

Historically, fire safety regulation for buildings in Malaysia focused on the design and construction of adequate life safety, fire prevention, fire protection and fire fighting facilities (collectively referred to as fire safety facilities) in new buildings. Upon completion of construction, the Fire and Rescue Department (Bomba) inspects these new buildings and a Certificate of Fitness (CF) is issued. Thereafter, the continuing maintenance of fire safety facilities and the preservation of their overall functionality were not regulated.

This is set to change when section 27-36 of the Fire Services Act, 1988 (Fire Certificate) comes into effect in August 2002. Owners and managers of designated premises are required to apply for a Fire Certificate which certifies that the premises “complies with the life safety, fire prevention, fire protection and fire fighting requirements of the Fire Services Act 1988”. Subsequently, it has to be renewed annually and is issued by Bomba “on condition that the said facilities remain in good order *at all times*”.

Two key responsibilities of building owners and managers now regulated through the Fire Certificate are:-



- To ensure that all fire safety facilities are maintained so that their overall functionality is preserved. Bomba may inspect at any reasonable time to ascertain this.
- To give notice to Bomba regarding any material change in the premises or any change in its use. Bomba may request appropriate steps to be taken as a result of any proposed changes.

These are new challenges facing building owners and managers. They are new not because these obligations did not exist previously, but because they are now regulated. Failure to carry out these responsibilities may render the Fire Certificate invalid, and this constitutes an offence under the Fire Services Act. These legal obligations and the implications, in terms of liability, on the part of building owners and managers will help to address two undesirable attitudes prevalent in our society today - indifference towards fire safety and complacency in maintenance.

In the light of these legal obligations, new strategies and solutions have to be explored and adopted – particularly in the area of maintenance. This paper briefly discusses some pertinent maintenance issues and considers some strategies and solutions for managing them.

Fire Safety Facilities & their classification

Fire safety facilities represent those features or components of a building that protect against the loss of life or injury and damage to property in the event of a fire or other emergency situation. They include equipment as simple as a fire door to complex electronic detection and alarm systems.

For the purpose of Fire Certificate application and renewal, fire safety facilities have been classified by Bomba under the following categories:

