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Fixing Electrical Fire Safety:

India's path to
sustainable growth



Expert Speak : Making India free of electrical accidents & fire

Analysis : How to protect cables against short-circuit currents

Guest Article : Step by step guide on cause & protection in electrical safety

Prevention : Basics of electrical fire, shock, its safety rules & prevention

India's Sustainable Urbanisation requires a Solution to the Burning Problem of Electrical Safety



As India envisions to become a developed nation by 2047, the nation's infrastructure will play a pivotal role in meeting this goal. It is expected that India's urban population size will almost double between 2018 and 2050, from 461 million to 877 million. In order to meet its developmental objectives, the country is witnessing rapid urbanisation along with an increased penetration of electrical appliances in Indian households.

To accommodate its rising urban population, there has been a significant increase in residential areas, commercial buildings, and common public spaces. As more residents opt to live in high-rise buildings in urban areas and commercial spaces expand, a crucial aspect to ensure safety is to prevent the occurrence of manmade calamities such as fire accidents in these thickly inhabited establishments.

As per the National Crime Records Bureau, fires caused due to electrical accidents accounted for 20% of the total cases in 2020. Compared to other forms of accidents and mishaps, the percentage of fatalities in fire incidents is very high (91%) among the total affected, making it a very serious issue. The Central Electricity Authority (CEA) reported 10,022 electrical accidents in India during 2019-2020, out of which approximately 55% were caused by faulty electrical installations.



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Human lives and assets in residential and commercial buildings are more vulnerable to fire accidents vis-à-vis standalone establishments on account of factors such as density of people living per square ft. area, higher utilization of electrical equipment, etc. Additionally, these spaces are witnessing an increased usage of electrical appliances, cooling and heating systems, and inflammable materials for storage and decoration, which further intensifies the risk of fire accidents.

Fire accidents, if not sustained immediately, can cause loss of life and can also have a lasting physical and psychological impact on the well-being of the residents. Moreover, they also cause severe damage to property and assets which includes replacement or repair costs for damaged assets and equipment, shutting down operations and moving out temporarily, loss of workdays and loss of output and revenue. All the factors added up can cause a major physical and monetary setback to the citizens.

Given the adverse impact of fire, safety standards and their enforcement become critical. In this regard, the government of India drafted the National Building Code (NBC) in 2016 with guidelines for fire safety in construction and maintenance of structures. Although State governments were advised to incorporate the NBC into their local building bylaws as a mandate, they are only partially adopted. The National Electrical Code (NEC) 2023 provides guidelines for the regulation of electrical installation practices across the nation. However, compliance for the same is voluntary in nature and not mandated.

In India, fire service is considered as a state subject according to the Constitution. All services pertaining to fire safety fall under the management of the concerned State Government, Union Territory, or the Urban Local Bodies (ULB) with the associated norms being laid down in state regulations or municipal bylaws. Many of the States barring a few have enacted legislations or rules for fire prevention and safety. However, enforcement of these standards is hindered by several systemic and functional challenges related to coordination and allocation of role and responsibilities to government and non-government stakeholders.



In the absence of a mandate for these codes, electrical safety is given a lower priority and electrical safety parameters are often overlooked. As a result, No Objection Certificates (NOC) or Occupancy Certificates (OC) are issued without prior inspection of electrical infrastructure in buildings. This poses the question – who takes care of these inspections?

The cost of installing electrical and fire safety equipment is carried out by the builders. On the other hand, the benefit of minimised fire risk in the buildings, lies with the occupants. A split incentive arises in this situation from the misplacement of incentives between the builder selecting the equipment for fire and electrical safety and the occupants who stay in a safe building. Using inferior quality conductors, wrong selection and under-sizing of wires and cables at the time of construction is a major threat to fire safety. It is important to ensure the use of quality material inputs, such as copper wiring, which provides a significant benefit of safety and reliability to consumers in the long run.

Considering the high rate of vertical expansion of cities, it is worthwhile to consider the example of other countries and their safety measures. Singapore's regulations for electrical instalments specify that the conductor should be of copper when the cable is to be used in an installation whether wholly or partially for domestic purposes. It also states that cables with aluminium conductors cannot be used in domestic electrical installations.

With an increase in negligence of electrical safety norms, periodic inspections of electrical infrastructure have become the need of the hour. Going forward, to reduce the number of electrical fire accidents, it is necessary to mandate adherence to safety norms and synchronise the Central and State laws. There is a need to outline accountability for inspection of safety measures and electrical installations. This collective effort will pave the path for India's sustainable urbanisation with the safety of its citizens being the central objective ■

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