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FIRE SAFETY REGULATIONS IN INDIA

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "**FIRE SAFETY REGULATIONS IN INDIA**". THIS TOPIC IS RELEVANT IN THE "**POLITY AND GOVERNANCE**" SECTION OF THE UPSC CSE EXAM.

Why in the News?

Recently, a fire broke out in New Born Baby care hospital in Delhi, leading to the death of seven babies. This unfortunate incident has highlighted the importance of implementing safety measures in hospitals and the necessity for accountability in these vital institutions.

POTENTIAL CAUSES OF FIRE IN HOSPITALS IN INDIA

- **Electrical Overloading and Faulty Wiring:** Due to increasing patient numbers, hospitals' electrical systems often become overstressed, causing overloading and overheating of wiring. This is particularly dangerous in ICUs, where a high concentration of electrical equipment can ignite fires.
- **Oxygen Enrichment:** Oxygen, especially in ICUs, can exacerbate fires. Oxygen-enriched environments intensify fires, making them harder to control.
- **Lack of Cross-Ventilation:** Insufficient cross-ventilation in ICUs, particularly noted in regions like Gujarat, contributes to fire spread by allowing the buildup of flammable materials and hindering containment efforts.
- **Flammable Materials:** Flammable substances such as sanitiser vapours, high oxygen levels, and synthetic PPE kits can accelerate fire spread, reducing response time.
- **Smoking:** Despite bans, smoking continues to be a significant fire hazard in hospitals. Improperly extinguished cigarettes and matches can easily ignite fires.
- **Overcrowding and Poor Housekeeping:** Overcrowded hospitals, particularly ICUs, facilitate rapid fire spread. Poor housekeeping, including waste accumulation and clutter, also increases fire risk.
- **Lack of Fire and Electrical Safety Audits:** The absence of regular fire and electrical safety audits allows potential fire hazards and electrical issues to go undetected.
- **Inadequate Fire Safety Measures:** A lack of fire safety measures, such as alarms, sprinkler systems, and extinguishers, hampers early detection and effective fire response.

- **Staff Training and Awareness:** Insufficient training and awareness among hospital staff regarding fire safety and prevention result in unpreparedness during fire emergencies.
- **Infrastructure and Maintenance:** Neglect in maintaining hospital infrastructure, including electrical systems and equipment, raises the likelihood of fires.
- **Lack of Mock Fire Drills:** The absence of regular fire drills in hospitals means staff are unprepared for fire emergencies. This lack of practice can lead to confusion and slow response times during an actual fire, increasing the risk of injury and property damage.

FIRE SAFETY MEASURES IN PLACE IN INDIA

- **National Building Code of India (NBC):** The NBC, issued by the Bureau of Indian Standards (BIS), serves as India's main framework for fire safety regulations. It outlines fire prevention, life safety, and fire protection requirements in buildings, detailing occupancy classifications, construction aspects, and protection features to reduce fire-related risks to life and property.
- **Fire Prevention and Firefighting Services:** In India, fire prevention and firefighting services are managed by the respective states, Union Territories (UTs), and Urban Local Bodies (ULBs). These services are essential for timely responses to fire incidents and ensuring people's and property's safety.
- **Model Building Bye-Laws:** According to the Model Building Bye-Laws, the Chief Fire Officer is responsible for granting fire clearances. The Development Authority must submit building plans to the Chief Fire Officer for approval, ensuring compliance with fire safety standards and regulations.
- **National Disaster Management Authority (NDMA) Guidelines:** The NDMA guidelines establish fire safety requirements for public buildings, including hospitals. They provide design standards for maintaining minimum open spaces, exit mechanisms, staircases, and evacuation drills, which are crucial for occupant safety during a fire emergency.
- **Regular Maintenance and Inspections:** Regular building maintenance, safe waste disposal, and periodic electrical system inspections are vital for preventing fire incidents. Ensuring proper grounding, wiring, and ventilation reduces the risk of electrical fires and the accumulation of flammable gases.
- **Fire Safety Equipment:** Installing and maintaining smoke detectors, heat detectors, fire alarm systems, fire extinguishers, automatic sprinkler systems, and fire hydrant and hose reel systems are essential for building fire safety. These systems help detect fires early and enable timely response and evacuation.
- **Fire Safety Training:** Providing fire safety training for employees and occupants, conducting regular fire drills, and raising awareness about fire safety signs, evacuation procedures, exit signs, and fire extinguisher locations are critical for ensuring preparedness and effective response in fire emergencies.

