

# Case Study & Learning on Major Fire Incident at COVID 19 Hospital in Mumbai Mall

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## **ABSTRACT:**

Hospitals play a very critical part in health care infrastructure. Hospitals primary responsibility is saving lives, they provide 24x7 emergency care service to public. Public perceive it as a vital resource for diagnosis, treatment, and follow-up for both physical as well as psychological care.

The guidelines on Hospital Safety have been developed by government as well as many private hospital safety organizations with the vision that all hospitals in India will be structurally and functionally safer from any type of disasters, such that the risks to human life or infrastructure are minimized. The global aim of the guidelines is to mainstream disaster prevention, mitigation, preparedness, and response activities into the health sector in our country, specific focus on hospitals; such that hospitals are not just better equipped but fully functional immediately even after disasters and are able to respond without any delay to all possible medical requirements of the affected community. Disastrous events can happen anytime, anywhere and at any measure, hence it becomes very important that the interventions suggested in this guideline are approached and implemented in a systematic and time bound manner. When such guidelines are not followed by hospital management it results in hazards just like a current incident that happened in Mumbai. In a shocking unexpected incident, 11 people were killed in fire accident that broke out at a Hospital in the Mall Complex at Bhandup in the suburbs of Mumbai. The fire initially started on first floor of the dream mall on Thursday midnight and soon it spread to the third floor, which houses the hospital. Initially categorized as level 1 (minor) fire, in no time it was upgraded to level-3 (major). More than 75 people including patients, hospital staff and the mall night duty staff were rescued by teams of Mumbai Fire Brigade and Disaster Management Unit of the Brihan Mumbai Municipal Corporation. The Dreams Mall complex is a ground-plus-three-story structure including a terrace and the hospital is located on the top floor. Hospital was started in exceptional circumstances last year when the Covid-19 pandemic broke out.

Mumbai Mayor Kishori Pednekar rushed to the incident place to oversee the ongoing fire-fighting operation. **“The fire has taken place in the mall...it also has a hospital...I have heard such a thing for the first time,”** she said.<sup>1</sup> Mumbai Police Commissioner said: "This is a very serious incident. Gross negligence of hospital management has come to light. We will register a case against the authority."

In a statement, The Sunrise Hospital management, however, claimed that there was no casualty due to fire and two dead bodies – Covid-19 casualties - of the hospital were evacuated. They also claimed that the fire started in the first floor of mall and later reached the top floor where hospital is located. The actual cause of the fire is yet to be ascertained and detailed investigation to its cause is on.

## **INTRODUCTION:**

Hospital are places where patients are cured of their ailments which makes it very essential to maintain the safety as well as functionality of such structures. This ensures responsible and desired healthcare system with patients' safety as their prime concern. It becomes essential to design the healthcare set up in such a planned manner that it can stand both internal as well stand strong during external disasters, be it fire, flood, epidemic or any other types of disaster risks. Equipment's must be maintained with respect to all possibilities and required standards and norms to adherence of safety standards. According to a report globally, every fifth fire-related death in 2017 took place in India. Fire can occur anytime, and at anywhere, health-care facilities in India are more prone to such disasters. In every 4-5 months we get news of fire incident in hospitals be it major or minor. Hospital fires are devastating in terms of loss of life, injuries to patients or staffs, loss of property/equipment, more so because hospitals house a

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<sup>1</sup> <https://m.economictimes.com/news/india/mumbai-hospital-fire-2-dead-70-covid-19-patients-evacuated/articleshow/81699191.cms>

large number of (old/sick/disabled/pregnant/children, immunocompromised, on life support, and incapable of moving) vulnerable people. People losing lives at the table of cure, is a saddening tragedy leading to several health, economic, and social consequences.

In the recent past, quite a lot of fire incidents have been reported all over India, to name a few, at AIIMS – New Delhi, SAL Hospital – Ahmedabad (Gujrat), SMS Hospital – Jaipur (Rajasthan), LNJP Hospital – Delhi, and many more. Loss of both human life and property by fire is always distressing and painful. Hospital fire occurs with shocking frequency and potentially devastating consequences in hospitals all around the world. Hospital infrastructures, designing, parking and roads within the hospital must follow fire safety measures and guidelines given by NDMA or any other organisations. Fire have frequently posed critical challenges to people worldwide. It is very important that hospital must realise that intelligent designs to ensure fire safety by adopting standard. Alertness regarding such safety practice will empower healthcare sector to limit irreversible losses associated with fire outbreak.

