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Guidance

ON-SITE EMERGENCY RESPONSE INSPECTION

This guidance has been prepared to help inspectors to assess and probe as necessary a company's on-site emergency response in the event of a major accident. It has been prepared in a format to help inspectors audit the emergency response arrangements.

Such arrangements are in effect the companies system for management of emergencies and are part of a range of systems that form the companies safety management system (SMS) for preventing and limiting the consequences of a major accident, which cover normal, upset, abnormal and emergency situations. Put another way, the emergency response arrangements should not be treated as a 'bolt on' and something different to other company systems and arrangements.

The guidance is therefore structured in line with HSE's guidance on 'Successful safety management systems' described in HS/G 65, and looks at emergency management in line with the POPMAR model i.e. Policy, Organisation, Planning, Measuring, Auditing & Review. When considering the adequacy of emergency response, inspectors will need to look at the whole 'POPMAR' structure. However the companies written emergency plan is a good starting point. Many of the questions raised in this guidance can be dealt with by reviewing the written plan in advance of the audit or inspection. Indeed if the plan has key points missing, then there may be little point in starting an audit/inspection until these are addressed.

The guidance could also be used selectively to assess the written on-site emergency plans. The plan is the framework for a company's emergency response. It should cover the objectives and information required by Schedule 5 Parts 1 & 2 respectively. If inspectors wish to comment on on-site emergency plans, then the objectives and minimum information should be addressed and this guidance indicates throughout the text points to be considered, wherever possible, on these matters as well as other features to be included in an on-site plan.

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Dealing with industrial major accidents involving dangerous substances is only one small part of a wider emergency planning field. The responsibility for this area of activity was previously with Home Office (HO) but has now been transferred to the Cabinet Office. HO has published guidance on emergency planning in general titled 'Dealing with disaster' and the Scottish Office 'Dealing with disaster together'. A copy of the HO guidance can be downloaded from www.co-ordination.gov.uk/dwd. This guidance is planned for update and re-issue by the Cabinet Office.

Although this protocol looks at the overall management of emergency response and is structured to help analysis by inspectors, it would be very unusual (and probably unworkable) to find a plan structured in this way. For example, 'Dealing with disaster' divides emergency response into 5 key stages

- Assessment
- Prevention
- Preparedness
- Response
- Recovery

It also makes the point that there could be up to 3 levels of management involved in a major emergency at Operational, Tactical and Strategic levels. This more or less reflects the responsibilities of the bronze, silver and gold commands that may be set up by the police on behalf of the off-site agencies responding to the emergency. However the action required during an incident is driven from the 'bottom' upwards unlike most other management systems.

Another way of looking at the key issues involved in a good emergency response is to check that the following features exist:

- Clear and well rehearsed procedures;
- An effective organisational structure;
- Efficient means of information handling;
- Required technical knowledge;
- Necessary resources, based on testing and experience;
- Clear aims and objectives;
- Planned and rehearsed interfaces between the various responders.

The business skills for properly managing a COMAH major accident are no different from other business damaging events. Companies who are skilled in these areas such as bomb threats, kidnapping, financial dealings, death of key personnel, power or fuel deprivation, purchasing inability, difficult financial dealings, litigation assault should also be skilled in responding to major accidents.

This guidance is not intended to provide an audit for off-site emergency plans, although it will allow inspectors to explore the key interfaces between on- and off-site plans.

POLICY/ OBJECTIVES

Key Issues

The overall objective of the emergency response is to ensure that appropriate response measures will be implemented when and where needed to minimise the harmful effects on people and the environment of major accident hazards.

Inspectors should be satisfied that

the plan has clear objectives with respect to the issues in COMAH Schedule 5 and

there is evidence that it is systematic in its approach and in how it has been devised.

In achieving this, there should have been appropriate consultation with those who have a part to play in the plan and account taken of review and testing.

- 1. Does an “on-site emergency” plan exist?**
- 2. Are the purpose and objectives of the plan clear?**

In particular with respect to:

- Containing and controlling incidents so as to minimise the effects and to limit the damage to people and the environment
- Implementing response measures (procedures, roles and resources) to protect people and the environment
- Communicating relevant information to the public and other services and authorities concerned in the area
- Providing for the restoration and clean up of the environment following a major accident – these may relate to indicative arrangements only and the plan include information about how this would be achieved for foreseeable scenarios e.g identifying expertise to call upon and where resources could be found.

This question covers the high level objectives set out in COMAH Schedule 5 Part 1 and required by Regulation 9(1). These are top-level questions and need to be considered once the emergency plan and response arrangements have been considered as a whole. The questions outlined in the remainder of this guidance will help to answer whether these objectives have been met.

The objectives of the emergency response should be stated as clearly as possible, although appropriate training should reinforce this. For example it should be clearly stated that the primary purpose is to protect people, followed by protecting the environment, protecting property, preserving the company’s reputation etc. How this might be achieved will be primarily covered by training, but the written plan might include important strategic considerations e.g. in the event of a fire, whether incoming and outgoing pipelines should be

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isolated, whether certain vessels take priority re protection by water curtains or cooling, in the event of a release of a toxic gas cloud explaining that the approach is to get people to safe muster point upwind or to reach safe havens for awaiting further instructions.

