**COURSE : DISASTER MANAGEMENT (MA/ MSc PART I)**
**Paper : III**
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**Topic : Chemical Disasters**

**INTRODUCTION**

A **chemical disaster** is the unintentional release of one or more hazardous substances which could harm human health and the environment. [Chemical hazards](https://en.wikipedia.org/wiki/Chemical_hazard) are systems where chemical accidents could occur under certain circumstances. Such events include fires, [explosions](https://en.wikipedia.org/wiki/Explosion), [leakages](https://en.wikipedia.org/wiki/Leak) or release of [toxic](https://en.wikipedia.org/wiki/Toxin) or [hazardous materials](https://en.wikipedia.org/wiki/Hazardous_material) that can cause people illness, injury, or disability.

While chemical accidents may occur whenever toxic materials are stored, [transported](https://en.wikipedia.org/wiki/Transport) or used, the most severe are [industrial accidents](https://en.wikipedia.org/wiki/Industrial_accident), involving major [chemical manufacturing](https://en.wikipedia.org/wiki/Chemical_manufacturing) and storage facilities. The most significant chemical accident in recorded history was the 1984 [Bhopal disaster](https://en.wikipedia.org/wiki/Bhopal_disaster) in [India](https://en.wikipedia.org/wiki/India), in which more than 3,000 people had died after a highly toxic [vapour](https://en.wikipedia.org/wiki/Vapour%22%20%5Co%20%22Vapour), ([methyl isocyanate](https://en.wikipedia.org/wiki/Methyl_isocyanate)), was released at a [Union Carbide](https://en.wikipedia.org/wiki/Union_Carbide) [Pesticides](https://en.wikipedia.org/wiki/Pesticide) factory.

**Chemical disasters may arise in number of ways, such as**:-

1. Process and safety systems failures
* Human errors
* Technical errors
* Management errors
1. Induced effect of natural calamities
2. Accidents during the transportation
3. Hazardous waste processing/ disposal
4. Terrorist attack/ unrest leading to sabotage

#### Status of Chemical Disaster Risk in India

India has witnessed the world’s worst chemical (industrial) disaster “Bhopal Gas Tragedy” in the year 1984. The Bhopal Gas tragedy was most devastating chemical accident in history, where over 2500 people died due to accidental release of toxic gas Methyl IsoCyanate (MIC).

Such accidents are significant in terms of injuries, pain, suffering, loss of lives, damage to property and environment. India continued to witness a series of chemical accidents even after Bhopal had demonstrated the vulnerability of the country. Only in last decade, 130 significant chemical accidents reported in India, which resulted into 259 deaths and 563 number of major injured.

There are about 1861 Major Accident Hazard (MAH) units, spread across 298 districts and 25 states & 3 Union Territories, in all zones of country. Besides, there are thousands of registered and hazardous factories (below MAH criteria) and un-organized sectors dealing with numerous range of hazardous material posing serious and complex levels of disaster risks.

#### Safety initiatives taken in India to address chemical risk

The comprehensive legal/ institutional framework exists in our country. A number of regulations covering the safety in transportation, liability, insurance and compensations have been enacted.

Following are the relevant provisions on chemical disaster management, prevailing in country:-

1. Explosives Act 1884                                      - Petroleum Act 1934
2. Factories Act 1948                                        - Insecticides Act 1968
3. Environment Protection Act 1986                 - Motor Vehicles Act 1988
4. Public Liability Insurance Act 1991               - Disaster Management Act 2005

Government of India has further reinforced the legal framework on chemical safety and management of chemical accidents by enacting new rules such as MSIHC Rules, EPPR Rules, SMPV Rules, CMV Rules, Gas Cylinder Rules, Hazardous Waste Rules, Dock Workers Rules and by way of amendments to them.

The National Disaster Management Authority (NDMA) of India had come out with very specific guidelines on Chemical Disaster Management. The guidelines have been prepared to provide the directions to ministries, departments and state authorities for the preparation of their detailed disaster management plans. These guidelines call for a proactive, participatory, multi-disciplinary and multi-sectoral approach at various levels for chemical disaster preparedness and response. Further, NDMA has provided specific inputs to the GOM for avoidance of future chemical disasters in the country, along with suggested amendments on the existing framework. NDMA is also working on revamping of CIFs ( Chief Inspectorate of Factories) to strengthen chemical safety in India. In addition, MoEF and NDMA are in process of finalizing the National Action Plan on Chemical Industrial Disaster Management (NAP-CIDM), which will act as the roadmap for chemical disaster management in India.

#### Precautions to be taken during and after the Chemical (Industrial) Accidents

* Do not panic, evacuate calmly and quickly perpendicular to wind direction through the designated escape route
* Keep a wet handkerchief or piece of cloth/ sari on face during evacuation
* Keep the sick, elderly, weak, handicapped and other people who are unable to evacuate inside house and close all the doors and windows tightly.
* Do not consume the uncovered food/ water etc open to the air, drink only from bottle
* Change into fresh clothing after reaching safe place/ shelter, and wish hands properly
* Inform Fire & Emergency Services, Police and medical services from safe location by calling 101, 100 and 108 respectively.
* Listen to PA (Public Addressal) System of the plant/ factory, local radio/ TV channels for advice from district administration/fire/health/police and other concerned authorities
* Provide correct and accurate information to government official.
* Inform others on occurrence of event at public gathering places (like school, shopping centre, theatre etc.).
* Don’t pay attention to the rumours and don’t spread rumours.