risk is posed by such cladding;
- the extent of the use of external cladding systems;
- the adequacy of the regulations pertaining to their use;
- what action may be necessary to counter any risks posed in existing buildings and to avoid any risks in new buildings or alterations to existing buildings;
- other matters which may arise in the course of questioning.

3. We received 18 written memoranda, and received 28 replies to a letter which we sent to the housing departments of all metropolitan borough councils to try to assess the extent of any risk which might be posed by the use of such systems.[19] We also took oral evidence from seven sets of witnesses. We are grateful to all those who submitted evidence to us at short notice, and we would like to thank Dr Raymond Connolly and his colleagues at International Fire Consultants Ltd, whose advice on the technical aspects of this inquiry was invaluable.

**External Cladding Systems**

4. There are a number of different product types falling under the broad heading of external cladding systems. Briefly put, the three main product types are

- external wall insulation (render) systems;
- 'rainscreen' (sheet boarding) systems;
- pre-formed 'in-fill' systems.

Such cladding serves a number of functions, including:

- providing weather protection;
- insulation;
- improving building appearance.

A note from the Committee's advisers gives more detail on the main types of cladding.[20]

5. None of our witnesses was able to give a definitive figure for the extent of the use of external cladding systems. However, it was estimated that there are approximately 3500 residential tower blocks (in excess of 10 storeys) in the UK, and that around 500 of these are fitted with external cladding.[21]

**Regulations pertaining to the fire safety of external cladding systems**

6. In England and Wales[22], where new buildings are erected, or existing buildings are materially altered, or (in certain cases) where there is a material change of use, the work is required to comply with the Building Regulations 1991. Schedule 1 of the Regulations contains the functional requirements: the section relevant to cladding systems is Requirement B(4), which states:

*'The external walls of the building shall resist the spread of fire over the walls and from one building to another, having regard to the height, use and position of the building.'*

7. Guidance on how to comply with the Regulations is given in Approved Document B (fire safety). This document provides guidance only: contractors are not required to follow its requirements provided that they can prove to the satisfaction of the local authority building standards officer that they have met the requirement of the Building Regulations in some other way. The guidance relevant to cladding systems includes the following:

(a) Any insulation material used in cladding on buildings over 20 metres tall should be of 'limited combustibility'[23];

(b) External surfaces (and hence cladding) closer than 1 metre to another building should be of a material classified as 'Class O' for spread of fire[24], to reduce the risk of fire spread to neighbouring buildings;[25]

(c) External surfaces (and hence cladding) more than 20 metres from ground level should be 'Class O', to reduce the risk of fire at heights which are difficult to reach from firefighting operations on the ground;[26]

(d) Where there is a gap between the cladding and the wall of the building, the provisions of (b) and (c) above also apply to the inside face of the cladding;[27]

(e) Where the building has a floor at more than 20 metres height, and there is a gap between the cladding and the wall of the building, this gap should be fire stopped, to prevent the fire spreading up the inside of the cladding.[28]

8. These requirements are aimed only at reducing the risk of fire spread from one building to another and of fire spread at heights which are difficult for firefighters to reach. They are not aimed at minimising damage to property except insofar as minimising damage to property is a by-product of these aims.[29]

**The adequacy of the regulations to ensure the safety of external cladding systems in a fire**

9. Witnesses to our inquiry (including the Fire Brigades Union,[30] the Loss Prevention Council (technical advisers to the insurance industry),[31] manufacturers of external cladding systems,[32] and independent fire safety consultants[33]) suggested that the guidance given in Approved Document B may not be adequate for the purposes of ensuring the safety of external cladding systems in a fire. We were also told in oral evidence by Poter Field of the Buildings Research Establishment, which has done a great deal of work on these issues, that the existing guidance "is far from being totally adequate".[34]

10. Witnesses' chief concerns lay with the risk of unexpectedly rapid fire spread involving these systems, which, it was suggested, may have a number of adverse consequences of which the existing guidance does not necessarily take full account. These are:

- shorter period available for escape from the building, thus potentially endangering life;[35]
- disproportionate difficulties in firefighting;[36]
- disproportionate damage to the building.[37]

11. Witnesses also raised a number of other potential problems of which existing tests may not take proper account:

- the fixtures which attach the cladding to the building may not withstand the fire, risking the detachment of the system from the building and endangering persons in and around the building, including firefighters;[38]

