

## Internal Emergency Planning

*Publication of Common Inspection Criteria is intended to share knowledge about technical measures and enforcement practices related to major hazard control and implementation of the Seveso Directive. The criteria were developed by Seveso inspectors to aid the dissemination of good enforcement and risk management practices for the control of major industrial hazards in Europe and elsewhere. This particular topic highlights the issues that are critical for limiting the consequences of accidents through effective internal emergency planning and response arrangements. Note that this document is not intended as a technical standard nor as a summary or replacement of any existing standards on the matter.*

### DEFINITION AND SCOPE

The internal emergency plan consists of measures to be taken inside an establishment in the event of an incident. This document provides guidance to inspectors on assessing the adequacy of internal emergency planning (IEP) arrangements by operators of Seveso III establishments for containing and controlling incidents so as to minimise the effects and limit damage to human health, the environment and property through:

- the preparation, review and testing of internal emergency plans prepared by upper tier establishment operators (Article 12 of the Seveso III Directive)
- planning for emergencies in the Major Accident Prevention Policy (MAPP) prepared by lower tier establishment operators (Article 8/ Annex 3 of the Seveso III Directive).

It provides a framework for the inspection of emergency response arrangements at Seveso establishments and a means to assess an operator's performance using defined success criteria.

### OBJECTIVE AND FOCUS OF THE IEP INSPECTION

The inspection should verify that the IEP is equipped to respond to emergencies associated with the accident scenarios considered relevant for the site. The plan should be sufficient to prevent or mitigate the negative consequences associated with them. In



Figure 1. Firefighters checking their gas masks (Photo credit: [Depositphotos.com](https://www.depositphotos.com))

this sense, the IEP should be aimed at meeting the criterion included in Article 5 of the Seveso Directive, that is to, limit the consequences to human health and the environment as well as, as much as possible, limit harm to the establishment itself. At least the following contents should be ensured:

- Systematic approach
- An established process for IEP preparation and revision
- Identification of roles and responsibilities
- IEP foresight and planning
- Detailed preparations and procedures
- Support to external intervention
- Coordination with the external emergency plan
- Communication during an emergency
- Warning systems
- Training
- Emergency drills programme

- Test of the IEP at 3-year intervals
- Information to the public
- Handling compliance deficiencies

Each of these elements is addressed in the sections that follow.

### SYSTEMATIC APPROACH

The operator should have in place an approach to planning for emergencies based on the possible major accident scenarios at the establishment that have been identified through a systematic process of hazard identification and risk assessment. For an upper tier Seveso site, the accident scenarios analyzed in the safety report should be considered as reference scenarios for defining the protection, intervention and response methods in case of emergencies involving unplanned chemical releases.

The emergency plan should also address:

- Major accident scenarios that could be induced by natural hazards or other external disruptions, such as power outages
- The possible consequences of a domino effect from/to neighbouring plants, after consultation with the competent authorities

In addition, all possible emergency scenarios should be adequately treated in the IEP with the appropriate degree of depth, and not only those related to chemical processes, but also:

- Rescue in confined spaces
- Rescue during work at height
- Scenarios that do not involve the intervention of the emergency team because they are mitigated by automatic fire-fighting systems, considering that automatic systems may not intervene
- Accidents during internal handling of dangerous substances

Scenarios that are similar by virtue of their type and severity, thus requiring the same intervention methods, should also be grouped.

### AN ESTABLISHED PROCESS FOR IEP PREPARATION AND REVISION

The site should have an established process for planning and updating the internal emergency plan, including the different stages of the process, reference documents to take into account, individuals and their roles in the process, and an approximate schedule for completing the plan.

The operator should periodically review and, when necessary, revise the internal emergency plan according to the intervals required by current legislation or after accidents or emergency situations have occurred. The review of the internal emergency plan should also be carried out on the basis of new technical knowledge on the matter and evaluating any changes to the organizational structures.

The preparation and subsequent updates of the internal emergency plan should include timely consultation with the personnel working in the plant, including long-term subcontracted personnel.

Moreover, the accident scenarios present in the IEP should be subject to a periodic review in order to eliminate accident hypotheses that are not credible or that have proved to be manageable via simple operating procedures, and therefore, do not require intervention by the emergency intervention team.

### IDENTIFICATION OF ROLES AND RESPONSIBILITIES

The emergency operating procedures should highlight the different

roles and responsibilities regarding the activation of the emergency in its various phases of alert, alarm, intervention, evacuation, external relations, and the end of the emergency. In general, there are two main responsibilities to be addressed, coordination of the internal emergency plan and the emergency intervention team that carries out the IEP.