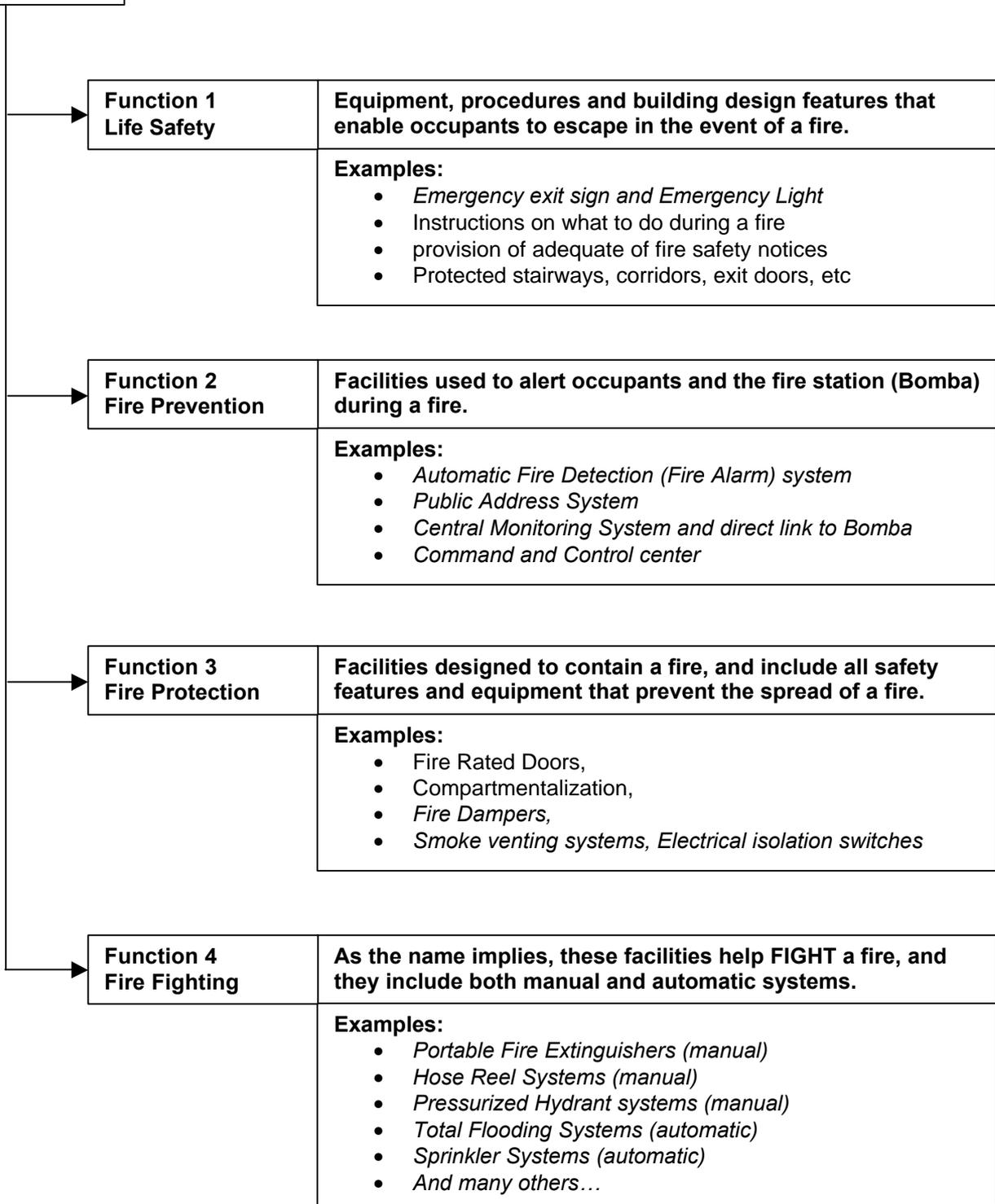
- Life safety facilities,
- Fire prevention facilities,
- Fire protection facilities and
- Fire fighting facilities.

A comprehensive list is contained in Schedule A (Form 1) of the Fire Services Act. It should be noted that individual premises are fitted with facilities relevant to its size and intended use and may not have all of the facilities.

The chart below illustrates their classification with examples of some common facilities.

Fire Safety Facilities

Organizing Fire Safety Facilities according to their functions and type.
 Examples in *italics* are **Active systems** while others are **Passive systems**.



Maintaining Passive and Active Fire Safety Facilities

The Fire Certificate application form classifies the various fire safety facilities according to the functions they play in overall fire defense. However, one may also classify them according to the nature of these facilities (Passive or Active). The latter classification may be more practical for the purpose of maintenance management because of the need for different emphasis and approach in maintenance arising from their differing natures. Referring to the chart above, Passive facilities are in normal print while Active facilities have been highlighted in *italics*.

Passive facilities mainly involve issues of building design like selection of fire resisting materials, compartmentalization, provision of fire exits, paths of travel, adequate access for Bomba trucks during emergencies, fire rated doors, and the like.

Maintenance of passive fire safety facilities is of paramount importance because failure to preserve the intrinsic fire safety features designed into each building can have severe consequences to life and property. Unauthorized renovations may alter the escape path of the original building design or introduce non fire-resistance materials into partitions. Obstruction of stairwells, corridors, exit points and leaving fire doors ajar are some common but potentially fatal fire hazards introduced into buildings due to poor maintenance of the passive fire safety facilities.

Building owners and managers have to set up a good and effective maintenance program that emphasizes strong administrative controls, good house keeping, regular periodic visual inspection and above all, an aggressive fire safety education campaign. Poor maintenance of passive facilities can often be attributed to ignorance concerning the functions and proper use of these facilities. As an example, if all occupants of a building were aware of the function and negative consequences to their own safety if fire doors were left opened, we will have a situation where there will be tens or hundreds of "safety officers" closing any fire doors intentionally or unintentionally left opened.

