

### **FIRE STRATEGIES – PAS 911 EXPLAINED**

#### **What, precisely, is a fire strategy?**

**Paul Bryant, CEO of Kingfell Plc and author of the new British Standard PAS 911, explains.**

Traditionally, if a fire engineer was asked what he or she understood by the term “fire strategy” there were as likely to be as many different answers as the number of opinions asked, even though the term has been around for a long time. So it is hardly surprising that there has been an equally vague understanding of how a fire strategy should be assessed and reviewed. There was no consistent approach, and so no way in which one fire strategy could be critically appraised or compared with another.

This lack of clarity inspired Kingfell, in conjunction with the British Standard Institution, to prepare a Publicly Available Specification on fire strategies or, to give it its full name, PAS 911 - 2007 Fire Strategies – guidance and framework for their formulation. The aim was, notwithstanding the specific legislative requirements, that there should be a mechanism to ensure that the potential threat of fire is minimised as far as is possible, and that any fire incident is properly and promptly dealt with.

It also set out to remove the confusion that had arisen in the UK following years of piecemeal fire safety legislation that was invariably introduced in response to a fire-related disaster. It additionally aimed to replace, with greater clarity, the complexity caused by the welter of British, European and international fire safety legislation and the special requirements of insurers and other interested bodies. However, PAS 911 does not cover specific fire safety topics, as these are already addressed affectively in the vast number of fire standards, specifications and codes.

So, when considering PAS 911, a good starting point is first to define the word “strategy”. The Cambridge Advanced Dictionary defines it succinctly as: “a detailed plan for achieving success in a particular situation”. The key words here are

“detailed”, which leaves no room for vagaries or lack of precision; “plan”, which necessitates forethought; “success”, which is a reminder that a strategy is geared towards a successful outcome rather than any outcome; and “particular situation”, which stresses the need to treat each and every fire strategy as a unique, one-off exercise. In other words, just as there is no such thing as a generic fire risk assessment, so there is no such thing as a generic fire strategy.

## **WHAT, AND BY WHOM.**

With such an important task, the first decision is to decide on the most appropriate person to prepare the strategy. In the PAS, I list the credentials of the ideal candidate as: someone with a good understanding of the fire-related aspects of a premises and their function; a person with appropriate knowledge of fire legislation and the requirements of the enforcing bodies, with knowledge of the relevant codes, and experience in their application. I also identified the need for the person to be appropriately qualified and experienced, as the creation of a fire strategy is the linchpin of the entire fire safety regime. For this particular role, I advocate that the task ought to be undertaken by a person with a degree level qualification in fire engineering and be a member of the Institute of Fire Engineers.

The task for this individual is to devise an approach that can be qualified; one where there is an agreed agenda and protocols, so the results can be analysed. The object is to enable fire strategies to be created that are a single overview of all of the fire precautions of a specific building. This strategy statement is not intended to delve into detailed designs or protocols, but is to provide a platform for more comprehensive assessments or design proposals. It should, therefore, be used as a touchstone for all future changes to the fire safety arrangements, so it needs to be precise, unambiguous and straightforward. Inevitably, it will need to be periodically reviewed.

Although fronted by the person responsible for the creation of the strategy, its development should be a team effort. In PAS 911, I suggest that this team meets periodically during the formulation process at key stages and includes people representing: the fire safety interests of the building or organisation; organisations affected by the strategy, such as human resources and heritage bodies; the regulatory authorities; insurers; the building’s designers and engineers; and fire systems engineers.

## **PURPOSE & PROCEDURE.**

The first step is to agree the most appropriate design basis for the fire strategy. Is it to be a prescriptive approach using established codes and standards, or is a

performance-based approach more appropriate? A third option is a hybrid that combines a performance-based approach with prescriptive guidance.

The starting point for the creation of the strategy itself is, of course, to understand its purpose. This, PAS 911 determines as being to:

- Prompt full and thorough consideration of the fire safety requirements of a building and its occupants.
- Widen the consideration of fire precautions in regard to broader objectives that may include life safety, property protection, business continuity and environmental protection.
- Assist in the review of fire system design criteria prior to the preparation of detailed proposals.
- Ensure that fire protection systems support the overall strategy.
- Provide a framework for future fire safety and protection work.
- Provide a framework for integrating fire protection measures in multi-occupancy and associated premises.

To be comprehensive, a fire strategy needs to embrace what I have identified as "input topics". There are seven in all that cover:

- Consideration of the prevailing and anticipated mandatory landscape.
- A review of the existing or proposed fire safety management and fire systems.
- A fire risk and hazard assessment.
- Identification of the objectives of the strategy.
- An assessment of the building's characteristics – its design, structure and use.
- An assessment of occupancy characteristics.
- Identification of technical, logistical and commercial constraints.