The IEP coordination team activates the IEP and is a center point for coordinating all actions, including managing (or shutting down) process installations during the emergency, as well as internal and external communications. It often operates in a



Figure 2. The 14 elements of the IEP inspection

meeting room (or crisis room) and should have available all necessary documents and resources to carry out its functions.

At minimum, the roles of the IEP coordination team should include:

- The IEP coordinator (head of the IEP coordination team)
- A focal point that communicates with the onsite emergency intervention team
- A focal point for communication to outside organisations, including the authority responsible for the external emergency plan, the external fire brigade, hospitals, the media, family members, corporate headquarters, the inspection authorities, other authorities that need to be notified (e.g., the police). Communication roles can be assigned to more than one individual, provided that their assignments are clear and distinct from each other.
- Depending on the needs of the site, specialists (hazardous materials, process installations, etc.)

Roles can be combined and assigned to a handful of individuals, as may be necessary on small sites, as far as it is practical and compatible with their competencies and their role in the organization.

The emergency intervention team implements the IEP in case of emergency and should also have the following roles assigned:

- An emergency intervention team leader
- A personnel safety coordinator that oversees evacuation or shelter-in-place onsite, as well as all responsibilities associated with tracking and optimizing staff location and medical condition.

If the intervention also counts on internal first responders, the emergency intervention team will have more components and therefore, could also include such roles as the incident commander and the head of the medical response team.

## **IEP FORESIGHT AND PLANNING**

IEP management and implementation is part of the safety management system (SMS) and should be integrated into appropriate and formalized business processes, in particular, in organisation and management of personnel. The arrangements should ensure that teams are always available in an emergency with all essential roles covered. The assignment of roles in an emergency should also be appropriate and relevant for the staff performing these roles.

The organisation of the coordination and intervention teams should take into account and verify both the composition and the availability of personnel during an emergency that can be mobilized. The potential location of any member of the emergency team in the event of an emergency should be considered to ensure that team members can be mobilized in a timely fashion whenever required. Moreover, coverage during each working shift for each of the roles should be ensured (for example, for processes working 24 hours a day). The assignment of substitutes for key members of the team, including the person in charge of the emergency intervention team, should be considered in case of absence or extraordinary circumstances, such as a pandemic. These arrangements should be periodically assessed and updated as necessary with the involvement of staff that are sufficiently knowledgeable of risks associated with the plant and emergency operations.

In addition, teams should be configured so that at all times they can execute the necessary technical interventions (fire fighting, protection of the equipment, etc.) to respond to the maximum foreseeable impact of any accident scenario. Planned interventions should also be designed to be sufficiently flexible to account for anomalous situations (for example, lack of energy, gas, water) and to easily scale up or scale down operations as necessary as the incident unfolds.

## **DETAILED PREPARATIONS AND PROCEDURES**

The IEP should foresee all actions and equipment necessary to ensure full operability for key personnel for each emergency scenario. In this regard, the plan should include:

- Establishment of one or more equipped emergency coordination centers. In particular, for each emergency scenario identified in the IEP, the positioning of the individual and collective protective equipment should be checked and planned, in order to limit response times and risks for the employees.
- Preparation of suitable plant safety measures based on the reference accident scenarios. Safety measures can include detection instrumentation (e.g., detectors for toxic or flammable vapours and liquids, fire detectors), mitigation and control measures (e.g., remote controlled sectioning valves for lines, water curtains, vapor barriers, water cooling, foam extinguishing system equipment, wind direction

and intensity detectors).

- Availability of a suitable, reliable, protected and, as appropriate, dedicated means of communication (such as telephones, radiotelephones, loudspeakers and intercoms), accounting also for scenarios that may involve failure of electricity, the IT network, and telephone lines
- Guaranteed availability of the necessary mobile emergency equipment (e.g., mobile fire-fighting vehicles, ambulances etc.)

In addition, for each accident scenario, it is advisable to prepare an operating instruction describing methods and steps to follow to complete an action for all personnel (both internal and external) involved in executing the emergency plan. There should be an emergency response card for each type of accident scenario (e.g., gas leak, pool fire, etc.) with instructions for the intervention team on what to do should such an incident occur.

The internal emergency plan should also establish the procedures and performance criteria for restoring the site after the major accident is concluded. Moreover, it should describe internal and post-incident investigation procedures, including support to investigation, reporting and enforcement obligations of the authorities.

