
INSTITUTE FOR SYSTEMS ENGINEERING
AND INFORMATICS

SER DIVISION

Support Activities for the Directorate-General Environment, Nuclear Safety and Civil Protection
on the Implementation of the Council Directive
on the Major Accident Hazards of Certain Industrial Activities

**COMMUNITY DOCUMENTATION CENTRE
ON INDUSTRIAL RISK**

National Approaches to the Safety Report
a Comparison



JOINT
RESEARCH
CENTRE

INSTITUTE FOR SYSTEMS ENGINEERING
AND INFORMATICS

SER DIVISION

Support Activities for the Directorate-General Environment, Nuclear Safety and Civil Protection
on the Implementation of the Council Directive
on the Major Accident Hazards of Certain Industrial Activities

**COMMUNITY DOCUMENTATION CENTRE
ON INDUSTRIAL RISK**

National Approaches to the Safety Report
a Comparison

A. Amendola, S. Contini

CDCIR Reference No.: 677 - EAb19 - 1.2



JOINT
RESEARCH
CENTRE

TABLE OF CONTENTS

	Foreword	II
1.	Background	1
2.	Some observations	3
3.	General information on national procedures	5
4.	Safety report requirements	26
5.	References	38
6.	Acknowledgments	41
	Appendix: Collection of the answers to the questionnaire	42

FOREWARD

The "Seveso" Directive, 82/501/ECC, requires certain industrial activities to notify the national competent authority of details about the dangerous substances involved or possibly involved in the industrial activity, information about the installation, and information about possible major accident situations. This collection of information is commonly known as the safety report. The scope of the information required may be found in Article 5 and Annex V to the Directive.

Some Member States have taken the opportunity to require the provision of further information to meet the particular needs of the control strategies they apply to major hazards sites. For instance, those Member states who have adapted the safety report for other purposes such as licensing or as a more general report on health and safety at work may require more detailed information on some topics.

This study is not restricted to the narrow requirements concerning the implementation of Article 5 safety reports by Member States which, therefore, explains some of these differences.

Although the report has therefore identified some variability in the level of implementation between the Member States, the Commission would not wish to suggest any relaxation of standards by individual states, but would encourage Member States to improve their own standards in line with the best practice across the Community, and to provide the public with the assurance of the highest level of safety.

III

Part I sets out the background to the report and the manner in which the Commission's Joint Research Centre at Ispra has carried the study forward in co-operation with the Committee of Competent Authorities for the Directive. The Member States are represented on this committee by the bodies they have appointed as competent authorities under Article 7. These bodies are charged with organizing inspections, receiving the notifications, examining the information provided, and ensuring that manufacturers take the most appropriate measures to prevent major accidents and to limit the consequences of any that do occur.

The Council Resolution (89/C 273/01) stemming from the Council of Environment Ministers meeting during September 1989, invited the Commission to work with Member States towards a mutual understanding and harmonization of national principles and practices regarding safety reports. This research project is part of that exercise.

It should be noticed that:

- the status of the national requirements corresponds to that at the date of the enquiry (December 1989).

The report could not take into account progress achieved in the meantime in the Member States;

- the report does only include discussions and answers from national authorities. Where the responsibilities are shared with regional administrations (like in Spain or in Belgium for external safety) regional differences could not be taken into account.

1. BACKGROUND

The action has been decided at the 18th Meeting of the Competent Authorities Committee (CAC) and has been developed according to suggested planning and modalities:

- At this meeting (February 1989) a draft questionnaire has been proposed (Room doc. XI/116/89-EN) as a possible scheme for comparison of the national requirements for the safety reports;
- As a result of some few comments received, the final version of the questionnaire has been distributed on April, 11;
- Between May, 4 and July, 11 the competent authorities have been personally contacted by JRC representatives either by paying visits in the capital cities (UK, IR, P, E, F, D, B, NL, GR) or by organizing meetings at Ispra/Varese (L,I) at the occasion of the Risk Communication Conference. The questionnaire could be discussed in any detail in such meetings; in some cases examples of safety reports could be seen (VROM has made available two external safety reports for the documentation center CDCIR); in most cases inspectors involved in analyzing the reports attended the meeting.

According to the procedure preferred either the questionnaire has been filled out by JRC and submitted for revision to the relevant authorities, or the answers to the questionnaire have been drafted at the meeting by the authorities themselves and afterwards sent to JRC fully compiled.

When in a country the responsibilities for the directive were shared among multiple ministerial organizations, these have been all represented at the meeting. In this way only one answer coordinated between the different bodies has been given. As far as Belgium is

concerned, after a joint meeting in which even representatives from the Environment Ministry participated, the questionnaire has been compiled only as far as the operational safety report is concerned by the Ministry of Labour. Indeed responsibility for external safety was shared with the regions, and JRC did not attempt to involve all the regions. However the answers got by the Vallonia authority even if not included in the appendix were used for the comparison summary.

- The answers taken from the inquiry have been documented in the Appendix in which no JRC comments have been introduced (quoted national documents have been introduced into the CDCIR);
- A more critical comparison has been drafted by JRC with the aim of identifying basic convergent or divergent points.
- The draft report has been submitted to the comments of all the authorities (October, 16) and has been reviewed by the working group set up at the 19th CAC Meeting, which met at Ispra on November, 16-17.
- This meeting has resulted in a revised version of the comparison report, which has been finalized after having incorporated in it any other comment or material made available by the authorities by the 12th of January 1990.

In any case, it should be stressed that this report, with its appendix, aims at reviewing the actual situation rather than at expressing any kind of recommendations. Indeed, any further action can only be suggested by the Commission working together with the Committee of the Competent Authorities.

2. SOME OBSERVATIONS

2.1 The questionnaire has proved to be sufficiently adequate to allow a structured comparison. However, the results indicate that more information could have been sought about the differing ways in which member states deal with existing installations and new ones in the different stages of the project and operation.

2.2 The enquiry has been focused principally on the contents of the safety reports (SR). However, it has been possible to have some interesting insights on the SR uses and acceptability criteria. These have confirmed that the most striking differences lie in the control/acceptance approaches. In most countries, the authority judgement is based on a more or less explicit risk acceptance criterion and, therefore, external consequences of accident scenarios are required to be evaluated in the safety reports in order to increase industry awareness about risk, to allow authorities to use the results for emergency planning or land-use purposes. The FRG acceptance principle is based on a deterministic zero-risk criterion to avoid public hazards: as far as external emergency planning is concerned, the amount of the inventory of dangerous substances which might be released in the case of an unpredictable calamity is derived by the safety report, but is communicated by other means to the civil protection authorities. Prescriptive quantitative risk acceptability criteria have been adopted only by the Netherlands as far as external safety is concerned. Risk criteria are set in the United Kingdom by health and safety legislation requiring the on and off site safety of persons to be ensured so far as is reasonably practicable. The United

Kingdom has also developed guidelines based on acceptable risk criteria for land-use planning purposes.

2.3 The safety report is not a stand alone object. Safety is controlled by inspections, safety audits, prescriptive rules and - in some cases - multiple authorities. This overall system may result in different standards for man and environment protection and in different cost and burdens to the industry. It can be misleading to single out the safety report as a separate issue. The CDCIR contributes to a reciprocal information about standards and norms. It should be considered whether this action is per se sufficient to achieve the desired objectives; or some more direct comparison of the approaches might be envisaged for selected classes of plants.

2.4 Links with environmental impact directive: in some countries (e.g. F, D, DK) both the safety report and the environment impact study are submitted to the same authority at the same time.

2.5 Certain countries (e.g. IR, GR) find it difficult to have information on hazards potentially affecting nearby installations which might be provoked by facilities not covered by Article 5 obligations.

3. GENERAL INFORMATION ON NATIONAL PROCEDURES

Belgium

For the safety of the workers, the Ministry of Labour at a national level has the responsibility to approve an operational safety report. The most important requirement is the demonstration that the manufacturer has implemented an adequate safety policy. The report, based on qualitative structured analysis techniques like HAZOP, is analyzed by ministerial inspectors. As far as external safety and environment protection are concerned, preventive control is implemented at regional level. A quantitative analysis is being required, even if no risk acceptability criteria have been defined. The report is analyzed by regional inspectors with the advice of external experts (e.g. Universities, Research Organizations, Certification Agencies like Vinçotte).

Denmark

The safety report is submitted to the local council, that sends copies to the district office of the Labour Inspection Service, the local fire authority, and the local chief of Police. It is also foreseen to inform the National Information Center for Toxic Substances. The approach to the safety report shows flexibility to include qualitative and quantitative methods without prescriptive acceptability criteria. New guidelines are being finalized, following the first ones issued in 1985. This issue is worked out by the Environmental Protection Agency, the Labour Inspection Service, Fire Authorities and the Police. The inspectors, as a consequence of the

relatively small number of plants, have a good knowledge of the plants; they can be contacted by the industry for advice on contents and requirements of the safety report. Emergency preparedness is requested on the basis of credible accidents.

France

The procedure follows the law of 19 July 1976 and the ministerial applicative decree of 21 September 1977. The installations classified according to the list established since the Napoleon time (1810) and updated continuously, are submitted either to a declaration procedure or to an authorization regulation depending on their nature. The safety report is supplied for authorization regulation. The authorization dossier is constituted of four parts:

- the description of the installation;
- the environmental impact study;
- the safety report (étude des dangers);
- the report on health and safety at work.

The dossier is established on the definitive design of installation. It is submitted to the "Prefet" of the department in 7/8 copies⁽¹⁾. The dossier presented to the public inquiry is distributed for the analysis and approval to the different competent bodies (e.g. fire brigades, water authority, agricultural department, etc.). The technical body analyzing the safety report is the regional service of inspection for industry (DRIR; there are 25 DRIRS in France). Normally

(1) The "Prefet" has the power to authorize by "arrêté préfectoral" (there are 95 prefets in France who are members of the State, and obey the Ministers).

the dossiers are kept at local level. The Ministry for Environment can get a copy of the dossier on request and has the power to impose to the Prefet all the decisions retained necessary.

There is now a proposal to finalize a ministerial decree in order that the most important dossiers have to be sent directly to the central ministry, without the formal request by the ministry itself, and for an ultimate decision by the minister.

The Prefet checks for completeness and can ask any complement of information he thinks to be necessary before opening formally the public inquiry: an instructor commissioner (named by the administrative tribunal) takes care of collecting the remarks or the approval from the competent bodies and public associations. The dossier without the confidential parts are at the disposal of the citizens in the municipal offices.

After reception of the advises of his technical services and the results of the public inquiry, the authorization is given (or not) at the end by the Prefet after consultation of its technical body CDH (Departmental Health Council).

The procedure can last 8 months if no major problem is encountered. If from the public inquiry there is a feedback on technical proposals or new information requirements, then it is necessary to repeat the entire procedure. This is the reason why it is preferred to complete the dossier by preliminarily answering possible remarks before starting the public inquiry (many meetings between industrial, expert, DRIR and eventually Prefet are necessary). Even on particular aspects or for particularly risky installations it is in the faculty of the Prefet to ask an independent critical review of the

safety analysis (étude de sûreté); he can also ask for safety audits on the site (e.g. after an incident; in this case even if the installation has been authorized to operate, it is always possible to require to stop to operate on waiting for further safety analysis).

In order to ensure that a uniform criterion is adopted in all places, the DRIR inspectors involved with the analysis of the safety reports have periodical meetings at the ministry of Environment (Service de l'Environnement Industriel) every 2/3 months to discuss in depth the way to compile and to judge safety reports.

Federal Republic of Germany

The Federal Immission Control Act (BImSchG) of 1974, its ordinances and the related administrative regulations provide the legal basis for the protection of people, animals, vegetation and other items against adverse environmental effects. They also provide protection against hazards, major disadvantages and high levels of nuisance caused by plants subject to licensing. Among other things, the Act lays down statutory licensing for certain types of plant as well as conditions which have to be met before a licence is granted. The 13 ordinances to the Act lay down and itemise requirements for the plants concerned, the obligations of the plant operators, the inspection requirements and the administrative procedures to be followed.

The 9th ordinance to the Act (9. BImSchV) governs the various steps in the licensing procedure. It regulates specifically the application procedure, the content of the applications, the type and scope of documents to be submitted, the involvement of the general public,

the involvement of the various authorities, the question of expert reports and the content of the licensing permit.

The competent authorities are responsible for implementing the Federal Immission Control Act in the Federal Republic of Germany. These authorities are normally the regional presidents (Regierungspräsidenten) and/or the industrial inspectorates (Gewerbeaufsichtsämter) attached to them. The licensing authorities also call for comments from the authorities whose area of work is affected by the project. These include, for example, the water authority, the fire brigade, the municipal authorities, etc. As part of the licensing procedure, a safety report has to be submitted for certain plants. The requirements are derived from the Hazardous Incidents Ordinance (12th ordinance to the BImSchG). This is the only one of the relevant regulations which defines requirements for plants in relation to operational disturbances, with the aim of preventing hazardous incidents or limiting the effects of such incidents. It thus represents to a particularly high degree an instrument for damage prevention. Article 1 of the Hazardous Incidents Ordinance defines the scope of application. Four conditions have to be met here if a plant is to fall within the scope of the ordinance and to be subject to its provisions:

- 1) The plant has to be one of those subject to licensing under the 4th ordinance (4. BImSchV).
- 2) The plant must be one of those specified in Annex I to the Hazardous Incidents Ordinance.
- 3) The plant must contain during normal operation a substance specified in Annex II to the Hazardous Incidents Ordinance, or it must

be possible for such a substance to arise during disturbance of normal operation.

- 4) The amount of the Annex II substance present or arising in the plant must be so great that it is clearly not possible to discount a public hazard arising through a disturbance of normal operation.

To ensure uniform interpretation of condition 4, the quantity specified for each of the substances mentioned in Annex II is that below which, on the basis of available experience and knowledge, there will clearly be no public hazard emanating from the plant. These quantities are recorded in the 1st administrative regulation to the Hazardous Incidents Ordinance (1. StörfallVwV), and they are given there as quantity thresholds A.

A public hazard is deemed to be present if one of the following three types of danger arises:

- 1) The health of a large number of people can be impaired.
- 2) The life of human beings is threatened or serious damage to the health of human beings is to be feared.
- 3) Material goods of a high value, particularly bodies of water, soil, stocks of fauna or flora, can be damaged if a change in their state, condition or usefulness would be detrimental to the public interest.

To demonstrate that there is no public hazard emanating from the plant, the safety analysis has to show deterministically that the plant has safety equipment to prevent hazardous incidents or to limit their effects. The 2nd administrative regulation specifies the re-

quirements for the individual matters to be dealt with in the safety analysis.

A hazardous incident in the meaning of the Hazardous Incidents Ordinance is defined as a coincidence of the following three events:

- 1) A disturbance to normal operation.
- 2) The release, formation, ignition or explosion of a substance according to Annex II, resulting from an event of the type described under 1.
- 3) The causation of a public hazard by an event of the type described under 1.

In order to attain the safety analysis' objective of demonstrating that no public hazard will arise through a disturbance, it is necessary to adopt a deterministic approach when dealing with incident scenarios and their possible effects. It is often not possible to determine the risk using probabilistic methods, because the data basis is not reliable. The result of the safety analysis is as follows: It highlights the effectiveness of all measures taken with regard to plant-related connections between hazard sources and the preconditions for the occurrence of incidents with a view to controlling such incidents and to ensuring work safety. It also identifies, where necessary, weak points in the design concept and highlights measures needed to rectify them.

The safety analysis must be drawn up by the plant operator. For existing plants, it has to be submitted to the competent licensing authorities by 31.08.1990 under the statutory regulations. For new plants, it must be submitted as part of the licensing procedure.

The safety analysis must be examined by the authority. The scope of the examination is defined in the 2nd administrative regulation. The authority may call for expert reports on specific matters in the safety analysis or on the safety analysis as a whole. For this purpose, competent and independent expert organisations are normally called in, for example the authorised technical inspection organisations (TUV). In the course of their assessment, the experts will visit the plant to check that the facts described in the safety analysis are in accordance with the actual design of the plant. Any nonconforming matters are discussed with the plant operator and, if necessary, improvements will be laid down in the report in the form of specific stipulations. The report then provides the basis for the licensing permit issued by the authority.

The safety analyses must be updated. Plant modifications must be subjected immediately to a corresponding safety-related examination.

Thus, the operator has to give very detailed consideration to safety matters in relation to his plant, and this is combined with the independent assessment of the safety report by experts. This means that plants with a high hazard potential are operated with a very high safety standard, and so any hazard to the environment emanating from the plant is limited to a residual risk.

Greece

A general legislative framework has been established since 1986, and specialized for major accident hazards in 1988; however, no impulse has been given until now to obtaining from industry the safety reports. Some risk studies have been performed but outside the legal

praxis of the directive. Guidelines or experience do not exist at the moment, so that the answers to the questionnaire express a verbal consensus on the way of collaborating between the Ministry of Industry responsible for giving the obligatory permit after the submission of the safety report and the Ministry of the Environment which is called to give an advice which is expected to be accepted, even if the law does not give it a mandatory status.

A very short period is established for the permit procedure, which involves advices from other Ministries (agriculture, culture, health, environment, labour).

The Ministry of Industry has a body of inspectors. However, the other competent ministries have right to inspect the plants according to their competences. The application is normally submitted to the provinces, but for major plants (of national interest) it is submitted to the central authority. Problems connected with the responsibility of the manufacturer and of the licensing authorities in the event of an accident must still be solved.

Luxemburg

Because of the size of the country, very few installations are covered by article 5 (three stockages already in operation, one still in design phase). The Interministerial Committee responsible for the safety control requires that the manufacturer let the safety report be performed by a designated organization "organisme mandatés", which is a non-profit organization constituted by the association of Lux-control (L), APAVE Alsacienne (F), AIB-Vinçotte (B) and TÜV-Rheinland (D).

It is worthwhile to remark that in addition to the four installations strictly covered by Article 5 obligations, three separate adjacent stockages of flammable liquids have been assimilated to a site which must satisfy Article 5 requirements.

Ireland

Article 5 safety report requirements of Directive 82/501 are implemented by Regulation 12 of the European Communities (Major Accident Hazards of Certain Industrial Activities) Regulations, 1986. Safety reports are submitted to the National Authority for Occupational Safety and Health (NAOSH) as the Central Competent Authority. Safety reports for existing installations were presented by the 8th of July 1989 and for new installations are required at least 6 months before commencement date.

The report is subjected to examination by NAOSH inspectors. A safety report meeting the requirements of Regulation 12 should systematically analyse all potential major accident hazards on-site, i.e., identify type, consequences and likelihood of potential major accidents, place them in a geographical and social context, identify controls and safeguards, comment on the acceptability of residual risk and reach overall conclusions.

NAOSH inspectors would initially examine all safety reports to establish that all areas requiring attention are addressed. NAOSH would inform the manufacturer of the areas that were not adequately addressed. Subsequent sampling of the safety report by NAOSH inspectors would look at chemical, mechanical, electrical and civil engineering aspects in detail. Site management, training, assessment of

major accident hazards and risk assessment would also be evaluated with this approach. Relevant protection of the environment from the effects of major accidents is also considered. The safety report is then used by area inspectors as an inspection tool especially when specific aspects of concern require detailed attention on-site.

Ireland does not operate an approval or licensing system of major hazard installations but rather a management control system based on inspection sampling techniques to assess compliance with the requirements of the "Seveso" Directive and other relevant national health and safety legislation such as the Safety Industry Acts 1955 and 1980 and the Safety, Health and Welfare at Work Act, 1989. NAOSH has received 20 safety reports to date. In collaboration with other E.C. Member States, NAOSH inspectors are building up their expertise in safety report evaluation.

Italy

The Italian law (DPR 175/88) identifies the Ministry of the Environment and the Ministry of Health as the central Authorities and the Regions as local Authorities, and gives to the competent Prefet the task of the external emergency planning.

The DPR 175/88 asks for:

- 1) a notification (art. 5 of EEC Directive) with a complete Safety Report from the manufacturer which uses, in industrial operation or in separate storage, dangerous substances in amounts larger than the threshold quantities (derived from Annex II and Annex III of the Directive as amended 19.3.1987);

2) a declaration (art. 3-4 of EEC Directive) from the manufacturer that uses (in industrial operation or in separate storage) cancerogenic, highly toxic, toxic, flammable liquid or explosive substances in quantities larger than the exemption limits (e.g. for industrial operation quantities larger than 1/5 of those established for the notification). The declaration must also be accompanied by safety documentation, that in some cases can be compared to a limited version of a Safety report.

The threshold quantities for notification apply also to a group of installations belonging to the same manufacturer and located in a distance of 500 m.

A notification is also requested by the Regions to the manufacturers of installations normally subjected to declaration where the distance between the installations is less than 500 m and the dangerous substances used exceed altogether the notification threshold. These highly concentrated areas are identified by the Ministries of the Environment and Health.

The notification had to be sent until 8 July 1989 to the Ministry of the Environment and the Ministry of Health, while the declaration has to be sent within the 31st of December 1990 to the competent Region and Prefet.

For all the plants subjected to declaration or notification the Italian law provides for a technical review of the Safety Report, carried out by the Regions on declarations and by the Ministry of the Environment and the Ministry of Health on notifications, respectively.

The Regions have, however, the task of sending the results of the analysis of the Safety Reports to the Central Authorities, that have the function of supplying directives and coordination on the activities relating to the law on Major Hazard of Industrial Activities. To cope with this aim, on the 31st of March 1989 a Decree of the President of the Council of Ministers was issued that sets a standard format for the compilation of Safety Reports attached to the declaration/notification, and defines criteria for information, training and workers' equipment.

The Decree fixes the quantities of substances that relieve the manufacturer of his declaration duty (art. 3-4 of EEC Directive) and establishes that the degree of depth of the analysis to be performed for the declaration depends on the quantities in the installation.

In the case of the notification (art. 5 of EEC Directive) the risk analysis is composed of various sections:

- preliminary analysis in order to identify critical areas of the installation by means of an index method;
- identification of accidents by the use of check-lists and historical analysis of abnormal occurrences, failures and human errors. For new industrial activities an operability analysis is required;
- estimate of accident occurrence probabilities on the basis of the frequency of initiating causes (data banks, reliability analysis).
If the available data are not sufficient the manufacturer is allowed to produce a qualitative estimate with a frequency range supplying a source term of conservative nature;

- consequence assessment (no particular model is required and a vulnerability analysis is not mandatory).

The results of this risk analysis are used for the preparation of an external emergency plan.

