ASSESSMENT OF COMAH SAFETY REPORTS: EMERGENCY RESPONSE CRITERIA

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The Control of Major Accident Hazards Regulations (COMAH) will come into effect on 3 February 1999 and will implement the Seveso II Directive in the UK. The Regulations will place a duty on operators of top tier establishments to produce a written safety report to demonstrate that all necessary measures have been taken to prevent major accidents and to limit their consequences for people and the environment. This paper describes the assessment criteria which the Competent Authority, consisting of HSE and the Environment Agencies, will use to assess the emergency response aspects of COMAH safety reports. The paper also outlines the process by which the criteria have evolved.
Key words: Safety Reports, Assessment, Major Hazards, Emergency Response

INTRODUCTION

The Control of Major Accident Hazards Regulations (COMAH) will be introduced in the UK on 3 February 1999. The Regulations will bring into force the requirements of European Council Directive 96/82/EC (the Seveso II Directive) of 9 December 1996 on the control of major accident hazards involving dangerous substances.

The COMAH Regulations, hereafter referred to as the Regulations, require operators of top tier establishments to produce a written safety report to demonstrate that they have taken all measures necessary for the safe operation of their establishment. The Regulations also place duties on the Competent Authority, consisting of HSE and the Environment Agencies, to communicate the conclusions of its examination of the report to the operator; or prohibit the continued operation or bringing into operation of an establishment, installation or any part where the measures taken by the operator for the prevention and mitigation of major accidents are seriously deficient.

HSE has drafted a set of assessment criteria *(the Safety Report Handling, Assessment and Review Principles and Processes manual (SHARPP))*, in conjunction with the Environment Agencies, to provide guidance for inspectors in the assessment of safety reports. This paper describes those criteria intended to assist inspectors in determining whether the safety report adequately demonstrates that all necessary measures have been taken to mitigate the consequences of major accidents and that adequate arrangements have been made for emergency response. The paper also outlines the main stages in the development of the criteria.

THE EMERGENCY RESPONSE ASSESSMENT CRITERIA

Purpose of the Criteria

The emergency response criteria are intended to provide a framework for inspectors in assessing whether a safety report meets the purposes of the Regulations with respect to measures taken by the operator to limit the consequences of major accidents to people and the environment. The criteria will be made publicly available.

Scope of the Criteria

The purposes of a COMAH safety report, as defined by the Regulations, include a demonstration by the operator that necessary measures have been taken to limit the consequences of major accident hazards to people and the environment. An additional purpose is to demonstrate that on-site emergency plans have been drawn up, and that the necessary information has been supplied to Local Authorities to enable the off-site emergency plan to be drawn up.

The Regulations specify the minimum information to be included in a safety report which may satisfy these purposes:

(a) description of the equipment installed in the plant to limit the consequences of major accidents;
(b) organisation of the alert and intervention;
(c) description of the mobilisable resources, internal or external;
(d) summary of elements described in sub-paragraphs (a), (b) and (c) necessary for drawing up the on-site emergency plan.

Installed equipment mitigation measures (element (a)) are covered in the technical aspects criteria which are the subject of a separate HSE paper. The emergency response criteria address elements (b), (c) and (d).

The emergency response criteria provide guidance on assessment of information provided in a safety report to establish whether the defined purposes of a safety report have been met in relation to emergency response.

The criteria are concerned with on-site arrangements to respond to a major accident, interface of these arrangements with the off-site emergency plan, and the resources that can be mobilised by the operator to take mitigatory action to minimise the consequences of a major accident. The criteria cover the information required to be supplied by the operator to enable the Local Authority to draw up the off-site emergency plan. The criteria also address those specific aspects of the Safety Management System which are directly relevant to emergency response.

As mentioned above, these criteria are specific to assessment of information submitted in safety reports. In addition, a working group led by HSE (via Safety Policy Directorate (SPD E)) is currently developing guidance on implementing the emergency planning aspects of the COMAH Regulations. Outputs from the SPD E led working group are outside the scope of this paper, however, it should be noted that development of the safety report emergency response assessment criteria took account of any relevant information from this work, through involvement of a member of the SPD E working group.