3. Do the arrangements in place reflect a systematic approach to planning for emergencies based on the major accident hazard scenarios?

The on-site plan should deal with the range of events identified as being most likely to occur in the company's COMAH safety report, i.e. those that dominate the risk and encompass the complete spectrum. The level of planning can be proportional to the probability of the accident occurring. The plan should be focused on those events identified as most likely to occur, although consideration should also be given to scenarios outside the range of events identified, if this requires additional measures in the plan. In auditing a companies emergency response it is important for an inspector to be familiar with the representative set of major accident scenarios described in the companies safety report to enable more questioning of individuals as appropriate.

4. Is there evidence that the statutory consultees, both internally and externally, are involved in devising the plan?

The safety report should state what consultation has taken place. If not then this should be included a part of any review and revision of the report. Consultation for the on-site plan, this should include employees; EA/SEPA; emergency services; health authority; local authority.¹

5. Is a formal review process in place that evaluates the effectiveness of the approach taken to emergency planning?

Setting response objectives in relation to the identified major accident scenarios (e.g. time to shut down & evacuate affected plant; onsite fire team and fire brigade response times) will help both in the preparation and particularly any subsequent review of emergency response.

¹ Except where the LA has been exempted from preparing an off-site emergency plan

ORGANISATION – Control

Key Issues

Maintaining control in emergency situations is very complex and the allocation of responsibilities to key people with appropriate accountability and job descriptions is important

Inspectors should be satisfied

that there is an effective organisational structure with suitable deputising and back up when required and

that the role and responsibilities are clear for those who play a part in the plan. A plan will normally identify a Site Main Controller and Incident Controller.

Command & control structure

6. Does the plan clearly identify who should assume responsibility in an emergency?

7. Is the command and control structure clearly defined and does it identify who responds to whom in the event of an emergency?

8. Are the levels of authority assigned within the command structure such that they allow decisions to be taken at the lowest level commensurate with the urgency of the situation?

An important example of this is whether people have authority to shut down processes or await authorisation e.g. outside working hours.

9. Is there a logical sequence of actions for key personnel that are identified and given a role in the emergency plan?

10. Are overview charts showing the emergency command and control structure available?

Such charts provide a useful summary for staff and external bodies.

A relatively flat emergency management structure helps to allow rapid flow of essential information.

11. Does the emergency plan show how on-site command and control arrangements interface with external bodies?

12. How will emergency responders be readily identifiable; where will the rendezvous be and how will they communicate?

Much time can be wasted if external services cannot find the right person at the scene. Use of tabards, flashing lights on vehicles, coloured helmets. Tabards are probably the most explicit but often not effective in the dark.

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Roles and Responsibilities

13. Are the roles and responsibilities clear, concise and unambiguous, with the decision-making boundaries clearly defined.

This question can be best answered after considering the more detailed questions below.

14. Does the emergency response plan identify key emergency responders and contain a statement of authority (mandates and roles of all concerned)?

For example the Senior Fire Officer of the external emergency services present will

- *Mobilise fire service resources*
- *Undertake fire fighting & rescue operations*
- *Carry out salvage operations in order to mitigate damage caused by fire fighting operations*
- *Provide lighting and rescue equipment*
- *Require identification of hazardous chemicals and methods of dealing with spillage or fire. The site management should have prepared information as part of their plan and pass this to fire officers at the earliest opportunity.*
- *Establish Fire Service Control Points in association with Police and Ambulance Control*

15. Is there a designated person (usually called the Site Main Controller) who has overall responsibility during an emergency?

N.B. Except at the incident scene where the Incident Controller has responsibilities when called, the Fire Brigade senior officer will assume control at the incident scene and this is confirmed by statute when fighting fires. However the police will still retain responsibility for co-ordinating the off-site response and operators will retain responsibility for their employees including HSWA duties.

16. Has the Site Main Controller got a deputy?

The position of site main controller is much strengthened by the addition of a deputy). The inclusion of a deputy role recognises the need to distance the Site Main controller from the detail (e.g. routine communications and detailed work.

17. Are appropriate measures in place to ensure 24-hour cover, 7 days a week (including sickness and holiday cover)?

18. Are the duties of the Site Main Controller specified?

The duties should include:

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- ✧ *being on site at the time of the incident or to be quickly available.*
- ✧ *going to and remaining at the designated control centre for the duration of the incident – unless the location becomes untenable.*
- ✧ *taking an overview of the incident and making sure certain resources are provided and steps taken to ensure the safety of others who may be affected.*
- ✧ *directing any operation from the control centre and ensuring liaison with public emergency services regarding developments and possible off-site effects.*
- ✧ *arranging for an incident log to be maintained.*
- ✧ *having the authority to make decisions on behalf of the site and to ensure correct liaison with media.*
- ✧ *arranging where necessary for off-site and environmental monitoring.*

19. Are the duties of the Incident Controller specified?

The duties should include the following:

