

**LEARN FROM
DISASTER &
PREPARE FOR A
SAFER FUTURE**

Conducted by

**Institution of Safety Engineers
(India)**

www.iseindia.in

INSTITUTION OF SAFETY ENGINEERS (INDIA)

WELCOME

In Free Webinar Classes on

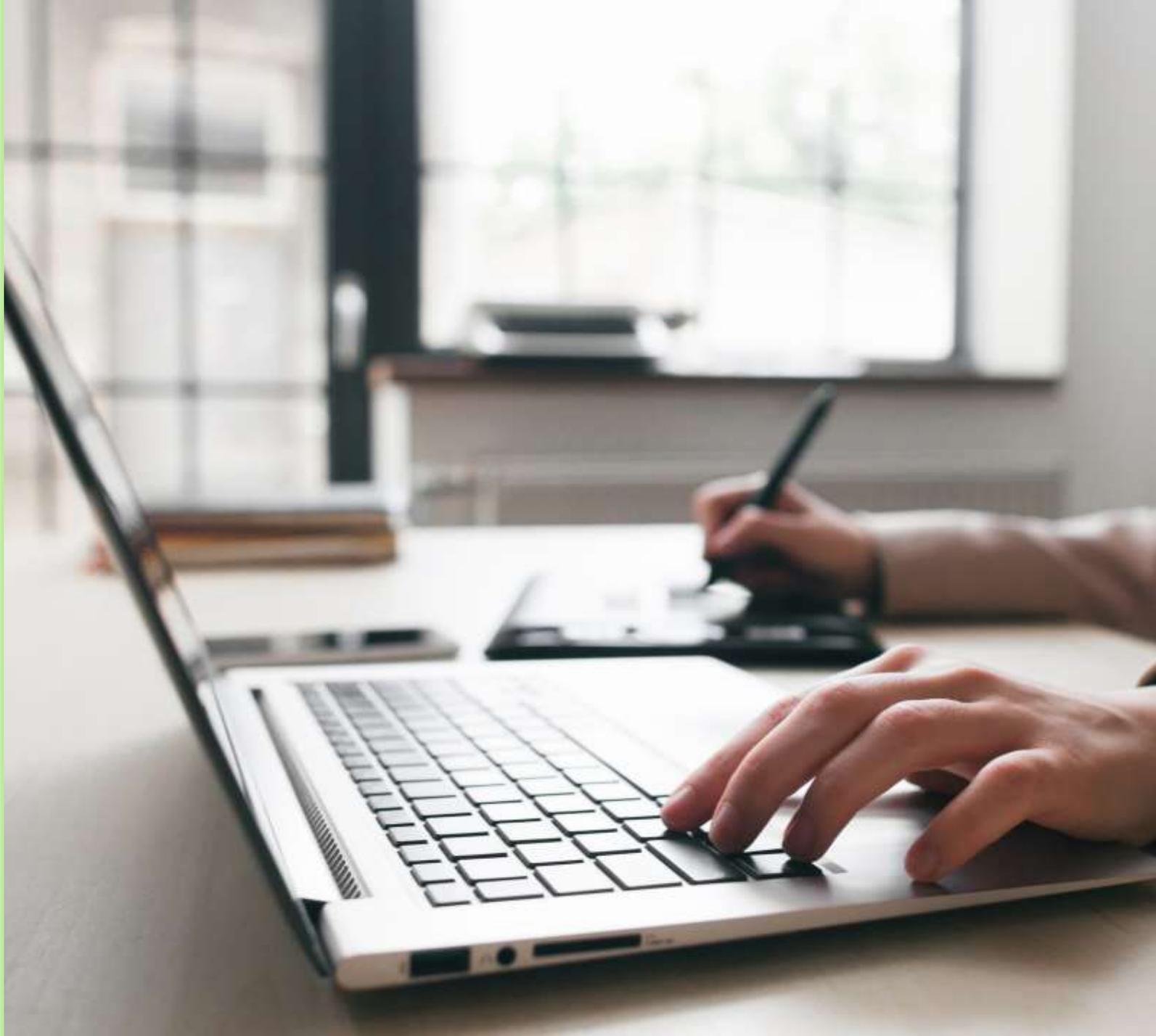
LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE

on

10 March 2021, 4:00 PM



ISE (INDIA)



INSTITUTION OF SAFETY ENGINEERS (INDIA)

LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE



आपदा से सीखें और सुरक्षित भविष्य की तैयारी करें

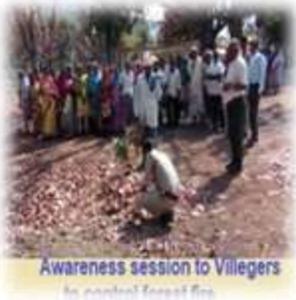
ABOUT US

Institution of Safety Engineers (India) is Non - Profitable organization set up in year 2012 under ZJEW Trust, Govt. Reg. No. 5240 and working with objective to prevent accident, protect environment & minimize losses during disaster. Institution of safety Engineers (India) imparting safety, health, environment & quality related training to needy & provide similar services to industries, organization, institution to achieve zero harm.

