

Experience on inspection and audit of Emergency Response System

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Emergency response is only ever effective if potential, credible emergency incidents are pre-planned and exercised. There is a need for effective response training that considers the site specific incidents that could occur and provides responders with a clear view of the scenario. How is it possible to estimate the performance of an Emergency Response System (ERS)?

This paper resumes the past experience on the inspections and audits of ERS carried out and discuss about the weak points met to achieve an effective response in case of emergency.

The management team identified in the ERS should be able to demonstrate really their capabilities to manage an emergency from both the low frequency event that has either escalated or has the potential to escalate into a major accident or environmental incident. The ERS must reflect the ability to withstand an emergency, using identified scenario (from COMAH, QRA etc.), training and assessment techniques.

1. Emergency Response System

We know that the objective of the management of emergency response is to safeguard the health and safety of persons on/or near an installation in the event of an emergency. Such management system ensures that the installations are prepared for any emergency that might arise and control, or help to contain, such events to safeguard persons who might be affected and to minimise damage.

How much confident are you about the capability of your Emergency Response System (ERS) to manage a real emergency? Do you believe that all the risks have been identified? Do you believe that all the environmental conditions have been considered (day, night, wind, rain etc.)? All the safety barriers will protect your plant and help you to manage the undesired event? Experience indicates that managers frequently complain about “the cost of safety”. What they never consider are the losses to the organisation as a result of accidents! The ERS is the last trump may be played by managers to contain losses.

History shows that for all industries, as the length of time from the last major accident increases so does the propensity to allow slippage to occur in the importance afforded the maintenance, development, testing and assessment of ERS. The temptation to be simplistic and superficial in verifying ERS may become the norm. It should be useful at

this stage remember that studies from experts in management show that less than the 15% of the problems in an organization could be checked from the workers, while the 85% could be controlled only from management.

2. Emergency Preparedness

Let me resume quickly the main feature of the emergency preparedness that is a combination of two interdependent different factors like:

- The characteristics of an installation that influence the emergencies. That means for example:
 - The risk assessment that should identify the foreseeable events that need to be covered by the ERS
 - The workplaces or work activities that could pose additional risks
 - Plant and arrangements for the prevention and mitigation of fire (i.e. layout, fireproofing, detection system for flammable and toxic gases, safe escape, safe protections, safety devices etc.)
- The pre-arranged ERS that become operative in the event of an emergency likes. For example:
 - Procedure which deals with the management and set out roles, responsibilities of the competent persons to implement the detailed actions.
 - Procedure which deals with the provision of equipment and plan to facilitate the operation and evacuation.

The characteristics of an installation determine:

- The likelihood of an emergency arising,
- The existence and capability of the system to detect the undesired event,
- The ability to withstand for the period of time required to effect the safe operations, evacuation and escape of the person.

The main elements of an ERS are:

- Identification of reasonably foreseeable emergencies.
- The Emergency Response Plan (ERP). This details the organisation and arrangements for handling any emergency including who does what and the procedures to be followed in different circumstances.
- Command structure. The command structure should be clearly established and should take into account the selection criteria, training and development of plans and assessments for persons occupying emergency command and other critical posts. It could be useful to remember that the first action that occurs at an incident is command action. This process ensures that operations start under control, remain under control, and that control is never lost from the very beginning of the event. The manager in charge of command should have the responsibility to:
 - Assume and confirm command and take an effective command position
 - Perform situation evaluation that include risk assessment
 - Initiate maintain and control incident communication
 - Develop an overall strategy and attack plan and assign units to operations

- Develop an effective incident organisation by managing resources, maintaining an effective span of control, and maintaining direct supervision over the entire incident
 - Review and evaluate and revise the attack plan as required
 - Continue, transfer and terminate command
- Competence of personnel in Emergency Response. The role, leadership, training and competence assurance arrangements for the emergency team and the emergency support team.
- Incident detection and assessment.
- Communication systems. Communication system including internal and external systems.
- Exercises and drill

3. Principles of inspection and audit

The inspection or audit should assess the overall or one of the four stages of an emergency:

