Position Paper on Safety against Fire in Buildings

By: Engr. Chen Thiam Leong, F.I.E.M., P.Eng.

Chairman, Position Paper on Safety againts Fire in Buildings

SUMMARY

This paper examines both the macro and micro issues relating to safety against fire in buildings. Issues reviewed cover the regulations in place; the role played by the owners and professionals; the capability of the installers and operators; right down to the part played by the end-users and the level of awareness of the general public.

The Issues

- Fire, anywhere, will always be a major cause of damage to property, injury and loss of life. Fire, accompanied with smoke within enclosed places such as buildings of any type, will pose even greater threats. Fighting a fire in order to save property and life is rather belated and ineffective whatever the facilities that is available.
- Thus the most appropriate solution against risk of fire is to adopt adequate safety measures incorporating prevention, early detection and fire extinguishing systems in case fire does occur.
- All buildings should be designed and provided with the appropriate level of safety measures in accordance with engineering and legislative requirements and thereafter be continuously maintained. Prevention should include proper design and installation of systems to mitigate against all potential causes of fire.
- It is noted that in Malaysia the occurrence of fire in buildings is still relatively high, whether reported in official statistics or from daily reports of such fires in the news media. This must and can be minimised through greater awareness and appropriate action plans.

The following recommendations were arrived at by The Institution of Engineers, Malaysia (IEM) after detailed deliberations and discussions with the relevant parties, culminating in a formal forum with IEM members:-

The existing regulations, policies and guidelines, though having served us well, need to be reviewed and updated to keep up with global developments and also to obviate inconsistent interpretations. In particular, the Uniform Building By-Laws (UBBL 1984) need to be revamped in the area of categorisation of buildings and occupancy types; and clearly stipulate the acceptance of performance-based approach. The responsibility and liability of installers need to be incorporated too. As an alternative, perhaps it may be more prudent for the Fire & Rescue Department Malaysia (FRDM) to consider enlisting the assistance of industry players to accelerate the production and publication of a Fire Regulations Requirement (as had been successfully achieved previously with the publication of the "Guide to Fire Protection in Malaysia"), rather than continue to wait for the revision to the UBBL 1984 which does not seem forthcoming in the near future.

In the area of public awareness and education on the risks of fires, compulsory modules and practical demonstrations of fire fighting and prevention should be considered at school level. Such a curriculum could next be extended to the newly introduced mandatory National Service programme. In terms of financing, a smart partnership with the General Insurance Association of Malaysia (acronym PIAM) could and ought to be considered; after all a 'Zero Fire' policy translates to 100% profit for the insurers. At the professional designers' level, the insurers could be roped in to provide a compulsory module as part of the Continuing Professional Development (CPD) syllabus. There is also need for some of the insurer's onerous and outdated technical requirements to be deliberated (and where necessary, amended) for meaningful application.

Whilst our fire regulations, designs and installations are comparable with world-class standards, the same cannot be said of our maintenance and sustenance of such installations. A concerted effort needs to be formulated to upgrade this area of weakness. FRDM is encouraged to work closely with the industry and in particular with the Malaysian Fire Protection Association (MFPA) and the Construction Industry Development Board (CIDB), to conduct the appropriate and compulsory training courses for proper maintenance of fire installations. A FRDM registration of qualified maintenance contractors will serve to upgrade the standard in the industry. MFPA (and others) can assist to benchmark the standard of maintenance and work with government agencies (starting with government buildings) to allow for fair maintenance charges to attain such a minimum standard. The insurers can also play their part by giving insurance incentives for the use of such registered maintenance contractors. The industry should also need to convince the insurers to acknowledge the value of Fire Certificates and provide equitable insurance incentives as such.

The FRDM is also urged to review and simplify their licensing and enforcement divisions for consistent and transparent standards. Such professionalism will help to gain public trust and appreciation as well as eliminate wastage of national resources. This will also serve to advance the ultimate goal that fire safety is 'our joint' responsibility rather than that of the Fire Authority alone.

Non-residential buildings are generally adequately protected as long as the issue of proper maintenance is addressed. The fire statistics attest to this statement as it clearly shows the majority of fires (over 42 %) affect residential dwellings. Meanwhile, the overall statistics show that annually, there are on the average over 2,000 fire incidents involving buildings for the past 13 years (1990 to 2002) and of these, residential fires are far ahead of the rest recording 13,552 out of the total of 32,057 which equates to 42.3% of the total. The average number of residential fires per year was 1,042.