MEMBERSHIP SERVICES



SAFETY HEALTH ENVIRONMENT RELATED TRAINING & SERVICES



ISE (INDIA)

JOURNAL PUBLICATION

News & Journal Published by ZJEWT in association with Institution of Safety Engineers (India), Govt. Reg. No. 5240
IJISEI, Vol. No.3, Issue 1, Jan-March 2020 Available online at www.ijournal.iseindia.in

**International Journal of Institution of Safety Engineers (India)
IJISEI**

Volume-3, Issue-1, Jan – March 2020

Published by ZJEW Trust, in association with Institution of Safety Engineers (India)
(Govt. Reg. No. 5240)

Available online at www.ijournal.iseindia.in
www.iseindia.in

**International Journal of Institution of Safety Engineers (India)
IJISEI**

Available online www.ijournal.iseindia.in

International Journal of Institution of Safety Engineers (India) is Published by ZJEW Trust, in association with Institution of Safety Engineers (India). ZJEWT is Non-Profitable organization established in year 2017, Govt. Reg. No. 5240 and publishing since January 2018. In association with International Journal of Institution of Safety Engineers (India), Journal publishing is done twice in every year i.e. one issue in every three months. International Journal of Institution of Safety Engineers (India) is also known as IJISEI in short form.

Objective to publish this Journal is to share information, knowledge among researchers, Professional and organization. Each Journal helps to gain their professional career, used for research purpose. Safety, Health & Environment related Journal is very helpful for professional, Institution, organization to learn and implement effective measures. Present Academic, Professional and industry leaders being Director.

International Journal of Institution of Safety Engineers (India)

www.ijournal.iseindia.in

OUR SPEAKER

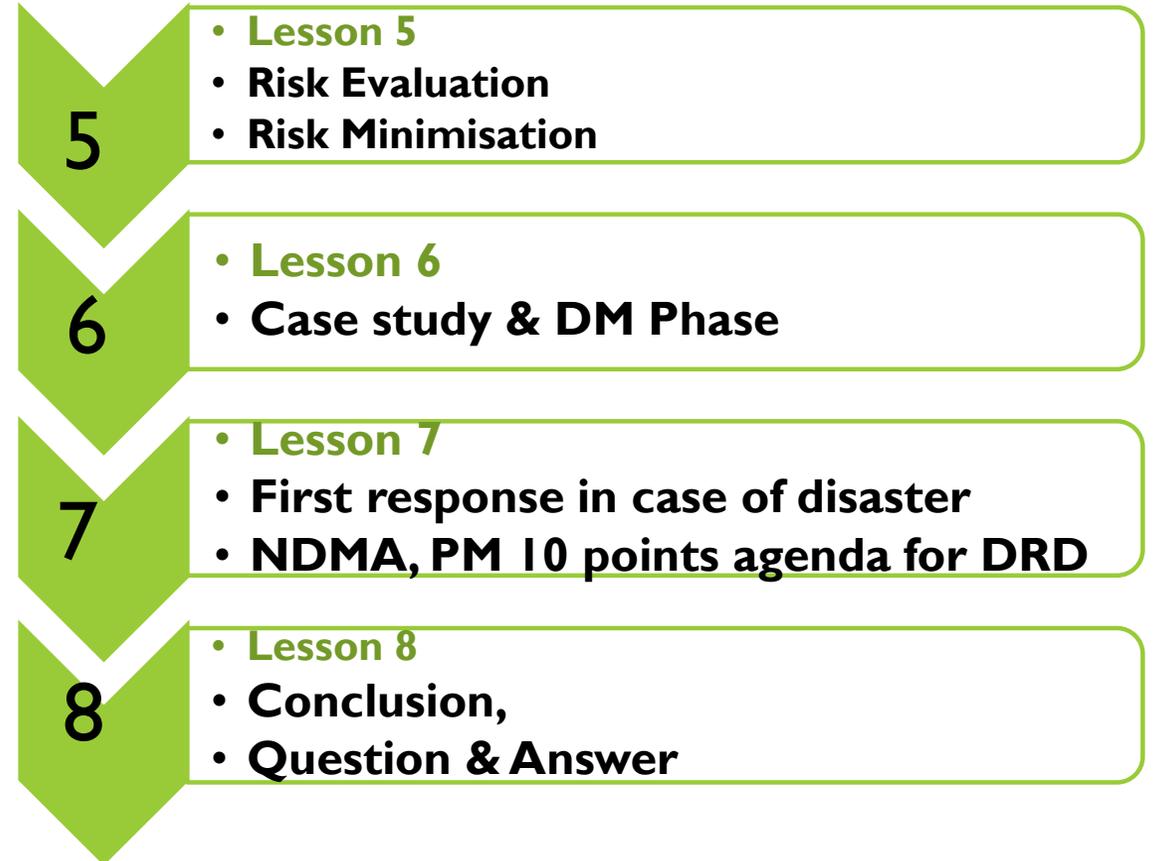
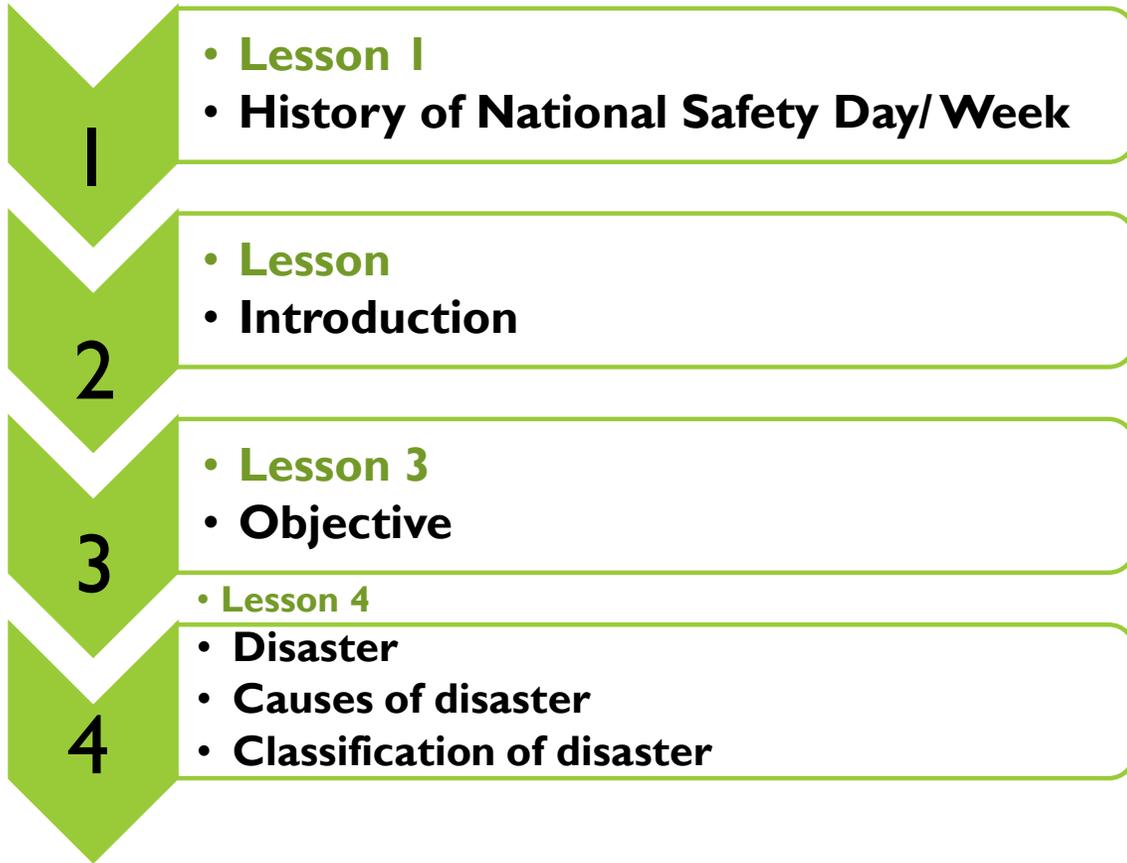
Mr. Shahnawaz Rampuri: Director-
Institution of Safety Engineers (India)

