

Construction Hazards and Risks Control

Lecture Title: – Emergency and Medical Response
on Construction sites

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Undergraduate Diploma in
Occupational Health and Safety

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. 646.06 – LN 11 of 2002 – Work Place (First Aid) Regulations

- Important Interpretations:
- "appointed person" means a person provided by the employer, who in the absence of a first-aider, otherwise takes charge of situation in which a person or persons require first aid;
- "first aid" means:(a) treatment for the purpose of preserving life and minimizing the consequences of injury and illness until such help is obtained from a medical practitioner or nurse, and (b) treatment of minor injuries which would otherwise receive no treatment, or which does not need treatment by a medical practitioner;

Interpretations

- "first aider" means a person who has received training and holds a valid certification attesting qualification issued by a first aid trainer;
- "first aid trainer" means a person in possession of a recognised qualification given by an awarding body which is accredited by the Malta Qualifications Recognition Information Centre (MQRIC).

First Aid Legislation Article 3...

- 3.(1) These regulations shall be considered as the minimum requirements in the provision of first aid.
- (2) The provisions of these regulations shall apply to all employers and to all places of work.
- (3) Where these regulations require the setting up of health and, or safety signs, it shall be the duty of an employer to ensure that all signs used at a workplace shall be in conformity with the provisions of regulations as are made for such purpose.

- Emergency escape or first-aid signs as per SL 646.09
- Intrinsic features:- rectangular or square shape- white pictogram on a green background (the green part to take up at least 50% of the area of the sign)



Emergency exit/escape route



This way (supplementary information sign)



First-aid post



Stretcher



Safety shower



Eyewash



Emergency telephone for first-aid or escape

3.5. Fire-fighting signs

Intrinsic features:

- rectangular or square shape
- white pictogram on a red background (the red part to take up at least 50% of the area of the sign)



Fire hose



Ladder



Fire-extinguisher



Emergency fire
telephone



This way (supplementary information sign)

SL 646.06 Art 4

- 4.(1) An employer shall ensure that each of his workers and any other person present at the workplace shall have rapid access to first aid whenever needed.
- (2) An employer shall provide, or ensure that there are provided, such equipment and facilities as are adequate and appropriate in the circumstances for enabling first aid to be rendered to whosoever becomes injured or ill inside the workplace. Such facilities shall include a readily accessible and adequately maintained first aid box. Where more than fifty persons are employed, there shall be an additional box in respect of every fifty persons beyond the first fifty.
- (3) First aid boxes shall be made of suitable material and designed to protect the contents, as far as possible, from damp and dust. First aid boxes shall be clearly identified as such by means of a white cross on a green background.



SL 646.06 – Contents of First Aid Boxes

(4) The contents of first aid boxes shall include the following items:

- (a) a minimum of ten individually wrapped sterile adhesive dressings in various sizes;
- (b) sterile eye pads with attachment;
- (c) a minimum of three triangular bandages;
- (d) a minimum of six safety pins;
- (e) a minimum of three sterile unmedicated dressings in various sizes;
- (f) a suitable supply of sterile eye wash;
- (g) a minimum of three pairs of surgical gloves;
- (h) a minimum of three roller bandages of different sizes;
- (i) one personal protection shield for use during artificial respiration;
- (j) three individually wrapped gauze pads.

First Aiders

5. (1) An employer shall ensure the presence at all times of such a number of first aiders as is adequate and appropriate in the circumstances for rendering first aid to his employees if they are injured or become ill at work.

(2) Where a first aider is absent in temporary and exceptional circumstances, it shall be sufficient compliance if the employer appoints a person, or ensures that a person is appointed, to take charge of the situation relating to an injured or ill employee who will need help from a medical practitioner or nurse, and of the equipment and facilities relating to the giving of first aid.

(3) There shall, in any case, be -

- (a) in a work place with relatively low hazards, including offices, shops, and banks, one first aider for every one hundred employees;
- (b) in a work place with a greater degree of hazard, including factories, ship repair and ship building yards, and docks, one first aider for every fifty employees:

Provided that where there are fewer employees than those stipulated herein, an employer shall provide an appointed person.