Drafting the Criteria

The criteria were drafted over a period of five months by a multi-disciplinary working group of six consisting primarily of HSE inspectors with experience of regulating the major hazards sector. The Environment Agencies were also represented. HSE inspectors on the working group were from:

- Chemical and Hazardous Installations Division (CHID) - project manager for development of the emergency response criteria, technical assessor and operational site inspector;
- Nuclear Safety Division (NSD) (whose regulation of emergency arrangements in the nuclear industry is well developed) - a member of NSD's Emergency Arrangements team;
- Safety Policy Directorate (SPD E) - a member of the HSE SPD E COMAH implementation working group on emergency planning.

Development of the criteria drew heavily on the knowledge and experience of the members of the working group. The criteria evolved via an iterative process. An initial set of criteria was drafted by the project manager on the basis of personal regulatory experience of the nuclear industry and on a review of existing literature on the subject. This preliminary draft of the criteria was considered at the first meeting of the working group and revised in light of comments from the working group. The process of review and redrafting was then repeated. The working group invited comments on its agreed assessment criteria from areas of CHID not represented on the working group, namely those areas with responsibility for risk assessment and for regulating the explosives sector. The working group took account of these comments when forming the final version of the criteria. This was sent out in parallel for internal consultation within HSE, for external consultation with industry and for use in the pilot exercise testing the developing criteria against COMAH-style safety reports submitted by industry.

The Structure of the Criteria

The working group made significant changes to the structure of the criteria in light of comments received from the consultation and pilot exercises; information on these exercises and resulting changes to the criteria are covered at a later stage. This section focuses on the revised criteria.

The criteria are representative of the type of measures which the Competent Authority would expect the operator to take to limit the consequences of major accident hazards to people and the environment.

The layout of the criteria is intended to reflect the layout of the Regulations. There are clearly defined links between the criteria and the Regulations to aid transparency of the assessment process. Each criterion is described, an explanation is given of why the criterion helps assessment against the defined purposes of a safety report, and examples of evidence are given indicating what constitutes sufficient information to satisfy the criterion.

Listed below are the headings under which the criteria are arranged. A brief description is given where an explanation of the heading is considered appropriate. In some cases, references have been made to assessment criteria covered in separate HSE papers. The emergency response assessment criteria are listed in Appendix 1 (sections on explanation and examples of evidence are not included).

Organisation of the alert and intervention *The safety report should describe the organisation of the alert and intervention in the event of a major accident to provide evidence that the necessary measures have been taken on site.*

Typical points covered under this criterion include: functions of key posts; arrangements for controlling and limiting escalation of accidents on-site; arrangements for alerting individuals on-site, neighbouring establishments (where relevant) and the general public to the hazardous situation; arrangements for alerting and mobilising individuals with defined responsibilities under the emergency response; provision for establishing and maintaining communications during the emergency response; location of access routes and emergency control centres; evacuation arrangements; roll call and search and rescue arrangements; the nature and location of any pollution control devices and materials, and arrangements for subsequent environmental clean up and restoration.

Description of the mobilisable resources *The safety report should describe the on-site and off-site resources which can be mobilised by the operator to provide evidence that the necessary measures have been taken to limit the consequences of a major accident to people and the environment.*

The description should cover human resources, hardware, for example fire fighting equipment, and ancillary equipment required to enable mitigatory action to be carried out, for example, personal protective equipment, vehicles transporting equipment to the site of the accident. This general criterion has been expanded to give ten more specific sub criteria for various types of resource.

Maintenance, inspection, examination and testing of emergency response equipment (aspect of Safety Management System (SMS)) This criterion addresses maintenance (planned and breakdown), inspection, examination and testing of emergency response

equipment and provisions. It expands on a general SMS assessment criterion covering arrangements for safe operation, including maintenance, of plant, processes and equipment; the emergency response criteria cross reference to the SMS criteria. Details of the SMS assessment criteria are given in a separate HSE paper.

