

Evaluation of Fire Protection Systems in Multiple Use High-rise Buildings for Fire Safety Optimization

Pravin Tathod¹ and Kamlesh Mishra²

Professor¹ and PG Scholar²

Shiv Kumar Singh Institute of Technology and Science, Indore, Madhya Pradesh, India

Abstract: Among the several types of occupancies, a multiple use Highrise building presents a more challenge to fire protection due to its functionality, complexity and financial value. The key objective of the present paper was to examine the situation of physical (as opposed to non-physical) fire protection systems in fourteen randomly selected commercial high-rise buildings in the Indore city for fire safety optimization. Methods used include; physical observations, document review and interviews. A multi- attribute evaluation model/approach was applied to establish sufficiency and/or suitability of fire protection systems in the light of the national regulations and approved standards. The study findings show that, save for the facilities of the disabled and the firefighting/evacuation lifts, other fire protection systems are mainly provided in the buildings. However, insufficient maintenance and/or unsuitable elements render their safety performance low. The results of the analysis showed that portable fire extinguishers had the highest performance with 77.57% of the buildings sufficiently and suitably in terms of number, locations, servicing etc., while few % of the building was sufficiently and/or suitably installed with a sprinkler system i.e. they all exhibited some deficiency in terms of coverage and maintenance issues. This could be associated with the cost factor. The results of other systems were as follows: Fire detection and alarm (14.29%); Escape route (50%); Emergency lighting (64.29%); Smoke control System (50.00%); Compartmentation (64.29%), Riser mains, hose reels and hydrants (64.29%); Fire Brigade access and facilities (64.29%); Safety signs and notices (7.14%); Portable fire extinguishers and Fire assembly points (28.57%). In view of the findings, it's recommended that increased efforts in inspection and maintenance of fire protection systems are considered to address the identified shortfalls throughout the project life. Provision for firefighting/evacuation lifts and facilities for the disabled persons should be considered during design of the commercial high-rise buildings.

Keywords: Fire Protection Systems, Maintenance, Provision, Optimization, High rise buildings, NBC, Building by laws