

**Determination in respect of the fire safety adequacy of fire detection in a hotel (Ref 004/006/003).**

Following advice from the Chief Fire and Rescue Adviser, the Secretary of State has determined, under article 36 of the Regulatory Reform (Fire Safety) Order 2005 ('the FSO'), that, in this case, the use of heat detectors provides a suitable technical solution to demonstrate compliance with the FSO.

This conclusion has been reached on the basis that the rooms will continue to be used for sleeping accommodation by people who do not have mobility or other relevant special needs.

This Determination is based entirely on the circumstances of the hotel in question and the decisions have been taken after careful consideration of the particular circumstances relating to this case.

A copy of the advice of the Chief Fire and Rescue Adviser to the Secretary of State underpinning this determination is set out below.

# **Chief Fire and Rescue Adviser's advice on a request for Determination under article 36 of the Regulatory Reform (Fire Safety) Order 2005.**

## **Introduction**

1. In accordance with article 36 of the Regulatory Reform (Fire Safety) Order 2005 (FSO) the enforcing Fire and Rescue Authority and the responsible person for the premises jointly applied to the Secretary of State for the determination of the disputed matters related to technical fire safety. The parties were not in agreement over the appropriate technical solution to satisfy the requirements of the FSO.
2. The Secretary of State has requested me to provide technical advice to the Secretary of State, in my role as Chief Fire and Rescue Adviser on receipt of a valid request for a Determination.
3. This determination relates to the requirement under article 13(1) (a) of The Regulatory Reform (Fire Safety) Order 2005 (fire-fighting and fire detection) which places a requirement upon the responsible person to provide:

*'where necessary (whether due to the features of the premises, the activity carried on there, any hazard present or any other relevant circumstances) in order to safeguard the safety of relevant persons, the responsible person must ensure that—*

*(a) the premises are, to the extent that it is appropriate, equipped with appropriate fire-fighting equipment and with fire detectors and alarms.*

4. In essence, the determination centres on the technical suitability of heat detectors heat or smoke detectors in hotel bedrooms.

## **Technical Description**

5. The premises are being put to use as a hotel. Built in the 1960s, the premises have two main buildings including 170 bedrooms and associated accommodation over ground and two upper floors. The bedrooms are provided with heat detectors, except for those used by disabled people where smoke detectors are installed.
6. The disagreement between the responsible person and the Fire and Rescue Authority is over the suitability of the type of fire detection

devices fitted in hotel bedrooms in the premises. The Fire and Rescue Authority is of the opinion that the heat detectors provided are not suitable and sufficient and do not satisfy the requirement given in Article 13 (1) (a) of the FSO. The responsible person maintains that heat detectors are in themselves suitable and sufficient.

7. No other features in the premises relating to risks from fire in this case have been considered in this advice.

### **The Responsible Persons' case**

8. The responsible person rests on the case that the fire alarm is designed, installed and maintained in accordance with British Standard 5839-1 'Fire detection and alarm systems for buildings-Part 1'. The premises has heat detectors in the majority of bedrooms and smoke detectors in those where people with disabilities may be accommodated. Smoke detectors are also located within the corridors, and would be described as being to an L2 category as defined within the British Standard.
9. The British Standard accepts that within this category and for this use of premises, heat detectors are regarded as appropriate for use in bedrooms.
10. The responsible person cites the Fire Safety Risk Assessment guidance for sleeping accommodation, issued by HM Government in support of the FSO, as an appropriate method of providing automatic fire detection within hotel bedrooms by referencing BS5839 as an appropriate standard.
11. The responsible person believes that this is a suitable and sufficient risk mitigation measure in relation to the risks posed in the bedrooms. The fire risk assessment does not show that these rooms pose any greater risk than any other hotel bedroom. Risk reduction measures, such as the banning of smoking also point to no particular increase in risk.
12. The responsible person is of the opinion that the test of what is acceptable is based on achieving risk reduction to a point which is as low as a reasonably practicable by compliance with the appropriate British Standard.
13. This is underscored by the responsible person's assessment of the risk. The risk is regarded as being no greater than any typical hotel bedroom and so protection provided in the form of heat detectors is sufficient. The responsible person cites official statistics gathered and academic studies into the risks associated with hotel bedroom fires which they claim demonstrate that the protection offered by automatic fire alarm systems designed to BS5839 have reduced the risk of death and injury in hotel fires to a very low level.