In the case of the declaration (art. 3-4 of EEC Directive), if the installation exceeds a first level of quantities, an analysis is required in order to identify critical areas on the installation. If the quantities exceed a second level, a qualitative analysis is required about accident occurrence probabilities with an assessment of the consequences to man and the environment on the basis of the worst credible accident. In the case that the consequences extend their influence beyond the installation boundaries, the manufacturer must supply the elements for an external emergency plan.

For each notification the competent Authorities will start a procedure that develops along different steps. Firstly the Minister of the Environment, in agreement with the Minister of Health, nominates for the Safety analysis of the installation a project leader who receives the advice from four Technical bodies. The Technical bodies are the following:

- the Superior Institute of Health and the Superior Institute for Prevention and Safety at Work (Ministry of Health);
- the Fire Department (Ministry of the Interior);
- the Research Council (Ministry of Scientific Research); the safety review group leader holds a Safety audit with the participation of the technical bodies and local Authorities, and sends a synthetic report on the Safety situation to two consulting bodies for advice.

The Consulting Institutes:

- a Commission established by the Ministry of Health with the participation of the territorial bodies and a Committee established by the President of the Council of Ministers for the coordination of the industrial safety activities.

Finally the Ministry of the Environment, in agreement with the Ministry of Health, expresses its conclusions on the installation, asking if it is the case, for modifications and for procedures in order to reduce the risk of the plant.

The manufacturer can appeal against the measures described; the appeal is decided upon by the Ministry of the Environment, in agreement with the Ministry of Health, consulting also the Ministries of Industry and of Labour.

For the manufacturers who do not produce in time the required notification or declaration, the law provides arrest.

Inspections on installations are carried out by the central or local Authorities through their own personnel or through other inspectors taken from the first three technical bodies mentioned above.

The Netherlands

Permit Application (PA): for any new factory or any time a major modification is planned, a permit application must be submitted to the competent authority: either to the city or to the province administration (province when the installation covers two or more municipalities; or when the permit is regulated by the "air pollution

law") (many laws exist which cover single aspects of man/environment protection).

When the installation is covered by the Seveso Directive, then an External Safety Report (ESR) must be submitted together with PA. ESR and PA are public (with some exception concerning industrial secret). For existing installations the ESR makes reference to the PA already approved. ESR and PA are made on a quasi definitive design: the layout must have been finalized, whereas P&IDs cannot be complete, unless safety significant systems are involved. Once PA/ESR are accepted, that is the information is considered to be sufficient, then by law in 7 months the procedure must be ended. After 7 months no answer of the authorities corresponds to a refusal and the owner is enabled to go to the Court.

The VROM ministry plays through its environmental inspectors an advisory role. These do not enter officially in the licensing procedure. However, the Ministry is called officially for an advice any time that because of disputes between industry and local authority the affair goes to the State Council. The advices of the inspectors are in praxis always accepted and applied.

The Operational Safety Report (OSR) has to be submitted to the labour inspectorate before the operation starts (even 1 h before!). The plant can operate even without the approval of the OSR. The OSR has to be evaluated in 6 months time, even there is no strict legal obligation. The labour inspectorate has the capability to request and to obtain that modifications retained necessary are implemented. OSR is requested only for the units which represent a considerable risk to the workers. These can be identified through PA/ESR. On the other

hand, even VROM receives the insights from the OSRs, which are made on the final design.

OSR is indeed to be presented in 7/8 copies (it is secret: however, it is fully available to the work council): copies for:

steam boiler inspectorate

local authority competent for PA

city council/bourgmeister

fire brigade chief

environmental inspectorates

labour inspectorates.

PA/ESR/OSR give a full coverage of the risk.

Portugal

To cope with the Directive the ATRIG authority has been created (Technical Authority for Major Industrial Risks) which, by coordinating competences of ministry for physical planning, with its directorate general for environment, industry, civil protection, is able to ensure a correct information flow for an effective inspection policy. New plants need a licensing on the basis of a safety report plus internal emergency planning. Old plants can be obliged to close on the basis of the safety report. Some safety reports have been already submitted. Experience should still further develop. A guidance note for the notification has been produced.

Spain

Guidelines for the safety reports have been drafted but not yet finalized. These draft guidelines have been supplied but could not yet

be included into the CDCIR. The guidelines are being finalized in agreement with a Technical Committee for the Chemical Risk created in March 1989, which includes representation of industry as well. The answer of the questionnaire reflects the state of the development of the activity and, therefore, should be considered provisional.

Whereas the Civil Protection Directorate coordinates the activities in the country, the implementation of the safety report issue is responsibility of the regional authorities. Basic information concerning emergency plans are communicated at the central level. The authority is attempting to create a technical body able to advise even the regional administration at the CIEMAT National Research Center.

United Kingdom

Article 5 safety reports have to be submitted to the Competent Authority, the Health and Safety Executive (HSE), at least three months before commencement of the industrial activity, although in practice manufacturers are normally already in discussion with HSE long before.

The report is subjected to expert examination by local inspectors and their colleagues with specialist knowledge in risk assessment, chemical, mechanical, electrical and civil engineering. Issues concerning human factors and the safe management of the installation are also examined as part of the review process. However, article 5 safety reports (and any subsequent changes to them brought about in the case of modifications referred to in article 6) are not seen as documents of relevance only before the start-up of an installation so that approval may be given in one form or the other.

Indeed, the United Kingdom does not operate an approval or licensing system of this sort. Instead it prefers a method of continuing control based on enforcement of well established health and safety legislation (the Health and Safety at Work Act) which complements the specific Regulations introduced for the purpose of the Seveso Directive. These include powers to prohibit an activity or to require improvements to it and such powers would be used to prevent start-up where the HSE was not satisfied about the safety of an installation.

The national approach adopted in the UK to article 5 reports does not end at the start-up of the operation. It also serves an important function as HSE goes on to its further roles under article 7 whilst at the same time fulfilling the broader and long-established pattern of preventive inspections and investigations as part of its wider enforcement role. Hence, key issues concerning the safe operation of the plant identified by inspectors specialising in this type of inspection will be targeted and reviewed during planned inspections of the activity. The information provided by the manufacturer in his Safety Report can then be compared to the conditions actually found. In this way, areas for improvement, be they technical or managerial, may be brought to the manufacturer's attention and appropriate action taken. This helps to ensure that the resources of both the inspector and the manufacturer are economically and effectively deployed. This approach is also used during the investigation of dangerous occurrences, accidents or complaints that come to the attention of inspectors, whether they concern events involving major accidents under the Directive or lesser events reported under other legislation. Indeed, the number of lesser events

that are required to be reported is such as to provide a valuable source of information which aids targetting of preventive inspection concerning major accidents.

Article 5 safety reports for existing sites are also used to check the information already held on specially created records for installations subject to the Directive, and provides one input for files concerning the inspection of newly established activities.

In addition to obligations met under the Seveso Directive, the UK has well established land-use planning controls. These involve the local community through their elected representatives serving on local authorities who have the power to grant or refuse planning permission. Such approval is required in the case of proposals for new installations subject to the Directive, modifications to existing installations as well as other proposals for development in the vicinity of existing installations. The local authority's decision making process is supported by advice from HSE about the "residual risk" to the public; that is, the small risk which remains when the likelihood and consequences of an accident are reduced to the low level required by the Seveso Directive but the hazard is not completely eliminated. HSE's advice to the local authority is based upon a quantified risk assessment of the installation at the conceptual design stage. However, it should be noted that the grant of planning permission is a separate legislative matter which does not turn on the submission of an article 5 safety report or issues concerning the safe operation of the installation.

Protection of the environment from the effects of major accidents falls to HSE. It is addressed in the safety report and in the work of HSE outlined above. Other environmental issues are the subject of further legislative controls falling to other enforcing bodies.

4. SAFETY REPORT (SR) REQUIREMENTS

A comparative summary of the answers obtained through the questionnaire is given in the next sections. However, a more detailed comparison can be get through the compilation in the Appendix. The distribution of this compilation has appeared to be useful for:

- moving towards a better mutual understanding of the different approaches which cannot be caught by simple summaries;
- moving towards a common language (it appears indeed from certain answers that not always there is agreement on the meaning of certain questions, even if these have been discussed in the ad-hoc meetings);
- allowing authorities who are elaborating (or reviewing) guidelines to have a direct access to what is existing in the other countries.

The abbreviations used in the following as well as in the Appendix normally follow those at item 3 (for instance, for NL, P.A. = Permit Application; ESR = External Safety Report; OSR = Operational Safety Report). The Appendix also refers to some existing standards and norms. These have been included into the CDCIR. Section 5 lists relevant national guidelines and regulations. It should also be remarked that the word "inspector" is used in a very broad sense including experts analyzing the safety report as well as performing field inspections.

4.1 Industrial complexes vs installations

Questions 1.1 to 1.4

This set of questions had the principal aim of identifying whether in large industrial complexes the presentation of multiple SRs might lead to:

- non identification of hazards provoked by interaction between the plants;
- non identification of hazard sources originated by minor installations not covered by Article 5;
- insufficient analysis of the organizational aspects and management of the whole site, which at the last end are the principal factors for safety achievement;
- insufficient account of possible "common cause failures" provoked by the loss of utilities or mitigating systems shared by the multiple units.

It appears from the answers that (with some few exception) these very important aspects have been considered in the national practices.

The following table summarizes how single or multiple reports are required for installations on a same site when belonging to a same owner.

Single	Multiple
DK, F, GR, IR, L NL (ESR)	B*, E, FRG, I NI (OSR), P, UK*

*A "core" report for the site is recommended

Questions 1.5 and 1.6

These questions have been addressed to understand the requirements for SR when minor installations belonging or not to a same owner might present major accident hazards because of their proximity. For installations of a same owner, if within 500 m distance the total quantity of a same substance exceeds the threshold, then a SR is always required. The situation is quite different in the different countries as summarized in the following, whereas interesting remarks can be read in the Appendix.

	Same owner	Different owners
Art.3 and 4 only (+ inspections)	FRG,GR,IR*,P,UK	FRG,E,GR,IR*,P,UK
Art.3 and 4 + SR at the judgement of inspectors, or local authorities	B(OSR),DK,E,F,I L,NL(OSR)	B(OSR),DK,F,I,L NL(OSR)

* IR underlines a deficiency in the directive, even as far as exchange of hazard information among plants of different owners is concerned.

Question 1.7 (further issues not covered by previous items)

DK and L indicated the problem of the pipelines and transport. However, the answers refer better to the questions put under item 2.4.

4.2 Installations vs Safety Report

Questions 2.1 to 2.4

For Art. 5 only F and FRG include more substances than those considered by the Directive, whereas DK includes further substances as

far as Art. 3 and 4 is considered. In NL, OSR is requested according to hazard criteria rather than substance names.

Lower thresholds are assumed by F for most of the substances and by FRG for many of them. The problem is under discussion in DK. I has established thresholds for "declaration" (minor safety analysis) for plants under Art.3 and 4.

Other kinds of plant are submitted to the same SR obligations in F, FRG and at a lesser extent in DK and in the NL for PA. Italy has not excluded plants under Art.2.3 (disposal of toxic and dangerous waste). On case by case decision a SR in FRG can be imposed by the authorities for each installation covered by the emission control law. In B and DK, SRs can be requested on demand of inspectors, in Italy after accidents.

Terminals connected with plants under Art.5 are to be considered in the SR for all states. Need of inclusion of marshalling yards under the same Art.5 obligations has been identified by F, NL and Italy. We noted that several articles of the council resolution of September 1989 rose the subject of risks connected with the transport of dangerous substances on a broader context.

4.3 Installations vs site related external hazards

This set of questions was addressed to understand at which extent the effects of natural or human-induced hazard from outside of the plant has to be considered in the SR. Generally all countries consider that the term "special analysis" (question 3.1) used in the questionnaire is not applicable, because external hazards should be normally included in the SR.

Seismic hazards (questions 3.2.1 to 3.2.4)

Whenever earthquake risk is present, antisismic construction national standards are assumed in the design. Extensive "safety studies" for toxic material storages and process installations have been requested by F. Arguments for adequacy of construction design operation with respect to the seismic hazard are requested by UK. Seismic occurrences should be considered by P accident scenarios. Earthquakes are included among the danger sources in the FRG. GR feels that the issue needs to be further considered.

Aircraft crash hazards (questions 3.3.1 to 3.3.3)

The problem does not seem to have been considered by B, E, GR and L; and impact analysis is not yet included in the Italian guidelines. Mostly landing/taking off corridors are considered as criteria for considering aircraft hazards. E, DK, UK use probabilistic evaluations of incident rate for any consequential action. Normally the owner is responsible of setting data and propose methodologies. Some national laboratories like RISO (DK), CEA (F), TNO (NL), SRD (UK) have developed some guidance notes or expertise for analysis. In most of the countries administrative procedures or regulations can be used to create exclusion zones. In some countries (e.g. NL and UK) even for military flights.

Sabotage (question 3.5)

The problem does not seem to have been considered by B, GR, L, IR, whereas E is planning to ask for measures in the future. In the other countries, security is not always completely included into SRs

because of the need to keep secret the measures but in any case is regulated by other means.

Hazards from nearby installations (question 3.6)

Generally the authorities have the possibility to facilitate the flow of information among owners. Only IR and GR seem to have problems as far as installations not covered by Art. 5 are concerned. Again IR notes a deficiency in the Directive.

4.4 Installation Description

In general the answers do not need a comment, since they show good agreement, with some few exceptions. In particular the following items should be remarked:

Question 4.4 (composition and expertise of the team performing the safety reports)

DK and NL (as far as OSR is concerned) prefer that company personnel and not consultants be involved. IR has the right to nominate a person when not satisfied with the competence of those who draw up SR. L has nominated an "organisme mandatés".

In general there is the preference that the company be involved as much as possible.

Questions 4.10 and 4.11 concerning standards and arguments for new technology

Only Spain seems to have not yet considered the item.

Question 4.18 (waste treatment, etc.)

France and FRG are emphasizing (see also the answer to the question 4.27 extra information) environment protection, whereas in other countries only the information relevant for releases able to create a major accident are included in the SRs, and smaller releases and controlled releases are dealt with by other legislative acts or authorities.

Questions 4.19 to 4.24 concerning safety organization, operator training, procedures, etc.

Whereas the human factor aspects have been recognized by some authorities as a most critical part of the safety report, the same awareness is not shown by all authorities (see also the answers to the question 5.6 concerning in general the analysis of the human factors).

Question 4.27 (further information)

I asks in the report information on company insurance for liability with respect to public and environmental damages.

4.5 Hazard Identification**Historical experience (questions 5.1(.1 to .4) and 5.3)**

All countries use more or less historical experience on accidents as a basis of knowledge and hazard awareness. Checklists based on past accidents have been established in FRG.

Systems analysis procedures (questions at section 5.2)

All authorities encourage or prescribe that systems analysis techniques (like HAZOP, FMEA, etc.) are used for hazard identification. The general trend is to leave the choice of the most appropriate one to the manufacturer, who should indicate the reason of his choice and present analysis transparent for the authorities. Only Italy requires a mandatory screening methodology (derived from Mond/Dow and Italian toxicity indexes), whereas NL limits the mandatory requirements for indices to the OSR, where the ranking is performed for identifying which further analysis steps have to be required.

As far as criteria used for judging completeness of the hazard identification in a SR, even by warning against the fact that checklists can never be exhaustive, F has produced some checklists as a guidance for the inspectors (5.1.4), whereas (5.2.2) UK relies on the analysis of the SR on an expert multi-disciplinary basis.

Questions 5.4, 5.5 and 5.6 concerning plant states, runaway reaction hazard and human factors which may be major contributors to the overall risks.

It must be remarked that not all authorities seem to have considered at a sufficient extent how to address such items in a SR.

4.6 Safety Systems and Procedures

Sufficient details and examples of extensive requirement description can be seen in the Appendix. It should be remarked that at the present state of development of guidelines, Spain has not yet

considered which requirements concerning standards and safety criteria the SR has to address (questions 6.1 - 6.6). Quantitative reliability targets seem to be requested by DK and NL for certain safety relevant systems; some authorities (F and FRG) may require special redundancies, other authorities (I, UK) are encouraging reliability assessments.

Pollution Protection Systems (questions 6.8 - 6.10)

The answers show a variety of positions, because in most of the cases they refer to responsibilities of different authorities and regulated under different legislations.

On-site emergency plans (question 6.11)

It appears that even if such a plan is a fundamental organizational safety measure, not always its description is included in the SR.

The answers to question 6.12 are quite differentiated among the statements: F (no zero risk can exist), and FRG (the probability of a public hazard must be zero).

4.7 Accident Scenarios

The basic philosophy is different from country to country (questions 7.1 - 7.3). FRG is evaluating consequences of malfunctions of units in order to demonstrate that there is no public hazard (there is the assumption that no more than a certain number of built-in barriers can fail). A complete probabilistic risk assessment is requested by the Netherlands. At a different extent probabilistic

analyses are required by other authorities, whereas F and UK tend to have a picture of consequences of a large spectrum of possible accidents (UK does not discourage use of probabilistic methods but avoiding cut-off or target values). The reason behind this choice is that evaluation even of remote scenarios increases industry awareness about risk and, therefore, moves towards a better prevention. Envelope scenario for F (see question 7.1), worst reasonably foreseeable for UK, e.g. full-bore failure of a large diameter liquid pipeline, BLEVE of LPG sphere are at the basis of emergency plans. No further examples have been given by other authorities, who however supply to the emergency planners the results of the SRs.

Useful indications on the praxis of dispersion, fire and explosion, vulnerability models as well as of calculation conditions can be found in the answers to the questions 7.4 - 7.13 of the questionnaire.

4.8 Other General Questions

Acceptance criteria (questions 8.1 - 8.2)

Only the NL has established risk criteria for acceptance of ESR, whereas probabilities, when used, are assumed as one among other elements in the overall judgement by the other authorities. State-of-the-art techniques, best engineering judgement mostly supported by ad-hoc studies especially for new plant types, are at the basis of the acceptance criteria for all authorities.

As far as backfitting is concerned some different statements are worth to be reported:

F backfitting is required according to a well defined program;

FRG backfitting or closure;

NL backfitting or closure. If the actions required correspond to up-to-date safety techniques, no compensation is foreseen. If additional measures are required because of land-use, support is given by the government;

UK on cost/benefit considerations.

Independent assessments

DK, F, GR, FRG, IR, I, L have the possibility to require, in addition to the SR, an independent study or an assessment at cost of the manufacturer (question 8.3, see also answer to question 4.4).

Most of the authorities have (or have planned to have) sufficient expertise to perform validation of the scenarios supplied by the manufacturer.

Mostly updating of SR is requested systematically at time intervals ranging from 2 years to 10 years, unless inspection or incidents show the need to do that out of any schedule. Of course, major modifications are subjected to the complete repetition of the procedure (question 8.5). The following table summarizes the situation.

	B	DK	E	F	FRG	GR	IR	I	L	NL	P	UK
Periodic revision (years) unless major modifications or accidents occur	10 (OSR)	5	4	2-4	2	-	3	3	-	4 (ESR)	-	3

Inspection policy

The answers given to question 8.6 show that the problem of planning inspections or safety audits on the basis of SR is not yet completely solved by all authorities.

The comparison of the times for approving or analyzing the report cannot be made on the basis of the answers given to the question 8.8, because the prescribed times are interrupted each time a supplementary piece of information is required, trial can be implemented, etc.

Support to the SR

Most of the authorities give the industry only information about the contents and guidance note, in certain cases they give advice. Only NL as far as ESR is concerned gives not only advice but may participate in the study and share the costs (question 8.9).

Responsibility problems have not yet been solved by legislation in Greece (question 8.10).

5. REFERENCES

Belgium

Arrêté royal relatif à la notification de certaines activités industrielles susceptibles de présenter des risques d'accidents majeurs (6 November 1987).

Politique de prévention, Work Protection Act, 1975.

Denmark

Pligter ved risikobetonede aktiviteter, National Agency for Environmental Protection, 1985.

France

Prévention des risques industriels, Législation des installations classées, Application de la Directive Seveso, Ministry of Environment, October 1989.

FRG

Notification of the Amendment of the 12th Ordinance for the Implementation of the Federal Immission Control Act (Hazardous Incident Ordinance), of 19 May 1988 (quoted as H.I.O or Annex 2).

First General Administrative Provision of the Hazardous Incident Ordinance, 26 August 1988 (FGAR).

Second General Administrative Regulation for the Implementation of the Hazardous Incident Ordinance, 27 April 1982 (SGAR or Annex 1).

Ireland

European Communities (Major Accident Hazards of Certain Industrial Activities) Statutory Instruments, Ministry for Labour, 1986.

Italy

Applicazione dell'art.12 del decreto del Presidente della Repubblica 17 maggio 1988, n.1757, concernente rischi rilevanti connessi a determinate attività industriali, Gazzetta Ufficiale, 21 aprile 1989 (referred to as DPCM, 31.3.1989).

The Netherlands

The External Safety Report, April 1989 (VROM).

Occupational Safety Report, Designatory guidelines for AVR, mandatory installations (1988), Labour Inspectorate.

Guidance for the contents of the occupational safety report (revised 1990).

Portugal

Notificação Da Segurança, Conteúdo Esquemático de Orientação para a sua Apreciação, AO ATRIG-89/046 Rev.01.

United Kingdom

The requirements of United Kingdom safety reports to comply with Article 5 are specified in Schedule 6 of the Control of Industrial Major Accident Hazards (CIMAH) Regulations 1984, referred to in this questionnaire as Schedule 6.