Training in the emergency response (aspect of Safety Management System (SMS)) This criterion covers the training of individuals on-site in emergency response procedures. and expands on a general criterion in the SMS assessment criteria covering provision and maintenance of appropriate levels of management and employee competence.

Testing of emergency plans (aspect of Safety Management System (SMS)) This criterion deals with testing, review and revision of on-site emergency plans in light of lessons learned. Interface with the off-site response is also covered.

Information required for off-site emergency plan As mentioned earlier, one of the purposes of a safety report is to include a demonstration that the necessary information has been supplied to Local Authorities to enable the off-site emergency plan to be drawn up. This criterion and its associated guidance identify the minimum information to be included in a safety report to demonstrate that the operator has provided the Local Authority with sufficient information to draw up the off-site emergency plan. This minimum information includes: details of the site, including its location, nearby roads and site access; site plan showing location of key facilities such as control centres, medical centres, location of main process plant and stores, staffing levels; details of off-site area likely to be affected by a major accident; details of dangerous substances on-site; details of technical advice that the company can provide to assist the off-site response; relevant technical details of resources (equipment or chemicals) normally on site which may be available to assist the off-site response; functions of key posts with *duties in the emergency response, their location and how they can be identified; outline* of initial actions, and procedures in on-site plans, to be taken by on-site staff once an emergency has been declared.

Elements in safety report necessary to draw up the on-site emergency plan This criterion requires the safety report to contain a summary specifying the basis for drawing up the on-site emergency plan and should cover:

- the equipment installed in the plant to limit the consequences of major accidents;
- the organisation of the alert and intervention;
- the on-site and of-site resources that may be mobilised.

SERIOUS DEFICIENCY

The Competent Authority has a duty to prohibit the continued operation or bringing into operation of an establishment, installation or any part where a serious deficiency has been identified in relation to measures taken by the operator to mitigate major accidents.

The Guiding principles for assessment of safety reports are described in a separate HSE paper. These principles state that where assessment of a safety report identifies a potential serious deficiency, assessors need to obtain first hand evidence by a site visit and by checking the facts with the operator, before taking a prohibition decision.

When considering the evidence for a serious deficiency, assessors are advised to take account of the adequacy of the totality of the emergency response provisions. Mitigatory measures which can be mobilised by the operator will be considered by the Competent Authority in the context of the permanent installed (fixed) mitigatory provisions and the resources that can be mobilised by the off-site emergency services. The following are examples of the type of deficiencies associated with the emergency response arrangements which the Competent Authority would regard as serious deficiencies:

- Essential roles and responsibilities not defined in the on-site emergency plans;
- Insufficient staff or other resources to discharge the key functions identified the on-site emergency plans;
- Lack of training for individuals with key roles under the on-site emergency plans;
- Lack of maintenance, examination, testing and inspection arrangements for the mitigatory provisions;
- Failure to supply the information required to enable the off-site emergency plan to be drawn up;
- Effective means of access for off-site emergency services not available.

The working group developing the emergency response criteria concluded that serious deficiencies associated with mitigatory measures would not necessarily attract an immediate prohibition, but could result in a deferred prohibition to enable the deficiencies to be rectified before the use of the plant was prohibited. This recommendation was based on time at risk arguments, that is, on the small likelihood of mitigatory action being needed on an immediate timescale.

CONSULTATION AND PILOT EXERCISES.

Consultation

There was significant consultation outside government departments or related bodies on the SHARPP manual which will form the basis of the Competent Authority's assessment of COMAH safety reports. The main organisations involved in the consultation represented a spectrum of industry considered to have the primary interest in the assessment process:

- the Chemical Industries Association (CIA) - primarily through the CIA COMAH Sub-group which included representatives from major companies such as Shell, BP, Exxon and ICI;

- the CBI (Confederation of British Industries);
- trade associations which represented smaller companies involved in manufacturing or distribution which have been brought together by the British Chemical Distributors and Traders Association (BCDTA);
- British Gas directly because of the large number of top tier sites they will have.

Environmental interest groups (English Nature; Scottish Natural Heritage; Countryside Council for Wales; Green Alliance; Friends of the Earth (Scotland)) were consulted on the assessment criteria.

