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General principles for preparedness and mitigation

This chapter provides general principles for emergency preparedness and mitigation across stakeholders for onsite and offsite emergency planning. Industry has the primary responsibility for onsite planning and public authorities have primary responsibility for offsite planning. However, to be effective, the emergency planning process requires co-operation among the various stakeholders including, for example, management of hazardous installations, public officials, response personnel, health/medical personnel, representatives of the public and the media.

Establish emergency planning programmes

Public authorities (at all levels) and management of hazardous installations should establish emergency planning activities/programmes for chemical accidents.

The objective of emergency planning activities/programmes is to put into place the arrangements needed to localise any accidents that may occur and, if possible, contain them and minimise their harmful effects on health, the environment and property.

- A prerequisite for effective emergency planning is the identification of the hazardous installations located within the area and the identification of potentially affected populations, environment and property, including in all potentially affected countries, to be covered by the emergency plan.
- Onsite and offsite emergency plans should be prepared that include details of appropriate technical and organisational procedures to minimise the effects on health, environment and property (both onsite and offsite) in the event of an accident.
- Emergency planning should take into account potential complicating factors that could be associated with chemical accidents, as well as factors that may make emergency response more difficult. These include, for example, transport accidents, extreme weather conditions, other natural hazards, loss of power or water supplies, problems with communication and transportation systems, synergistic effects of accidents with multiple substances, “domino effects” and malicious acts.

Identification of possible scenarios, an assessment of potential environmental consequences of accidents and health consequences as well as of the potential risks should be part of the emergency planning process.

Preparedness and mitigation of chemical accidents should be based on the principles of risk management. This builds on the principles of and uses the knowledge gained in chemical accident prevention.

Emergency plans should provide the necessary guidance to allow for flexible responses to a range of possible situations (from small accidents to worst-case scenarios). To avoid failure in their implementation, emergency plans need to take into account a number of aspects in their planning and preparation phases. These should include:

- The limited availability of information at the time of an accident.
- The need to train and practice the various elements of the emergency plan.
- The possibility that communication systems may fail.
- The notion that individuals are likely to be acting under increased levels of stress and therefore have limits in their performance and in the demands which can be placed on any one individual.
- The need to reduce and avoid complexity as far as possible in the emergency plan.

Emergency planning should take place at a local level to involve local stakeholders and communicate clearly with all parties, and so establish and maintain acceptance for and trust in emergency planning activities.

Countries of origin should inform all potentially affected countries of their emergency plans regarding hazardous activities that are capable of causing transboundary effects. All countries concerned should endeavour to make their offsite emergency plans compatible and, where appropriate, establish joint offsite emergency plans to facilitate adequate response measures.

Identify areas and populations potentially at risk

Areas and populations living and working in these areas potentially affected by a chemical accident should be identified with regard to the extent and severity of any consequences. These may arise from: direct contact with toxic or irritating substances; indirect exposure through ingestion of contaminated food or water or contact with soil and other sources; thermal radiation or overpressure; or indirect injuries from collapsing structures, projectiles or fire.

In carrying out this investigation, attention should be paid to the existence of critical infrastructure (including transport facilities and roads), environmentally sensitive areas and developments with sensitive populations (such as hospitals, nursing/retirement homes, shopping centres, schools or other areas where people congregate). In the case of developments with sensitive populations, it may be necessary to make direct contact with specific instructions in the event of an accident and the emergency plan should take this into account and set up processes to ensure that this takes place.

Within the risk assessment process, it may be useful to classify areas of similar adverse effects into zones to allow for the planning of warnings, evacuation and other response measures.

Co-ordinate onsite and offsite planning

The offsite emergency plan and all relevant onsite emergency plans should be consistent and integrated. This is necessary so that there is effective co-ordination and close co-operation between those responsible, interfaces between organisations are defined and responsibilities for various response functions are clear. In this regard, those involved need to be able to communicate effectively (i.e. common terminology and understanding).

Emergency plans (onsite and offsite) should identify the roles and responsibilities of all parties concerned and should indicate the chain of command, the lines of communication, the co-ordination among parties and the means for obtaining necessary information, resources and equipment.