14. The responsible person is also of the opinion that the choice of detector will have a significant effect on unwanted fire signals (false alarms). It is argued that using heat detectors will reduce the level of unwanted fire signals which will have a beneficial effect on safety by reducing the complacency that high levels of unwanted fire signals can produce. While accepting that other methods of reducing unwanted fire signals are possible, such as the use of staff alarms, these require a level of management response that is not available in this hotel. As such, the use of heat detectors is a suitable method of reducing the risk that complacency can cause in responding to unwanted fire signals.

### **The Fire and Rescue Authority's case**

15. The view of the Fire and Rescue Authority rests on the requirement of the FSO to adequately protect all relevant persons. Occupants using the hotel bedrooms are clearly relevant persons.

16. The Fire and Rescue Authority is of the view that the provision of heat detectors in the bedrooms does not provide adequate protection to the relevant persons. The Fire and Rescue Authority makes the case that smoke detectors would provide a quicker response to any fire in the room, particularly in the case of smouldering fires, and so provide better protection. This case is supported by reference to various factors. The Fire and Rescue Authority cite the concept used in fire engineering to understand how escape times in case of fire can be assessed which is explained in the British Standard document PD 7974-6:2004, 'The application of fire safety engineering principles to fire safety design of buildings. Human factors. Life safety strategies. Occupant evacuation, behaviour and condition (Sub-system 6)'.

17. This document analyses the processes and factors that are important in enabling people to evacuate safely from a building a fire situation. This analysis explains that the time it takes for people to become aware of a fire is of significant importance in determining whether people will have enough time to escape from a fire. The Fire and Rescue Authority claim that heat detectors will not give enough warning for occupants of a bedroom to escape a fire and that the likely type of fire within a bedroom is likely to be a smouldering fire with minimal heat release, unlikely to activate a heat detector.

18. The Fire and Rescue Authority use evidence from the CLG 'Fire Kills' campaign to make the case that the provision of smoke detectors is appropriate, making the link between the success of the domestic smoke detectors campaigns arguing that as smoke detectors are appropriate in domestic settings, they are also appropriate for providing protection in the hotel bedrooms. The Fire and Rescue Authority also cites BS 5839-1:2002 which notes that heat detectors will not give early warning to smouldering fires.

19. The Fire and Rescue Authority also discuss the status of the British Standard 5839-1 and the Fire Safety Risk Assessment guidance for sleeping accommodation, issued by HM Government. They argue that by following these guidance documents alone does not in itself guarantee compliance with the requirements of the FSO.
20. The issue of cost is addressed by the Fire and Rescue Authority. They do not directly address the cost statements made by the responsible person. However, they make the case that domestic fire detectors could be installed as an interim measure in bedrooms to reduce the risk.
21. The Fire and Rescue Authority addresses the potential problem of unwanted fire alarm signals. Their case is that unwanted fire signals in similar hotels are not a significant problem and so to use smoke detection in hotel bedrooms should not be a problem. The Fire and Rescue Authority also argue that the management of unwanted fire signals can be successfully performed where smoke detectors are fitted as it is a management issue, and not a technical problem solved by detector choice.