The disaster case examined in present study was a fire which broke out at a Mumbai Covid mall hospital. The fire broke out at the Sunrise Hospital in the Dreams Mall building in Bhandup area shortly after midnight, where around 70 patients were rescued, and 11 patients died. The hospital is located on the top floor of the four-storeyed mall building and, most of them being admitted and treated for COVID-19. Moreover, the hospital in this mall was started last year in "exceptional circumstances" of the pandemic breakout and has helped save many lives during extreme need of healthcare facilities in the state. It was on temporary permission given by the state to boost healthcare infrastructure to treat covid-19 patients which was to end on March 31, 2021. The cause of the fire has not been discovered yet. Twenty fire engines, 15 water tankers and ambulances were rushed to the incident spot by fire brigade. The hospital was well functioning with all due compliances required like fire licence, nursing home licence.<sup>2</sup> According to civic official report BMC had issued notice to the mall in November last year for allegedly flouting fire safety norms.<sup>3</sup> There was mismanagement found in terms of security and even the fire safety equipment was not checked on time according to report. It was also found that even though there are 1,108 shops in the mall, approximately 40 per cent of them are shut and currently not in operation. As a result of fire accident nine Covid-19 patients undergoing treatment at the hospital died due to suffocation, whereas two other patients at the hospital had already died due to coronavirus before the fire broke out. The hospital inside dreams mall complex was first projected in 2014 but the plan was stalled. It was functioning on a provisional occupation certificate granted in May 2020 by BMC though the building that housed it had got notices for construction irregularities and fire safety violations.<sup>4</sup> Incidentally the mall basement, first as well as second floors failed to get an all clear from the fire department. However, to surprise sunrise hospital applied for and promptly got an NOC from the very same department.<sup>5</sup> Even of the fact that there were not sufficient ducts to let the smoke out after the fire started clearly shows that the go-ahead was given without a rigorous fire safety audit and great negligence was done.<sup>6</sup>



<sup>2</sup> <https://www.thehindu.com/news/cities/mumbai/many-evacuated-fire-in-dreams-mall-sunrise-hospital-bhandup-mumbai/article34166543.ece>

<sup>3</sup> <https://thewire.in/government/mumbai-fire-at-covid-19-hospital-70-patients-rescued>

<sup>4</sup> <https://timesofindia.indiatimes.com/city/mumbai/mumbai-sunrise-allowed-as-exception-to-treat-covid-in-health-staff/articleshow/81715169.cms>

<sup>5</sup> <https://timesofindia.indiatimes.com/city/mumbai/mumbai-mall-didnt-have-noc-but-hospital-inside-got-it/articleshow/81715101.cms>

<sup>6</sup> <https://www.freepressjournal.in/mumbai/mumbai-sunrise-hospital-tragedy-yet-again-raises-safety-concerns>



(Fig: Fire fighters carry out rescue operations at Sunrise Hospital after a major fire broke out at Dreams Mall in Bhandup in Mumbai on Friday.)

According to the CCTV FOOTAGE the fire smoke first entered through the rear end of the hospital at 11.10 pm, where private VIP suites are located. The ICU, in which most of the patients who died were admitted, was only 25 metres from the point from where the smoke bellowed into the hospital premise.<sup>7</sup> The smoke entered through a window separating a hospital corridor from the mall. With no other outlet for the escape of smoke due to the mall's glass facade, smoke from the fire on the first floor of mall rose up to the third floor, and from there it entered the hospital's ventilation ducts. In the succeeding 5-10 minutes, the smoke spread throughout the third floor. The hospital is spread over one lakh sq. metres. After the fire alarm went off, the smoke in the hospital severely affected the visibility of evacuation and made it more difficult for patients and staffs to find way out. Patients were taken to the terrace. The staff of the hospital faced lots of difficulties while evacuating the trapped patients. Some patients were wheeled out, but there were patients on high-flow oxygen support too. It was quite impossible to separate them from the ventilator. The nurses could not stay with them for long, to ensure continued oxygen supply, though ventilators continued to work on battery backup despite a power cut shortly before midnight. But the smoke was so dense, that in due course it made its way into the patient's oxygen tube. There were 16 patients admitted in hospital ICU, and one patient was wheeled out on an ICU bed till the terrace by hospital staff. According to hospital reports last fire drill was undertaken a week ago in the hospital, but still staffs were not trained enough to handle the situation in right way at right time. Lots of miscommunication and confusion was observed and faced by patients and visitors from the side of hospital management and team.<sup>8</sup>

