

Health and Safety Essentials

Lecture 14 - Emergency Preparedness and Response

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Undergraduate Diploma in
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Recap Question 1

Which of the following BEST describes the role of epidemiology in occupational health?

- A. Treating individual workers who develop occupational diseases
- B. Enforcing health and safety legislation
- C. Studying patterns of disease in worker populations to identify causes and preventive measures
- D. Conducting air sampling and noise measurements



Recap Question 2

According to the five principles of occupational hygiene, which sequence is correct?

- A. Anticipate → Recognise → Evaluate → Control 
- B. Control → Evaluate → Recognise → Anticipate
- C. Recognise → Control → Evaluate → Anticipate
- D. Evaluate → Anticipate → Control → Recognise

Objectives of the Lecture

1. Understand the importance of emergency planning and foreseeability.
2. Learn the components of an emergency response plan.
3. Explore EU and UK frameworks for emergency preparedness.
4. Study real-life case studies for lessons learned.
5. Apply concepts through a practical activity.



Introduction to Emergency Planning

- Definition: ISO 45001 (BSI, 2018, p.30) defines potential emergency situations as:
 1. unplanned or unscheduled situations that require an immediate response (e.g. a machine catching fire in the workplace, or a natural disaster in the vicinity of the workplace or at another location where workers are performing work-related activities);
 2. include situations such as civil unrest at a location at which workers are performing work-related activities which requires their urgent evacuation.



Introduction to Emergency Planning

- Importance of Foreseeability:
 - Identify potential emergencies.
 - Analyse risks using past incidents and trends.
- Key Elements of Planning:
 - Risk identification and assessment.
 - Development of procedures.
 - Communication systems.
 - Resource allocation.
 - Business continuity planning.