Active facilities cover a wider range of systems designed to give warning of an outbreak of fire, containment and extinguishment of the fire. These cover both automatic facilities like fire alarms, total flooding, sprinkler, stairway pressurization systems, and manual facilities like hose reel, hydrant, portable extinguishers, public address systems and many others.

While the primary tools for maintaining passive fire safety facilities are administrative and manual in nature, they are often not sufficient in themselves

to effectively and efficiently maintain the active facilities. Active components are far more prone to failure or deterioration due to "wear and tear" that occur after commissioning. In contrast with passive systems, they are "active" or "live", thereby requiring a more proactive maintenance regime compared to their passive counterparts. Considering the fact that they form a majority of all fire safety facilities, there is less room for error and a higher degree of reliance on the operation of overall fire defense system in a building.

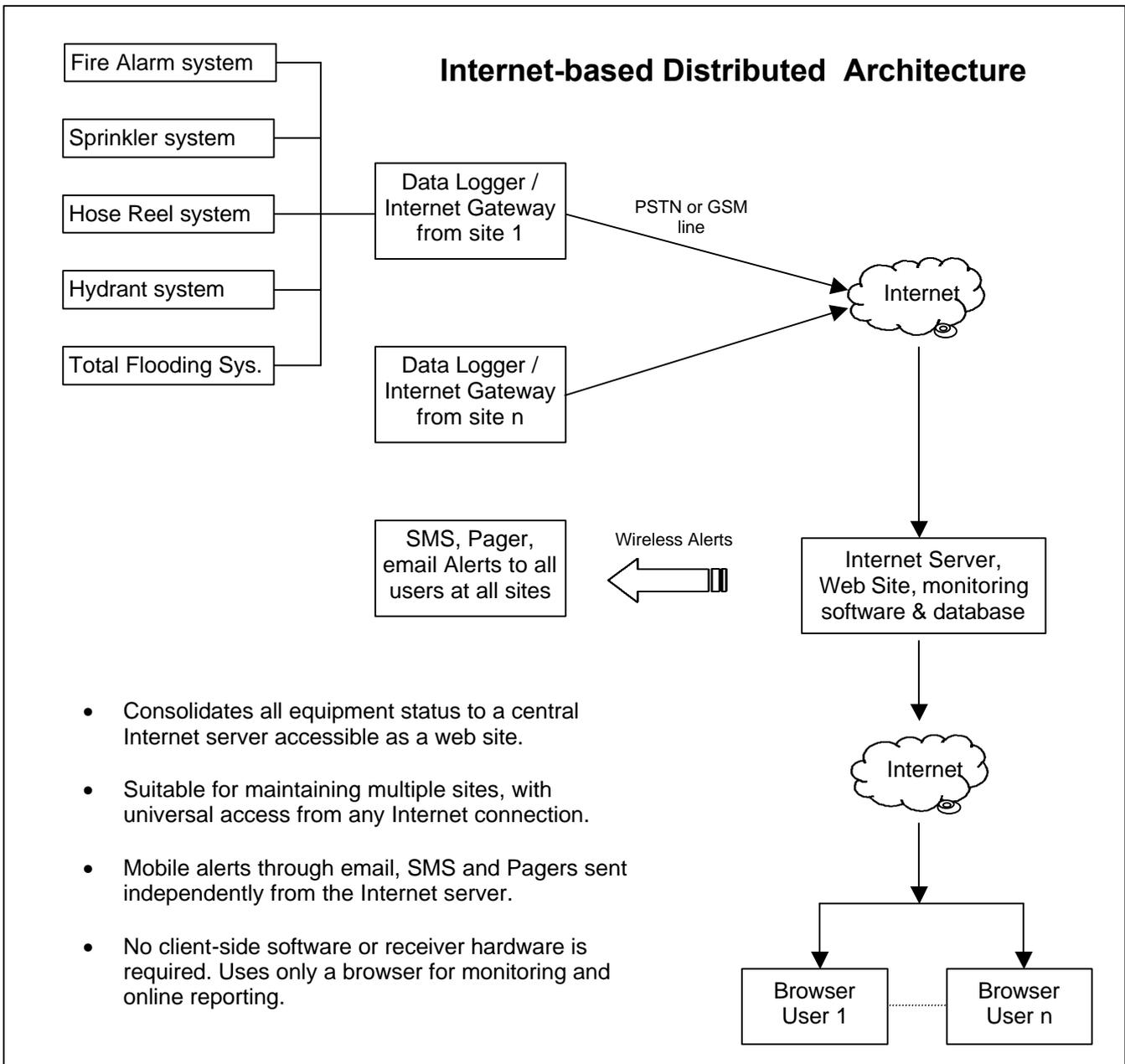
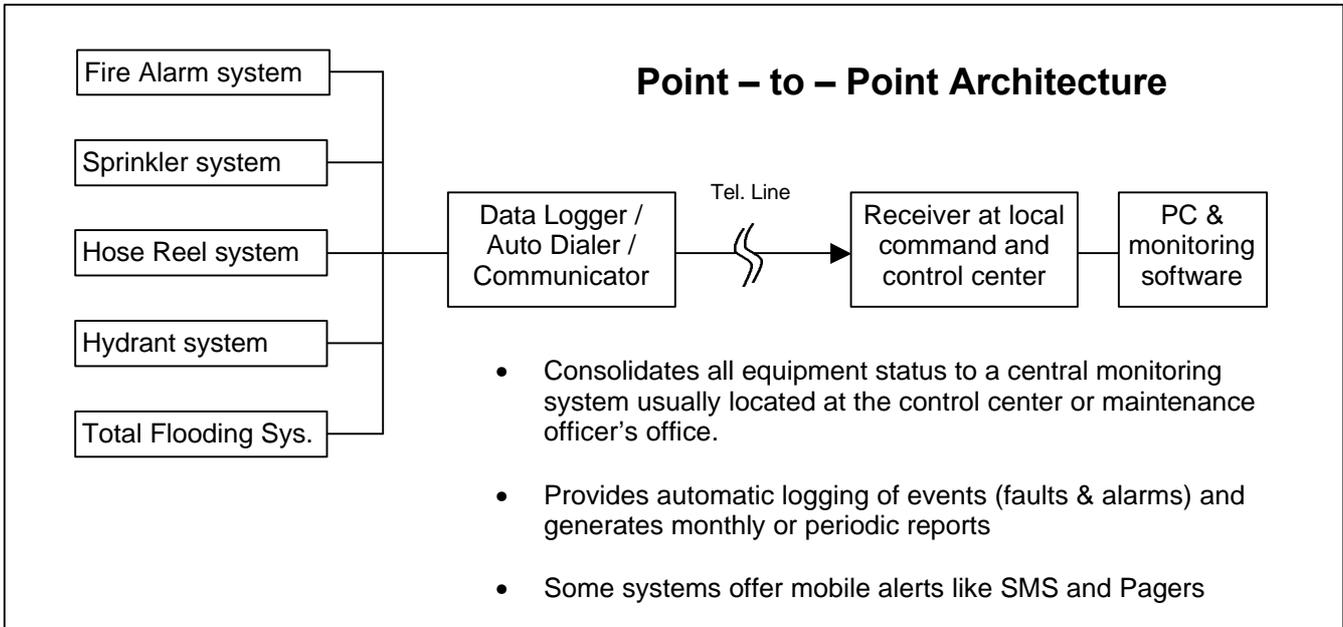
It is self-evident that the failure of any active facility in a building to operate effectively when required may lead to injuries or death or unnecessary property damage in the event of fire. Active fire safety facilities are required to perform only rarely but *must* work when required. Hence, active fire safety facilities are more appropriately maintained by utilizing an "active" maintenance system.

Electronic Maintenance: A tool to maintain Active Fire Safety Facilities

Within the facilities management industry, much progress has been made towards implementing "active" maintenance systems, more commonly referred to as electronic maintenance, e-maintenance, online monitoring, or other similar terms. Conceptually, they all have one feature in common; that is to automatically gather status of equipment to be maintained and to transmit the status to some form of computerized monitoring and alerting system.

