GUIDE TO BUILDING FIRE CATAGORIES

1. Introduction

"Categories" of fire alarm system were first introduced into BS 5839-1 in 1988 - when they were described as "Types" of system. In the 2002 revision of BS 5839-1, two new Categories were added, L4 and L5. However, there still remains confusion, particularly amongst users, specifier's and fire risk assessors, regarding the application of these categories and the responsibility for specifying the appropriate category for any building.

The purpose of this guidance document is to clarify the responsibility for identifying the appropriate category of system, and to give general guidance on the typical category that is appropriate for different building uses.

This guide incorporates extracts from various published documents and is not an original works of the writer.

2. The Categories

SANS 10139, Part 1 defines eight categories of system, the lowest of which is a purely manual system whilst the highest category requires extensive automated fire detection.

The eight categories of system are defined as follows:

Category M systems: These are manual systems and require no automatic fire detectors.

Category L systems: These are automatic fire detection systems intended for the protection of life and are further subdivided into sub-categories of system as follows:

Category L1: Systems installed throughout all areas of the building.

Category L2: Systems installed only in defined parts of the building, including all parts necessary to satisfy the recommendations of the code for a Category L3 system. The additional areas protected, over and above those protected in a Category L3 system, are those in which there is either high likelihood of fire starting or a high risk to life if fire does start.

Category L3: Systems designed to give warning of fire at an early enough stage to enable all occupants other than, possibly those in the room of fire origin, to escape safely, before the escape routes are impassable due to the presence of fire, smoke or toxic gases. To satisfy this objective, other than in the case of very short corridors, fire detectors need to be installed in all rooms or areas that open onto the escape routes.

	Category L4:	Systems installed within those parts of the escape routes comprising circulation areas and circulation spaces, such as corridors and stairways.
	Category L5:	Systems in which the protected area(s) and/or the location of detectors is designed to satisfy a specific fire safety objective (other than that of a Category L1, L2, L3 or L4 system).
Category P systems:		These are automatic fire detection systems intended for the protection of property. There are then two subcategories, namely:
	Category P1:	Systems installed throughout all areas of the building.
	Category P2:	Systems installed only in defined parts of the building.

3. Responsibility for Selection of System Category

Since there are eight system categories defined in SANS 10139-1, a reference to SANS 10139-1 without a reference to a system category is meaningless. Therefore it is essential that any project specification, fire risk assessment clearly identifies the Category of building to be protected as outlined within statutory requirements imposed by enforcing authorities.

The category of system to be installed should always be included in a specification. In addition, other than in the case of a Category M, L1, P1 and L4 system, further information needs to be included regarding the areas of the building that are to be protected by automatic fire detection. In a Category M system, there are no such areas, while all areas are protected in a Category L1 or P1 system, and only the escape routes are protected in a Category L4 system.

It is essential to understand that the responsibility for determining the appropriate system category for any application does not rest with the designer of the fire alarm system, such as a fire alarm contractor, who is not expected to have sufficient expertise in the principles of fire safety to make this decision. Whilst many fire alarm designers may have this expertise, the majority of fire alarm installation companies in South Africa do not and therefore the decision as to the building fire category rests with the fire safety specialist and not the fire alarm system specialist.

The roles of the fire safety consultant/specialist and that of the fire alarm installation company must therefore be clearly defined prior to the commencement of any installation. As long as the information issued by the fire consultant/specialist includes the Building Category and any additional information relating to Categories L2, L3, L5 and P2.

The additional information to be provided in the case of certain system categories is as follows:

Category L2:	The rooms or areas that need to be protected, over and above those that require to be protected in a Category L3 system, and the type of detector to be provided.
Category L3:	The type of detector to be provided in rooms or areas opening onto escape routes.

Category L5:	The rooms or areas of the building that are to be protected, and the types of detectors to be installed. This decision may arise from a fire risk assessment but it is a misconception that this will always be the case; for example, it may simply be that detectors are required to operate fire protection measures (such as fire doors) or are being installed in lieu of vision panels to give an early warning to those in an inner room of a fire in an access room.
Category P2:	The rooms or areas that are to be protected and the types of detector that are to be installed. This decision may arise from a form of property protection, or business interruption; risk assessment or may be dictated by the requirements of property or business interruption insurers.

Whilst the emphasis to confirm the system category rests squarely on the shoulders of the fire consultant/specialist/system purchaser (or their appointed agent) within the tender specification/scope of work document, in reality, this commonly does not occur as a result of a lack of understanding on the part of users and specifiers of the principles described above.

If this does not occur, the Standard recommends the fire alarm system designer makes the fire consultant/specialist/system purchaser (or their appointed agent) aware of the proposed category of the system to be used to create the design based on the fire alarm designer's interpretation of the building and it's usage.