- if plastic materials are used for the cladding, they could melt and form burning droplets which again endanger people below;[39]

- certain materials could degrade over time and become less resistant to flame spread than they were at the time of construction.[40]

12. Witnesses' complaints about the adequacy of the guidance focus on the methods of testing a material for resistance to fire spread. The classifications 'limited combustibility' and 'Class O' referred to in Approved Document B rely on small-scale tests conducted in laboratory conditions. It was suggested that these tests do not properly evaluate the performance of large, complete, cladding systems in a 'live' fire situation.[41]

13. Concerns about the fire safety of external cladding systems are not new. A fire which occurred in a tower block in Knowsley in 1991 was started at ground floor level and spread up 11 floors behind 'rainscreen' cladding. The inquiry which followed this fire resulted in a change to Approved Document B which provided for the requirements for 'Class O' material to be used on both the inside and outside of external cladding, and to include 'fire stopping' in the gap between the cladding and the wall of the building (see (d) and (e) in paragraph 7 above).

14. The inquiry also prompted further research at the Fire Research Station of the Buildings Research Establishment (BRE). The conclusions arising from this research, which was carried out in 1994, support the claims of our witnesses that the small-scale tests upon which existing guidance relies are insufficient properly to evaluate the performance of complete cladding systems in a fire, and that there is therefore a clear need for full-scale testing.[42]

15. BRE proceeded to develop an appropriate full-scale fire test, known as '*A test for assessing the fire performance of external cladding systems*'.[43] This test was submitted to the DETR in 1996.[44] Witnesses suggested that this test would be a considerable improvement on the small-scale testing which is currently carried out to ascertain the fire performance of materials used in external cladding systems.[45]

16. Other witnesses suggested that this test would not be suitable for all external cladding systems, and in particular that it would not be a suitable method of testing the fire performance of 'infill' systems such as that which was involved in the fire at Irvine.[46] However, we note the view of Peter Field of BRE, which developed the test, who told us, "We believe the test facility itself could be accommodated to assess the fire performance of systems which are not the same as total cladding systems and may involve windows and decorative panels"[47]. The advice we have received concurs with this opinion.

17. The DETR told us in written evidence that this test will be referenced in Approved Document B, and that it was intended that it become a British Standard.[48] However, such reference does not amount to a requirement that cladding systems pass the test: simply that the test is one way of ensuring that the system meets the requirements of the Building Regulations.

**Conclusions**

*Whether a risk is posed by such cladding*

18. **The evidence we have received during this inquiry does not suggest that the majority of the external cladding systems currently in use in the UK poses a serious threat to life or property in the event of fire.** There have been few recorded incidents of serious fire spread involving external cladding, and, although in our view any loss of life in incidents such as these should be prevented if at all possible, neither have there been many deaths (indeed, it is uncertain whether any of the deaths in the fires of which we have been informed can be directly attributed to excessive fire spread via the external cladding).[49] Furthermore, the responsible attitude taken by the major cladding manufacturers towards minimising the risks of excessive fire spread has been impressed upon us throughout this inquiry.[50]

*The adequacy of the regulations pertaining to their use*

19. **Notwithstanding what we have said in paragraph 18 above, we do not believe that it should take a serious fire in which many people are killed before all reasonable steps are taken towards minimising the risks.** The evidence we have received strongly suggests that the small-scale tests which are currently used to determine the fire safety of external cladding systems are not fully effective in evaluating their performance in a 'live' fire situation. As a more appropriate test for external cladding systems now exists, we see no reason why it should not be used.[51]

20. We believe that all external cladding systems should be required either to be entirely non-combustible, or to be proven through full-scale testing not to pose an unacceptable level of risk in terms of fire spread. **We therefore recommend that compliance with the standards set in the 'Test for assessing the fire performance of external cladding systems', which has been submitted to the British Standards Institution for adoption as a British Standard,**[52] **be substituted in Approved Document B for previous requirements relating to the fire safety of external cladding systems.**

*Further action*

21. Action taken as above will ensure that external cladding systems integral to new buildings will achieve an appropriate level of fire safety. It should also ensure the appropriate level of fire safety for new cladding systems installed on buildings not previously clad. However, as under current legislation Building Regulations are not retrospective, this will not ensure that the same standards apply to existing cladding, nor to cases where the existing cladding is being refurbished or replaced.[53] We note that the DETR has already said that "this is a problem area and one that the Department may need to review."[54]

