



Analysis and summary of Member States' reports on the implementation of Directive 96/82/EC on the control of major accident hazards involving dangerous substances

Final Report

March 2017



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European Commission Directorate-General Environment

Analysis and summary of Member States' reports on the implementation of Directive 96/82/EC on the control of major accident hazards involving dangerous substances

Final report



May 2017

Amec Foster Wheeler Environment
& Infrastructure UK Limited



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Executive summary

This report presents an analysis of the status of Member States' implementation of Directive 96/82/EC (the Seveso II Directive) during the 2012-2014 period and a comparison with previous reporting periods. The findings in this report are primarily based on the information contained in the reports submitted by Member States for the fifth and last reporting period under the Directive. This report also presents a statistical analysis of the eMARS¹ and eSPRIS² databases. In addition, this report provides initial groundwork to support the future evaluation of Directive 2012/18/EC (the Seveso III Directive), by considering possible benchmarking approaches and insights into understanding differences in outcomes in the EU and in selected other countries. Initial groundwork on possible indicators to monitor the implementation, and to assess the achievements, of the Seveso III Directive is also presented.

Implementation of the Seveso II Directive

The responses provided by Member States to the implementation questionnaire were mostly complete and clarifications were provided by most Member States (20 out of 24 requests) when requested.

Overall implementation

Overall the Seveso II Directive is mostly well implemented by the Member States. From the responses provided by Member States it appears that processes and structures are in place for implementing the Directive and only three Member States (Croatia, Greece and Italy) are considered to have difficulties relating to the implementation of key features of the Directive.

External emergency plans

An average of 88% of the upper-tier establishments had an external emergency plan at the end of the 2012-2014 period. This means that 407 upper tier establishments were not covered by an external emergency plan by the end of the 2012-2014 period. This marks a worsening since the last reporting period where an average of 93% of the upper tier establishments had an external emergency plan but an overall improvement since the beginning of the implementation of the Directive. This recent decline might be explained by the increase in the number of establishments and challenges for the competent authorities to keep up with this. It can also be explained in part due to newly classified establishments for which the deadline to adopt external emergency plans had not yet been reached.

On average 75% of the external emergency plans had been tested during the reporting period. This is a slight improvement over the last reporting period. However, the variability between Member States remains high. The information reported seems to indicate that Member States are now more efficient at reviewing and testing those plans.

Providing information to the public

On average 81% of the upper tier establishments had made safety information actively available during the reporting period. This represents a slight decrease since the last reporting period and the differences between Member States remain. Part of the discrepancies are explained by upper-tier establishments being newly classified.

Inspections

Upper tier establishments: On average, inspections were undertaken annually for 58% of the upper tier establishments, with inspections at 86% at least once over the three-year period. When excluding those Member States that base inspections on systematic appraisal of hazards (where annual inspection is not mandatory), the share of annual inspections of upper tier establishments is 79% which shows an

¹ The Major Accident Reporting System, accessible at: <https://emars.jrc.ec.europa.eu/>

² Seveso Plants Information Retrieval System: <https://espirs.jrc.ec.europa.eu/>

improvement since the end of the last reporting period. However, it is important to note that, for some Member States, annual inspection levels were relatively low and there may be a need for more support in this area.

Lower tier establishments: The inspection level of lower tier establishments has significantly improved with, on average, inspections undertaken in 77% of the lower tier establishments during the reporting period compared to 42% in the previous reporting period.

Actions taken in case of non-compliance

Enforcement instruments were reported as available but in practice these were used in limited instances during the reporting period. The range of actions available included fines, remedial orders and closure orders.

Analysis of establishment and major-accident data

Major accidents

Between 2000 and 2014 a total of 490 accidents (including major accidents, near misses and other) were reported to the eMARS database³. Out of these 490 accidents, the data for 389 accidents has been processed, confirmed and published online, while the remaining 101 accidents are still being processed and as such are considered as 'unpublished' data. Out of the 490 accidents, 421 were major accidents. On average, 33 new accidents have been reported in the eMARS database per year since 2000 based on all data. The average for major accidents is approximately 30 every year between 2000 and 2014.⁴

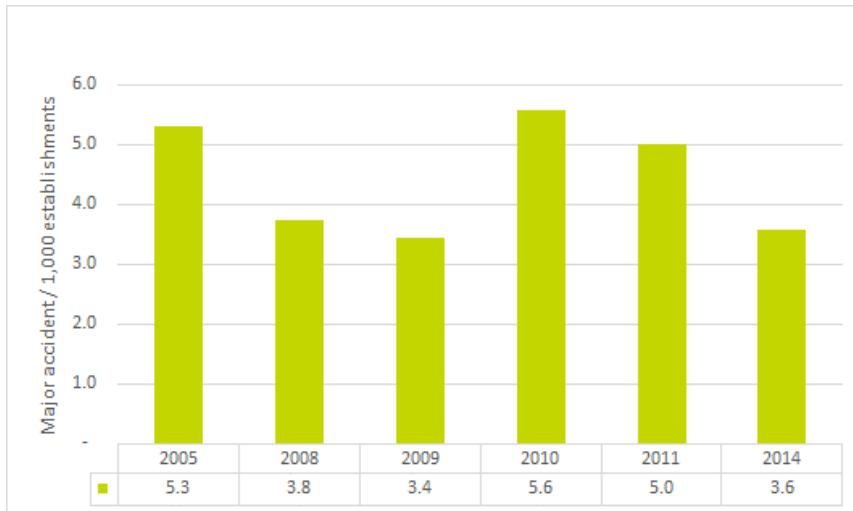
The figure below presents the evolution of the ratio of number of major accidents to the number of upper tier establishments. The chart is based on the data on major accidents recorded in eMARS (unpublished data) and the number of upper tier establishments reported by Member States through the triannual reporting.

Overall, a decrease in the number of major accidents per establishment is noticeable during the 2005 – 2009 period, followed by an increase in 2010 but it has not been determined that this a statistically significant trend. Because major accidents are reported in such small numbers, a variation in the number will exaggerate the impact. In addition, the latest data from 2014 are not considered complete so could represent an under-estimate. From the figure below it is impossible to conclude on whether there is an overall increase or reduction of major accidents, however it is possible to conclude that the numbers are relatively stable.

³ eMARS was established by the first Seveso Directive (EC/105/82) and launched in 1984 as a voluntary reporting system. In 1996 the new Seveso II Directive included the obligation for Member States to report major accidents to the European Commission at which time the Annex VI criteria was created, defining major accidents that fall under this obligation. Annex VI criteria contains reporting thresholds for different categories of impact including deaths injuries, environmental and property damage, and transboundary effects. Since it was launched, more than 1,000 accidents have been reported to eMARS.

⁴ Whenever possible the analysis in this report uses the complete dataset including unpublished data. Reports are not published until the Member State confirms all the information in the report. Hence, since some data fields in the unpublished reports have not yet been verified (e.g., consequences) only the published reports have been analysed.

Evolution of the number of major accidents per 1000 upper-tier establishments (2005-2014)



Source: eMARS database

Note: The figure presents only major accidents occurring in upper tier establishments as the number of lower tier establishments is not available before 2009. The number of upper tier establishments used are from Member States' reporting. Number of major accidents from upper tier establishments are from eMARS data including unpublished data.

Note 2: A total of 56 major accidents were reported between 2000-2014 as from establishments of 'tier unknown', these are not included in the figure above. These refer to reports submitted before Seveso II notifications were checked and finalised.

Note 3: The uneven intervals (2005, 2008, 2009, 2010, 2011, 2014) are due to the different ways in which the data was reported by Member States in their reports.

The eMARS data indicates that upper tier establishments have experienced more major accidents than lower tier sites between 2000 and 2014, with approximately 70% of major accidents occurring on upper tier sites and 17% on lower tier sites, while for 13% the tier is unknown.

The accidents in Enschede, the Netherlands, 2000 (22 fatalities, 527 injuries) and Toulouse, France, 2001 (31 fatalities and nearly 2,500 injuries) significantly increased the annual figures for fatalities and injuries in these years compared to subsequent years. In 2012, a peak can be observed in the number of onsite injuries due to several releases of toxic gas during this year. Therefore, any trend needs to be considered with caution due to the short period of time (2000-2014), given that they are heavily influenced by major accidents such as those of 2000 and 2001.

The release of toxic substances to air, ground or water appears to be the most frequent type of hazardous phenomenon associated with major accidents. (For nearly half the accidents (226), a phenomenon was not indicated which may be partially due to the transition from the pre-2009 reporting system to the current eMARS system, in which some of the phenomena are classified differently).

