



F-SEVESO

Contract n°070307/2007/476000/MAR/A3

Annex 1A: Analysis
on-line Survey

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F-SEVESO

Study of the effectiveness of the Seveso II Directive

Contract n°070307/2007/476000/MAR/A3

Annex 1A

**Detailed analysis of the results of the survey
(on-line questionnaires)**

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1 Introduction

This annex is based on the answers collected during the on-line survey launched on 6 February 2008 and closed mid-April 2008. It presents the detailed analysis of the responses for the 3 stakeholder categories: Industry, Competent Authorities and Others.

155 participants answered the on-line survey with an important participation from Industry, followed by Competent Authorities and Others. The distribution of the answers by categories is the following:

- 102 responders from Industry
- 33 responses from Competent Authorities (CA),
- 20 responses from Others.

The on-line survey was organised in 4 sections, in the following way:

Issue 1. Transposition of the Seveso II Directive requirements and general approach

Issue2. Implementation of the main requirements of the Seveso II Directive by the operators: practices, weaknesses and possible problems

Issue 3. Effectiveness of the implementation

Issue 4. Seveso II and the competitiveness of the European Industry

Different questions related to the Major Accident Prevention Policy, Safety Report, System Management System, internal emergency plans, etc were proposed in the survey. The distributions of the questions was performed in the following way:

Categorie of the On-line Survey	Number of questions					
	Issue 1	Issue 2	Issue 3	Issue 4	Further Remarks	TOTAL
Industry	4	43	18	4	2	71
Competent Authority	4	18	11	3	2	38
Others	7	10	14	5	2	38

The information provided in this document was then completed with the inputs collected through the 23 interviews which have followed until 6th June 2008, and which are described in Annexe 1B.

2 Competent Authorities questionnaire

The present analysis takes into account the responses to the questionnaires of 33 competent authorities obtained at the 11st April 2008.

Half of these 33 competent authorities are central or national.

2.1 Issue 1: *Transposition of the Seveso II Directive requirements and general approach*

1) Does the national law require the submission of specific information that is used as indicators?

A majority of respondents answered (65%) that the national law requires the submission of specific information that is used as indicators. They referred to notifications (article 6), safety reports (article 9), major accidents (article 14).

2) Are the directives related to prevention of accidents and protection of the environment linked in your country or under an explicit common framework?

For 68%, the directives related to prevention of accidents and protection of the environment are linked in the country or under an explicit common framework.

It appears that in different European countries, the Seveso 2 directive is linked to several national laws.

In Bulgaria for example, the framework for major accident prevention and the protection of the environment is laid down in the Environmental protection act. The procedures for Seveso and IPPC permitting are similar.

In Spain, for new establishments "Ley 16/2002 for the integrated prevention and control of contamination" includes Directiva 96/61/CE. For the old ones there is no common framework.

3) Do you see a need for any improvements?

Lots of recommendations were formulated:

- Creation of a common framework for a vocabulary in related directives.
- Improved method of defining the application of the Directive to avoid substances and preparations with no major hazard potential coming into scope as a result of changes to EC legislation on classification, packaging and labelling.
- Clarification and removal of overlaps with other legislation, such as legislation covering fire safety, explosive atmospheres, major accidents control, safety and health at work to the operators.

- Avoid anomalies for preparations. Illustratively, as a result of changes to 2nd ATP (Adaptation to Technical Progress) of the Dangerous Preparations Directive, 99 tonnes of biocide would not attract Seveso, but 100 tonnes of the same product diluted with only ½ tonne (if present at 0.5%) of biocide would.
- Proportionality in respect of work needed for a dispensation (derogation) to limit the information in a safety report (EC publication 'Explanations and guidelines for the application of the dispensation rule of Article 9, paragraph 6 of Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances' refers). The process is burdensome (for industry and regulators) and would benefit from a simplified approach or clarification on what is considered an adequate application.
- Also on the dispensation rule, consideration of an extension to include other areas of the Directive in cases where the substances present are incapable of creating a major-accident hazard.
- Consideration of the need to extend the Directive to include CO2 sequestration and storage activities
- Clarification on the uncertainty over application to gas storage in depleted oilfields.
- Consideration of whether the Directive might move towards a more hazard/risk-based approach with less reliance on threshold quantities.
- In the Netherlands, the enforcement of SEVESO directive doesn't seem to be equal: there are three different competent authorities for the supervision of "brzo" (seveso directive). There is a need to develop same tools.
- Fewer Competent Authorities should be involved in the implementation or supervision of Seveso legislation.
- Deadlines for the elaboration of plans should be established.
- Consideration of the possibility to require some parts of the Safety report to "low-tier", e.g. the directive should clearly indicate that safety management system is required also for low tier
- Need of sound methods to calculate environmental vulnerability. Directive seems only to address aquatic environment vulnerability (R50-51-53) and it should address other environmental risks.
- In land-use planning, need for more communication among different authorities.
- It is suggested that Seveso studies should address more clearly the impact/benefits of the implementation of safety measures.
- The inclusion of carcinogen means specific studies comparing to the rest of the substances, that now can not be adequately covered

- 4) If you are aware of the availability of specific best practices in specific Member States that could provide a model for improved implementation of the directive, please describe the information available, give the references, etc.

There is a wish to develop sharing of experience between all inspectors.

In some countries like UK or Holland there are expert independent groups that provide homogeneous expertise, recommendation and criteria to all the country.

In Germany, the work of the Störfallkommission is mentioned.

2.2 Issue 2: Implementation of the main requirements of the Seveso II Directive by the operators: practices, weaknesses and possible problems

- 1) How are the requirements translated in the national regulations (e.g. Risk analysis, probabilistic versus deterministic approach)? deterministic, probabilistic, consequence-based, other

No specific method emerges from this question. Indeed respondents noted that methods are used in function of the final objective. An operator can use either a deterministic method or a probabilistic one.

- 2) Are existing European guidance documents adequate?

72% of respondents think that existing European guidance documents are adequate.

Guidance deals largely with the directive's philosophy.

Some improvements were formulated:

- Need of a less general guidance
- Need of more concrete proposals
- All the subjects are not equally cover and guidance about emergency planning, terminology of the directive, basic investigation techniques, information on safety measures should be developed.
- Need of more documents on reference scenarios, inspection tools
- Need of more specific harmonised criteria; for instance in the selection of scenario, endpoints, common criteria for land use planning, etc. including examples.

- 3) Are there some general or specific guidance documents available at national level prepared by the authorities for the preparation of the documents required by the Seveso II Directive?

81% of respondents claims that some general or specific guidance documents for the preparation of the documents required by the Seveso II Directive are available at national level and prepared by the authorities.

- 4) If you have answered 'Yes' to the previous question, did the preparation of the guidance documents involve the industry or other stakeholders?

68% of them states that the preparation of the guidance documents involves the industry or other stakeholders.

The involvement of industries or other stakeholders can be done at different steps of the preparation of the guidance:

- Participation:
 - during compilation / set-up of data or of documents
 - during the writing of the documents
- as a consultation before publication
- testing of the guidance before widespreading it at a large scale and inclusion of the testers commentaries

Mostly industries or other stakeholders' involvement is an active participation.

One issue is highlighted:

Only industries with associations or federations are informed about a possible participation of industries in the preparation of the guidance documents.

5) Is the information provided by operators sufficient for your needs? If no, how are or can these shortcomings overcome?

74% of respondents think that the information by operators is sufficient for their needs. However, most of them give indications to improve shortcomings.

The respondents outline that the information that is stipulated by the directive and that has to be submitted is sufficient. But, sometimes, some exchanges with operators are necessary to obtain missing information.

Some problems raised:

- Competent authorities do not have the possibility to test the industries results and have to rely upon those results.
- Diversity of methods used to assess risk.
- Difficulty to verify that scenarios are exhaustively covered.

One improvement was formulated:

- unified defined criteria for risk assessment to unify hazard identification and risk assessment

6) Are there adequate systems and procedures for the appraisal of the information?

81% of respondents think that adequate systems and procedures for the appraisal of the information exist.

Documents that exist:

- Guidance and described procedures
- A website
- A digital inspection room
- Manual with embedded criteria
- Tools as checklist

- Availability of intervention plans for all major hazard sites, reports about accidents investigations
- In some countries (Spain, France...) the authorities use the second opinion/critical assessment of the Safety Report by an "authorised" third party. In Spain, the evaluation is made before the checking by the authorities. In France, it is performed if requested by the authority after a first examination.

7) Does your examination of the safety report influence your decision-making?

90% of respondents assert that their examination of the safety report influences their decision-making. The safety report results are used for:

- Giving a permit for the present industry or for an other one which would be next to the present one,
- Prohibiting a use of an existing installation,
- Land use planning purposes,
- Defining more mitigating measures,
- Determining inspection programs and key issues to be inspected.

8) Do you assess the safety management system?

94% of respondents assess the safety management system during:

- The assessment of the safety documents (safety report or other documents),
- Inspection, audits or visits.

9) Is the length of time taken to provide responses/issue approvals reasonable?

83% of respondents think that the length of time taken to provide responses/issue approvals is reasonable. It is comprised between 3 and 12 months and 3 months is not sufficient. Length is due to:

- The lack of human resources (one situation that should be pointed out: "*the competent authority has to engage foreign consultants to evaluate the safety reports. This is a difficult and time consuming process*")
- The deficiencies in original submission of documents,
- The big size of documentation to assess and approve,
- The involvement of many control and supervision authorities.

10) On average, how many possible major-accident scenarios are assessed per establishment?

Respondents had difficulty to answer this question. The scenarios can vary from 1 to 100 at least.

For instance, in Catalonia (Spain) the average is 41 hypotheses by establishment.

11) Of these, how many with consequences outside the establishment?

Respondents had difficulty to answer this question. The scenarios can vary from 1 to all the studied scenarios.

12) Is there a critical dialogue with the operator over the scenarios used?

77% of respondents think that a critical dialogue with the operator over the scenarios used is ensured.

The dialogue takes place:

- During the assessment of the SR (and concerns essentially the selection of scenarios)
- During inspections and audits
- During the compiling of the internal emergency plan

13) Is necessary updating assured?

97% of respondents think that the necessary updating is assured.

The safety report is a living document which is updated:

- At any significant change of the site
- Periodically (e.g. every 5 years)
- After inspections

One respondent point out that *"When documents are due for an update, we will send reminders if the establishments fail to send an update on time. In inspections we will check that the establishments have procedures that ensure updating when required (either due to changes, or set frequencies)"*.

CAs respondents generally refer to the directive requirements or national legal requirements but do not inform about the real concrete practices of industrials that they note during inspections.

One local Competent Authority mention that, although there are instructions and requirements to assure updating, and also authorities send written notice of them, the "management of change" is the first failure in the inspection of the safety management system.

14) Express your level of agreement with the following statement: For internal emergency plans, operator consultation of workers, and provision of information and training, is adequate

61% of them consider that operator consultation of workers, and provision of information and training, is adequate for internal emergency plans. Some respondents point out that it is a requirement of SEVESO directive. These actions are done through training, working procedures, emergency drills. They are mostly actions of the SMS controlled by inspections and audits or actions of emergency plans.

Information provision and training are difficult to ensure for small companies.

Some respondents point out that information provision and training are done but not mostly inadequate or could be improved (e.g. improvement of emergency drills).

15) How do you see the relationship / interaction between the directive's requirements and occupational safety and health, and other rules / standards (e.g. ISO 31000)? Complementary, duplicative, no link

A large majority (85%) of respondents consider that the relationship / interaction between the directive's requirements and occupational safety and health, and other rules / standards (e.g. ISO 31000) are complementary.

Duplication issues pointed out come from:

- The lack of consistency between the different Directives
- The necessity to have different documents which are similar but given to separate authorities.