22. As noted above, it appears that no readily available information exists for the number of external cladding systems currently in use. More particularly, there is no indication of how many systems are still in existence which do not meet the standards set following the Knowsley fire (see paragraph 13 above). **We recommend that DETR and the Housing Corporation instruct local authorities and Registered Social Landlords**[55] **to undertake a review of their existing building stock with a view to ascertaining how many multi-storey buildings are currently using external cladding systems; and how many cladding systems are in use which, whilst complying with the regulations in force at the time when they were installed, do not comply with current Regulations. Competent fire safety assessors should then be called in to evaluate what work may be necessary to ensure that no undue risk is posed by any of these systems, with particular reference to the lessons learnt from the fires at Knowsley Heights and Garnock Court. Local authorities and Registered Social Landlords should also be instructed to monitor existing cladding systems carefully to ensure that the materials from which they are constructed do not degrade over time and become less resistant to flame spread than they were at the time of construction.**[56]

*Other questions*

*Fire risk from 'in-fill' systems*

23. There was some disagreement between our witnesses as to whether the pre-formed 'in-fill' systems of the type involved in the fire at Garnock Court constituted 'external cladding' or not.[57] However, whether or not the industry regards these systems as 'cladding' is in our view immaterial. **Approved Document B should make it clear that any addition to the**

**outside of a building which has the potential to lessen its resistance to external fire spread is subject to the Building Regulations and therefore to the guidance contained within that document.**[58]

*Fire safety legislation*

24. It was also brought to our attention during the course of this inquiry that there may be a need for a review of the body of fire safety legislation, which is currently contained in 69 separate pieces of legislation. **We would strongly support any moves to consolidate existing fire safety legislation.**[59]

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19 See Annex 1 Back

20 See Annex 2 Back

21 Ev p.35 (ROF05); Q102 Back

22 Scotland has a different set of Building Regulations Back

23 Ev p.27 (ROF31); Q132. A product is of 'limited combustibility' if it passes British Standard test BS 476 Part 11. Back

24 'Class O' is a classification designed to limit the fire propagation and the spread of flame over the surface of a material. This classification is defined for the purposes of the Building Regulations, and is used for critical situations where a particularly high standard of performance is required. It is measured through a combination of test results from BS476: Part 6: 1989 and BS476: Part 7: 1987. **It should be noted that both 'Class O' and 'limited combustibility' are different from the classification 'non-combustible', which is the highest level of material performance on exposure to fire, and is measured by reference to test BS476: Part 4: 1970 or Part 11: 1982. In no circumstances are external cladding systems required to be non-combustible. Back**

25 Ev p.27 (ROF31) Back

26 *ibid Back*

27 *ibid Back*

28 Ev pp.27-28 (ROF31) Back

29 Q132 Back

30 Ev pp.1-4 (ROF28) Back

31 Ev pp.43-44 (ROF35) Back

32 Ev p.36 (ROF05); pp.42-43 (ROF29); ev not printed (British Plastics Federation) Back

33 Ev p.46 (ROF38) Back

34 Q46 Back

35 Ev p.43 (ROF35) Back

36 Ev p.2 (ROF28); p.43 (ROF35); Q6 Back

37 Ev p.43 (ROF35) Back

38 Ev p.2 (ROF28); p.36 (ROF05) Back

39 Ev p.6 (ROF26); Q13 Back

40 Ev p.38 (ROF22); QQ31, 32, 79-80 Back

41 Ev p.3 (ROF28); p.36 (ROF05); p.44 (ROF35); QQ13, 16, 29, 46, 49, 71 Back

42 *Investigation of the behaviour of external cladding systems in fire: Report on 10 full-scale fire tests*, Fire Research Station Report CR143/94, April 1994 Back