All parties involved in an emergency response effort should be involved in the emergency planning process. This includes at least public authorities at different levels, management at the hazardous installations and first responders. Additional organisations may be involved as required, such as utility companies (electricity, water, gas, telecommunications), transportation, equipment or service providers.

Industry, public authorities and health/medical organisations should co-operate in order to ensure that health/medical personnel – who may be involved in an emergency response involving hazardous substances – are aware of the hazardous substances that are produced, used, transported or otherwise handled in significant quantities in their community. Health/medical personnel should also be aware of relevant aspects of local emergency plans and of their roles within these plans.

Warning systems should be developed to provide management of hazardous installations and local communities with warnings of natural hazards that can trigger Natural Hazard Triggered Technological Accidents (Natech, including, for example, floods, storms, high winds and extreme temperatures).

Communicate with the public

There should be opportunities for representatives of the public to provide input into the emergency planning process and their concerns should be taken into account in the process of developing the emergency plan. Representatives of the media should also be consulted during the development of emergency plans (e.g. the contacts and modes of information for warnings to the public) and involved in the awareness raising, communication and publicising of the plan.

Emergency plans should include processes to inform the potentially affected public of the correct response to an emergency, taking into account the unique communication situation within the relevant area. This communication should include guidance on what steps the public should take and cover amongst other information: a description of how the public will be warned; sheltering in place; requirements for evacuation; and emergency telephone numbers. Communication should be appropriate to the potential communities affected.

Emergency warning systems should be in place to warn the potentially affected public when a chemical accident occurs or if there is an imminent threat of a chemical accident. Suitable information explaining the purpose and use of early warning systems should be shared with the potentially affected public. The system chosen should be effective and provide timely warnings. Suitable warning systems could include one or a combination of, for example, sirens, automatic telephone messages and mobile public address systems, mobile telephone push services and smartphone applications. Systems should be regularly tested in advance so that their correct function can be ensured and their significance is fully understood by the public.

Spokespeople designated for emergency situations should be carefully chosen during the planning process so that they have the necessary knowledge, skills, authority and credibility to effectively communicate with the public.

- Spokespeople should be specifically selected and trained so that they understand how to develop information for target audiences and how to deliver information effectively.
- Since effective communication with the public during an emergency requires the co-ordinated involvement of a number of relevant parties – including, for example, local response officials, corporate spokespersons, employee representatives, community representatives, public authorities, technical experts and the media – the duties of these parties should be established during the preparation of emergency plans.

Review and test emergency plans

Onsite and offsite emergency plans should be tested and reviewed regularly. Tests should include both tabletop exercises and field exercises.

Emergency plans should be kept up-to-date taking into account, for example, changes in the nature of the risks, new residential and commercial developments in the area, changes in response technology and capabilities, lessons learnt from tests and from the application of plans during accidents and near misses, and changes in personnel.

Emergency plans should be reviewed to be sure they take into account preparedness for and mitigation of Natech, as well as the possible impacts of natural hazards and other natural hazards on infrastructure and response capabilities.

Exercises and testing increase the competency and confidence of response personnel in being able to deal with real emergencies. After testing, there should be a systematic review process to assure that the lessons learnt have been identified and the appropriate measures implemented. The process of reviewing and testing emergency plans should cover:

- Testing of emergency plans at appropriate intervals.
- Identifying needs for training (individuals, organisations and topics).
- Outlining goals and objectives:
 - Use of Specific – Measurable – Attainable – Realistic – Timely (SMART) goals
- Defining the scope of the test:

- Time, place, activities, scenarios, people and organisations.
- Assessing the need for cross-border activities and the requirements that this brings.
- Creating a learning and “no blame” atmosphere/environment throughout the process.
- Who should be involved:
 - Internal/external participants.
 - Different levels in the organisations from industry and public authorities.
 - Participation from the public.
 - Use of independent observers and evaluators.
- Selecting the most suitable methods for training (Figure 4.1).
- Evaluation – openness and transparency.
- Lessons learnt and improvements.
- Implementation of measures.

