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Technological Disasters

INTRODUCTION

A grave occurrence having ruiness result is disaster. According to W.H.O – Disasters are any occurrence that causes damage economic destruction, loss of life and deterioration in health and health services on large-scale sufficient to warning and extraordinary response from outside the affected community or area. Disasters caused by technology involve the failure or breakdown of systems, equipment and engineering standards that harms people and the environment. The term itself includes a wide range of modern issues and consequences of technology mismanagement and engineering mistakes. Technology disasters include structural collapses, such as bridges, mines and buildings, but also industrial accidents, such as chemical or nuclear explosions. The

effects of pollution, like smog and acid rain, are long-term manmade disasters. Taking care of sudden disaster may be straightforward, but chronic problems sometimes divide communities or put the public at odds with the government. It may be hard to pinpoint who is ultimately responsible for the cause of a complex disaster and paying for the costs of recovery. Technological disasters can be considered a man-made disaster meaning there is an "identifiable cause" characteristic. Due to this characteristic, impact on communities can often be more detrimental. The effects of a disaster on families and individuals may be long lasting and can endure for years. However, symptoms may appear gradually, and impacts may not be seen immediately.

TYPES OF TECHNOLOGICAL DISASTERS

- chemical split
- radiation leak
- gas leak
- fire
- explosion
- poisoning &
- bridge collapses
- dam failures
- maritime, aviation and industrial accidents.
- **other**

Major technological disasters in India:

Gas leak in LG Polymers plant in Vizag. (Image: Twitter)

A major gas chemical leak at LG Polymers Ltd in Visakhapatnam left 11 dead and more than 5,000 hospitalized.

On 7 May, 2020, A tragic chemical gas leak incident left at least 11 dead and more than 5,000 sick in Visakhapatnam district in Andhra Pradesh. The incident happened at around 3 am at LG Polymers Ltd at Gopalapatnam - a major commercial and residential neighborhood in Visakhapatnam – when residents of the nearby colonies were asleep. This is not the first such gas leak disaster in India. Here is a list of the major industrial disasters in India in the last 80 years.

Bombay Docks Explosion (April 14, 1944)

Chasnala Mining Disaster (1975)
On December 27, 1975, a huge explosion rocked the Chasnala Colliery in Dhanbad (then under Bihar) killing 372 miners. The explosion is supposed to have caused by sparks from equipment igniting a pocket of flammable methane gas. The flooding in the mine drowned the miners trapped under the debris.

The Union Carbide Gas Tragedy (1984)

In what is the biggest industrial disaster of the last hundred years in India, 5295 people died and 5,27,894 were affected after being exposed to some 40 tonne of methyl isocyanate gas leaked from a pesticide plant owned by the US multinational, Union Carbide Corp, in Bhopal. It has been more than 35 years since the incident which happened on December 3, 1984, but there is still a massive debate on the number of people affected. Some activists estimate around 20,000 to 25,000 deaths.

Korba Chimney Collapse (2009)

On the September 23, 2009, 45 people lost their lives when a chimney under construction at a power plant at the Bharat Aluminium Company (Balco) collapsed in Korba in Chhattisgarh. The structure had reached a height of 240 metres when it collapsed on top of more than 100 workers due to incessant rainfall and lightning in the area.

Jaipur Oil Depot Fire (2009)
On October 29, 2009, an oil fire broke out at the Indian Oil Corporation (IOC) depot's giant tank in the Sitapura Industrial Area on the outskirts of Jaipur, killing 12 people and injuring at least 130. The blaze continued for more than a week and half a million people were evacuated from the area post the incident.

Mayapuri Radiolgical Accident (2010)
A big radiation scare hit the national capital ten years ago when one person was killed and 8 others hospitalised at AIIMS after exposure to radioactive substances at the Mayapuri scrap yard in West Delhi. The event was rated level 4 out of 7 on the International Nuclear Events Scale.

Visakhapatnam HPCL Refinery Blast (2013)
23 people were killed on August 23, 2013, when a blast caused due to sparks originating from welding after a heavy build-up of hydrocarbons in a pipeline, led to the collapse of the cooling tower in the HPCL refinery in Visakhapatnam.

Nagaram GAIL pipeline explosion (2014)
18 people were killed and around 40 injured when in June 2014, a massive fire broke out after a blast in the Gas Authority of India Limited (GAIL) underground gas

pipeline in the coastal village of Nagaram in the East Godavari district of Andhra Pradesh.

Bhilai Steel Plant Gas Leak (2014)
Six people were killed and over 40 injured due to a leakage in methane gas pipeline at a water pump house in the Bhilai Steel Plant in Durg district in Chattisgarh.

