

EMERGENCY MANAGEMENT: CONCEPTUAL FRAMEWORK (Industrial Emergency Preparedness)

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Emergency management

- *Emergency management* is the generic name of an interdisciplinary field dealing with the strategic organizational management processes used to protect critical assets of an organization from hazard risks that can cause disasters or catastrophes, and to ensure the continuance of the organization within their planned lifetime.
- Assets are categorized as either living things, non-living things, cultural or economic.
- Hazards are categorized by their cause, either natural or human-made.

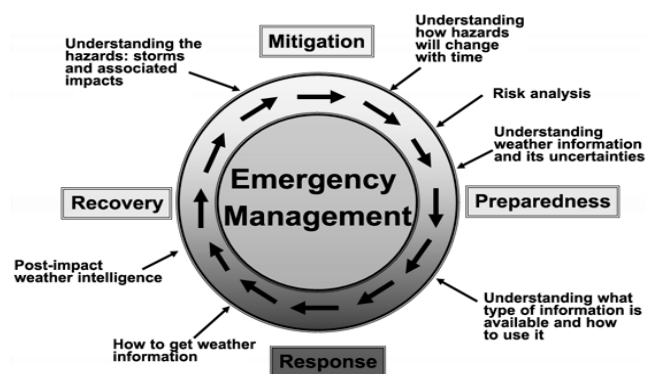
Emergency management is a continuous process by which all individuals, groups, and communities manage hazards in an effort to avoid or reorganize the impact of disasters resulting from the hazards.

The main attributes of a disaster include unpredictability, unfamiliarity, speed, urgency, uncertainty, threat etc. Accidents in Chemical industry can occur due to human errors, leaks, failure of vessels/equipments or pipelines, lack of safety measure etc.

The four fields normally deal with risk reduction, preparing resources to respond to the hazard, responding to the actual damage caused by the hazard and limiting further damage (e.g., emergency evacuation, quarantine, mass decontamination, etc.), and returning as close as possible to the state before the hazard incident.

Emergency Management is a strategic process, and not a tactical process, thus it usually resides at the Executive level in an organization.

Effective Emergency Management relies on a thorough integration of emergency plans at all levels of the organization, and an understanding that the lowest levels of the organization are responsible for managing the emergency and getting additional resources and assistance from the upper levels.



Emergency Management cycle

Phases and professional activities

The nature of management depends on local economic and social conditions.

Emergency Management must include long-term work on infrastructure, public awareness, and even human justice issues.

The process of Emergency Management involves four phases: mitigation, preparedness, response, and recovery.

Mitigation

- Mitigation efforts are attempts to prevent hazards from developing into disasters altogether or to reduce the effects of disasters.
- The mitigation phase differs from the other phases in that it focuses on long-term measures for reducing or eliminating risk.
- The implementation of mitigation strategies is a part of the recovery process if applied after a disaster occurs.
- Mitigation measures can be structural or non-structural.
- Non-structural measures include legislation, land-use planning (e.g. the designation of nonessential land like parks to be used as flood zones), and insurance.
- Mitigation is the most cost-efficient method for reducing the effect of hazards although not always the most suitable.
- Mitigation includes providing regulations regarding evacuation, sanctions against those who refuse to obey the regulations (such as mandatory evacuations), and communication of risks to the public.
- A precursor to mitigation is the identification of risks.
- Physical risk assessment refers to identifying and evaluating hazards.
- The hazard-specific risk (R_h) combines a hazard's probability and effects.

The equation below states that the hazard multiplied by the populations' vulnerability to that hazard produces a risk Catastrophe modeling.

The higher the risk, the more urgent that the vulnerabilities to the hazard are targeted by mitigation and preparedness. If, however, there is no vulnerability then there will be no risk, e.g. an earthquake occurring in a desert where nobody lives.

Preparedness

Preparedness is a continuous cycle of planning, managing, organizing, training, equipping, exercising, creating, monitoring, evaluating and improving activities to ensure effective coordination and the enhancement of capabilities of concerned organizations to prevent, protect against, respond to, recover from, create resources and mitigate the effects of natural disasters, acts of terrorism, and other man-made disasters.