In UK, " *As far as possible, COMAH and other health and safety regulations have been drafted to be complementary and to avoid overlapping or duplicative requirements that could create administrative or other burdens for industry, regulators and other stakeholders. There is a similar overlap between environmental legislation and COMAH. The competent authority works to a 'Memorandum of Understanding' to avoid potential conflicts and ensure consistent decision-making.*"

16) Is there equality of treatment between operators?

87% of respondents think that there is an equality of treatment between operators that is ensured by:

- Directive requirements
- National legislation
- National uniform procedures and instructions for all CAs
- Training of CAs
- Inspection instruments and criteria to support inspectors

The difference of treatment between operators could come from:

- the differences between each individual inspectors,
- the lack of uniformed criteria that all CAs could follow for inspections
- due to the existence of authorised organisations for evaluation that are paid by operators, one respondent suggests that this can disturb their independence of judgement.

17) Do you have any estimates of the costs for operators related meeting the requirements?

77% of respondents do not have any estimates of the costs for operators related meeting the requirements.

Only 13% do have any estimates of the costs for operators related meeting the requirements that can come from:

- UK: A Regulatory impact assessments (RIA) carried in 1999, review of this assessment in 2005 included in the consultative document (at <http://www.hse.gov.uk/consult/condocs/cd193.pdf>), survey about costs and benefits of the COMAH Regulations (<http://www.hse.gov.uk/research/rrpdf/rr343.pdf>)
- Turkey: 117.413.483 € (Reference: Directive Specific Implementation Plan for Seveso II directive in Turkey)
- Sweden: report R 2006:03 about Trade and industries' administrative burdens within the framework of labour legislation (Näringslivets administrativa kostnader på arbetsrättsområdet R 2006:03), study by Nutek (http://www.nutek.se/content/1/c4/35/35/R_2006_01_webb.pdf)
- Catalonia (Spain). Points out, in average, for an upper establishment:
 - periodically: IS development (aprox 18000 €) (5 years), evaluation costs (aprox 10.000 + 1500 €) (5 years), PEI updating (aprox 1500 €) (3 years)
 - Costs for the annual collaboration in PEE development (depends on substances)
 - Costs due to changes

One respondent from Finland consider that "*normally costs for preparing a safety report are between €1000 and €10000. In 14% of the companies the costs are more than € 10 000. The main cost seems to be working hours of the company of itself. On the average 48 work days are used for the preparation of a safety report*". He does not give any reference.

18) Do you have any estimates of the benefits related to the implementation of the Seveso directive?

74% of respondents do not have any estimates of the benefits related to the implementation of the Seveso directive.

2.3 Issue 3: Effectiveness of the implementation

1) From your point of view, is the approach of the Seveso II directive appropriate to prevent major accidents and mitigate their consequences?

94% answered: YES !

In sum the approach itself is appropriate but the quality of implementation (the understanding of requirements, the quality of documentation, the qualification of inspectors etc.) give some uncertainty on this matter.

Some improvements are recommended:

- behavioural safety and/or safety culture at management level should be improved.
- to develop tools to assess / inspect safety culture in a Seveso establishment.

2) Are there some requirements not covered by EU legislation that could improve the prevention of major accidents and the mitigation of their consequences?

A majority of respondents answered NO (67%).

Some recommendations are formulated:

- To develop a tool to assess safety culture on a Seveso site.
- To establish an independent commission from the authorities to investigate the causes of accidents (like US Chemical Safety Board).
- To suggest to investigate smaller incidents.
- To create a formal requirement for a permit or license for Seveso establishments, preferably linked to the IPPC-directive.
- The evaluation of the effectiveness of the Safety Management System is complex, so a recommendation is made regarding the dissemination of good practices in this sense.

3) Are the requirements proportionate to the aims of the directive?

YES ! For 90%, the requirements are proportionate to the aims of the directive.

A justification of a "NO" is interesting to be developed here: *"in practice the same processes need to be managed in lower and upper tier establishments. Level of formalism depends more on size and kind of activity than on the status "upper" or "lower" tier".*

4) Do the requirements lead to a recognisably higher level of safety in comparison with industrial sites not covered by the Directive?

YES for 75%.

Two specific points were developed:

- The very positive contribution of the safety report (for upper tier) including risk assessment
- The positive contribution of SMS,
- The positive contribution of emergency planning,
- the positive effect of the yearly inspections. *"Most establishments that have Seveso-inspections for the first time, have far more non-conformities than the establishments that have been under the directive for a long time. Thus we conclude that the inspections have great effect".*

Some respondents answer YES, but they added that it is very difficult to objectively measure this.

Checking and adjustment of safety equipment, of organizational measures and training lead towards higher safety awareness. The preparation of incident scenarios leads to better consider the risks in the surrounding environment of the plant.

5) Do the different requirements for upper and lower tier establishments result in differing levels of safety?

Opinions are equally divided.

On the one hand, it seems that the level of safety is sometimes ensured by the other legislation related to the environmental, safety at work, occupational risk assessment, preparedness to emergency situations.

But it is well recognised that the level of safety for upper and lower tier establishments is different (remark based on inspections).

A respondent reminded that *"the difference in the level of requirements has lead many operators to place their activity just below the upper tier limit and thus not reach the desired level of safety"*.

The good impact of the safety report is often noted.

One respondent points out the it is supposed that lower tier can not cause external consequences; he added that experience has shown the opposite and proposes to include vulnerability criteria in the classification of establishment and not only quantity of substances.

A recommendation was suggested:

- To develop, for the lower tier establishments, a requirement for the provision and description of major accident hazards scenarios.

6) Do you use specific indicators to measure performance related to major accidents?

The majority of respondents (63%) do not use specific indicators.

7) If yes, please describe your indicators.

The indicators used are those developed by industry: activity and outcome indicators.

8) A majority of respondents agrees that:

- the Seveso II directive should be made more consistent with IPPC and safety at work directives. It is recommended to *"remove overlaps"*.
- the safety nature of cross media effects needs to be more explicitly and visibly taken into account during BAT development

A recommendation is formulated for managing safety and environmental protection as a unity. *"There may be cases when BAT is contradictory between safety and environmental protection and where the optimum in the single case must be found."*

At the same time there is much room for innovation for new BAT that takes account of environmental protection as well as safety".

- 9) Opinions are equally divided for this statement: "Internal communication within establishments is sufficient".

A majority of respondents agrees that:

- Workers have many opportunities to be consulted on decisions related to major accident prevention development.

- 10) Should standards be descriptive or performance based (based on qualitative or quantitative criteria)?

A majority of respondents answered that standards should be both descriptive and performance based, where appropriate.

One respondent added that, if the criteria are qualitative, subjective interpretation is possible and the results could not be compared.

- 11) Opinions are equally divided for this statement: "The Seveso II directive has led to the transfer of some risks to transport systems. In fact, there are cases where quantities present on site have been reduced in order not to fall under the scope of the Directive, by transporting more often (in lower quantities) the dangerous substances". Other example is the existence of logistic storages that supply establishments.

A majority of respondents agrees that:

- Measures to mitigate major accidents can NOT lead to increase risk for the workers. An explanation was provided: *"Measures to mitigate major accidents do not lead to an increased risk for the workers. The operator/employer has to address all risks of his industrial activity (environment / safety of workers / safety of the public). The first victims of an uncontrolled release of dangerous substances are nearly always the workers present on site (except releases of ecotoxic substances). Workers are therefore the first to benefit from the measures to prevent losses of containment. In addition, in a safety culture aimed at the prevention of major hazards, occupational hazards receive often more attention as well (but not vice versa!). Major hazards are not only related to the operational risks of an installation but are also present during maintenance work and shut down. Work permit systems and shut down management are measures to prevent major accidents that have a direct impact on worker safety as well."*
- The risks for workers could be increased if mobile storages instead of fixed tanks are used in order to reduce inventory.
- Risk management approaches are always a compromise; we need to find the optimum.

2.4 Issue 4: Seveso II and the competitiveness of the European Industry

1) Is the general approach consistent with the aim to protect people and preserve at the same time the competitiveness of the European Industry?

A majority of respondents (83%) answers YES! It is reminded that *"safer installations are often more productive (less down time) and provide better means for quality control. In addition, economic losses due to accidents are prevented"*.

Some respondents explained that the implementation of the requirements of the Seveso II directive is quite costly and labour-intensive.

2) A majority of respondents agrees that the level of implementation is NOT highly cost- & labour-intensive & a significant reallocation of resources have NOT been observed to maintain industry's competitive advantage

- A majority of respondents disagrees that "the level of implementation is so costly & labour-intensive that a substantial re-organisation has been observed to maintain industry's competitive advantage leading to: a) a move from upper tier establishments towards lower tier establishments; or b) a move from lower tier establishments towards establishments falling outside of the Seveso II Directive."

A respondent points out that these movements have been observed in some cases where it was possible with few efforts

- A majority of respondents disagrees that the level of implementation has led to significant market distortions because of undue productivity losses, negative trade balance influences & capacity to absorb new technologies within Europe, since the severity of the requirement varies between sectors or between MS.
- A majority of respondents disagrees that the level of implementation has led to significant market distortions because of productivity losses, negative trade balance influences & capacity to absorb new technologies with third countries, in particular, emerging economies.
- A majority of respondents agrees that the level of implementation is seen to be highly effective, providing an added value and enhancing the industry's image at national, European and/or international level leading to a competitive advantage based on investment in service skills and openness.

3) To your knowledge, have market distortions been evaluated?

The majority of respondents (95%) answered NO to this question.

4) Do you have any further remarks about the application and effectiveness of the Directive?

NO.



5) If you have answered 'Yes' to the previous question, please provide details.

"The measurement of the effectiveness of Seveso is very complex because indicators for it have not been defined previously. The directive now allows CA to have lot of information from industries to develop the emergency plans. But the information derived from Seveso do NOT show which ADDITIONAL safety measures have implemented the industries (additional to the ones implemented by other regulations). And this could be used as an indicator.

"The threshold values used for the dispersion of toxic gases used in general in EU (AEGL, ERPG) provide planning distances that are very difficult to manage in the external emergency plans (and also few realistic)."

3 Industry questionnaire

102 industries have answered.

Majority of countries from western Europe (France, UK, Italy, Germany).

3.1 Issue 1: Transposition of the Seveso II Directive requirements and general approach

1) Are national requirements in line with the Seveso II directive?

Yes (83%) !

11 respondents answered NO, with the following answers:

- *"The actual law as transcribed is the same but the interpretation of what this means is different particularly the phrase 'all necessary measures'. In the UK this is interpreted as doing everything technically possible, in other states it is interpreted as a balance between cost and risk".*
- In Spain, a respondent answered that in some parts of Spain, local authorities demands more requirements than Seveso national laws
- Implementation in German national law through Federal Emission protection law (Bundes-Immissionsschutzgesetz) and Accident Order (Störfall-Verordnung). Insufficient implementation of Art. 12 „Land-use planning“ in German laws.
- In the Netherlands, one omission was detected regarding distances to natural areas.
- Some national requirements seem to be stricter than in the EC directive: *"We believe national requirements tend to exceed what is required by the EU directive".*

2) If there are differences, do these present significant implementation problems?

Logically, 75% of the respondents ensured that the differences do NOT present significant implementation problems. The main reason is that in each country, there exists some specificity.

This can cause difficulties for multi-national organisations, that have the same industry in different countries.

A respondent from Spain that answered YES points out that local authority demands Quantitative Risk Analysis to lower tier establishments, which is not a requirement in the Seveso national laws.

3) Does the national law require the submission of specific information that is used as indicators?

Opinions are equally divided.