(4) An employer shall ensure the availability of a sufficient number of first aiders or appointed persons in the case of shift

First Aiders (2)

workers, with the number of first aiders and appointed persons being determined by the number of employees at work on each shift and in the same ratio as for workers who do not work on shift.

- This includes also to cover sick leave and vacation leave

First Aid – High Risk Areas

6. (1) Where two hundred or more employees are at work in a place of work, or where the type of activity or the frequency of accidents so dictate, an employer shall provide and adequately maintain a suitably equipped first-aid room which shall be readily accessible to stretchers:

High risk areas.

Provided that the contents of a first aid room shall be commensurate with the degree of risk that is present in the place of work.

(2) In places of work which present special or unusual hazards, including the ship-building and repair industry, chemical industries, quarries and foundries, there shall be an adequately equipped first-aid room together with a suitable number of first aiders irrespective of the number of employees in that place of work.

(3) A first-aid room shall be readily available at all times when employees are at work and shall not be used for any purpose other than the rendering of first aid.

(4) A first aid room shall be positioned as near as possible to a point of access to facilitate the transfer of injured or sick persons to hospital.

(5) A first aid room shall contain suitable facilities and equipment commensurate with the level of risk present at a place of work, and shall be adequately ventilated, heated, lit, cleaned and maintained.

(6) A first-aid room shall contain a couch, and such room shall be large enough to hold the couch, with space for people to work around it.

(7) A first aid room shall be clearly identified as such by suitable signs.

First Aid Outside Work/Self Employed

- 7. Where employees are sent to work outside of their employer's place of work, their employer shall ensure, or ensure that there is made, adequate and appropriate first-aid provision for them: Provided that if their work involves special hazards, as in the case of use of potentially dangerous tools and machinery, the employer shall provide a suitably equipped first-aid box.
- 8. A self-employed person shall provide, or ensure that there is provided, such equipment, if any, as is adequate and appropriate in the circumstances to enable him to render first aid to himself while he is at work, or for others to give him first aid.

S.L. 646.08 Work Place (Minimum Health & Safety Requirements) Regulations Art 7.

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- 7.(1) The employer shall take all the necessary steps to provide and maintain suitable and sufficient emergency routes and exits so that in the event of danger, workers and all persons therein can evacuate all the workplace and all parts thereof quickly and as safely as possible.
- (2) Without prejudice to the generality of sub regulation (1), the employer shall ensure that emergency routes and exits:
 - (a) are kept clear at all times, and lead as directly as possible to a safe, open air, specifically designated area outside the premises, which shall be on the ground floor: Provided that no lift shall be used as an emergency route unless such lift has been certified by a mechanical engineer as being safe to be used in emergencies: Provided further that all traffic routes and doors giving access to such emergency doors and exits shall also be free from obstruction so that they can be used at any time without hindrance;



S.L. 646.08 Work Place (Minimum Health & Safety Requirements) Regulations Art 7.

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- (b) are of appropriate number, distribution, dimensions and layout, taking into consideration the use, equipment and dimensions of the workplaces and the maximum number of persons that may be present;
- (c) if they require illumination, are provided with emergency lighting of adequate intensity in case of failure of the normal lighting system;
- (d) are indicated by adequate luminescent directional signs which shall be placed at appropriate locations, at height of not more than three point five metres and not less than two metres from the floor level, and which are maintained in a good state



S.L. 646.08 Work Place (Minimum Health & Safety Requirements) Regulations Art 9.

- 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.



- (9)(b) 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.
- (12) The employer shall inform his workers of any fire risks present, and of the measures required to minimise such risks.
- (13) 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 workplace by the Civil Protection Directorate.

Case Study

- Serious Injuries - The BP America 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>



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://www.youtube.com/shorts/-MlxnbwDmU>



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 response plan becomes essential. Proper risk management is crucial to safeguard the public, employees, and emergency services personnel.



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.

Contents of an emergency plan such as ...

- Contact details for key people – ex. fire wardens, and first aiders
- 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.

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



- 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??

