Human Safety Factors Information

Prepared by the Safety Advisory Group

Safety Info HF - 06/09

Organisation

Site Emergency Response

Site Emergency Response: Plant managers and employees do everything they can to stop emergency situations such as fires or leaks from happening, but emergencies are still possible on any plant. The plant should have the necessary emergency plans and resources in place: designated workspaces, equipment and people organised to manage the potential emergencies so as to reduce harm to employees and public and damage to facilities.

Learning more about emergency response

If the answer to any of the questions below is 'no', then you need to take action

1. Is there a designated and recognised chain of command to deal with emergency situations?
   - Is there a designated person with overall responsibility for dealing with an emergency situation on all shifts?
   - Are contingency plans in place to cover the absences of the designated people?
   - Are provisions made for the safe handling of an emergency situation that may arise out of normal working hours?
   - Do the operators on each shift know what the designated chain of command is?
   - Does the chain of command defined in the safety plan adequately cover all likely eventualities?
   - Is there recognition that emergency support roles are equally important as frontline/immediate response roles?
   - Are appropriate measures in place to ensure 24-hour cover, 7 days a week (including sickness and holiday cover)?

2. Is there good collective awareness of potential emergency situations?
   - Are risk assessments considered as part of the emergency planning process?
   - Are previous incidents / accidents reflected in exercises?
   - Does the planning process consider both worst-case scenarios and more realistic, though less serious, events?

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3. Is there a written on-site emergency plan document which covers the following key areas:
   - Clearly defined authority for decision-making, including scope of authority?
   - Who should assume responsibility in an emergency?
   - Deputising arrangements?
   - Identification of who responds to whom in the event of an emergency (including off-site)?
     - A defined command and control structure?
     - Overview charts showing the emergency command and control structure available?
   - Clear, concise and unambiguous definitions of all roles?
   - Un-ambiguous criteria for calling the emergency services?
   - Does the presentation of the plan document include:
     - Well structured formatting in order to enhance the information for communication & training?
     - Aide memoirs such as charts, maps, and flow charts to remind staff of key information?
     - Do team members consider the procedures usable?
   - Does the plan address responsibility for communications with media and head office?
   - Does the plan include an up to date "emergency telephone list"?

4. Is there an on-going training programme?
   - Is there a process for defining the skills, knowledge and any external qualifications required for key personnel who will respond in the event of an emergency?
   - Are emergency support staff (as well as frontline or immediate response staff) trained in their roles?
   - Are the emergency plan and procedures used in the training programme?
   - Do operational staff and contractors receive regular training to prepare them for potential emergencies?
   - Is training realistic?
     - E.g. have operators practised with full breathing apparatus and chemical suits and in plant areas where they may need to be used in an emergency or for escape?
     - Does training with breathing apparatus or other equipment reflect likely real conditions (low visibility, smoke etc)?
   - Is there evidence in training records or via discussions with staff that training has been received?
   - Do the training arrangements include competency assessment and is this seen as credible by staff?

5. Are there processes in place to ensure that the emergency response plans are tested and kept up-to-date?
   - Is there a process to ensure that emergency planning arrangements are reviewed in light of any changes to plant/processes/operation?
   - Are emergency training programmes reviewed and updated in the light of changes to plant, processes or operations?
   - Is there an on-going programme of drills or exercises to prepare on-site personnel for an emergency?
     - Do exercises reflect current operations and cover all expected scenarios?
     - Are the exercises realistic and credible?
   - Is there an effective mechanism to ensure that the lessons from exercises and accidents are used to improve the effectiveness of emergency planning arrangements?

6. Has liaison with Fire and Emergency Services been established and maintained?
   - Are the responsibilities of the Fire and Emergency Services and the company clear and agreed?
   - Is it clear who is responsible for activating the plan and liaising with outside bodies (e.g. local authorities, fire and emergency services) especially outside normal hours?
   - Are the emergency services informed and kept updated on current practices/ procedures?

What can we do about it?

Management Responsibility

It is the responsibility of management to ensure:
- emergency plans and equipment are in place,
- resources are available,
- training and drills are conducted,
- roles and responsibilities of personnel during the emergency are clearly communicated and understood.

You can think of emergency response arrangements as what you do:
- Before the emergency (planning)
- During the emergency (doing)
- After the emergency (learning/improving).

Stages in emergency response: what to do

Preparing for Emergencies:

You should assess your site risks to find out what are the most likely and/or most damaging emergencies that could arise e.g.
- locations where dangerous substances are stored,
- loading and unloading areas,
- potential for release of substances from plants,
- external risks.