Centralized and automated reporting features common to any e-maintenance systems will be of particular benefit to building owners in the light of the requirements of the Fire Certificate. As highlighted in the introduction, the Fire Certificate is issued "on condition that the said facilities remain in good order *at all times*". Thus, having an automatic, online or centralized reporting mechanism as part of the maintenance program will facilitate the building owners or managers to "proof" to the authorities that their respective premises "have remain in good order at all times". This is particularly useful when it comes to the annual renewal of the Fire Certificate or when Bomba decides to inspect any particular site.

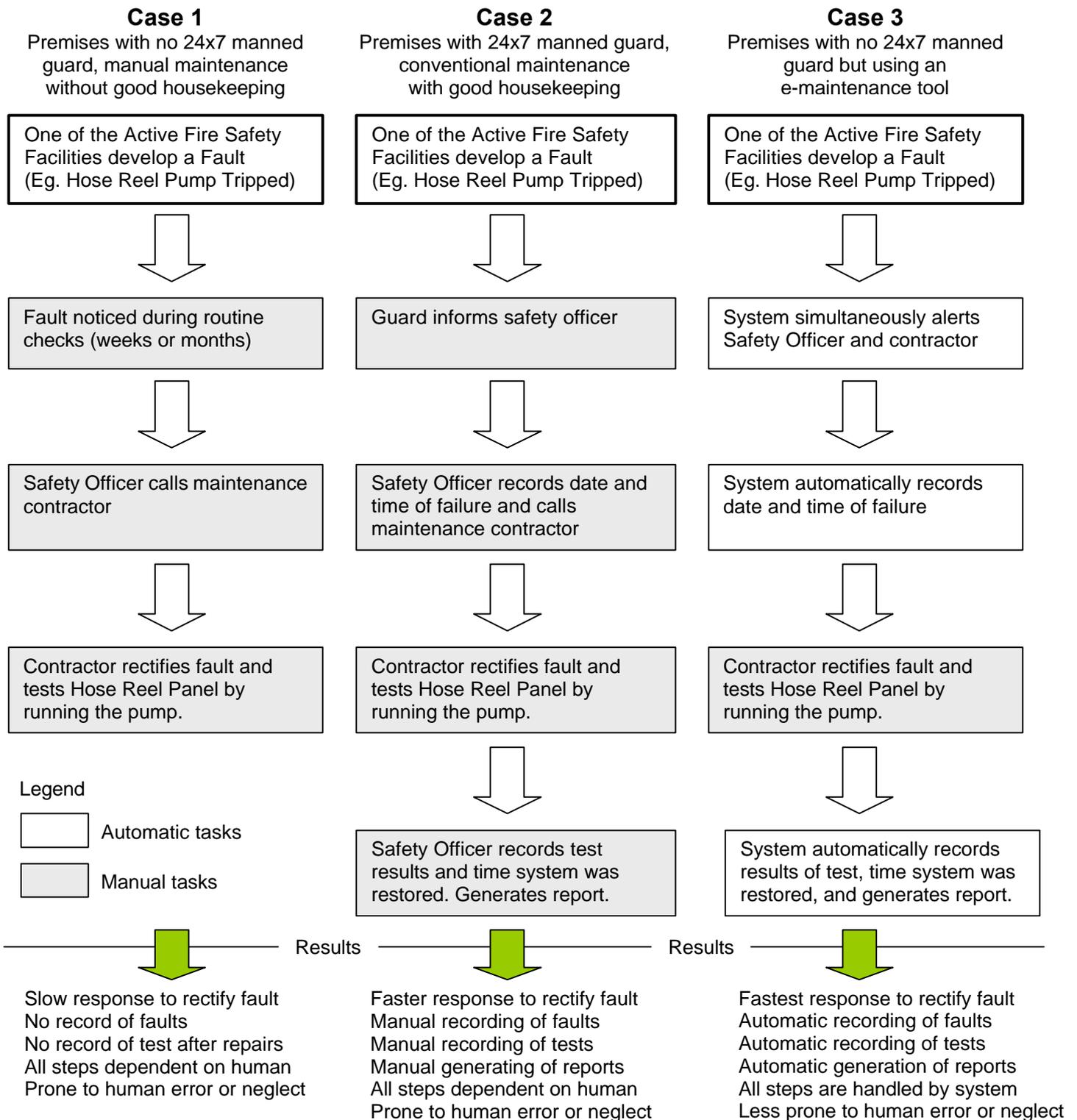
Many such systems are available in the market, and it will be beneficial for building owners and managers to explore the possibilities and identify a solution that best fits their maintenance program. Presented below are two of the more popular architectures in use in the industry.