- ✧ *being on site at the time of the incident.*
Inspectors should give particular attention to unmanned sites and how the plan deals with situations where the emergency services arrive first.
- ✧ *being generally aware of the overall site situation and having detailed knowledge of the incident area.*
- ✧ *staying at or near the incident and directing the efforts of the site emergency team to control the situation at the scene of the incident – distinctive clothing recognisable by all concerned is recommended.*
- ✧ *overseeing all responsibilities pending arrival of Site Main controller.*
- ✧ *ensuring liaison with public emergency services at the scene.*
- ✧ *communicating progress of the incident to the control centre.*
- ✧ *accounting for personnel located near the incident scene.*
- ✧ *initiating search and rescue, where necessary, usually jointly with the fire brigade.*
- ✧ *initiating arrangements for casualty treatment.*

20. Is there adequate technical expertise available to support the Site Main Controller and the Site Incident Controller?

Generally the Site Incident Controller should be separate from the Site Main Controller.

21. Has more than one senior management team been trained to deal with emergency situations?

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22. Are the duties of the emergency response teams clear, concise and unambiguous?

These should include those of the response team, fire, security and medical services.

23. Are the team skills and experience appropriate for the identified major accident scenarios identified?

24. Are team roles clearly defined?

However, there still needs to be sufficient flexibility to adapt to specific emergencies.

25. Is there evidence of a broad understanding of peer roles?

This is important to allow individuals to understand how their role integrates with those of others?

26. Can it be shown that there is an appropriate distribution of workload across the team?

This may be difficult to demonstrate other than by verifying through practical drills and exercises.

27. What consultation has there been with employees during the preparation of the plan?

Consultation with those that have a role in the plan is clearly important, however it is important that all employees have an opportunity to give an input, e.g. via the safety representative or TU representative.

ORGANISING – Competence

Key Issues

Thorough pre-planning is vital for competence. Competence in the area of emergency response can generally only be achieved via testing, training and learning from the lessons and experience of others. These considerations define the nature of the training needed. Elements of required training for inspectors to check knowledge is given.

Inspectors should be satisfied that

there are arrangements in place to ensure all involved have the necessary skills and knowledge required and that

those involved in the plan have the required technical knowledge relating to the foreseeable major accident scenarios.

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28. Are the required competence criteria (i.e. knowledge & skills) defined for all personnel on site?

This should include staff, contractors, visitors, etc and is concerned with staff with emergency duties.

29. Is the defined essential knowledge based on risk?

This might include; site geography; knowledge of plant operation; familiarity with key information; physical properties & access to detailed information; fire-fighting strategy for different chemical hazards; emergency procedures; etc.

30. Is there a training programme established for on-site personnel?

This should include contractors.

Any assessment of competencies should not be based on a 'snap-shot' 'one-off' performance.

31. Are training programmes and exercises aimed at meeting the defined competency levels?

Minor exercises should be conducted to hone certain skills/competencies.

32. Are arrangements in place for visitors?

Both staff and visitors should be aware of these arrangements.

33. Is there evidence that training covers co-ordination with outside bodies, for example, the emergency services?

Knowledge of Key Scenarios

34. Can the emergency response team demonstrate a detailed knowledge of significant hazards & potential incidents?

Team members should be able to show they know what foreseeable scenarios they are likely to encounter and what actions are required to bring the incident under control.

35. Is the Site Main Controller able to proactively manage the incident and take a strategic view of events?

This question will involve subjective judgement. For example, the SMC should not need to refer any issues elsewhere before coming to a decision. However it should be clear whether there are any issues that the SMC feels the need to refer elsewhere for a decision e.g. closing down plant, pipeline feeds etc. The SMC should also be able to think 'outside the box' . In doing this SMCs will need to understand what the key objectives of the emergency plan are (see earlier). They should be clear about the bases for making decisions such as

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- *understanding priorities e.g. protection of people, environment, property, good name of company*
- *Strategy for handling foreseeable scenarios*
- *Importance of protecting the majority when considering the safety of individuals*

36. Are members of the emergency team sufficiently well trained and briefed to be able to respond appropriately without having to constantly refer back to the incident controller regarding predictable developments?

The 'emergency team' includes all those who have roles and responsibilities during an emergency response. For example it will include the incident team and senior management. Elements of training that are relevant include:

- *Relevant legal requirements*
- *Emergency planning principles*
- *Knowledge of the companies emergency plan procedures, including how to recognise and respond to a major emergency on site*
- *Appreciation of different types of major accidents*
- *The nature of the hazards and how to prevent harm being realised e.g. fire prevention*
- *Technical capability. This should include the different ways (organisational & physical) of mitigating the effects of major accidents. The following categories of incident, and the associated relevant action, should be identified:*

- *Gas clouds – flammable/explosive/toxic*
- *Fire/explosion*
- *Spillage of toxic liquids and solids*
- *Spillage of flammable liquids and solids*
- *Domino effects – how an incident on-site impacts on other sites and the consequent impact for the site of such domino effects*
- *Natural incident e.g. floods if site is close to a river etc*

- *Appreciation of the roles and limitation of the various emergency response organisations*
- *Having been involved in exercises to develop both skills and knowledge*
- *Required casualty care and appreciation of the concerns of the public*
- *Knowledge of ranks of emergency services*

The level of detail will vary for different groups of staff. Specialist staff will require additional training e.g.:

- *Command and control (site main & incident controllers & deputies)*
- *Fire fighting*

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- *First aid*
- *Handling the media*

And training for use of specialist equipment e.g.