Some examples of information used as indicators:

- In France, there is an obligation for the annual submission of a document. This document gives an evaluation of the performance of PPAM and SMS.
- Amount of investments for the prevention of majors accidents.
- In Italy: The attachment n2 of DM 9Aug 2000 (SGS) is requiring the analysis of managing factors (*analisi dei fattori gestionali*) that failed in case of accidents or near misses.
- In Italy: specific risk indices requested by DPCM 1989 (Italian law).
- Number of incidents and the number of potential incidents
- Facilities, activities and the hazardous substances are reported to the competent authorities.
- Preparation of Safety Report and off-site emergency plans
- Additional category of incidents that are not covered by Seveso II directive, which makes the comparison Germany/Europe difficult.
- Quantity of dangerous substances and declaration (of substances).
- Detailed information about processes, substances and units, geographical position, possible hazards as well as the corresponding mitigation measures and incident measures, etc. have to be submitted inside the safety report and during the licensing procedure.
- Safety report, safety concept, detailed information about safety relevant parts of the plant. Detailed information about substances, information about the incidents.

4) Should the Seveso Directive be supported by further European reference documents (guide of best practices, standards, etc)?

Opinions are equally divided.

The respondents of the survey noted that their countries have produced national guidance on the preparation of safety reports.

Some other specific guidance were noted:

- In France: existence of a specific document developing fault tree methodologies, and a guide with a list of generic scenarios with typical causes
- In Spain: existence of specific document developed by national and local authorities and by industry (Issue 2, questions 4 & 5)
- Guide of best practices within our industrial category with the minimum standards. An operator noted that: "it is important that the interpretation of the directive is the same for all companies to avoid distortion of competition".
- In the Netherlands: QRA fire brigade requirement
- In Germany, there are a lot of legal requirements, technical guidances, norms and auxiliary documents existing.
- In Italy:
 - Unified SMS check list,

- Unified documents for land use planning,
- Guidelines for risk sustainability

Industry made a general suggestion that is to develop European Guidance, with the strong involvement of the Industry and regulators.

Other suggestions are about the creation of new guidance:

- Creation of a data base gathering results of modelling (thermal, toxic, overpressure effects)
- Develop an example of safety report.
- *"Reference documents should be provided for what level of information is required across the whole of the EU so that all member states are on a level playing field"*.
- Develop guidance for storage in tanks and warehouses. An operator complained about existence of large differences in EU countries.
- Develop Guidance on acceptability criteria for on-site and off-site risk
- Develop a guide for internal emergency plan
- Develop a guide for verification of a Safety Management System
- Develop guidance for competent authority in order to harmonise SEVESO application in Europe.
- Unified criteria for inspection and auditing (existence of great differences depending on the Region within a country and on the people inspecting/auditing)
- Harmonised criteria for the development of Risk Analysis and Quantitative Risk Analysis
- Unified Technical criteria for industrial sectors.
- Criteria for consequence analysis
- Guides of Good Practices for the use and maintenance of Seveso establishments.

3.2 Issue 2: Implementation of the main requirements of the Seveso II Directive by the operators: practices, weaknesses and possible problems

1) Are you aware of the European guidance for the implementation of Seveso?

Opinions are totally divided. Only 50% of the respondents are aware of existing European guidance for the implementation of Seveso. The other half of respondents are not aware.

2) If you have answered 'Yes' to the previous question, is it used?

There are more respondents to this question than the number of the respondents that are aware of the European guidance for the implementation of Seveso. However, only 28% of respondents think it is used and 40% of them don't know if this guidance is used or not.

3) If you have used the European guidance for the implementation of Seveso, is it sufficient? If not, what more is required? On which issues?

Only 61% of participants seem to have used the European guidance for the implementation of Seveso.

Among industries which have used the European guidance for the implementation of Seveso, 21% consider that the European guidance is sufficient and 13% consider it is not. But, 67% of respondents think that the question is not applicable as:

- the national CAs imposed unofficially to use national guidance documents which are providing the interpretation of the European guidance and methods or tools.
- The European guidance sets out principles and the philosophy of the SEVESO directive but it is too generic to be used for the implementation of the Directive in each industry and it is not sufficient to provide sufficient information to some CAs that demand more than the Directive. Then, national guidance documents are generally more helpful and concrete than European guidance.

A possible improvement would be to have guidance documents less generic than the present ones and which goal would be to standardise all European practises. Guidelines could particularly be of concern for site wide lines of defense, criteria for acceptability of risk (to human life and environment), domino effects, explosion prediction and protection, best firefighting principles.

A respondent point out the necessity is not only to have more specific documents but also training/workshops so differences among inspectors/auditors can be avoided.

4) Are you aware of national guidance prepared by the authorities for the implementation of Seveso? If yes, which? Is it used?

75% of respondents are aware of national guidance prepared by the authorities for the implementation of Seveso.

The examples of national guidance documents are the following ones and are used:

- France: National guidance for writing and reading a safety report
- UK: HSE and EA guidance on COMAH (Control of Major Accident Hazards) compliance, preparation and review of safety reports, emergency plans, land-use planning aspects.
- Germany: guidance provided by the "Disruptive Incident" Commission (SFK), Technical Committee on Systems Safety and (TAA), The Federal Ministry for the Environment, Nature Conservation, and Nuclear Safety of Germany (BMU)
- Netherlands: NL guidance (CPR-20 / PGS-6), BRZO 1999, RRZO 1999
- Italy: attachments I,II and III of the decree DPR 175/88 and further modifications; Document issued by national authority (The Italian Environment Protection and Technical Services Agency, APAT) containing SMS requirements and inspections guidelines
- Spain: decrees (. RD 1196/2003, RD 393/2007), guidance documents for the safety report preparation, emergency plan, technical guidelines of the General Direction of Civil Protection,; also there are Guides provided by local authorities (for instance, in Catalonia)
- Hungary: some books and documents for the implementation of Seveso and preparing Safety Report are in preparation by the National Directorate General for Disaster Management and by Hungarian Trade Licensig Office.
- Swedish: guidance from Swedish Rescue Services Agency.

5) Does industry have its own guidance documents, available at national or European level? If yes, which?

Opinions are divided about the existence of guidance documents provided by industry. 45% of respondents think that industry has its own guidance documents and 55% of respondents do not think so.

Examples of such guidance quoted by respondents are provided by the following industries or industries associations:

- France : UIC (Chemical Industries Association), FEEM (European federation of Explosive Makers), work groups like "Risk assessment - Safety report", EIGA (European Industrial Gases Association), AFGC, INERIS, GESIP
- UK: Tank Storage Association (TSA), Energy Institute (EI), CIRIA, Chemical Industries Association (CIA), Chemical Business Association (CBA), CONCAWE, : British Coatings Federation, Responsible Care, LPG guidance on major accident prevention policies, British Aerosol Manufacturers' Association (BAMA)
- Germany: German Chemical Industry Association
- Netherlands: VNCI
- Spain: COASHIQ (Autonomous Commission for Safety and Hygiene at Work in the Chemical and Related Industries), FEIQUE (Chemical Industries Association),

- Italy: UNI (Italian national standardisation institute)

6) Are there specific guides for SMEs?

91% of respondents points out that there is no specific guide for SMEs.

There is a guide provided by HSE in UK.

7) Major-Accident Prevention Policy (MAPP): Are resources for ensuring "0 accidents" described in the policy? Does the MAPP clearly describe how to resolve any conflicts between production (or normal operation) and safety? In operational terms, is the policy known by the middle management and the staff and applied?

64% of respondents considers that resources for ensuring "0 accidents" are described in the MAPP.

A lot of respondents react about the notion of "0 accidents", because they think it is unrealistic. Then "rather than "0 accidents", policy states commitment to reduce risks to "as low as reasonably practicable" (ALARP)."

Opinions are more divided about the presence of elements in the MAPP to resolve any conflicts between production (or normal operation) and safety. 45% of respondents considers that the MAPP allows to resolve any conflicts between production and safety, but 35% considers that the MAPP does not solve this conflict because:

- the objective of the MAPP is not to resolve any conflicts between production and safety,
- safety is more important than production, as in case of safety issues, industry can loose workers and goods. Then, production must be stopped in case of safety issue,
- safety/production conflicts are resolved by applying corporate values to a given situation,
- Conflicts between production and safety are resolved by the use of appropriate risk assessment techniques.

Information and training of workers for the MAPP seems good. 74% of respondents consider that is the policy is known and applied by the middle management and the staff. But workers are not implicated only by the MAPP. The implication of middle management and staff could be done by the management of elements important for safety.

Some respondents points out that their MAPP is integrated in the SMS (lower tier sites) and is not sufficiently detailed to answer these issues. Moreover, a generic layout and structure for a MAPP would be useful since there is no prescribed format for this document

Some respondents point out that MAPP is integrated in the management system and this is included in the General Policy of the Company; also MAPP is included in the General Policy of Labour Risk Prevention.

- 8) Safety Report (SR): How is the SR prepared? Predominantly by the operator or consultants

Practices are divided. For 76% of respondents, operators prepare the SR and for 63% of them, it is consultants. So, most of safety reports are prepared both by operators and consultants.

- 9) Safety Report (SR): Do you consider that the safety report contributes to a continuous improvement of the establishment? Did the preparation of these documents influence safety measures and procedures in the establishment? Did the conclusions of the examination of the SR by the authorities influence them? Is the length of time taken to get responses and approvals too long?

71% of respondents consider that the SR contributes to a continuous improvement of your establishment, but 14% of them think that it does not contribute. Preparing the SR with risk identification and risk assessment is a good opportunity to let the whole organisation be aware of risks and to contribute to a continuous improvement. But it is only one element of the continuous improvement and "*Safety Report has made a limited contribution to continuous improvement in certain areas (e.g. Management of Change, Planned Maintenance).*" In some countries (e.g. Germany), where the level of safety was high before Seveso II, improvement still is ongoing more or less continuously but the improvement is considered to be remarkable for establishments which fell under the Directive just after the release of Seveso II. Examination by CAs can be a part of the improvement as exchanges can bring industries to justify their actions plan for continuous improvement.

74% of respondents consider that the preparation of these documents influence safety measures and procedures in the establishment because:

- It is helpful to improve the state of process safety.
- According to the results of the modelling of a major accident, the objective is to find technical or organisational measures to reduce the impact of a major accident.

But 12% of them think that it does not influence. One respondent points out that, for a low risk Top Tier site, requirements, which are resource intensive and complicated, are excessive compared to safety implications. For an other one, "*The things that are identified by incidents are no-revealed failures, poor interface management with emergency services, competency gaps etc. None of these are described in sufficient detail in SRs to be highlighted at the time*". However, one English respondent points out that "*Responsible operators do not learn much more about their hazards from compilation of SRs however it is good discipline to write it down in a structured way.*"

57% of respondents consider that the conclusions of the examination of the SR by the authorities influence them, but 23% of them think that it does not influence them. One English respondent judges that *"The assessments by the UK regulator are often low value added and slow"*.

51% of respondents consider that the length of time taken to get responses and approvals is too long, but 24% of them think that it is not because of the disproportion with the level of detailed required, the resourcing of the regulator, and the processes involved in assessing the reports. The disproportion between the time that industries get to submit their SR and the length of time taken to get responses and approvals is pointed out. In Germany, one respondent points out the federal structure of his country which checks the generation of a similar standard even in all the country and consequently, *"the regional authorities are totally overstrained. This is the reason why more and more duties are given back to industry or to external consultants. This is a big competitive disadvantage related to Non-EU countries."*

Improvement proposal for reducing the length of time taken to get responses and approvals: a more effective use of the time would be a rigorous audit programme covering Seveso II issues, with programme compliance assessed by the Competent Authority.

10) Safety Report (SR): How is necessary updating ensured?

Reviews of safety reports are ensured by:

- Change of legislation
- Periodicity of review due to internal policy, defined in the SMS or defined by legal obligation (every 5 years in general)
- meaningful modifications or changes of the establishment
- inspections of CAs, audits (internal /external)
- feedback: safety relevant issues, incidents, accidents, lessons learnt, legal watch, technical watch, feedback of safety drills of emergency plans

11) Identification and accidental risk analysis and prevention methods: Which methodology do you use, deterministic or probabilistic approach?

A majority use a probabilistic approach to identify and analyse risks. For the others, used approaches are equally divided between probabilistic approach and a melting approach of probabilistic and deterministic methodologies.