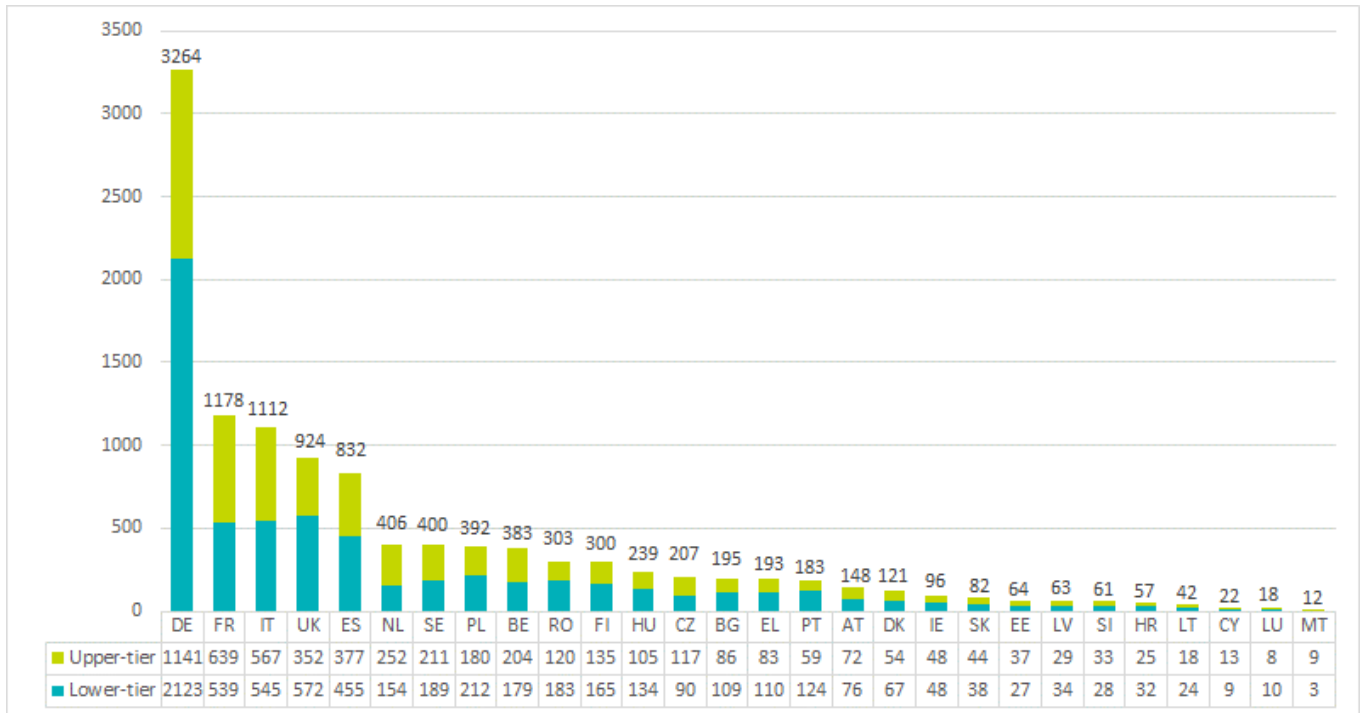
Analysis of establishments

Total number of establishments

In 2014, on average 44% of all establishments were upper-tier (representing 5 018 establishments) and 56% lower-tier (representing 6 279 establishments). The complete EU28 data set reported for 2014 is presented in the figure below⁵.

⁵ This report contains two separate sources of Seveso establishment information: data provided by Member States for the purpose of this 2012-2014 implementation report and data from the European Commission's eSPIRS establishment database, that Member States may update at any time and not necessarily at any fixed interval. The 2012-2014 data from Member States in almost all cases is based on a different time period than that in the eSPIRS data. The analyses in this report uses the 2012-2014 data provided in Member State reports, except when it is indicated that eSPIRS data were used.

Total number of Seveso establishments in the EU-28 (as of 2014)



Source: 2012-2014 Implementation reports

When compared to the data reported at the end of 2011, by 2014 there was a net increase of 983 establishments, most of which belong to the lower-tier establishment category (756). The increase is not easily attributable to economic growth, given that growth was quite low during the 2012-2014 period. As a result, this increase is perhaps unexpected.⁶ Alternatively, economic restructuring in the EU may have increased the presence of hazardous industries in relation to other economic sectors, or possibly new hazard classifications or improvements in enforcement may have caused more sites to be recognised as Seveso sites. It may also be related to better enforcement. This is not something that is evident from the questionnaire responses.

Activities of the Seveso establishments

When considering the information reported by Member States for the 2012-2014 period using the eSPIRS classification, the most common categories of activities for the Seveso establishments are general chemicals (12% of total establishments) and fuel storage (11%) although a miscellaneous group of 'other activities' is the single largest category (14%).

Distribution of establishments

The eSPIRS database has been used to view data on number of establishments per Member State and to compare this to GDP, population and surface (density of establishments per km²). The key conclusions are presented below:

- ▶ Bulgaria, Latvia and Estonia lead with respectively 4.23, 2.67 and 2.53 Seveso establishments per billion € GDP. Germany, which has the most establishments overall, is ranked number 18 out of the 28 Member States;
- ▶ Finland has the most establishments per inhabitants, with 48.2 Seveso establishments per million inhabitants, followed by Estonia and Sweden. It has not been possible to establish within

⁶ In 2012 less than half of the Member States reported economic expansion, in 2013 the EU-28 GDP grew by 0.2% and 1.5% in 2014, http://ec.europa.eu/eurostat/statistics-explained/index.php/National_accounts_and_GDP



this analysis whether this means that in these Member States the populations are more exposed to hazards from industrial installations; and

- ▶ In terms of density of Seveso establishments, Malta has the highest concentration of Seveso establishments, with 34.8 establishments per 1000 km². Then follow Belgium, the Netherlands, Luxembourg and Germany. 20 of 27 Member States for which data are available in eSPIRS⁷ have fewer than 3 Seveso establishments per 1000 km².

These data show that beyond the absolute number of establishments, in order to understand the significance of Seveso establishments for Member States, context is important. For example, the density by area and population are potentially important in relation to likely proximity to establishments, but these are relatively crude measures and further data would be required to better understand and compare amongst Member States.

Benchmarking

An initial review of existing databases in other countries was conducted in order to compare performance observed in the EU with those of other countries in terms of safety and major accidents. The review covered nine databases with a wide geographical coverage.

It has been challenging to compare the data reported, in particular due to the fact that there are no countries outside the EU that have a similar national reporting requirements based on a common definition of a major accident. From our analysis, it is not possible to conclude whether the EU is performing better than non-EU regions in reducing chemical accident risk. In order to compare the trends and the impact of policy on chemical accident risk, it would be necessary to have equivalent reporting regimes at national level in non-EU countries based on a similar definition of major accidents.

Indicators

In preparation for the upcoming evaluation of the Seveso III Directive, the Better Regulation guidelines⁸ foresee the use of indicators to assess progress made by an EU intervention in achieving its objectives. As such a review of possible monitoring indicators was conducted in order to identify in particular data gaps and needs to address when considering the Better Regulation requirements.

Our review considered the five evaluation criteria (effectiveness, efficiency, coherence, relevance and EU-added value.) and identified a range of relevant indicators, which will need to be further reviewed and prioritised, with further work required in order to identify the needed data.

⁷ Croatia did not contribute to the eSPIRS database in 2013 or 2014.

⁸ European Commission, 2015, Better Regulation Guidelines http://ec.europa.eu/smart-regulation/guidelines/docs/swd_br_guidelines_en.pdf



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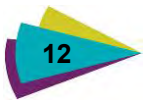
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1 Introduction

1.1 This report

This is the final report for contract 070201/2016/734452/SFRA/ENV.C4 between the European Commission and Amec Foster Wheeler Environment and Infrastructure UK Limited (“Amec Foster Wheeler”) in collaboration with EU-VRi and INERIS. It concerns the “analysis and summary of Member States’ reports on the implementation of Directive 96/82/EC on the control of major accident hazards involving dangerous substances”.

This report presents our analysis of the status of Member States’ implementation of the Directive 96/82/EC (Seveso II Directive) during the 2012-2014 reporting period and a comparison with previous reporting periods. The findings in this report are primarily based on the information contained in the reports submitted by Member States for the fifth and last reporting period under the Directive. This report also presents a statistical analysis of the eMARS⁹ and eSPIRS¹⁰ databases. In addition, this report provides initial groundwork to support the future implementation of Directive 2012/18/EC (the Seveso III Directive), by considering possible benchmarking approaches and understand differences in outcomes in the EU and in selected countries. Initial groundwork on possible indicators to monitor the implementation and to assess the achievements of the Seveso III Directive is also presented.

The work comprises six main tasks, some of which are interlinked, which are as follows:

- ▶ Task 1 includes the review and analysis of the implementation of the Seveso II Directive for the 2012-2014 period and a comparison with previous reporting periods;
- ▶ Tasks 2 and 3 includes the review of the statistical data available in the eMARS and eSPIRS databases;
- ▶ Task 4 includes initial research work onto possible benchmarking approaches in order to understand better the performance of the Seveso III Directive;
- ▶ Task 5 includes initial research onto possible indicators to be used in the future assessment of the Seveso III performance; and
- ▶ Finally, Task 6 aims at creating an information leaflet to showcase EU action on industrial accidents prevention and its benefits¹¹. A draft version of the leaflet is presented in Appendix G.