- *BA*
- *Hoses*
- *PPE*
- *Fire extinguishers*

37. Are the emergency team members familiar with the plan and do they have detailed knowledge of those aspects relating to their involvement?

ORGANISING – Communication

Key Issues

Communication during an emergency is vital and “lessons learned” studies have shown that communication between the operator and the emergency services is the most critical factor in determining the success or not of an emergency response. Speed of communication is a key factor here, as every incident will develop rapidly in the early stages. The effects of poor decisions made in these early stages will be compounded as the incident develops. Inter-organisational communication “networks” need to be established and are very complex. In addition, emergency services will each establish their own complex communication networks.

Inspectors should be satisfied that

there are planned interfaces between the operators and emergency responders and

there are efficient means of information handling between all parties.

These are essential elements for ensuring the necessary interface between on- and off-site emergency plans. Focusing on arrangements during the early stages of an incident is key.

Inspectors should also be satisfied that the plan and associated documentation contain the required information and are appropriate for their purpose.

38. Have information requirements been identified as far as possible prior to an incident?

These relate to the type and nature of information, which is likely to be required during an emergency either by staff or by external organisations.

39. Have communication flows been defined for staff that is involved in undertaking emergency duties?

For each staff role this is likely to involve identifying the following:

- ◇ What information persons require to perform their tasks,*
- ◇ What information they need to supply to others,*
- ◇ What communication media are necessary to supply this information,*
- ◇ When and how the communications will take place.*

40. Is there a strategy in place to promote a shared team understanding during incident?

Although the skills of the team leader are important here, there are approaches that will help shared understanding. For example

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- *Logging of information by the emergency response team as it is received is essential. The log should be regularly reviewed as the incident progresses and actions followed through*
- *the emergency response team (considering tactical issues) might call 'Time Outs' to enable members of the team to say what they understand is happening and for all to get an overall view of the incident. 'Time outs' will include taking phones off the hook for a short period; however phone contact should be retained with the incident control team at least.*

Liaison with Offsite Bodies

41. Has the company consulted with and provided information to relevant statutory consultees?

Relevant statutory consultees are local authorities, the Agencies, emergency services (police, fire & ambulance plus HM Coastguard where appropriate) and the local health authority?

Consultation is required to enable development of the interfaces between the off-site and on-site plans.

Information needs for the emergency services are outlined in Appendix 2 of HS/G 191 'Emergency planning for major accidents'.

42. Does the emergency plan identify what information needs to be given to emergency services during an incident?

There should, as far as possible, be a clear interface between the on- and off-site emergency plans. The provision of information is key to this.

For example, companies should ensure that they are able to supply the emergency services with information on the location of people across site and the details of any missing personnel,

All those involved in providing assistance in the event of an emergency should have identified the information they need to assist their response and the plan should be clear how to access the information quickly during the actual incident. This should also cover organisations other than statutory consultees who may require further information.

43. Are there arrangements in place for the company to provide information on hazardous chemicals to the emergency services?

This should be planned for and provided in advance of an incident. However operators may need to be adaptable. An operator does not need to give details of every possible chemical and it's products of combustion but does need to give an indication of the type of harm to health and the environment based on categories of chemicals liable to be on site to enable a planned response. Products of combustion for example should at least be treated as toxic and steps taken accordingly. Certain products or mixtures of chemicals

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may give off particularly noxious fumes in the event of a fire and may require additional personal protective measures and specific treatment if people are exposed. These should be identified in advance and emergency services and hospitals advised.

44. Are arrangements in place to ensure that the Site Main and Incident Controllers and team share a common picture of the emergency in terms of what has happened, what is the current situation and a forward plan of what needs to be done?

The use of aids such as white boards should be considered as a means to promote this shared understanding.

45. Are arrangements in place for giving advice and necessary information to relevant bodies and the public?

46. Does the statutory off-site emergency plans state clearly:

- what immediate actions are needed to prevent and mitigate environmental contamination during or after a major accident?
- who has responsibility for undertaking them?

47. Has the company provided up to date information to the public?

Information should be provided in accordance with Regulation 14(1) of COMAH. The company and local authority should also consider what information is required to people beyond the area that is designated under COMAH (i.e. the PIZ) before and during the incident. This will help allay the anxieties and concerns of those who are not at risk but may hear the alarm siren.

Documentation presentation & layout of emergency procedures

48. Is the content of the emergency response procedures adequate?

This should include location of individuals; means of identification; main duties, equipment and information provided/needed; aide memoir of key prompts.