Miss Tamanna Afroz : B.Tech, PDIS, SMISE
Co-ordinator, Institution of Safety Engineers (India)

Mr. Shahnawaz Rampuri

He is graduate in Mech. Engineering, **M.Tech** (Env. Sc. & Eng.) from BIT, Durg, **PDIS from RLI Kol.**, PGHRD from AMU, NEBOSH-IGC and apart from this he has achieved several certification and Diploma in field of occupational Health & Safety from different reputed institution. He has Published several Articles/Journals related to occupational, Health Safety & Environment.

He has more than 15 year experience in Field of Safety, Health & environment as EHS professional in National/ Multinational company in India, Africa & Gulf. He is also Chartered Engineer (I), Life Time Associate Member of Institution of Engineers (India) & Life Time Senior Member of Institution of Safety Engineers (India) & Member of ZJEW Trust. In Past his Experience is in Saudi Aramco, L & T, Shree Cement, Lohia Group, RNSN Seriate, IJT, Gammon India Ltd, like company. Apart from this he is Associated with several Non-Profitable organization as Member and Chief Editorial officer (CEO) of IJISEI.



COURSE OUTLINE

HISTORY OF NATIONAL SAFETY COUNCIL

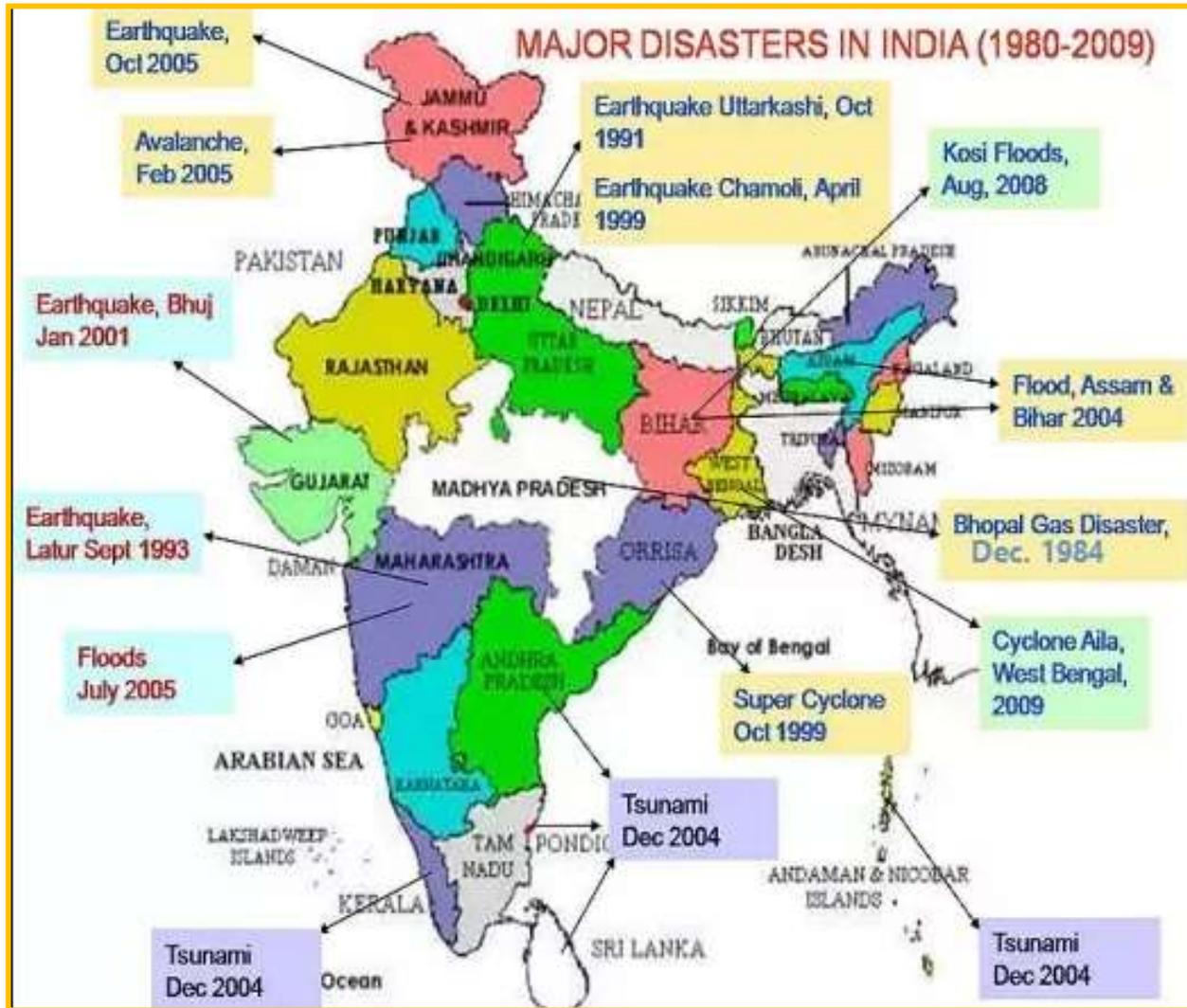
National Safety Day was observed for the first time in 1972, on the foundation day of the **National Safety Council**. **National Safety Council** is a non-profit, self-financing and tripartite apex body at the national level. It was set up by the **Government of India, Ministry of Labour and Employment** on 4 March 1965 to generate and develop a voluntary movement on **Safety, Health, and Environment**. It is an autonomous body.

ISE (INDIA)

The objective of the **National Safety day/week** is to renew the commitment of employees and the general public to work safely and ensure the integration of a safe and sound work culture and lifestyle. The campaign started as a single-day celebration on 4 March and spread over a week (**National Safety week**) from March 4-10.