Figure 4.1. Examples of tests and training

- Functional exercise (1-6 hrs)



- Discussion-/table top exercise (2-5 hrs)



- Game practice (4 hrs - several days)



- Full-scale exercise (4 hrs - several days)



Source: Adapted and translated from DSB (2016^[1]), *Grunnbok: Introduksjon og prinsipper*, https://www.dsb.no/globalassets/dokumenter/veiledere-handboker-og-informasjonsmaterie/veiledere/grunnbok_oving.pdf.

Assess and ensure the availability of resources

During the emergency planning process, there should be a realistic assessment of the existing skills, equipment and other resources that are available for a response effort, and an assessment of the skills, equipment and other resources required based on the range of possible accident scenarios, including

worst-case scenarios. These assessments will provide insight into what additional skills, equipment and resources are needed.

All responsible parties should ensure that human resources, equipment (including communication equipment and personal protective equipment) and financial and other resources necessary to carry out emergency plans are readily available for immediate activation in the event or imminent threat of an accident.

- Public authorities in neighbouring communities (within a country or across borders) and neighbouring facilities may consider sharing (mutual aid) or pooling their resources (including equipment, expertise, health-related resources and information) in order to make the best use of response capabilities. Efforts should be made to ensure the compatibility of equipment and other relevant resources that are made available for sharing with other communities (e.g. hose fittings).
- In certain areas, it may be necessary for enterprises to provide response capabilities such as equipment and resources to respond to accidents originating at their installations to compensate for the lack of resources available to local authorities.

Emergency planning activities need to be transparent to stakeholders with regard to the resources and capabilities available and their limits. It is important to clearly communicate what response activities will not be possible and the expected behaviours to be adopted by the public in the event of an emergency.

Emergency plans should ensure that information, supplies and equipment are available in an event and mechanisms are available to collect data (e.g. metrological data, detection of hazardous substances).

The emergency plans should have in-built resilience. For example, alternative communication lines should be available, relief and recovery for responders should be assigned, sanitary facilities and feeding stations should be provided and an alternative command centre should be designated in the event that the primary centre cannot function properly.

Engage in international co-operation

Public authorities, industry and other stakeholders should be involved in multinational and regional co-operative activities related to emergency planning, where appropriate, in order to share experience, improve planning and facilitate appropriate co-ordination of emergency response in the event of an accident.

Countries, with the assistance of international organisations, should train those involved in response to chemical releases caused by chemical accidents in the principles of health risk communication, in particular in the context of malicious acts. Materials should be developed to strengthen the capacities and capabilities of a range of professionals, including public health professionals, emergency responders, medical professionals and others.

Prepare for cyber events

Industry should have plans in place to identify and respond to cyber events. These should cover roles and responsibilities, mitigation measures, information pathways and required resources.

Plan for events of (potential) international health concern

Emergency plans should address chemical events that are of (potential) international public health concern in accordance with international and transboundary regulations and agreements, in particular the World Health Organization (WHO) International Health Regulations (IHR) (Box 4.1).

Box 4.1. WHO International Health Regulations (IHR)

The IHR are an instrument of international law that is legally binding on 196 countries, including the 194 WHO member states. The IHR grew out of the response to deadly epidemics that once overran Europe. They create rights and obligations for countries, including the requirement to report public health events. The regulations also outline the criteria to determine whether or not a particular event constitutes a “public health emergency of international concern”.

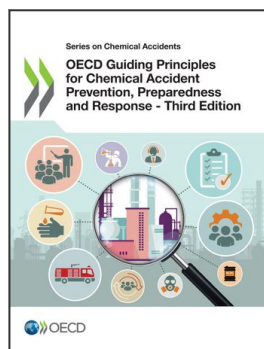
At the same time, the IHR require countries to designate a national IHR focal point, to establish and maintain core capacities for surveillance and response, including at designated points of entry. Additional provisions address the areas of international travel and transport such as the health documents required for international traffic.

Finally, the IHR introduce important safeguards to protect the rights of travellers and other persons in relation to the treatment of personal data, informed consent and non-discrimination in the application of health measures under the regulations.

Source: WHO (2023^[2]), *International Health Regulations*, https://www.who.int/health-topics/international-health-regulations#tab=tab_1

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