A more comprehensive forensic data gathering of all fires needs to be implemented for research purposes to identify and

eliminate or at least reduce the prevalent cause of such fires. Local research should be encouraged to improve safety against fires as well as balance the need for over provision of requirements. Some of the issues that have been proposed to be studied are as follows:

Residential Sprinkler System to Malaysian Standard

- The fire statistics in Malaysia clearly shows residential fires to be many times more prevalent than other building fires. Proposals to introduce self- contained smoke detectors have been put forward and such installations will certainly help to detect fire early and save human lives. However, the statistics also show that incidence of residential fire due to carelessness is rather high (when occupants are not home) and thus fire fighting installation and not merely fire detection system may be more appropriate.
- Automatic wet sprinkler installations have been proven to be the best form of fire fighting and prevention tool so much so that insurance premium reduction of up to 50% are given.
- However, installation of residential sprinklers in strict compliance with established codes are expensive to implement in Malaysia. Perhaps a less stringent code but sufficiently effective residential sprinkler system installation for Malaysia should be researched and developed. Suggestions would include tapping off from a pressurized water mains or hydro-pneumatic pumping system within individual residential units.

District Sprinkler System

- Similar to 'District Air Conditioning Chilled Water System', 'District Sprinkler System' should also be explored for this country to make fire sprinkler system installation compulsory and yet affordable for more applications.

Non Combustible Material for Electrical Distribution Boards

- There is need to explore materials which will retain and contain any fire within the casing of electrical distribution boards. Designers and installers also need to review location of such components to reduce fire risk.

Internal Hydrants in lieu of Wet Risers and Hose Reels

- Wet risers are required for buildings exceeding 30.5m height. Except for residential classification, such high-rise buildings inevitably require total sprinkler protection.
- The high pressure and flowrate for such system are so high that they are meant only for use by fire fighting personnel. With spacing of fire fighting lift lobbies limited to 61m horizontal distance (under UBBL 1984), wet riser spacing will also be dictated likewise. Hence, the pressure rating of 75 psi is in practice rather excessive for internal building application.
- At the same time, hose reel flowrate and pressures are rather low and their effectiveness questionable for buildings with such sprinkles, since complimentary portable extinguishers would suffice.
- R&D to combine the two systems (wet riser and hose reel) into a single internal hydrant system usable by both the occupant and fire personnel should be explored. Such installation (if proven to be workable) will not only be more effective but also more economical.

Accelerate the use of 6 kg (and below) portable Dry Powder Extinguishers

- 9 kg Dry Powder extinguishers are too heavy and bulky to be handled by a normal built and able-bodied Malaysian. Whilst such products have been replaced with 6 kg extinguishers in other countries, we have not only persisted with this impractical product but has even managed to be a leading producer and exporter of such products to less developed (and similarly naïve) countries.
- Instead of now merely considering catching up with 6 kg extinguishers, we should carry out further R&D to determine perhaps a lighter version to suit our smaller physique.

The industry further suggests that the FRDM consider the initiative of carrying out joint post-incident fire investigations with fire consultancy practices so that consultants can see where building protection has failed and where it has worked and thus gain a better understanding of how their designs may perform in a fire. This dissemination of knowledge should be extended to include:-

Publication of Cases

- As a developing country with a maturing populace, there is necessity to use the 'stick and carrot' method to nurture the society to adhere to regulations meant to benefit and protect them when the need arises. Hence, it would be prudent to publicise cases of owners and premises charged with serious non-compliance of the Fire Regulations to serve as an example and deterrent to other potential offenders.
- Publication of technical details related to fire incidents will serve to help the relevant industry players to review and eliminate or at the least improve on their shortcomings. Such would include designers, manufacturers, installers, operators and owners.

Data Collection Centre Open for Public Reference

- FRDM data collection centers should be structured to permit easy access and encourage the public to utilise their contents. Such access should not be restricted to the industry players alone but also provide for academic researchers and any interest groups.
- Web-site access and updated information be regularly disseminated to the industry players.

Forensic Studies and Education

- It is noted that the FRDM has embarked on their forensic programme and it is hoped that this timely development will be expanded over the years in line with our advanced needs.
- Results of forensic investigations need to be published and made available to the public for educational and development purposes.

IEM strongly recommends that the above policies and procedures be implemented by the Government as soon as possible to improve and enhance the fire safety of our buildings. ■