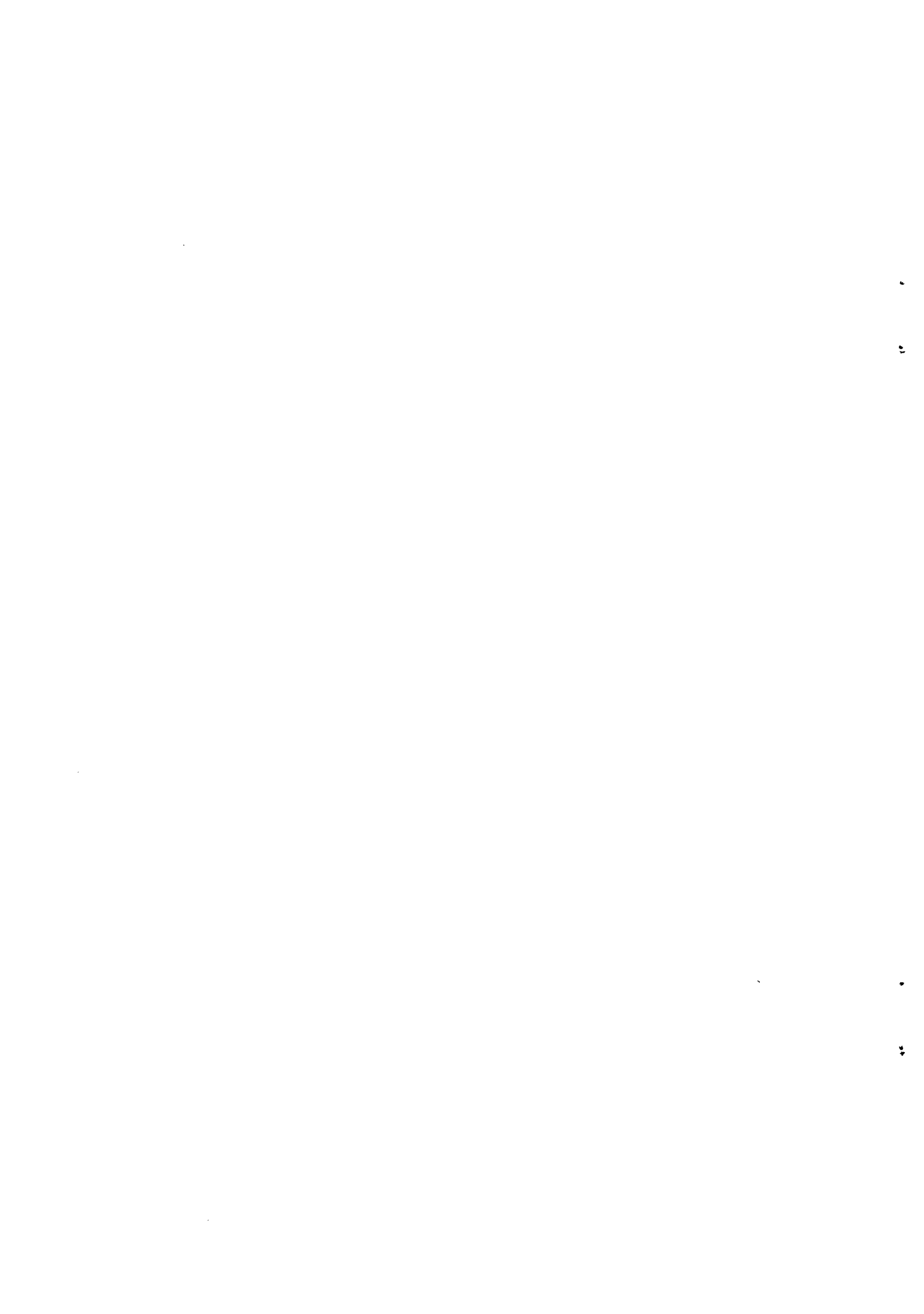
Guidance on the preparation of a UK safety report is given in HS(R)21,
A guide to the Control of Industrial Major Accident Hazards
Regulations 1984, referred to in this questionnaire as HS(R)21.

6. ACKNOWLEDGMENTS

The report has been made possible through the intensive co-operation of the national competent authorities and their inspectors.

The editors are grateful to all of them who participate in the discussions, filled-up the questionnaire and revised the report.

Advice has been given by N. Labath (C.A.T. consultant) for establishing the questionnaire and evaluating the answers.



A P P E N D I X

COLLECTION OF THE ANSWERS TO THE QUESTIONNAIRE

1. INDUSTRIAL COMPLEXES VS INSTALLATIONS

On the same site there may be several installations operated by the same owner.

1.1. Do you require a single safety report for the site or multiple safety reports for the single major hazard units?

B (ML) For every plant, the manufacturer must present a safety report. He is free of presenting a single global one or one for each installation or unit. In the case of several installations it has been revealed more convenient to prepare a general report explaining the general safety policy and one report for every installation where the safety measures adopted are detailed and justified.

DK Single. A safety report shall cover all facilities at the plant and consists of individual sections for each installation.
All substances involved, even in quantities less than the thresholds, have to be listed.

E Multiple. It is required a safety report for each installation.

F Single. Normally an industrial activity is defined as delimited by the fence of the site. Of course, for existing industrial complexes it is accepted that separate safety reports are submitted at different times. These however should then constitute a single dossier.
Interactions must be considered from one part to the other.

FRG Multiple. (The workers in a neighbouring unit are considered as " Public ". The safety study of one unit must demonstrate that no public hazard is put to the workers of the neighbouring units. The workers are associated with a specific unit and are not allowed to move freely across units).

GR Single.

IR Single.

I Multiple. It is under discussion the possibility of requiring a single safety report for every industrial activity (fence).

L Single.

NL Single: for external safety report (ESR).
Multiple: for occupational safety report (OSR).
However OSR covers only a subset of the units in a site.

P Multiple.

UK Multiple. Each installation (unit) requires a safety report (SR): but it is quite acceptable to have a site SR dealing with all matters common to the whole site (the Core SR) which is supported by SRs covering specific matters at each installation/units.

1.2. If multiple, do you require an additional report for possible interactions among units?

If yes, do you consider only major hazard units?

B (ML) For every installation at the site that may have an influence on plant safety presenting a major accident hazard, the manufacturer must indicate the preventive measures taken to avoid these hazards.

DK Not applicable.

E No. An additional report is not required. Anyway possible domino effects between nearby units must be considered in every report.

F No. Within the fences of the installation, even smaller units shall be considered in the same dossier.

FRG Yes. They are included in the analysis of external danger sources.

GR Not applicable.

IR Not applicable.

I No. Information regarding all possible interactions foreseen among the existent units are required in the Safety Report.

L Not applicable.

NL No for OSR. Only for fire irradiation. Toxic release is evaluated if this can affect operators in control room.

At the moment "no escape possibility" has been detected for risky units: ESR and OSR result in a complete coverage of risk control. Should some weakness in the system be detected the laws would be changed.

P No, however in every safety report external hazards due to the other neighbouring units or plants must be considered.

UK No. We require each specific installation SR to deal with interactions between itself and other installations plus those non-Article 5 installations which could either cause a major accident at an Article 5 installation or affect the severity of the consequences of such an accident.

1.3. If multiple, do you require detailed information on responsibility sharing and on the overall organization for emergency for the whole site?

B (ML) Yes.

DK Not applicable.

E Yes. For every installation it is required the internal organization.
For industrial complexes, a common action plan for emergencies is required.

F In the single dossier, the complete responsibility sharing and the organization scheme must be supplied, as well as the existence of mutual aid agreement with other industries in the nearby sites.

FRG Yes. This is achieved by a particular chapter of a Safety Report, but in some cases there may be a general report covering the site organization.

GR Not applicable.

IR Not applicable.

I Yes.

L Not applicable.

NL Yes. Even in OSR there is a common part describing the overall organization structure.

P No. For industrial complexes, every plant must present an internal emergency plan, that must be coherent with the general organization for safety in the complex.

UK Yes.

(a) In practice these are matters that are largely dealt with in the "Core" SR referred to in 1.1. above.

Also each installation SR should clearly show how it links into the Core SR and how it implements universal site safety procedures and precautions.

(b) In addition each site has to have an adequate on-site emergency plan detailing how major accidents will be dealt with. This is a separate legal requirement (CIMA regulation 10). This plan must cater for major accidents at each separate installation and for accidents involving interactions between installations.

1.4. If multiple, do you require detailed information on common possible utilities, common auxiliary services and common protections against pollution accidents due to waste treatment, sewers, etc.?

B (ML) Yes, as far as the safety of workers can be threatened.

DK Not applicable.

E Yes. There are some operative common action plans in industrial complexes.

F Of course, this is part of the dossier.

FRG Yes.

GR Not applicable.

IR Not applicable.

I Yes, for common auxiliary systems. Information are required for waste treatment. Inspectors may ask for additional information during safety review.

L Not applicable.

NL Yes. As for point 1.3.

P Yes.

UK Yes. As for 1.3. (a) above. For example, the "Core" SR should address precautions against major electrical supply or water supply failure and each individual installation SR should clearly explain whether these precautions apply at that installation or whether alternative protective systems are in operation.

1.5. 1) How do you deal with installations not exceeding separately the thresholds established for the safety report obligation, but presenting major accident risk because of their proximity?

2) In case you foresee a special requirement for such situations, which are the separation distance criteria that you apply?

B (ML) The rule of the 500 m is applied. There exists in Belgium a regulation, called Prevention Policy, that contains exactly the same obligations foreseen in Articles 3 and 4 of the Directive. It is very probable that under this prevention policy frame, an inspector may impose the manufacturer to prepare a safety report.

DK 1) Articles 3 and 4. If the plant presents a major accident hazard (after an inspection) a safety report may be required. This is decided by the local inspector.

2) There are, at the moment, no criteria for establishing safety distances. There are some regulations only.

Safety distances are applied for the installation of new plants.

As background information is used experience and guidelines developed in other countries (U.K., F.R.G., N.L.).

E Seveso Directive criterium of 500 m. is applied, with the following differences:

-For distances less than 500 m., it is required for installations of the same substance and belonging to the same owner.

-When different substances are considered. The Regional Authorities decide the criteria to apply.

F For the whole site of every owner, the total activity is considered, whatever the distance (all the quantities are added). The safety report is also requested for units under the thresholds established by Seveso Directive. French legislation have other thresholds; most of them are lower. The Prefect can record all units and ask for all information about them.

FRG The rule of the 500 m. is applied. Case by case analysis and consequence evaluation are performed.

- GR Only notification is required.
- IR We address such installations as best we can under Regulation 10 which imposes general duties upon manufacturers who are subject to Articles 3 and 4 of the Directive and under Regulation 9 which enables us to require demonstration of safe operation and storage.
There is in our view a basic deficiency in the Directive in that it does not provide for the cummulation of adjacent hazards.
- I The competent Authority defines the areas at elevated industrial activity concentration and local authorities (regions) ask for notification to industries sited within a 500 m. radius.
- L If proximity makes possible domino effects, the rispective amounts are added and the required criteria are applied.
- NL It is not required for ESR. For OSR it depends case by case; in some cases it is not required.
However the safety is controlled through the Permit Application (PA), which is a safety report even if no risk quantification is performed. It contains hazard identification, calculations of possible accidents, of duration of releases and doses, etc.
For triggering this kind of analysis, there are no fixed thresholds when chemicals are involved: rather this is a matter of judgement for the local authorities.
In this way also explosives, military installations, dust explosion risks are controlled.
- P Portuguese legislation foresees the mandatory presentation of a safety report for every plant included in article 5 of the Directive.
The safety reports regarding large industrial complexes will be analysed and consequently safety notifications will be asked for particular installations not fulfilling minimum safety requirements.
In present legislation a particular attention from Inspection Organizations is devoted to the installations included in the Directive.
- UK If the aggregate quantity of a specific individual dangerous substance in the installations exceeds the threshold level then a SR is required. This SR covers all of the installations. This applies to all installations within 500 meters of each other and at larger separation distances when the installations can interact.

Note: With the exception of emergency planning and

information to the public the CIMAH regulations is not the main safety standard setting legislation in the UK. Safety standards are set and enforced under the Health and Safety at Work etc. Act 1974 (HSW Act), approved codes of practice and guidance notes, etc. All industrial activities subject to the HSW Act are routinely inspected at a frequency largely determined by the risk arising from those activities. Hence even where the above aggregation rule does not apply the HSW applies and the installations are regularly inspected to ensure that the manufacturer is meeting his obligations to ensure that his plant is as safe as is reasonably practicable.

1.6. How do you deal with the question raised at point 1.5. when installations belong to different owners?

B (ML) These installations are not subjective to Seveso Directive. Nevertheless, in view of the Prevention Policy regulation each owner has to take appropriate measures in order to protect his employees.

manufacturer has to consider possible interactions with nearby industries.

DK All plants are inspected. If needed, Safety Reports are required. The attention is focused on safety devices intervening in those cases when a possible accident can affect nearby plants. There is no written regulation (except in the nuclear field), but only some guidelines.

E It is not required. Law 2/85 from Civil Protection Ministry may be applied to such cases.

F It is in the same way as in item 1.5. If there is a risk, the manufacturer has to consider possible interactions with nearby industries. The Prefect can impose the safety report, and plant owners have to communicate information to the other manufacturers.

FRG Treated similarly as indicated for point 1.2.

GR At the moment it has not been established.

IR There is no specific provision. We again would deal with them under Regulation 9 and 10.

There is a particular difficulty here in that manufacturers will argue that they have no way of knowing what dangerous substances their neighbours have or what the conditions of storage are. We would expect manufacturers to address patent hazards on adjacent sites.

This again draws attention to the fundamental deficiency in the Directive referred to at 1.5. above.

I See point 1.5.

L Primarily, separate reports are made. Afterwards, if there are possible interactions, a global supplementary analysis is done considering domino effects.

NL See answer to point 1.5.

P See answer to point 1.5

UK By inspection and enforcement under the HSW Act.

1.7. Is there any further issue not considered by the previous questions, that you consider relevant.

B (ML) No answer.

DK The safety of the pipelines.

E No

F No

FRG No.

GR No.

IR No

I No

L Presently, storage stations are considered in safety reports. In the future, it is foreseen to include pipelines and transport roads for dangerous materials.

NL No

P No answer.

UK No.

2. INSTALLATIONS VS SAFETY REPORT OBLIGATIONS

The EEC Directive and its 2 Amendments state a minimum common content, but national praxis may use more restrictive criteria for safety report obligation.

2.1. Do you include further substances with respect to the Directive?

If yes, which ones and which are the thresholds for submitting a safety report?

B (ML) No.

DK Yes, for articles 3 and 4. No for article 5.
Carcinogenic, mutagenic, teratogenic and neurotoxicity.
A booklet exists containing a complete list of dangerous substances (Art. 5 substances included).

E No

F Yes. The sites covered by the "classified installations" regulation.

FRG Yes. See Annex 1.

GR No

IR No

I No, substances and categories of substances included in Allegato IV of D.P.R. 175/88 are required.

L No.

NL No for ESR.
Yes for OSR. The list is established according to "criteria" rather than substance names.

P No.

UK No

2.2 For which substances do you assume lower thresholds with respect to the Directive ?

B (ML) None.

DK No comments at the moment because the issue is under discussion.

E None. Some regions ask simplified notification for installations where the amounts present are below established thresholds. Anyway they are not required to present a safety report in such cases.

F For most of them.

FRG For many of them. See Annex 1.

GR None.

IR None.

I None for Article 5.
See Art. 3 of D.P.C.M. 31/3/1989 where quantitative limits are indicated, regarding the obligations for the declaration concerning Articles 3 and 4.

L For flammable liquid storage (gasoline, gasoil) belonging to three owners and keeping their total quantity lightly below the threshold values for Article 5 application.

NL See answer to point 2.1.

P None.

UK None.

2.3. Are further installations (e.g. factories with dust explosion hazards) subjecte to the same obligations concerning safety reports?

If yes, which ones?

- B (ML) No, but within the prevention policy frame the plant owner may be asked for to present a risk analysis to demonstrate that he has taken all the necessary measures.
- DK Yes. For instance Hexane extraction facilities under vacuum.
Also for factories not covered by the Directive (for example explosives) but potentially dangerous, a Safety Report can be required.
The decision about the request for a Safety Report is taken by the local inspectors, sometimes with the support of the central authority.
- E No. There are some related norms from Ministry of Industry and from National Institute for Safety and Hygiene at Work.
- F See answer to point 2.1.
For instance: silos of organic powder, explosives factories, all new installations (whatever type they are) require a safety report to obtain the authorization to operate.
- FRG Yes. See Annex 2.
- GR No.
- IR No.
- I There are two exceptions:
- Plants indicated in Art. 2, point 5 of Seveso Directive.
- Cases where an accident happens, for which a safety report is required.
- L Not applicable.
- NL Yes for P.A.
No for ESR.
- P No.
- UK No.

2.4. Are there special safety report obligations for the activities concerning interface between transport and storage/processing facilities; i.e. is a safety report required for dock installations or other loading/unloading stations?

B (ML) For loading and unloading installations related with plants subjected to the Directive, the manufacturer must indicate what preventive measures he has taken.

DK Yes. If the facility is close to the factory or within the area of the factory there exist the obligation to include it in the Safety Report. If the facility is some Km far, it is not required its inclusion in the Safety Report, but it is covered by Art. 3 & 4 of the Directive. In any case the facility is subjected to inspection. (The Directive is not clear about the border line: 500 m. is the considered distance). Ships are not covered. Transport means outside the area of the factory are covered by other regulations.

E No. They are considered part of the installations and must be included in the safety report. There are special regulations for loading and unloading of hazardous materials in docks.

F France recognizes the risks connected with sites which are still belonging to the "transport" regulations, whereas they constitute a kind of storage area. However, at the moment only loading/unloading facilities connected with fixed installations are included within the safety study of such connected installations. Storage installations are also included upon some thresholds.

FRG Yes.

GR Terminals are included.

IR No. If dock installations are an integral part of a major hazard installation the safety report would be expected to deal fully with them in the context of the site.
If a jetty is in the vicinity we would expect the occupier to address it in the same way as other off-site hazards.

- I Yes. The transport activities functionally connected with the installations are included in the Safety Report. In general, Italy is considering the problem of transport (pipelines, marshalling yards) to be not sufficiently covered by existing regulations.
- L Hazards inherent to storage stations are integrated in safety reports.
- NL Yes. Docking and loading/unloading activities fall under requirements of the Nuisance Act, and thus under the major hazards regulation. An ESR is required for the major ones.
- P No. However if they belong to industrial installations subjected to the Directive, they must be considered in the safety report for that plant.
- UK No. Not explicitly but as these interfaces and operations are likely sources and causes of major accidents, they must be dealt with in detail under the requirements of Paras 5 (a), 5 (b) and 5 (c) of Schedule 6.

3. INSTALLATIONS VS SITE RELATED EXTERNAL HAZARDS

3.1. Do you require that a special analysis is devoted to external hazards possibly having a heavy impact on the installation?

B (ML) Yes.

DK Yes. External hazards shall be assessed in accordance with Art. 3 & 4.
We are preparing guidelines for the manufacturer on how to prepare the Safety Reports.
Anyway, for particular aspects, the manufacturer may get advice from the authority.

E Yes. Safeguard procedures to avoid intrusion are required as a part of the safety report.
Some external hazards have to be considered (flooding, etc.). Aircraft impact analysis is not required.

F Yes. Even if the term "special" is not applicable, indeed all external hazards (technical and natural) having impact on the installations are normally to be identified and analysed in the safety report (a SMHV chart for France has been made available).

FGR Yes. It is part of the safety report.

GR Yes.

IR No. We do require however that patent off-site hazards be addressed in terms of their possible impact on the site . (c.f. 5th Schedule 5 (a)).

I Yes. In the D.P.C.M. 31/3/89 the analyses to identify external risks to installations are indicated.
Inspectors may ask additional analysis during safety report review.

L No.

NL Yes.

P No. Not being considered as a special analysis, it is required a description of the external hazards coming from other industrial units, transport structures, natural characteristics of the site, sabotage or vandalism acts.

UK No. But the report for the installation must address all relevant external hazards.

3.2. Seismic hazards

3.2.1. If a seismic site is concerned, do you establish the seismic parameters against which the installation must be safely designed?

B (ML) No.

DK No. Not relevant for Denmark, because the probability is low (10^{-6} - 10^{-7}).

E Yes. Seismic analysis is required. Installations must be designed according to antiseismic construction national standards.

F It is duty of the plant owner to ask the BRGH (Institute for Geology and Mining Research) for getting the seismic parameters applicable to the site and the corresponding construction rules. The manufacturer has to demonstrate that these rules are respected.

FGR Yes. See N^o 3.2.4.2.C) 3rd. line of S. G. A. R.

GR Construction must be made according to seismic regulations.

IR No. This is not seen as a problem in Ireland.

I Yes. They are established according to the national norms for building construction.

L No. Luxembourg is not situated in a seismic zone.

NL Seismic hazards are irrelevant for Netherlands.

P No. But it is required to demonstrate that current legislation on the subject has been met (Law 235/83 of 31st May).

UK No. But the report should address relevant issues and show that the installation design, construction and operation are adequate for the seismic hazard. Standard methodologies and guidance texts are acknowledged for the assessment of seismic hazards as a function of the location of the site in the UK and the local geological conditions.

3.2.2. If yes, which are the criteria adopted for assigning the relevant parameters?
(If published rules exist please provide a copy).

B (ML) Not applicable..

DK Not applicable.

E There are no general rules. They depend on specific site characteristics.

F Design reference is the SMHV (Earthquake Historical Maximally Probable) + 1 (a step superior to the maximum recorded), called SMS. But all elements must be searched for by the manufacturer. Even existing plants are being checked against earthquakes.

FRG They are established in DIN 4149, part 1 (April 1981). The existing plants are being reviewed according to the norms.

GR No answer.

IR Not applicable.

I National territory is divided in seismic zones to which different parameters are assigned.

L Not applicable.

NL Not applicable.

P Not applicable.

UK See previous answer.

3.2.3. In addition to fix the parameters, do you favour particular methodologies for a seismic safety analysis?

If yes, please indicate them.

B (ML) Not applicable.

DK Not applicable.

E Yes. They are included in the Antiseismic Standards.

F No particular methodology is favoured, but for serious cases in depth analyses are requested.
BRMG or CEA has been asked to perform special studies, for instance, dynamical stress analysis of double containment of very toxic substances (phosgene).

FRG No.

GR No answer.

IR Not applicable.

I No. Inspectors may require the application of particular methodologies for seismic analysis, during the safety review.

L Not applicable.

NL Not applicable.

P No. However, possibilities of seismic occurrence has to be hypothesised when analysing likely accident scenarios.

UK See above, but in addition any methodologies may be used provided they are transparent to the competent authority.

3.2.4. If, at the time being, you do not require any seismic analysis, are you planning it for the future?

B (ML) No.

DK Not applicable.

E Not applicable.

F Not applicable.

FRG Not applicable.

GR For the time being, no planning is possible.

IR Not applicable.

I Not applicable. Italy is reviewing the geological mapping (Law 305, 28 August 1989)

L No.

NL Not applicable.

P No.

UK Not explicitly, but see previous answers.

3.3. Aircraft crash hazard.

3.3.1. Under which circumstances do you require taking into account for aircraft crash hazards?

B (ML) Aircraft crash hazards should be considered in the general context of off-site hazards. An aircraft crash on a process plant is normally very unlikely in Belgium.

DK If the plant is situated near a landing corridor.