Irrespective of the architecture selected, the e-maintenance solution will generally offer superior results compared to conventional maintenance where every process has to be tracked, recorded and implemented manually.

The comparative chart below illustrates the difference in workflow between a conventional

maintenance program compared to one incorporating an e-maintenance solution. It is evident that adopting an e-maintenance solution (Case 3) greatly enhances the efficiency and effectiveness of the overall maintenance program. In cases 1 & 2, dependence on a security guard (a non-fire safety personnel) to transmit crucial information from a fire safety system to the management is often the weakest link.



Contracting out fire safety maintenance obligations: Legal & practical issues and how e-maintenance can help.

For new contracts, owners and managers could look at means to minimize their risk by nominating contractors with adequate experience, track record and proper accreditation.

It is evident from the above discussion that the task of preserving the intrinsic fire defense features of a building (Passive facilities) and maintaining all the varied components of the Active facilities requires good knowledge of fire safety in general and technical expertise of the various sub systems in particular.

| Day/Date/Time | Event Name | Channel Name |
|--------------------------|------------|---------------------|
| 15:58:08 16-Jul-2002 Tue | Run | Hose Reel Pump Run |
| 15:20:18 16-Jul-2002 Tue | Normal | Hose Reel Pump Trip |
| 10:05:44 15-Jul-2002 Tue | Trip | Hose Reel Pump Trip |

Typical e-maintenance online report detailing the sequence of events from system failure, to restoration, to system test

Coupled with the legal obligations that comes with the introduction of the Fire Certificate, building owners and managers may choose to engage a third party to address both the technical issues and legal obligations.

Additionally, engaging contractors who employ e-maintenance tools offers some distinct advantages.

A high level of transparency

A common way in which a building owner or manager may manage the risk involved in maintaining fire safety facilities is to delegate that function to a consultant or fire maintenance contractor. For example, the maintenance of fire safety facilities including the application, management and renewal of Fire Certificates may be "contracted out" to a professional party accredited by the authorities.

Owners have the ability to review and audit their buildings at any time online. Logging of equipment failures and their corresponding rectification are not subject to human error or manipulation. Mandatory tests to be performed after system repairs are automatically logged.

Evidence of Compliance

When this option is adopted, it is imperative that building owners and contractors alike are aware of the legal and practical issues involved.

Owners and contractors alike can use the independent and automatic logging of activities of the entire active fire safety facilities to demonstrate compliance with requirements of the Fire Certificate or other statutory requirements.

Conclusion

Unlike other commercial obligations, responsibility for non-compliance with statutory obligations which impose criminal penalties cannot be transferred from an owner (the party who is usually responsible) to another party. In other words, a person with statutory responsibilities under the Fire Services Act cannot "contract out" of their potential criminal liability. Therefore owners, and managers acting on behalf of owners, need to be aware that contracting out obligations to contractors or including obligations in a lease requiring a tenant to comply with the statutory obligations of the owner, will not have the effect of transferring any potential criminal liability to the contractor or tenant.

The Fire Certificate is an honorable attempt by the authorities to raise the standard of fire safety in designated premises. With it comes legal obligations for building owners and managers to ensure that the entire fire safety facility remains functional at all times.

Implementing a good fire safety maintenance program to comply with the Fire Certificate is a highly specialized task. Owners may choose to manage their obligations and risks, by delegating part or all fire safety maintenance tasks to third parties.

Notwithstanding the above, owners and managers who have existing contracts with maintenance contractors should review the contracts to ensure that they are adequate to cover the obligations under the Fire Certificate.

Since statutory obligations cannot be delegated, it is in the interest of owners to be selective, and to engage only suitably qualified and accredited maintenance professionals who employ the latest state of the art maintenance tools.

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