1.2 Study context

1.2.1 Overview of the Directive

Directive 96/82/EC¹² (commonly referred to as Seveso II) provides a benchmark for industrial accidents policy in the EU and beyond on the control of major industrial accidents involving dangerous substances. The aim of the Directive is to ensure the implementation of measures at establishment and Member State levels to prevent accidents and, where they do occur, to effectively minimise their consequences. Annex I of the Directive includes two lists of chemicals and associated thresholds for quantities stored/handled above

⁹ The Major Accident Reporting System, accessible at: <https://emars.jrc.ec.europa.eu/>

¹⁰ Seveso Plants Information Retrieval System

¹¹ Diverging from the Terms of Reference that require two leaflets, it was agreed with the European Commission that the deliverable should be one information factsheet.

¹² Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances, OJ L 010, 14.1.1997, <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01996L0082-20120813&from=EN>

which Seveso II applied. This includes both a list of named substances and also a list of relevant hazard categories for health, physical, environmental and 'other' hazards.

Prevention and control of accidents is achieved through specific requirements placed on operators storing or handling certain dangerous substances above a threshold quantity. There are requirements for both operators and Member State competent authorities, as listed in Table 1.1.

Table 1.1 Main requirements for operators and Member States competent authorities

Main obligations for operators	Article*	Main obligations for Member State competent authorities	Article*
Notification of all establishments	6	External emergency plans for upper-tier establishments and ensuring the public is being consulted	11
Major accident prevention policy	7	Land-use planning for the siting of establishments	12
Provide information to the public on safety measures	8, 11 and 13	Publication of relevant information on safety measures	13
Safety report for upper-tier establishments	9	Ensuring that any necessary action is taken after an accident including emergency measures, actions to ensure that the operator takes any necessary remedial measures and informing the persons likely to be affected	14
Internal emergency plan for upper-tier establishments	11	Submission of information on major accidents to the Commission	15
Provide access to information on major accidents to the competent authority	14	Prohibition of unlawful use or operation of establishments	17
		Inspections	18
		Exchange of information on experience regarding the prevention of major accidents and limitation of their consequences	19
		Submission of implementation reports every 3 years	19(4)

*= as in Directive 96/82/EC. Note that the article numbering changed in Seveso III

At the end of the previous reporting period (2011), the Seveso II Directive applied to more than 10 000 industrial establishments, including both lower tier and upper tier establishments. At the end of the latest reporting period, ending in 2014, the Seveso II Directive applied to 11 297 establishments¹³.

Seveso II was repealed by Directive 2012/18/EC¹⁴ (known as Seveso III) in 2012. As such, the reporting period 2012-2014 is the final reporting period under Seveso II.

1.2.2 Historical developments

Since first adopted, the Seveso Directive has been amended to incorporate lessons learned from major accidents as well as improvements identified in the implementation of the Directive. It has also been amended to reflect, for example, changes in the EU's approach to classification and labelling of chemicals.

Directive 82/501/EEC (the first Seveso Directive) was prompted by the impacts of an accident in a small chemical plant in the town of Seveso (northern Italy) in July 1976. The incident was triggered by the release

¹³ Sum of establishments reported by Member States in their tri-annual reporting

¹⁴ Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC, OJ L 197, 24.7.2012, <http://eur-lex.europa.eu/legal-content/EN/TXT/?qid=1456909234840&uri=CELEX:32012L0018>

of a toxic vapour cloud which resulted in death of livestock, skin lesions (i.e. chloracne) in the population and pollution of soil. The incident also resulted in an increase of cardiovascular mortality in residential populations¹⁵.

The revision of Directive 82/501/EEC was undertaken following the statements of the fourth and fifth Action Programme on the Environment and in light of the consequences of the accidents at Bhopal (leakage of methyl isocyanate and other chemicals in 1984) and Mexico City (gas leak and subsequent fire at a gas terminal in 1984). The first Directive was replaced by Seveso II in 1996.

The Directive was amended further in 2003¹⁶, to incorporate lessons learned from industrial accidents that occurred after 1996 such as those in Baia Mare (cyanide spill, 2000), Enschede (fireworks explosion, 2000) and Toulouse (explosion of a fertiliser plant, 2001).

Finally, Seveso III replaced Seveso II in 2012. The new Directive had to be transposed in all Member States by 1 June 2015. It incorporates the globally harmonised system (GHS) for classification and labelling of chemicals which is implemented through the Regulation on classification, packaging and labelling of chemicals (Regulation 1272/2008, the CLP Regulation), and also the changes to the regime on access to justice and information.

This most recent revision of the Directive took into account the information from the implementation reports for the period 2006-2008¹⁷ and was adopted after a proposal from the Commission¹⁸ and subsequent impact assessment¹⁹.

Seveso III incorporates changes that are expected to improve the effectiveness of the Directive, namely:

- ▶ Updating and aligning the list of substances covered by the Directive to the CLP Regulation;
- ▶ Strengthening citizens' rights on access to information, justice and on participation in decision-making;
- ▶ Improving the way information is collected, managed, made available and shared;
- ▶ Introducing stricter standards for inspections, ensuring more effective implementation and enforcement; and
- ▶ Clarifying and updating of provisions, including streamlining and simplification to reduce administrative burden.

In parallel to European developments, international initiatives have focused on increasing the safety of industrial sites, in particular through the UNECE and the OCED. These include:

- ▶ The UNECE adopted a Convention on the transboundary effects of industrial accidents (TEIA) in 1992. Member States and the European Union are parties to this Convention. It aims at protecting human beings and the environment against industrial accidents by preventing such accidents, reducing their frequency and severity and mitigating their effects. The UNECE has issued a series of guidelines including for example on land-use planning, on the identification of hazardous activities and on the preparation and inspection of a safety report. The Working Group on Implementation of the Industrial Accidents Convention reviews and analyses the implementation reports of the Parties to the Convention. The actual national implementation reports from the Parties are not available beyond 2011, however the Working Group has

¹⁵ Bertazzi, P., 1991, Long-term effects of chemical disasters. Lessons and results from Seveso, *Science of the Total Environment* 106, 5-20.

¹⁶ Directive 2003/105/EC of the European Parliament and of the Council of 16 December 2003 amending Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances, OJ L 345, 31.12.2003

¹⁷ Document C(2010) 5422 final

¹⁸ Document COM(2010) 781 final

¹⁹ Document SEC(2010) 1590 final

prepared summary analysis of the implementation, whose findings were included in our analysis²⁰; and

- ▶ In 2013, the OECD marked 25 years of chemical accident prevention policy²¹. In 1985 and in the aftermaths of the Bhopal and Schweizerhalle accidents, the OECD first mentioned the need to 'ensure the existence of appropriate measures to control potentially hazardous installations'. This was followed by the establishment of a committee, the 'High Level Meeting of the Chemicals Group', that concluded in 1987 on the need for international action on chemical accidents. The following year, a high-level conference was organised which concluded with the creation of a Working Group to focus for the following three years on improving safety of chemical installations. Following this work, it was decided to formally adopt the Expert Group on Chemical Accidents (later renamed Working Group on Chemical Accidents). The latest group has been extended for the 2013-2016 period. The Working Group has issued several guidance documents on developing safety performance indicators, on guiding principles for chemical accident prevention, preparedness and response, and on integrated management systems.

1.2.3 Reporting obligations

As described in Table 1.1 Member States have reporting obligations which allow the Commission and others to monitor the effectiveness of the Directive's implementation as well as to inform potential future policy. These are:

- ▶ **Reporting information on establishments covered by the Directive (article 19(1a)):** The Commission has set up a database known as the Seveso Plants Information Retrieval System (SPIRS), which contains restricted access information on establishments to individuals authorised by the Commission or by the competent authorities of the Member States. Member States are required to report information on number of establishments, distinguishing upper-tier and lower-tier, and the activities of these establishments;
- ▶ **Reporting major accidents (article 15):** The Commission holds information in a database accessible by all Member States. Publicly available extracts of this information can be found on the eMARS database website²². Member States are required to report information on events that meet the thresholds defined in Annex VI listing the criteria for the notification of an accident to the Commission; and
- ▶ **Reporting on the implementation of the Directive (article 19(4)):** Member States are requested to submit an implementation report on the basis of responses to a questionnaire provided by the Commission. The questionnaires are adopted as Implementing Decisions. The latest, covering the 2012-2014 period, was adopted in June 2011²³. The questionnaires cover all the key aspects of the Directive and request information on the status of implementation during the period. Under Seveso II this requirement occurred every three years²⁴.

In the 2006-2008 report, it was expected that the 2009-2011 period would be the last reporting period under Seveso II. However, the 2012-2014 period was ultimately covered by Seveso II as well, given that the deadline for transposition of Seveso III was in June 2015.