The hospital had 35 staffs on duty at time of incident took place. The maintenance staff began searching for the source of smoke in the hospital and the nursing staff began the evacuation process. The entire mall, at that point, was deserted.<sup>9</sup>

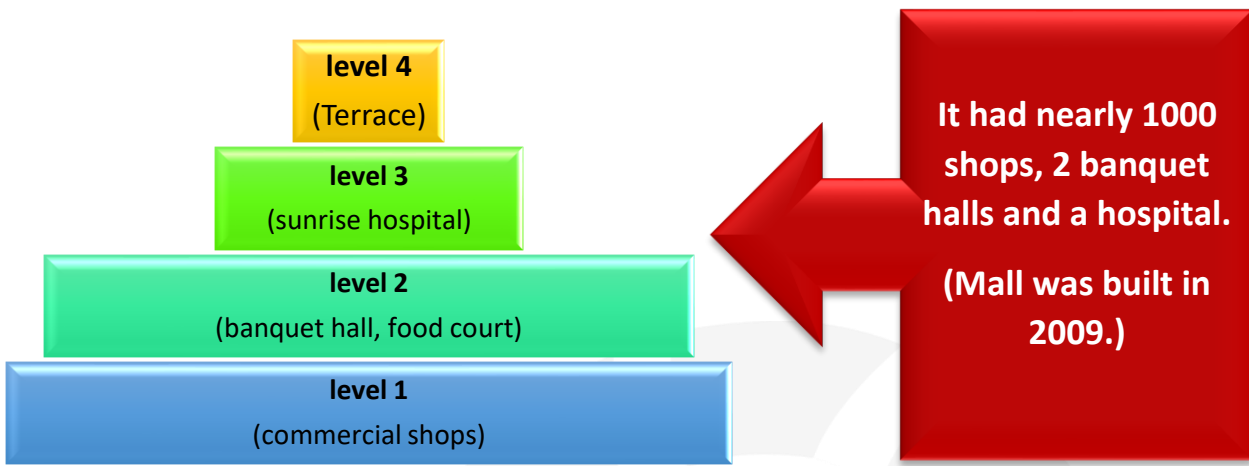
**Kaushal Chakravarthy, who was admitted in a regular ward along with his parents, said the staff in the hospital was new and seemed confused about whether to use the emergency staircase. "We all rushed to the terrace because that seemed the safest. It was only when the Fire Brigade arrived and said it was safe to use the staircase did, we proceed towards it," he said.**

PEOPLE PROCESS TECHNOLOGY

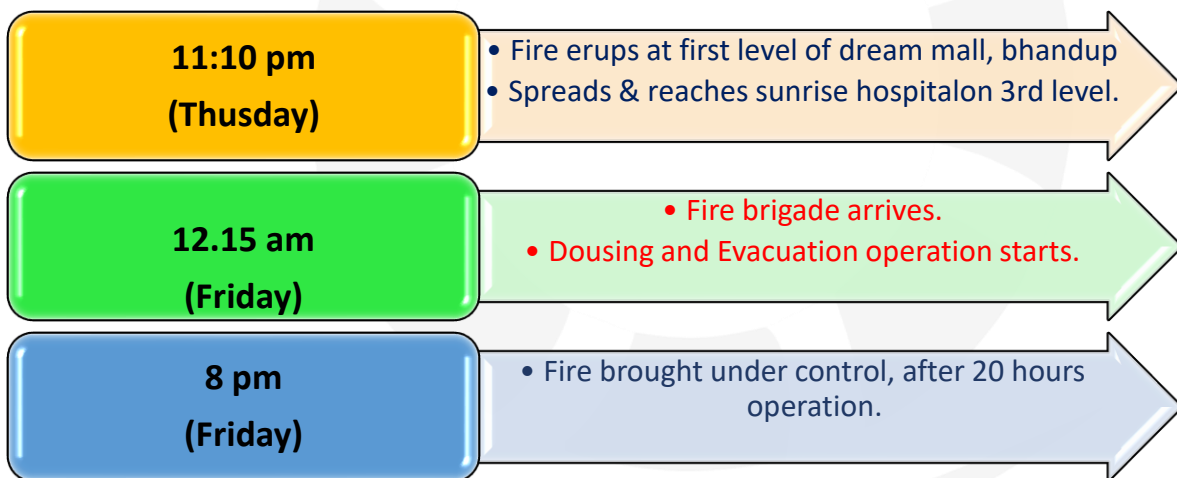
<sup>7</sup> <https://indianexpress.com/article/cities/mumbai/hospital-fire-sunrise-hospital-dream-mall-7248533/>