E It is not considered in any case.

F The owner has to study the level of probability of a plane accident and justify his calculations. Whatever the level is, he must evaluate the consequences of such an accident destruction: of the biggest vessel, biggest storage tank fire, etc. In case the probabilistic level be significant, he must study the ways to protect the installations.

FGR Air traffic as a source of danger can, as a rule, be neglected if the installation is located:

- near airports outside the approach zone (Article 12, para 1, N^o 5 LuftVG+) or outside the approach sector, but less than 4 km. from the beginning of the runway or

- in the case of landing grounds outside a sector of 75 m. on both sides of the axis of the landing strip at the beginning of the landing strip, and within a sector of 225 m. on both sides of the axis of the landing strip at a distance of 1.5. km. from the beginning of the landing strip, unless particular conditions are giving rise to an increased hazard rate (e.g. obstacles to air traffic in the vicinity of the airport.)

+) LuftVG = Air Traffic Act.

GR No answer.

IR Aircraft crash hazards should be addressed in the general context of off-site hazards.

I Whether the factory is below a flight landing/taking off corridor.

- L Aircraft crash hazard is not considered.
- NL Whether the factory is below a flight landing/taking off corridor. (Military flights are included)
- P When it is considered pertinent (near airports or air corridors).
- UK Their relevance should always be considered in a SR: consequential action is a function of the probability of incident, and the potential effectiveness of counter or mitigating measures.

3.3.2. In the case you require aircraft crash analysis, do you provide the owner with relevant data and guidance notes?

- B (ML) No.
- DK Yes. Riso has developed a specific methodology for assessing the aircraft crashing probability. In case of request of such analysis, we supply the manufacturer with the methodology and relevant data. Until now no requests of this type have been made.
- E Not applicable.
- F Data must be provided by the owner. A technical office in France (DRAC : Delegation Regional de l'Aviation Civile) can furnish them. The manufacturer has to calculate the probability of accidents.
- FGR It is the owner's responsibility.
- GR Yes.
- IR No. The owner is responsible for acquiring relevant data, establishing and justifying methodologies.
- I No. It is not generally requested. A case by case approach is used.. Inspectors may ask for an analysis during the safety review.
- L Not applicable.
- NL Yes. If relevant, local authorities supply the necessary data obtained from the National Air Traffic Control Service, and expertise available at some few specialized groups like TNO.
- P No answer.
- UK No. Not directly, but HSE and others, including SRD, publish limited guidance on aircraft strike rates and on methodologies for assessing aircraft risks.

3.3.3 Do regulations exist which impede civil or military flight-corridors over particularly hazardous sites, once these hazards have been identified after a safety report?

B (ML) No.

DK Yes, for nuclear facilities.
No, for industrial facilities.
We have never had an experience of this type.
However, in case of accident in a factory, the airport is warned.

E Not applicable,

F Presently, a discussion is pending regarding how to lay down a particular chart for regulating the problem. Several plants have been already noticed on aeronautic maps with a cross, mentioning forbidden places. This will apply to low altitude flights, e.g. turistic ones. For commercial flights the proximity of landing / taking off corridors will be taken into account.

FRG Yes.

GR Yes.

IR Yes. Under the Air Navigation and Transport Act 1936 the Department of Tourism and Transport can create an exclusion zone over any premises.
Overflights have been prohibited over certain installations using this legislation. However this has so far been on an ad hoc basis and has not been formally related to plant safety reports which are a relatively new requirement. However if it becomes apparent in the light of a safety report that air traffic poses a particular hazards to a specific installation it is foreseen that steps will be taken to create an exclusion zone.

I See answers to item 3.3.2.

L No.

NL Yes, very complex flight regulations do exist which consider the problems put by hazardous sites. These regulations obviously control low-altitude both military and civil flights, and is respected even by NATO aircrafts.

P No. However technical authority for serious industrial risks, after the analysis of safety reports may propose pertinent legislation.

UK No. But administrative arrangements exist in certain cases to restrict or prevent over-flying. Such arrangements are rarely the direct result of the preparation of the SR.

3.4. Other natural hazards.

Do you require analysis and protection against other natural site-dependent risks (e.g. flooding, tornado, extreme meteorological conditions, lightning, electromagnetic perturbations, etc.)?

B (ML) Yes.

DK Yes. The decision is taken by the local inspectors. When needed the manufacturer is asked to consider such risks and to describe in detail the safety measures taken.

E No. There exists only general normative for construction. No specific analysis are required, except data for flooding and extreme meteorological conditions.

F Yes, for all hazards applicable to the site. Information for plant owners is available from "Météorologie National", where they can extract extreme natural conditions for external hazards evaluations.

FRG Conditions or events that are due to natural site characteristics shall include:

- flooding, flood waves or tidal waves if the installation is located in an area which, as several years of experience have shown, may be deemed to be endangered
- landslides or subsidence if the installation is located in a mining area
- earthquakes if the installation is located in a seismic area as defined in DIN 4149, Part 1 of April 1981.

GR Not applicable.

IR Yes. The owner would be expected to address the impact of natural hazards on the site. For example flooding would have to be addressed if the location was prone to flooding.

I Yes. Only information regarding protection is required, without establishing specific methods of analysis. Along the safety review period, this analysis may be required.

L No.

NL Yes, specially flooding and geological risks (foundations instability) which are peculiar NL risks.

P Yes.

UK Yes. The depth of the investigation and the extent of the precautions required are functions of the likelihood of the event (s) and the magnitude of the potential consequences. Source data and methodologies used in an assessment must be adequately referenced.

3.5. Do you ask for special security requirements against externally induced sabotage?

- B (ML)** No. Anyway the plant owner must take measures to interdict the entrance in hazardous units to all people that do not work in these areas.
- DK** Yes, if necessary. See 3.4.
This risk from sabotage is not a priori excluded. Generally, if the plant is very dangerous and something can be done, we ask the manufacturer to do it.
- E** Yes. There are specific regulations for public refineries.
They will be applied to private refineries and later on to other industrial sectors.
- F** In the safety report general measures are described without giving details. It depends on the risk.
As far as LPG structures are concerned, there may be requirements for resistance to external impacts, equivalent to bazooka shots. Further information can be obtained by the inspectors.
- FRG** Yes. "Unauthorized persons" shall be deemed to be especially those persons who acquire illegal access to the area of the installation.
Dangers caused by persons who act on the installation from outside with the intention to destroy shall only be considered if the parts of the installation that are of significance from a technical safety standpoint are particularly accessible to such actions.
- GR** No.
- IR** No. A reasonable general level of security is expected appropriate to the nature of the installation. However specific precautions against guerrilla attack are not sought.
- I** Only general information in the safety report. Along inspection period, detailed information may be asked for.
- L** No.
- NL** Yes. But these are not contained in the safety reports, since all this information is secret, known however by all relevant authorities (specially by secret services).
- P** Yes.

UK No. Site security is however, to be addressed, where relevant in a SR.

3.6. For an installation within the range of fire, explosion, missile hazards provoked by nearby installations of different owners, shall the safety report take account of such risks?

Who is responsible for assigning the relevant input data to the owner so that he can adequately analyse the risk induced by such external activities?

B (ML) The manufacturer of an installation subjected to the Seveso Directive, within the notification dossier, must identify the hazards provoked by the nearby installations. It may happen indeed that on a same site, installations are exploited by different manufacturers.

If a manufacturer plans to install a new activity or to modify an existing installation and this may increase the risk, he is obliged to submit his plant to a permit application according to the regulations on classified installations. During the public inquiry, all the interested parties have the possibility to consult the dossier and therefore have access to the information concerning the risk of nearby installations. In the praxis there is a good cooperation in Belgium among the manufacturers interested by the Seveso Directive to exchange information.

DK Yes. The owner in collaboration with the Authorities.

E Yes. Domino effects must be considered among these different plants, even though not enough experience on the subject is available.
The Competent Regional Authorities are responsible of information flow regarding this subject.

F Yes. Even risks induced by transport activities outside the establishment have to be taken into account (pipelines, trucks, ships, railways, etc.)
The owner of nearby installations gives the necessary information. In case of difficulties the Prefect can facilitate the exchange of relevant information. The Prefect is in fact aware of the situation through the declaration and notification procedures.

FRG Yes, according to the following criteria.

a) Not only immediately adjoining installations shall be regarded as danger sources, but also installations at a greater distance if the installation under review is within the danger zone of any of these installations.
Only such installations shall be deemed to fall under this category which may cause danger

through explosion, vibrations or the release of acutely toxic substances.

b) Neighbouring transport facilities (road, railway, water) shall be considered as sources of danger if the increased risk is due to the traffic conditions in the vicinity of the installation (e.g. traffic density, traffic routes, type of transports, weather conditions). These conditions are, as a rule, fulfilled in the following cases:

- fuel or gas wharfs at Federal waterways,
- shunting stations for tank wagons,
- traffic areas of large-scale fuel depots or corresponding filling stations,
- internal roads, including access roads where flammable gases or liquids are transported and loaded or unloaded.

Data collection is the plant owner's responsibility.

- GR There are problems to be solved by legislation, but it is possible to make an extended use of existing legislation to force something.
- IR Yes. The safety report is expected to address patent off-site hazards.
There is no mechanism for the provision of relevant information to manufacturers by their neighbours unless the sites are subject to Article 5. Again the problem arises due to a deficiency in the Directive which does not deal explicitly with 'domino effects'.
There is no problem if both sites are subject to Article 5.
(c.f. Schedule 5, 5(a)).
- I No. Only information is required. Competent Authority may require a safety report for the whole area (Art. 12, point 3d in D.P.R. 175/1988).
- L Yes. Auditory organizations are involved in this task.
- NL Normally this information is given by the responsible owners: until now no difficulty has appeared. In any case the Ministry would have the possibility to intervene heavily.
- P Yes.
- UK Yes. In the first instance, it is for the owner to seek to obtain the requisite data from his neighbours.
Under section 3 of the HSW Act 1974 there is a general

public and neighbours etc. This includes cooperating with each other in the provision of information, and it is this duty which will be used to modify regulation 12 of the CIMAH regulations to incorporate item (k) of Annex B of directive 88/610/EEC.

4. INSTALLATION DESCRIPTION

A safety report can be assessed only if the concerned installation is carefully described with respect to its production/storage activity, its interrelations with the site, and the overall organization for safety. The amount of information that may be required can differ substantially in terms of extent and detail.

The questions laid down in the following cannot be considered to be exhaustive.

If you require further information from the plant owner please describe it at the end of this section.

Do you require information on :

4.1. Ownership and links with mother and associated companies?

B (ML) Yes.

DK No.

E Yes.

F Yes, but not too detailed.

FRG Yes. The responsibility for plant operation has to be stated in the safety report.

GR Yes.

IR No.

I Yes. One objective will be the promotion of research of new technologies in less dangerous process to limit environmental hazards.

L Yes.

NL Yes, for both ESR and OSR.

P No. It is possible to know it informally.

UK No. Many of the companies submitting reports will be national, international or well know local firms. These details will generally be known from other inspection contacts with them.

4.2. Managerial and safety responsibilities?

- B (ML) Yes.
- DK Yes. Name of persons responsible for the plant safety (for major accidents) and organization.
- E Yes.
- F Yes, with the description of the organization.
- FRG Yes.
- GR Yes.
- IR Yes.
- I Yes. A detailed scheme regarding hierarchical organization and responsibilities is required.
- L Yes.
- NL Yes, for PA/ESR and very detailed into OSR.
- P Yes. The general organigram of the company and the safety organigram are required, including a description of attributions and responsibilities of different hierarchical levels.
- UK Yes. These are specified in para 4 of schedule 6.

4.3. Updating of these responsibilities in time?

B (ML) Yes.

DK Yes. Only if the organization structure significantly changes or, regularly, every 5 years.
The information on the organization is also required when:

- 1) an accident occurs;
- 2) a new know - how is introduced;
- 3) the potential hazard of the plant is increased.

E Yes. When responsibilities are changed, data must be updated.

F Yes. Any time that the onsite emergency plan has important modifications (and responsibility sharing is an important one) this shall be communicated to the Prefect.

But the responsibilities in front of the law remains on the director of the site.

FRG Yes.

GR Yes.

IR Yes. Safety cases have to be updated every three years. If any event we would expect all organization charts, job descriptions etc. referenced in the notification to be updated on an ongoing basis.

I Yes. Every 3 years whether there are no modifications.

L Yes. Auditory organizations perform periodic safety audits to update respective responsibilities.

NL Yes, in OSR (a copy of which is supplied also to VROM).

P Yes.

UK Yes. As required by CIMAH regulation 8; other than this, current information is collected and recorded during normal inspection work and from updating on-and-off site emergency plans.

4.4. Composition and expertise of the team having performed the safety reports?

B (ML) Yes.

DK Yes. The factory itself shall be directly involved in working out safety reports, according to the guidelines supplied by the authorities.

E Yes. Personal references and experience are required as well as responsible signing.

F No. In reality the full responsibility is put to the manufacturer, even though the "attitude de danger " can be done by consultants.
The inspectors tend to increase the awareness of the manufacturer in safety matters, to encourage keeping of historical records of the reasons why particular devices do exist in the plant, to increase participation of industry personnel in the preparation of the safety report.

FRG Yes. No special requirements. But generally the large company performs the safety report by itself.

GR Yes.

IR Not specifically but our inspectors would monitor the calibre of those persons involved in drawing up the document. Regulation 14 provides that when the Central Competent Authority is not satisfied with the competence of those who draw up a report the manufacturer may be required to have a new report drawn up at his own expense by a person nominated by the Authority.

I Yes.

L Yes. In the case of Article 5, this study is performed by an specialized organization.

NL No particular requirements. However this information is known because of existing collaborations.
For ESR there is no preference.
For OSR it is preferred to be compiled by company personnel and not by consultants.

P No.

UK No. It is preferred that the company does it and to be closely involved if consultants are employed such that the report becomes transparent to the company, so that it understands implications for safety management (Para 1.1.4 of HS (R)12).

4.5. Siting of the installation, which demonstrates how the owner is aware of natural or human induced risks from outside the establishment?

B (ML) Yes. A map is required.

DK Yes. A map is required, with a scale depending on the type of the plant and of the accident.

E Yes.

F Yes. In particular, the risks of flooding, sliding, other plants, transport of dangerous materials, etc..

FRG Yes. See section 3 of this questionnaire.

GR Yes, for natural events.
For industrial risks a legislation step needs to be implemented.
In emergency plans agreement for mutual aids is required.

IR Yes.

I Yes.

L Yes. Analysed by a designated organization.

NL Yes.

P Yes.

UK Yes. This is specified in Para 3 (a) · Schedule 6.
However in general the emphasis is on assessment of hazard arising on the installation on the environs rather than vice-versa.

4.6. Siting of the installation with respect to the neighbouring land use?

B (ML) Yes. A map is required (refer to 4.5.).

DK Yes.

E Yes. A map is required containing the following information within a distance of 10 km :

- Installation perimeter;
- forests or green areas;
- lakes and rivers;
- farms;
- other residential, industrial, recreative or commercial installations;
- transport lines;
- land use in a radius of 5 km;
- hunting and fishing activities in the area;
- water sources siting, nature and uses.

F Yes. Specially regarding land planning to avoid new houses around the plant.

FRG Yes.

GR Yes.

IR Yes.

I Yes.

L Yes. For new installations, separation distances are defined. For existing facilities, negotiations are foreseen with responsables for national and regional territory disposition.

NL Yes, regarding population distribution, land use, monuments and particularly sensitivity of water courses, soil and groundwater to pollution problems.

P Yes.

UK Yes. Details are specified in para 3 (e) of schedule 6. In addition HSE has detailed knowledge of all existing and proposed land-uses in the vicinity of CIMAH installations because we advise the Land Use Planning Authorities about the safety aspects of proposed developments.

4.7. Siting of the installation with respect to particular ecological protected areas?

B (ML) Yes, if relevant.

DK Yes.

E Yes. Description of vegetal and animal life, habitat and distribution is required, including those with temporal or permanent residence, their migration periods, etc.

Previous epidemics or natural disasters that affected such areas must be described, as well as the verified and/or foreseen impact produced by the installation under analysis.

F Yes. Particular attention shall also be given to the cultural heritage, and to the aesthetics.

FRG Yes.

GR Yes.

IR Yes.

I Yes. Only general information is required. Inspectors may anyway ask for it during plant inspection.

L Yes. Ministry for Environment is represented at Seveso Interministry Committee.

NL Yes.

P Yes.

UK Yes. Paras 3 (a) and 3 (c) of schedule 6 are intended to cover the hazards to vulnerable ecological areas.

4.8. Siting of the installation with respect to meteorological conditions?

B (ML) Yes.

DK Yes.

E Yes. Data required are:

- Annual frequencies of every meteorological condition defined by wind velocity, wind direction and atmospheric stability class.

- Rain data with monthly rate, average value by month and average value for maximum and minimum monthly rate.

- Other natural phenomena as fog, snow, etc., with monthly rates and averages.

F Yes.

FRG Yes.

GR Yes.

IR Yes.

I Yes. See point. 4.7

L No.

NL Yes.

P Yes.

UK Yes. Para 5 (e) of schedule 6 refers.

4.9. Siting of the installation with respect to geological situations?

B (ML) Yes, if relevant.

DK Yes.

E Yes. Terrain and its surroundings features must be described, including topography, stratigraphy, and typology of soil and rocks, enclosing different maps in adequate scale. Aquifers in the area, until 200 mt., will be indicated, including the following data: aquifer flow, water properties and contaminants, and other aquifer properties.
Water courses in an area of 10 km will be indicated, describing their main parameters, flow patterns and contaminants.

F Yes. Specially regarding plant waste discharges.

FRG Yes. See answer to point 3.4.

GR Yes.

IR Yes.

I Yes. See point 4.7.

L No.

NL Yes.

P Yes.

UK Yes. Paras 3 (a) and (e) of schedule 6 refers.

4.10. Plan typology, adopted technology, and design standard utilized?

- B (ML)** Yes. The plant owner must specify which norms or codes he uses. Except those established by regulations, the manufacturer may use the codes and norms he prefers. Anyway there are certain rules to respect :
- It is not possible to " mix " the norms.
 - He must explain how he treats the situations not foreseen in the chosen norm.
 - In case of serious hazards, an inspector may ask for some controls more severe than those prescribed required by the norms.
- DK** Yes.
- E** No. Design characteristics are required, but not the standards used.
- F** Yes. There are different legislations which control the design standards.
Inspectors have access to all relevant documentation.
In the safety report, reference has to be made to the standards adopted, and a demonstration has to be done that the best possible design and process conditions have been chosen.
- FRG** Yes.
- GR** Yes.
- IR** Section 4b of the 5th Schedule requires, inter alia, that the manufacturers provide information to show that arrangements are made to ensure that the means provided for the safe operation of the plant are adequate. The manufacturer must therefore demonstrate that appropriate design standards have been used and any deviations must be justified.
- I** Yes. it is required in detail.
- L** Yes. There exist only a general legislation regarding these aspects. According to company convenience, normally the design and construction standards from the company's country are adopted. German standards are preferred.
- NL** Yes. All items must be described in PA and OSR.
- P** Yes.
- UK** Sufficiently detailed descriptions are required to enable proper assessment of the processes involved and

measures taken to prevent, control or minimise the consequences of a major accident.

With standard plants and common hazardous substances it may be sufficient to describe the steps taken to ensure that the plant conforms with appropriate standards eg. for LPG and chlorine conformance with HS/G34 and HS/G28 respectively (see Community Documentation Center on Industrial Risk-CDCIR). If the particular plant differs from the "standard", then the report must contain technical justifications for these variations.

With novel plant or with hazardous substances that have special problems of containment eg. HF, a more fundamental series of descriptions are needed including descriptions of the quality control procedures for material purchasing and construction.

4.11. Specific arguments supported either by calculations or experiments, for new technologies, where no previous history is available and standards are difficult to be applied?

B (ML) Yes.

DK Yes. In case of plants based on new technologies we ask for the use of the most safety and the cleanest available feasible technology.

E No.

F Yes. Examples already exist for cases in which specific requests have been made. These can also be requested through the legislation on pressure vessels. Inspectors have access to the results of any test or calculations.

FGR Yes.

GR Yes, in the near future.

IR Yes.

I Yes (some clarifications are expected) .

L Not applicable. Storage installations in Luxembourg may be considered of standard type.

NL Yes. This is the reason why P.A. is particularly difficult for new kinds of plants. Since the owner is obliged to supply very extensive documentations for the processes, he is allowed to give certain information under "secret restrictions": this will be not included into the public reports.

P Yes. It is always possible to ask new information to the manufacturer.

UK Yes. For example assumptions made in scaling up from laboratory reactions to production scale. The report must show competency in the application of predictive assessments and engineering judgement.

4.12. Plan layout description

B (ML) Yes.

DK Yes. The layout of the whole plant is required.

E Yes. A plan with scale between 1/500 and 1/5000 is required, containing:

- Reception and dispatching areas.
- Possible ignition sources.
- Pipe bridges and pipe racks.
- Storage areas and vessels.
- Process and auxiliary units.
- Drainage and sewers.
- Plant accesses.
- Natural and artificial barriers.

Partial plans are also required for storage areas and process units.

F Yes.

FRG Yes. See DIN 28004, part.1

The description of the installation shall contain data on the plant and equipment required for operation including ancillary units and equipment which must be constructed, installed and operated on near-by premises for reasons of process technology; it shall be deemed irrelevant whether the technical plant and equipment was licensed by one or several notifications.

Location

The description of the installation shall contain data on the location of the installation and of the individual parts of the installation, especially:

- site survey
- spacing of the individual parts of the installation;
- delimitation towards other installations;
- spacing with regard to other installations and buildings;
- distances from traffic routes;
- use of the areas within the danger zone around the installation which is permissible according to the development plan and actual use of the areas within the danger zone around the installation;
- other special site characteristics as far as

the required information is accessible to the operator without unreasonable expenditure.

This documentation shall, to the extent possible, consist of drawings.

Structural characteristics and design data of the individual parts of the installation

The description of the installation shall contain data on the structural characteristics and on the lay-out of the individual parts of the installation, especially:

- materials used, as far as they are of significance from a technical safety standpoint (for example with regard to corrosion resistance and strength);
- design data (e.g. working pressure, operating temperatures, volumes);
- scaffolding and desing of load-bearing parts;
- foundation;
- heights of buildings;
- size of storage and collection facilities;
- static stability (static calculations and data on soil mechanics).