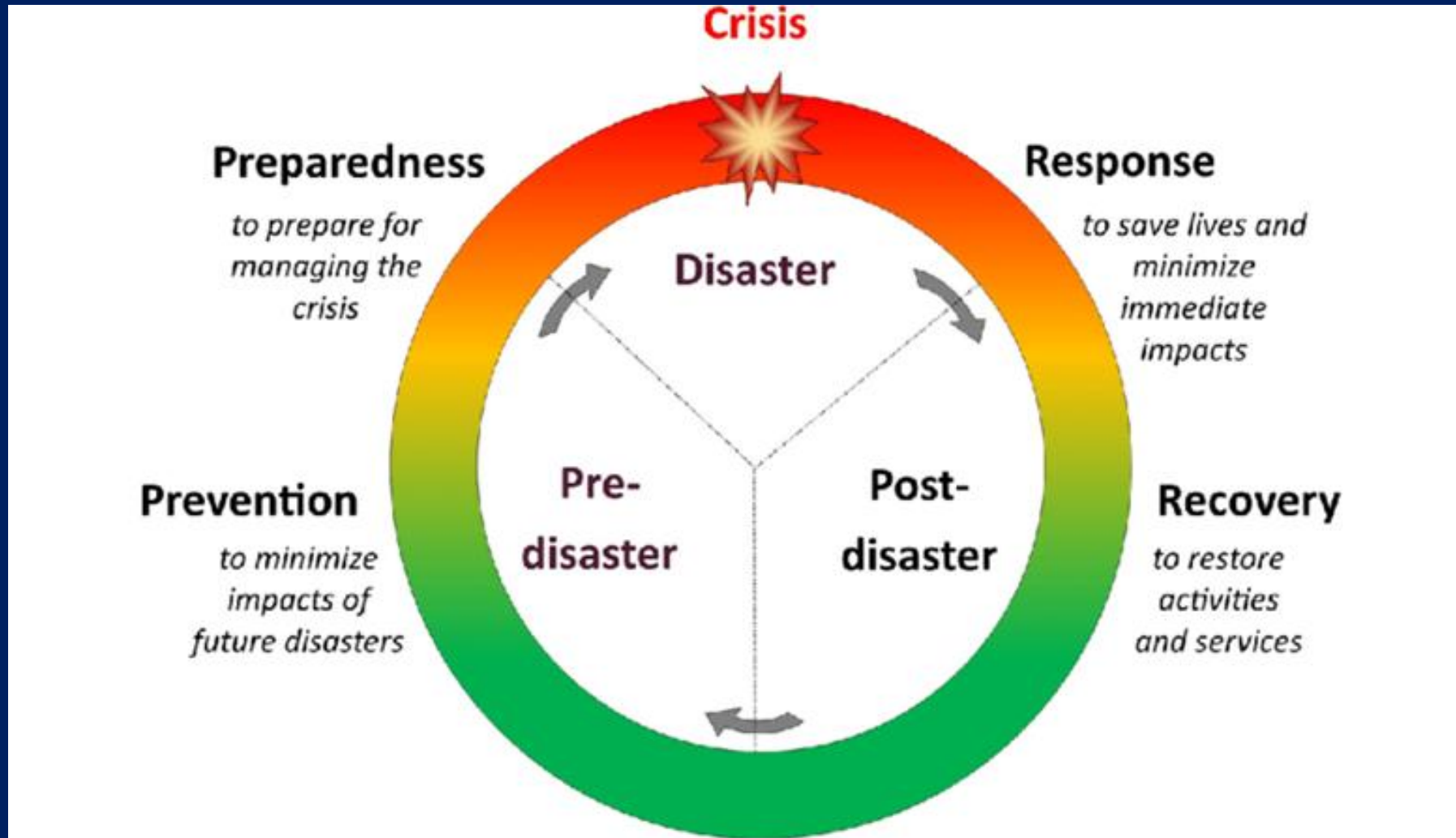


Understanding Emergencies

- What Defines an Emergency?
 - Seriousness and need for immediate action (ISO 45001).
- Examples:
 - Fires, explosions, natural disasters, pandemics, and civil unrest.
- Legal Requirements:
 - UK and EU frameworks:
 - Civil Contingencies Act (UK).
 - Seveso III Directive (EU).
 - Maltese adaptations (e.g., Work Place Regulations).



4 Phases of the Disaster Cycle



Contingency Planning

- The Plan 'B' designed to ensure business continuity and minimise losses in the event of unforeseen circumstances. Contingency planning addresses a wide range of risks, including safety, health, environmental, security, financial, and other operational challenges.
- Key Features of Contingency Planning
 1. Comprehensive Coverage: Plans must address multiple types of risks and provide a structured response tailored to the organisation's specific needs.
 2. Customisation: There is no universal solution for contingency planning; each plan must reflect the organisation's unique context and vulnerabilities.
 3. Emergency Response: The required response can range from simple actions, shutting off power in a localised incident, to complex strategies, such as coordinating an evacuation across multiple locations.



Stages of Emergency Planning

Effective contingency planning involves two critical stages:

- Identification of Precipitating Events:
 - Recognising potential emergencies that could disrupt normal operations.
 - Examples include natural disasters, industrial accidents, cyberattacks, or public health crises.
- Identification of Actions and Timescales:
 - Defining the necessary steps to address the emergency.
 - Setting realistic and actionable timelines for implementing these steps.



Implementation vs Activation

- Implementation:

Refers to the work required to establish the contingency plan. This includes conducting risk assessments, assembling resources, and training personnel.

- Activation:

Refers to the execution of the plan in response to an actual emergency.



Challenges

- **Inability to Simulate Real Emergencies:** As Boyle (2019, p.358) explains, the efficacy of an emergency plan cannot be tested by creating a real emergency. This limitation necessitates alternative methods, such as:
 - **Desktop Exercises:** Simulated discussions and walkthroughs of the plan to identify potential gaps.
 - **Full-Scale Drills:** Controlled exercises to test the plan in a realistic, albeit simulated, environment (e.g., fire evacuation drills).
- **Intermittent Nature of Emergencies:** Unlike ongoing processes, emergencies are sporadic, which makes regular testing and preparation essential.



Actions and Procedures

- Developing an Emergency Plan:
 - Inventory of hazardous materials.
 - Communication systems.
 - Training and drills.
 - Emergency detection and control measures.



Actions and Procedures

- Team Approach:
 - Assign roles and responsibilities.
 - Establish liaison with emergency services.
- Testing and Reviewing:
 - Drills and simulations.
 - Post-incident reviews.



Identifying the Emergency Event

- Emergency events share common characteristics that set them apart from routine operations. These include:
 1. Urgent Response Required:
 - a) Emergencies necessitate the rapid deployment of resources beyond those typically used in daily operations.
 2. Specialised Competences:
 - a) Emergencies demand skills and knowledge not required in everyday activities.
 3. Concerted and Rapid Actions:
 - a) Immediate actions are essential, including evacuation, equipment and environmental damage control, and collaboration with emergency services.
 - b) Preservation of life and personal safety is always the primary objective.



Predictive Techniques in Emergency Identification

- To forecast and identify potential emergencies, predictive risk assessment techniques are invaluable:
 1. **Fault Tree Analysis (FTA):** Analyses potential causes leading to a specific undesirable event.
 2. **Cause-Consequence Analysis (CCA):** Explores possible consequences following an initiating event.
- These techniques are outlined in **ISO 31010:2019** (BSI, 2019) and support the modelling and extrapolation of likely scenarios using past data or simulation.

Risk Assessment vs Emergency Planning

- **Risk Assessment:** Aims to prevent the occurrence of undesirable outcomes.
- **Emergency Planning:** Focuses on mitigating the effects if an adverse event occurs, identifying necessary actions to respond effectively.

