



## Industrial Accidents

**For Prelims:** [Occupational Safety, Health and Working Conditions Code, 2020](#), Labour Bureau, [International Labour Organisation](#), ILO Conventions.

**For Mains:** Occupational safety and health in India - Analysis, Challenges and Steps that can be taken, Framework Regarding Labours in India, Grey Areas Related to the Current Labour Reforms

**Source:** [IE](#)

### Why in News?

Recently, an explosion in a chemical unit in Thane, Maharashtra, killed 11 people. Such industrial accidents in India and elsewhere in the world constitute a major problem for industrial establishments.

### Industrial and Chemical Disaster

- **Industrial Disaster:** An industrial disaster is a **significant accident at an industrial site** that results in **extensive damage, injuries, or fatalities**.
  - Such disasters can stem from various causes, including **chemical, mechanical, civil, or electrical processes**, as well as **accidents, negligence, or incompetence**.
  - **Types: Chemical disasters, Explosions, Mining disasters, Falling objects, Radiological incidents.**
- **Chemical Disaster:** It is defined as the **release or spill of a toxic chemical** that results in an abrupt and serious disruption of the functioning of a society, **causing widespread human, material, or environmental losses** that exceed the ability of the affected society to cope using only its own resources.
- According to the [National Disaster Management Authority \(NDMA\)](#), over 130 significant chemical accidents have been reported in the country in the last decade, claiming more than 250 lives.

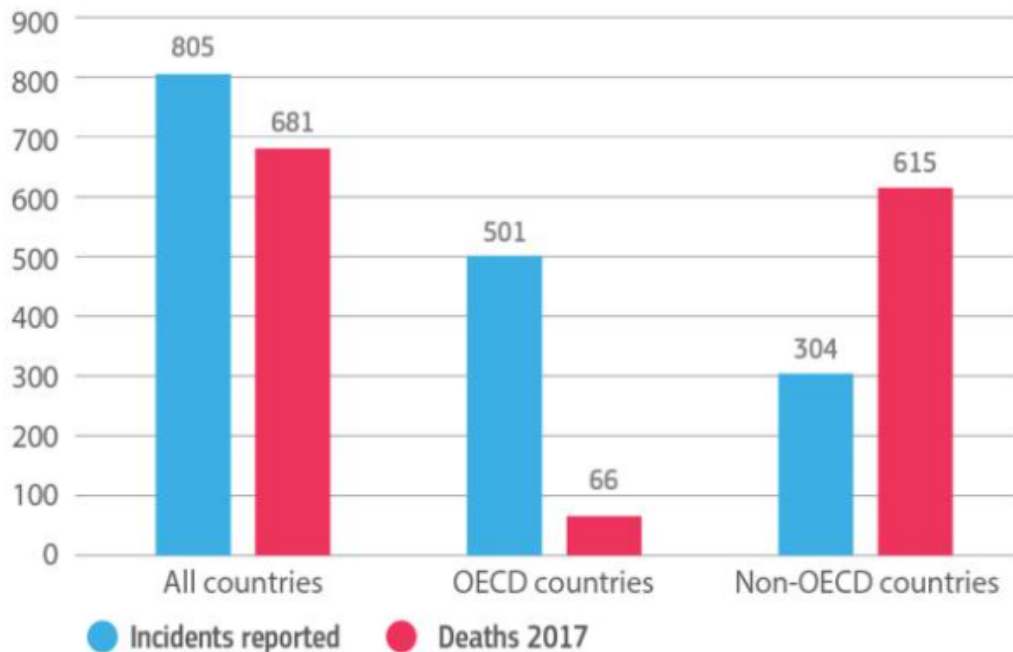
### What are the Key Factors Contributing to Industrial Accidents in India?

- **Inadequate Regulation and Monitoring:** Redundant regulations, including 15 Acts and 19 rules, **lack a unified approach for the chemical industry**. This fragmentation leads to overlapping jurisdictions and loopholes, weakening oversight and enforcement of safety measures.
- **Lack of Comprehensive Chemical Risk Database:** The lack of a central database on industrial chemicals and **their risks creates a knowledge gap, hindering hazard assessment** and safety protocol development.
- **Insufficient Worker Training and Awareness:** Boiler operation often falls to untrained,

contractual workers, lacking proper safety and emergency response training as **highlighted by IIT Kanpur**.