<sup>8</sup> <https://indianexpress.com/article/cities/mumbai/hospital-fire-sunrise-hospital-dream-mall-7248533/>

<sup>9</sup> <https://indianexpress.com/article/Mumbai/hospital-fire-sunrise-hospital-dream-mall>



(Figure showing Dream's mall, Bhandup, Mumbai- outline structure)



**Background of hospital mall:**



The mall was built by Rakesh Wadhawan's HDIL in year 2009. But since mall did not make profit, the builder failed to pay charges to BMC, water and electricity supply to the mall was disconnected. The shop owners approached the national company law tribunal for immediate help. In year 2016, the NCLT appointed an administrator for the mall. But by this time, the builder had already built a hospital on the top floor of the mall. Initially the hospital did not get permission for operations. But when the pandemic started the authority granted conditional permission from May 2020 till March 31, 2021. The NCLT appointed administrator of mall revealed that he had wrote several letters to BMC

and fire services pointing out concerns to fire safety deficiencies, but no immediate action was taken by any of the authority. If action would have been taken in right time the blaze could have been avoided.<sup>10</sup>

**Fire brigade development:** 16 Fire engines, 15 jumbo tankers, 3 normal water tankers, 2 aerial ladder platforms, 1 turntable ladder and 3 breathing apparatus vans.<sup>11</sup>

#### **Conflicting theories on death:**

**Sunrise hospital:** - According to the statement given by hospital authorities, the fire started on the first floor of the mall, and not in the hospital. Later the smoke reached up to the Hospital. All fire alarms beeped, and all patients were safely evacuated from their wards to the fire refuge area. There were two dead bodies (reason of death due to Covid) which were also evacuated. There was no casualty due to fire. All patients were on time shifted to Jumbo Covid centre (and some to other nearby private hospitals). The patients were transferred alive, but there were few patients on ventilator at that time and were extremely critical. Hospital claims that the casualties had not occurred due to fire, but either in transit or at other hospitals. Though hospital was started in “exceptional circumstances of Covid last year” but was “functioning with all due compliances”. The hospital staff did their best in safely evacuating patients both on wheelchairs and beds to the refuge areas and by following the fire drills and training done earlier.<sup>12</sup>

**Fire brigade:** - Officials from the Mumbai Fire Brigade (MFB) said the firefighting system, including sprinklers, were non-functional. A legal notice for non-compliance of fire safety norms was issued to the mall in November 2020, according to Mumbai deputy chief fire officer, the mall was in violation of safety standards. In the backdrop of a fire last year in City Centre Mall, this Dreams Mall was also inspected. A legal notice was issued to them for non-compliance of fire safety norms. During firefighting also, it was observed that none of the fire suppression mechanisms got activated. There were serious lapses in terms of safety compliance by hospital authority as well as mall authority. The biggest lapse was that the mall did not have required NOC from state fire department the basement, first and second floors of dream mall had failed to get an ‘all clear’ from the Mumbai fire department. Yet, the hospital housed inside it applied for and promptly without any obstacles got an ‘NOC’ from the very same department.<sup>13</sup> The fact that there were not sufficient ducts to let the smoke out of premise after the fire started shows that the go-ahead was given without a rigorous fire safety audit. In all, 78 patients were rescued and brought down with ladders and lifts or led out by firemen using the mall’s emergency staircases. Patients who were declared dead had shown no signs of movement upon evacuation the terrace. Those who succumbed were stated dead on reaching other centers and hospitals. Asphyxia was quoted as the reason.<sup>14</sup>