This course of action will avoid any potential disputes during the course of a contract regarding the type of system required and the areas to be protected. The FDIA will make recommendations to their members to provide a standard notification to the purchaser of the system suggesting they obtain clarification from a suitably qualified third party to ensure the proposed system meets the requirements of the authority having jurisdiction or the insurer of the property.

4. Selection of System Category

In most instances, the Specifiers or End Users Given that purchasers and specifiers are unable to interpret the standards and determine the category of system required and any additional information that should be provided. It is therefore important that the fire alarm designers/installers have a good understanding of the category of system that will generally be suitable. The guidance provided below has been provided to assist in the evaluation process.

A Category M system is generally sufficient to satisfy the requirements of fire safety legislation in workplaces in which no-one sleeps. In the case of premises in which people sleep, quite extensive automatic fire detection is normally required. Generally, this will be a Category L2 or L1 system. In premises with cellular accommodation such as hotels, there is in fact, very little difference between a Category L2 and a Category L1 system. In a hotel or similar sleeping risk, the bedroom floors are generally protected by a system that is effectively equivalent to a Category L3 system but additional detection is provided throughout the premises, thereby making the system a Category L2 or Category L1 system.

The least likely subcategory of Category L system to be specified would be a Category L4 system, in which automatic fire detection is provided only in escape routes. To ensure adequate warning of occupants before escape routes are made impassable by the presence of smoke (as would normally be required in a sleeping risk), at least a Category L3 system would normally be required.

There may be instances in which a Category L4 system would be suitable; for example, whilst workplaces in which no-one sleeps need only have a manual fire alarm system to comply with the standard, some employers provide limited automatic fire detection to enhance the safety of occupants beyond the minimum legislation requirement. An example of this would be where employees might work alone in a large building after normal office hours.

If the offices are cellular in nature, a Category L3 system becomes similar to a Category L1 system, at a substantial expense, it is often debated that the installation of detectors within escape routes only provides significant improvement of the safety of those employees at a reduced cost.

It is becoming more and more common for automatic fire detection to be provided as a component of a fire engineering solution, often referred to as a Rational Fire Design in which a "bundle" of fire precautions is provided to conform with the life safety objectives of legislation without applying the Codes of Practice that apply under the legislation. Fire risk assessments carried out to satisfy legislation can also identify the need for some form of fire detection, perhaps within a localised area that does not always need to comply with the recommendations of SANS 10139-1 for a Category L1, L2, L3 or L4 system. In such an instance, this would be considered to be a Category L5 system.

The purpose of a Category L5 system is to support a specified fire safety objective or address a particular fire safety problem. It should, therefore, be possible to identify and document the exact objective that the Category L5 system is designed to achieve. This is solely the responsibility of the fire safety specialist and is not something that should be undertaken by the designer of the fire alarm system.

Whilst not recommended, a Category L5 system can, in some cases, become a very simple in design. An example would be where in the design of means of escape.

It should never be the case that a specifier simply calls for a Category L5 system without information as to the areas that are to be protected by automatic fire detection. The fire alarm contractor should reject any request to conduct a risk assessment to determine the design of a Category L5 system.

A thorough fire risk assessment is required to identify and determine the need for fire detection in only specific areas. However, it does not necessarily follow that the need for a Category L5 system arises specifically from a fire risk assessment.

Category P systems generally improve life safety within a building, however, this is not their primary objective which is to provide protection of property or protection against interruption to the normal operations of the company as a result of fire. By providing early detection of a fire and enabling rapid extinguishment, Category P systems as in the case of any automatic fire detection system, also protect the environment by minimising the pollutants that are often produced by a fire and the amount of contaminated fire-fighting run-off water. The highest level of protection, a Category P1 system is generally provided, this is particular to buildings that house equipment and systems which are critical to the operations of the company. In a Category P2 system, fire detection is installed in areas of high fire hazard or in areas in which the risk to property or business continuity from fire is high. Typically this would be server/network rooms, electrical sub stations etc.

5. Legislative Requirements

In virtually all new buildings, a fire alarm system will be required by building regulations.

In England and Wales, guidance on compliance with the Building Regulations 2010 is given in Approved Document B, which subscribes to the view that automatic fire detection systems are not normally needed in non-residential occupancies. However, Approved Document B acknowledges that, even in non-residential occupancies, fire detection may be needed:

- to compensate for some departure from the guidance elsewhere in Approved Document B (e.g. relating to means of escape from fire)

- as part of the operating system for certain fire protection systems, such automatic door releases or smoke control systems

- where a fire could break out in an unoccupied part of the premises and prejudice the means of escape from any occupied parts of the premises

- in a building with phased evacuation, in which case, a system complying, at least, with the recommendations for Category L3 is advocated