### **The Chief Fire and Rescue Adviser's View**

22. The central issue to be determined is how the choice of appropriate detector type is established, and how this decision is made. It is my view that to comply with the FSO the technical solutions will have to reduce the risk to a level which safeguards the safety of relevant persons so far as is reasonably practicable. In deciding whether the risk is reduced to a level which is as far as is reasonably practicable involves a comparison between the control measures that the responsible person is proposing and the measures that would normally be found in such circumstances appropriate to that hazard i.e. relevant good practice.
23. Neither the responsible person or the Fire and Rescue Authority have offered any technical or evidential based analysis to compare the differing levels of risk reduction that smoke detectors may achieve when compared with heat detectors, for example an evaluation of the differing times to activation of both types of detector in the hotel rooms in question.
24. The responsible person has relied on a risk assessment of the premises, carried out to satisfy the requirements of the FSO. As such, the risk assessment is based on an understanding of the risks from fire in the hotel rooms and establishing the control measures guided by appropriate standards. My view is that this has been carried out appropriately.
25. BS 5839-1 does allow for the provision of heat detectors in bedrooms. In discussing the choice of detectors, BS 5839-1 explains that a

balance has to be achieved between the effectiveness of the detector and potential problems given by unwanted fire signals. The responsible person is of the view that this balance has been struck by the use of heat detectors in this case.

26. BS 5839-1 does note that the use of heat detectors in bedrooms is not to provide the earliest warning of fire to the occupants but to provide an adequate means of fire detection when combined with smoke detectors in the escape route. The responsible person's assessment is that heat detectors will give warning and that the escape distance within the bedroom is relatively small. This is supported by statistical analysis of fires in hotel bedrooms that demonstrate that in terms of risk, the technical standards contained within BS 5839-1 is adequate.
27. The Fire and Rescue Authority have based their case on a general argument about the relative performance of smoke detectors compared to heat detectors. In making their case they have used a very general approach. The reference to PD 7974-6:2004 is by way of illustration and make no reference to the particular hotel in question or make any attempt to quantify the perceived difference in detector would make, as would be expected by the use of a fire engineering case.
28. The Fire and Rescue Authority uses examples of some hotel fires to point to the risks posed in such premises. The case made by the Fire and Rescue Authority does not illustrate how these examples advance the discussion over the choice of detectors.
29. The Fire and Rescue Authority cites the CLG Fire Kills campaign as evidence that smoke detectors should be used in this hotel. It is recognised that this campaign has been successful. However, it relates to the risk presented in a domestic setting. There is no evidence offered as to how this relates to the particular hotel in question, other than in the most general terms. It is also worth noting that the guidance on placing smoke detectors in this campaign is within escape routes, and not bedrooms. As such their success has been achieved by offering the same type of detector in escape routes as BS5839-1 requires.
30. It is therefore my view that the choice of heat detector over smoke detectors in this particular case has been carried out in accordance with available guidance related to the particular hotel. In conforming to the British Standard, the responsible person has evaluated the risk in the hotel and concluded that the provision of heat detectors is as low as reasonably practical and that the risk presented in the hotel are those envisaged in these documents.
31. The Fire and Rescue Authority based their assessment on general arguments about risk without demonstrating why this particular hotel presents a higher risk than those anticipated within the British Standard. They have failed to show in this particular case that the

relevant persons in the hotel bedrooms would be put at a higher risk which would be unacceptable. The reliance on a general approach does not carry sufficient weight to question the reliance on the British Standard. The determination is not intended to be a commentary on the technical standards in themselves. However, in this case, compliance with the British Standard does show that the risk has been appropriately assessed and therefore that the technical decision to use heat detectors within the hotel bedrooms is the appropriate technical solution in this case.

## **Conclusion**

32. Article 13(1) (a) of the Regulatory Reform (Fire Safety) Order 2005 requires that where necessary, in order to safeguard the safety of relevant persons, the responsible person must ensure that 'the premises are, to the extent that it is appropriate, equipped with appropriate fire detectors and alarms. '
33. I have given careful consideration to the particular circumstances of this case and the arguments of both parties. I have concluded that in this case, the use of heat detectors in the hotel bedroom provides a suitable technical solution to demonstrate compliance with the FSO, and I am advising the Secretary of State accordingly.