Particularly relevant to the emergency arrangements criteria, the Society of Industrial Emergency Services Officers (SIESO) held a workshop for discussion of the SHARPP outputs.

The consultation exercise (covering both internal HSE and external comments) identified a number of points for consideration by the working group developing the emergency response criteria. As for other SHARPP criteria, the presentation of the emergency response criteria was to be modified to a common format. Since comments had been made to the effect that there were too many criteria, the working group had to establish whether the number of criteria could be reduced. To show that all criteria were justified in relation to the requirements of COMAH, explanatory text was to be included on how each criterion was rooted in legal requirements; where this justification could not be made, the working group would need to consider whether the particular criterion merited inclusion. The level of detail given in the criteria was to be re-evaluated. For each criterion, examples were to be given indicating what information was required to satisfy the requirements of the Regulations. Overlaps of the emergency response criteria with other criteria were to be considered with a view to eliminating unnecessary overlap.

There were some points specific to the detail of the emergency response criteria. The working group was required to provide guidance on whether emergency plans could be included as part of a safety report or whether the operator had to re-submit this information. It was necessary to clarify that the Competent Authority was only concerned with assessment of the operator's fire fighting and fire protection provisions, not of resources available from local and other fire brigades; although, it was expected that the operator would take account of such resources. Textual amendments proposed by consultees were to be considered in relation to improving the suitability and clarity of the criteria.

Pilot

In order to assist the Competent Authority in evaluating how the assessment criteria would work in practice, the following four establishments volunteered to produce COMAH-style safety reports for assessment:

- Elf, Flotta;
- International Speciality Chemicals Limited (ISC), Hythe
- BP, Hull
- British Gas Transo, Cheltenham.

Correspondingly, the Competent Authority set up four teams, of similar composition to those proposed for assessment of actual COMAH safety reports, to assess these voluntarily submitted safety reports. The pilot version of the SHARPP manual was used for assessment purposes.

The pilot exercise results were in line with those obtained from the consultation exercise. A significant additional point to be considered by the emergency response criteria working group was provision of additional guidance on what constituted a serious deficiency in relation to measures taken by the operator to mitigate major accidents. This was particularly important since the Competent Authority has a duty under COMAH to prohibit where such measures are seriously deficient.

Changes to criteria following consultation and pilot exercises

The working group evaluated the criteria taking into account the results of the consultation and pilot exercises. The criteria were re-structured from a list of 21 criteria with supporting guidance to a format describing each criterion, reasons for inclusion of the criterion, and examples of evidence expected in safety reports to show how the requirements of the Regulations had been met.

Re-consideration of the criteria against legal requirements resulted in the number of criteria being reduced from 21 criteria to 7 key criteria and 10 sub-criteria; the majority of technical information included in the original 21 criteria but not in the revised list was still considered important by the working group and was generally incorporated into examples of evidence under appropriate revised criteria.

Overlaps of the emergency response criteria with other criteria were considered, in particular with those covering Safety Management Systems: maintenance, inspection, examination, testing of emergency response equipment; training in the emergency response; testing of emergency plans. The working group considered that criteria related to these issues was important in consideration of the emergency response aspects of safety reports and supported their retention in the emergency response criteria. These criteria were cross referenced to the Safety Management Systems criteria.

A large number of the textual changes proposed by consultees were taken on board by the working group. These changes were thought to present the criteria in a more clear, concise and user friendly manner. Amendment of a few criteria was considered appropriate to make it clear that the Competent Authority would not be assessing the fire fighting capability of fire brigades.

The working group re-considered measures which could constitute a serious deficiency in terms of emergency response. The types of measures originally suggested remained unaltered. However, more emphasis was given to the point that due account was to be taken of the adequacy of the totality of the emergency response provisions.

The working group concluded that emergency plans could be included in safety reports but a supplementary route map would be required clearly identifying how the safety report purposes were met. Guidance on this point was not to be included in the criteria but would incorporated in an appropriate section of the SHARPP manual.