43 Ev p.28 (ROF31) Back

44 Ev p.3 (ROF28) Back

45 Ev p.14 (ROF03); p.36 (ROF05); Q28 Back

46 QQ86-95, 99 Back

47 Q39. See also QQ52, 68. Back

48 Ev p.28 Back

49 Four of the MBCs to which we wrote informed us that they had experienced fires involving external cladding systems: each recorded that the fire had been contained locally and had not spread through the cladding system (see ev p.37 (ROF13), pp.39, 40 (ROF24), p.40 (ROF25), p.45 (ROF36)). See also ev p.19 (ROF45) and QQ9, 10, 31, 36,42-43, 87-88, 102. Back

50 QQ63, 66, 67,72-75, 101 Back

51 Ev p.36 (ROF05); Q53 Back

52 See Q16. Back

53 Ev p.28 (ROF31); QQ148-149 Back

54 Ev p.28 (ROF31). See also QQ138, 148-149, 158 Back

55 The Housing Corporation regulates, funds and promotes registered social landlords (RSLs), which are the major providers of new subsidised social housing. The majority of RSLs are housing associations and they have, since the Housing Act 1988, become responsible for owning and managing increasing numbers of local authority housing stock, including a number of multi-storey tower blocks. Back

56 See QQ155-156 Back

57 Ev p.6 (ROF26); p.35 (ROF05); QQ29, 86, 112-113, 118 Back

58 See ev p.13 (ROF03). See also Q147 Back

59 QQ145-46 Back

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## SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

- **The evidence we have received during this inquiry does not suggest that the majority of the external cladding systems currently in use in the UK poses a serious threat to life or property in the event of fire (paragraph 18).**

- **Notwithstanding what we have said in paragraph 18 above, we do not believe that it should take a serious fire in which many people *are* killed before all reasonable steps are taken towards minimising the risks (paragraph 19).**

- **We therefore recommend that compliance with the standards set in the *'Test for assessing the fire performance of external cladding systems'*, which has been submitted to the British Standards Institution for adoption as a British Standard, be substituted in Approved Document B for previous requirements relating to the fire safety of external cladding systems (paragraph 20).**

- **We recommend that DETR and the Housing Corporation instruct local authorities and Registered Social Landlords to undertake a review of their existing building stock with a view to ascertaining how many multi-storey buildings are currently using external cladding systems; and how many cladding systems are in use which, whilst complying with the regulations in force at the time when they were installed, do not comply with current**

**Regulations. Competent fire safety assessors should then be called in to evaluate what work may be necessary to ensure that no undue risk is posed by any of these systems, with particular reference to the lessons learnt from the fires at Knowsley Heights and Garnock Court. Local authorities and Registered Social Landlords should also be instructed to monitor existing cladding systems carefully to ensure that the materials from which they are constructed do not degrade over time and become less resistant to flame spread than they were at the time of construction (paragraph 22).**

- **Approved Document B should make it clear that any addition to the outside of a building which has the potential to lessen its resistance to external fire spread is subject to the Building Regulations and therefore to the guidance contained within that document (paragraph 23).**

- **We would strongly support any moves to consolidate existing fire safety legislation (paragraph 24).**

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## ANNEX 1

### LETTER TO DIRECTORS OF HOUSING OF METROPOLITAN BOROUGH COUNCILS

28 June 1999

Director of Housing
Metropolitan Borough Council

Dear Director of Housing

**Potential Risk of Fire Spread in Buildings via External Cladding Systems**

The Environment Sub-committee of the House of Commons Select Committee on the Environment, Transport and Regional Affairs has resolved to conduct a brief inquiry into a matter of concern which has been raised with it, namely the potential risk of fire spread in buildings via external cladding systems. This follows a fire some two weeks ago in Irvine, in which the Sub-committee understands one of these cladding systems may have been implicated.

The Sub-committee would like to receive from you assurances that any cladding systems which may be used on any buildings, particularly multi-storey tower blocks, in your area are not in any way susceptible to the risk of serious fire spread on the face of, or immediately behind the cladding. This should include an assurance that the full implications of redecoration - for example with anti-graffiti paint - have been considered.

As this is a relatively short inquiry, we would be grateful if you would reply as soon as possible, and in any case no later than Tuesday 6th July.

I enclose a copy of the terms of reference of the Sub-committee's inquiry, for your reference. If you have any queries relating to this matter, please do not hesitate to contact me on the above number.

Yours sincerely

**Clerk, Environment Sub-committee**

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## ANNEX 2

### MAIN TYPES OF EXTERNAL CLADDING SYSTEM

The basic generic methods of cladding construction are set out in Figures 1 to 3. Whilst there are many variations in form and content these demonstrate in lay terms the basic concepts of external cladding.