²⁰ Seventh report on the implementation of the Convention (2012–2013) Report by the Working Group on Implementation, http://www.unece.org/fileadmin/DAM/env/documents/2014/TEIA/COP__Gva__3-5_Dec_14/ECE_CP.TEIA_2014.4.E.pdf

²¹ OECD, 25 Years of chemical accident prevention at OECD, History and Outlook, <https://www.oecd.org/chemicalsafety/chemical-accidents/Chemical-Accidents-25years.pdf>

²² <https://emars.jrc.ec.europa.eu/>

²³ Document C(2011)4598 final, Commission Decision of 30/06/2011

²⁴ Previous questionnaires were: Document C(2008)5088 final, Commission Decision of 19/09/2008; Document C(2005)3103 final, Commission Decision of 13/10/2005 and Document C(2002)2656 final, Commission Decision of 17/07/2002.

This study assesses the last implementation reports of Seveso II (for the period 2012-2014), giving the Commission an opportunity to evaluate the implementation of the Directive as a whole. It will also assess the latest information reported on establishments and on major accidents.

1.2.4 eMARS and eSPRIS databases

The Major Accident Reporting System (MARS) operated by the Major Accident Hazards Bureau (MAHB) of the Joint Research Centre was established to handle information on 'major accidents' submitted by Member States to the European Commission in accordance with the provisions of the Seveso Directives. Since 2008, this reporting is available online on the eMARS platform. The aim of eMARS is to facilitate the exchange of lessons learned from accidents and near misses involving dangerous substances in order to improve chemical accident prevention and mitigation of potential consequences. Currently, eMARS holds data on more than 750 events provided since 1984 by the Member States (including major accidents and near misses) but also non-EU OECD and UNECE countries (for which reporting is voluntary). The database includes information on accidents that are reported as required by the Seveso Directive, according to the criteria of Annex VI.

This interim report contains information on the accident type, substances directly involved, and immediate sources of accident, immediate causes, immediate effects, emergency measures taken, and immediate lessons learnt.

Information on the eMARS database is available at: <https://minerva.jrc.ec.europa.eu/en/minerva> and the database can be accessed via: <https://emars.jrc.ec.europa.eu/>

The Joint Research Centre also operates the "Seveso Plants Information Retrieval System" (SPIRS) database which allows easy visualisation with a Geographical Information System (GIS) tool of important hazard and risk related information from Seveso establishments in Europe. In 2012, the SPIRS reporting was updated and MAHB in consultation with DG Environment developed eSPIRS as a platform to present information on establishments that are considered to present major hazards due to the potential accident risk associated with the presence of dangerous substances as defined by the Seveso III Directive. eSPIRS currently holds information on more than 10,000 establishments in the EU 28, Iceland, Norway and Switzerland.

In accordance with the requirements of article 21(3) of the Seveso III Directive, eSPIRS presents information on name (or trade name) of the operator, the full address of the establishment and the activity of the establishment. It is foreseen that the database will be made available to the public as of January 2017.

Information on the eSPIRS database is available at: <https://minerva.jrc.ec.europa.eu/en/espairs/content>.

1.3 Structure of the report

The report is structured as follows:

- ▶ Section 2 provides an overview of the completeness of the reports submitted by Member States;
- ▶ Section 3 provides an analysis of the Member States' reports, including an analysis of responses to each question at EU level;
- ▶ Section 4 provides an analysis of the implementation of the Directive, including information from other sources and a summary of the implementation for each Member State;
- ▶ Section 5 provides statistical analysis of data on major accident and number of establishments;
- ▶ Section 6 provides analysis of possible benchmarking approaches;
- ▶ Section 7 provides analysis of possible monitoring indicators;
- ▶ Appendix A presents the questionnaire that Member States responded to reporting on the implementation of the Directive;

- ▶ Appendix B presents summary sheets detailing the analysis of implementation for each Member State;
- ▶ Appendix C presents the remaining gaps identified in Member States implementation reports;
- ▶ Appendix D presents some of the data on establishments from Member States reports;
- ▶ Appendix E presents some of the data on establishments from eSPIRS;
- ▶ Appendix F presents the detailed results of the analysis of the accident databases; and
- ▶ Appendix G presents the project leaflet.

2 Analysis of the completeness of Member States' reports

2.1 Overview

This section presents the findings related to the completeness of the information submitted in Member States' reports. First, the methodology is set out, followed by a description of remaining gaps in the information submitted by the member states and overall conclusions on completeness.

2.2 Methodology

This section provides a description of the methodology adopted for the completeness of Member State reports and further clarifications provided.

For each of the seven questions, an assessment was made as to the extent to which the Member States have provided an adequate answer, or provided sufficient data in relation to the reporting requirements under the Directive and the Commission's questionnaire.

This assessment was conducted using a 'traffic light' approach. The definitions for each category are presented in the table below.

Table 2.1 Overview of the traffic light assessment of completeness

Colour	Completeness level
GREEN	Response which fully answer the question or sub question
ORANGE	Response which only partially meets the needs of the question or which suggests potential minor implementation gaps.
RED	Response has not been provided to questions that are not optional or where the response suggests potential serious implementation gaps.
WHITE	Questions where no response is expected either because it is optional or because it is not applicable

The traffic light approach is to be considered as a range, some of the Member States rated as orange have only minor issues to take into account while others will have more important implementation gaps. More information on specific gaps are presented in the Member State summary sheets in Appendix B.

2.3 Remaining gaps

An overview of responses warranting further investigation was compiled and formed the basis of engagement with Member States' competent authorities.

- ▶ Clarifications were requested from: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Greece, Finland, France, Spain, Croatia, Hungary, Italy, Luxembourg, Latvia, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia and the UK; and
- ▶ Clarifications were received from: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Spain, Hungary, Italy, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovenia, Slovakia and the UK.

As a result, gaps and uncertainties remain for Croatia, Greece, Latvia, and Sweden. These are presented in Appendix C. This means that for these Member States and for the overall analysis, some limitations can be

observed due to the lack of data. These limitations are highlighted in our overall analysis and in the corresponding Member State summaries.

2.4 Overall conclusions on completeness

A response was provided by all Member States and to all questions (excluding optional questions). Some clarifications had to be requested from several Member States, primarily related to questions requesting quantitative data. In particular, clarifications were often needed for:

- ▶ Question 1.c which requests Member States to provide a list of establishments per activity. In several Member States, the sum of the establishments listed did not match the total number of establishments reported under Question 1.b. This was mostly due to reporting reflecting different time periods or to mistakes made on the classification of activities;
- ▶ Question 3.c which requests a statistical breakdown to be provided for the entities making information available and the means by which the information is made available. The statistical element was often not included in the original responses. It appears that Member States may have been uncertain on how to respond to this request which was a new feature of the 2012-2014 questionnaire;
- ▶ Questions 4.d and 4.e which request Member States to report the number of upper tier establishments that were subject to on-site inspections every twelve months and those not covered by 4.d and inspected at least once in the last three years. For many Member States, the numbers reported in 4.d and 4.e did not match the total number of upper tier establishments reported. This was mostly due to annual variations in the number of establishments during the reporting period; and
- ▶ Question 4.f which requests Member States to report the number of lower tier establishments that were subject to on-site inspections in the last three years. For some Member States, the numbers reported in response to 4.f was higher than the total number of lower tier establishments reported. This was mostly due to annual variation in the number of establishments during the reporting period.

Clarifications also related to qualitative questions, in particular:

- ▶ Question 2.d which requests Member States to provide information on the alert systems and how these are set up to provide information to the public. This was often not distinguished in Member State responses; and
- ▶ Question 2.e which requests Member States to provide information on criteria used to determine whether external emergency plans are considered adequate. This was often not included in Member States' responses.

3 Analysis of Member State reports

3.1 Overview

This section provides an overview of the status of the implementation of the Directive across the EU-28 for the reporting period 2012-2014. First, the methodology is described, followed by analysis under each of the questions asked in the reporting questionnaire.

3.2 Methodology

The analysis presented in this section is based on the responses from Member States to the questionnaire²⁵. A copy of the questionnaire is provided in Appendix A for reference. This section follows the structure of the questionnaire. It draws conclusions on the common themes regarding implementation status and highlights any trends across the Member States, as well as exceptions to those trends.

Furthermore, considering this reporting period is the last one for the Seveso II Directive, the analysis included when possible, a comparison with previous reporting periods and a commentary on the overall evolution of the implementation of the Directive.