CONCLUSIONS

HSE, in conjunction with the Environment Agencies, has drafted criteria which will be used by the Competent Authority in assessing the emergency response aspects of COMAH safety reports. The criteria have been developed by a Competent Authority working group with significant experience of regulating the major hazards industry. In developing these criteria, the Competent Authority has consulted industry, Environmental Groups and specialist organisations, for example, SIESO with respect to the emergency response criteria. A pilot assessment exercise has been conducted by the Competent Authority to test and refine the developing criteria using COMAH-style reports submitted voluntarily by industry. Considerable change has been made to the structure of the criteria following the consultation and pilot feedback, however, the technical content remains largely unaltered.

ACKNOWLEDGEMENTS

Development of the criteria was a team effort involving HSE and EA staff. HSE members involved in developing the criteria were: Mrs J Rutherford (team leader to the point at which the criteria were sent out for use in the consultation and pilot exercise), Mr J Carter, Mrs M Wilson, Mr R Cowley, Mr R Hadden, Mr P Rushton. Mr B McGlashan provided the EA input.

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APPENDIX 1

REVISED EMERGENCY ARRANGEMENTS ASSESSMENT CRITERIA FOLLOWING PILOT EXERCISE AND EXTERNAL CONSULTATION.

Organisation of the alert and intervention

1. The safety report should describe the organisation of the alert and intervention in the event of a major accident to provide evidence that the necessary measures have been taken on-site.

Description of mobilisable resources

2. The safety report should describe the on-site and off-site resources which can be mobilised by the operator to provide evidence that the necessary measures have been taken to limit the consequences of a major accident to people and the environment.

   2.1 The safety report should provide evidence that sufficient personnel can be made available within appropriate timescales to carry out the mitigatory actions required by the on-site emergency plans.

   2.2 The safety report should provide evidence that suitable and sufficient arrangements are in place to ensure that the equipment to be mobilised for mitigating the consequences of reasonably foreseeable major accidents will be fit for purpose when called upon for use.

   2.3 The safety report should provide evidence that suitable and sufficient personal protective equipment will be available in the event of a major accident.

   2.4 The safety report should provide evidence that suitable and sufficient on-site fire fighting and fire protection provisions can be mobilised in the event of a major accident, taking account of resources available from local and other fire brigades.

   2.5 The safety report should provide evidence that suitable and sufficient provisions can be mobilised to minimise the release of, and mitigate the consequences of, airborne toxic and/or flammable substances in the event of a major accident.

   2.6 The safety report should provide evidence that suitable and sufficient resources can be mobilised to minimise the consequences of loss of containment of a hazardous substance(s) to ground or water (including Controlled Waters).

2.7 The safety report should provide evidence that suitable and sufficient provisions for monitoring and/or sampling can be mobilised in the event of a major accident.

2.8 The safety report should provide evidence that suitable and sufficient provisions have been made for the restoration and clean up of the environment following a major accident.

2.9 The safety report should provide evidence that suitable and sufficient provisions have been made to mobilise first aid/medical treatment during the emergency response.

2.10 The safety report should provide evidence that suitable and sufficient provisions have been made to mobilise any ancillary equipment which may be required during the emergency response.

Maintenance etc. of emergency response equipment

3. The safety report should provide evidence that suitable arrangements have been made for the maintenance, inspection, examination and testing of the mobilisable resources and other equipment to be used during the emergency response. (This criterion only applies to mobilisable resources and other equipment for which the operator has responsibility.)

Training in the emergency response

4. The safety report should provide evidence that suitable arrangements have been made in the safety management system for training of individuals on-site in the emergency response.

Testing of emergency plans

5. The safety report should provide evidence that procedures have been made and adopted to test and review emergency plans, and to revise the emergency arrangements in the light of the lessons learned.

Information required for the off-site emergency plan

6. The safety report should supply information to enable the off-site emergency plan to be drawn up.

Elements in the safety report necessary to draw up the on-site emergency plans

7. The safety report should summarise those measures of protection and intervention which have been used as the basis for drawing up the on-site emergency plans.