## **SUPPORT FOR EXTERNAL INTERVENTION**

Where the operator relies on external fire and rescue services to assist with the response to incidents at the establishment, the emergency planning measures should demonstrate that there are adequate arrangements in place between the operator and responders. The internal emergency plan should foresee the needs associated with the support that the plant staff must provide to the external intervention teams, for operations both inside and outside the plant.

Any other establishment adjacent to the site can be informed and involved in the development of the operating procedures. The IEP should take charge of the procedures and means of activating, signaling and terminating the alarm.

## **COORDINATION WITH THE EXTERNAL EMERGENCY PLAN**

The operator should maintain ongoing communication and consultation with relevant external responders and planners to inform about activities and changes in emergency planning on site

that might affect off-site emergency planning and response. Consultation with off-site emergency service providers and local authorities should ensure that the internal plan and response arrangements effectively dovetail with those off-site. This should include instructions on how, when and by whom the external emergency plan will be initiated. The key to effective dovetailing is communication between site personnel and good information flow on a regular basis.

If, in the external emergency plan, prepared by the competent authorities, there are consequences of a domino effect from or to neighboring plants, the operator should prepare, in agreement with the authority, and as far as the operator is competent to so:

- information on incidental scenarios with domino effect outside / inside
- internal and/or external prevention and mitigation measures
- means of warning and emergency communication

In the internal emergency plan, there should also be information on the management of the personnel gathered at the meeting points outside the plant and the possible participation of the staff in the implementation of the external emergency plan.

The operator should ensure that any changes to the internal emergency plan that may affect the external emergency plan are reported to the appropriate authorities.

## **COMMUNICATION DURING AN EMERGENCY**

The internal emergency plan should have clear arrangements on communicating an emergency situation, both internally and externally. Arrangements for internal communication should at minimum, address when and how to notify that an emergency situation has occurred and how to behave during the different types of emergency scenarios. Specifically, the site should ensure that any person on site knows whom to alert when they see a (possible) emergency situation (leak, fire, injury, etc.). For example, a site may have a permanently manned hotline whose number is advertised at various locations on site.

Such arrangements may also include automatic detection systems (fire detection, gas detection, etc.) that give off their alarms in permanently manned locations by personnel who have been instructed on how to respond to these alarms. In

the same way, there should be information on the behavioral procedures to be followed by all staff present in the plant in case of emergency through suitable means such as signs or posters posted in places where people are present (control rooms, meeting rooms, offices, etc.).

Similarly, the IEP should include arrangements for communication to external parties, that is, the authorities, the public and any neighbouring establishments, providing them with specific information relating to the accident and the behaviour to be adopted. The arrangements should include criteria for when the communication should be launched, organisations to be alerted, and their contact information.

## WARNING SYSTEMS

The structure of the alarm system should be such that the signals are clearly interpretable and perceptible in the whole area of the plant potentially affected and taking account potential blockages or failures that could precipitate, or result from, an emergency event (e.g., power failure, network failure). There should be an optical and acoustic signaling system that is guaranteed to function under all foreseeable emergency events. As such, the system should be appropriately selected and configured in the context of the complexity of the plant and to avoid malfunction during any of the emergencies foreseen in the IEP. These optical and acoustic alarm systems should be periodically tested in order to verify that they are visible and audible in any situation. Windsocks, which are particularly important for assessing the direction and speed of the wind during a chemical release, should be subjected to periodic integrity checks and, if necessary, replaced.

## TRAINING

All individuals involved in the coordination and intervention should be trained in execution of their responsibilities during an emergency and provided with individual protection equipment as appropriate.

The site training programme should specifically address these training needs, and should include:

- Training for executing the roles of the emergency coordination and intervention teams for each scenario
- Training on procedures during the emergencies for each emergency for the emergency response team

- Training for personnel assigned to responding to alarms and hotlines
- Training for personnel (company staff, contractors, and visitors) on behaviour during an emergency. For staff and long-term contractors, the training should be refreshed at regular frequencies, e.g., annually
- An emergency drills programme, as discussed in more detail in the subsequent section

Training must be coherently planned and include verification of its effectiveness

## EMERGENCY DRILLS PROGRAMME

The organisation should provide general and specific tests of the internal emergency plan, at specific intervals, or in case of changes, for the purpose of training and for testing on specific elements and scenarios. An emergency drills program should implement a strategy that takes into account the need for:

