

# Construction Hazards and Risks Control

**Lecture Title: – Emergency and Medical Response on Construction sites**

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# What is Emergency Response?

- An emergency response is an immediate, systematic response to an unexpected or dangerous occurrence. The goal of an emergency response procedure is to mitigate the impact of the event on people, property, and the environment.
- Emergencies warranting a response range from hazardous material spills resulting from a transportation accident to a natural disaster.



# Types of Emergencies

- Fire
- Medical
- Structural failure
- Hazardous Material Release
- Weather



# S.L. 646.08

- It shall be the duty of an employer to take the necessary measures for first aid, fire-fighting and evacuation of workers in the event of serious and imminent danger:
- Provided that the measures which are to be taken shall be adapted to the use of the building, the nature of the activities and to the size of the workplace:
- Provided further that the measures taken shall take into account all persons present or who may be present at any time, as well as the physical and chemical properties of the substances present.



- Ensure that the workplace is equipped at all times with suitable and sufficient fire-fighting equipment and with fire detectors and alarm systems, as necessary, taking into account the dimensions and use of the buildings, the equipment they contain, the physical and chemical properties of the substances present and the maximum potential number of persons present.
- The employer shall inform his workers of any fire risks present, and of the measures required to minimise such risks.
- The employer shall ensure that workers are adequately instructed and trained as appropriate in the proper use of firefighting equipment as may be required for that work place by the Civil Protection Directorate.



- **Serious Injuries - The BP Texas City Refinery Explosion (2005):** This catastrophic explosion resulted in 15 fatalities and over 180 injuries. Investigations revealed inadequate safety protocols and emergency response plans. In the aftermath, BP implemented more rigorous safety measures and emergency training programs to prevent similar incidents in the future.
- <https://www.csb.gov/bp-america-texas-city-refinery-explosion/>



# The Lebanon explosion

- The catastrophic blast that occurred on August 4, 2020, at the port of Beirut, Lebanon. The explosion was caused by the detonation of approximately 2,750 tons of ammonium nitrate, a highly explosive chemical compound that had been improperly stored in a warehouse for several years.
- The blast resulted in widespread devastation, killing over 200 people, injuring thousands, and displacing hundreds of thousands from their homes. It caused extensive damage to buildings, infrastructure, and the port area, leading to significant economic repercussions for the country.

<https://www.youtube.com/watch?v=u1P5cVMxhyl&t=31s>



# Poisoning - The Bhopal Gas Tragedy

- This incident involved a gas leak at a pesticide plant in India, resulting in thousands of deaths and injuries. The tragedy underscored the necessity for strict safety regulations and emergency response plans for handling toxic substances. In subsequent years, many companies revised their emergency protocols, focusing on chemical safety and employee training.
- <https://www.britannica.com/technology/chemical-engineering>





# Electrocution - The Death of a Construction Worker

- A construction site in New York experienced a fatal electrocution incident due to inadequate safety measures. The investigation revealed that the site lacked proper training and emergency response protocols for electrical hazards. In response, OSHA implemented stricter regulations and safety training programs for construction sites across the state.



# Safety Hooks



# Chlorine Gas Leak in Aqaba Port

- The Aqaba port chlorine leak occurred on June 27, 2021, in Aqaba, Jordan, when a container holding chlorine gas fell and ruptured during unloading. The incident resulted in a significant release of chlorine gas into the air, leading to a hazardous situation for workers and nearby residents.
- [https://iomosaic.com/docs/default-source/publications/a-review-of-the-aqaba-bay-chlorine-incident.pdf?sfvrsn=4093d7d4\\_6](https://iomosaic.com/docs/default-source/publications/a-review-of-the-aqaba-bay-chlorine-incident.pdf?sfvrsn=4093d7d4_6)
- <https://www.youtube.com/watch?v=i5YZWeNzHEw>



# Incident investigation

- Within one week the committee announced its preliminary findings  
Primary cause was the use of improper lifting equipment
- The lifting slings were designed for a maximum load of 8.6 tons, almost 3 times less than the 28.9 tons load that was being lifted.



# Further investigations revealed

- This was only the second time hazardous chemicals were handled in the specific port lane where the incident took place .
- Port staff were unfamiliar with hazards specific to chlorine and this type of operation.
- The failed cable was “worn out, rusted, and lacking technical specifications” according to the preliminary investigation reports.
- There was non-compliance with safety procedures in the port Employees had no specific training for the handling of such chemicals.
- There were very poor hazard communication procedures some of the concerned personnel were not aware of the contents nor the weight of the lifted tanks, while others were under the impression, they were loading empty ISO container tanks.



# Construction sites ERP

- Construction sites must prepare for a range of potential emergencies, and a crucial aspect of the preparation is having a comprehensive emergency response plan.
- In the event of a serious incident, it's essential to implement emergency measures that enable you to effectively manage the repercussions.
- This is where your construction emergency action plan becomes essential. Proper risk management is crucial to safeguard the public, employees, and emergency services personnel. In this blog post, we will discuss the emergency procedures you should implement to ensure the safety of your construction site.



# Emergency Response Plan

- Write an emergency plan if a major incident at your workplace could involve risks to the public, rescuing employees or co-ordinating emergency services.
- Where you share your workplace with another employer you should consider whether your emergency plans and procedures should be co-ordinated



# What shall be covered in an ERP

- How to effectively respond to an emergency
- Evacuation procedures
- Notifying emergency services quickly
- Medical treatment and help
- Communication protocols between the emergency response coordinator and all people at the workplace
- When and how to do emergency procedure testing
- Information, training and instructions to relevant workers about the emergency procedures.