The emergency plan documentation should cover:

- *Introduction*
- *Installation details*
- *Hazard data (including chemical properties). Only the relevant properties should be given e.g. boiling point, storage temperature and pressure, reaction with air/moisture, behaviour of gas cloud or evaporating liquid in various air conditions.*
- *Chemical effects on people; needs to be specific regarding effects of increasing concentration; length of exposure; effects on vulnerable people; food safety implications.*

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Potential major accidents

- *Emergency plan activation arrangements*
- *Organisation*
- *Control centres & communication arrangements (both physical (e.g. telephones) & lines of communications)*
- *Support services*
- *Medical response*
- *Public protection*
- *Information management/press/media/arrangements*
- *Domino effects*

49. Does the plan show where communications may need to be established?

For example between:

- Emergency response team at the scene
- Emergency response team in the dedicated control centre
- All other parts of the site
- Fire/police/ambulance/service from the emergency response teams
- Media
- Water companies
- Local Authority
- Competent Authority
- DEFRA (& equivalents in Wales and Scotland) especially for off-site
- Adjacent premises
- See also ORGANISATION - *Control*

50. Do team members consider the procedures usable?

The procedures should be succinct (no more than two pages per role) and to the point. As a rule, the key elements of the procedures should be capable of assimilation in about 1 minute.

51. Are 'aide memoirs' such as charts, maps, and flow charts used where appropriate to remind staff of key information?

Possible examples include; a scheme for warning and communication, telephone calls lists of personnel, services, authorities etc, organisation charts, chart for emergency assistance and command.

52. Is information well structured in order to enhance communication & training?

Information Provision for External Organisations

53. Has (where appropriate) advanced information (e.g. site plans, inventories, shelter points and muster points etc) been provided to external organisations?

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54. Has chemical information been provided to the Ambulance service and hospitals e.g. MSDS sheets?

It is good practice for local hospitals to be briefed in advance about practical implications when dealing with affected casualties; i.e. pre- and during-incident exchanges between site and hospital medics.

55. Can incident specific information be easily provided during the incident itself?

For example,

- *confined space information, or details of particular processes in the area of the incident*
- *details of fire fighting strategy for specific plant areas;*

which are tailored to local conditions.

ORGANISING – Co-operation

Key Issues

The emergency response arrangements should encourage cooperation. A successful response will need full cooperation between all the parties involved; the site, the emergency services and so forth.

Inspectors should be able to determine this from feedback from earlier tests, which test the interface between on, and off-site emergency plans. Observation of such a test will provide a direct indication.

56. Do the emergency response arrangements encourage co-operation?

The following are agencies that may be involved.

- *The police service*
- *The fire service*
- *The ambulance service*
- *HM Coastguard*
- *Local authorities*
- *Adjacent LA and emergency services*
- *Environment agency*
- *Health and Safety Executive*
- *Health Authority*
- *Water Company*
- *Other utilities*
- *Media*
- *Voluntary organisations*
- *Adjacent Major hazard sites (e.g. domino effect & sharing resources)*
- *Contacts and arrangements for obtaining further advice and assistance e.g. technical advice*
- *Meteorological e.g. wind direction and strength and forecast changes*

PLANNING & IMPLEMENTING

Key Issues

Methods need to be in place for developing the emergency response arrangements and the procedures contained within or referred to within those arrangements. The company should also be able to demonstrate that adequate resources are in place to implement the plan.

Inspectors should be satisfied that there are

- clear site-specific procedures

Particular procedures include the setting up and use of the Emergency Control Centre (ECC), muster & evacuation, decontamination, fire fighting, shut down, PPE, gas monitoring, first aid & medical support.

- planned interfaces between emergency responders

- efficient means of information handling

Tailored to Local Requirements

57. Is the plan tailored to reflect the site/ location?

The plan should not simply be a generic company document.

58. Is information about the specific site adequate and readily available?

Information that should be included (where appropriate):

- ◇ *the company products and personnel*
- ◇ *the locality (e.g. residential population, industrial installations, prevailing winds, etc)*
- ◇ *site plans (including drains) and neighbourhood maps*
- ◇ *processes carried out*
- ◇ *hazardous materials used, stored and manufactured*
- ◇ *classification of hazardous areas*
- ◇ *equipment, buildings, storage*
- ◇ *transport (including vehicle access routes)*
- ◇ *special hazards*
- ◇ *external risks (off-site)*
- ◇ *safety/emergency organisation*
- ◇ *fire-fighting materials, extinguishing equipment & water supplies.*

Information on the main buildings, plant/equipment and control rooms including (where appropriate):

- ◇ *Substances, properties, hazards*
- ◇ *Hazardous areas classification*

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- ✧ *Equipment containing hazardous materials*
- ✧ *Stores*
- ✧ *Numbers of people*
- ✧ *Local organisation*

Alert and Communication Facilities

59. Are the criteria for calling the emergency services unambiguous?

There should not be any doubt about what these are. Discussions on previous incidents and what happened may help to clarify issues.

For some sites, an emergency will be declared in such a way that the emergency services do not await confirmation but respond with an appropriate predetermined response for a major accident.

60. Has a site wide warning system been provided to enable everyone on site to be alerted to a major emergency?

61. Are site alarms clear and unambiguous?

Hazards requiring a specific, different response should be assigned a discrete alarm. N.B. The number of distinct alarms should be manageable (preferably no more than three).