Protective zones

Protective zones or any other special zonings, e.g. for areas with an explosion hazard, protective or safety spacing, etc. shall be indicated as far as they are already existing or envisaged in the installation or in its surroundings or required because of technical safety standards.

Accessibility of the installation

The description of the installation shall contain data on the accessibility of the installation, especially on:

- the escape routes within the installations;
- its connection to traffic routes ;
- the traffic routes in the vicinity which may be of significance for rescue and salvage operations.

GR Yes.

IR Yes. It is required a map of the establishment and its surrounding area to a scale large enough to show any features that may be significant in the assessment of the hazard or risk associated with the establishment. Besides, a scale plan of the establishment showing the locations and quantities of all significant inventories

of the dangerous substances.

I Yes. It is required in detail.

L Yes. it is required in detail.

NL Yes. However P & I diagrams only for crucial parts in ESR, for which the complete design must be finalized at P.A. time. Most of P & I diagrams are certainly included into the OSR.

P Yes. Description must contain enough information and a degree of detail sufficient for the authority to understand measures adopted by the manufacturer.

UK Yes. Paras 3 (b) and 5 (b) of Schedule 6 refer.

4.13. Main processes and mass balances?

B (ML) Yes.

DK Yes. We may also ask for mass balances, when the understanding of the process to a sufficient level requires it.

E Yes.

F Yes.

FRG Yes. The description of the process used shall indicate the technical purpose of the installation.

Basic features of the process used

The description of the process used shall include a description of the operational steps required to serve the purpose of the operation, especially:

- basis operations;
- chemical and physical conversions and transformations;
- on-site interim storage;
- discharge, retention, re-use and recycling or disposal of residual substances and wastes;
- discharge and/or treatment of waste gases;
- other basic features of the process, especially treatment and processing operations.

Process conditions

The process description shall include the data which are of significance from a process technology and technical safety standpoint, e.g. the pressure and temperature ranges of the successive step of the process.

In addition, any specific precautions shall be stated which must be complied with during storage, transport or handling because of the specific substance characteristics (e.g. protection from vibrations or precautions relating to the state of the ambient air, e.g. concerning air humidity).

Description of the process

Flow sheets containing the information mentioned in DIN 28004 Part 1, June 1977 shall be added to the description of the process.

For units of the installation or steps of the process which involve parts of the installation that are important from a technical safety standpoint, the safety analysis shall also include a process flow sheet containing all data mentioned in DIN 28004, Part I, No. 5.

For the description of individual parts of the installation that are of importance from a technical safety standpoint, a piping and instrumentation diagram with information selected on a case-by-case basis in accordance with DIN 28004 Part I, No. 6, may be required.

The flow sheets or added tables shall in particular contain data on:

- the machinery and equipment needed in the process as well as the main flow patterns;
- energy of energy resource;
- characteristic process conditions, such as pressure and temperature ranges;
- dimensions of the containers and pipes that may contain substances under Annex II of the Ordinance;
- characteristic parameters of state for the substances under Annex II of the Ordinance;
- basic measuring, control and regulating requirements.

The starting materials and auxiliary agents used as well as intermediate, secondary and final products shall be given. The quantities used and reacting or the throughput shall be given for the individual steps of the process.

The residual substances shall be indicated as far as they fall under Appendix II of the Ordinance or as far as substances falling under Appendix II of the Ordinance may be formed from them.

Energy supply

The energy supply system of the installation, including the emergency supply system, shall be described; the parts that may be of importance for preventing hazardous incidents or limiting their effects, shall be marked.

GR Yes. Overall and block diagrams are in report. More extensive information must be available to competent authorities at the site.

IR Yes. It is required:

- a description of the processes or storage involving the dangerous substance and an indication of the conditions under which it is normally held,

- a general description of the technological processes used at the establishment.

I Yes.

L Yes. There are only storage stations at Luxembourg, with the exception of an oxygen plant.

NL Yes in both ESR and OSR. But a special completeness is presented by the OSR in which all reactions (even the side reactions) are described. With the information contained in the OSR it may be possible to build the plant !!

P Yes, with sufficient detail to understand the measures adopted.

UK Yes. Para 3 (c) of schedule 6 refers. The process descriptions may be quite brief but would include reaction chemistry and conditions. Any side reactions would be described if they could lead to a major accident. Process flow mass balances would normally be provided.

4.14. Description and inventory of storage areas?

B (ML) Yes.

DK Yes.

E Yes. Detailed plans are required (scale 1/250 or 1/500). Besides, mechanical design specifications must be detailed (normal and total volume, temperature, pressure, dimensions, materials and different widths, heat transfer equipment, safety valves, release disposal, etc.).

F Yes.

FRG Yes. See answers to points 4.12 and 4.13.

GR Yes.

IR Yes. It is required:

- a scale plan of the establishment showing the locations and quantities of all significant inventories of the dangerous substance,

- a description of the processes or storage involving the dangerous substance and an indication of the conditions under which it is normally held.

I Yes.

L Yes.

NL Yes.

P Yes.

UK Yes. Para 3 (b) of schedule 6 refers. The scale plan of the site is asked for showing the position and inventories of dangerous substances eg. in storage, in pipelines or in process. Loading/unloading in transport are recognised as relatively high risk activities (see answer to 2.4.).

4.15. Organization of internal transports and loading/unloading facilities with involved substances?

B (ML) Yes.

DK Yes.

E Yes.

F Yes.

FRG Yes. See answers to points 4.12 and 4.13.

GR Yes.

IR Yes. Definition of "industrial activity" includes internal transport.

I Yes.

L Yes.

NL Yes.

P Yes.

UK Yes. See 4.14 above.

4.16. Hazardous potential of substances stored, processed, transported and produced?

B (ML) Yes.

DK Yes.

E Yes. Hazardous substances related data that are required include identification parameters, general properties, specific properties for flammable or toxic substances, procedures for storage and handling, emergency procedures in case of accidental dispersion, and/or fire, neutralization means, etc.

F Yes. Toxicity and safety data sheets for all substances are requested.

FRG Yes. The information required includes:

- designation;
- substance and reaction characteristics;
- state of the substances;
- quantities.

GR Yes.

IR Yes. It is required:

- a brief description of the hazards which may be created by the substances including immediate and delayed effects for man and for the environment,
- the chemical and physical behaviour of the substances under normal conditions of use in the industrial activity, and
- any other substances whose presence could have an effect on the potential hazard presented by the industrial activity.
- information relating to situations where substances may be transformed into dangerous substances in the case of abnormal conditions which can be foreseen.

I Yes.

L Yes.

NL Yes.

P Yes.

UK Yes. Paras 2 (c) and 5 (a) of Schedule 6 refer.

4.17. Auxiliary services and utilities?

B (ML) Yes.

DK Yes. The requests of information on auxiliary devices and utilities depend on the type and complexity of the plant. For very simple plant, for instance, this information is not required. The decision is taken by the local authority on request.

E Yes.

F Yes. For their significant links with environmental impact and risks.

FRG Yes. See answers to points 4.12 and 4.13.

GR Yes.

IR Yes.

I Yes.

L Yes.

NL Yes.

P Yes.

UK Where relevant in creating any condition or event which could be significant in bringing about a major accident. (See answers to 1.2 and 1.4).

4.18. Waste treatment and disposal, sewer systems and liquid effluents?

B (ML) Yes.

DK Yes, if necessary. See 4.17

E Yes.

F Yes, waste treatment and disposal have to be described to evaluate chronic pollution. France also requires information on the confinement capacity and method of treatment of polluted waters used for fire fighting during an accident.

FRG Yes. Waste treatment and disposal must be described and evaluated. Even confinement capacity and method of polluted waters.

GR Yes. These aspects are normally controlled by the Ministry for environment and also by the Ministry of Health and Agriculture for pesticides.

IR Yes. Where appropriate.
This item is particularly site dependent and we envisage close liaison with local environment authorities in certain cases.

I Yes. Information on plant facilities must be included into the Safety Report. But the question is principally dealt with by other regulations.

L Yes. Cooling of fire fighting waters is considered.

NL Yes.

P Yes.

UK Yes where relevant to an environmental major accident. Smaller releases and controlled releases are dealt with under other legislation such as the Control of Pollution Act. 1974, enforced by HM Pollution Inspectorate.

4.19. Detailed safety organization and responsibility sharing for normal and abnormal conditions, for work and maintenance permits, etc.?

B (ML) Yes.

DK Yes.

E Yes. Alarm systems and personnel evacuation are also included.

F Yes. On site, inspectors have access to operating procedures even in normal operation. The problem of work and maintenance permits (external companies working on the site, possible communication errors, no awareness of the site hazards, etc.) has been identified as a very serious one. (Lyon accident, i.e.) However, how to deal with these problems in a safety report is still open to discussion.

FRG Yes.

GR Yes. There is a legal obligation to nominate a safety engineer responding to the general manager.

IR Yes.

I Yes.

L Yes.

NL Yes. Very detailed in OSR, for which guidelines are being finalized. They will appear in short time.

P Yes. It is required to foresee possible abnormal reactions, and to describe their characteristics and control measures proposed.

UK Yes. Para 4 of schedule 6 refers. This is considered to be a most crucial part of the safety report and detailed guidance is also given in Paras 202-207 of HSR 21.

Information must be given which details the overall organization and arrangements for safety including review and revision. Matters covered should include quality assurance arrangements, operating procedures, training, management supervision, monitoring, welfare and management structure, etc. The report should give some indication of the activity within each of these elements. The report would not be considered adequate unless it included descriptions of the procedures for:
1) identification of work required to achieve the

- desired safety objectives;
- II) the establishment of standards for all of the management activities;
 - III) performance measurement to assess degree of compliance with set standards;
 - IV) evaluation of performance over time which is communicated to accountable persons;
 - V) the means to correct deficiencies in performance standards.

This part of the report (and those covered by items 4.21, 4.22 and 4.23) form a vital tool for HSE inspection of major hazard installations. Serious defects in managements organization and arrangements for safety revealed by the safety report can be remedied by inspectors taking enforcement action under the HSW Act.

4.20. Number of personnel and its location in administrating buildings, warehouses, laboratories, units?

B (ML) Yes.

DK Yes.

E Yes. Personnel distribution inside the plant and population data outside it (within 5 km) are required.

F Yes. The number of people working in administrative buildings within the installation fences is also controlled.

FRG Yes.

GR Yes.

IR Yes. (c.f. 5 th Schedule 3d).

I Yes.

L Yes.

NL Yes for OSR.

P Yes.

UK Yes. Only actually require:

- Schedule 6,3. (d) - maximum number likely to be present on the site.
- Schedule 6,5. (f) - estimate of the number exposed to the hazards.

4.21. Minimal requirements for personnel training and education with respect to the hazards presented by the activity?

- B (ML) Yes.
- DK Yes, if necessary.
- E No. Personnel training information is required, but no minimal requirements are fixed.
- F Yes. Frequency of training and the way in which the personnel is informed on the site hazards must be included in the safety report.
- FRG Yes. Every 6 months.
- GR Yes.
- IR Yes.
- I Yes. Only general information is required.
- L Yes.
- NL Yes. The P.A. can be approved as conditional to certain provisions and therefore, requirements on procedures and training can be requested.
All training is described in O.S.R.
The owner is responsible for the information of the workers.
- P Yes.
- UK Yes. Paras 4 (b) and (c) of Schedule 6 refer. See also answer 4.19 above.

4.22 1) Operational procedures for normal and abnormal plant conditions?

2) Do you require, in the safety report, a list of main parameters that must be controlled and the measures to correct their deviation?

B (ML) 1) Yes in both cases.

2) No. Only critical parameters.

DK 1) Yes. We ask for the existence of procedures, but we do not ask for their inclusion in the Safety Report. The inspectors may ask, at any moment, to look at a given procedure considered to be particularly important.

2) Yes.

E 1) Yes.

2) Yes.

F 1) Yes. It is required that all procedures be clearly laid down and easily readable.

2) Yes. Safety reports do not cover all details; but for major risks the alarms and signals available or necessary must be included. France is putting a great stress on "important parameters for safety" and "important equipment for safety". They have to be listed in the description, indicating why they have been selected and how they have been sized, demonstrating their efficiency. Inspectors have access to all kind of information and further many controls are achieved by inspections.

FRG 1) Yes.

2) Yes.

GR 1) In the safety report the procedures must be mentioned, but the information can be consulted in the plant.

2) No answer.

IR 1) Yes.

2) Yes.

I 1) Yes.

2) No.

L 1) No. Operating procedures are analysed in plant during safety audit.

2) No. Critical parameters that are controlled in plant are verified during safety audit.

NL 1) Yes. Both in P.A. and O.S.R.

2) Yes.

P Yes in both cases.

UK 1) Yes. Paras 3 (c), 4 (b), 5 (a) and 5 (c) of Schedule 6 refer. See also answers to 4.19 above.

2) Yes.

4.23. Minimal requirements for training of control room operators and field operators?

B (ML) Yes.

DK Yes. In the report the manufacturer is asked to supply this information. After that the inspectors judge if this is sufficient or not.

E No. Personnel training information is required, but no minimal requirements are fixed.

F Yes.

FRG Yes.

GR Yes.

IR Yes.

I Yes.

L Yes.

NL Yes.

P Yes.

UK Yes. Para 4 (c) of Schedule 6 refers. See also answer to 4.19 above.

4.24. Do you require to describe the degree of involvement of operators in the elaboration of normal and emergency procedures?

B (ML) Yes.

DK Yes. All situations involving safety have to be considered by the management and the staff.

E No it is not required. It is recommended as desirable for a good quality of HAZOP results.

F Inspectors are aware of the "spirit" of the operators, if they are informed and condive the reason of certain procedures.

Operators presence in the working team performing the safety report is encouraged in France.

Employees will be officially consulted by the State on normal and emergency procedures laid down by the manufacturer, before the analysis be made by the administration.

FRG Yes.

GR No.

IR Yes. Inspectors assess this area routinely in the course of regular inspection of premises.

I Yes.

L Yes. These elements are considered by the organization designated and outlined in the safety report.

NL In principle no specific requirements.

The owner must organize in such a way that the operators follow the procedures correctly. No requirements for simulators. However new plants have them for training.

Safety audits are often organized both through the OSR procedure and through conditions under which PA is accepted.

P No.

UK Yes. But good management practice would be to consult the operators when formulating these procedures.

During routine inspection HSE pay particular attention to whether operators understand the need for adherence to specified procedures, and whether the company has exercised reasonable foresight about operators taking dangerous "short-cuts", etc.

4.25. Security procedures with respect to external persons and transport means?

B (ML) Yes.

DK Yes, if necessary. If the facility presents a certain risk, as part of the emergency plan we ask the manufacturer to describe the measures taken for the safety of the external persons and transports.

E Yes. Procedures for installation access control are required. Transport access procedures are prepared by plant owner.

F These must be generally indicated (see also answers to points 3.6 and 4.19)

FRG Yes.

GR Yes.

IR Not specifically.

I Yes.

L Yes. They exist, but they are not described in the safety report.

NL Yes in OSR (for "sabotage secrets" see point 3.5.)

P Yes. Safety procedures and rules to be respected by subcontractors are required.

UK No.

4.26. Can you list the documents and drawings (with indication of the level of detail) you require on siting, plant lay-out, topography, systems descriptions, flow-diagrams, etc.?

B (ML) Topographic map indicating villages, other industries, railways, roads and airports, water courses....

General layout of the plant (1 : 1000).

Meteorological data usually provided in the form of a "wind rose" on a map.

Plot plan of Seveso equipment (1 : 200).

Block diagrams containing all information regarding dangerous substances in the different process steps.

Simplified process flow-sheets.

Management structure diagrams.

DK - MAP 1: 4000

- Plan lay-out : for instance 1: 500

- Flow-diagrams (PI diagram frequently simplified, but complete for those parts of the plant that present some risk.).

- Physical planning in the area of system descriptions.

- Topography is necessary.

- Description of safety systems (those involved in preventing major accidents).

E MAP with an adequate scale, containing the following information:

- Plan propriety limits.

- Main structures of the installation.

- Position of other industrial, residential or recreational centres in the area.

- Roads, railway lines and water courses in the area.

- Indication of any historical, archeological, architectural, cultural or social element of interest.

Demography: population distribution in a 10 km radius area, at different distances (250 m., 500 m., 1 km, 2 km, 5 km and 10 km) and for 16 wind sectors. Data should include age and sex distribution in different sectors, when available, as well as the population with cardio - respiratory problems.

Also data regarding the itinerant population should be included, in different periods of the year (days, weeks and seasons).

Transport networks within a distance of 10 km (roads, railway lines, ports, canals, etc) including some traffic references.

Sanitary installations.

See answers to points 4.6, 4.7, 4.8, 4.9, 4.12, 4.14 and 4.16.

- F Map 1: 25000 or 1 : 50000 indicating plant location. Map 1:2500 containing plant site and its surroundings until a distance equal to 1/10 of the radius established in Annex 3 (minimum value of 100 m). In this map all buildings and their destination will be included, as well as railways, public roads, bridges, channels and other water courses.
A plan 1:200 minimum, indicating plant layout, as well as, and within a distance of at least 35 m, the use of neighbour buildings and terrains and the sewers network.

FRG See answers to points 4.12 and 4.13.

GR Case by case, according to external site.

- IR - Map of establishment and surrounding area
- Site plan
- Process flow diagram or simplified P & I.

In addition specific P & I diagrams must be sought if required.

I Many plant diagrams and plans are required for all these items:

- Site plan 1:25000, including the plant, its limit and surrounding areas within a radius of 5 km. In this plan indication must be given for schools, hospitals, buildings, industries. roads, railways, highways, airports, air corridors, etc.
- Plan map 1: 2000 including the surrounding areas within a radius of 1.000 m.
- Plot plans of different plan sections (1 : 500). for significant details scale must be at least 1 : 200.
- Block diagrams indicating raw materials and products processing steps.
 - Simplified process flow-sheets, including quantitative information.
 - Meteorological information for the last 5 years.

- L - Site plan 1: 2500
- Construction plan 1:100

- Layout plan.
- Fault trees and event trees.
- Startup procedures.
- Fire fighting system description and procedures.
- Evacuation plan.

NL Photos of the sites are not obligatory.
 All the drawings available at P.A. time. These are certified (the plant must correspond to its documentation).
 The remaining documents are in OSR. Any change concerning OSR must be communicated.

P

- Topographic map 1 : 25000 of the area, indicating : villages, other industries, railways, roads and airports, water courses, high voltage lines and electrical installations, protected areas, etc.
- General layout of the plant, indicating buildings, structures, equipments, process areas, storage areas, warehouses, etc.
- Installation plan, indicating main equipment, control rooms, laboratories, energy, water and raw materials supply systems, raw materials and product storage areas and transport structures, internal roads, access points to the plant, etc.
- Process flow diagrams
- Process diagrams containing all information regarding dangerous substances in the different process steps

UK

- Ordnance survey map 1: 10000 - See paras 3 (a) and (e) of Schedule 6.
- Scale plan with location and inventories of dangerous substances (3(b) of Schedule 6).
- Plant diagrams, usually simplified piping and instrumentation drawings showing significant features (para 5 (b) of Schedule 6).
- Meteorological data, usually provided in the form of a "wind rose" on a map (para 5 (e) of Schedule 6).
- Normally also a scaled plan of the site.
- Management structure diagrams, flow diagrams and other systems information are usually also included.

4.27. Extra information

B No.

DK The extra information required differs from plant to plant, concerning all those aspects that need to be described for a better comprehension of the safety report.

E No.

F It is required to plant owners to describe the means they have to measure the consequences of an accidental pollution inside or outside the plant, either in air or water.

They are also asked which means they have to fight against these effects outside the plant (closing roads to traffic, give general/partial alarm to population and/or authorities, etc.).

FRG All the required information is detailed in the SGAR.

GR No.

IR No.

I Asks in the safety report information on company liability.

L No.

NL No.

P No.

UK No.

5. HAZARD IDENTIFICATION

The particular hazards presented by an installation can be identified by analysis of past occurrences on similar plants and/or structured systems analysis procedures. A combination of both techniques should result in a more exhaustive assessment.

5.1. Historical experience

5.1.1. Do you require that previous malfunctions in installations by the same owner are commented upon, with the lesson learned and implemented to ameliorate the concerned installation?

B (ML) Yes.

DK Yes. Previous history if available in terms of accidents occurred and measures taken to avoid recurrences.

E No.

F Yes. Historical occurrences are not however the bases of French evaluations, even if they are an important reference. French approach is more deterministic than probabilistic and source of information is the notification of incidents to the inspectors.

FRG Yes. Other regulations deal with reporting of dangerous occurrences either for workers or for the environment.

GR Yes.

IR Yes, if significant.

I Yes (see answer to item 2.2.4.). Italy is planning to implement a procedure for systematic reporting of dangerous occurrences.

L No.

NL Yes. For both ESR and OSR, even on similar plants. The normal requirement for P.A. is that the licensing authorities be informed on all abnormal occurrences, not necessarily leading to accidents. (Permit Conditional to).
Records to be kept by owner are regulated by law. (Labour Conditions Act. Art.9).

P No. It must be considered, but it is not required a recording system.

UK Other regulations dealing with the reporting of accidents and dangerous occurrences provide a complementary flow of information about events which are not major accidents.

5.1.2. Do you require that the safety report shows a sufficient awareness of main accidents, their causes and consequences, occurred in similar plants?

B(ML) Yes.

DK Yes.

E Yes.

F See answer to point 5.1.1.

FRG Yes.

GR Yes.

IR Yes. There would not necessarily be a specific section dealing with this but we would expect the safety case throughout to reflect this when appropriate. In the course of their site visits our inspectors would monitor whether personnel were appropriately aware of such matters.

I Yes.

L Yes.

NL Yes.

P Yes.

UK Yes. In so far as they are relevant to the plant in question.

5.1.3. Do you require a description of the information sources from which the historical experience has been drawn?

B (ML) Yes.

Dk Yes, if necessary.

E No. It is foreseen to develop specific data banks.

F Yes, but bibliographic references could be enough.

FRG Yes.

GR Yes.

IR No. But they should at least be referenced and made available if required.

I Yes.

L Yes.

NL Yes.

P Yes

UK No. But such information may be sought as part of discussions arising out of the report.

5.1.4. Have you established a generic or plant specific check list only based on past occurrences, against which an installation must be protected?

If yes, please supply examples.

B (ML)No.

DK No. However we give full advice to the manufacturer on how to perform the safety report.

E No.

F No. A checklist cannot be exhaustive. The fact that something has never occurred does not imply that it will not happen in the future. Checklist may be useful to guide the inspectors in analysing the safety reports.

