INTERNATIONAL JOURNAL ON OCCUPATIONAL HEALTH & SAFETY, FIRE & ENVIRONMENT – ALLIED SCIENCE
ISSN 2349-977X

VOL. 1 ISSUE 1 JULY-SEPT,2014 (017-019)

Available online at www.ohsfejournal.com

Assessment of Fire Prevention and Protection Measures in Group "C" Buildings of Dehradun City

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ARTICLE INFO

Article history:
Received 05 June 14
Received in revised form 30 June 14
Accepted 28 July 14

Keywords:
Each keyword to start on a new line

ABSTRACT

Fire in any occupancy has potential to cause harm to people and severe damages to property. According to NBC 2005, Part IV; Hospitals and Nursing homes have been classified under GROUP "C" buildings. Fire Safety audit is found to be the effective tool for assessing fire safety standards of an organization. It helps the people to identify the areas for improvement and evolve an action plan.

In addition to this the project titled, "Assessment of Fire Prevention and Protection Measures in Group 'C' Buildings of Dehradun City" has been carried out to study, analyze and assess the level of implementation of Critical Safety Parameters by conducting Inspection and to suggest ways and means for improving the level of implementation of Critical Safety Parameters.

It is done by carrying out field inspections using checklists i.e. inspection and by checking critical safety parameters of each building using level of compliances for measuring implementation of safety procedures.

This thesis presents an overview of the features and advantages of assessment, its findings and level of implementation of critical fire safety parameters of Hospitals and Nursing homes in the Dehradun city.

1. Introduction

A fire can happen at any time at any place. The recent major fires that occurred in various parts of country during the last few months reinforce the view that a fire can happen at any place. You can expect a fire at any structure, irrespective of its occupancy status - residential / commercial / industrial / hospitals / theaters / malls and so on... It means that a fire in any structure has the potential to cause harm to its occupants and property. However, when it comes to residential buildings, in particular, high raised buildings, the problem becomes more complex and poses very high risk to the life and property of its occupants. The magnitude of the problem can be reduced only when the structures are designed, constructed, equipped, maintained and operated with a view to save the life and property of its occupants. Therefore, any structure or building should be erected only after meeting the basic infrastructure needed to protect them from fire and explosion, and even to withstand natural calamities like earthquake, lightening, etc. NBC recommends for periodical fire safety inspection by the key personnel of the occupants of the building to ensure fire safety standards. In case of industrial buildings the statutory authorities insist for fire safety audits by external agencies depending on the type of activity and nature of materials handled in the buildings. The Maharashtra Fire

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Peer review under responsibility of Dr. Akula Ramakrishna.

Hosted by International Journal on Occupational Health & Safety, Fire & Environment. – Allied Scicence.

Prevention and Life Safety Measures Rules, 2009, made it mandatory for building owners and residents to conduct half – yearly fire safety audits and submits the report to the fire department.

Table 1 – General Classification of buildings based on the occupancy.

Group	Type of Buidling
A	Residential
B	Educational
C	Institutional
D	Assembly
E	Business
F	Mercantile
G	Industrial
H	Storage
I	Hazardous

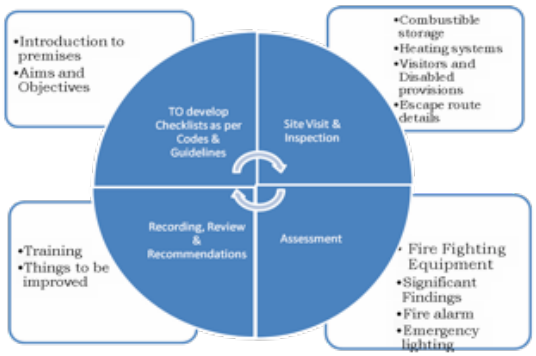
1.1. Need for the Study

Fire can occur at any place and at any point of time if proper preventive measures are not practiced on a regular basis. The grief striking fire incident of AMRI hospital, Kolkata is still fresh in our minds. This fire raised the death toll up to 90 persons including patients and staff members due to asphyxiation. Does it mean that such type of incident is far away from our city? Fire safety is a matter of vital importance in hospitals where there are large numbers of sick, disabled people, children and infants who cannot move on their own and need assistance. It becomes a tough challenge to handle such people in bulk in case of an emergency like fire. Thus a hospital should have an up to date fire fighting facilities along with good housekeeping.