62. Are communications facilities and information management systems tested regularly and realistically?

More than one telephone technology is desirable along with a back-up system in case of power failure.

63. Can radio systems use alternative frequencies?

The communication system should not solely rely on radios as they have high failure rates and are not reliable in high noise areas.

64. Are the communication facilities adequate once people are mustered?

For example PA system with plant radios as backup.

65. Is a list of phone numbers of services, staff, external bodies, etc readily available?

66. Can it be demonstrated that the initial response team is able to cope for as long as it has to during out of hours or at times when others have to be called in?

Demonstration will be required by showing the required training has been provided supported by testing. This should cover all shift teams for example and for each type of hazard that is relevant.

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67. Are effective arrangements in place for contacting and calling in staff during low manning periods (e.g. night shifts, weekends, etc)?

These should be tested to ensure an appropriate speed and rate of response (for example testing how quickly staff respond to pagers during out of hours periods).

68. Are there clear arrangements for alerting the public?

At major hazard sites equipped with public warning sirens, agreement should be reached between the company and the emergency services on the circumstances in which the alarm can be sounded and who can order its sounding. This procedure should also be written into the off-site emergency plan.

69. Can the company demonstrate that means of public warning (sirens etc) are effective and reliable?

Evidence is required of how this is tested and feedback recorded and acted on. Back-up power supplies should be provided where necessary.

Emergency Control Centre

70. Is there an Emergency Control Centre, with sufficient resources to manage the emergency?

This will normally be the location occupied by the site main controller and others e.g. senior officers of the emergency services in attendance for tactical and operational command & control.

Guidance can be found re the resources required by the ECC in HS/G191 at Para. 87 onwards. 3 main categories are required (HS/G191 para.90).

- *Equipment for external off-site communications*
- *Equipment for internal (on-site) communications*
- *Site plans & maps to show clearly the current incident situation.*

71. Can non-permanent facilities be set up very quickly?

This will require clear instructions to be given, all equipment (telephones, fax machines, PCs, etc) to be stored in an orderly way and on-site people trained to deploy efficiently.

72. Does the emergency control centre have a means of collating a record of who is on site and their location?

This information will be required by the emergency services upon arrival on site.

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73. Can an alternative emergency control centre with the required resources be made available if the main one is liable to be incapacitated during an emergency?

A means of moving from one to another needs to be established and practised.

Muster and Evacuation

74. Can the company show that there is a sufficient number of muster points to allow those not involved in emergency duties to gather?

This should include provision for contractors and visitors as well as for all company staff.

75. Has the location of muster points been carefully assessed?

There should be sufficient muster points to ensure safety, depending on wind direction.

Hazards such as blast (over pressure & flying debris) smoke, hazardous fumes etc should be considered as part of this assessment. Muster points will generally be at safe locations outside, but a number of companies identify safe havens located in buildings for people to resort to in the event of a toxic release.

Guidance on safe havens can be found in the CIA's Guidance 'Safety in the design and location of Occupied Buildings at hazardous installations'.

76. Are procedures in place to ensure that the number and identity of people at each muster point is noted, reported to the emergency control centre and acted upon?

There must be practical arrangements in place to account for personnel and to identify any that might be missing. Good practice is for central control to ring refuge rooms. Multiple telephones trying to contact one point such as central control are likely to block lines. There should be appropriate communication points at each muster point.

77. Does the muster point roll call include the assessment of potential casualties, and their location, as well as the factual roll-call information?

Casualties should be identified as a priority. The casualty identification system should operate more quickly than the roll-call system, especially on larger sites.

78. Are appropriate arrangements in place to deal with emergencies of long duration?

This is a consideration for all major accident scenarios but is key for dealing with those people who have travelled to a 'safe haven'. It may be preferable to move people from muster points to alternative safe locations in such

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circumstances. There should be an appropriate contingency plan in place to evacuate safe havens, where necessary.

79. Does the site have several evacuation routes?

This will make it possible to evacuate upwind of an incident.

Decontamination procedures

80. Are decontamination facilities available and is staff trained in its use?

Chemical or radioactive contamination must be cleaned away before PPE is removed. Also casualties need to be decontaminated before loading into ambulances.

81. Can the decontamination facilities be put into effect without delay?

82. Is there a policy to cope with casualties who are too ill or injured to be fully decontaminated?

This relates to how such casualties are handled. Protective arrangements for first aid/ medical staff, early warning to ambulance service/ hospitals are issues to be covered.

On-site Fire Fighting

83. Is the overall fire fighting strategy clearly defined?

The fire-fighting strategies should address the range of on-site hazards, appropriate actions to take, and means of preventing escalation. This should include any 'let burn' decisions which should be discussed with the fire service.

84. Does the emergency plan include details of on-site fire-fighting expertise?

Site personnel should have expertise in chemical fire-fighting and gas-cloud handling. Managers should be properly trained if they are to direct fire teams because this requires a high level of fire-fighting competence.

85. Does the emergency plan include details of fire fighting facilities including materials, equipment and water supplies?

86. Does the range and capability of fire fighting equipment match the on-site demand or can it be supplied in a timely way by external fire service?