CHALLENGES IN ENFORCING FIRE SAFETY REGULATIONS

- **Lack of Awareness and Enforcement:** A significant challenge in enforcing fire safety regulations in India is the general lack of awareness and inadequate enforcement. Many people are not well-informed about fire safety measures, and regulations are often not properly enforced.

- **Complexity in Handling High-Rise Building Fires:** Fires in high-rise buildings, particularly residential ones, present unique challenges. The complexity of salvage operations and the difficulty of rescues often lead to fatalities and substantial property damage.
- **Rapid Modernization and Lack of Awareness:** The rapid modernisation of Indian industries has complicated the fire safety landscape, with awareness about fire safety lagging behind. The changing nature of industrial activities and infrastructure adds to the difficulty in ensuring compliance with fire safety standards.
- **Lack of Uniform Legislation:** Despite the high incidence of fire accidents in India, there is no consistent national legislation on fire safety. This lack of uniform regulations hampers effective enforcement and compliance with fire safety norms nationwide.
- **Natural and Climatic Causes:** Natural weather conditions such as lightning and extreme heat with low humidity can ignite fires in urban areas. These climatic factors pose significant challenges to fire prevention and management.
- **Absence of Smoke Management and Emergency Lighting:** The lack of effective smoke management systems and emergency lighting in high-rise buildings exacerbates fire risks. Inadequate smoke control and emergency lighting can hinder safe evacuation during a fire.
- **Lack of Vulnerability Mapping:** Poor regulation and enforcement of the National Building Code and the absence of vulnerability analysis in building construction contribute to the frequency of urban fires. The lack of proper vulnerability assessments affects the preparedness, response, and recovery from fire incidents.

MEASURES NEEDED TO STRENGTHEN FIRE SAFETY IN INDIA

- **Enact Comprehensive Fire Safety Legislation:** India requires robust, uniform fire safety laws at the national level to ensure consistent enforcement across all states and union territories. These laws should clearly outline the roles, responsibilities, and accountability of building owners, occupants, and authorities in implementing and maintaining fire safety measures.
- **Strengthen Fire Safety Audits and Inspections:** Mandatory, regular fire safety audits and inspections should be conducted for all buildings, particularly high-risk ones such as hospitals, schools, and high-rises. These audits should assess compliance with fire safety codes, identify hazards, and recommend corrective actions, with penalties for non-compliance.
- **Improve Fire Safety Infrastructure and Equipment:** Invest in modernising and expanding fire services across states, ensuring adequate fire stations, vehicles, and equipment. Under NBC standards, all buildings should be equipped with functional fire safety systems, including alarms, sprinklers, and extinguishers.
- **Enhance Awareness and Training:** Implement public awareness campaigns to educate on fire safety practices and evacuation drills. Provide regular training for fire service personnel, building staff, and occupants on fire prevention and response strategies.
- **Strict Enforcement and Penalties:** Fire safety codes should be rigorously enforced during construction approvals and occupancy permits. Violators should be punished severely, and cases of negligence that lead to fire incidents should be prosecuted.
- **Streamline Coordination:** Improve coordination between fire services, urban planning authorities, and disaster management agencies. Integrate fire safety considerations into urban planning and development processes.

- **Continuous Improvement:** Regularly review and update fire safety codes and guidelines to address emerging risks and incorporate best practices. Research fire safety and adopt innovations in materials, systems, and procedures.

Prelims Based Question

Q1. Consider the following statements regarding Fire safety in India:

1. Fire services is a state Subject.
2. The National Building Code is the main framework for fire safety regulations in India.

Choose the correct answer using the codes given below:

- (a). 1 Only
- (b). 2 Only
- (c). Both 1 and 2
- (d). Neither 1 nor 2

ANSWER: C

Mains Based Question

Q1. Fire incidents have been on the rise at vital places such as Hospitals. Discuss the potential reasons for such numerous fire incidents and explain why present safety regulations in India are not very effective.

[Vikas](#)

CYCLONE REMAL

THIS ARTICLE COVERS 'DAILY CURRENT AFFAIRS' AND THE TOPIC DETAILS OF "CYCLONE REMAL". THIS TOPIC IS RELEVANT IN THE "ENVIRONMENT" SECTION OF THE UPSC CSE EXAM.