External cladding serves a number of functions including;

- providing weather protection;
- insulation;
- improving building appearance.

Cladding systems always include the outermost external envelope (the facade) of a building. In residential buildings cladding systems do not usually include the innermost surface of the building envelope. More often cladding systems (as the name suggests) are mounted on a supporting load-bearing structure. Hence, cladding systems are often called 'over-cladding' systems.

There are three main product types within the external cladding family:

1) External wall insulation (Render) systems, see Figure 1
2) Rainscreen (sheet boarding) systems, see Figure 2
3) Pre-formed in-fill systems, see Figure 3

**1) External wall insulation (Render) systems.**

These systems consist of two components:

i) insulating material fixed to an external wall;
ii) external surface membrane (typically rendered) to provide weather protection.

The absence of a cavity within these systems means that thermoplastic insulants may be safely used if correctly designed. Building Research Establishment Report BR135 (1988) gives detailed guidance on appropriate combinations of insulant, fire barrier and fixing.

The fact that these systems may be applied quickly without need for a structural frame as well as their economic attractiveness explains why these systems make up in the region of 50-60% of all over-cladding installed in the UK.

**2) Rainscreen (sheet boarding) systems**

These systems consist of three components:

i) structural frame affixed to external wall of building;
ii) insulating material fixed to external wall of building;
iii) external surface membrane board to provide weather protection.

There is a wide range of product types within the above generic descriptions, with the external sheeting being the most frequent variable.

The insulating material integral to such systems is open into a cavity alongside the external sheet. It is a well established practice but not mandatory (for tall buildings) that such insulation be of limited combustibility.

This precludes plastic products and hence evidence relating to the merits of polystyrene, polyurethane, polyisocyanurate insulants do not usually relate to this type of cladding product. It is also established following BRE Report BR135 (1988) that in tall buildings such systems should include cavity barriers at regular intervals.

The fire at Knowsley Heights, Liverpool, 1991 involved a rainscreen system. The fire tests commissioned by the Department of the Environment at the Building Research Establishment were predominantly undertaken on rainscreen systems.

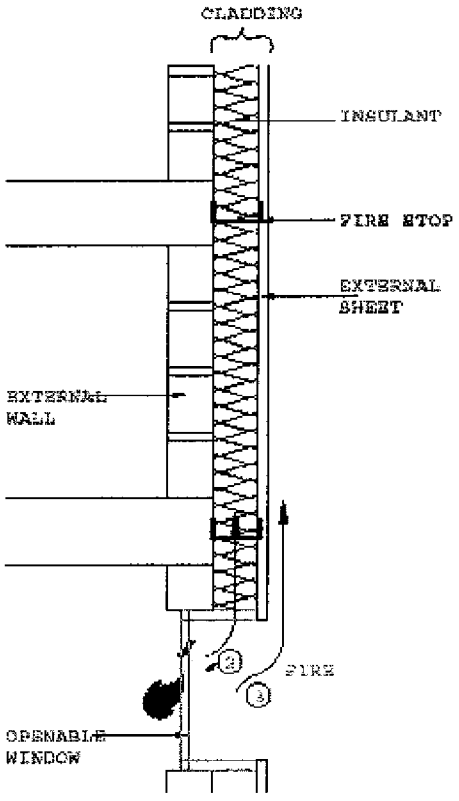
Rainscreen systems constitute some 40% of the over-cladding market.

**3) Pre-formed In-fill systems**

In-fill systems are typically pre-formed remote from the building and fixed in place on-site. They have a wide variety of configurations and differ from render/rainscreen systems in that they may be fitted to only limited areas of the building envelope, eg spandrel panels beneath windows.