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87. Is the location of fixed and mobile fire-extinguishing systems clearly indicated in procedures/maps/plans?

88. Is the location of fixed and mobile fire-extinguishing systems clearly marked?

These should be in line with the Safety Signs and Signals Regulations.

89. Is a testing and maintenance regime in place for the materials and fire fighting equipment to ensure that it is fit for purpose?

Documentary evidence is required that the regime is in place and actions taken on findings. The frequency of equipment testing and maintenance should be regularly reviewed.

Safe Isolation & Shutdown

90. Is there a defined process in place for managing the isolation and shutdown of plant, processes and equipment during the emergency?

91. Are there arrangements to check and test the integrity of isolations?

Documentary evidence is required that the regime is in place and actions taken on findings. The frequency of equipment testing and maintenance should be regularly reviewed.

92. Is a system for maintaining essential services in place?

This should include provision of sufficient staff to keep essential services such as water available during the emergency itself.

Personal Protective Equipment (PPE)

93. Is there sufficient PPE available to protect all personnel who may be at risk including staff, contractors, and visitors?

It may be useful if on-site breathing apparatus is compatible with that used by the Fire Brigade. Often site personnel with local knowledge need to assist the Fire Brigade. Logistics are eased if similar systems of the same duration are used. For example it is good practice for operator's staff to work from the same BA control board as the Fire Brigade. This is a matter for discussion with the Fire Brigade at the planning stage and then supported by the required training.

94. Has the location of PPE storage points been carefully considered?

For example, does it take into account the location of site hazards, evacuation routes etc?

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95. Are the PPE storage points clearly marked?

These should be in line with the Safety Signs and Signals Regulations.

96. Is there a testing and maintenance regime in place to ensure that the PPE is fit for purpose?

Documentary evidence is required that the regime is in place and actions taken on findings. The frequency of equipment testing and maintenance should be regularly reviewed.

Gas monitoring

97. Are gas monitoring facilities and procedures in place?

There is usually a need to determine gas concentrations at key positions such as the site boundary. Adequate resources and reliable equipment must be available to do this. Mobile monitoring may be used where this is not likely to put people at risk in setting it up.

Medical

98. Does the emergency plan include details of first aid and medical facilities?

This should cover medical treatment, triage and casualty handling procedure – linking with the ambulance service for casualty labelling and tracking.

99. Are first aid/medical facilities provided suitable (in so far as is reasonably practicable) to deal with immediate effects of the emergency e.g. gas inhalation; burns?

100. Are personal records (e.g. next of kin, relatives, etc) readily available?

101. Is there a planned approach for accounting for casualties and evacuating them?

Resourcing

102. Can the company demonstrate that it has provided sufficient resources to enable appropriate development and testing of the emergency plan relative to the foreseeable major accident scenarios identified in the COMAH Safety Report?

103. Can the company demonstrate that it has provided sufficient resources, so far as is reasonably practicable, to contain the major accidents identified in the safety report until the emergency services arrive? [See also COMAH Safety Report]

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'Resources' refer to both manning levels and equipment.

Inspectors should have considered this demonstration as part of the COMAH safety report assessment. The company should be able to support the demonstration by giving information about the results of testing the emergency plan.

The adequacy of manning levels should be assessed by considering

- the worst foreseeable major accident scenario, identified as foreseeable in the COMAH safety report;*
- including periods where the manning levels are lowest such as 'out-of hours' or 'call-in' situations.*

When deciding on the manning levels required to deal with emergencies, it is preferable to initially 'man-up' beyond perceived requirement, and then 'man-down' later.

104. Are arrangements in place for individuals to take responsibility on behalf of others in order to cope with the full range of possible circumstances?

This includes coping out-of-hours and with the absence of personnel.

105. What resources are available on site and what additional resources could be quickly obtainable?

The following are examples that would normally be expected to be available where relevant for the identified major accident scenarios:

- Fire and toxic gas alarms.*
- Fire-fighting equipment, e.g. assured water supply, hose reels, etc.*
- First aid facilities.*
- Sandbags or other absorbent materials.*
- Windsock or flag (illuminated at night).*
- Radiophone or telephone backup.*

The following additional resources may be on-site or there should be arrangements to make them available, where necessary. Details of where the resources are to be obtained from should be readily available during an emergency. Performance measures for obtaining these should also be available i.e. clear timescales. These should be consistent with the major accident scenarios and the risk assessments argued in the COMAH safety report.

- Heavy lifting gear.*
- Bulldozers and other transport facilities for movement of equipment.*
- Specialised fire-fighting equipment.*

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- *Extra communications equipment, e.g. loudhailers, two-way radio.*
- *Water spray or curtains.*
- *Standby water supplies, e.g. pump out of local river.*
- *Specialised protective clothing.*
- *Atmospheric monitoring equipment.*
- *Gas dispersion expertise*
- *Emergency engineering work, e.g. provision of emergency lighting, temporary modifications, oxy-acetylene cutting equipment, ladders or scaffold, etc.*
- *Medical facilities, including specific antidotes where necessary.*
- *Extra breathing apparatus.*
- *Specific neutralising agents, antidotes or absorbent materials.*
- *Access to firms or individuals with specialised chemical knowledge, laboratory facilities, computing expertise, etc.*
- *Containment equipment for materials that get into waterways, e.g. strategically placed boom.*
- *Early warning devices, e.g. smoke detectors.*

Additional resources can often be obtained from nearby sites. Where these are to be relied upon, then there should be formal agreements in place.