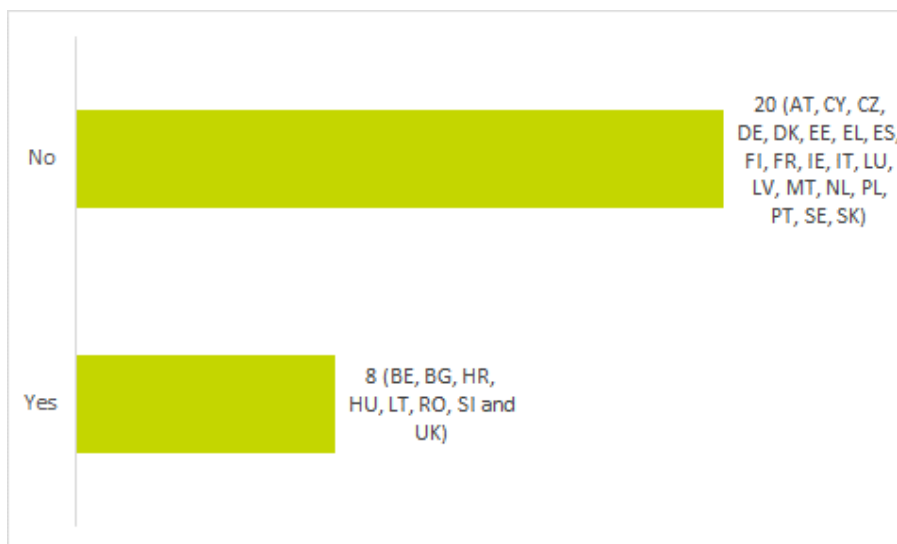
A Member State specific analysis of the responses to the questionnaire is presented in Appendix B.

3.3 Question 1: General information

3.3.1 Changes to competent authorities (Question 1(a))

Overall, the majority of Member States (20) have not reported any significant change to the main competent authorities during the reporting period. Figure 3.1 presents the responses from Member States.

Figure 3.1 Responses from Member States on changes



²⁵ Document C(2011)4598 final, Commission Decision of 30/6/2011, available on CIRCA BC: https://circabc.europa.eu/webdav/CircaBC/env/seveso_seg/Library/reporting/reporting_2012_2014/Reports%20of%20Member%20States%20and%20EEA%20countries/HR%20report%202012-2014.pdf

Of those reporting significant changes, the most frequently reported are:

- ▶ Changes made to the authorities in charge of inspection (BE, BG, HU and RO);
- ▶ Changes made to authorities in charge of the implementation of other Seveso-related measures (e.g. assessing safety reports, major accident prevention) (BG, SI and the UK);
- ▶ Changes made to authorities in charge of permitting (HU, RO and the UK); and
- ▶ Changes made to the supervising authority for environmental protection (LT and SI).

Croatia, having been a member of the European Union since 2013, reported detailed information on its competent authorities in charge of the implementation of the Directive, namely the Ministry of Environmental and Nature Protection (MENP), the inspectorates, the National Protection and Rescue Directorate (NPRD) and the Croatian Environmental and Nature Agency (CENA) which are assisted by the Ministry of Construction and Spatial Planning (MCSP) and local government and regional self-government units.

Finally, Estonia and Greece indicated that, while the authorities have not changed there have been some changes made to their names. For example in Estonia, the Competent Authority's name has been modified from Technical Surveillance Authority to Technical Regulatory Authority.

Considering this is the last reporting period for the Seveso II Directive, the fact that the majority of the Member States have not reported significant changes indicates that the structure and processes for the implementation of the Directive are already in place.

3.3.2 Data reported on number of establishments (Question 1(b))

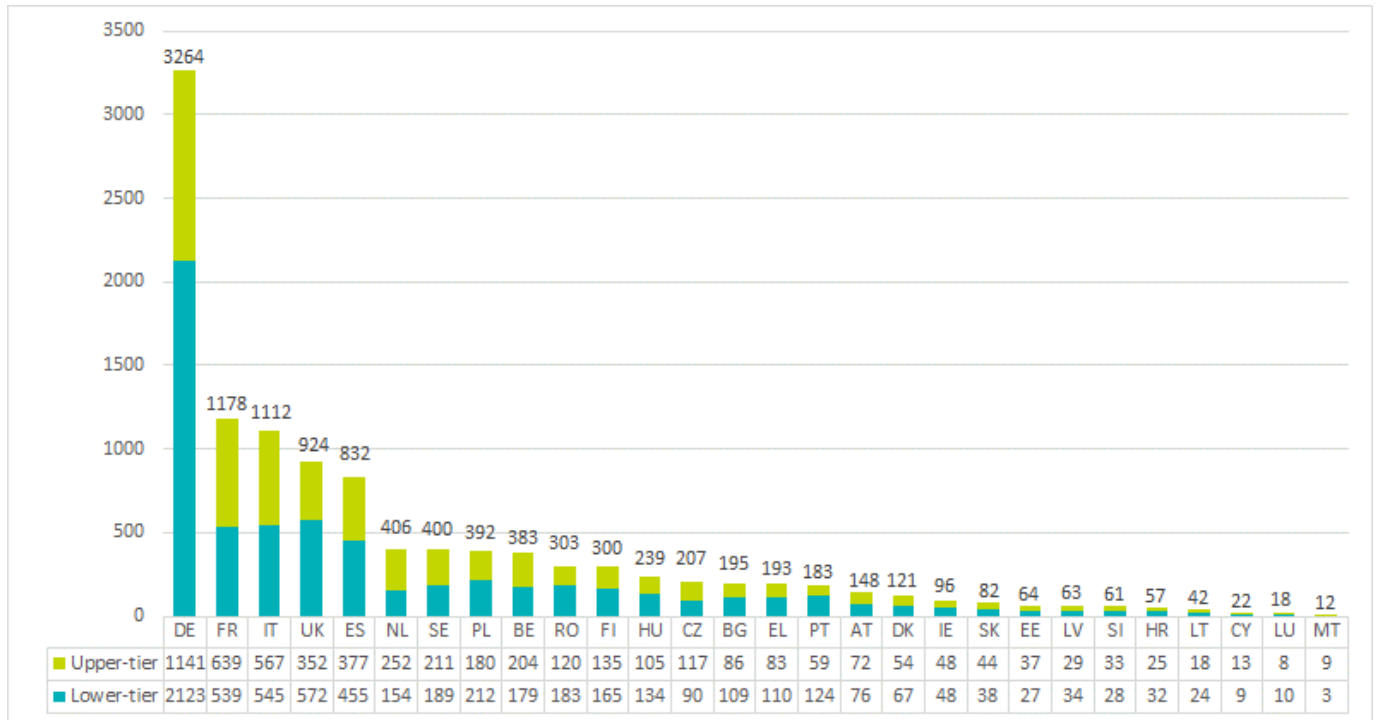
Question 1.b requested Member States to report the number of upper-tier and lower-tier establishments covered by the Seveso II Directive on 31/12/2014 (i.e. the end of the reporting period).

Based on the information provided by Member States it is apparent that data on numbers of establishments (both upper and lower-tiers) are widely held with all Member States providing figures for both categories. During the reporting period, the number of Seveso establishments increased with a total of 11 297 establishments²⁶ falling under the scope of the Seveso Directive. A significant share of these establishments was located in Germany (29%), France (10%), Italy (10%), the UK (8%) and Spain (7%).

In terms of types of establishments, the share between upper-tier and lower-tier establishments was more or less equal during the reporting period, with on average 44% (representing 5 018 establishments) of all establishments being upper-tier and 56% (representing 6 279 establishments) lower-tier. The complete EU28 data set reported for 2014 is presented in Figure 3.2 and a table with the number of establishments per Member States is presented in Appendix D.

²⁶ Sum of total establishments reported by Member States

Figure 3.2 Total number of Seveso establishments in the EU-28 (as of 2014)



Source: 2012-2014 implementation reports

When compared to the data reported for the last reporting period (i.e. the end of 2011) there has been in the 2012-2014 period a net increase of 983 establishments, most of which are lower-tier establishments (756) and the remainder upper-tier (227). Considering that the 2012-2014 period had relatively low economic growth²⁷, this increase is perhaps unexpected. It may be due to an actual increase through there being more installations meeting the qualifying thresholds, or it may relate to changes in implementation of the Directive (for example related to substances receiving new hazard classifications and hence being subject to the provisions of the Directive); this is not something that is evident from the questionnaire responses. Early implementation of the Seveso III Directive could also influence the increase in the number of establishments, due to some falling under the scope of the Directive for the first time.