MAJOR DISASTER IN INDIA (1980-2009)



HISTORY

Disaster creates huge destruction, damage to property, personnel injury and death. In past decades several disasters occurred in India and resulted huge losses including people death, people lost their homes and communities. In 1984, Bhopal Gas Tragedy occurred. Similarly Odisha Super Cyclone (1999), Gujarat Earthquake (2001), Indian Ocean Tsunami (2004), Maharashtra Drought (2013) and Uttarakhand Flash Floods (2013). Disaster Impact to environment, People and economy.

Learn from Disaster help to identify future gaps and ensure adequate Measure to handle any future emergency and reducing or controlling to destruction or any Loss. Past disaster event help to learn lesson.

OBJECTIVE

- **Learn from disaster & prepare for a safer future**
- **Disaster related Risk Evaluation**
- **Resources Management**
- **Risk Minimisation**
- **Preventing Society or Organizational Harm**
- **Enforcement of Disaster Management Policy**

**LEARN FROM DISASTER
&
PREPARE FOR A SAFER FUTURE**

DISASTER (आपदा)

An event or fact that has unfortunate consequences.

A sudden accident or a natural catastrophe that causes great damage or loss of life

Undesired event that may be man made or natural and create huge losses and destruction including people death



LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE

Disaster Origantes from French word **Desastre**

Desastre is Combination of Two words

Des + Aster

means

means

Bad or evil

Star

Thus the term refers to 'Bad or Evil star'.



ACCIDENT

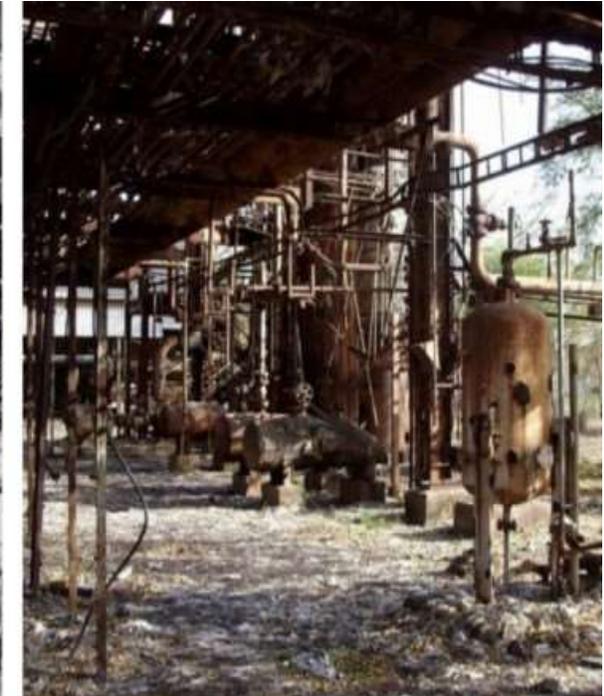
Accident are results of Human & Mechanical Failure



DISASTER

A sudden accident or a natural catastrophe that causes great damage or loss of life.