- Coverage of all areas of intervention, including specific zones or subsections, as well as the entire plant
- Testing of the IEP for all emergency scenarios (toxic release, fire, explosion, confined space, etc.)
- Testing of all planned emergency actions associated with scenarios, to reinforce training and identify corrective actions
- Coordinated integration of the various teams involved in the response, such as internal and external teams, and, in the case of industrial areas, teams from different establishments in the area
- Testing of all roles and responsibilities and effectiveness of employee training
- Testing of response times to confirm or update IEP assumptions
- Testing internal and external communication protocols
- Strict compliance, as far as possible, with the sequence of events and actions planned for the exercise

The training exercises should not only include interventions to mitigate consequences and stop the dangerous phenomenon (e.g., fire or toxic release) but also include rescue operations such as evacuation of personnel, potentially dealing with injured personnel, and other important actions. Different levels of exercises can be provided: planned and scheduled, announced to the staff, or without notice and at different times. Performance

in adverse conditions (rain, heat, darkness) or in particular situations, however credible, which can complicate the carrying out of emergency interventions (for example, during shift change). A versatile and thorough emergency drills programme can ensure that personnel will automatically take the correct action in the event of an emergency, thus reducing reaction times and human error.

The results of emergency drills should be analysed, discussed, and recorded with corrective actions implemented in the IEP and, as appropriate, in the periodic review of the SMS. The emergency drills programme itself should be reviewed periodically.

During the drill, the operator should periodically verify that maintenance and checks of emergency equipment, systems and equipment for firefighting and containment of consequences are foreseen and implemented. Positioning of emergency equipment should be such that they are always accessible to personnel in any situation.

An inventory of the equipment available to the emergency team should be prepared, with a periodic check of integrity, functional verification, deadlines, maintenance, specific for each type. If actions are planned to deal with emergency situations with the presence of toxic substances, special rooms should be provided for the undressing of operators and decontamination and eventual disposal.

### **TEST OF THE IEP AT 3-YEAR INTERVALS**

Apart from the emergency drills programme, the operator should review, test and update as necessary, the key elements of the internal emergency plan at least once every three years in compliance with Article 12 of the Seveso Directive. The nature of the scenario tested should vary in each 3 year cycle, to examine the range of emergency responses required for foreseeable incidents. As indicated in Article 12, the review should take account of any changes occurring on the site, new technical knowledge, and knowledge concerning the response to major accidents.

An IEP test can also involve testing of existing safety systems, testing of conduct of staff and contractors during an emergency, and in particular, testing of the

actions and reactions of the internal emergency team. Performance indicators can be used to monitor adequacy of key emergency response elements either during testing, or in a real scenario.

An IEP can be tested with the involvement of the competent authority, who will then acquire specific operational experience on the site. Operators should actively exchange information with the local fire brigades, invite them on site and ask if they could (occasionally) participate in an exercise. One should be aware however that local fire brigades do not have the time and resources to systematically participate in emergency exercises of companies in their community.

### **INFORMATION TO THE PUBLIC**

The operator should put in place arrangements to provide all useful information so that local authorities can prepare actions for informing the public around the site about the site, any safety measures that are in place, and the actions required of the public in the event that a major accident occurs at the site. This information should be periodically reviewed and revised, as well as in the event of changes, regulatory updates, accidents, updates to the safety report, requests from the competent authority.

General information about how the public will be warned and if necessary appropriate behaviour in the event of a major accident should be made available in accordance with the Member State's public information requirements.

### **HANDLING COMPLIANCE DEFICIENCIES**

Any deficiencies found, which may concern both the active and passive safety means and the organizational structure, should be eliminated and the emergency plan itself should be revised. The review may also be necessary after the operating results recorded following an accident that has occurred or on the basis of new technical knowledge on the subject. The review may concern both the active safety systems provided for the management of emergencies and the organizational structure and/or operating procedures of the plant personnel and/or the emergency team

---

### **About the bulletin**

This bulletin is a product of the EU Technical Working Group on Seveso Inspections. For more information related to this bulletin and other similar products, visit <https://minerva.jrc.ec.europa.eu/en/shorturl/minerva/publications>

### **Contact**

European Commission Joint Research Centre, Directorate E - Space, Security and Migration, Technology Innovation in Security Unit, via E. Fermi, 2749 21027 Ispra (VA) Italy  
Email: [info@MINERVA-Info@ec.europa.eu](mailto:info@MINERVA-Info@ec.europa.eu)