In Germany, deterministic methodology is widely used and probabilistic approach is only used for supporting in case of specific issues, because *"the factor of risk acceptance is regarded with big scepticism"* and because *"the lack of approved risk based acceptance levels in Germany"*.

When both methodologies are used, hazards and scenarios are defined with a deterministic approach and then, a probabilistic approach allows to estimate the probability of each scenario.

12) Identification and accidental risk analysis and prevention methods: Do you develop this approach in a working group composed of employees and management or with consultants?

81% of respondents develop identification and accidental risk analysis and prevention methods in a working group and 66% with consultants.

13) Identification and accidental risk analysis and prevention methods: Did you try to establish links between all types of risks in your plants (occupational and external risks)?

80% of respondents try to establish links between all types of risks in your plants (occupational and external risks).

14) Identification and accidental risk analysis and prevention methods: Does your risk analysis include potential accidents triggered by natural disasters (floods, earthquakes, storms, temperature extremes, heavy precipitation, etc.)? If so, how do you consider the impact of natural disasters on your establishment (only in the prevention phase or also in the mitigation phase)?

80% of respondents include potential accidents triggered by natural disasters in their risk analysis.

However, the way to include them in the risk analysis and to deal with prevention and mitigation measures to reduce and control them is different according to the country and to the type of industry:

- Natural disasters are considered like other industrial risks and mitigation measures for natural disasters are identified. Natural disasters are primary causes of accidents or hazards.
- they can be included on a generic way.
- Natural disasters are taken into account in the preliminary risk analysis or are not taken into account in the SR but in the emergency plan.
- Natural disasters are taken into account by frequency failures included in QRA.
- Natural disasters are only taken into account in the prevention phase and in the mitigation phase.

Natural disasters taken into account and given by respondents are storms, snowfall, heavy rainfall on roofs and sewer capacity, floods, earthquakes, lightning, extreme temperatures. They are considered or not according to their likelihood.

15) Identification and accidental risk analysis and prevention methods: Do you think that specific guidance would be useful to help you better consider natural disasters in your risk analysis?

Opinions are quite equally divided between respondents who think that specific guidance would be useful to help them better consider natural disasters in their risk analysis (46%) and who do not think so (54%).

Specific guidance documents on the likelihood and potential consequences of natural disasters could be useful to help you better consider natural disasters in their risk analysis because:

- It would help to identify and to estimate natural disasters and their effects
- It would help to reinforce prevention measures to reduce consequences of an accident caused by a natural disaster
- It would provide for greater consistency Europe-wide (while there is actually a huge gap in the data available in Eastern countries compared to the new EU members) and better deliver what the Directive intends
- It would provide for greater consistency between local authorities intends and industrials' approaches.
- It would reduce the need for operators (usually) non-specialists to research the potential for natural disasters, a practice that must be duplicated across many operators
- It would provide data for all natural disasters.

Specific guidance is not wished as documents already exist or are under development or because natural disasters are though not to be the biggest risks.

16) Identification and accidental risk analysis and prevention methods: How many possible major-accident scenarios have been assessed?

The scenarios can vary from 1 to 400, which is a great discrepancy.

17) Identification and accidental risk analysis and prevention methods: How many of them with consequences outside the establishment?

The scenarios can vary from 1 to all the studied scenarios.

18) Identification and accidental risk analysis and prevention methods: On which basis are identified scenarios excluded from further analysis (what cut-off criteria, based on likelihood, based on consequences, etc)?

Identified scenarios in a preliminary analysis are excluded from further analysis according to the following criteria, which are generally based on risk ranking:

- Their likelihood
- Their consequences such as extent of affected area and potential numbers killed, after mitigation measures: total absence of consequences for human being and for the environment or severity of consequences
- A severity – likelihood matrix
- Feedback, combined with a ranking of likelihood or of severity of consequences

19) Identification and accidental risk analysis and prevention methods: Did a critical dialogue about the scenarios take place with the Competent Authorities? Do you have a methodology in order to evaluate the efficiency

and adequacy of safety measures? Do you have difficulties in establishing clear links between the consequences of scenarios and the measures of protection?

62% of respondents consider that a critical dialogue about the scenarios takes place with the Competent Authorities, but 24% think that no dialogue takes place. The dialogue with Competent Authority can take place during Safety Report preparation and at assessment stages. Some respondents point out intensive discussions with competent authorities, the difficult dialogue with CAs, the lack of *"expert judgement in authorities to discuss potential progress"* and the lack of understanding between competent authorities and the industry. In UK, one respondent blames the authority for the fact that *"there was far too little guidance and assistance to individual sites from the Regulators about what was required"*.

64% of respondents do have a methodology in order to evaluate the efficiency and adequacy of safety measures, but 23% do not have. Methodologies and methods used and quoted by respondents to evaluate the efficiency and adequacy of safety measures are quantitative risk analysis, bow tie method, Fault Tree and Event Tree analysis, risk matrices, ALARP principle and gap analysis against Recognised Good Practice (RGP). Also, *"safety drills are used to evaluate the effectiveness of response in case of various identified case scenarios"*. And, *"The efficiency and adequacy of the safety measures is judged by an expert team on the basis of process and plant information and long time experience of the experts."*

An improvement proposal is to have homogeneous and free data about estimation of efficiency of safety measures and about the estimation of risk reduction obtained through these measures.

Only 24% of respondents have no difficulties in establishing clear links between the consequences of scenarios and the measures of protection. A large proportion (63%) of respondents has such difficulties (a respondent points out that they have technical and organizational measures of protection that are not included in the risk analysis because the consultants have difficulties to justify). Some difficulties in linking consequences and measures of protection appear because it is difficult to be precise about the nature of the consequences, to estimate the imponderables linked to the specific natural and industrial environment during the accident. It is not always possible to estimate the contribution of each safety measure to risk reduction.

One respondent pointed out that consequence analysis provide results very conservative compared to data obtained in their past accidents; and he added that it is very difficult to plan when areas affected (based on the consequence analysis) are so large.

20) Identification and accidental risk analysis and prevention methods: How can you ensure exhaustiveness of the risks analysis?

Exhaustiveness of the risks analysis is ensured by:

- Organising a work team with internal expert departments as well as operation site managers/personnel/workers/operators
- the use of consultants, of experts (internal or external to industry), of a "tierce expertise" (second opinion), through the evaluation performed by "authorised

organisations for evaluation" (organisations accredited by local authorities in some parts of Spain and in France).

- taking into account authorities remarks,
- making use of the internal and external feedback,
- analysing risk in a work team with competent managers and operators who know the process,
- having a process hazard review that scans all the parts of the process
- the use of appropriate methods such as:
 - ARPPIP (Risk analysis of industrial pyrotechnic proceedings)
 - Systematic approach covers all substances, locations and operational activities
 - ARAMIS method
 - HAZOP
 - APR (preliminary risk analysis)

21) Identification and accidental risk analysis and prevention methods: How do you manage the danger that the risk analysis is too theoretical and not in correspondence with reality?

The following points ensure that the risk analysis is not too theoretical and is in correspondence with reality:

- Risk analysis in work team and choice of the risk analysis team which covers a wide range of internal functions (e.g. operator, engineering, safety officer, worker) and sometimes consultants:
 - Participation of people with operating experience in the hazard identification exercises and in assessing safeguards. to the risk analysis,
 - Involvement of manufacturing, process engineers and fire brigade personal and professionals,
 - Involvement of appropriate internal and external experts,
- Observation of the practical work on site
- Specific analysis for each site of an industrial group,
- Use of actual company/industry experience and data,
- Analysing risks on the real process and not on its theoretical use,
- Involvement of appropriate internal and external experts,
- Calibration with actual events (feedback),
- Having cut-off for low likelihood and low consequence events,
- Organising safety drills.
- Through the evaluation performed by authorised organisations for evaluation (in some parts of Spain).

22) Identification and accidental risk analysis and prevention methods: Do you manage internal inspections on the basis of the results of the safety report?

74% of respondents manage internal inspections on the basis of the results of the safety report and 26% do not.

23) Identification and accidental risk analysis and prevention methods: How do you manage the ageing of the installations?

The ageing of the installations is managed by following points:

- Choosing the highest material quality
- Planned periodically preventative maintenance system
- Ordinary maintenance
- Rolling plan for replacement of infrastructure
- Legal controls of equipment
- Future inspection frequencies determined according to age, history and condition
- regular checks/reviews of the risk assessment
- checking the state of process safety in compliance with the usual industrial standards
- Inspection to take into account changes in general industrial and technical standards
- Reassessment of the plant safety

Many of these points are part of the Safety Management System.

24) Identification and accidental risk analysis and prevention methods: Do you have a specific risk-based maintenance programme?

70% of respondents have a specific risk-based maintenance program and 30% do not have such a program.

25) Safety Management System (SMS): Do you have a SMS? If yes, how do you measure that it is efficient or not?

A large majority (91%) of respondents have a SMS.

They measure the efficiency of the SMS by:

- Safety results
- use of performance indicators (such as Proportion of preventive actions done in planned delays)
- CAs inspections
- Intern inspections
- Regular audits
- Periodic reviews
- Periodical monitoring of safety relevant installation (e.g. instrumentation)
- Use of the European Single Assessment Document II (ESADII)

- International Safety Rating (ISRS) which is a system developed by DNV, for measuring, improving and demonstrating safety, environmental and business performance

26) Safety Management System (SMS): Is your SMS assessed by the competent authorities? Do you think that there is a strong link between your safety efforts and the results?

The SMS of 71% of respondents is assessed by the competent authorities.

72% of respondents consider that there is a strong link between your safety efforts and the results.

27) Safety Management System (SMS): Do you have other management systems? If yes, in which way are they connected with the SMS?

89% of respondents do have other management systems than SMS.

These systems are quality management system, business management system, environmental management system or integrated management system which covers environment, quality, safety and occupational risk assessment. They are also associated to adapted procedures.

All the systems comply with one or some of those standards: ISO 14001, ISO 9001, OHSAS 18001, ISO 13485, ISO 22000, EMAS, HACCP, GMP+.

28) Safety Management System (SMS): How do you see the relationship / interaction between meeting the directive's requirements and occupational safety and health and other rules / standards (e.g. ISO 31000): complementary, duplicative, no link

79% of respondents consider that meeting the directive's requirements and occupational safety and health and other rules / standards is complementary; 13% think that the relationship is duplicative and 8% think that there is no link between meeting the directive's requirements and occupational safety and health and other rules / standards.

Any management standard is a business benchmark and leads to continuous improvement. It is complementary to management system requirements. However, directives have a legally aspect that do not have standards. Therefore, standards are not recognised by CAs.

SEVESO II directive and occupational safety and health rules and standard participate all to continuous improvement. The principles of risk management are the same for occupational safety and for process safety. They can be managed in the same way, with the same structure. *"Many of the key underlying systems such as process instructions, training and competence are common to all rules"*. Therefore, an integrated system is often applied. Moreover, *"The evaluation of occupational health issues and major hazard prevention are based on the same methodology"*.

Most of respondents consider that SEVESO II directive and occupational safety and health rules and standard are complementary because:

- *"The aim of occupational safety management is different from a Seveso II Directive"*
- *"the detail will be different for major accident hazards than for occupational safety"*
- *"Seveso II requirements address mainly process safety issues, and other safety rules/standards tend to be more concerned with personal safety"*
- *"The evaluation of occupational health issues and major hazard prevention are based on the same methodology. However, focused on the complex matter of major accident prevention we do not seek actively further links between both issues."*

However, in practice, there are overlaps for requirements and due to long-standing company systems and procedures that already tend to address both process and personal safety matters.

The assessment by CAs is pointed out as an issue. The competent authorities (leading the SMS inspections and SEVSO requirements inspections) are not prepared to similar complementary approach, as *"CAs do not communicate between each other"*. It is difficult for industrials as *"Individual checks by different agencies go over the same ground and duplicate the work already done"*. On respondent points out a wish that standards compliance will be recognise as sufficient for CAs.