<sup>10</sup> <https://www.hindustantimes.com/cities/fire-fighting-system-at-city-centre-mall-was-non-functional-mumbai-fire-brigade/story-EEmbuhmJ1SxNTVZWB7p4H.html>

<sup>11</sup> <https://m.economictimes.com/news/india/mumbai-hospital-fire-2-dead-70-covid-19-patients-evacuated/articleshow/81699191.cms>

<sup>12</sup> <https://www.indiatoday.in/cities/mumbai/story/mumbai-s-sunrise-hospital-blame-dreams-mall-administrator-for-fire-that-killed-11-1784442-2021-03-28>

<sup>13</sup> <https://www.republicworld.com/india-news/general-news/mumbai-fire-blaze-engulfs-covid-19-hospital-in-bhandup-mall-over-70-patients-evacuated.html>

<sup>14</sup> <https://www.hindustantimes.com/cities/mumbai-news/bhandup-mall-fire-oct-audit-highlighted-flaws-in-firefighting-system-101617393484393.html>





(Fig: Fire fighters trying to douse fire at Sunrise hospital at Bhandup)<sup>15</sup>

#### **Firefighting Setup Observations:**

- Mall and the hospital had inoperative firefighting system.
- Firefighting systems like wet riser, sprinklers pumps, booster pumps and pumps were non-functional at the hospital too.<sup>16</sup>
- On the day of fire only the fire alarm and smoke detector were in working condition. All firefighting systems were non-functional.
- The existing fire-fighting systems- wet riser system, fire pump, jockey pump, sprinkler pump, booster pump, sprinkler system and smoke detection system were tested in presence of Pona corporation (a government-licenced agency.)
- Nine recommendations, including sealing of electrical cables were made in audit report.
- According to BMC officials after several follow-ups with hospital, finally the hospital submitted a fire safety compliance certificate in July 2020, stating that hospital complied with all fire safety norms recommended to them. But which proved false during the time of fire breakout and investigation. The work of providing open windows in hospital premises was also not fulfilled.
- Spoke person from sunrise hospital claimed that in November 2020, the mall was inspected by fire brigade and the mall administrator was asked to fulfil the required fire safety compliances as it their responsibility not the hospital administrators. All operations and licences *of the mall* are the responsibility of the administrator appointed by the court not by hospital administrator. All hospital permission and licences have been taken care of and are in required order.

#### **Action taken by government:**

- The Brihanmumbai Municipal Corporation has ordered an immediate fire audit of all the Covid-19 hospitals and health centres of state in the wake of the incident that took place.<sup>17</sup>
- Mumbai's mayor Kishori Pednekar has ordered an additional inquiry into how a Covid hospital was allowed to run inside a mall.

<sup>15</sup> <https://www.thehindu.com/news/cities/mumbai/hdils-wadhwas-named-in-fir-filed-in-mumbai-hospital-fire/article34178030.ece>

<sup>16</sup> <https://www.livemint.com/news/india/mumbai-10-dead-in-fire-at-mall-hospital-treating-coronavirus-patients-11616741446406.html>

<sup>17</sup> <https://www.livemint.com/news/india/mumbai-10-dead-in-fire-at-mall-hospital-treating-coronavirus-patients-11616741446406.html>

- Mumbai police has filled an FIR against six persons including Housing Development and Infrastructure Ltd promoter Rakesh Wadhawan and his son Sarang, directors of the mall & owner of sunrise hospital causing deaths due to negligence, in promise to take action against the guilty. No arrests have been made so far.
- Chief Minister Uddhav Thackeray, ordered an enquiry into the incident, along the announcement of ₹5 lakh compensation to the family of the deceased.<sup>18</sup>
- BMC decided not to renew the licence of hospital of hospital which expired on March 31,2021.<sup>19</sup>

#### Hospital patients were shifted:

Sl.no	Centre/hospital name	No. of patients
1	Jumbo covid, Mulund	30
2	Fortis hospital, Mulund	3
3	Agarwal, Mulund	6
4	Sarathi, Bhandup	1
5	Viraj, Thane	2
6	Godrej hospital, Ghatkopar	1
7	BKC Phase 1	1

2 patients were sent home  
 9 patients died due to fire incident.  
 2 more died of covid.  
 (Rest counts were hospital staffs & relatives.)