FRG Yes. Provided by various data banks.

GR No.

IR No.

I No.

L No.

NL No.

P No.

UK Not specifically, but these matters are dealt with either via:

- a) or codes of practice/standards:
- b) or generic guidance/model cases

For example HSG 34 referred to above and GN1 "A Guide to the Writing of LPG Safety Reports" published by the Liquifull Petroleum Gas Industry Technical Association. (See CDCIR).

5.2. Systems analysis procedures

5.2.1. Do you require specific methodologies being employed for hazard identification?

B (ML) Ministry for Employment and Work requires a qualitative analysis. Ministry does not impose any method, but it must have an equivalent level to F.M.E.A. There may be exceptions to this criterium either when there are enough historical data on such plants indicating good operating records without dangerous situations or when the manufacturer can show, f.i. through DOW index method or preliminary risk analysis, that the whole installation or parts of it presents a lower risk.

For those installations presenting a particular risk, the Ministry expects that the manufacturer makes an analysis deeper than F.M.E.A. (f.i. HAZOP , fault trees, etc.)

The plant owner must supply the following information regarding the risk analysis:

- The description of the chosen method and how he has applied it.
- The composition of the team that has performed the analysis.
- The time devoted to the analysis.
- The measures taken after the conclusion of works and the destination of recommendations proposed by the analysts.

The whole analysis must not be enclosed with the safety report, but it must be available at the plant for inspection.

DK Yes, if relevant. Normally hazop is required. Other methods could be required if a certain aspect of the plant is relevant. This is possible because of the communication between authority and manufacturer during the preparation of the safety report.

E Yes. HAZOP methodology is recommended. Other techniques may be used if they meet certain acceptability criteria.

F No. It is expected that the manufacturer utilizes a systematic hazard identification procedure but the choice of the most appropriate one (HAZOP, What if, Cause-Consequence Diagrams, etc.) is free for the manufacturer, who must justify the reasons why a particular method has been chosen.

FRG Yes. See answer to point 7.1.2.

The safety analysis to be prepared by the operator according to Article 7 of the Ordinance is a documentation which must be intelligible as such, and summarize and evaluate a systematic assessment of all conditions which are of significance for the safety and security of the installation and its operation. This documentation shall only be deemed complete if it contains the information required according to Article 7, para 1, N^o. 3.2. of the Ordinance.

The information shall be sufficiently comprehensive and detailed to allow the responsible authority to adequately assess the operator's compliance with the safety obligations pursuant to Articles 3 and 6 of the Ordinance. If calculations are required for this purpose, it shall become manifest from this documentation that they have been carried out.

The safety analysis shall also provide a clear picture of the various steps of the assessment methods used for the systematic analysis of the installation with regard to the parts of the installation which are of significance from a technical safety standpoint, critical situations, the effects of hazardous incidents and safety precautions. Deterministic methods of process and regulating technology or other methods may be used, e.g. Hazop (Hazard and operability study, tabular checklists, failure modes and effects analysis (2), preliminary risk analysis (2), fault trees (3), event analysis (4).)

(2) DIN 25448 of June 1980.

(3) DIN 25424 of June 1977.

(4) DIN 25419, Part I of June 1977.

DIN 25419, Part II of February 1979.

GR Not a specific, but an appropriate one to the case under study.

IR No. But a systematic approach is required. Manufacturers must justify methodologies used.

I Yes. A mandatory screening methodology (derived from Mond/Dow and Italian toxicity indexes) is required. Other methodologies are suggested to be adopted on the identification of events, evaluation of their probability and assessment of the consequences for man and environment.

L No.

NL Yes. However the methodologies listed in the guidance note have to be chosen according to the problem.

P Yes. However, methodologies to be used are a free decision of the plant owner.

UK But their use is not discouraged. It is however necessary that every methodology that is used is transparent to the competent authority.

5.2.2. If not, what do you require to the manufacturer in order to judge whether his analysis is as complete as desirable?

B (ML) See previous answer.

DK Not applicable.

E Not applicable.

F See answer to point 5.2.1.

FRG Not applicable.

GR Any methodology provided that applicability criteria are adequate.

IR The onus is upon a manufacturer to supply sufficient evidence to support his case.

I (See 5.2.1).

L Identification methods are chosen by the designated organizations. For every potential hazard, the maximum risk is estimated with its safety radius. Generally a quantitative analysis is required for existing installations. The Seveso Committee decides eventually whether analyses are complete or not.

NL Not applicable.

P Not applicable.

UK It is for the manufacturer to define the limit of his analysis. HSE then examines the SR on an "expert multi disciplinary basis"* to see if we accept that the analysis is sufficiently comprehensive in every important aspect. If it is not action is taken to make the manufacturer improve his coverage of these issues. Usually this is done by discussions with the manufacturer but CIMAH regulation 9 gives HSE the legal power to demand this further information.

* Each report is examined by risk assessment experts and experts in chemical, mechanical, electrical, and civil engineering as well as by factory inspectors who are experts in human-factors managerial aspects of safety.

5.2.3.1. If yes, do you require that the methodology to be chosen is depending on the seriousness of the hazards involved?

B (ML) See previous answer.

DK Yes. As discussed before. Obviously, for less critical plants, a less detailed hazop may be sufficient.

E Yes. When foreseen hazards are considered relevant, quantitative analysis may be required by the competent Authorities.

F Yes. See answer to point 5.2.1.

FRG Yes.

GR Yes.

IR No. But the manufacturer must justify the methodology used as being appropriate to the risk.

I (see 5.2.1).

L Yes.

NL Yes.

P Yes. See answer to point 5.2.1.

UK No, but the manufacturers are encouraged to tailor the depth of his investigation of the risks to the significance.

5.2.3.2. Do you ask for check list methods?
Please give us examples.

B (ML) No.

DK No. Normally, we do not ask specifically for check list methods, but if the manufacturer wants to use it, he can do it but only after approval.

E Yes. It is recommended as a possible method to use.

F Not systematically.

FRG Yes. Hazop and failure mode and effect analysis (FMEA).

GR Yes, for small plants and/or small LPG installations.

IR No.

I Yes.

L No.

NL It can be used if appropriate for the case being examined.

P They are admitted.

UK No. But these are frequently used and their use is not discouraged. However it is stressed that check lists are not necessarily exhaustive.

5.2.3.3. Do you ask for ranking hazards according to fire and explosion and toxicity indexes ?
If yes, which of them?

B (ML) See answer to point 5.2.1

DK No. Normally we do not ask specifically for the use of ranking hazards according to DOW, MOND indexes. We accept, however, such an analysis if the manufacturer presents it (or he is willing to use it), but only for screening purposes (i.e. for proving that for some units it is useless to perform the Hazop because of the low level of risk).

E Yes. Toxicity:

- Pel 30 (permitted exposure limit).
- Health and safety immediate and dangerous limit (IPVS).

Thermal radiation : Continental Oil Company Indexes (1986).

Missiles and explosions: several recommendations from different Institutions.

F Such kind of indexes are not encouraged, except for chemical plants that produces many substances changing operation process weekly or monthly.

FRG No.

GR No. Ranking is required for possible scenarios.

IR No. But hazards must be ranked in some way:

I Yes. Detailed information is required in order to rank hazards (see answer to 5.2.1).

L No.

NL No. Indices are exceptions in ESR, even if some ranking is performed for QRA.

They are obligatory used in OSR, where their values trigger subsequent analysis to be performed.

P They are admitted.

UK No. But their use is not discouraged.

5.2.3.4. Do you ask for hazop analysis?

Yes for all sections.
Yes for selected sections.
No.

B (ML) See answer to point 5.2.1.

DK Yes for selected sections. Hazop is requested for the most critical sections of the plant. The selection of these sections is performed by the authority (the judgment is frequently based on experience).

E Yes for selected sections.

F Yes for selected options. See answer to point 5.2.1.

FRG Yes for selected sections (safety relevant units).

GR Yes for selected sections. It is one of the techniques required.

IR Any of these methods may be acceptable.

I Yes. It is requested for new installations. It could be useful for existing ones.

L No. There are only storage installations, relatively simple.

NL Yes for selected sections in OSR according to index values.

In ESR it depends case by case.

It is especially requested for new plants (the information otherwise is not considered to be sufficient for accepting a P.A.)

P They are admitted.

UK No. But their use is not discouraged. More importantly, the criteria for judging the appropriateness of remedial measures are required to be transparent.

5.2.3.5. Do you ask for other techniques even only at a qualitative stage (e.g. whatif, FMEA, cause-consequence diagrams, fault trees, event trees, etc.)?

B (ML) Yes. See answer to point 5.2.1.

DK Yes. FMEA for instance.
The type of technique required depends on the potential hazards presented by the section of the plant (i.e. the need to identify the behaviour of the plant in case of malfunction of one or more components or in case of human error).

E Yes. Modifications to Hazop or other alternative techniques are commented in Safety Report Elaboration Guide.

F Yes. See previous answers in this section.

FRG Yes.

GR Only in extremely dangerous situations or very important for the owner.

IR No. Manufacturers may make a case for such techniques as are appropriate.

I Yes. It is accepted as an alternative to HAZOP (see 5.2.3.4) .

L Yes. Fault trees. Even trees.

NL These techniques can be used in ESR.
OSR can ask for fault tree qualitative analysis when new plants and new techniques are concerned.

P They are admitted.

UK No. But their use is not discouraged and many form part of the report or supporting documentation.

5.3. Do you ask both for historical analysis and for systems analysis procedures?

B (ML) Yes.

DK Yes. If that is of interest in the case involved.

E Yes.

F It depends on the cases analysed. See previous answers in this section.

FRG Yes.

GR Yes. Historical analysis is required to rank the possible relevance in cumulative frequency. Hazop or FMEA are the techniques mostly required.

IR Possibly.

I Yes.

L Yes. An historical analysis of previous accidents in similar installations is required.

NL Yes.

P They are admitted.

UK Not specifically but indirectly such approaches are welcomed.

5.4. Do you ask to perform hazard identification in every plan state (e.g. normal operation, start-up, normal shut-down, anticipated transients, maintenance, loading-unloading)?

B (ML) Yes.

DK Yes, if relevant.

E No.

F Yes. All states must be considered. Even the effects of maintenance on possible transients should be described.

FRG Yes.

GR Yes.

IR Yes.

I Yes.

L Yes. Hazard identification is required only for normal operation, loading and unloading.

NL Yes for both ESR and OSR.

P Yes.

UK Yes. All conditions and events that may be significant in bringing about a major accident must be considered. Start-ups and shut-downs are recognised as periods of higher risk than normal.

5.5. Runaway/side/decomposition reaction hazards.

Since the risks of runaway reactions are hardly to be caught by systems analysis methods please give a free description of the requirements you ask the manufacturer concerning description of hazardous processes, experimental campaigns, impurity control, etc.

B (ML) The manufacturer must indicate if there is any risk of runaway reaction.

The extent of the experimental research would have to be referenced. The implications of a runaway scenario must be described. Normally a fault tree analysis is necessary in order to illustrate the relevant safeguards.

DK If runaway reactions may be suspected, the manufacturer shall take necessary steps to prevent and reduce the risk.

E No answer.

F All experimental campaigns and the procedures adopted must be justified. The safety report must give evidence that the risk has been identified and adequate measures taken to control it. Impurities control has to be specially described.

FRG The conditions that may lead to a hazardous incident (critical conditions) shall be described in the safety analysis. Critical conditions are events prompted when a danger source is becoming active. The critical conditions may also be described together with the danger source concerned.
See also points 3.2.2.1.

GR No answer.

IR Manufacturers must provide basic process details and identify potential exothermic steps e.g. polymerisations, nitrations, Grignards, etc.

Manufacturers should identify hazards as follows:

(1) HAZOP.

(2) Hazard Analysis

- Assessment of process, experimental and chemical hazards- look at process chemistry here
- thermochemistry rates of reaction, laboratory

techniques to determine reaction rates DSC, DTA, Dewar Calorimetry current techniques in reactor venting - DIERS systems - to vent or not to vent justify this.

- Assessment of consequences of a reactor explosion including risk to operators, risk to other personnel in nearest buildings, risk to the public.

(3) Fault tree analysis.

The extent of the experimental research would have to be referenced.

The extent of the campaigns carried out would have to be detailed and the quality control procedures should be also referenced.

I The owner must perform the required analysis to determine the possibility of existence of uncontrolled reactions.

L Not applicable.

NL It is necessary to rely on what the company supplies when exothermic or side effect reactions are inspected. ARC tests, impurity controls, etc., can be requested. It is a matter of experience for the inspectors who refer also to data from sources like

- Brethick (1975) in Lees' Loss Prevention, page 1080.
- Data bank DIMDI in Germany.
- NFPA guide USA.
- Process Safety Analysis (enclosed).

P The manufacturer should foresee runaway reactions, and emphasize the means to prevent them.

UK Where a major accident hazard can be perceived to result from an excursion (unwanted or uncovenanted situation) the implications of that scenario are to be investigated and the relevant safeguards described.

Any risk of an exothermic reaction leading to a major accident hazard would be covered in the process description or when describing sources of major accidents. Precautions such as venting and scrubbing systems, vessel design, etc., would be covered by paras 5 (c) of Schedule 6. The role of impurities and stabilisers would be covered together with descriptions of management arrangements for insuring safe operation of the plant.

5.6. Human factors

Please give a brief description regarding the way you ask that human factors are included into the hazard identification procedure.

- B (ML)** For Ministry safety organization and personnel training are very important. Plant owner must describe in detail how these activities are performed. He must also indicate how he communicates to personnel from external companies that perform some works in his plant the particular hazards existing in the installation. The Ministry has prepared a questionnaire based on questionnaire MORT, to examine internal organization in the company. Methods like SHARP and THERP are not used by chemical industry yet. There are some companies that have asked other external companies to audit their organization.
- DK** Only in relevant cases (risky situations) and by using the single failure criterium which is the normal procedure for the analyser.
- E** It is included as a part of Hazop technique. Not specific analyses are required.
- F** No quantification is required. The consequences of human faults shall be investigated. A particular study on human factors has been committed to C.E.A. as based on its previous experience with nuclear power plant.
- FRG** The following human actions that may endanger the safety of the installation, must be considered:
- Lacking compliance with the safety provisions under public law, with accident prevention requirements or with operating instructions.
 - Operator errors.
 - Errors made during monitoring and maintenance operations, e.g. when checking the operation of parts of the installation that are important from a technical safety standpoint, or errors made during the supply of the installation with types of fuel or energy which are of significance from a technical safety standpoint.
- GR** It can be included in Hazop or other techniques.

Operation procedures are required.

- IR We would expect human factors to be addressed as an integral part of whatever procedure is used. In any event human factors are routinely addressed in the course of routine inspections of premises.
- I It is required on the evaluation of failure event probability.
- L It is not specifically required. Only in the event trees these interventions are considered.
- NL ESR: many kinds of human errors are already included into the components failure rates. For typical human actions it is necessary to single out the appropriate datum and evaluate consequences of errors.
- OSR: qualitatively human factors are always included in Hazop. Sometimes a special hazop study has been devoted to human actions only. The systems must be tolerant to human failures. It is possible to ask for certain automatic processes. It is controlled that the control load to single operators for computer surveillance is not excessive. A special attention is given in OSR to the organization structure.
- P It is not required specifically, considering that they are englobed in applicable methodologies.
- UK Human factors should be addressed whenever appropriate when identifying possible major accident hazards. We would expect operator errors to be addressed as well as human behaviour during normal operations and in emergencies. Specific advise on how to deal with human factors is given in HSE booklet HS(G) 48 - "Human Factors in Industrial Safety" recently forwarded for the Community Documentation Center on Industrial Risk.

6. SAFETY SYSTEMS AND PROCEDURES

Internal and external hazardous occurrences identified in the previous items of a safety report should be prevented to develop into major accidents by protection systems and emergency procedures. Should these fail, then major accidents might occur which are dealt with in the next section. The questions asked in this section refer to the characteristics of preventive, protective and mitigating systems.

6.1. Do you require that in the safety report there is a detailed description of the safety criteria assumed in the design to protect equipment and buildings from:

- out of normal process variables,
 - overpressures,
 - heat radiation,
 - wind loads,
 - other internal and external random loads
- (If yes, please indicate them below).

B (ML) Yes.

DK Yes for all cases.

Other loads : for those identified by the manufacturers.
A check of safety criteria is performed for all situations identified in the risk study.

E Safety systems description is required. Safety criteria followed are not required.

F Yes for all cases.

FRG Yes for all cases. See answer to point 6.2.

GR Yes for all cases.

IR Yes for all cases. Other loads : mechanical damage due to transport, for example.

I Yes for all cases.

L Yes for all cases.

NL Yes for all cases.

P It is required to give indications regarding the safety solutions adopted at project design phase of installations, with specific regards for control and command units.

UK Yes for all cases.

Where relevant. For example, the safe shut-down of a plant may be dependent on the survival of operators in a blast-proof or positively pressurised control room. Similarly, the integrity of a bulk storage vessel may depend on it being designed to withstand certain degrees of overpressure, levels of flood or intensity of earthquake shock.

6.2. To what extent do you require that logic diagrams, interlock systems, fire fighting systems, explosion relief systems, emergency procedures, etc. are described into a safety report?

B (ML) Ministry does not ask all details. Plant owner must explain in the safety report his safety policy/philosophy, illustrating it with examples and making reference to all available documents that may help inspectors to perform their work.

DK Fully description if necessary based on the identified hazards. For complicated interlock systems the testing program adopted is required.

E Exhaustive description is required.

F A rather detailed description is required.

FRG The safety analysis must contain a description of the parts of the installation which are of significance from a technical safety standpoint. Parts of the installation that are of importance from a technical safety standpoint are:

- parts of the installation containing specific substances
- safety equipment, installations and structures,
- other parts of the installation that are required for safe operation.

The description of the parts of the installation that are of significance from a technical safety standpoint shall, in particular, indicate the:

- function,
- type and extent of strains and stresses to be expected,
- significance from a technical safety standpoint,
- specific design characteristics, to the extent they correspond to specific risks.

Parts of the installation containing specific substances

Parts of the installation containing specific substances are parts of the installation where a substance may be present or formed in significant quantities from a technical safety standpoint, especially:

- handling, processing and storage vessels (tanks, bunkers, silos),
- reactors,
- furnaces, kilns and ovens

- filters, separators, scrubbers,
- columns, distillation units,
- pumps, compressors, ventilators,
- heat exchangers, including condensers,
- piping.

Safety equipment, installations and structures

Safety equipment, installations and structures include in particular :

a) systems designed to limit the release of any substance under Annex II of the Ordinance or of substances which may form any substances under Annex II of the Ordinance, such as:

- rapid closing interlocking devices and mechanisms,
- collecting vessels,
- water or vapour screens, sprinkler systems, spraying and scrubbing systems,
- compressed-air barriers (to produce traps on water surfaces);

b) fire protection units and systems, such as:

- fire protection walls,
- traps for flammable liquids,
- stationary or mobile fire-fighting units,
- sprinkler systems for cooling purposes;

c) units and systems for the protection against the impact of explosions, e.g.:

- pressure relief systems, such as blow-down towers, expansion and relief systems
- protective walls, protective embankments.
- bunkers.

Other parts of the installation that are required for safe operation:

- machinery and equipment for safeguarding an appropriate energy cycle, e.g. pumps, compressors, control valves, switches, emergency generators,
- machinery and equipment for safeguarding appropriate mass flow, e.g. pumps, valves piping,
- Parts of the installation used for the discharge, disposal or retention of substances under Annex II of the Ordinance which may be present in the installation

during normal operation or of substances from which substances under Annex II of the Ordinance may be formed e.g. filtering and scrubbing equipment, flare systems and after-burning installations, collecting vessels, chimneys, blow-down towers, emergency expansion and relief systems.

GR They must be included.

IR The above should be described in sufficient detail to allow preliminary judgements to be made.

References should be included as to when further specific information is given.

I See D.P.C.M. The following details are generally required:

- Design standards/norms followed.
- Operating conditions and design description.
- Testing criteria.
- Availability parameters, if available.
- Quality control procedures followed during their manufacturing and installation.

L From the mechanical standpoint, the safety report describes the type, the physical characteristics of the protection and the construction code.

NL ESR requires full description of fire fighting systems, explosion protection, emergency procedures, monitoring of important equipment. The other information depends on the case.

OSR asks for more information concerning logical diagrams and interlocks even for less significant safety related items.

P Information contained in the safety report must be sufficiently comprehensive and detailed to permit the authority to perform a global, in depth and coherent assessment of plant safety aspects, including hazard identification and evaluation, preventive, protective and control measures, and workers training and information.

UK In a form, at a level, and to an extent which makes the information provided comprehensible to the Health and Safety Executive.

Only those systems fundamental to the prevention, control or minimisation of a major accident would be

covered but then a description complete enough for adequate assessment would be required with references as appropriate. For example, the design brief for an emergency shut-down system may be required with justification for the use of a Programmable Electronic Control System or the adoption of a particular maintenance regime. These are the sort of matters that would be followed up by subsequent general inspection.

6.3. 1) Is the conformance of safety systems, safety devices, safety distances, etc., to acknowledged design standards and codes of practices accepted as a sufficient criterion to allow plant operation?

2) Or do you ask for the reasons why a given design standard has been assumed by the owner as applicable to the case under investigation?

B (ML) See answer to point 4.10

DK 1) Yes. If not, we will ask for the 2nd question.
2) Yes.

E 1) No.
2) No.

F 1) No.
2) Yes. If it is considered necessary, safety audits by independent expert can be organized on the site, to verify it. The safety report could be itself examined by an independent expert.

FRG 1) Yes.
2) Yes. "State-of-the-art of safety technology" means the state-of-the-art of development of advanced process, equipment and modes of operation, which indicates the practical suitability of a measure to prevent hazardous incidents or to limit their effect. The assessment of the state-of-the-art of safety technology shall in particular be based on comparable processes, equipment or modes of operation that have been successfully proven in practice.

GR 1) Yes. When no greek standards are available, appropriate international standards are accepted, according to the case analysed.
2) No answer.

IR 1) Yes. We would expect that an appropriate recognised standard is used, onus on owner to justify choice of standard. We would not accept an obscure standard with lesser criteria or an " a la carte " approach choosing lowest elements of different standards.
2) Yes.

I 1) No.
2) Yes. During inspection and for certain cases it may be required to justify why an specific standard was chosen.