- a) Preparedness. Preparedness takes the form not only on the availability of plans and procedures but with the familiarisation of every employee through:
 - Training and drills with the details of plans and procedure and, in particular the key personnel. Drills and simulation are essential elements of preparedness
 - Programme of inspection of potentially hazardous areas, testing of warning/detection systems.
 - Periodical updating and revision of the ERP.
- b) Response. Response is defined as the actions taken to save lives and prevent further damage in an emergency situation. Response is putting preparedness plans into action. Inspection or audit should ensure that emergency key personnel will be able to provide the best response possible. Response activities may include:
 - Risk and damage assessment. Identifying the need for mutual aid and requesting aid through appropriate channels.
 - Advising any threatened employee/population of the emergency and apprising them of safety measures to be implemented
 - Search and rescue, Fire fighting, and sheltering victims
 - When a hazard is imminent, actions are precautionary and emphasize protection of life.
- c) Mitigation is the cornerstone of emergency management. Mitigation efforts occur both before and following disaster events. Eliminating or reducing the impact of hazards which exist and are a threat to life and property are part of the mitigation efforts. Post-disaster mitigation is part of the recovery process.
- d) Recovery. Recovery is defined as the actions taken to return the plant and community to normal following an emergency. Repairing, replacing, or rebuilding assessment and property are examples of recovery.

Experience shows that a document review alone is a misleading indicator of emergency preparedness and must be backed up by site inspection. At this stage, there are several important indicators of emergency management performance.

Observing an emergency exercise is not a sufficient indicator to be used in isolation, as it only provides a snapshot of one particular team's performance. The exercise must be considered alongside the overall emergency preparedness of the site performance.

The level of senior management commitment, in terms of involvement, leadership and financial support for emergency preparedness training and exercising is strongly reflected in team performance. A realistic and risk-based site emergency response philosophy is indicative of strength in depth across the site emergency arrangements as a whole. Given effective resources, a team with defined roles and mandates, in a structure that promotes fluid information management and a reliable leadership structure, can be expected to demonstrate a robust chance of managing a site emergency successfully. The process of handling information and presenting it as a basis for decision-making is a key factor in emergency team performance. The frequency, realism and detail of emergency exercises have also an impact on performance. A defined structure of frequent small scale drills with less frequent large-scale simulations based on the site safety case or actual incidents is a good practice. Factors which most influence the quality and the performance of team preparedness are: training in command and control techniques; competence assurance of emergency managers; professional coaching of emergency management teams during exercises; and continuity in membership of emergency teams.

Inspectors should look for strong links between installation safety cases and emergency response plans. The structure of an emergency response plan reflects the type of installation and the range of hazards. There is no one correct structure but whatever structure is adopted, the result should provide a concise source of information that would be readily accessible and retrievable in the event of an emergency. Inspectors should compare safety case endurance times for escape routes and temporary refuges and the times for muster, evacuation and escape with what appears in the emergency response plan and, where appropriate, with the achievements in drills and exercises. Any discrepancies in which the emergency response plan or the outcomes of drills or exercises exceeds the safety case performance standards should be pursued.

Inspectors should consider the safety culture that exists on the installation with a view to assessing if this is conducive to the total ownership of the emergency response system by all persons. Culture is difficult to define but it embraces such issues as organisational structure, the degrees of recognition given to each level of management or individuals, the values and respect attached to individuals, the degree of reliance on individual competencies and motivations, whether or not an organisation is an open and listening organisation, etc. All of these factors have influence on health and safety in the workplace but are particularly relevant in the event of an emergency.

The emergency response system for a particular installation will be set out in some detail in the safety case. Inspectors should familiarise themselves with the relevant part of the safety case and then enquire of the general approach to emergency response being followed by the duty holder. Any discrepancies with the safety case should be pursued. Inspectors should enquire of designated site main controllers, that is the person in overall command in the event of an emergency arising and is the leader of the emergency team, to test whether or not they are clear about their roles, how they would

undertake their duties in the event of an emergency and, in the case of combined operations, are the two managers involved clear about the scope of their respective responsibilities in the event of an emergency arising.

Inspectors should enquire of designated operations coordinators whether or not they are clear about their roles, how they handle information overload, whether they would be comfortable operating as the site main controller in the event of the installation manager not being available etc.

4. Conclusions

- Emergency preparedness, which embraces the characteristics of an installation to withstand an emergency and the emergency response system, remains a central part of the 'protection in depth' philosophy applied to safeguarding the health and safety of persons. With the passage of time from the last accident it is appropriate for a stimulus to be given to the total provision of emergency response capabilities of installations;
- The performance standards in design and operational safety cases relating to the endurance times of escape routes and temporary refuges, and muster, evacuation, escape and rescue times, all of which are based on ALARP considerations, are important inputs into the preparation of an emergency response plan but, should be periodically revised;
- Emergency response system should be audited in both its two parts, first the command capabilities of the management team and, second, all the other support systems and hardware;
- Emergency command capabilities of management teams is of vital importance and, as in other fields involving the possibility of low frequency, high consequence events, professionally organised scenario based training and assessment is the only way of developing and assessing individuals likely to be engaged in emergency command activities.

5. References

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