You will then know how most emergencies could start and progress and how to detect them. You should then match your response plans to the scale and probability of those emergencies.

Decide what information everyone will need to handle the emergency; how to get that information and pass it on.

You should set out what resources you will need. This will include:
- Detectors and alarms
- An emergency control centre
- Access and escape routes
- Fire-fighting and first aid equipment
- Power supplies
- Communication equipment (phones and radios)
- Remote controls to shutdown or isolate plant;
- Clear procedures and checklists.
- Protective clothing and special equipment (e.g. breathing apparatus, cutting or lifting gear)
- A competent, well organised emergency team with clear responsibilities assigned to all
- Help from off site (e.g. fire and emergency services, assistance in dealing with media)

You should make sure that your plan works under all foreseeable conditions e.g.

- day or night,
- in all weathers,
- with personnel off sick or on leave,
- with contractors or visitors on site,
- when emergency team members are missing or busy.

Communications with external local authorities, hospitals, and fire and emergency services should be established to ensure that the plan will work and that they are also prepared.

You must exercise and evaluate emergency plans under realistic conditions as often as needed to maintain competence.

- Keep records of what happened in exercises; use the information to improve your emergency response.
- Use different forms of exercise from 'table top' exercises to full drills.

Actions During an Emergency:

Start of Emergency

- A sensor, or someone on the site, detects a problem (e.g. a leaking vessel).
- Manual or automatic alarms alert everyone on site.
- All on site go to their assembly station.
- The emergency team assembles.
- A roll call establishes who is present and who is missing.
- The emergency team gathers information to decide:
  - What triggered the alarm (a fire, leak, bomb threat).
  - Where the problem is.
  - Possible hazards (smoke, flames, chemicals, unsafe structures).
  - What to do next to deal with the problem (stop the leak, put out the fire)
  - What to do to deal with its effects (rescue and treat casualties; clean up; save property)

Emergency Continues

The emergency team continues to:

- Gather information, which may not be complete
- Keep everyone informed about the situation
- Keep a record or log of events and actions
- Liaise with outside help
- Take decisions (bring in outside help; evacuate the site)
- Manage the effects of stress (mainly to avoid errors)

Emergency Ends

The team is satisfied that the emergency is over and stands down.
Management determines if it is possible to restore operations at the site or sets out to repair damage.

After an Emergency:

Site management reviews the response to the emergency and identifies lessons from the emergency about plant safety and response actions, i.e.

- which decisions and actions were successful and which were not,
- what changes need to be made to:
  - the overall approach to emergencies,
  - facilities and equipment,
  - procedures,
  - emergency team structure and competence
- whether the safety culture supported the execution of the plan.

	Management passes on information to employees, other divisions and other companies and ensures they learn from *their* experiences.
Training:	All personnel should be trained in the emergency plan and their role and responsibilities during the emergency and when to activate the plan. Drills and 'what if' table top exercises should be conducted to test the plan and the understanding of the personnel; these should involve other external authorities such as the fire and emergency services. Lessons learned from these exercises should be communicated to all personnel and used to update the emergency plan or identify additional training requirements.

Useful Reference Information

1. Health and Safety Executive, Emergency Response, HSE Human Factors Briefing Note No 5.
2. Health and Safety Executive, HSE Human Factors Toolkit, June 2004.
3. There is additional information on specific Emergency Response provisions and requirements for different processes and substances in EIGA documents, e.g.
    - EIGA, Disposal of Gases, IGC Document 30/XX
    - EIGA, Prevention of Major Accidents Guidance on Compliance with the Seveso II Directive, IGC Doc 60/XX
    - EIGA, Handling Gas Container Emergencies, IGC Doc 80/XX
    - EIGA, Code of Practice Nitrogen Trifluoride, IGC Doc 92/XX
    - EIGA, Code of Practice Nitrous Oxide, IGC Doc 116/XX
    - EIGA, Carbon Monoxide and Syngas Pipeline Systems, IGC Doc 120/XX
    - EIGA, Hydrogen Transportation Pipelines, IGC Doc 121/XX
    - EIGA, Code of Practice Acetylene, IGC Doc 123/XX
    - EIGA, Unmanned Air Gas Plants: Design & Operation, IGC Document 132/XX
    - EIGA, Code Of Practice Compressed Fluorine and Mixtures with Inert Gases, IGC Document 140/XX

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