- This leads to confusion during accidents and increases risks, especially with hazardous chemicals.
- **Poor Investment in Worker Safety:** Cost-cutting by some industries **often neglects safety equipment and infrastructure**, such as proper ventilation and fire safety.
  - IIT Kanpur study (2023) stresses the **need for increased investment in worker safety to reduce industrial accidents**.
- **Lack of maintenance:** The [Visakhapatnam gas leak](#) involving benzimidazole raises concerns about maintenance and operations.
  - **In the [Neyveli incident](#)**, a boiler being revived unexpectedly blew out, despite **not being operational** and mainly involving a furnace and steam production.

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## Chemical incidents and fatalities

### Major Industrial Disasters in India in the Past:

India has a long history of industrial accidents, with over 130 significant chemical mishaps reported recently.

- **[Bhopal Gas Tragedy \(1984\)](#):** The worst industrial disaster ever, a gas leak from a pesticide plant killed over 3,700 people and injured many more.
- **[Chasnala Mining Disaster \(1975\)](#):** An explosion in a coal mine caused by methane gas and a subsequent mine collapse led to the deaths of around 700 people.
- **[Jaipur Oil Depot Fire \(2009\)](#):** A fire at an oil storage facility resulted in 12 deaths and the evacuation of over half a million people. The lack of a proper disaster management plan was a major issue.
- **[Korba Chimney Collapse \(2009\)](#):** A chimney under construction collapsed due to poor construction practices, killing 45 workers.
- **[Mayapuri Radiological Incident \(2010\)](#):** Workers unknowingly dismantled a radioactive research irradiator in a scrapyards, exposing themselves and others to radiation.
- **[Bombay Docks Explosion \(1944\)](#):** A cargo ship carrying explosives exploded in Mumbai harbor, killing around 800 people and causing widespread damage.

## What are the Consequences of Such Industrial and Chemical Accidents?

- **Loss of Life and Injuries:** Industrial accidents result in numerous fatalities and serious injuries. Example: The explosion at a chemical factory in Thane claimed 11 lives.
- **Environmental Damage:** Chemical leaks, explosions, and improper waste disposal can cause severe environmental damage (air, water, and soil pollution).
  - Example: The **Bhopal Gas Tragedy of 1984** serves as a horrific event, in which leak of **methyl isocyanate gas** from a Union Carbide plant resulted in thousands of deaths and long-term health problems for countless others.
- **Economic Disruptions:** The cost of repairing damage to facilities, compensating victims' families, and treating injured workers can be substantial.
  - A study by the **US Environmental Protection Agency (EPA)** found that chemical accidents can decrease property values in surrounding areas by 5-7%, further impacting the local economy.
- **Psychological Trauma:** The trauma associated with industrial accidents can have long-lasting psychological effects on survivors, witnesses, and families of victims.
  - Anxiety, depression, and **post-traumatic stress disorder (PTSD)** are common consequences.
- **Loss of Public Trust:** Frequent industrial accidents can erode public trust in regulatory bodies and industries. This can lead to public fear and resistance to new industrial projects.

## ILO Recommendations on Industrial Disaster Prevention

- **Identification of Hazardous Materials:**
  - Establish a list of hazardous chemicals and flammable gases based on their inherent risks and set specific threshold quantities.
  - Any facility handling hazardous material exceeding the designated amount would be classified as a "major hazard workplace."
- **Inventory of Major Hazard Workplaces:**
  - Each state should maintain a comprehensive **inventory of major hazard workplaces** within its jurisdiction with details like the type of facility, chemicals used, and quantities stored.
- **Centralised Data Management:**
  - The **list of hazardous materials and the inventory** of major hazard workplaces should be **stored in a centralised computerised database**.
  - This would allow for **easier access to critical information by regulatory bodies, emergency responders, and the public**.

## What are the Legal Safeguards against Chemical/Industrial Disasters?

- **International:**
  - [Sendai Framework for Disaster Risk Reduction 2015-2030](#)
  - **UN Convention on the Transboundary Effects of Industrial Accident (1992):**
    - It provides a legal framework for **international cooperation** on preventing and responding to industrial accidents.
    - Parties **share information, plan emergencies, and help each other** during disasters. This reduces risk of widespread accidents.
  - **Flexible Framework for Accident Prevention and Preparedness (CAPP) (2006) of UNEP:** It adopts a flexible approach to help countries, especially developing ones, build programs to prevent and prepare for chemical accidents.
    - It also offers **guidance on creating these programs considering a country's specific needs**.
  - **OECD Programme on Chemical Accidents (1990):** It focuses on **preventing accidents through information sharing and best practices in chemical safety**.