Tughlakabad Gas Leak (2017)
As many as 200 school students of the Rani Jhansi School for Girls were admitted to four hospitals after a chemical gas leakage from a container truck at the customs area of Tughlakabad depot in South Delhi.
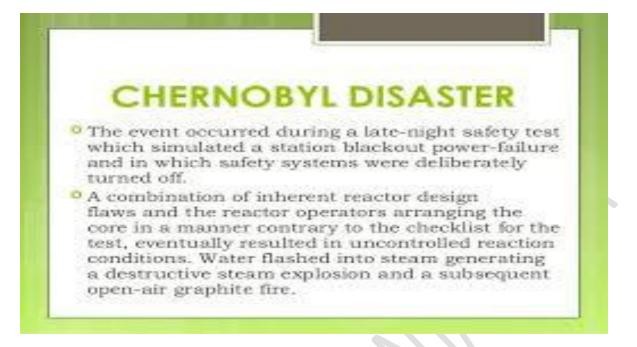
Kanpur Ammonia Gas Leak (2017)
On the March 15, 2017, Ammonia leaked from the gas chamber of a cold storage facility at Shivrajpur in Kanpur district of Uttar Pradesh. Many farmers were trapped inside the building, waiting to stock the potato harvest, when the tragedy occurred. Five people were killed and nine others injured in the incident.

Belur Chlorine Gas Leak (2017)
More than 10 people took ill and were rushed to the hospital following a chlorine gas leak at a water treatment plant at Gandehalli in Belur near Hassan in South Karnataka in May 2017.

Bhilai Steel Plant Pipeline Blast (2018)
An explosion in a gas pipeline connected to the coke oven section of the Steel Plant in Bhilai in Durg district of Chhatisgarh, operated by the Steel Authority of India Limited (SAIL) resulted in the death of 9 people while injuring 14 others.

CHERNOBYL DISASTER

- The event occurred during a late-night safety test which simulated a station blackout power-failure and in which safety systems were deliberately turned off.
- A combination of inherent reactor design flaws and the reactor operators arranging the core in a manner contrary to the checklist for the test, eventually resulted in uncontrolled reaction conditions. Water flashed into steam generating a destructive steam explosion and a subsequent open-air graphite fire.

All types of disasters are challenging, but technological disasters tend to be even more difficult and challenging due to following reasons:

- The threat of technological disasters cannot be anticipated. It is sudden, unexpected and unpredictable.
- It is human instigated disaster. Therefore, People are responsible for it. Victims of the disasters tend to feel anger toward people who were responsible for accidents that may have been prevented.
- Community breakdowns and conflict may result. Technological disasters can create disputes within communities.
- The nearby communities and communities settled nearby other such industrial areas come under tension and lives under life threat. The lives under mental torcher .
- Longer Recovery—Community members tend to concentrate on litigation and blame and less on cleanup and recovery.
- Media Exposure—Media covering a technological disaster can be constant adding to already heightened stress levels.

Affect –

Technological disasters tend to affect specific occupational groups. In the case of the Deep-water Horizon/BP oil spill, the fishing and tourism industries were severely impacted as damaged renewable natural resources were destroyed (Grattan et al. 2017). In addition, the social and economic impact from this disaster was wide spread, impacting communities in five coastal states. Many communities experienced effects, even if they did not have oil on their coast (Morris et al. 2013). Examples of Technological Disasters Bhopal Gas tragedy Recalling the night of December 2-3 1984 in Bhopal still sends a shiver down the spine of those who were there that fateful night when toxic Methyl Isocyanides (MIC) gas leaked from the factory owned by Union Carbide. The gas silently spread out engulfing the densely populated areas around the factory. People woke up and ran outside desperately gasping for breath only to take in more of the deadly gas. Many died in their sleep while others went blind. Over time, several people suffered from post trauma diseases, while many continue to suffer even today. This was one of the worst chemical disasters globally that resulted in over 10,000 losing their lives (the actual number remains disputed) and over 5.5 lakh persons affected and suffering from agonizing injuries. The tragedy was a result of human error and poor supervision at the factory.

Unfortunately, several industries in India still continue to operate with very little government pressure on implementation of safety protocols as per Standard Operating Procedures laid down by the authorities. Effects of Technological Disasters Technological disasters are stressful, especially because they are unpredictable. Individuals, families, and communities are affected. Some of the results include income loss, loss of job security, uncertainty about the future, family conflict, and stress. In particular, post-traumatic stress disorder (PTSD), depression, and anxiety symptoms were common responses to a disaster similar to the Deep-water Horizon/BP oil spill, the Exxon Valdez oil spill. Impacts may persist over time for some individuals, while others show resilience earlier.