3.3.3 Data reported on activities from establishments (Question 1(c))

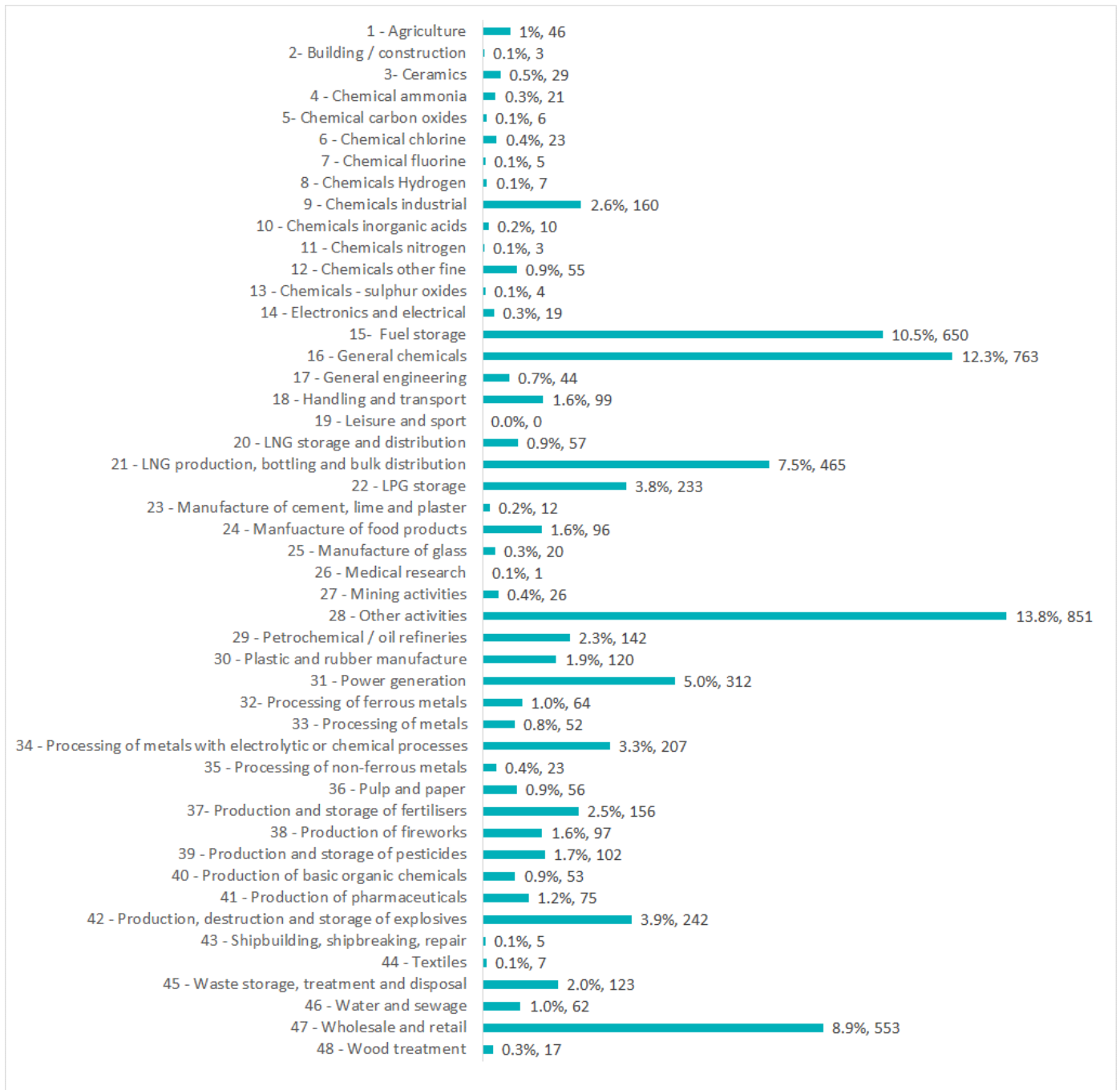
Question 1.c requested Member States to provide information on the activities of their establishments based either on the eSPIRS activity list or on the NACE classification²⁸. While the majority of Member States provided SPIRS-based activity lists, NACE reporting was opted for by Belgium, Croatia, Germany, Netherlands, Sweden and the UK which account all together for more than 5 400 establishments. Poland reported using a national activity list very similar (but not identical) to the eSPIRS activity list.

For the other Member States, the total number of establishments per eSPIRS category and the share of the total establishments reporting this activity is presented in Figure 3.3. Establishments for those Member States reporting using the NACE classifications are not included in the figure below.

²⁷ In 2012 less than half of the Member States reported economic expansion, in 2013 the EU-28 GDP grew by 0.2% and 1.5% in 2014, http://ec.europa.eu/eurostat/statistics-explained/index.php/National_accounts_and_GDP

²⁸ NACE classification is the reference system for statistical classification of economic activities and was established by Regulation 3037/90.

Figure 3.3 Overview of the establishments' activity according to eSPIRS category



As can be observed, the most common specific categories of activities are general chemicals (12%) and fuel storage (11%) although “other activities” is the single largest category (14%). This trend can be observed in most Member States with a few variations as detailed below:

- ▶ 23% of Seveso establishments in Belgium and 30% of establishments in Slovakia are conducting **wholesale and retail activities** (vs 9% EU average);
- ▶ 14% of Seveso establishments in Bulgaria, 27% of Seveso establishments in Cyprus, 18% of Greece’s establishments, 20% of Poland’s establishments and 20% of Slovenia’s establishments are conducting **LPG storage activities** (vs 4% EU average);

- ▶ 16% of Seveso establishments in Bulgaria and 12% of Seveso establishments in the Czech Republic are conducting activities related to **the production, destruction and storage of explosives** (vs 4% EU average);
- ▶ 18% of Seveso establishments in Ireland are conducting activities related to the **production of pharmaceuticals** (vs 1% EU average);
- ▶ 24% of Seveso establishments in Italy and 17% of Malta's establishments are conducting activities of **LNG production, bottling and bulk distribution** (vs 8% EU average); and
- ▶ 15% of Seveso establishments in Poland are conducting activities of LNG storage and distribution (vs 1% EU average).

The composition of the 'other' category is unclear, in particular it is unclear why such a large number of establishments are reported under this category. Given that the range of categories to choose from is diverse and specific without being restrictive it is worth considering why such a large number of establishments are classified as 'others'. This may highlight difficulties of Member States to identify the relevant category for their establishments in which case more guidance could be appropriate. This may also reflect the situation of establishments conducting mixed activities, for example storage of other chemicals within a primarily pesticides handling establishment.

No comparison with previous reporting period could be undertaken as this is the first time Member States were asked to report the number of establishments per category according to the eSPIRS classification. However, a comparison with the eSPIRS database reporting is presented in Section 5.4.

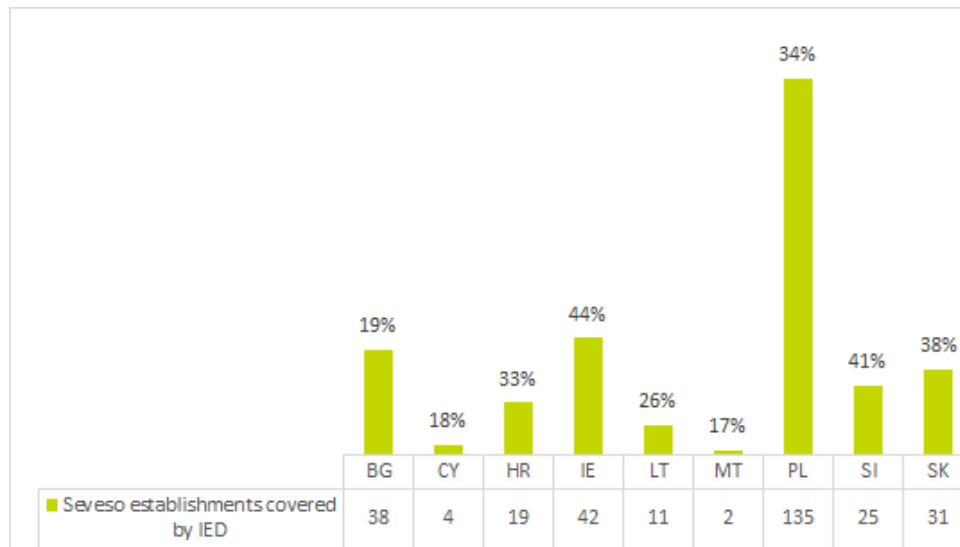
3.3.4 Coherence between Seveso and IED (Question 1(d))

For the first time, the questionnaire requested Member States to report on the relationship between the Industrial Emissions Directive²⁹ (IED) and the Seveso regimes. Member States were asked to indicate how many of their establishments were also regulated under the IED. This question was optional and 11 Member States provided a response.

From the information reported, a total of 307 Seveso establishments were also IED installations in 2014. This does not account for German and Dutch establishments where no numerical response was available but the competent authorities were aware that it was the situation of 'a large share' and 'many' establishments. The share of establishments covered by both the Seveso and the Industrial Emissions Directives ranged from 17% to 44%. The details of the information reported is presented in Table 3.3.

²⁹ Directive 2010/75/EC of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2010:334:0017:0119:en:PDF>

Figure 3.4 Establishments covered by Seveso and Industrial Emissions Directives



The second part of the question asked Member States to explain what impact in practice this overlap had on the way Seveso was applied. Again, 11 Member States provided a response to this question and from the responses received, it does not appear that the fact that both Directives are applicable is creating any notable impacts with five Member States (Cyprus, Ireland, Lithuania, Malta and the Netherlands) responding reporting no impacts which seems to indicate that in these Member States both regimes are coherent with each other's and can be efficiently implemented. The Netherlands added that emissions and safety are distinct aspects which are assessed separately.