Disaster may be cause of Natural or Manmade



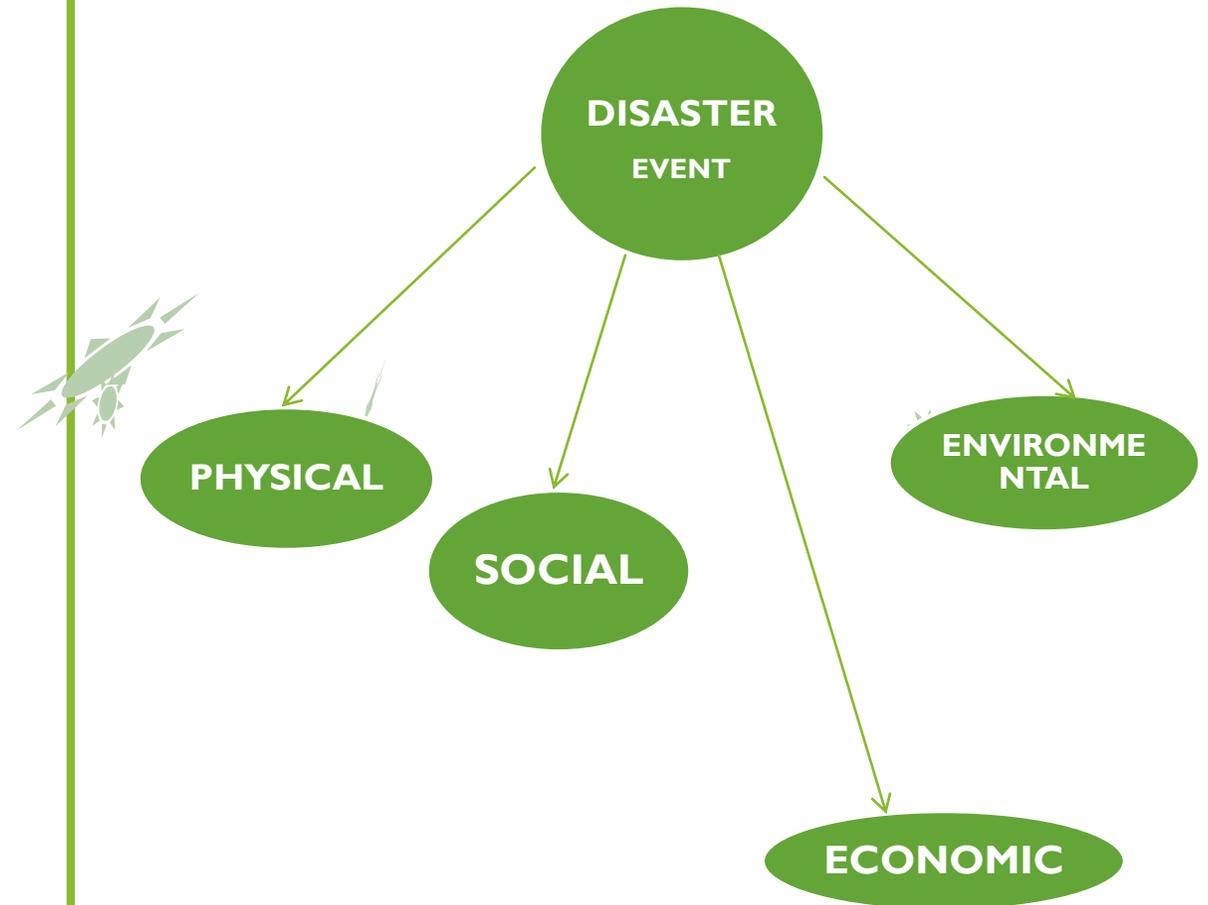
IMPACTS OF DISASTER

- Human losses
- Property losses
- Resources destruction
- Environmental destruction,
- Disruption of social order, and
- Threats to the normal functioning of lifelines and production lines etc.



IMPACTS OF DISASTER

- **Physical** (Building, Structure, Physical Property, Industry, Roads, Bridges etc.)
- **Environmental** (Water, Land/Soil, Land-use, Landscape, Crops, Lake/Rivers/Estuaries, Aquaculture, Forest, Animals/Livestock, Wildlife, Atmosphere, Energy etc.)
- **Social** (Life, Health, Employment, relations, Security, Peace etc.)
- **Economic** (Assets, Deposits, Reserves, Income, Commerce, Production, Guarantee/Insurance etc.)



Factor that increase Risk of destruction

- Population Density
- Poverty
- Environmental degradation
- Urbanization
- Time Duration
- Intensity for Cyclone/ magnitude Of earthquake
- DM policy enforcement
- Disaster Awareness etc.

Apart from this risk factor of disaster also depend on types of war, Terror attack, Political issues, and proactive safety measure including information received of potential likelihood of disaster earlier like factor.

CLASSIFICATION OF DISASTER

ON BASIC OF ORIGIN

- NATURALS,
- MAN-MADES

MAN MADE DISASTER

May be

Intentional ← → Unknown

ON BASIC OF IMPACT

- MINOR
- MAJOR

Causes of Man made Disaster

- Chemical spills,
- Pollution
- Landslides (due to bad farming practices or poor infrastructure decisions), or
- Nuclear fallout
- Vessel or pipeline Bursting
- Structure Collapse
- Train De-railed or collision
- Terror attack
- War etc.

LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE

Gas Leaks



Nuclear Meltdown



LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE

Oil Spills



Industrial Fires



LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE

Structure Collapsed



Lightning Strike



LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE

Train Collision



Vehicle Collision



LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE

PAST FEW DISASTER IN INDIA

Kashmir Floods, 2014



CAUSE:

Continuous torrential rainfall and swelling of Jhelum River

In this disaster more than 550 death occurred, several people injured and huge losses of property. Damaged properties cost was estimated between Rs. 5000 cr and 6000 cr. Due to continuous torrential rain fall, the water of the Jhelum river swelled and entered into residential area of Kashmir.

Gujrat Earthquake 2001



CAUSE:
Earthquake

In This earthquake Approx. People lost their live 20000, Injured 167000 and 400000 become homeless.
The scale of earthquake was 7.6 to 7.9 and lasted for 2 minutes.

Indian Ocean Earthquake & Tsunami, 2002



CAUSE:
Tsunami

In this Tsunami more than 2.3 Lakh people killed. This Tsunami was started on the west coast of Sumatra, Indonesia and effected to 12 countries. The magnitude of this Tsunami was 9.1 and 9.3.

Bhopal Gas Tragedy,



Summary

Cause: Leak of Methyl isocyanate (MIC)

Start date: Mid Night of 2nd Dec. 1984

End date: 3 December 1984

Plant Name: Union Carbide India Limited (UCIL) pesticide plant in **Bhopal**, Madhya Pradesh, India.

Results (Bad consequence): Over 500,000 people were exposed to methyl isocyanate (MIC) gas.

At least 3,787; over 16,000 claimed.

PAST FEW DISASTER IN INDIA

2014 GAIL Pipeline Blast:

Date: On 27 June 2014

Summary: A massive fire broke out following a blast in the underground gas pipeline maintained by the Gas Authority of India Limited (GAIL) at Nagaram, East Godavari district of Andhra Pradesh. The incident killed at least 15 people while injuring over 40 others. People in the village where the accident took place said they had complained to the GAIL authorities about the gas leak but no action was taken to plug it. The impact of the blast was so severe that it left a huge crater on the ground and the fire spread rapidly engulfing houses, coconut trees and vehicles over a large area.

Bhilai Steel Plant Gas Leak:

Date: June 2014 at Bhilai Steel Plant in Chhattisgarh's Durg district

Consequence: Six people were killed and over 40 injured in an incident of leakage in a methane gas pipeline at a water pump house. The six deceased were employees at the plant run by the state-owned SAIL, including two deputy managers.

Table I. Disasters with a natural trigger from 1969 to 1993: Number of events over 25 years

Description	Africa	America	Asia	Europe	Oceania	Total
Earthquake	40	125	225	167	83	640
Drought and famine	277	49	83	15	14	438
Flood	149	357	599	123	138	1,366
Landslide	11	85	93	19	10	218
High wind	75	426	637	210	203	1,551
Volcano	8	27	43	16	4	98
Other*	219	93	186	91	4	593

Source: Walker 1995.

* Other includes: avalanche, cold wave, heat wave, insect infestation, tsunامي.

Table II, Disasters with a non-natural trigger from 1969 to 1993: Number of events over 25 years

Description	Africa	America	Asia	Europe	Oceania	Total
Accident	213	321	676	274	18	1,502
Technological accident	24	97	97	88	4	310
Fire	37	115	236	166	29	583

Source: Walker 1995.

Table III. Disasters with a non-natural trigger: Number by global region and type in 1994

Description	Africa	America	Asia	Europe	Oceania	Total
Accident	8	12	25	23	2	70
Technological accident	1	5	7	7	0	20
Fire	0	5	5	9	2	21

Table IV. Examples of industrial explosions

Chemical involved	Consequences		Place and date
	Death	Injuries	
Dimethyl Ether	245	3,800	Ludwigshafen, Federal Republic of Germany, 1948
Kerosene	32	16	Bitburg, Federal Republic of Germany, 1948
Isobutane	7	13	Lake Charles, Louisiana, United States, 1967
Oil slops	2	85	Pernis, Netherlands, 1968
Propylene	–	230	East Saint Louis, Illinois, United States, 1972
Propane	7	152	Decatur, Illinois, United States, 1974
Cyclohexane	28	89	Flixborough, United Kingdom, 1974
Propylene	14	107	Beek, Netherlands, 1975

Adapted from ILO 1988.

Table V. Examples of major fires

Chemical involved	Consequences		Place and date
	Death	Injuries	
Methane	136	77	Cleveland, Ohio, United States, 1944
Liquefied petroleum gas	18	90	Ferzyn, France, 1966
Liquefied natural gas	40	–	Staten Island, New York, United States, 1973
Methane	52	–	Santa Cruz, Mexico, 1978
Liquefied petroleum gas	650	2,500	Mexico City, Mexico, 1985

Adapted from ILO 1988.

Table VI. Examples of major Toxic Releases

Chemical involved	Consequences		Place and date
	Death	Injuries	
Phosgene	10	–	Poza Rica, Mexico, 1950
Chlorine	7	–	Wilsum, Federal Republic of Germany, 1952
Dioxin/TCDD <small>(2,3,7,8-tetrachlorodibenzo-p-dioxin)</small>	–	193	Seveso, Italy, 1976
Ammonia	30	25	Cartagena, Colombia, 1977
Sulphur dioxide	–	100	Baltimore, Maryland, United States, 1978
Hydrogen sulphide	8	29	Chicago, Illinois, United States, 1978
Methyl isocyanate	2,500	200,000	Bhopal, India, 1984

Adapted from ILO 1988.