- L 1) No.
2) Yes.
- NL 1) Yes, i.e. API standard 520 or DIERS por relief systems.
VDI norms for dust explosion
2) No. The licensing authorities know the applicable standards.
More information and arguments are requested when runaway reactions are of concern.
- P 1) Yes.
2) Case by case.
- UK 1) Yes.
2) Yes.

Sometimes, in both cases. Well established criteria tend to requi re less further justification (see previous answers). In most cases the fitness of a particular standard, whether international, national, industry or legal would be obvious. If it is not obvious then justification would be required.

- 6.4. Do you ask for quantitative availability targets (as obtainable either by historical data or by a reliability analysis) for certain particular significant safety systems?.
- B (ML) No. However, the manufacturer may invoke his own or other companies experience to justify the safety system he has chosen. This experience must be documented and available for inspectors.
- DK Yes. Only for systems involved in major accidents.
- E No.
- F No quantitative targets. However, it is possible to require special redundancies, diversity and reparation for particularly significant safety systems. Besides inspectors can impose that important equipment for safety be sized on quantitative criteria, i.e., resist to overpressures of " X " mbars, to a radiation level of " Y " kw/m², etc..
- FRG No. However, the reliability of safety and control systems must be described, for instance, through :
- Indicated equipment whose reliability is certified (according to the meaning of D.I.N. 40 042) .
- Use of fail-safe devices.
- Redundancy, diversification, independence of multiple redundant components, tests at regular time intervals.
- GR No.
- IR No.
- I Yes. Only at informative level. The inspector may ask for it during safety review and audit.
- L Yes. Quantitative evaluation of systems reliability is based on historical data for pipelines and on reliability analysis for BLEVE.
- NL Yes, sometimes. But the targets are at the discretion of the licensing authorities. (There is a tendency to move to a quality class concept - CEN).
- P No.
- UK No. Not specifically, but their use is not discouraged; and such information may be sought additionally, as part of on-going inspection procedures.

6.5. 1) Do you ask for selected special inspection and testing for particularly significant components (e.g. relief valves, emergency diesel generators, piping and vessel corrosion, possible leak points)? To what extent should these procedures be described into a safety reports?.

2) Do you ask for frequency and items to inspect?

B (ML) 1) Yes. Certain components (pressure vessels, relief valves, electrical equipment...) are subject to inspections according to special regulations (Steam Boiler Law).

2) Procedures should be described in general terms. Ministry does not ask all details (see also answer number 62).

DK 1) Yes. If not already covered by existing regulations (i.e. pressure vessels regulation) these problems are discussed with the authority, who requires that procedures for testing particular significant components be sufficiently described.

2) No. Not explicitly required because it is part of the maintenance program of the factory, which is always required.

E 1) No.
2) No.

F 1) Yes. Certain components (pressure vessels) are subjected to inspections according to special regulations covering particular aspects.

2) Yes. An internal inspection plan is generally proposed together with the safety report by the manufacturer.

FRG 1) Yes.

2) Yes. The following measures are required:

Monitoring and surveillance, maintenance

- Monitoring of the operating parameters that are important from a technical safety standpoint, using measuring devices in the process control station or in the unit concerned;

- Surveillance of the parts of the installation that are important from a technical safety standpoint, e.g. by marking rounds or providing for remote control;

- Monitoring of the services that are important from a technical safety standpoint (e.g. electricity, steam, instrument air, cooling water, deactivating agents);
- Maintenance at regular intervals.

Maintenance and repair work

- Type of maintenance and repair work;
- Generally accepted rules of technology applied.

GR 1) Yes. According to standard specifications, but not on probabilistic criteria.
2) No answer.

IR 1) Yes.
2) Yes. Procedures should be described in general terms and detailed procedures should be referenced. Frequency of testing should be given and reasons for deciding on frequency.

I 1) Yes. Some components are subjected to inspection according to other laws.
2) Yes. The manufacturer shall provide the data of test frequency. See answer to point 6.2

L 1) Yes. Periodic testing are mandatory by law for pressure vessels.
2) Yes.

NL Yes for both questions. Either because frequencies are established by special regulations. (f.i. Steam Boiler Law) or because it is determined by quantitative reliability studies (f.i., crack propagation rate).

P Yes for both questions.

UK 1) Yes.
2) Yes.

Some pieces of plant will be subject to statutory tests and examination. Others will be subject to a system of periodic checking and testing established by the firm. The report may summarise and refer to site standards, but it is for the manufacturer to justify that his inspection periods are adequate, etc. Often such periods are established by published codes or by existing industry custom and practice.

6.6. 1) Do you ask information on the location of automatic detection systems for toxic or flammable substances if these are present?

2) Have you criteria or technical guidance notes to require installation of automatic detection systems?

Please supply us with existing technical rules.

B (ML) 1) The manufacturer must describe how he detects releases of flammable or toxic products. If there is a detection system, he must supply a plan indicating detectors lay out and explain what criteria he used for design.

2) Ministry has no directive or norms to recommend or impose for these systems.

DK 1) Yes. A scheme of the detection systems is requested.

2) No. There are institutions that can supply, as a technical service, guidance on this problem.

E 1) Yes.

2) No. It is under study by Technical Committee for Chemical Hazards.

F 1) Yes.

2) No. The manufacturer shall explain the criteria adopted.

FRG 1) Yes.

2) Yes. It is decided case by case.

GR 1) Yes.

2) No.

IR 1) Yes.

2) Yes. In some cases: e.g.

I.S. 3216: 1988 Code of Practice for the Bulk Storage of Liquefied Petroleum Gas

I.S. 3213: 1987 Code of Practice for the Storage of LPG Cylinders and Cartridges. (Published by the National Standards Authority of Ireland, Dublin 9, Ireland).

- I** 1) Yes.
- 2) No. The manufacturer shall explain the criteria adopted.
- L** 1) Yes. Automatic detection requirements depends on the case analysed.
- 2) No.
- NL** 1) Yes.
- 2) No.
- P** 1) Yes.
- 2) No.
- UK** 1) No. Not in the report, but inclusion of such information is not discouraged.
- 2) No. Not normally, but some guidance exists (HSE, trade, technical association publications, etc.), eg Health and Safety at Work Guidance note CS1 "Flammable Gas Detectors".
- In general it is for the manufacturer to demonstrate that his plant is "fit for purpose" and that accordingly the detectors, etc., are properly located for early detection of significant releases.

- 6.7. Is a particular section of a safety report devoted to the description of protective measures against domino effects?
- B (ML) The manufacturer must describe the preventive and protective measures taken against hazards coming from neighbouring plants.
- DK Yes.
- E Yes. It is not a special section, but information regarding domino effects is required.
- F Of course. Domino effects shall be discussed in the safety report.
- FRG Yes. Many sections of the safety report must consider this problem, not mentioning it specifically as domino; but it is included in the general sense of effects.
- GR Yes.
- IR No. But domino effects within the installation would have to be addressed.
- I Yes, they must be considered and the preventive/protective measures against them described.
- L Yes.
- NL Yes.
- P It depends on the case analysed.
- UK No. But such hazards should be addressed where relevant.

6.8. When the plant is provided with a secondary containment (e.g. for runaway reaction quenching or avoiding toxic and flammable substance release), do you ask in the safety report for design criteria, availability studies and description of final safe disposal of the contained substances?

B (ML) Yes.

DK Yes.

E No.

F Yes.

FRG No.

GR Yes.

IR Yes. Should be summarised with reference to detailed specification.

I Yes. Detailed analysis could be requested during safety review.

L Not applicable.

NL Yes, in P.A.

P Yes.

UK No. But inclusion of such information is not discouraged, and in any event may be sought as part of the inspection procedures by HSE.

6.9. Do you require measures to avoid that non-major emergencies lead to release of pollutants or toxic substances into water courses, without any treatment?

B (ML) Normally only the major malfunctions are part of the safety report.

DK Yes. If this can occur.

E Yes. Analysis of these emergencies is required as well as protective measures foreseen to minimize damage. No specific protective measures are required.

F This part is rather a grey area between environmental impact study and the safety report. Normally only the major malfunctions are part of the safety report, being the chronic ones part of the environmental impact report. But it is treated in one or the other.

FRG Yes.

GR Yes. There is legislation regarding major events for pesticides. There are strict regulations concerning accidents with oil releases on the sea.

IR No. These measures are dealt within legislation implementing other Directives and enforced by D.O.E.. Appropriate liaison would be carried out with local authorities responsible for routine environmental monitoring to determine what would in fact be regarded as a major accident in the context of a particular installation.

I Yes. Design criteria to reduce the effects of hazardous substances must be described.

L Yes.

NL Yes, either in P.A. or in permit from water authorities. No escape possibility, more probable is duplication.

P No. However these aspects are considered during licensing period and along controls of industrial production.

UK No. This may be required by other legislation, not based upon directive 82/501/EEC. (See previous answers).

- 6.10 Do you require availability targets for effluent treatment systems? Are these targets depending on the particular water basin into which the plant may discharge?
- B (ML) No. This is taken into account for the waste water discharge permit.
- DK No. The targets depends not only on the particular water basin, but also the substance involved and a pipeline can be connected to the effluent system and even through an aquarium.
- E No. These matters are managed by specific organizations like General Direction for the Environment, Nuclear Safety Council, etc. These normatives determine acceptable thresholds for every case.
- F The same inspection deals with emissions in water and/or air, so that no different policies exist. Norms for emission limits are to be respected all the time including during accidents. Courts have decided that even during accidents plant owner must respect the rules.
- FRG Yes.
- GR No. It is controlled by the Ministry of Health.
- IR No. This area is dealt with by the Department of the Environment in the context of other Directives.
- I No.
- L No.
- NL Yes, under the water pollution act.
- P No. These aspects are covered along industrial effluent licensing period.
- UK No. But other anti-pollution legislation may address such issues in some cases- see previous answers.

6.11. Is the on-site emergency plan an integral part of a safety report? Do you require that such a plan be tested in the presence of authority inspectors?

B (ML) Yes. The plant owner must describe how he conceived the internal emergency plan. Ministry asks for this plan to be tested. It is not required inspector presence to perform the test, but he has the right to attend to it.

DK Yes. The on-site emergency plan is part of the safety report. The test of the plan can be done in the presence of an inspector in some cases, where particularly dangerous plants are of concern.

E Industries affected by articles 3 and 4 of the Directive 82/501/CEE must have them available. Those affected by article 5 must prepare an internal plant site emergency plan.

F Yes. The on-site emergency plan (Plan de operation interne) is done by the plant owner and it is included in the safety report. Normally the on-site emergency plans are tested in presence of the inspectors. There is a trend to include in the test even the immediate region external to the establishment in order to ensure the link between internal and external emergency plans. The manufacturer is also in the best situation to provide the first external interventions.

FRG Yes.

GR Yes.

IR No. It is a separate document. Such plans are monitored by the Industrial Inspectorate and monitoring could in some cases involve a test in the presence of an inspector.

I Yes. Inspectors Auditors may ask for an emergency plan test with their presence.

L Yes.

NL In ESR/PA a statement about its existence is required. OSR contains only a summary. It is secret because of sabotage risks. Fire brigades are mostly present when it is tested.

P Yes. It is not required the presence of the authority.

UK

No. A summary of the plan is required (see para 5(d) of schedule 6). Preparation of an on-site emergency plan is required by CIMAH Regulation 10 but there is no requirement to submit a copy to HSE. However this is usually done in practice. Inspectors will be involved in assessing that the plan is adequate and may well be present during tests as part of routine duties. Alternatively an inspector may be present during a review of a test by the company and emergency services.

6.12. Under which circumstances do you consider that items 1 to 6 are sufficient for a safety report, so that no further accident scenario analysis is required?

B (ML) Sections 1 to 6 cover most application fields of royal decree of 6 November 1987.

DK We have not enough experience to answer to this difficult question.

E Whenever that initial plant features and external plant conditions do not change significantly.

F Never, for there is no zero risk : analysis of accident consequences for even the worst conditions must be performed.

FRG If the requirements of the SGAR are fulfilled there is no further accident scenario analysis necessary (deterministic approach, the probability of a public hazard must be zero).

GR No.

IR Do not foresee any circumstances in which these items alone would be considered sufficient.

I Necessary and sufficient information are those required in DPCM 31/3/1989.

L No answer.

NL Never for ESR.
Normally OSR does not include consequence calculations, excepting the adequacy of the flare capacity, the protection of control room operators from heat radiation and toxic releases.

P Never.

UK When the information package provided is deemed by HSE:

(a) to satisfy the information requirements detailed in schedule 6 including proper assessment of the consequences of possible major accidents; and

(b) to satisfy any additional needs of the competent authority to allow it to discharge its relevant functions, i.e. to judge that the precautions and control measures on the plant are adequate.

7. ACCIDENT SCENARIOS

7.1. Do you recommend the study of accident scenarios according to a probabilistic criterion? Generally? Or in selected cases? Which ones?

B (ML) The Ministry asks for a qualitative analysis only.

DK Yes. In cases involving large quantities of toxic materials. We do not ask for a preliminary spectrum of criticality of events.

E Not in general. Only when competent authorities consider that external hazards recommend it.

F No. All accident types must be analysed, even the worsts.

FRG No.

GR No.

IR Yes, in selected cases. It may be useful in eliminating further consideration of highly improbable events. Useful for making comparisons and putting risks into context.

I Yes. It is generally required a probabilistic analysis of incident scenarios.

L Yes. For L.P.G. storage and oxygen storage, a probabilistic analysis is required.

NL Yes

P No.

UK No. The information about major accidents in Article 5.1. refers to all events with a potential to injure people seriously (several), on or off-site, or to cause serious damage to an eco-system. This could include events ranging from relatively likely but moderate consequence events which have the potential to escalate (eg leaks from joints in pipe-work) up to extremely unlikely but massive consequence events such as catastrophic failure of a liquid gas storage tank. The safety report must address a representative range of this spectrum of accident severity in order to show that the precautions taken are adequate.

7.1.1. 1) If yes, do you accept a cut-off rule for low probability events?
If yes, which thresholds?

Do you recommend particular data bases?
If Yes, which ones?

B (ML) Not applicable.

DK 1)No. The question is at the moment being considered.
2)Some data bases are referenced in our risk guideline, but not recommended. (i.e. FACTS, OREDA, API, EUREDATA).

E 1)No.
2)Yes. CHAFINCH, FACTS.

It is foreseen to develop a data bank containing:
- Accidents occurred;
- Plant, system and component reliability;
- Hazardous properties of substances.

F Not applicable.

FRG Not applicable.

GR Not applicable.

IR 1)No specific cut-off point.
Would expect manufacturers to justify what they claim are acceptable levels with reference to probabilities of other events.

2)No answer.

I 1)No.

2)No.

L 1)No. Assessment results are analysed by Seveso Committee members. All events are considered, included those with very low probabilities.

2)No.

NL 1)No, except those normally generated by numerical approximations.

2)No. Mostly data are those usually accepted from standard collections, TNO experience, safety database.

P Not applicable.

UK No.

1)In general we believe it would be counter productive to set a specific cut-off level: firstly because QRA are rarely capable of identifying all possible routes to the top event; secondly setting such a level would make it a target which many manufacturers would waste resources trying to prove that their plant met, instead of showing that further risk reducing measures were not reasonably practicable (ie worth the extra cost involved).

2)We try to encourage the widest possible use of the most appropriate databases, including a manufacturers own database constructed from his own accident plant failure and routine test reports. Accordingly we expect industry to make use of the data which they consider most appropriate, and to justify their use of this data and judgements they have made in using it.

7.1.2. If not, on which basis do you accept the scenarios proposed by the safety reports?

According to historical events?

According to a qualitative ranking of the importance of the mal-functions identified in the hazard identification study?

According to

- "the worst possible case"
- "maximum credible accident"?

B(ML) Maximum credible accident (worst reasonably foreseeable accident).

DK See answer to point 7.1.1.

E No answer.

F Different cases are fully evaluated. Scenarios found on past accident occurrences must be considered. Particularly relevant are two scenarios : a maximum credible scenario or reference accident and the worst possible case (envelope scenario).
- The reference scenario is assumed as basis for the physical planning and the evaluation of safety distances.
- The envelope scenario is taken into account for the external emergency plan .
Examples: for toxic substance storage, the "envelope scenario" is defined as that corresponding to the guillotine break of the maximum penetration into the containment; automatic valve is supposed to fail to close: the release continues until manual isolation is possible. The worst case is the rupture of the vessel. The same considerations apply to underground L.P.G. storage; however in this case, after the release, ignition and explosion processes are considered. The "envelope scenario" can be the break of the whole containment instantaneously. For L.P.G. spheres the B.L.E.V.E. of a sphere is considered as an envelope and reference scenario. France does not favour cut-off rules to be used to neglect some accidental scenarios with possible very serious consequences. Consideration of these extreme cases results in safety measure improvement for industry.

FRG See answer to point 5.2.1.

Information must be given on the potential effects of credible hazardous incidents (i.e. those which correspond to the possible loss of the built barriers) . The loss of more than two passive, or of more than 3-4 active barriers is considered to have probability zero. The estimation of the consequences of the corresponding scenarios must demonstrate that there is no public hazard.

Scenarios proposed by the safety report must be based on the following statements.

Danger sources are conditions or events that may give rise to hazardous incidents.

The safety analysis shall describe the internal danger sources, the external danger sources and the actions of unauthorized persons.

It is not required to include all thinkable danger sources but only danger sources that cannot reasonably be excluded. Practical experience is of particular significance in this context, the following criteria being of particular importance:

- the general state of technological and scientific knowledge;
- experience gained with similar-type installations;
- calculations, assessments or transfer of knowledge to the case in question.

When considering the obligations ensuing from Article 3, para 1 of the Ordinance, it may, as a rule, be excluded:

-that various independent external sources, such as earthquakes and flooding, will act on the installation at the same time;

-that substances which can only form a substance under Annex II of the Ordinance in case they react with each other will be released simultaneously and independently.

The description of the danger sources shall not consider any measures taken to prevent hazardous incidents.

The responsible authority shall assist in making the required detailed description possible if the operator of the installation is unable to acquire the knowledge needed for the description.

Internal danger sources

a) Internal danger sources include any potential failures and breakdowns resulting from the characteristics of relevant parts of the installations or from error functions, such as:

- mechanical failure of walls, e.g. as a consequence of corrosion;
- breakdown of machines, e.g. pumps, compressors, ventilators, agitators;
- failing energy supply, e.g. electricity, instrument ;
- failure of measuring, control or regulating devices for pressure, temperature, filling level, quantity, concentration, retention time, etc.;
- disturbed supply or discharge of thermal energy;
- unintended energy supply, e.g. frictional heat, heating of revolving parts;
- leakages;
- plugging, e.g. of blow-out or expansion lines;
- accidents during internal transport operations.

b) Internal danger sources also include actions endangering the safety of the installation, such as:

- lacking compliance with the safety provisions under public law, with accident prevention requirements or with operating instructions;
- operator errors;
- errors made during monitoring and maintenance operations, e.g. when checking the operation of parts of the installation that are important from a technical safety standpoint, or errors made during the supply of the installation with types of fuel or energy which are of significance from a technical safety standpoint.

External danger sources

External danger sources are:

- neighbouring installations;
- neighbouring transport facilities (road traffic, railway, water);
- conditions or events that are due to natural site characteristics;
- provided they imply an increased risk to the safe operation of the installation,
pursuant to a) to c).

a) Not only immediately adjoining installations shall be regarded as danger sources, but also installations at a greater distance if the installation under review is within the danger zone of any of these installations. Only such installations shall be deemed to fall under this category which may cause danger through explosion, vibrations or the release of acutely toxic substances.

b) Neighbouring transport facilities (road, railway, water) shall be considered as sources of danger if the increased risk is due to the traffic conditions in the vicinity of the installation (e.g. traffic density, traffic routes, type of transports, weather conditions). These conditions are, as a rule, fulfilled in the following cases:

- fuel or gas wharfs at Federal waterways;
- shunting stations for tank wagon,
- traffic areas of large-scale fuel depots or corresponding filling stations;
- internal roads, including access roads where flammable gases or liquids are transported and loaded or unloaded.

c) Conditions or events that are due to natural site characteristics shall include:

- flooding, flood waves or tidal waves if the installation is located in an area which, as several years of experience have shown, may be deemed to be endangered;
- landslides or subsidence if the installation is located in a mining area ;
- earthquakes if the installation is located in a seismic area as defined in DIN +) 4149, Part 1 of April 1981.

Actions of unauthorized persons

"Unauthorized persons" shall be deemed to be especially those persons who acquire illegal access to the area of the installation.

Dangers caused by persons who act on the installation from outside with the intention to destroy shall only be considered if the parts of the installation that are of significance from a technical safety standpoint are particularly accessible to such actions.

GR

According to historical events. The other alternatives are evaluated case by case depending mainly on the site.

IR There may be combinations of the above depending on the particular case.

I Yes, according to historical events as a part of the identification process.

Yes, according to a qualitative ranking of the importance of the identified malfunctions as a part of the identification process.

According to - "the worst possible case". For the installations which are subjected to the declaration obligation.

No criteria are established, even though these elements are all considered.

L According to - "the worst possible case" Yes.
- "maximum credible accident" No.

Most unfavourable cases must be considered, i.e. a B.L.E.V.E. on the rupture of oxygen vessel.

The B.L.E.V.E is evaluated considering the maximum possible level in the vessel.

NL Not applicable.

P According to a qualitative ranking of the importance of the malfunctions identified in the hazard identification study.

UK According to historical events? Neither yes nor no.
According to a qualitative ranking of the importance of the malfunctions identified in the hazard identification study? Neither yes nor no.
According to - "the worst possible case" Neither yes nor no.
- "maximum credible accident" Neither yes nor no.

See previous answers: we expect the scenarios to be chosen to reflect the whole range of possible major accidents. Where explicit quantification is used to support conclusions about the adequacy of precautionary measures, the source failure rate data should be referenced and any adjustment of the data to take account of site specific factors should be explained and justified.