Both Bulgaria and Germany indicated that in practice permit conditions are drafted to ensure compliance with both Directives. Germany also indicated that there are public consultation, monitoring and inspection processes of the IED that Seveso establishments have to comply with. This seems to indicate the compatibility of both regulatory regimes, and that for these Member States it was possible to integrate similar requirements from both Directives. In Croatia and Poland inspections are coordinated, so for example inspections conducted under the Seveso Directive also consider compliance with the conditions of the integrated permits in terms of major-accidents.

For those reporting some impacts, inspections were the most often quoted feature of the implementation of both Directives where coherence could be improved by coordinating the different inspection services.

3.4 Question 2: Emergency Plans

3.4.1 Overview

Article 11 of the Seveso II Directive requires that competent authorities draw up an external emergency plan for upper-tier establishments on the basis of the information contained in the safety reports. The external emergency plans must establish the measures to be taken outside the establishment in case of emergencies.

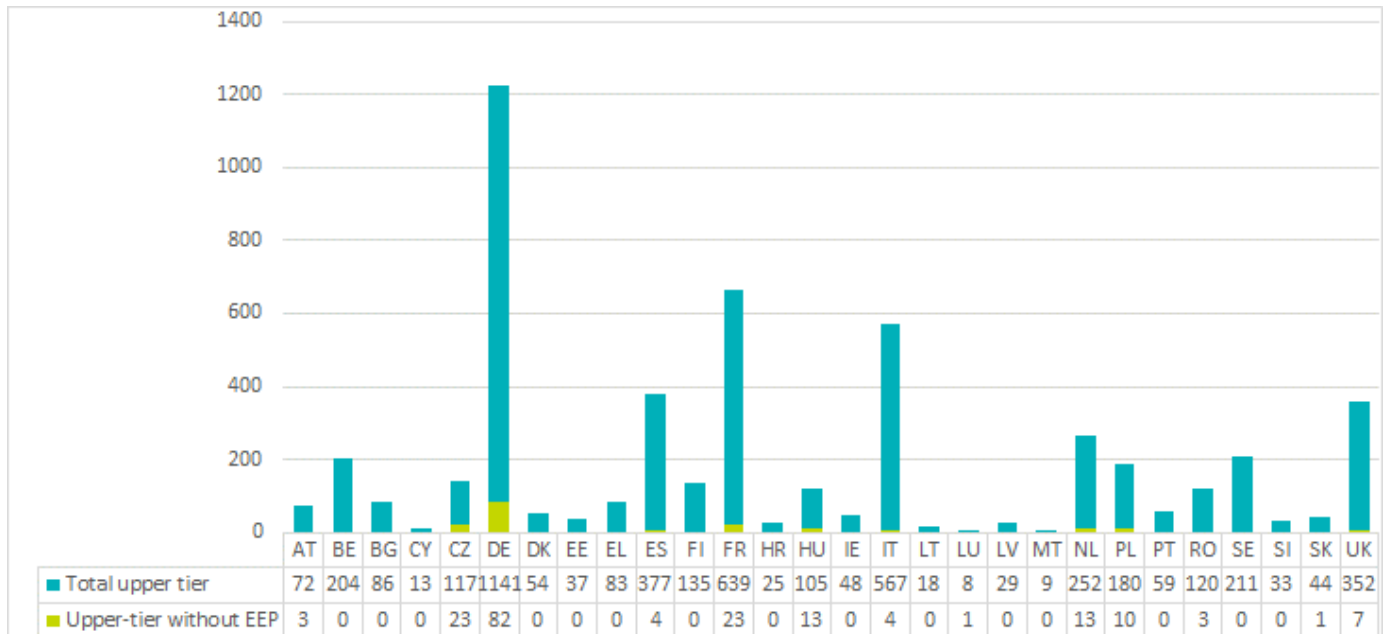
3.4.2 External emergency plans

3.4.2.1 Application of Article 11(6) (Question 2(a))

Article 11.6 of the Directive foresees that "the competent authority may decide, giving reasons for its decision, in view of the information contained in the safety report, that the requirement to produce an external emergency plan under paragraph 1 shall not apply". The questionnaire asked Member States to report how many of their upper-tier establishments were in this situation.

A total of 13 Member States have made use of the flexibility included in Article 11(6) during the reporting period, and external emergency plans were not requested for some upper tier establishments in Austria, Czech Republic, Germany, Spain, France, Hungary, Italy, Luxembourg, Netherlands, Poland, Romania, Slovakia and the UK. Overall, this concerns 187 establishments, which represents 4% of the existing upper-tier establishments in the EU-28. The information reported is presented in Figure 3.5.

Figure 3.5 Upper-tier establishments without a requirement for external emergency plans (Article 11(6))



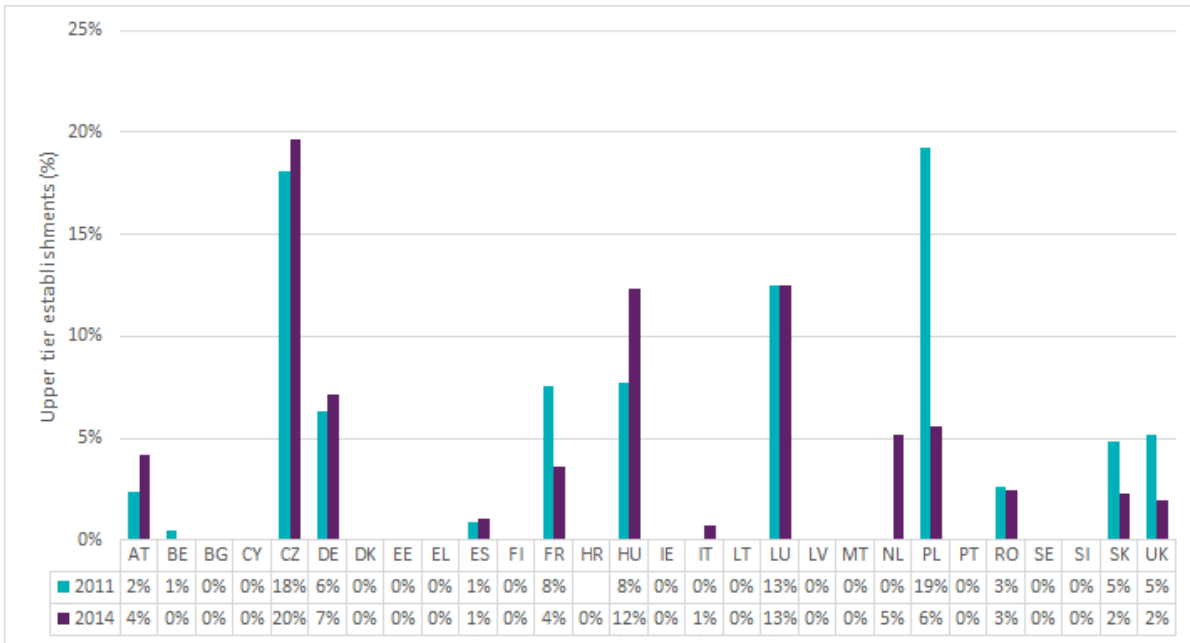
Only a small percentage of upper-tier establishments have been exempted from this requirement. The Czech Republic has the highest share of upper tier establishments for which the Competent Authorities decided that the external emergency plan was not required (20%).

Cases where the requirements to produce an external emergency plan do not apply in accordance with Article 11.6 referred to establishments where the consequences of a major accident were not expected to exceed the site’s boundary. Where additional information was provided, the combination of the location of the establishment (remote, far from habitation) and the existing safety measures were the main factors used to decide that there was no need to prepare an external emergency plan.

When compared to previously reported data³⁰, the 2012-2014 reporting period display the same overall trends, with an average of 4% of the upper tier establishments applying Article 11(6) and the higher share of these establishments being located in Germany. However, in absolute numbers there has been a slight decrease in comparison to the previous reporting period where the requirement to produce an external emergency plan did not apply to 208 upper tier establishments (21 fewer establishments in the 2012-2014 period). The figure below presents the evolution of the number of upper tier establishments for which external emergency plans were not required. Note that data are only available for the latest two reporting period for this particular aspect of the implementation of the Directive.

³⁰ Note that data on the number of upper establishment for which external emergency plans were not requested is available only for 2009-2011 and 2012-2014 reporting periods.