According to the way that industries consider the relationship between major accidents, occupational safety and health, it could be conclude that *"there is an overwhelming amount of all kind of systems and it is a pity that every authority and or commercial institute has developed its own system"*.

29) Internal emergency plan: Do you measure the efficiency of this emergency plan? If yes, how?

93% of respondents measures the efficiency of the emergency plan through the following meanings:

- Periodic emergency drills and assessment of the drills, with a defined program and by monitoring compliance with the program and doing a post-drill review (evaluation of the response)
- Emergency drills with fire brigade, with a lot of departmental and site evacuations training and checks with regional fire brigades and other disaster fighting teams (police, hospitals etc.)
- Regular training of workers
- *"emergency training program including different kinds of trainings (like simple evacuation drills, more complex scenario-based trainings of operators / emergency teams / emergency managers / partly in cooperation with external fire&rescue services) - followed by valuation and action plans"*
- Internal and external audits
- Reviews

30) Internal emergency plan: Do you consult workers and provide them with relevant information and training? If yes, how?

99% of respondents consult workers and provide them with relevant information and training for applying the internal emergency plan by the following meanings:

- Periodic and continuous formation and training (training is part of the SMS)
- Organisation of work groups
- Emergency drills (with simulation of real situations and feels with stress, for example)
- Inclusion of emergency procedures in process instructions
- Participation to procedures writing

31) Internal emergency plan: Do you involve internal subcontracted personnel? If yes, how?

72% of respondents involve internal subcontracted personnel in the Internal emergency plan. For most of them, subcontracted personnel are part of the personnel and are taken into account in the internal emergency plan. In particular, they have safety training when they arrive (about the specific risks of the site) and they take training about emergency. They also participate to emergency drills like the internal personnel. Safety documents (permit to work, fire permit, prevention plan, etc.) review the safety measures that subcontractors must apply. However, they can be difference of involvement level with the personnel, as they would not play an active role in case of setting off of the internal emergency plan:

- *"subcontracted personnel are taken into account in the internal emergency plan but they are not active participants to the crisis structure"*
- *"Even if they are not directly involved in the operations of the internal emergency plan, contractors receive an initial training about the behaviour to adopt in case of emergency and they are taken care of like all the personnel"*

Some points out the difference between long term and short term subcontracted personnel:

- *"Long term contractors are treated in the same way as our own employees. Short term contractors are given basic induction to the site but are not expected to do any special tasks",*
- *"porter's lodge subscribe all externals and contractor and visitor training at reception with safety pictures and verbal training and examination checks. For larger projects and regular contractors we have specific training events (and documents)."*

32) Internal emergency plan: When there is a change in your organisation, do you manage to update the plan? If yes, how?

88% of respondents manage to update the plan when there is a change in their organisation. The internal emergency plan are updated in case of change and it is either a legal obligation, or an obligation of a management system. The updating delay depends on the industry:

- Immediate updating in case of change

- Updating only of the change would impact the internal emergency plan or emergency procedures

Sometimes, there is a compulsory periodic updating (e.g. every two years).

Most of them have a formal mechanism to update plans and procedures.

- 33) Do you think that the issue of multi-operator sites (i.e. linked establishments or installations located on one site) is sufficiently addressed within the Directive?

Opinions are equally divided about this issue. 47% of respondents consider that the issue of multi-operator sites is sufficiently addressed within the Directive and 53% consider it is not.

- 34) If you have answered 'No' to the previous question, what are the aspects to be addressed?

- Definition of multi-operator site
- Impact of the hazardous activities on other operators that should be considered as specific third parties (industrial neighbours)
- Opportunities for collaboration (e.g. shared emergency organisation)
- Other, provide the aspects to be considered

Respondents who consider that the issue of multi-operator sites is not sufficiently addressed within the Directive are:

- 72% to consider that definition of multi-operator site should be better addressed
- 80% to consider that Impact of the hazardous activities on other operators that should be considered as specific third parties (industrial neighbours) should be better addressed
- 82% to consider that opportunities for collaboration (e.g. shared emergency organisation) should be better addressed
- 20% to find other aspects to address such as:
 - Co-ordination of the different operators work at multi-operator sites to avoid duplication of work
 - compliance between the different management systems of multi-companies establishments, in order to achieve the original level of prevention
 - co-ordination where an operator subcontracts a part of their operation to another company (e.g., utilities provision)
 - co-ordination where a third party owns and operates equipment within the establishment
 - consideration of "neighbourhood events as causes of hazards"
 - consideration of "domino-effect" or superposition of accidents zones
 - share of emergency measures and facilities

Some improvements are proposed:

- The example of the pyrotechnic industry could be used to develop a common approach for multi-operator sites. Applying safety conventions for one site shared by several operators, with periodic review committees allows to have the same culture, the same language, the same safety rules and the same emergency means.
- Multi-operator sites should also be better addressed in land-use planning.

35) For the **safety report**: Do you have any estimates of the costs for the operator related to the implementation of the Seveso directive?

Opinions are quite equally divided about having an estimation of the costs of safety report implementation: 58% of respondents have an estimate of the costs for the operator related to the implementation of the safety report and 42% do not have.

36) If you have answered 'Yes' to the previous question, please select ranges below :

- Less than 10 Person.Months
- Between 10 and 30 Person.Months
- More than 30 Person.Months
- Not applicable

The costs for the operator related to the implementation of the safety report is estimated to be

- Less than 10 Person.Months by 62% of respondents
- Between 10 and 30 Person.Months by 16% of respondents
- More than 30 Person.Months by 10% of respondents

Internal cost reports are based on contact with the competent authority and time spent on Seveso directive related work. Cost depends on the complexity of the site and the type of site (low or upper tiers). Respondents give the following complementary data:

Cost of the safety report elaboration:

- 3-5 full time employees
- 1-2 full time employees
- 1 full time engineer and 1 external consultant during 6 months
- 1 full time engineer and 4-5 part-time employees (2 meetings/week during 1 year)
- 1 part-time engineer (1/10) and 6 part-time employees (2 hours/week during 3 years) during 3 years
- 40-50 person-years (ie, 480 - 600 Person.Months)

Cost of the safety report review:

- 2 full-time external consultants during 4 months and participation of 20 employees
- 4-5 man-years (expectation).

Financial costs estimation:

- 40 k€ for safety report elaboration and 30 k€ for tierce expertise
- 15-20 k€ for safety report elaboration
- 60 k€ for safety report elaboration and 10 k€ for review
- 5% of the turnover
- 30-50 k€ for safety report with external consulting

Other costs:

"There are also very significant external costs to consultants - in excess of €500,000 for sites with ~100 employees."

- 37) Which parts of the SR are the most costly : Identification of hazards, system analysis – calculation of frequencies, Consequence analysis – use of sophisticated models, Acquisition of data, Documentation of the whole report, Other

51% of respondents think that the consequence analysis with the use of sophisticated models is the most costly part of the SR.

Opinions are quite divided about the importance of the cost of identification of hazards, of system analysis, of data acquisition.

The costs are also due to:

- CAs approval, CAs complementary demands (change in the SR, answering CAs questions, demands of complementary surveys, etc.), CAs inspections
- Use of external consultants
- Tierce expertise
- Inspection of SR
- Use of modelling

Note: *"the less costly parts of the SR are the parts that are done by intern workers and not by consultants, but they are also costly"*

One respondent says that he doesn't know which part is the most costly because the SR is made by consultants.

- 38) For the safety management system : Do you have any estimates of the costs for the operator related to the implementation of the Seveso directive?

60% do not have any estimates of the costs for the operator related to the implementation of the safety management system.

Only 40% of respondents do have any estimates of the costs for the operator related to the implementation of the safety management system.

39) If you have answered 'Yes' to the previous question, please select ranges below :

- Less than 10 Person.Months
- Between 10 and 30 Person.Months
- More than 30 Person.Months
- Not applicable

The costs for the operator related to the implementation of the safety management system is estimated to be

- Less than 10 Person.Months by 75% of respondents, so a large majority
- Between 10 and 30 Person.Months by 10% of respondents
- More than 30 Person.Months by 4% of respondents

Some respondents can not estimate the costs because:

- *"the contents of the directive are an integral component of [their] striving for safety and would be complied in most of the topics by the operator without an official legislation, so factual efforts cannot be separated well"*
- *"Most of the safety management system was already in place exists before required by Seveso II therefore there were not a significant amount of additional costs"*
- The implementation of the SMS is structural and the cost is not estimated.
- all the employees participate to the implementation of the SMS so it is not possible to estimate costs
- For many respondents, the SMS has been implemented jointly with other management systems such as the quality management system and the environmental management system, by the same work team

One respondent points out that the cost is due more to audit and inspections of the SMS than to its implementation.

One respondent specifies that costs are equivalent to 15% of its turnover and of its personnel.

40) For emergency plans : Do you have any estimates of the costs for the operator related to the implementation of the Seveso directive estimated?

Opinions are quite equally divided: 55% of respondents do not have any estimates of the costs for the operator related to the implementation of emergency plans and 45% do have any estimates.

41) If you have answered 'Yes' to the previous question, please select ranges below :

- Less than 10 Person.Months
- Between 10 and 30 Person.Months

- More than 30 Person.Months
- Not applicable

The costs for the operator related to the implementation of emergency plans is estimated to be

- Less than 10 Person.Months by 81% of respondents, so a large majority
- Between 10 and 30 Person.Months by 8% of respondents
- More than 30 Person.Months by 1% of respondents

Some respondents can not estimate the costs or have no supplementary cost because emergency plans already exist before required by Seveso II.

Tasks such as meetings, training, drills and reviews linked to emergency plans are time consuming and a lot of specific competences are necessary (direction, EHS engineers, employees involved in the crisis structure, first-aid workers, emergency aid employees)

Cost of emergency plans:

- 1 part-time employee
- 1 full-time employee in charge of the organisation and the functioning of emergency teams
- 1 k€ every 3 years
- half the cost of the safety report.
- 0.1% of the turnover and of the personnel.
- 3 k€ every 3 years

42) Do you have estimates of the costs of prevention / mitigation measures installed as a result of the systematic analysis of risk performed in the Safety Report?

71% of respondents do not have estimates of the costs of prevention / mitigation measures installed as a result of the systematic analysis of risk performed in the Safety Report.

Examples of costs estimations:

- Several hundreds of kE
- 600 à 800 k€ per year
- 3000 –5 000 k€ in the last 10 years
- 10 000 k€ in the last 6 years, of which 30% is related to Seveso II regulations
- entre 150 à 200 k€/year during 5 years
- less than 10 persons-month in a plan to reinforce industrial safety

Costs of prevention and mitigation depends on the site (environment, land use, states of installations (old or not), etc.). Moreover, costs of prevention and

mitigation are spread out over several years and contribute to a technological improvement, and then it is difficult to separate their costs and the induced gains.

Prevention and mitigation is not implied only because of SEVESO directive application but also because of safety issues, because of national requirements, etc. So it is impossible to distinguish which of them are a result of the systematic analysis of risk performed to comply with SEVESO or with its national implementation and the others.

One respondent points out that the reduction of risks at source (reduction of dangerous products quantities, replacement of dangerous products by less dangerous ones) has implied the reduction of its turnover.

A upper tiers site of a multi-company thinks that very few improvements have been made as a direct result of the Seveso directive that would not have been made anyway either due to company policy or existing legislation.

43) Do you have estimates of the benefits related to the implementation of the Seveso directive? If yes, please provide the document references.

A large majority (91%) of respondents do not have estimates of the benefits related to the implementation of the Seveso directive. For many of them, there is no financial benefit. When some of them consider that a financial benefit is possible, they have no estimation and point out that it is difficult to measure because financial benefits are indirect and due to:

- The reduction and mitigation of occupational accidents,
- The improvement of occupational safety,
- The improvement of process safety,
- The improvement of legal compliance that avoids to have fines and so allows to save money,
- A guaranty to ensure the continuous existence of the industry and "*Continued license to operate*"

On the other hand, these point are qualitative benefits and are benefits for safety improvement. "*The increased focus on process safety and on compliance is a benefit*".