1.2. Objectives

- To assess and take measures to eliminate or minimize the possible causes of fire.
- To assess and take measures to minimize personal injury or loss of life from any fire, especially to those employed on the premises, those resident on the premises, those visiting the premises and those with disabilities.
- To assess and take measures to minimize major financial losses from any fire.
- Examine the availability of suitable emergency plan detailing responsibility and action of key personnel.
- Review the availability of suitable fire alarm and detection system.
- Review the availability of suitable fire fighting facilities, such as hydrants, sprinklers, extinguishers, etc.
- Evaluate passive fire protection systems provided.
- Evaluate the general awareness of occupants and security personnel on matters relating to fire safety and rescue operations.
- Evaluate the training and instructions on fire safety imparted to the employees and occupants.

2. Methodology



2.1. Site Visits

Sr.No.	Place of Visit
1.	Hospital A
2.	Hospital B
3.	Hospital C
4.	Hospital D
5.	Hospital E
6.	Hospital F

Hospital A: General Observations:

- Width of Ramps were not as per the standard dimension
- Fire extinguishers were not in appropriate conditions
- No periodic checks of fire extinguishers
- Disaster management room was used for storage
- Some internal staircases were blocked and not adequately illuminated
- Apart from some Fire extinguishers, No other fire fighting facility were installed
- Absence of safety signage and emergency plan

Hospital B: General Observations:

- Width of Staircases were not as per the standard dimension
- Apart from some Fire extinguishers, No other fire fighting facility were installed
- No periodic checks of fire extinguishers
- Absence of safety signage and emergency plan

Hospital C: General Observations:

- Width of Staircases were not as per the standard dimension
- Fire fighting facility were installed and maintained
- Periodic checks of fire extinguishers was up to date
- There were no pressurized staircases as facility was Centralized Air Conditioned
- Some Emergency Exits were Locked

Hospital: D General Observations:

- Width of Ramps and Staircases were as per the standard dimension
- No periodic checks of fire extinguishers
- Fire Fighting Facilities, Viz. Detectors and Sprinkler Systems, MCPs, Fire Alarm System, Hydrants, Hose reels were installed
- Absence of safety and emergency signage at some corridors
- Height of Main Entrance Gate was short as compared to NBC guidelines

Hospital E: General Observations:

- Width of Ramps and Staircases were as per the standard dimension
- Periodic checks of fire extinguishers were done
- Fire Fighting Facilities, Viz. Detectors and Sprinkler Systems, MCPs, Fire Alarm System, Hydrants, Hose reels were installed
- Absence of safety and emergency signage at some corridors

Hospital F: General Observations:

- Width of Staircases were not as per the standard dimension
- Enclosed staircases were not illuminated properly
- Apart from fire extinguishers not much fire fighting facility were installed
- Periodic checks of fire extinguishers were done
- Absence of safety and emergency signage at some corridors

General Recommendations:

- Width of ramps and staircases should be as per standards
- Ventilation and illumination should be adequate
- Safety and emergency signage should be placed
- Emergency plan and escape routes should be displayed
- Refresher training to be conducted on regular basis
- All employees should be given fire-fighting training
- Mock drills should be conducted periodically
- All the ducts, openings should be properly sealed
- Incident reporting and investigation system should be adopted
- Training and awareness programs on special safety rules, plant safety rules should also be conducted
- There should be provision of pressurized staircases if the facility is centralized air conditioned
- Escape routes should be always kept clear
- All the fire fighting equipment's should be maintained periodically. Passive fire protection measures should be applied to increase fire resistant capacity of construction material

3. Results and Discussions

From the statistical data we can conclude that fire has the potential to occur at any place and cause destruction to life and property. The preventive measures that are suggested and undertaken should be aptly followed. A fire safety plan should be proposed before laying out the foundation of any organization. Many new technologies in prevention of fire be further introduced to reduce the risk associated with fire. It is also seen from the inferences that the fire safety equipment's are installed but their periodic checkups are not carried out.

4. Conclusion

Most of the hospitals having fire extinguisher equipment fail to do the periodic checks and review of same at least once in six month or year. It all depends on the firm how much importance is given to it. In many working firms it is mandatory to provide training to employees from each department from the expert and for that they gets certificate as well also. In the wake of growing fire incidents, fire department has to take up huge campaign tie up with celebrities and NGO's to creating awareness among all the employees about fire protection and prevention measures. Government should bring amendment to existing policies and made it mandatory to have fire prevention and protection measures, also employees should have the training from authorized agencies and should keep review and renewal of fire safety measures. This is the only way to prevent indiscriminately happening fire accidents.

Fire Safety inspections with qualitative assessment by using internationally accepted techniques will make the management of any organization to appreciate the need for fire safety measures and treat the recommendations with respect.

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