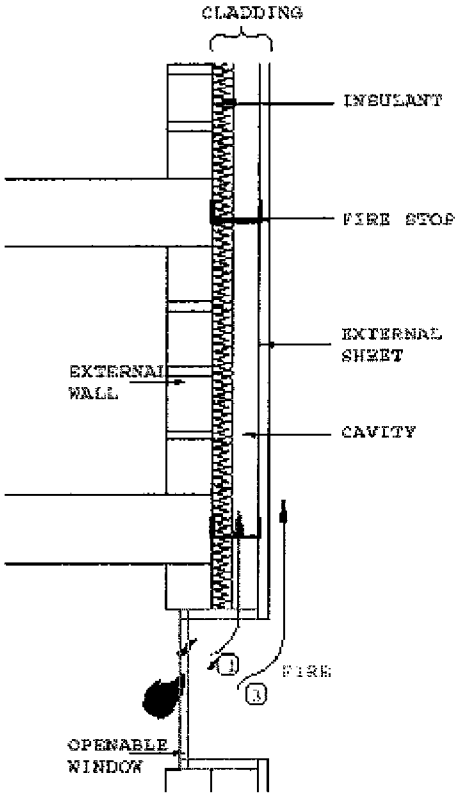
In-fill systems are less often used for weather protection or building insulation and more often for improving appearance. Such systems do not cater to the same market as render/rainscreen systems and are considered by some to be outside the "over-cladding" family. However, such systems undoubtedly constitute external cladding and fall within the terms of the Committee's reference. The system at Irvine, Ayrshire is best described as a pre-formed in-fill system.

**Figure 1**



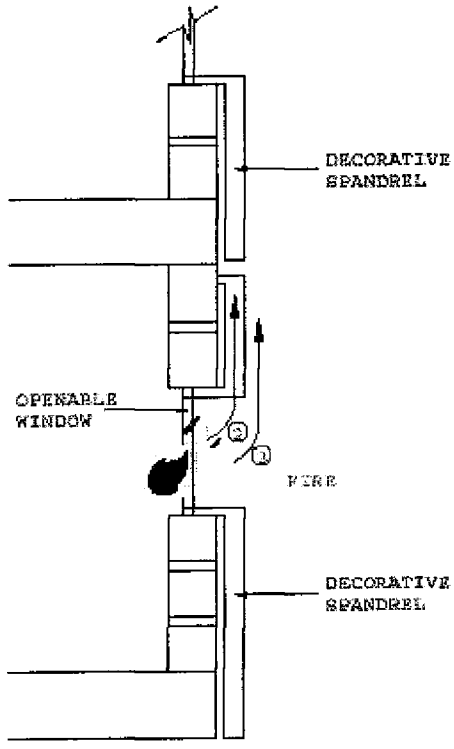

RENDER SYSTEM

**Figure 2**




RAINSCREEN SYSTEM

**Figure 3**




IN-FILL SYSTEM

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# PROCEEDINGS OF THE ENVIRONMENT SUB-COMMITTEE RELATING TO THE REPORT

TUESDAY 7 DECEMBER 1999

Members present:

Mr Andrew F. Bennett, in the Chair

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|---|---|
| Mr Tom Brake | Mrs Gwyneth Dunwoody |
| Christine Butler | Mr James Gray |
| Mr John Cummings | Mr Bill Olner |
| Mr Brian Donohoe | Mr John Randall |

The Sub-committee deliberated.

Draft Report [Potential Risk of Fire Spread in Buildings via External Cladding Systems], proposed by the Chairman, brought up and read.

*Ordered,* That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 24 read and agreed to.

Annexes agreed to.

*Resolved,* That the Report be the First Report of the Sub-committee to the Committee.

*Ordered,* That the Chairman do make the Report to the Committee.

[Adjourned till Tuesday 14 December at a quarter to Ton o'clock.

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## PROCEEDINGS OF THE COMMITTEE RELATING TO THE REPORT

TUESDAY 14 DECEMBER 1999

Members present:

| | |
|---|---|
| Mr Hilary Benn | Mrs Louise Ellman |
| Mr Andrew F. Bennett | Mrs Teresa Gorman |
| Mr Tom Brake | Mr Bill O'Brien |
| Mr Brian Donohoe | Mr John Randall |

Mr Andrew F. Bennett was callad to the Chair.

The Committee deliberated.

Report from the Environment Sub-committee [Potential Risk of Fire Spread in Buildings via External Cladding Systems], proposed by the Chairman, brought up and read.

*Ordered,* That the draft Report be read a second time, paragraph by paragraph.

Paragraphs 1 to 24 read and agreed to.

Annexes agreed to.

*Resolved,* That the Report be the First Report of the Committee to the House.

[Adjourned till Wednesday 15 December at Ten o'clock.

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