The principal issue is that safety requirements should not reduce too much the rate of profit; otherwise, it leads to the closure of the industrial site.

Presently, some respondents point out that costs of implementing SEVESO II can be so significant that the viability of the operators activities or the existence of its site can be threatened. "*The total seveso II costs a lot of money*"; "*The costs are so significant that the viability of our operations on site are threatened*"

Moreover, costs are important for small sites: "*non structured small or family leaded establishments (overpassing the limit amount for hazardous chemical) are obliged to develop a safety report and implement safety management system otherwise carried out only by bigger structured firms*".

3.3 Issue 3: Effectiveness of the implementation

1) From your point of view, is the approach of the Seveso II directive appropriate to prevent major accidents and mitigate their consequences?

A majority of respondents (84%) considers that the approach of the Seveso II directive is appropriate to the prevention of major accidents and mitigation of their consequences.

Some respondents noted that:

- *"Assumed the process data for risks analysis are delivered correctly (reflecting the true hazard scenarios)"*
- *Through the systematic analysis of the plant safety, safety management as well as through internal incident reaction planning.*
- *"It is relatively easy to write a good safety report, but much harder to have the correct values in the organisation and to ensure that individuals do the right thing every time. It isn't clear how the current directive addresses corporate and local culture effectively".*
- *Seveso directive requires systematic and comparable approach towards identification of hazards, their assessment and derivation of necessary counter-measures from all enterprises.*
- *The approach based on substances for the identification of critical parts of the plant has proved its value, as the number of incidents lightly decreases through the course of the years.*
- *Even under the consideration that no 100% safety or "zero-Risk" cannot exist, the goal of prevention of major industrial accidents and reduction of their consequences through the Seveso Directive and its German implementation is adequate.*
- *"Yes, but in addition to other aspects not covered by Seveso like good operative practices, and good information and training of people."*
- *"Yes to the identification of accidents and prevention and mitigation measures; but consequence analysis and probabilistic analysis are very costly".*

The reasons for which people think that the approach of SEVESO II Directive is not appropriate are presented below:

- The approach is inappropriate because it is time consuming (too bureaucratic).
- The documentation requirements and inspection load (by multi discipline authority teams) makes it to become a bureaucratic load for companies.
- The public character of the information in the Safety Report could become a terrorism threat if widely spread (over the internet) to inform the public.
- Some risks are transferred on the road.
- A respondent (multinational company_) points out that Seveso is redundant with the corporate internal system.

2) Are the requirements proportionate to the aims of the directive?

Yes for 80%.

Respondents that answered NO: one added that they imply much duplication; other says yes to the identification of accidents and prevention and mitigation measures; but consequence analysis and probabilistic analysis are very costly.

Some improvements are formulated:

- An operator suggests to an audit programme instead of spending lot of time for the compliance with a safety report:

"The safety report requirements are disproportionately onerous when compared to the effect they have on reducing major accident potential. The time/resource taken by operators to prepare and issue safety reports would be better spent following a rigorous audit programme covering process safety/major accident issues, and taking those actions that would have the greatest effect in reducing risk. The time/resource that Competent Authorities devote to assessing reports would be more effectively spent assessing operators' compliance with such an audit programme, and carrying out on-site inspections/assessments of priority sites."

- Some operators suggest that the requirements could be proportionate to the level of risks (for example *"too many formal requirements especially for SMEs"*).

3) Do the requirements lead to a recognisably higher level of safety in comparison with industrial sites not covered by the Directive?

Yes at 89%! The requirements lead to a recognisably higher level of safety in comparison with industrial sites not covered by the Directive, but other European Directives contribute to that success.

The success is achieved because of two main factors:

- A good awareness from employees and contractors on site of safety issues and safety behaviour
- The involvement of the competent authority (inspection)

An operator reminds that very severe accidents can also happen to sites which fall below the Seveso 2 thresholds: e.g., a major explosion in a factory in Glasgow, UK, which killed ca 10 people but was not under COMAH.

YES but ...

- Safety and costs: *"Sites covered by the directive are generally at a higher level but the difference between lower and upper tier is probably not that significant to justify the significant additional costs"*

Seveso does not mean internally added requirements because the corporative ones are similar or superior.

On the SEVESO sites it is necessary to implement other and more comprehensive measures in order to achieve the proper safety level. To consider this level as higher is not correct in context of other sites.

Seveso directive requires systematic consideration of all risks; this is in other industries not so common. But in the own company, all the sites and plants that are not under Seveso directive are systematically checked, too.

Seveso directive is applicable on the sites and companies with relevant risk potential and prescribes requirements. Industries or plants and utilities (i.e. public utilities) that do not have this risk potential have to fulfill lower requirements. It is to assume that those enterprises try to fulfill societal requirements towards safety in their own interest.

4) Are there some requirements not covered by EU legislation that could improve the prevention of major accidents and the mitigation of their consequences?

71% answered NO to that question.

This question gives the opportunity to make some other suggestions. For example:

- The need to have a risk acceptability defined at a European level.
- The need to integrate security to the Seveso Directive
- The need to harmonise regulations between countries (example given of Belgium, France and Netherlands)
- The need to cover also transport of dangerous goods and pipelines.
- The need to extend SEVESO requirements to railway stations and harbours.
- Aquellos relacionados con la normativa OHSAS 18001

Respondents that answered YES suggest, one respondent to require quantitative risk analysis to all establishments and, other respondent to include requirements of OSHAS 18001.

5) Are the Seveso requirements complementary to other "non-Seveso" safety requirements?

YES for 87%.

6) Are these requirements overlapping?

Yes for 67%.

Operators noted that the Seveso II directive is overlapping with ATEX, Occupational directive, fire protection legislation, other safety legislation.

7) Do you use specific indicators to measure performance related to major accidents?

Yes at 70%.

In French regulation (*arrêté du 10 mai 2000*), there is an obligation for the operator to provide each year a report describing the efficiency of the SMS and Accident Prevention Policy.

8) If yes, please describe your indicators.

Many indicators are named:

- indicators related to potential SEVESO incidents as well as major and minor incidents,
- "lagging" indicators = after incidents,
- indicator related to safety critical maintenance,
- indicator related to checks on the permit to work system,
- leading indicator, for example: conducted actions for updating HAZOP, number of inspections, or Quantity of risk analysis per year
- data on process deviations and losses of containment which are indicators for major accidents as well as other operational problems...

9) Do you keep statistics?

Yes at 95%.

10) Do you have a system in place for reporting incidents in your establishments and for learning lessons from them?

99% of the respondents declared having a system in place for reporting incidents.

The incidents can be investigated by site managers, safety professionals, employees.

11) Do you have indicators for these incidents?

Yes at 75%.

12) What is your threshold for incidents records?

The respondents give no specific example of threshold at which incident is recorded. Each incident is recorded.

Except for "*a loss of primary containment less than 50 kg*".

One respondent point out:

"There is investigation of all personnel, industrial and traffic accidents and incidents with high potential of losses.

Other incidents are register for posterior investigation. It is advisable to investigate all accidents and incidents.

Nevertheless only will be computed as indicators the ones with one or more of the following effects:

- *fire or explosion with losses > 25.000 €*
- *leak > 2.2 Ton of inflammable or a quantity higher than the demanded report in the list EHS of EPA*
- *any fire, explosion or leak with associated serious or very serious personal consequences*

In the case of personnel accidents associated to events, these will be registered also as personnel accidents."

13) A majority of respondents agrees that:

- The approach and the requirements are robust and relevant.
- The approach and the requirements are clear.
- The approach and the requirements are not excessive.

14) A majority of respondents agrees that:

- Most of the incidents and accidents find their origin in human and organisational factors
- Most of the prescriptions after an accident are technical.

A majority of respondents disagrees that:

- *"It is difficult to share experience on accidents and near-misses because there is a fear of punishment".*

A majority of respondents disagrees with the statements:

- *"I do not see the benefit of reporting accidents to the authorities".*
- *"There is no feedback from the reporting on incidents and accidents made to the authorities".*

15) A majority of respondents disagrees with the statements:

- *"Internal communication within establishments is not sufficient".*
- *"Workers have only few opportunities to be consulted on decisions related to major accident prevention development".*

Some improvements are formulated:

If internal communications and consultations arrangements are generally strong, Industry recognise that there is always a scope for improvement. For example for the management of change and in learning from past incidents.

Some operators noted that "*internal communication with operators in the workplace is always difficult*", even if there are many ways to involve them: meetings, involvement of the workers during risks analysis, training, briefings ...

"We are a small company where all workers are very much aware of safety issues so they continuously give improvement ideas. "

The employees are closely involved in the i.e. risk assessment. They are also involved in the discussion and decision about the measures.

Inside the operating areas, at all levels, the routine discussions are taking place, with involvement of employee representatives, i.e. HSE panels. The employees are involved through training, instructions, and especially through workplace risk analysis in the risk prevention.

Communication in the form of experience exchange is highly recommended and it takes place regularly. Inside the working area, regular routine discussions on different levels and on different topics are taking place. The employees are involved through training, instructions, and especially through workplace risk analysis in the risk prevention. The involvement of the employees in the process is the result of legal requirements of Germany, but also the result of the internal company belief that this is necessary and meaningful.

Routine discussions inside the plant, briefing and project and work place related risk assessments, as well as different coordination groups inside the chemical park on the safety-related topics.

Sometimes, in the investigation of major accidents, workers don't have enough technical competencies.

16) A majority of respondents agrees that:

- the Seveso II directive should be made more consistent with IPPC and safety at work directives.

Many respondents think that the consistency of different regulatory regimes could lead to a simpler, clearer set of requirements for operators and would result in greater compliance and higher standards.

A respondent would prefer to "*tackle the area of duplication rather than consistency*".

A respondent identified conflicts between different regulations and directives: protection of the workers, protection of the environment. He also complied about the need to have different contacts with the authorities.

- The safety nature of cross media effects needs to be more explicitly and visibly taken into account during BAT development.

A respondent noted that BREF documents are difficult to read, to analyse and to use.

A respondent suggested that some organisational safety aspects should be integrated in the BAT.

Harmonisation with occupational health regulation is needed, but it should not lead to "over-regulate".

17) Should standards be descriptive or performance based (based on qualitative or quantitative criteria)?

Different answers were given.

A general recommendation is to have firstly performance based standards.

The difficulty of "*performance based standards*" is the variety of solutions to a same problem. That's why some respondents recommended a mixture.

One improvement is formulated:

A general recommendation is that standards are written with the involvement of Industry.

18) There is an equality for the statement "the Seveso II directive has led to the transfer of some risks to transport systems".

A general comment is that many establishments manage their inventories so as to avoid the higher level of SEVESO. This situation often entails the multiplication of small storage and additional transport. This also puts at risk other workers who would not previously have been exposed.

Some respondents ask for more risk analysis of the transfer of some risks to transport systems.

- A majority of respondents disagrees with that statement: "Measures to mitigate major accidents can lead to increase risk for the workers"
- A majority of respondents agrees that: "Risk management approaches are always a compromise; we need to find the optimum".

Our transportation accident statistics shows no increase over the years. Critical is the displacement of transports on the roads with high accident rates. In this case we do not see significant relation to our safety concepts in the company and plants. Safety of plant should not and it is not in conflict with the work place safety. Risk management is always a trade-off between too much and not enough. The protection of workers is always on the first place.

Through the implementation of the Seveso directive the outsourcing of the production takes place into the countries that do not have those requirements or they have but do not implement them. As a necessary consequence, the increase of the import of the critical substances takes place.

Storage and intermediate storage quantities are reduced, but a displacement towards transport did not take place. The safety measures increase in general the safety of the workers. Reasonable risk management requires the balance of all points of view.