- In critical emergencies, coordinating with emergency services will likely be necessary. Does your emergency response plan account for this, and how do their procedures align with yours?
- Engaging with emergency personnel at the beginning of a project ensures that you address all aspects and comprehend what to include when crafting your plan.



# What shall we put in an emergency plan?

- Contact details for key people – like fire wardens, floor wardens and first aid officers
- Contact details for local emergency services
- How to alert people at the workplace to an emergency or potential emergency – for example, using a siren or bell alarm
- Help for hearing-, vision- or mobility-impaired people
- A map of the workplace showing where to find fire protection equipment, emergency exits and assembly points
- Triggers and processes for telling your neighbours about emergencies
- The post-incident follow-up process – for example, notifying the regulator, organising trauma counselling or medical treatment.



# Things to consider

- The nature of your work
- Hazards at your workplace
- Workplace size and location – for example, how close you are to health services
- Workforce size and structure – for example, employees, contractors and others, including visitors
  
- You should also take into account:
  - External hazards, for example a chemical storage facility across the road
  - How relevant laws apply, including public health laws – for example, for workplaces that are also public places



# Emergency Procedure Training

- You must provide training to your workers, including on procedures for:
  - Evacuations and assembly points
  - Equipment example evacuation chair
  - First aid
- You may need different training for different people, for example:
  - Induction courses for new workers
  - Refresher training for existing workers
  - specific training for people with formal roles in an emergency – for example, fire wardens, floor wardens, first aid officers.



# Working at Heights Rescue Procedure

- Where a person is suspended at a height in a safety harness after a fall a rescue must be effected immediately due to the following dangers:
- Injuries sustained from striking fixed objects or structures during the fall.
- Suspension trauma
- A person suffering from suspension trauma may experience any of the following conditions:
- Injuries sustained from the action of the Personal Fall Arrest System in arresting the fall
- Hypothermia, Dehydration, Pain, Restricted blood circulation, Shock, Fatigue
- Pre-existing medical condition
- The rescue team will need to gain access to the person who is suspended, and this may be possible by using an MEWP
- Where a person has fallen from the basket of an MEWP and cannot regain the basket on their own, the Emergency Lowering Device located on the base should only be used where there is no risk to the victim from the scissor or boom mechanisms. If the emergency lowering device cannot be used another MEWP should be used to effect the rescue.



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- Due to the nature of suspension trauma an individual may lose consciousness quickly and hence a rescue must take place as quickly as possible.
- The following procedure is envisaged
- If a fall from height occurs, the site EHS department must be contacted immediately so that the Site Emergency Plan can be put into operation.
- If the fallen victim cannot be rescued safely from a lower level every effort should be made to support their legs, (prevent suspension trauma).
- •When suspended, fall victims can slow the onset of suspension trauma by pushing down vigorously with the legs, by positioning their body in a horizontal or slight leg high position, or by standing up.
- •Where an MEWP is used, the rescuer(s) is to don a safety harness and Inertia Block as soon as possible and attach the lanyard to the anchorage point in the MEWP basket. A second Inertia Block should be attached to the anchorage point of the basket.



- On reaching the rescue point the basket of the MEWP should be placed immediately underneath the victim. The platform should then be raised to allow the victim to be placed in the basket. The second Inertia Block is to be immediately attached to the D Ring of the safety harness of the victim. The lanyard used in the fall arrest should only be cut after ensuring that he/she is standing within the basket or at worst in a sitting position on the floor of the basket.
- If the individual has lost consciousness, he/she may be suffering from suspension trauma and great care must be taken when cutting him/her down.
- The MEWP should be lowered to ground level as soon as possible so that the condition of the person may be assessed.
- Victims should be kept sitting in the “W” position for at least 30 minutes. This is to prevent a surge of poor unoxygenated blood from flooding back to the heart and brain. Moving the individual from a horizontal to vertical position too quickly can be fatal for the individual involved.
- Whether the person is conscious or unconscious, the sitting position should always be used. Expert medical attention should be sought before any further movement of the victim occurs.
- Remove the Personal Fall Arrest System from service immediately.



# Confined Space Rescue

- No lone working/buddy system shall always be in place.
- ALL CS equipment to come with certificates
- Rescue tripod arrangement in place prior entry
- Task lighting available prior entry
- Atmosphere checked prior to each entry and at regular intervals
- 2 Way radio checked before and immediately after entry
- Exhaust fumes from any adjacent stationery vehicles, shall be considered prior entry.
- Trained rescue team on standby





- Atmosphere check prior to each entry and intervals
- Preferred rescue arrangements are an external tripod with winch with a rescue harness secured worn by person in confined space.
- No one shall enter CS without rescue harness
- No one shall enter CS unless there is visual and verbal contact
- In the event of an emergency, the person on top shall raise the alarm with First Aiders and Supervision
- In the event of an emergency – Rescuers will not enter the confined space unless wearing a BA or atmospheric testing confirming safe to enter and the Tripod winch remaining manned.
- Only employees trained in CS are authorised to enter



# What shall we also consider...

- Medical emergencies - Heart issues that may occur.
- Is an AED available and where is it located?
- Do we have enough trained employees to cover every shift?
- Did we consider disabled persons?
- Did we consider young workers?



# Reviewing emergency plans

- You must maintain your emergency plan so it remains effective. Reviewing your emergency plan will help it stay current, and let you know if you need to revise it. You should review your plan when:
  - There are changes to your workplace, like re-location or refurbishments
  - The number or arrangement of your workforce changes, including if there are more temporary contractors
  - Your work activities increase or change
  - After testing the plan.



# Questions??

