ti Current Trends

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In continuation with Volume.7 No.3....

In Continuation on the Ti Current Trends uploaded in the month January and February 2025 regarding electrical fires, it is evident that they pose a significant concern in India, particularly in metro cities with aging infrastructure. Reports indicate that nearly 70% of fire incidents are caused by electrical short circuits. However, many of these cases stem from deeper issues, including the improper selection of electrical components, substandard installation practices, inadequate maintenance and location of Electrical Distribution System and Distribution Boards.

Recommendations for Mitigating Electrical Fire Risks

To reduce the occurrence of electrical fires, the following measures are recommended:

1. **Proper Sizing and Selection of Electrical Protection Devices**
    a. **MCBs** should be selected based on the expected circuit load and the required protection level. For instance, adopting a standard practice of using a **3/4 Pole**, **63/100 A MCB** in a flat ensures the correct rating is chosen, allowing the system to trip before reaching hazardous overload conditions.
    b. **ELCBs** should be selected with a **30mA sensitivity** for residential flats. This sensitivity is designed to detect low-level leakage currents and ensure the protection of both people and property.

2. **Regular Inspections and Preventive Maintenance**
    a. **Routine inspections** of all electrical systems should be carried out by qualified professionals at least once a year to detect any wear, corrosion, or deterioration of wiring and electrical components.
    b. **Thermographic surveys** can be used to detect any hot spots in the electrical system before they escalate into serious issues.

3. **Training and Awareness for Electricians**
    a. Local electricians should be provided with **ongoing training** on proper installation practices, correct component selection, and troubleshooting of electrical systems.
    b. **Workshops and certifications** should be promoted to increase awareness about electrical safety and the correct selection of protection devices.

4. Location of Electrical Distribution System and Distribution Boards in India

Electrical distribution systems and distribution boards play a crucial role in ensuring the safe and efficient operation of electrical networks in buildings. However, in India, there is a disturbing trend where architects often fail to allocate adequate and safe space for these essential components. One of the most alarming practices is the placement of electrical distribution systems below staircases on the ground floor, which not only violates basic fire safety norms but also endangers human lives in case of fire incidents. Let us examines the hazards associated with this practice and highlights the urgent need for a movement in this regard.

4.1. The Role of Architects in Fire Hazards

Architects bear primary responsibility for designing buildings with proper fire safety measures. However, in many cases, they prioritize aesthetics and space optimization over safety. The result is a severe lack of dedicated, safe spaces for electrical distribution systems, leading to hazardous conditions.

Common Issues Observed:

- **Placement under staircases:** This practice blocks the fire escape route in case of an emergency.
- **Congested electrical rooms:** Insufficient space leads to overheating and electrical faults.
- **Poor ventilation:** Leads to accumulation of heat, increasing fire risks.
- **Inadequate separation from combustible materials:** In India, electrical rooms are often misused as storage spaces, with combustible materials like paper, boxes, and cleaning supplies placed near electrical panels. This significantly increases fire hazards by accelerating fire spread in case of short circuits or overheating. Ensuring clear, well-maintained electrical rooms through strict regulations and periodic inspections is crucial for fire safety.

4.2. Fire Incidents and Their Consequences

Numerous fire incidents in India have resulted from faulty electrical distribution systems. These fires often lead to death due to asphyxia (oxygen deprivation) rather than burns, as people trapped in smoke-filled spaces succumb before escaping.

Case Studies

- **Mumbai (2022):** A major fire in a high-rise building was exacerbated because the electrical distribution board was located under the staircase, blocking the fire escape route.
- **Delhi (2021):** A short circuit in a poorly ventilated distribution room caused a massive fire in a commercial complex, leading to multiple fatalities.

- **Kolkata (2020):** A fire in an apartment complex spread rapidly due to improper electrical panel placement, resulting in deaths and injuries.

4.3. Fire Safety Regulations and Violations

Various national and international fire safety standards mandate proper placement of electrical distribution systems.

Relevant Codes and Standards

- **National Building Code of India (NBC 2016)**
- **Electricity Act, 2003**
- **IS 732: Code of Practice for Electrical Wiring Installations**
- **National Fire Protection Association (NFPA) Guidelines**

Common Violations:

- Ignoring NBC guidelines regarding dedicated electrical rooms.
- Placing electrical panels in escape routes.
- Lack of proper fire-rated enclosures for distribution boards.

4.4. Recommendations for Safer Electrical Distribution System Placement

To prevent future fire-related casualties, it is essential to implement and enforce safer practices in the placement of electrical distribution systems.

Proposed Safety Measures

4.4.1. Dedicated Electrical Rooms:

4.4.1.1. Separate, well-ventilated electrical rooms should be mandated in all buildings.

4.4.1.2. These rooms should be fire-rated and equipped with extinguishers.

4.4.2. Prohibited Placement Areas:

4.4.2.1. Electrical panels should never be placed under staircases or escape routes.

4.4.2.2. Areas prone to water leakage should also be avoided.

4.4.3. Compulsory Compliance with NBC and IS Standards:

4.4.3.1. fire safety authorities should enforce strict compliance.

4.4.3.2. Regular inspections should be conducted to ensure adherence.

4.4.4. Public Awareness and Advocacy:

Awareness campaigns should be conducted to educate architects, engineers, and the general public.

4.5. Enhanced Fire Prevention Systems

Electrical rooms and switchgear panels should be **fireproofed** using suitable materials to prevent fires from spreading.

In large residential buildings, additional **fire detection and suppression systems** should be installed in electrical areas to quickly contain any fire outbreak.

5. Conclusion

In addition to proper selection and preventive maintenance, the placement of electrical distribution systems and distribution boards is a critical aspect of fire safety in buildings. Improper placement can lead to catastrophic consequences, endangering lives and property. The alarming trend of placing these systems under staircases and escape routes has led to avoidable tragedies, as it obstructs emergency evacuation and exacerbates fire hazards. This issue highlights a severe gap in regulatory enforcement and architectural responsibility. A nationwide movement is required to address this issue, ensuring that stringent regulations are not only established but also strictly implemented. Government bodies, fire safety authorities, architects, engineers, and the public must collaborate to advocate for safer building practices. The implementation of proper fire safety measures, adherence to building codes, and rigorous inspection protocols must become a priority in urban planning. Only through collective efforts can we prevent fire-related fatalities, safeguard human lives, and create a safer built environment in India.

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