Using this approach, six of what I term as “output sub-strategies” were developed as part of the creation of the overall fire strategy. These are:

- A fire strategy statement.
- A fire safety management strategy.
- An evacuation strategy.
- A fire and smoke control strategy.
- A firefighting strategy.
- A fire protection strategy.

Each of these output strategies needs to be arrived at by taking into account the findings of the seven inputs, analysing them in a structured way and following a systematic set of activities.

I summarised these activities in the new PAS into a five-step process. Step One is to determine the design basis of the fire strategy; is it to be prescriptive, or a performance-based fire engineering solution approach? The second step is to consider the seven input topics. Stage Three is the overall strategy formulation, which is followed by Stage Four, the creation of the six output sub-strategies. The fifth step is the finalising the fire strategy.

## **RISK & HAZARD ASSESSMENT.**

Since the introduction of the Regulatory Reform (Fire Safety) Order in October 2006, tens of thousands of words have been written about the need for fire risk assessments. It is also reasonable to presume that any organisation sufficiently aware of the importance of fire safety to develop a fire strategy will appreciate the need for a properly conducted and regularly reviewed fire risk assessment. However, PAS 911 does include an approach to conducting detailed fire and hazard risk assessments. More on this later.

It overviews risk profiling as a means of removing the possibility of subjectivity when undertaking an assessment of the building for which the strategy is being prepared. This comparative risk assessment approach can also be used to support or challenge the findings of the particular site’s risk and hazard assessments.

## **PROTECTION. BUT PROTECTION OF WHAT?**

Let us take a look at some of these input factors in a little more detail, starting with the setting of objectives. This, at first glance, may appear to many to be a statement of the obvious. Surely, it is protection from fire? But protection of what – life or property, or both? And what about the business continuity and environmental implications?

If life preservation is the issue, the fire strategy must consider whose lives? Is the strategy concerned with everyday occupants, such as employees; visitors such as shoppers or patients; contractors and suppliers that are temporarily on the premises; or emergency services firefighters that may have not visited the site? If property protection is the strategy's driver, the type of construction needs to be taken into account, as does the fabric of the building, along with the fire load nature of any stock held on the premises, fixed assets and movable assets.

Of course, the simple solution that is understandably appealing to adopt is for a fire strategy that addresses all of these preservation and protection aims with equal importance. However, this will inevitably lead to over-protection. Arriving at the optimum solution is also linked to one of the seven key inputs mentioned earlier – the need to make a realistic risk and hazard assessment. There are many forms of risk assessment and there is no shortage of guidance on how to conduct them. However, the form of assessment will need to be agreed by all parties involved in the preparation of the strategy. PAS 911 contributes to the process by the use of a Kingfell-developed "tool" to help picture the relevant hazard level of the room or area. It does this by allowing the plotting of the area based upon the hazard rating of the environment and internal processes on a two-by-two grid.

### **THE PAS 911 "TOOLKITS".**

Starting with what I have termed the "green zone", where there are minimal environmental and process hazards, risks can be assessed as being in the "magenta zone", where the process is adequately controlled but where there are hazards in the room, the enclosure, the building itself or the surrounding environment. They can also be assessed as being in the "blue zone", where environmental risks have been accounted for, but where the remaining hazards are predominantly in the processes undertaken in the building. The final zone is the "red zone", where action needs to be taken on both environmental and processes risks to fire safety.

So, the person responsible for formulation of the fire strategy needs to be wary of over-specifying, going above the optimum level of fire precautions that provides an effective fire strategy, to include extra fire safety measures that add little or no benefit, while significantly adding to the cost of providing fire protection. A "timeline" for the particular building might be a very useful reality check. Presented in matrix format, this should show the starting point and duration of each

of the fire strategy components, from initial detection through to salvage operations. This can be useful in determining the role of each element – such as detection, pre-movement of occupants, all-out or phased evacuation procedures and fire suppression – against, say, the anticipated time that will be taken by the emergency service to respond, and the emergency service’s ability to contend independently with any high-hazard risks.

This approach will help to create a clear picture of precisely what the fire strategy depends upon for its successful execution, by identifying mission-critical elements in another tool developed by Kingfell’s fire engineers that takes the form of a “spider graph”. For example, efficient fire compartmentation and effective early detection, combined with an anticipated fast response from the emergency services, may reduce the need for automatic fire suppression or first-aid firefighting measures. On the other hand, automatic fire suppression may be a priority for a business that is highly dependant on, for example, its IT or communications infrastructure, or where the destruction of key assets may jeopardise the businesses’ continued ability to trade.

There is a very real sense in which this approach to developing effective fire strategies is already well proven; Kingfell has been adopting and developing the methodology, particularly in the heritage and mass transit sectors, since the 1990s. However, the widespread understanding and implementation of the technologies, concepts and ideas – both nationally and internationally – is definitely new. In this wider context, the PAS contains fresh thinking and innovative approaches to the creation of fire strategies.

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