Interest of the company and of the industry is to achieve the goals, i.e. higher safety levels and environmental protection. These goals are of fundamental nature and therefore independent from the surrounding environment, law jurisdiction and legal requirements. The "objects of protection" employees and the neighborhood have to and are at the same time traced and solved. Risk has always the aspect of the prospects and possible drawbacks.

Accident reduction measures according to the Seveso II are mostly directed towards the protection of the surrounding of the establishment, but through the cause-effect relation lead to reduction of risk for the employees. Risk management: there are always more ways to achieve the goal, that have to be judged under the consideration of the commensurability.

One respondent points out: "to control all risks is very difficult and interpretations of the legislation by inspectors can address to demand more and more safety measures that sometimes can be self-defeating or not relevant at all!"

3.4 Issue 4: Seveso II and the competitiveness of the European Industry

1)

- A majority of respondents disagrees that *"the level of implementation is so costly & labour-intensive that a substantial re-organisation has been observed to maintain industry's competitive advantage leading to: a) a move from upper tier establishments towards lower tier establishments; or b) a move from lower tier establishments towards establishments falling outside of the Seveso II Directive."*
- A majority of respondents disagrees that *"the level of implementation has led to significant market distortions because of undue productivity losses, negative trade balance influences & capacity to absorb new technologies within Europe, since the severity of the requirement varies between sectors or between MS"*.
- There is an equality for the statement: *"the level of implementation has led to significant market distortions because of productivity losses, negative trade balance influences & capacity to absorb new technologies with third countries, in particular, emerging economies"*.
- There is equality for the statement: *"the level of implementation is seen to be highly effective, providing an added value and enhancing the industry's image at national, European and/or international level leading to a competitive advantage based on investment in service skills and openness"*.

2) Does "too high safety requirements in Europe" represent a significant factor in delocalisation of production towards third countries?

Opinions are equally divided.

The general trend is that the overall business costs in Europe compared to elsewhere is a more significant factor. In this context, "safety costs" are just one part of this wider picture.

On the other hand, Industry is aware of the fact that safety costs are financially beneficial in the long run, because they reduce the chances of facing the huge cost of major accidents,

Some improvements are formulated:

- Some respondents would like a reduction of the bureaucratic burden, and of the inspections.
- Another suggestion is the reduction of the delay for the delivery of a permit by competent authority. This factor seems to impact the industry performance.
- To reduce the delocalisation due to safety requirements", some Industry suggest to harmonise the SEVESO II directive with other internal regulation.

- "It is impossible to compete with countries where there is no safety regulations. Safety companies should be protected."

- Outsourcing of industrial activities in the countries outside Europe is determined through other factors, that is, the requirements of the Seveso directive have no relevant influence. Multinational companies are aspiring the same security level globally; therefore this is not really decision criterion.
- "I think that European regulations, and not only Seveso, lead to delocalisation to more permissive countries. "
- Main factor for outsourcing are in general not the security requirements. For the multinational companies, the safety standards are valid world-wide.

3) Does safety represent a reason to keep the production in Europe?

Opinions are equally divided.

There is no specific remark or suggestion concerning this question. It can be noted the following remark from an English Operator: *"Our plants in China and India are constructed and operated to western European standards. They produce the same product that is produced in Europe. European plants only stay open where they are able to control their costs to an equivalent level"*.

4) To your knowledge, have market distortions been evaluated?

A majority of respondents (89%) answers NO to that question.

One respondent that answered YES pointed out "in the GLP installations for storage and distribution to final clients"

5) Do you have any further remarks about the application and effectiveness of the Directive?

NO (84%)

6) If you have answered 'Yes' to the previous question, please provide details.

These final remarks can be considered without being reformulated:

- *"We are a relatively new Top Tier site we were included as a result of the reclassification of products that we have made / used for many years. We have a well established safety system and the plant has been operational for over 50 years without any significant off site incident. moving to Top Tier status has cost a significant amount of money and will involve ongoing costs of approx £30000 per year in fees to the UK authorities. Along with similar costs for IPPC the UK is not an attractive place to locate chemical manufacturing facilities and we fear that this could have a significant effect on the viability of our site"*.
- Possibly no change in the Seveso Directive, in order to minimize the bureaucracy costs necessary generated by it. The main focus should be on the continuous and sustainable implementation of the directive.



- The quantities would have to be adjusted due to the introduction of GHS, while a lot of sites would have to move lower to higher tier, without the real change in the safety aspects. Our site is one of them. Additionally, it should be considered to remove the environmental substances from the directive and taken over the water protection legislation, as their hazard potential is not comparable with other criteria.
- The scope of Seveso Directive should be revised.

50 Tons of chlorine can cause a mayor accident so it is necessary a SR. It is difficult that 200 Tons of a not volatile "T "or "N" classified substance as acrilamide 50% or solid ZnSO4 could cause a major accident, but according to the actual version of the Directive, a SR is necessary.

- Applicability to pipelines and to GLP storage and distribution installations for final clients (domestic uses).

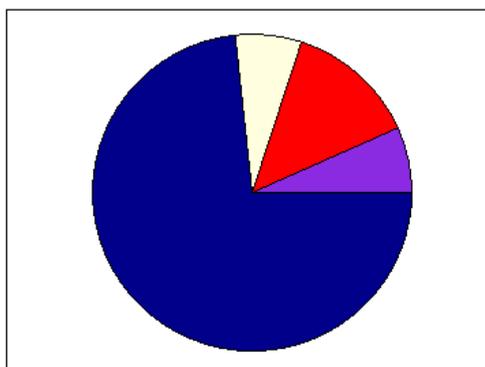
4 “Others” questionnaire

The present analysis takes into account the responses to the questionnaires of 20 “Others” obtained at the 11st April 2008.

Others are:

- Two National NGO,
- One European or international NGO,
- Two Union (National level),
- One Union (European level),
- 11 organisations, for example: layer, consultants, research organisation, trade association ...

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■ National NGO ■ European or int...
■ Union (National... ■ Union (European...
■ Other organisat...

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All the countries are from Western Europe: Belgium, France, Germany, Italy, Netherlands, Spain, United Kingdom.

4.1 Issue 1: Transposition of the Seveso II Directive requirements and general approach

1) Does the national law require the submission of specific information that is used as indicators?

YES at 71%.

2) Are national requirements in line with the Seveso II directive?

Yes for a majority of respondents (94%)! And in general, it appears that some European countries requirements exceed the EC Directive.

3) If there are differences, do these present significant implementation problems?

62% answered NO to this question.

For Yes, the justification is:

Differences could be found in the interpretation of some threshold indexes. For instance, the application of AEGL index differs from its original sense, leading to excessively conservative values (distances longer than reasonable).

4) Should the Seveso Directive be supported by further European reference documents (guide of best practices, standards, etc)?

A majority of respondents (83%) expressed their wish for the Seveso Directive to be supported by further European reference documents.

Some recommendations are listed below:

- How to take into account specific problems such as aircraft impact, earthquake?
- Harmonisation of requirements of land-use planning.

For Yes, the justification is:

Harmonization of risk calculation criteria avoiding "local" interpretations will be welcome should be welcome. Production of EU-wide scope guidelines would produce more equilibrated safety reports, avoiding national differences which are conditioning international competence.

A person advises to *"use existing guidelines instead of reinventing new one"*.

5) Are the directives related to prevention of accidents and protection of the environment linked in your country or under an explicit common framework?

A small majority of respondents (60%) agrees because in lot of European countries, there is a single set of regulations for safety and environmental concerns.

6) Do you see a need for any improvements?

69% would like the SEVESO II to be improved.

The recommendations are listed below:

- "Consequence analysis is not practical. There is no control of posterior control derived from it. Need of more restrictions in the implementation phase.
- Include the soil and air aspects as environmental issues in the risk assessment.
- Harmonise European methods / tools
- Make clear relation between safety and security
- Harmonisation of risk calculation criteria avoiding "local" interpretations will be welcome
- Implementation of the effects of taken measures in the risk calculation models.

- *"There is a great differences in fulfillment and controls between establishments interested by Seveso Directive and establishments below lower tier threshold, although the dangers may be the same and the risks of the second group also higher. Specific requirements should be forecast also for the establishments with dangerous substances below the lower tier threshold".*
- land-use planning - guideline to risk evaluation (simple model like the EPA reference)

7) If you are aware of the availability of specific best practices in specific Member States that could provide a model for improved implementation of the directive, please describe the information available, give the references, etc.

Each member state established independent criteria. A synthesis of the best practices should be expected in a near future.

4.2 Issue 2: Implementation of the main requirements of the Seveso II Directive by the operators: practices, weaknesses and possible problems

1) Are existing European guidance documents adequate? If no, please explain what more is required?

62% of respondents think that existing European guidance documents are not adequate. Firstly, they outline that European guidance documents deal with general principles and philosophy of SEVESO directive and are too generic to be useful. Then they are hardly or not used in practice. They also need interpretation of CA to be used. Moreover, they are not or badly known by industries. Lastly, each country has developed its own national guidance documents to cope with national practices and organisation and those national guidelines are generally used.

One improvement is formulated:

Necessity to develop additional guidelines for some aspects that are badly or not cover in existing guidance documents, such as major accidents risks assessment, emergency planning.

2) Are there some general or specific guidance documents available at national level prepared by the authorities for the preparation of the documents required by the Seveso II Directive?

For all the respondents, some general or specific guidance documents are available at national level and prepared by the authorities for the preparation of the documents required by the Seveso II Directive.

3) If you have answered 'Yes' to the previous question, did the preparation of the guidance documents involve the industry or other stakeholders?

For 75% of respondents, the preparation of the guidance documents involve the industry or other stakeholders.

But it appears that:

- when an involvement of industries exist, its extent is limited: only few industries are involved,
- when an involvement of industries exist, there were not enough iteration with them to ensure a strong consensus
- not every document is prepared with industry or other stakeholders.

- 4) Are there adequate systems and procedures to ensure the sufficiency of the information provided by operators and its appraisal by the authorities?

For 81% of respondents, adequate systems and procedures exist to ensure the sufficiency of the information provided by operators and its appraisal by the authorities. One points out that it is adequate *"provided that authorities have sufficient knowledge to 'ask the right questions"*. Nevertheless, *" EC guidance isn't sufficient for this purpose"*. Moreover, these systems and procedures could be improved. For example, a list of generic accidents that should be studied according to a type of installation and to chemical products that are used, would be helpful.

In Spain, the procedure for the appraisal of the information differs among regional authorities. In one case it is suggested that greater independence of "authorised organisations for evaluation" from industries would improve evaluations. Finally, *"it exists an Spanish harmonised procedure to evaluate the information, but I seriously doubt that it is being fulfilled by the all the Spanish autonomous authorities"*.

In Italy, there is no guidance *"to help in the evaluation of the sufficiency of the information provided by operators and its appraisal by the authorities"*.

In France, the application of national requirements is difficult and authorities need many exchanges with operators to ensure the sufficiency of the information.

In Poland, *"The requirements of the executive ordinances issued according to provisions of The Environmental Protection Law concerning the control of major accident hazard by the Minister of Economy and the Minister of Environment are very detail and precise."*

- 5) Is necessary updating assured?

For 75% of respondents, the necessary updating is assured.

In Spain, updating is compulsory by regulations but its implementation in practice depends on the concerned regional authority.

In France, updating is compulsory for all industrial sites that need a safety reports.

- 6) Is the length of time it takes industry to get responses and approvals from competent authorities too long?

For two tiers of the respondents (60%), the length of time it takes industry to get responses and approvals from competent authorities is too long.