HOW TO MINIMIZE RISK OF MANMADE DISASTER

- Enforcement of Disaster Management policy
- Effective Disaster management Plan & Enforcement
- Develop a Strong **Disaster** Recovery Plan.
- Test your DMP including **Disaster** Recovery Plan & Emergency Resources.
- Conduct Awareness Program regularly
- Limit Access to Sensitive Systems.

In Industries to prevent any Potential Man-made disaster, need to Identify hazard, access potential risk and ensure effective measure.

Time to time check to Existing/available safety measure that is adequate or note.

Disaster Management Phase

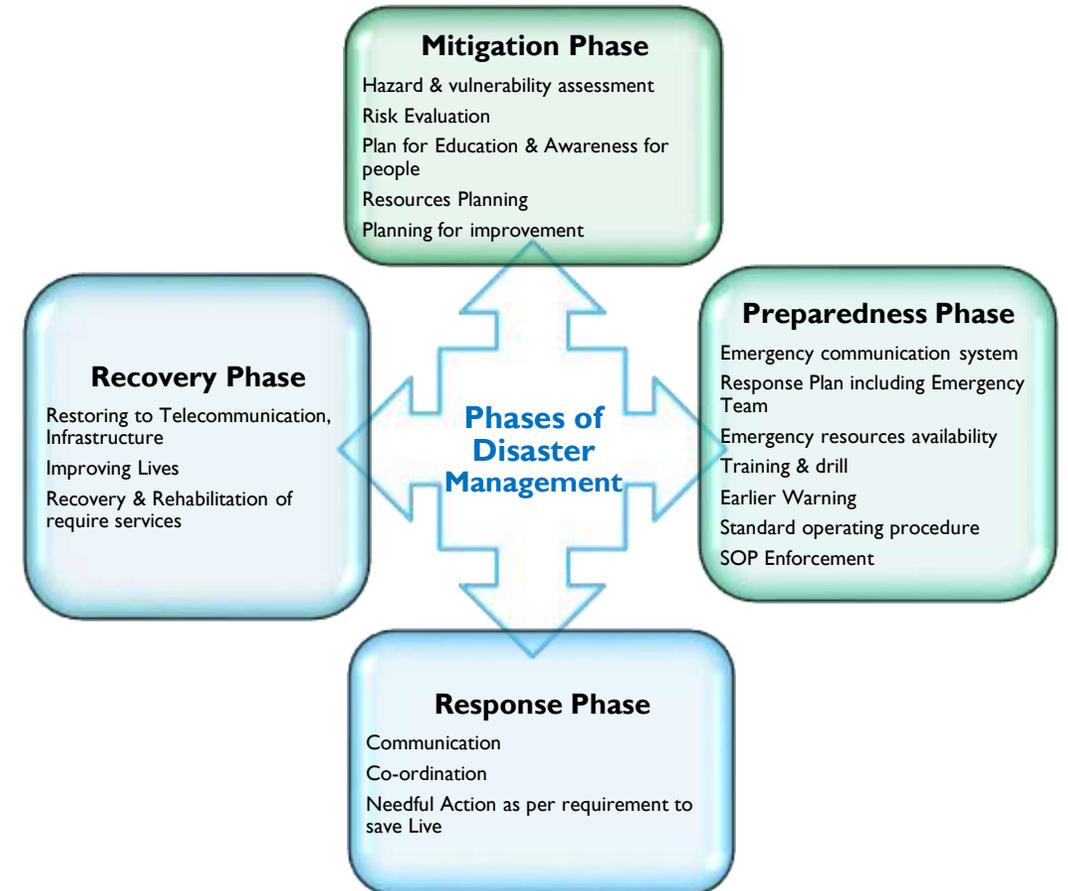
PRE DISASTER

- Prevention
- Mitigation
- Preparedness

POST DISASTER

- Response,
- Recovery
- Reconstruction

DISASTER MANAGEMENT PHASE



CONTROLLING RISK RELATED TO DISASTER

ISEI Method

- I** **Identify** the potential sources of Disaster
- S** **See** likelihood of event occurring & their Potential impacts
- E** **Evaluate Risk** (on Based on potential Likelihood & disaster event Occurring)
- I** **Identify Action Plan** & See for their implementation



WHAT TO DO IN CASE OF DISASTER

Nature of Disaster	Description	First Response
Earthquake	The shaking of the earth's crust, caused by underground volcanic forces of breaking and shifting rock beneath the earth's surface	Shut off utilities; Evacuate building if necessary; Determine impact on the equipment and facilities and any disruption
Fire (wild)	Fires that originate in uninhabited areas and which pose the risk to spread to inhabited areas	Attempt to suppress fire in early stages; Evacuate personnel on alarm, as necessary; Notify fire department; Shut off utilities; Monitor weather advisories
Flood	Flash flooding: Small creeks, gullies, dry streambeds, ravines, culverts or even low-lying areas flood quickly	Monitor flood advisories; Determine flood potential to facilities; Pre-stage emergency power generating equipment; Assess damage
Heat wave	A prolonged period of excessively hot weather relative to the usual weather pattern of an area and relative to normal temperatures for the season	Listen to weather advisories; Power-off all servers after a graceful shutdown if there is imminent potential of power failure; Shut down main electric circuit usually located in the basement or the first floor
Hurricane	Heavy rains and high winds	Power off all equipment; listen to hurricane advisories; Evacuate area, if flooding is possible; Check gas, water and electrical lines for damage; Do not use telephones, in the event of severe lightning; Assess damage
Landslide	Geological phenomenon which includes a range of ground movement, such as rock falls, deep failure of slopes and shallow debris flows	Shut off utilities; Evacuate building if necessary; Determine impact on the equipment and facilities and any disruption
Lightning strike	An electrical discharge caused by lightning, typically during thunderstorms	Power off all equipment; listen to hurricane advisories; Evacuate area, if flooding is possible; Check gas, water and electrical lines for damage; Do not use telephones, in the event of severe lightning; Assess damage
Tsunami	A series of waves hitting shores strongly, mainly caused by the displacement of a large volume of a body of water, typically an ocean or a large lake, usually caused by earthquakes, volcanic eruptions, underwater explosions, landslides, glacier calvings, meteorite impacts and other disturbances above or below water	Power off all equipment; listen to tsunami advisories; Evacuate area, if flooding is possible; Check gas, water and electrical lines for damage; Assess damage