WHY IN THE NEWS?

Recently, severe cyclonic storm Remal made landfall between the coasts of West Bengal and Bangladesh, unleashing winds up to 135 mph. At 8:30 pm on Sunday, the storm struck between Sagar Island and Khepupara near the southwest of Mongla in Bangladesh. It brought torrential rains, flooding homes and farmlands and leaving widespread destruction in its wake.

Oman gives the name 'Remal' in the list of tropical cyclones. It will be the first cyclone to hit the region this 2024 pre-monsoon season. 'Remal,' meaning 'sand' in Arabic.



WHAT IS A CYCLONE?

- A cyclone consists of a massive air mass revolving around a core of low atmospheric pressure. Its defining feature is the circular motion of its winds, which move counterclockwise in the Northern Hemisphere and clockwise in the Southern Hemisphere, a phenomenon attributed to the Coriolis effect.
- Cyclones are intense storm systems characterized by strong winds and significant rainfall. They develop from the ascent of warm, moist air, leading to a low-pressure region. The air from surrounding areas rushes into this low-pressure space and begins to spin because of the Coriolis effect. **There are several types of cyclones:**
 1. Tropical cyclones form over warm ocean waters and include hurricanes and typhoons.
 2. Polar cyclones occur over the Arctic and Antarctic seas.
 3. Mesocyclones, which are rotating updrafts within thunderstorms.
 4. Extratropical cyclones form along frontal boundaries in the middle latitudes.
- The Indian Meteorological Department (IMD) categorizes cyclones based on their wind speeds as follows:
 - **Depression:** Wind speeds range from 31 to 49 km/h.
 - **Deep Depression:** Wind speeds are between 50 and 61 km/h.
 - **Cyclonic Storm:** Wind speeds range from 62 to 88 km/h.
 - **Severe Cyclonic Storm:** Wind speeds are between 89 and 117 km/h.
 - **Very Severe Cyclonic Storm:** Wind speeds range from 118 to 166 km/h.
 - **Extremely Severe Cyclonic Storm:** Wind speeds are between 167 and 221 km/h.
 - **Super Cyclonic Storm:** Wind speeds exceed 222 km/h.

ABOUT TROPICAL CYCLONE:

- A tropical cyclone is a swiftly spinning storm characterized by a centre of low pressure, intense winds, and a spiral configuration of thunderstorms that results in significant rainfall. These phenomena develop above warm tropical or subtropical seas, gaining their energy from the evaporation of water. This vapour turns into clouds and precipitation as moist air ascends and cools.

- The core of a cyclone is notably tranquil and clear, characterized by significantly low atmospheric pressure. Cyclones typically move at an average velocity of 120 mph, facilitated by closed isobars, contributing to their high speeds.
- Isobars, conceptual lines on weather maps, link areas sharing the same atmospheric pressure. Cyclones form exclusively over bodies of water like oceans and seas.
- They occur periodically and travel from the east to the west, driven by the trade winds. Landfall is the event of a tropical cyclone coming onto land after being over water.
- According to the IMD, when the centre, or “eye,” of a tropical cyclone crosses over the coastline, the storm is considered to have made landfall. The eye is the calm region at the heart of the storm, known for its relatively mild weather conditions.
- It appears as a circular or oval zone with minimal rainfall, distinguished by gentle breezes and clear skies. Inside the eye, the winds are weak and changeable, and the sky can be clear or only partly cloudy.
- The diameter of the eye can greatly differ, stretching from a few kilometres to more than 50 kilometres (approximately 30 miles) across in the case of larger cyclones.
- During landfall, the storm’s outer bands bring winds, rain, and surge, but a ‘direct hit’ means the eyewall hits the coast, even if the centre stays offshore.

CONCLUSION:

Cyclones are formidable atmospheric phenomena characterized by their unique rotating wind patterns, leading to extreme weather events. Specific atmospheric conditions influence the development and strength of these systems, and they can have far-reaching and catastrophic effects. The havoc wrought by cyclones includes but is not limited to, powerful gusts, significant precipitation, coastal storm surges, and widespread flooding. Despite their potential for destruction, cyclones also contribute significantly to the global climate by moving heat and energy from the tropics to other parts of the world.

MAINS PRACTICE QUESTION:

Q. Which atmospheric conditions influence the development and strength of cyclones? Discuss long-term strategies to rebuild and rehabilitate areas in India affected by cyclones.

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