MEASURING PERFORMANCE

Key Issues

The emergency response arrangements need to be thoroughly tested. Testing is essential to make sure that the arrangements are suitable, accurate and capable as working as intended.

Inspectors should be satisfied that there are

*Well-rehearsed procedures
rehearsed interfaces within on-site teams and between those teams and various responders
and that these are tested by those who have the skills and knowledge to do so.*

106. Is there a testing programme in place to regularly test and improve the effectiveness of emergency arrangements?

The testing programme should include drills and exercises to test a range of scenarios.

107. Who conducts and evaluates these tests?

For the test to be worthwhile, the person running the test should have the skills and knowledge in the emergency response matters being tested, the necessary technical knowledge and be able to understand and evaluate what is happening during the test.

108. Do the scenarios selected, test across a wide range of the worst foreseeable and lesser, more realistic events?

109. Do the scenarios respond to actions taken by the emergency team, rather than leading them through the exercises?

This question is aimed at developing the scenario in response to the actions of the emergency team. This would require some skill by the 'tester' and would need some planning in setting up the test to develop the scenario, depending on the actions of the team. Computer based tests, which are often aimed at command and control skills can be programmed to respond to actions being taken place by the team.

110. Is the testing scenario ever moved beyond the procedural envelope, so that the flexibility of the arrangements can be tested?

For example, are there scenarios, which have been discounted by the safety report because they were not considered foreseeable, but could be used to test how well the arrangements work beyond their original scope.

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111. For each exercise, are there clearly defined exercise objectives?

The objectives of the exercise need to be met. However, if the scenarios change sufficiently, as discussed above, then the exercise may never get to the part that is to be tested.

112. Are appropriate types of exercises selected?

The purpose of an exercise with its objectives should be clear. Some examples of tests and their value are outlined below.

- a) **Drills** – testing a specific and relatively simple aspect of the emergency plan in isolation. Examples are fire drills; roll call and searching; cascade telephone calls; spillage control and recovery;
- b) **Seminar exercises** – training of staff and developing emergency plans. They facilitate discussion about different organisations responses in particular circumstances during an emergency;
- c) **Walk through exercises** – training staff or developing emergency plans. The emergency response is “walked through”, including visiting appropriate facilities such as Emergency Control Centres;
- d) **Tabletop exercises** – allowing information exchange and dissemination between organisations at the emergency control centre, together with decision making to be tested. They are carried out in relation to a model, plans or photograph to depict the establishment. They could involve using information technology or virtual reality systems;
- e) **Control post exercises** – testing the communication arrangements during an emergency, with participating organisations located where they would be during an emergency;
- f) **Live exercises** - fully testing some or all aspects of the emergency plan for the on-site and off-site response. These exercises will be costly.

113. Do the emergency exercises used simulate so far as possible a real emergency and do they keep to a realistic time-line?

114. Is an adequate range of staff involved in the exercises?

This should include practising taking on other roles, for example, covering for the absence of colleagues

115. Does the testing programme incorporate some exercises that involve collaborating with off-site services?

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116. Is there careful observation of the response of key players during an exercise?

This can be used to study the effectiveness of training of the decision makers and their suitability for involvement in emergency response.

AUDIT AND REVIEW

Key Issues

Audit and review is essential to the effective development of the emergency response arrangements. It is only by reviewing the emergency response arrangements (e.g. by means of post exercise de-brief) can the emergency response be amended and adapted to address the shortcomings identified by the emergency response exercises. Review of the emergency response arrangements should also take place after changes on site.

117. Is information from the testing programme used as the basis for evaluating and improving the emergency plan?

For example, the command and control structure and interfaces should be reviewed on a regular basis.

It would be valuable to know what information is recorded and collated from testing to inform any such review.

Evaluation of adequate resources is a key element of a review and should inform any changes proposed to the procedures.

118. Is the frequency and nature of the testing programme itself periodically reviewed?

119. Is there a process in place for evaluating team performance?

This should address issues such as whether the team brought the emergency under control, saved life, whether the team performed well together, where were the weaknesses.

120. Can it be shown that the plan reflects lessons learned from previous incidents/ exercises?

Management of Change

121. Is there a formal review process in place that is initiated following any significant changes to plant/process/location/personnel or after a defined period?

The review process should consider the impact of change to plant/process/location and personnel COMAH at Regulation 8 requires a review and also revision of the safety report where there are changes that have significant repercussions with respect to the prevention of major accidents or the limitation of consequences of major accidents to persons and the environment. A company management of change system should include confirmation as to whether a Regulation 8 review is required and a record of the conclusions. As a result the safety report and the on-site emergency plan may require amendment. Where possible, the company should attempt to

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maintain the continuity of key personnel in emergency roles. Where this is not possible, an emergency response review process should be triggered

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