## ▪ India:

- [The Bhopal Gas Leak \(Processing of Claims\) Act, 1985](#)
- [The Environment Protection Act, 1986 \(EPA\)](#)
- **The Public Liability Insurance Act, 1991 (PLIA):**
  - This act mandates insurance for industries handling hazardous substances. This insurance provides financial relief to those affected by accidents involving these substances.
- **The National Environment Appellate Authority Act, 1997:**
  - This act establishes the **National Environment Appellate Authority (NEAA)**, which hears appeals regarding restrictions placed on certain industrial activities under the [Environment Protection Act, 1986 \(EPA\)](#), ensuring a fair and transparent process.
- **The Hazardous Waste (Management Handling and Transboundary Movement) Rules, 1989:**
  - It requires industries to identify significant accident risks, implement preventive measures, and report any potential hazards to the appropriate authorities.
- **Additional Measures:**
  - The [National Disaster Management Authority \(NDMA\)](#) has issued specific guidelines on Chemical Disaster Management. These guidelines provide direction to various authorities for preparing detailed disaster management plans.
  - Several other laws and regulations, like the [Factories Act, 1948](#), and the Insecticides Act, 1968, also play a role in ensuring industrial safety.

## Way Forward

- **A Robust Regulatory Framework:** ILO recommends a **comprehensive national framework with clear roles for different government agencies** to enforce safety regulations.
  - [World Bank \(2018\)](#) suggested strong chemical safety regulations as key to reducing chemical accidents.
- **Strengthened Monitoring and Enforcement:** IIM Ahmedabad (2020), blames weak enforcement for India's industrial accidents. They recommend stricter penalties and more frequent inspections by qualified personnel.
- **Building a Chemical Risk Database:** The Bhopal Gas Tragedy of 1984 emphasises the critical need for a centralised database in India to document the risks associated with industrial chemicals.
  - [OECD](#) promotes the **Global Harmonized System of Classification and Labelling of Chemicals (GHS)** offers a standardised way to classify these chemicals, aiding in better risk assessments.
- **Investing in Worker Training:** A 2017 [National Safety Council of India \(NSCI\)](#) study linked worker unawareness of safety protocols to a high number of industrial accidents.
  - NSCI recommends comprehensive training programs with drills for all staff levels.
- **Promoting Best Practices and Technologies:** The [UNEP](#) encourages industries to **adopt environmentally sound technologies (ESTs)**.
  - ESTs can minimise the use of hazardous materials, improve waste management, and reduce the risk of accidents.
- **Incentives and Support for Upgrading Safety Measures:** To incentivise safety improvements, **financial aid like tax breaks or subsidies can be offered for upgrading infrastructure** and adopting new technologies.

## The Occupational Safety, Health and Working Conditions Code, 2020

- **Employer and Employee Duties:** Defines responsibilities for both employers and employees regarding safety.
- **Sector-Specific Safety Standards:** Establishes safety standards for different industries.
- **Employee Well-being:** Focuses on worker health, working conditions, working hours, leaves, etc.
- **Contractual Worker Rights:** Recognises and protects the rights of contract workers.
- **Gender Equality:** Promotes gender equality by **allowing women to be employed in all establishments for all types of work.**

## Conclusion

The tragic incidents of industrial accidents in India, underscore the **urgent need to address the regulatory and knowledge gaps in the country's industrial landscape**. By taking a holistic and proactive approach, involving both the government and industry stakeholders, India can work towards a safer and more sustainable industrial development.

### **Drishti Mains Question:**

Q. Frequent industrial accidents highlight serious regulatory deficiencies and inadequate safety measures. How can India bridge the knowledge gap and prevent future tragedies?

## UPSC Civil Services Examination, Previous Year Question (PYQ)

### **Prelims:**

**Q1. In India, why are some nuclear reactors kept under “IAEA safeguards” while others are not? (2020)**

- (a) Some use uranium and others use thorium
- (b) Some use imported uranium and others use domestic supplies
- (c) Some are operated by foreign enterprises and others are operated by domestic enterprises
- (d) Some are State-owned and others are privately owned

**Ans: (b)**

### **Mains:**

**Q1. With growing energy needs should India keep on expanding its nuclear energy programme? Discuss the facts and fears associated with nuclear energy. (2018)**

PDF Reference URL: <https://www.drishtias.com/printpdf/industrial-accidents>