Delay can be more than one year in UK and several years in France. Respondents outline that terms of response and decisions are mentioned in low, but delays can not be met. Delay varies from region to region because of the different regional CAs, of their standards for analysis. Respondents explain the length of time necessary to obtain responses and decisions of authorities by:

- the procedures the authorities have to follow
- manpower of CAs
- competence
- conflicts of interests
- the time limit for operators to provide documents and the length of time before documents are analysed
- demand of further or complementary information or further survey
- the lack of standards for risk analysis
- national regulations that are more demanding than Directive

- 7) Express you level of agreement with the following statement : For internal emergency plans, operator consultation of workers, and provision of information and training, is adequate

86% of the respondents agree that operator consultation of workers, and provision of information and training is adequate for internal emergency plans. Those are generally legal requirements and can be included by internal procedures. Workers participate to safety drills of the internal emergency plan. Moreover, workers groups of representation participate with operators to work meetings about health and safety.

- 8) How do you see the relationship / interaction between the directive's requirements and occupational safety and health and other rules and standards (e.g. ISO 31000): complementary, duplicative, no link.

According to 80% of respondents, the relationship / interaction between the directive's requirements and occupational safety and health and other rules and standards (e.g. ISO 31000) are complementary. However, they are duplicative for 10% and *"There may be some overlap, but, generally, major accident risks are handled differently."* One respondent sums up his opinion as *"In the principle, structures of all management systems are formally very similar but often, they behave independently or like "non-consumed marriage", being together under one roof, but not really acting together"*.

Justification for duplicative:

Many times, persons in charge of both aspects are different. OHS and Seveso II have their own and separate frameworks in Spanish legislation. Conciliation between them is not an easy subject.

- 9) Do you have any estimates of the costs for operators related meeting the requirements? If yes, please provide the document references.

80% of respondents have no estimate of the costs for operators related meeting the requirements.

Costs depends on the nature, complexity, extent and organisation of the enterprise, but it varies *"obviously, between 0.1 and 5 person years per year"*.

"The cost for the implementation of the Seveso directive (SRs, SMSs, Emergency plans, etc.) may vary between € 25000 (galvanic industry) and € 150000 (refineries). The maintenance depends from the controls and may vary between 10000€ and 50000€ per year".

One respondent answers that *"it is not easy to differ costs of safety from other expenses, sometimes even impossible"* and that operators do not give "related documents" for this aspect!

- 10) Do you have any estimates of the benefits related to the implementation of the Seveso directive? If yes, please provide the document references.

75% of respondents have no estimate of the benefits related to the implementation of the Seveso directive. However, *"The benefits of the Seveso directive are obvious, its implementation is questionable"*.

For the quarter that has an estimate, the benefits result in:

- the low workers fatality rate in the chemical sector compared with the tertiary sector,
- the improvement of overall safety level and safety culture
- the stable frequency of major accidents per year. *"Among 8000 SEVESO plants in Europe, there are 25-30 major accidents per year. This frequency did not really decrease in the last 15 years."*

The benefits were principally *"to identify the key element of the plant which contribute or cause risk to the public and the environment and to get quantitative ranking of these contributors in order to priorities intervention"*.

4.3 Issue 3: Effectiveness of the implementation

1) From your point of view, is the approach of the Seveso II directive appropriate to prevent major accidents and mitigate their consequences?

A majority of respondents (81%) considers that the approach of the Seveso II directive is appropriate to the prevention of major accidents and mitigation of their consequences.

A respondent that unsewered NO added that risk analysis are performed but the implementation of measurements derived from it relays on industrials and there is no control about that.

2) Are there some requirements not covered by EU legislation that could improve the prevention of major accidents and the mitigation of their consequences?

There is an exact balance for the answers.

Some lacks are pointed out, that could lead to some improvements:

- The transport of gas or petrol by pipe (cf accident Ghislenghien in Belgium in July 2004)
- The risk of the transport. The Italian specific case is developed: *"In Italy the average of the deaths per year are as follows: 2 due to dangerous substances in Seveso plants (average of last 25 years) 6 due to dangerous substances in the transport (average of last 25 years) 1000 due to accidents with trucks (transport of non dangerous goods) 5000 due to accidents in the transport of people. It follows that the Seveso directive works well for the Seveso establishments, but that the problem lies mainly outside them. A Seveso-like directive should be forecast also for the dangerous goods transport, but also for the human transport"*.
- *"The acceptability matrix should be defined at a European level"*.
- APELL process should be included in order to encourage involvement of stakeholders (local population, authorities, industry). The person refers to the CLIC initiative in France.

One comment mentioned:

The information of the population in cases of accidents has to be improved. Warning and evacuation has to be trained and publicly known. The distances to the sensitive infrastructure and surrounding sources of risk have to be defined also for old, existing sites. The possibility of the license denial in cases of i.e. too small distances have to be defined more clear. There should be the regulation of the minimum of personnel. The state of the art of the safety equipment should be defined and periodically revised. The incident report should publicly announce the names, locations and substances released. The substances released during the accident should be measured using reliable and traceable methodology in the actual release radius. The information of the population in the further adjusted areas affected with the substance has to be improved.

3) Are the requirements proportionate to the aims of the directive?

A majority of respondents (73%) considers that the requirements are proportionate to the aim of the directive.

But it was reminded that the requirements are the same for all the establishments independently from the risk level.

4) Do the requirements lead to a recognisably higher level of safety in comparison with industrial sites not covered by the Directive?

At 93%, YES! A person noted that it is due to the strict and extensive monitoring by authorities.

- The development of MAPP, SR and EP leads to higher safety levels.
- One respondent added that "Nevertheless, in Spain, the new legislation "Norma Básica de Autoprotección" (for the development of emergency plans in centres, establishments...) leads also to similar safety levels in non Seveso establishments."

5) Do the different requirements for upper and lower tier establishments result in differing levels of safety?

Opinions are equally divided.

For those who agrees:

- Upper tier leads to the development of external emergency plans and to public information, which guarantees higher protection to the public.
- Depends on the additional requirements.

For those who disagrees:

- Requirements vary only in the technical parts and these very few times are made in collaboration with companies.

There is no real difference in the requirements and the criteria applied by authorities. For instance, in the case of Catalonia (Spain), exigence levels are not equal, but similar. Quantitative risk analysis is required for both levels.

6) Do you use specific indicators to measure performance related to major accidents?

67% answered that they use indicators.

7) If yes, please describe your indicators.

Two main types of indicators are used: activity and outcome indicators. Some of them were developed in the program "Responsible Care".

8) A majority of respondents agrees that:

- The approach and the requirements are robust and relevant.
- The approach and the requirements are clear.
- The approach and the requirements are NOT excessive.

9) A majority of respondents agrees that:

- Most of the incidents and accidents find their origin in human and organisational factors

There is equality for the statements:

- "Most of the prescriptions after an accident are technical".
- "it is difficult to share experience on accidents and near-misses because there is a fear of punishment".
- "In many cases the analysis of incident/accident causes leads to identify failures in the SMS. Nevertheless, the problem to share experiences is not due to fear of punishment but to give a sense of "establishment with low safety performance" to the authority and the public.

A majority of respondents disagrees with the statement: "I do not see the benefit of reporting accidents to the authorities".

There is equality for the statements:

- "There is no feedback from the reporting on incidents and accidents made to the authorities".
- "We disagree with the existing statistics of the ZEMA report on human factors. Especially in the direction that they are the highest cause of the incidents/accidents. The subject can be seen as a broad subject, but comes to certain boundaries quite fast. Therefore is the subject to be handled with the focus on the feasibility of implementation. In the case when the national codes of practice are considered as regulation, this is not true. Germany has the system for the collection of experience of accidents and near-misses, initiated by the industry. Through the anonymisation the problems are not appearing. The goal is achieved."

10) A majority agrees that:

- "the public has the possibility to get easily information on the risks related Seveso establishments"
- "the public or representatives of relevant stakeholders have the opportunity to be properly consulted in the decision making process".
- "Processes submitted to public information: a) new establishments (artic 9), b) modification of those, c) modifications that leads to be affected by artic 9,

Some reasons are given:

- the information has a restricted availability due to security concerns.
- the evaluation procedures are not always transparent. And if they permit to involve public, the information is often difficult to judge and to understand.
- Both procedures are clearly established by the Spanish law. However, general population doesn't access such an information or, generally, doesn't understand it or its relevance.

11) There is equality for the statement "Internal communication within establishments is not sufficient".

A majority of respondents disagrees with the statement: "*Workers have only few opportunities to be consulted on decisions related to major accident prevention development*".

12) There is equality for the statement: "the Seveso II directive should be made more consistent with IPPC and safety at work directives". Italian person recommended not distinguishing SEVESO establishment from IPPC establishment. He recommends having a generic fulfilment "risk related". One respondent from Spain points out "Only better guidance for application should be produced."

- There is an equality for the statement "the safety nature of cross media effects needs to be more explicitly and visibly taken into account during BAT development"

13) Should standards be descriptive or performance based (based on qualitative or quantitative criteria)?

There is no major trend for this point.

One respondent "A wide basis of concrete cases should be exposed, disseminating to industry the criteria used by "experts" and avoiding local misinterpretation of better practices."

14) There is equality for the statement "the Seveso II directive has led to the transfer of some risks to transport systems".

One respondent **DESAGREE** but added that in some cases, to reduce the quantities of storage and level of affectation, frequency of transports has been increased.

- Measures to mitigate major accidents can NOT lead to increase risk for the workers.
- Risk management approaches are always a compromise; we need to find the optimum.

4.4 Issue 4: Seveso II and the competitiveness of the European Industry

- 1) There is equality for the statement "Is the general approach consistent with the aim to protect people and preserve at the same time the competitiveness of the European Industry?"

A general remark was formulated about the fact that there is a need for an international, not just EU, accord to achieve this aim.

- 2) A majority of respondents agrees that the level of implementation is NOT highly cost- & labour-intensive & a significant reallocation of resources have NOT been observed to maintain industry's competitive advantage
- A majority of respondents disagrees that "the level of implementation is so costly & labour-intensive that a substantial re-organisation has been observed to maintain industry's competitive advantage leading to: a) a move from upper tier establishments towards lower tier establishments; or b) a move from lower tier establishments towards establishments falling outside of the Seveso II Directive."
 - A majority of respondents disagrees that the level of implementation has led to significant market distortions because of undue productivity losses, negative trade balance influences & capacity to absorb new technologies within Europe, since the severity of the requirement varies between sectors or between MS.
 - There is equality for the statement: "the level of implementation has led to significant market distortions because of productivity losses, negative trade balance influences & capacity to absorb new technologies with third countries, in particular, emerging economies".
 - There is equality for the statement: "the level of implementation is seen to be highly effective, providing an added value and enhancing the industry's image at national, European and/or international level leading to a competitive advantage based on investment in service skills and openness".
- 3) Does "too high safety requirements in Europe" represent a significant factor in delocalisation of production towards third countries?

Opinions are equally divided.

It is considered that it is a factor in delocalisation, but it is not a main factor.

For instance, "European safety standards are just one of the factors limiting competitiveness. It is true that some aspects, such as time to authorization of new activities, should be improved. However, political and economical support policies for new industrial activities, and environmental, energy and manpower costs are limiting European industrial growth. In the case of chemical production, REACH is more preoccupation than major accidents policy."

- 4) Does safety represent a reason to keep the production in Europe?

There is a majority of respondents of NO (57%). The working costs appeared to be the most important factor.

"Except if new importations policy includes extra taxes or other limitations for non-safe production, it is not a reason to keep European production of dangerous materials."

A respondent that answered "YES" points out that external emergency plans can be a reason to keep production as it means an external collaboration and resources to face emergencies.

5) To your knowledge, have market distortions been evaluated?

The majority of respondents answers: NO (86%)

6) Do you have any further remarks about the application and effectiveness of the Directive?

Opinions are equally divided.

7) If you have answered 'Yes' to the previous question, please provide details.

Lots of commentaries were carried out. Two are quoted:

- *"In the UK the level of intervention by the CA's appears to be greater than in other countries. Introduction of charging for intervention has a strongly negative effect and it may be disproportionate to that adopted by other countries".*
- *"The importance of a seveso-like directive also for the dangerous goods transport and for the human transport."*