This incident is clearly a case of gross negligence, mal-administration, and bungling.

The very fact that a 107-bed hospital was running on the top floor of a mall that housed a multiplex, shops, eateries, banquet halls, restaurants, and bars, that too without required licenses and NOC speaks about the gross negligence for itself. There were ventilators and oxygen for patients inside the hospital but no appropriate fire safety precautions. Mumbai fire Brigade had not given No Objection Certificates for the first and second floors but had given permission to run a hospital on the third floor. There were fire extinguishers in the hospital but there was no equipment to tackle smoke coming out from the blaze. There was no defined safe passage or exit for patients to escape during emergency.<sup>20</sup>

#### **Some of the Guidelines given for fire safety should be strictly followed while designing the hospital or any healthcare structure.<sup>21</sup>**

- The 'part 4' of 'National Building Code of India – 2005' based on 'Fire and Life Safety' covers all the requirements for fire prevention and life safety in relation to fire and fire protection of any healthcare buildings.
- The Code specifies construction, occupancy in addition protection features that are necessary to minimize danger to life and property from fire during any accident.
- Buildings on the basis of occupancies have been divided into different groups in the stated chapter.
- Hospitals in India have been classified as sub-division C-1 under Group C for Institutional Buildings with some detailed requirements applicable for this category in addition to the general requirements which is common for all occupancies.
- The NBC gives complete detailed guidelines for Construction Materials, General Requirements for all buildings, Life Safety, Fire Protection, Specific Occupancy wise Requirements in addition to specific requirements for buildings above 15 meters.
- **Legal Compliance:** It is compulsory for all hospitals to obtain No Objection Certificate (NOC) from the concerned Fire Department before the building can be occupied. The NOC is to be renewed every year.<sup>22</sup>
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<sup>18</sup> <https://www.hindustantimes.com/cities/mumbai-news/9-covid-patients-killed-in-fire-at-mumbai-hospital-101616796965257.html>

<sup>19</sup> <https://www.mumbailive.com/en/civic/sunrise-hospital-to-be-closed-permanently-63297>

<sup>20</sup> <https://mumbaimirror.indiatimes.com/mumbai/other/mumbai-major-fire-breaks-out-in-bhandup-mall-patients-evacuated-from-sunrise-hospital/articleshow/81696617.cms>

<sup>21</sup> [https://www.nabh.co/Images/PDF/Fire\\_Safety\\_NABH.pdf](https://www.nabh.co/Images/PDF/Fire_Safety_NABH.pdf)

<sup>22</sup> [https://www.nabh.co/Images/PDF/Fire\\_Safety\\_NABH.pdf](https://www.nabh.co/Images/PDF/Fire_Safety_NABH.pdf)



- Exit Facilities:<sup>23</sup>
  - In buildings occupied by bed-ridden patients where the floor area is around 280 m<sup>2</sup>, facilities will be provided to move patients in hospital beds to the other side of a smoke barrier from any part of such building or part not directly served by permitted horizontal exits or exits from the first floor (floor 2) of a building to the outside area.
  - Not less than two exits of one or more of the following types shall be provided for every floor, including basement, of every building or section:
    - ❖ Doors leading directly outside the building;
    - ❖ Stairways;
    - ❖ Ramps;
    - ❖ Horizontal exits; and
    - ❖ Fire tower.
  - All essential exits that serve as egress from hospital or infirmary sections shall be not less than 2 meter in clear width including patient bedroom doors to allow transportation of patients on beds, litters, or mattresses. The minimum width of corridors helping patients' bedrooms in buildings shall be around 2400 mm.<sup>24</sup>
  - Elevators constitute a desirable supplementary facility but are not counted as required exits. Patient lifts should be provided with sufficient room for transporting a stretcher trolley during incident.
  - Any area exceeding around 500 m<sup>2</sup> should be divided into compartments by good fire-resistant walls. Doors in these fire-resistant walls shall be so connected that these may normally be kept in open position but will close automatically. Corridor door openings in smoke barriers shall not be less than 2000 mm in width. Facility shall also be made for double swing single as well as double leaf type door.
- Additional Precautions:
  - No combustible material of any kind shall be stored or used in any building or section thereof used for institutional occupancy, except as necessary to normal occupancy and use of the building.
  - Bare minimum quantities of flammable material such as chloroform, ethyl alcohol, spirit, etc shall be allowed to be stored and handled. The handling of such liquids should not be allowable by un-authorized persons. Bulk storage of such items must be governed by relevant rules in addition safe practices.
- Exceptions & Deviations: It is recognized that in institutions or part of buildings casing various types of psychiatric patients, or punishing and mental institutions, it is compulsory to maintain locked doors and barred windows; and to such extent that necessary provision in other sections of the Code requiring the keeping of exits unlocked might be waived. It is also recognized that certain type of psychiatric patients is not capable of seeking safety without adequate guidance. In any buildings where such situation prevails, reliable means for the quick release of occupants shall be provided, such as remote control of locks, or by keying all locks to keys commonly used by attendants.

