An Investigation on the Building Officials’ Perception for the Use of Performance-Based Fire Engineering Approach in Building Design

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Abstract. Traditionally, the spatial design of a building is influenced by the prescriptive fire safety codes. As buildings develop and become more complex and new materials are used, the prescriptive fire safety rules may not provide an efficient solution to the new building design. A system approach to the design of fire safety in buildings on the basis of performance criteria may be necessary. The recently published fire codes in Hong Kong have recognized the use of a performance-based fire safety engineering approach as a means to demonstrate the adequacy of fire safety design in a building. However, the judgement on the adequacy is made by the building control officials. Whether they believe the use of such a performance-based fire safety engineering approach can provide adequate fire safety level in a building can have influence on promoting performance-based design. This paper discusses the Hong Kong system and a survey on the views of the building control officials. The investigation indicates that the officials, in general, agree with the need of using performance-based approach, in particular to keep pace with the advancement of building technology. However, they have reservations on the adequacy of current tools for fire safety engineering design. Such views are in line with that of the building officials in the United States.

Key words: performance-based code, building officials’ views, plans approval

Introduction
All building works in Hong Kong should have prior approval given by the Buildings Authority. Under the Buildings Ordinance, every person, such as a developer, for whom building works are to be carried out should appoint an Authorized Person (AP) as the project coordinator, who will be entirely responsible for submission of building plans, supervision of the building works and to ensure that the works are in compliance with the Buildings Ordinance [1]. A chart showing the building control mechanism in Hong Kong is given in Figure 1.

Fire safety is one of the major safety issues that should be considered by the Hong Kong Building Authority. In general, the fire safety issue is controlled under two separate legislations, namely the Buildings Ordinance (BO) and the Fire Services Ordinance (FSO).
Figure 1. Building control mechanism in Hong Kong.

The spatial design and fire resisting construction are prescribed under the BO, whereas the fire services installation (FSI) requirements are prescribed under the FSO. However, the approval of FSI at building design stage is also through the BO in that every building plan should be endorsed with a certificate issue under the FSO by the Director of Fire Services before it can be approved.

The prescriptive requirements of fire safety are given in the Code of Practice on: (a) means of escape [2], (b) fire resisting construction [3], and (c) means of access for fire fighting and rescue [4] issued by the Hong Kong Buildings Department as well as the code of practice on minimum fire services installation [5] issued by the Hong Kong Fire Services Department.

Of all the fire codes issued by the Hong Kong Government, the Code of Practice on Means of Escape was the first published and came into operation on 1st January 1960. It provided guidance for the design of the sizes and capacities of various building elements in respect of evacuation. Although some minor amendments were added to the code over the intervening years, the majority of the requirements had not been updated since its first publication. In view of the rapid building development, the Hong Kong Government in 1990 decided to update the requirements in the code and a working party on the