- 7.2. For which scenarios do you require the information to be used in an off-site emergency plan?
- B (ML) Maximum credible accident.
- DK Reasonable accident to be expected.
- E For most probable scenarios the maximum credible accidents are hypothesised and consequence analyses are performed for every case.
- F See answer to point 7.1.
- FRG The safety analysis shall contain data on the effects that may result from hazardous incidents. The description of the effects of hazardous incidents serves the purpose of assessing whether the operator has taken adequate precautions to limit the effects of hazardous incidents as much as possible - (Article 3, para. 3 of the Ordinance).
- GR The maximum credible accident. The effects of any hazardous incident that are of relevance for disaster control planning shall also be described. In case any hazardous incidents may take different forms (release, formation, ignition or explosion of a substance under Annex 2 of the Ordinance), each of these forms shall be described. When describing the effects of hazardous incidents, the precautions taken in the installation to limit the effects of hazardous incidents may be allowed for.
- IR The off-site plan should focus on the most probable scenarios but should be capable of being extended to deal with the most extreme scenarios.
- I No specific criteria are required to the manufacturer.
- L Most unfavourable case.
- NL External emergency plans are responsibility of the Ministry of Interior Affairs. At the moment, there is no precise regulation. For the ESR now available, there will be a judgement of all scenarios against their frequency, specially regarding their preparedness.
- P All are considered
- UK Off-site emergency planning is a separate legal duty under CIMAH Regulation 11. Under this regulation the

manufacturer must provide the planners with information about the consequences of a range of major accidents with significant off-site effects. The accidents selected must be representative of all possible major accidents which could occur on the site.

It is expected that detailed off-site emergency plans would be based upon the consequences of the "worst reasonably foreseeable" accident, eg full-bore failure of a large diameter liquid pipeline.

7.3 Do you require analysis of consequences of accident scenarios with effects confined within the establishment site?

B (ML) Yes. These are essential for the purposes of on-site emergency planning.

DK Yes.

E Yes. But not only these cases.

F Yes. They also include advice of work inspectors (and fire brigades) especially for chronic risks.

FRG Yes.

GR Yes.

IR Yes. External effects must also be considered.

I Yes.

L Yes.

NL No. ESR is directed to outside risks. However the risk contours give indications to the OSR authorities even for risks to workers.
At the moment the problem of the acceptability of risk for workers has not been arisen (voluntary vs. involuntary risk).

A mean value for workers is about 3.10^{-4} / year.

P Yes.

DK Yes. These are vital for the purposes of on-site emergency planning, and a means of demonstrating the adequacy of prevention control and mitigation measures.

7.4. Do you recommend specific models and computer codes for evaluating effects of fire, explosions and toxic substance dispersion?

B (ML) No for the moment.

DK No.

E Yes: TNO models. If other codes are used, references showing experimental validation are required.

F No. It is always duty of the manufacturer to justify models and assumptions. But the Authority has its own computer models to verify the results.

FRG No. Prerequisite is that computer codes are acknowledged. For toxic substance dispersion see VDI-Richtlinie 3783, part 1 and 2, where the main features and parameters to be used for a Gaussian dispersion model are presented.

GR No.

IR No.

I No. The manufacturer must give arguments.

L Yes. The designated organizations use
- Technica codes "WHAZAN";
- T.N.O. models;
- E.D.F. models.

NL No.

P No.

UK No. But we expect those used to be referenced, or if they are not publicly available we require the manufacturer to provide sufficient information for us to assess them. That is, we do not accept "black-box" outputs.

7.5. If not, do you require arguments, i.e. validation by test or comparison, supporting the models and the assumptions performed in the safety report?

B (ML) Yes.

DK Yes.

E See answer to point 7.4.

F Yes.

FRG Yes. See answer to 7.4.

GR Yes.

IR Yes.

I Yes.

L Not applicable.

NL If new models are used, strong arguments and comparisons must be supplied to let them be accepted.

P Yes, justifying the options selected.

UK Yes. See above.

7.6. For which meteorological conditions do you ask consequence evaluations?

- B (ML) The conditions selected are a matter for the manufacturer.
- DK The most probable ones? Yes.*
Selected defavourable conditions? Yes.*
A probabilistic average? No.
* 2 scenarios are used: F2 and D5 with the most probable wind direction.
- E The most probable ones? No.
Selected defavourable conditions? Yes.
A probabilistic average? Yes.
- F For the envelope scenario the most defavourable conditions (i.e., for toxic releases a wind speed of 3 m/s). No probabilistic approach is mandatory.
- FRG The most probable ones? Yes.
Selected defavourable conditions? Yes.
A probabilistic average? No.
- GR The most probable ones.
- IR Each as appropriate.
The most probable ones? Yes.
Selected defavourable conditions? Yes.
A probabilistic average? Yes.
- I The most probable ones? Yes.
Selected defavourable conditions? Yes.
A probabilistic average? No.
- L The most probable ones? Yes.
Selected defavourable conditions? Yes.
A probabilistic average? No.
Most probable meteorological conditions are (D,5) and most unfavourable (F,2).
- NL Six weather cathegories together with 12 wind directions (site depending) must be considered.
- P For the most probable ones.
- UK The most probable ones? Neither yes nor no.
Selected defavourable conditions? Neither yes nor no.
A probabilistic average? Neither yes nor no.
The conditions selected are a matter for the manufacturer, but we expect at least both Pasquil (D, 5) and (F, 2) to be included.

7.7. Do you ask for evaluation of damages to public and properties?

B (ML) No answer.

DK Yes. In some specific cases only.

E Yes. A vulnerability study for personnel and property is required through probit equations.

F Yes.

FRG It has to be demonstrated that no public hazard can occur.

GR No answer.

IR Yes.

I Yes. Mainly for public damage.

L Yes.

NL For public yes.
For properties not yet in a quantitative way.

P Yes.

UK Yes.

7.8. Which consideration must be given in the safety report to environmental damages?

B (ML) No answer.

DK Toxicity short and long term impact.
Ecotoxicity short and long term impact.

E No answer.

F Description of accident effects on water and soil must be included.

FRG Description of eventual damage to bodies of soil, water, stocks of fauna and flora must be included.

GR A description of accident effects on environment is required.

IR Appropriate consideration must be given.

I Environmental consequences must be included in the accident analysis.

L Description of damage to environment remains very general.

NL Qualitative assessment for water, soil, groundwater and air pollution.

P Effects on air, water, soil, subsoil and eco-systems must be considered.

UK The manufacturer must address all significant, relatively long lasting (but not necessarily irreversible) damage to crops, plants or animals or contamination of land or water arising from a single event (i.e. not chronic pollution effects). In deciding what is significant the manufacturer must take account of the extent of the damage or contamination, the toxicity of the substance released to flora and fauna, its persistence and its ability to disperse throughout the environment. In preparing the report the manufacturer is encouraged to consult widely with the relevant environmental organizations and agencies, e.g. the local water authority and the regional office of the Department of the Environment. Similarly in assessing the report HSE consults with these environmental agencies.

7.9. Do you recommend particular vulnerability models to be used?

B (ML) No answer..

DK Yes. In some cases we require use of probit equations. We also supply the coefficients of the probit.

E Yes. Probit models are required.

F For toxicity the IDLH criteria are generally considered. Levels have been defined for overpressure, thermal radiation (Eisenberg's curves) and doses of toxic substances, when information is available (probit equations).

FRG No.

GR No.

IR No.

I No.

L Yes. According to the designated organization criteria.

NL No.

P No.

UK No. We expect those used to be referenced. Where non-published models are used they must be supported by sufficient information to enable them to be validated.

7.10 Do you ask for an overall recomposition of risk in terms of risk contours?

B (ML) Not applicable.

DK Yes. Only in some cases in order to define emergency plans.

E Yes. Zone classification based on hazard intensities is required.

F No.

FRG No.

GR No.

IR No.

I No.

L No. Risk contours are defined by the maximum potential risk. In certain cases, individual risk for population is represented as isorisk curves.

NL Yes.

P No.

UK No. But this occasionally happens although we do not encourage it because:

I) SR are rarely based upon full quantified risk analysis.

II) The variety of models and criteria used would make comparison meaningless, or worse still misleading.

Note: HSE carry out QRA of CIMAH installations for land use planning purpose using its own models and criteria and information contained in the SR may be used for this purpose.

7.11. In such recomposition which consideration is given to domino effects?

B (ML) Not applicable.

DK Not applicable.

E According to the possibilities.

F Not applicable.

FRG Not applicable.

GR Not applicable.

I Not applicable.

IR Not applicable.

L Not enough knowledge is available to permit a definite answer to this problem.

NL Domino effects should be included into the frequency calculations.

P Not applicable.

UK Not applicable.

7.12. Do you ask for frequency/expected fatalities curves?

B (ML) Not applicable.

DK Yes. In some particular cases considered necessary by the authority.

E Yes, based on probit analysis.

F No.

FRG No.

GR No.

IR No.

I No.

L Yes. For L.P.G. and oxigen storage instalations, collective risk curves were estimated (probability as a function of the number of victimes: Netherlands approach).

NL Yes.

P No.

UK No. See 7.10 but we do get them.

7.13. 1)If yes, do you allow any credit to the existence of emergency/evacuation procedures?

2)If yes, do you establish some time limit after which it is supposed that all endangered people have been evacuated? (This time limit should be used as maximum exposure time in consequence evaluations)

If yes, which are the values or criteria established?

B (ML) No answer.

DK 1)No.

2)No answer.

E 1)Yes.

2) Yes, thresholds values published by NIOSH/OSHA for toxic vapours/gases.

For overpressures (30 KPa) or impulse (25 KPa.s) and for thermal radiation (5 Kw/m).

F No answer.

FRG Not applicable.

GR Not applicable.

IR Not applicable.

I Not applicable.

L 1)No.

2)No answer.

NL 1)Yes, if these emergency procedures are available. Otherwise is a matter of judgement whether 1/2 hour or 1 hour exposure to toxic releases has to be hypothesised.

P Not applicable.

UK Not applicable in view of answer of 7.12. However, in its own QRA for land use planning HSE does allow for the effectiveness of emergency response and emergency planning, and our criteria for making judgements about these matters are published.

8. OTHER GENERAL QUESTIONS

8.1. If you require probabilistic analysis, have you fixed acceptability limits? or do you use the probability information as a further element in your judgement without normative values?

B (ML) No answer.

DK We use probability information in our judgement.

E No acceptability limits have been adopted. They are considered as an additional element for judgement.

F Element of judgement only.

FRG Not applicable.

GR No.

IR Manufacturers are not given any target in the event of their electing to use probabilistic methods but must make a case for whatever level they nominate.

I Probabilistic analysis is required, without being established acceptability limits. Information obtained with probabilistic analysis is used as a further element during the auditing phase.

L Dutch criteria regarding unacceptable risk are considered. These results are then interpreted by Seveso Committee.

NL Yes.

P A probabilistic analysis is not required.

UK Where probabilistic analysis have been provided we take account of them in our overall judgement but do not have fixed criteria.

8.2. a) Is your acceptability criterion based on the use of state-of-the-art techniques and best engineering judgement?.

b) What about completely new designs?

c) Do you ask for backfitting of old type designs?

B (ML) No answer.

DK a) Yes. To a certain extent.

b) No answer.

c) No answer.

E References regarding similar installations are required.

F a) Yes, especially for known processes.

b) New designs are normally subjected to independent safety studies (etude de surete).

c) For old plants, backfitting is required according to a program with well defined timing.

FRG Yes.

GR a) Yes.

b) No answer.

c) No answer.

IR a) Yes.

b) We would require appropriate tests, validation, etc.

c) When appropriate.

I Acceptability criteria are based on state-of-the-art techniques and best engineering judgement, even for new plants.

Auditing may result in existing plant modification requirements.

L Until now, acceptable risks are not established. They will be defined case by case.

NL a) State-of-the-art technique for OSR, but also for ESR, is a very significant decision criterion.

b) For new designs much more arguments are required.

c) Backfitting is required. Alternatives are: closure, immediate backfitting or backfitting at next maintenance period.

If the actions required correspond to up-to-date safety technique no compensation is foreseen. If further measures are required because of population proximity, support is given by the government.

P

No answer.

UK

a) Yes. But supported where necessary by predictive analysis/assessment.

b) Here prediction plays a more dominant role.

c) Depends upon costs versus risk reduction balance and the lifetime of the plant.

- 8.3. a) In which cases do you require an independent assessment to be performed?
b) Who will pay the costs?
- B (ML) Qualitative risk analysis must be performed by people that know the plant very well. In this sense it is believed that specialised plant personnel are the most adequate to do it.
- DK a) In some cases in which new design/technology are used.
b) The cost will be paid by the owner. For instance, computerised safety systems have to be evaluated by the Electronic Testing Agency.
- E A Technical Committee for Chemical Hazards has been created to treat this and other controversial matters.
- F An independent assessment (etude de surete) is very often requested for major installations or new designs. The study is performed before the public inquiry for a new installation. The industry has the possibility to choose select the organization performing the study within a list of organizations endorsed by the authorities. The bulk of the costs is supported by the manufacturer, sometimes with the help of the Administration.
In the safety studies scarce use of probabilities is generally done ; when done, it is only in relative terms.
- FRG Each safety report has to be assessed by the competent authority or an independent expert. The owner has to pay the costs.
- GR If the Ministry does not agree. (External consultancy is used in these cases).
- IR In the event of an inadequate notification a manufacturer may be required to have a new analysis carried out by a person nominated by the Central Competent Authority. Such an analysis would be at the manufacturers own expense (c.f. regulation 14).
- I It is possible to require an independent study as a result of an audit.
If it is required by the owner, he will pay the costs.
- L All assessments are made by designated organizations and paid by the plant owner.
- NL No.

P It is not foreseen.

UK Never. However, in the context of the manufacturer seeking permission from the local planning authority to develop an installation he may be required by that authority to submit a risk assessment. HSE advises the authority on the validity of this assessment and the significance of the assessed level of risk. Often this risk assessment is carried out by an independent consultant and the assessment is used as a supporting document to the eventual safety report. The manufacturer pays all the costs of such independent assessments.

8.4. Do you perform in your technical service an independent assessment of selected scenarios?

B (ML) No.

DK Yes.

E No. In the future it will be performed by the Centro de Investigaciones Energéticas Medio Ambientales y Tecnológicas (C.I.E.M.A.T.).

F Yes. Inspectors can verify the calculations and the assessments of plant owner safety report by their own models and expertises.

FRG See answer to point 8.3.

GR No. If required, external consultancy is used.

IR We require manufacturers to carry out their own analysis of selected scenarios. Some limited analyses of selected scenarios are also carried out inhouse when assessing the safety reports to compare results.

I Yes. Analysis is made by technical organizations (I.S.P.E.S.L., I.S.S., Corpo Nazionale dei V.V.F., C.N.R.). Only when doubts rise regarding the validity of assessment, a technical analysis regarding incidental scenarios may be required.

L No.

NL Yes. In the case that the calculations done by the company were with all evidence negligent, the bill can be passed to the company.

P Yes.

UK No. But as a matter of course HSE's technical experts will validate certain scenarios as part of the assessment of the safety report

- 8.5. a) Do you require a periodical updating of the safety report?
- b) Or only after major modifications?
- c) If yes, what is considered to be a major modification?
- B (ML) Yes, every 10 years and after every significant modification that may introduce new risks.
- DK We require updating in the following cases:
- a) Yes. Every 5 years.
- b) After major modifications.
- c) When new know-how is adopted (i.e. it requires well trained people).
- d) In case of accident.
- E a) Yes. Every 4 years.
- b) Yes.
- F For major modifications (new production unit, a large storage unit, etc.) all the procedure with the public inquiry must be repeated. Also when inspections detect or identify new problems. If industry does not respect the regulations, or after any accident, safety audits and/or updating of the safety report can be requested. The internal emergency plan must always be kept updated. As a matter of praxis, an updating is achieved every 2-4 years.
- FRG a) Yes, every 2 years.
- b) Yes, in the case of major modifications.
- GR a) Yes.
- b) Yes.
- IR a) Yes. Three yearly and after major modifications (Regulation 12).
- b) Yes.
- c) A major modification would be any modification to the installation or process with a possible impact on safety.

- I a) Yes, every three years.
b) Yes.
c) Plant modifications are by the moment regulated by D.P.R. 577 and D.M. 02.08.84, Allegato A, chapter 3.
- L a) Yes.
b) According to the modification of the risks identified and evaluated in the previous report.
- NL a) Yes. Every five years for ESR or at application for permit for change of the establishment which influences risk, whichever is earlier.
b) Any change affecting OSR must be communicated. In this way it is possible to argue whether an ESR revision is necessary.
- P Every time that significant modifications are done, implying possible new risks, or when new technological advances are registered on these areas.
- UK Yes to both. As required in CIMAH regulation 8 i.e. :
a) periodically - within 3 years of the last report;
b) for proposed modification - 3 months beforehand;
c) a modification is one which could materially affect the particulars in the safety report.

- 8.6. How the safety report is utilized for the authority inspection policy?
- B (ML) Until now, experience does not justify changing present policy.
- DK No firm practice has been established yet. We try to use it as a base for a more systematic inspection.
(Now in a preliminary phase).
- E There exists no experience at all.
- F The safety report is the contractual document : all obligations deriving from it, as well as correspondence between real installation and its description in the report must be respected; otherwise fines can be applied, up to the withdraw of the authorization.
- FRG The safety report is a tool for the authority to convince themselves that:
- for existing installations the legal requirements and technical rules are fulfilled
 - for new installations a licence can be issued.
- GR Useful parts of the safety report are the emergency plan and information regarding land use.
It is also used to verify correspondence with reality.
- IR The report is used as the base document for ongoing inspection.
- I The report together with the procedures and operating manuals will be the basic documents to perform the audits and the inspections.
- L It is an internal document, used by public competent authorities.
- NL P.A. can be approved as conditional to certain inspection programs.
For OSR, during the 6 months examination period, the weak points to inspect are identified.
- P Plants will be audited according to their risk seriousness. It is also useful for the reinforcing of respective inspections.
- UK The report becomes an important source document for future inspection work. It highlights those areas that both the firm and the inspectors can address most profitably. See section 3 of the main report to U.K. procedures.

- 8.7. Do you require that the complete report be submitted to the authority or only an extended summary, with main documents available to the authority at the plant site.
- B (ML) It is not required a complete safety report. Many documents may be mentioned and kept available at the plant for inspection.
- DK The complete report shall be submitted to the authority.
- E The complete report is required.
- F The complete report is required (a part of it is kept confidential, if necessary). All other documents necessary must be available to inspectors on the site.
- FRG The complete report is required.
- GR The report is considered secret. An extended summary is sent to the authorities. The approval is given on the complete report, which is at any time available at the plant to the competent authorities.
- IR The complete report must be submitted to the authority but many areas may be dealt with by an extended summary with detail in supporting documentation which is referenced in the report but does not form part of the report proper.
- I The complete report is required. Some detailed document can be required during the safety review.
- L The complete report is required, in 8 copies.
- NL A full report is required. Even if sometimes the full HAZOP is not included into a OSR (because of its length), but it is available at the plant. The OSR contains however the relevant results.
- P A complete report is required.
- UK The report as submitted must contain adequate descriptions of all the matters specified in schedule 6. In many cases references may be made to other documents or their contents summarised. For example: safety policy, standard operating procedures, training manuals, etc.

8.8. Can you give an estimation of the average time for approval of a submitted report, and any further comments on the procedure?

B (ML) Approximately six months.

DK 1 Year ; this long time is needed because 3 authorities are involved(Environment, Labour and Interior) and the decisions made by the local environmental authorities, can be appealed to the Agency of Environmental Protection and further to the National Appeal Board.

E Regulations established that Emergency Plans must be finished two years later than the safety report was presented by every industry. In that period the following activities are included: new information required by the authorities to the plant owner, report revision and emergency plan development and approval.

F If the dossier has been sufficiently agreed before the public inquiry, the average time is 6/8 months and the maximum may be even two years.

FRG It depends on the size and complexity of the installation (several months).

GR 40 days.

IR We do not approve safety reports as we do not operate a licencing system. Assessment of the limited number we have received so far is taking several man-months.

I D.P.R. 175/88 is not one of approval type. An audit period of 90 days is considered to present conclusions regarding the safety report. Supplementary information required to plant owners from the inspector during the safety review may imply considerable time, not easily quantifiable.

L Period may range between 3 months and 1 year.

NL 7 months for ESR and 6 months for OSR.

P For new companies it is foreseen three months, with eventual prorogation if additional information must be required. For existing companies, schedule will be defined after July 1989.

UK

An accurate assessment is not available at this time but may become available.

Note: HSE does not formally approve safety reports. However, serious plant or operational deficiencies detected as part of the assessment of the SR and the subsequent targetted inspection are remedied by enforcement under the HSW Act. This enforcement can include prohibiting the use of the plant.

8.9. Do you give any advice or technical support to the plant owner in performing the study?

If yes, in which cases and to what extent?

B (ML) Ministry invited all companies that have to present a safety report to explain them how to prepare the document. Often there are preliminary contacts before the presentation of the safety report.

DK Yes. We make courses, work out guidelines, give advices, etc. , but we do not give any technical support.

E Yes. The following documents are being prepared:

- Basic directives to manage chemical hazards.
- Safety report elaboration guide.

F No. See answer to point 8.3.

FRG Yes.

GR Yes. For all that is available to the Ministry.

IR Yes. Advice is given as to what is required to complete a notification.

I Yes. Advice may be given, if required by the plant owner, only for the safety report preparation.

L Negotiations with plant owner are done in presence of the designated organization and the competent public administration.

NL Yes. For OSR the Labour Inspectorate gives advice but the work must be performed by the company.
For ESR, VROM may give advice on request of competent authorities.

P No.

UK No. We think it would be counter productive to do so because it would transfer some of the responsibility for safety away from the manufacturer.

- 8.10. To what extent the expert or team performing the safety report is considered responsible of the content and the conclusions of the safety report?
- B (ML) The manufacturer is responsible of the safety report content.
- DK The manufacturer is responsible, not the analyst.
- E The manufacturer is responsible, not the analyst
- F The manufacturer is responsible, not the analyst.
- FRG The owner is responsible.
- GR The owner is not officially responsible (only for sea pollution).
- IR The manufacturer is considered responsible for the content and conclusions. If the Central Competent Authority considers a report deficient a manufacturer may be required to have the report reported by a nominated competent person at his own expense.
- I Absolutely not responsible. The manufacturer is responsible of the content of the safety report. Plan owner's consultant might be responsible according to the contractual agreement signed between them. Plant owner is required to specify what kind of insurance has been foreseen for possible damage to personnel, equipment, people and environment.
- L The designated organization is responsible of presenting a "neutral" report. Its status of non-profit organization is important in this sense. In case of irregularities, the Ministry of Labour may cancel the agreement to the designated organization.
- NL The owner is the only responsible.
- P It is not considered responsible in any sense.
- UK The manufacturer is completely responsible for the content of the report. We do not encourage the production of reports by third parties. If independent experts are used we expect them to work very closely with the manufacturer so that the resultant report is an accurate description of what the manufacturer understands the major accident hazards of his installations to be, and what he does to ensure the safety design, construction and operation of that plant.