FIRST RESPONSE IN CASE OF DISASTER

Disaster	Description	First Response
Bioterrorism	The intentional release or dissemination of biological agents as a means of coercion	Get information immediately from public health officials via the news media as to the right course of action; If you think you have been exposed, quickly remove your clothing and wash off your skin; put on a HEPA to help prevent inhalation of the agent
Fire (urban)	Even with strict building fire codes, people still perish needlessly in fires	Attempt to suppress fire in early stages; Evacuate personnel on alarm, as necessary; Notify fire department; Shut off utilities; Monitor weather advisories
Hazardous material spills	The escape of solids, liquids, or gases that can harm people, other living organisms, property or the environment, from their intended controlled environment such as a container.	Leave the area and call the local fire department for help. If anyone was affected by the spill, call the your local Emergency Medical Services line
Nuclear and radiation accidents	An event involving significant release of radioactivity to the environment or a reactor core meltdown and which leads to major undesirable consequences to people, the environment, or the facility	Recognize to incident has or may occur. Gather, assess and disseminate all available information to first responders. Establish an overview of the affected area. Provide and obtain regular updates to and from first responders.
Power failure	Caused by summer or winter storms, lightning or construction equipment digging in the wrong location	Wait 5–10 minutes; power off all servers after a graceful shutdown; do not use telephones, in the event of severe lightning; shut down main electric circuit usually located in the basement or the first floor

DISASTER MANAGEMENT IN INDIA

The National Disaster Management Authority (NDMA), headed by the Prime Minister of India, is the apex body for Disaster Management in India. Setting up of NDMA and the creation of an enabling environment for institutional mechanisms at the State and District levels is mandated by the Disaster Management Act, 2005. NDMA is mandated to lay down the policies, plans and guidelines for Disaster Management. India envisions the development of an ethos of Prevention, Mitigation, Preparedness and Response. The Indian government strives to promote a national resolve to mitigate the damage and destruction caused by natural and man-made disasters, through sustained and collective efforts of all Government agencies, Non-Governmental Organizations and People's participation.

This is planned to be accomplished by adopting a Technology-Driven, Pro-Active, Multi-Hazard and Multi-Sectoral strategy for building a Safer, Disaster Resilient and Dynamic India.

NDMA has 5 major divisions

- Policy & Plans,
- Mitigation
- Operations & Communications
- Information & Technology
- Administration and Finance.



Prime Minister's Ten Point Agenda for Disaster Risk Reduction

- 1. All development sectors must imbibe the principles of disaster risk management**
- 2. Risk coverage must include all, starting from poor households to SMEs to multi-national corporations to nation states**
- 3. Women's leadership and greater involvement should be central to disaster risk management**
- 4. Invest in risk mapping globally to improve global understanding of Nature and disaster risks**
- 5. Leverage technology to enhance the efficiency of disaster risk management efforts**
- 6. Develop a network of universities to work on disaster-related issues**
- 7. Utilise the opportunities provided by social media and mobile technologies for disaster risk reduction**
- 8. Build on local capacity and initiative to enhance disaster risk reduction**
- 9. Make use of every opportunity to learn from disasters and, to achieve that, there must be studies on the lessons after every disaster**
- 10. Bring about greater cohesion in international response to disaster**

POINT TO BE REMEMBER/CONCLUSION

Natural disaster can't be eliminated but risk can be minimize or reduce

Majority of Man made disaster can be eliminated through effective planning, Safe operating Procedure and adequate measure

Enforcement of DM Policy help to Control Disaster event related Risk

Learn from disaster & prepare for a safer future

Accident are results of Human Failure & Mechanical Failure

Follow Guideline of NDMA

REFERENCES

- <https://ndma.gov.in/Governance/PM-10-Agenda>
- Sources: https://en.wikipedia.org/wiki/Bhopal_disaster
- ISE Manuals
- Wikipedia, Google
- <https://www.iloencyclopaedia.org/part-vi-16255/disasters-natural-and-technological/item/363-disasters-and-major-accidents>
- <https://www.outlookindia.com/website/story/india-news-its-not-just-vizag-and-bhopal-past-major-gas-leaks-in-india/352243>
- <https://ndma.gov.in/index.php/Governance/DM-Plan-Templates>

LEARN FROM DISASTER & PREPARE FOR A SAFER FUTURE



Any Question



THANK YOU!

FOR MORE DETAILS VISIT - WWW.ISEINDIA.IN

OR MAIL - INFO@ISEINDIA.IN

CALL +91-6266474225, +91-8720831773



www.iseindia.in