In the preparedness phase, emergency managers develop plans of action carefully to manage and counter their risks and take action to build the necessary capabilities needed to implement such plans. Common preparedness measures include:

- ❖ communication plans with easily understandable

- ❖ proper maintenance and training of emergency services, including mass human resources such as community emergency response teams.
- ❖ development and exercise of emergency population warning methods combined with emergency shelters and evacuation plans.
- ❖ stockpiling, inventory, streamline foods supplies, and maintain other disaster supplies and equipment terminology and methods.
- ❖ develop organizations of trained volunteers among civilian populations.
- ❖ Another aspect of preparedness is casualty prediction, the study of how many deaths or injuries to expect for a given kind of event.
- ❖ This gives planners an idea of what resources need to be in place to respond to a particular kind of event.
- ❖ Emergency Managers in the planning phase should be flexible, and all encompassing – carefully recognizing the risks and exposures of their respective regions and employing unconventional, and atypical means of support.
- ❖ Depending on the region – municipal, or private sector emergency services can rapidly be depleted and heavily taxed.
- ❖ Non-governmental organizations that offer desired resources, i.e., transportation of displaced homeowners to be conducted by local school district buses, evacuation of flood victims to be performed by mutual aid agreements between fire departments and rescue squads, should be identified early in planning stages, and practiced with regularity.

Response

- The response phase includes the mobilization of the necessary emergency services and first responders in the disaster area.
- This is likely to include a first wave of core emergency services, such as firefighters, police and ambulance crews. When conducted as a military operation, it is termed **Disaster Relief Operation (DRO)** and can be a follow-up to a Non-combatant evacuation operation (NEO). They may be supported by a number of secondary emergency services, such as specialist rescue teams.
- A well rehearsed emergency plan developed as part of the preparedness phase enables efficient coordination of rescue.
- Where required, search and rescue efforts commence at an early stage. Depending on injuries sustained by the victim, outside temperature, and victim access to air and water, the vast majority of those affected by a disaster will die within 72 hours after impact

Recovery

- The aim of the recovery phase is to restore the affected area to its previous state.
- It differs from the response phase in its focus; recovery efforts are concerned with issues and decisions that must be made after immediate needs are addressed.
- Recovery efforts are primarily concerned with actions that involve rebuilding destroyed property, re-employment, and the repair of other essential infrastructure.
- Efforts should be made to "build back better", aiming to reduce the pre-disaster risks inherent in the community and infrastructure.
- An important aspect of effective recovery efforts is taking advantage of a 'window of opportunity' for the implementation of mitigative measures that might otherwise be unpopular. Citizens of the affected area are more likely to accept more mitigative changes when a recent disaster is in fresh memory.

✓ **Disaster Management activity basically comprises of three stages, i.e.**

- Pre- Disaster Stage
- Emergency Stage
- Post-Disaster Stage

Disaster Management Cycle –Phase I: Mitigation

Disaster management cycle:

- A cycle with phases that reduce or prevent disasters
- **Mitigation:** Reducing or minimizing an impact of a hazard or disaster.
- **Risk management:** Consists of identifying threats (hazards likely to occur), determining their probability of occurrence, estimating what the impact of the threat might be to the communities at risk, determining measures that can reduce the risk, and taking action to reduce the threat.
- **Vulnerability:** A condition wherein human settlements, buildings, agriculture, or human health are exposed to a disaster by virtue of their construction or proximity to hazardous terrain.
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- **Preparedness:** Planning how to respond. Examples: preparedness plans; emergency exercises/training; warning systems.

Defining Emergency Preparedness

- Emergency Preparedness – against natural & manmade hazards
- Building disaster resistant Infrastructure,
- General Awareness & Knowledge Management.
- Developing Capabilities
- Preparedness & training of first responders
- Community preparedness
- Communication plan
- Integrated DM Plan covering complete DN Cycle.

Testing of Emergency Preparedness Plans

- Training and Re-training of all stakeholders/service providers
- Awareness among Community
- Specialized response at industry/district/state/ national level
- Coordination between various Emergency Support Functionaries
- Testing the organized response through conduct of Mock Exercise

Mine Emergency Response Plan Guidelines for the Mining Industry

Prompt action is required to control mine fires, explosions, entrapments, or inundations. A **Mine Emergency Response Plan (MERP)** that outlines procedures and is prepared in advance is essential for effective containment of an emergency situation. For example, an MERP helps to determine the following:

- ✓ what actions can be taken to prevent an emergency;
- ✓ what precautions would minimize the effects of an emergency, should one occur;

- ✓ what immediate actions mine personnel should take to contain an emergency;
- ✓ whether mine employees have the skills necessary to carry out the procedures outlined within the MERP;
- ✓ who will assume temporary command of the emergency effort;
- ✓ who is in charge of which parts of the emergency operation;
- ✓ what kinds of special services and mutual aid support are available to sustain rescue actions;
- ✓ how key personnel will obtain information and assess reports to make critical decisions; and effective media relations procedures.

Management can then develop specific goals for improving the company's emergency preparedness program.