### **Recommendations:**

#### **A) For avoiding such incidents in future, the following is recommended:**

- 1) Licensing authorities should be strict with rules and regulations necessary for safety of patients and no relaxation or escape should be provided to hospital authorities.
- 2) Strict punishment under law for non-competent auditors and safety officers.

<sup>23</sup> <https://nidm.gov.in/PDF/pubs/NDMA/18.pdf>

<sup>24</sup> [https://www.nabh.co/Images/PDF/Fire\\_Safety\\_NABH.pdf](https://www.nabh.co/Images/PDF/Fire_Safety_NABH.pdf)

- 3) Quarterly re-assessment and external audits of safety and firefighting equipment's by hospitals.
- 4) Government should encourage and organize more frequent fire safety drills and trainings for both government and private hospitals.
- 5) All hospital staffs must have hands on trainings related to all types of disasters, irrespective of high or low chances of that disaster in that location.
- 6) Proper planning and designing of hospital, according to given guidelines by the 'part 4' of 'National Building Code of India – 2005'.

#### **B) For fire safety of hospitals:<sup>25</sup>**

- ✓ Instructions for Personal Safety, All Hospital Staff should know: -
  - The location of Manually Operated Electronic Fire Alarm (MOEFA) push button Fire alarm boxes.
  - Location of different types of Fire extinguishers, Hose Reel, etc. provided on their respective floors.
  - The nearest exit from their work area
  - Their assembly points.
  - operating the Fire extinguishers/hose reel provided on the floor (after taking guidance from the Fire Warden)
  - Evacuation drills, as directed by the Fire warden.
- ✓ Fire safety system- The hospital premises should have Fire Safety system in place. The Extinguishers, Exit Pathways, Sprinklers, Hydrant, etc should be frequently checked also always kept ready. This ensures the building is always Fire safe.
- ✓ Fire safety audits- Periodical Fire Safety Audits are also necessary. This benefits the hospital management to know if there are any potential Fire Hazards or not and areas. The audit also recommends preventive measures if there are any chances of risk.
- ✓ Fire mock drills, workshops & trainings- The staff should be trained to handle emergency situations. If there is any state of panic, they may not be in a situation to help patients who need their assistance. Periodic and professional Fire Drills for the staff prepare them and train them for any emergency situations. The Evacuation becomes much easier and beneficial when the staff is prepared. Necessary action based on different situations should be taken to address any issues that crop up during mock drills.
- ✓ Matters to be reported to the Fire/Deputy Fire Warden on time & immediate action should be taken.
  - If any exit door or route is obstructed by any loose materials, goods, cartons, etc.
  - If any staircase door, lift lobby door does not close automatically, or does not close completely.
  - If any push button Fire alarm point or Fire extinguisher is obstructed, damaged or apparently out of order.
- ✓ Training regarding evacuation Procedure should be given regularly conducted and each staff should be well trained for any type of disaster or accident incident.
  - Evacuate through the nearest safe Exit.
  - If an operation is in progress, the decision to evacuate is at the discretion of the surgeon in charge of the operation.
  - When operations are not in progress, the designated senior staff member will supervise whatever evacuations may be required by whatever means are safest.
  - Staff should make every attempt to turn off all medical gas supplies and electrical equipment before vacating the site.
- ✓ Defined fire prevention and control Infrastructure for hospital:
- ✓ The organization must have updated NOC from state Fire Department.
- ✓ The organization should have a multi-disciplinary safety committee with a senior person as the chairman of the safety committee. The safety committee meetings are to be held at least once in 3 months. The minutes of the meeting to be recorded and put up to the senior management.