In addition, there are immediate and long-term impacts on mental health. Individual Stress Individual stress from a disaster may result in some of the following symptoms: • Emotional—anxiety, shock, disbelief, fear, irritability, anger, sadness, depression, resentment, guilt, shame, and nightmares • Cognitive—confusion, disorientation, decreased attention span, memory difficulties, trouble concentrating at work, and self-blame • Behavioral—increased alcohol or drug use, heavier smoking, increased arguing or conflict with family members, withdrawal, domestic violence, and suicide attempts • Environmental Worry—Worry over environmental restoration and recovery Most individuals do not show all of these symptoms, but it is common for those under a high degree of stress to show at least one or two. Those who are experiencing a large number of symptoms or those whose symptoms are impacting their ability to function in daily life should seek professional assistance. Not only can high levels of stress have a negative impact on the individual, but the poor functioning that often results from such stress could also have long-term impacts on children and the family as a whole. Family Stress Marriage and partnerships have the potential to be negatively affected by stress following a disaster. For example, • couples can experience difficulties arising from loss of trust, irritability, withdrawal, or isolation; and • women tend to feel marital stress following a disaster. Women also absorb their husbands' stress more powerfully than their husbands absorb theirs . Children's Stress The ways in which children respond to a disaster depend in part on age. Below, separated by age range, are some typical behaviors that might be exhibited by children under stress. Preschool age (1–5) symptoms of stress: • Acting younger through behaviors such as thumb sucking and wetting the bed • Expressing feelings of helplessness • Struggling with understanding the disaster • Exhibiting behavioral problems such as crying, throwing tantrums, behaving aggressively, or being defiant • Changing sleeping and eating patterns School age (5–11) symptoms of stress: • Acting younger through behaviors such as asking their parents to dress them • Having trouble

focusing on school work • Displaying aggressive behavior due to increased anger • Exhibiting behavioral problems such as withdrawal, tearfulness, and defiance Adolescent symptoms of stress: • Becoming less interested in activities previously enjoyed • Engaging in risky behavior • Withdrawing from friends, which could lead to breakdowns in relationships It is important to note that children tend to deal with stress and loss differently than adults, and their expression of stress may come out in more subtle ways. It is also important to remember that a child's ability to understand the impact of a disaster is often limited, particularly for younger children. Although children tend to be fairly resilient in dealing with adversity, children repeatedly exposed to trauma—such as those who live in disaster-prone areas or in places where there is recurring violence—are at higher risk for the development of mental health problems. Not all children are resilient, so it's important for parents to pay attention to children's reactions and provide the support and reassurance they need. Guidelines for Dealing with the Stress of a Technological Disaster Individuals are advised to do the following: • Maintain routine as much as possible. • Reduce exposure to media covering the event. • Stay healthy and find healthy ways to reduce stress, such as doing things outside, getting exercise, and doing stress reduction exercises. • Seek accurate sources of information to better understand the situation. • Talk to someone you trust. • Keep a positive perspective—you can get through this! • Seek professional help if you are feeling depressed, anxious, or have trouble controlling your emotions. Couples are advised to do the following: • Talk with each other about what they are going through. • Be patient with each other. • Discuss how bills will be paid if there has been a job loss; develop a plan. • Seek counseling if the relationship is under too much strain. The impact of any disaster on children depends in large part on how adults in the home respond. To minimize the stress for children, parents are advised to do the following: • Limit watching television coverage of the disaster. • Answer all questions a child may have without lying, and use words a child can understand. • Stay

positive and focus on how things will get better. Know when to seek professional help for children. Significant behavioral changes, particularly those lasting for longer periods of time, may indicate that a child is struggling (Evans & Wiens 2004).

Bouncing Back:

Resilience in Disaster Situations: People who go through a disaster often experience symptoms of distress, such as depression and anxiety. Usually these symptoms subside over time, but can be longer with technological disasters. If an individual has been feeling very distressed for more than six months to a year, and if the symptoms are negatively impacting his or her ability to function, it is important to seek help from a health care provider or a counselor. Some research on disasters shows that the individual's belief in the ability to cope is more important for a resilient outcome than concrete coping strategies. Children have a natural tendency toward resilience, especially at younger ages, because they are not yet able to fully comprehend the implications of a disaster. Although this is reassuring to parents, it's also important for parents to realize that when they are under stress, they may overlook children's symptoms. Parents play a key role in children's resilience, providing essential emotional support, reassurance, and safety.

It is therefore, all people living near or nearby any industry especially near chemical industry are suggested to always be in a attention mood and keep necessary measures to tackle any technological disaster at any time.

Thank you.