Emergency planning also considers short-time-frame scenario analysis to determine actions for immediate response.



Actions for Emergency Preparedness and Response

ISO 45001 (BSI, 2018) provides clear guidance on emergency preparedness and response. Organisations are required to:

1. Establish a Planned Response:

- Develop comprehensive response strategies, including first aid.

2. Provide Training:

- Ensure workers are equipped with the knowledge and skills to respond effectively.

3. Test and Exercise the Plan:

- Regularly test response capabilities through drills and simulations.

4. Evaluate and Revise Plans:

- Review performance after drills or real emergencies and update plans as necessary.

5. Communicate Roles and Responsibilities:

- Inform workers of their duties and responsibilities during emergencies.

6. Engage Stakeholders:

- Share relevant information with contractors, visitors, emergency services, government authorities, and, where appropriate, the local community.

7. Consider Needs and Capabilities:

- Involve all relevant parties in the development of emergency plans, ensuring inclusivity and adaptability.



Flexibility in Emergency Response

BS 45002-2:2019 (BSI, 2019a) highlights the importance of adaptability:

- Organisations should anticipate likely emergencies and develop detailed plans.
- Real emergencies may not unfold as expected, necessitating **on-the-spot risk assessments** and flexible responses.



Break



Identifying Required Actions and Procedures

1. Inventory and Location of Hazardous Materials:

- Maintain an up-to-date record of hazardous materials, including their storage locations.

2. Numbers and Locations of People:

- Identify the total number of personnel present, their usual locations, and any individuals requiring special assistance.

3. Critical Systems Impacting OH&S:

- Determine systems essential for the organisation's OHS and ensure they are prioritised.

4. Provision of Emergency Training:

- Deliver training to workers to equip them with the skills necessary to respond appropriately.

5. Detection and Emergency Control Measures:

- Implement systems for detecting emergencies (e.g., fire alarms, gas leak detectors).

6. Medical Equipment and First Aid Kits:

- Ensure the availability of first aid kits and medical equipment, strategically located and accessible.



Identifying Required Actions and Procedures

7. Primary and Secondary Control Systems:

- Develop robust primary systems for immediate response and secondary systems as backups.

8. Monitoring Systems for Hazardous Materials:

- Establish mechanisms to monitor hazardous materials continuously, ensuring early detection of potential issues.

9. Fire Detection and Suppression Systems:

- Install and maintain fire alarms, sprinklers, and other suppression systems to protect personnel and assets.

10. Emergency Power Sources:

- Ensure the availability of backup power systems (e.g., generators) to maintain critical operations during power outages.

11. Local Emergency Services and Existing Arrangements:

- Liaise with local emergency services and establish details of any existing arrangements for collaboration.

12. Legal and Other Requirements:

- Ensure compliance with legal obligations and other relevant requirements in emergency planning.

13. Previous Emergency Response Experience:

- Review lessons learned from past emergencies to improve the current response plan.



Team Approach to Emergency Response

A **team-based approach** is essential for emergency response planning. This involves:

1. Assigned Roles and Responsibilities:

- Clearly define roles for team members, ensuring that everyone understands their tasks during an emergency.

2. Sources of Specialist Equipment:

- Identify and ensure access to specialised equipment required for specific emergency scenarios.

3. Training Requirements:

- Provide targeted training to enhance team members' competence and readiness.

4. Communication Lines and Liaison Arrangements:

- Establish clear communication channels and liaise with relevant stakeholders, such as emergency services and regulatory authorities.



Documentation, Review, and Testing

An emergency response plan must be:

1. Documented:

- Comprehensive and accessible documentation is essential to ensure that all stakeholders can refer to the plan during an emergency.

2. Reviewed Periodically:

- Regular reviews should be conducted to keep the plan current, especially after organisational changes or incidents.

3. Tested:

- Conduct periodic drills and simulations to test the plan's effectiveness, identify weaknesses, and implement improvements.



Learning from Experience

Case Studies:

1. Buncefield Fire (UK): Importance of reviewing plans for rare events.
2. Um El Faroud Explosion (Malta): Gaps in risk assessment and safety protocols.
3. Seveso Disaster (Italy): Role of regulation (Seveso Directive).
4. Beirut Explosion: Consequences of poor hazardous material management.

Group Activity

Scenario:

A chemical spill occurs in a workplace. Each group will assess the scenario and create an emergency response plan specific to their assigned workplace type.

- Group Assignments:

- Group 1: Large Vehicle Mechanical Repair Shop
- Group 2: Food Processing Facility
- Group 3: Sea Port Facility



Group Activity

Task:

1. Identify risks and potential impacts.
2. Draft an emergency response plan.
3. Present your plan to the group.





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