<sup>25</sup> <https://nidm.gov.in/PDF/pubs/NDMA/18.pdf>

- ✓ The organization must have a formally appointed Fire Safety Officer in-charge of all concerns related to Fire Prevention & Safety.
- ✓ The organization must have a written plan for Fire Prevention and Safety and a Fire Safety Manual approved by the safety committee.
- ✓ The organization must have an Emergency Command Centre that becomes functional immediately whenever there is an emergency. There must be a written protocol and written constitution of the committee and the Fire Command Centre is update with the name of the members. A designated person should be given the responsibility of informing to all the Emergency Command members.
- ✓ The Fire Safety Manual is must for each hospital staffs covering the following components:
  - Plan for fire prevention & control.
  - Systems for fire prevention & control.
  - Maintenance Schedules/ SOPs for systems related to fire prevention & control.
  - Inspection protocols for fire safety installations.
  - Codes for announcement of fire related emergency, procedures, and communication protocols for the same.
  - Responsibilities of different departments in case of fire.
  - Procedures, frequency & protocols for mock drills.
  - Constitution of Fire Fighting & Evacuation Teams.
  - Evacuation Plan.
  - Electrical Safety & System.
- ✓ The escape routes must be free from any materials that would cause hindrance during evacuation.
- ✓ The Fire Doors must have a proper fire rating and open outside.
- ✓ The Fire Doors preferably should have panic bars.

The Fire Doors must always remain open.

- ✓ The Fire cabinets should be left open all the time.
- ✓ The Manual Call Points should have means to break the glass.
- ✓ The Fire Alarm systems should be properly tested and maintained, and a record should be kept for the same.
- ✓ The Emergency Exit signs should be displayed prominently.
- ✓ The stairwells used for evacuation should not be pressurized in case of fire emergency.
- ✓ The lifts should not be used in case of fire breakout.
- ✓ The HVAC system should have appropriate fire dampers to prevent spread of fire that function properly in case of fire. The dampers should be tested and have a regular preventive maintenance schedule.
- ✓ All the equipment's have an organized preventive maintenance schedule that is recorded, and stickers put on the equipment's showing the date of preventive maintenance check and the next date for maintenance.
- ✓ Appropriate type & number of fire extinguishers must be installed according to the type of fire that could take place.
- ✓ The Fire Extinguishers must have a regular preventive maintenance schedule and stickers put on them showing the date of checking and the next scheduled date for checking.
- ✓ 10% of Fire Extinguishers are used every year for checking the same.
- ✓ The building must have an approachable peripheral road around it for access by fire brigade.
- ✓ The Fire Pump House is to be maintained properly and the pumps must have pressure gauges that have been calibrated and appropriate pressures are maintained in the fire hydrant & sprinkler lines.
- ✓ There is a proper training program for handling fire emergencies and training records are maintained. The entire staff is imparted fire safety training.
- ✓ The staffs must be aware of the firefighting systems, responsibilities during fire emergencies, evacuation routes & techniques, conversant with the type of fire extinguishers and their area of use, skilled and trained to operate fire extinguishers, code announcements and assembly points in case of fire.

- ✓ The organization policies & protocols for storing, dispensing & use of flammable materials. Appropriate warning signs for flammables are displayed.
- ✓ Electrical safeties should be in place. Preventive maintenance & testing is to be done at regular pre decided intervals and recorded and stickers affixed.
- ✓ All electrical panels must have a rubber mat in front of them.
- ✓ The earthing system should be tested regularly.
- ✓ The UPS batteries are to be checked regularly by loading the same periodically to check any heating up etc.
- ✓ There should be proper ventilation in panel, UPS & equipment rooms to avoid overheating.
- ✓ Approval from the Indian Explosives Department for bulk storage of Diesel & any other flammable material as per Indian Explosives Act, in case stored in bulk.
- ✓ The pumps used for pumping fuel should be of flame proof construction.
- ✓ The Provisions to take care of fuel overflow.

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