Figure 3.6 External emergency plans not required in 2011 and 2014 (Article 11(6))



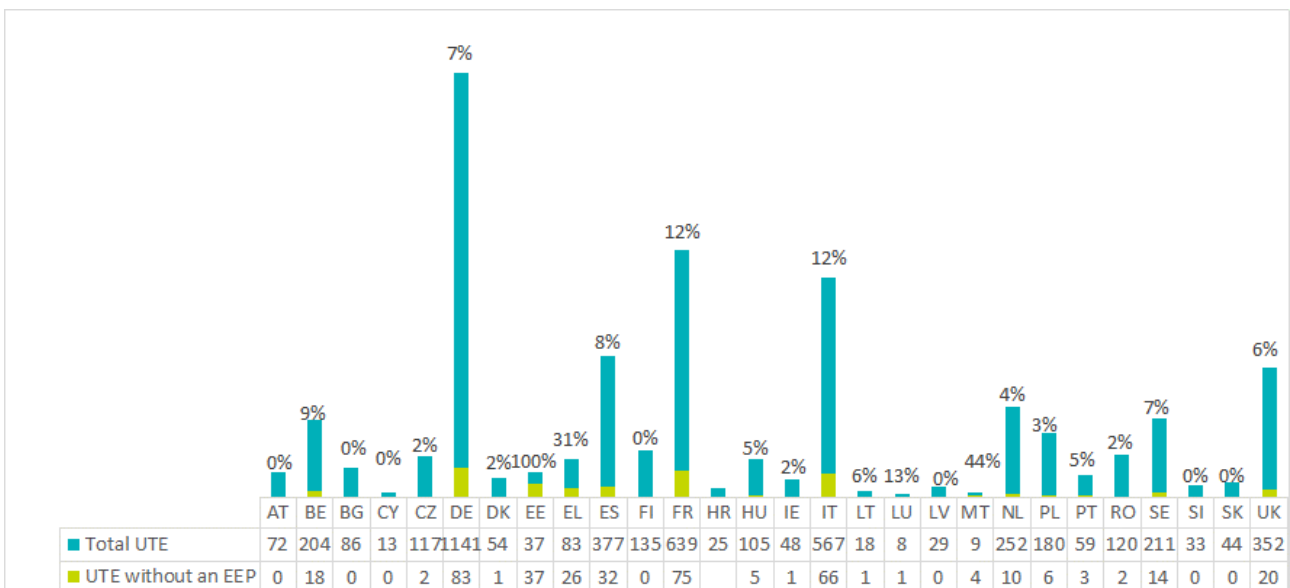
Note: Data on establishments for the year 2011 have been provided by Member States in the three-year implementation reports submitted to the Commission.

Note 2: Total number of external emergency plans not required in 2009-2011: 208, in 2012-2014: 187

3.4.2.2 Establishments without an external emergency plan (Question 2(b))

The questionnaire requested Member States to report the number of upper tier establishments for which no external emergency plan had been adopted. By the end of the reporting period, 407 upper tier establishments were in this situation which represented 8% of the total upper tier establishments at EU level. Note that this excludes the 187 establishments for which the competent authorities decided an external emergency plan was not required (Article 11(6)). The figure below presents the data reported for each Member State on the number of upper tier establishments without external emergency plans and the share that these represent out of the total Member State upper tier establishments.

Figure 3.7 Upper tier establishments without external emergency plans



Note: Croatia indicated that 6 of its regional authorities had not adopted external emergency plans, however there is no indication of how many of its 25 establishments are covered by these regional authorities.

The figure above shows that there are a lot of variations between Member States.

For the purpose of monitoring implementation, it could be considered that those Member States with a share above a defined percentage of installations (e.g. 8% which is the EU average) could potentially be facing compliance difficulties and hence might be candidates for further support or investigation. The majority of Member States have a relatively low average share of upper tier establishments without an external emergency plan drafted. For example, in seven Member States (Austria, Bulgaria, Cyprus, Finland, Latvia, Slovenia and Slovakia), all upper-tier establishments had an external emergency plan in place by the end of 2014.

However, for eight Member States the share of upper tier establishments without an external emergency plans is higher than 8%. This is the case for Belgium, Estonia, France, Greece, Luxembourg, Italy, Malta and Spain. There might be some merits in the Commission following up on this aspect with the Member States.

In some instances, explanations were provided by to explain why external emergency plans had not been drawn up:

- ▶ Belgium (9%), Luxembourg (13%), Italy (12%) and France (12%) indicated that either information to prepare the plans had been received with some delays or that the information was being processed, thus leaving no time to approve the external emergency plans before the end of the reporting period;
- ▶ Malta (44%): the competent authorities are still within the deadline to adopt the external emergency plans as three out of the four outstanding external emergency plans are for new upper tier establishments classified in February 2014;
- ▶ Spain (8%) and Greece (31%) did not provide further explanations to explain why the plans were not drawn up; and
- ▶ Estonia (100% of the total) reported that up to now, there has only been one national emergency plan for all Seveso establishments drawn up by the Ministry of the Interior according to the Estonian Emergency Act. This does not seem to meet the requirements of the Seveso II Directive in relation to external emergency plans. However, Estonia added that remedial action was being taken. In 2015, the Estonian Rescue Board decided to produce regional external emergency plans for all upper-tier establishments. These were planned to be completed for 2016.

No share could be calculated by Croatia, as it indicated that 6 of its regional authorities had not adopted external emergency plans, however there is no indication of how many of its 25 establishments are covered by these regional authorities.

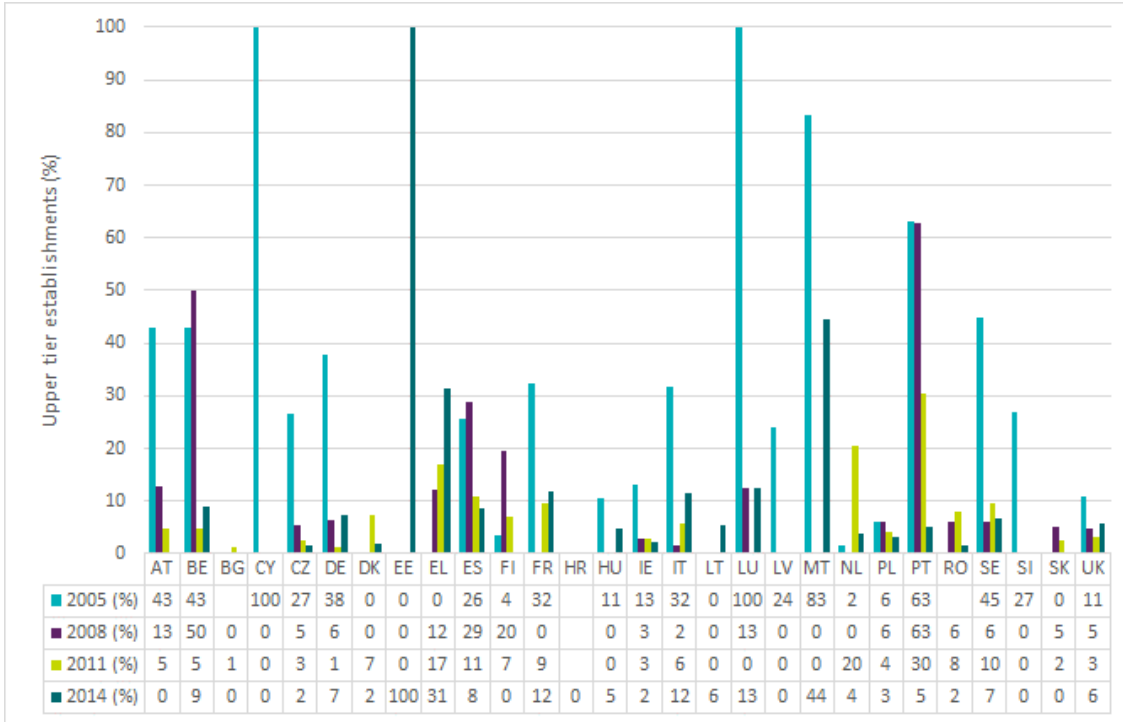
In addition, Member States indicated that for establishments joining the upper-tier category during the reporting period, a certain period of time is needed between the receipt of the documents necessary for drafting external emergency plans, such as safety reports, and the finalisation of the process by competent authorities. On this point, Hungary indicated that the authorities have 6 months to adopt the external emergency plans from the submission of the safety report while this delay is of 2 years in Malta. Other Member States did not provide such information was provided (although it is important to note that this was not requested).

The main conclusion that can be drawn from the information submitted by Member States is that overall data across the EU generally show general compliance with this requirement of the Seveso II Directive as only 12% of establishments did not have an external emergency plan of which 8% were lacking such a plan and 4% had been exempted in accordance with Article 11(6). For those where competent authorities had not drafted the external emergency plans, many Member States reported that these were in the process of being drawn up (e.g. having recently been classified as upper-tier establishments).

The absolute number of upper-tier establishments without an external emergency plan (407 at the end of the 2012-2014 period) has increased since the previous reporting period where 307 establishments were reported in this situation. In relative terms, this represents an increase from 6% of upper tier establishments without external emergency plans in 2011 to 8% in 2014. While this might indicate a possible compliance issue, it is more likely that this increase reflects the increase in the number of upper tier establishments for

which external emergency plans are still being developed. The figure below presents the evolution of the share of external emergency plans not drawn up throughout the reporting periods.

Figure 3.8 External emergency plans not drawn up in 2005, 2008, 2011 and 2014 (% upper tier establishments)



Note: Data on establishments for the years 2011, 2008 and 2005 have been provided by Member States in the three-year implementation reports submitted to the Commission.

Note 2: Total external emergency plans not drawn in 2005: 1 099, in 2008: 392, in 2011: 307 and in 2014: 407

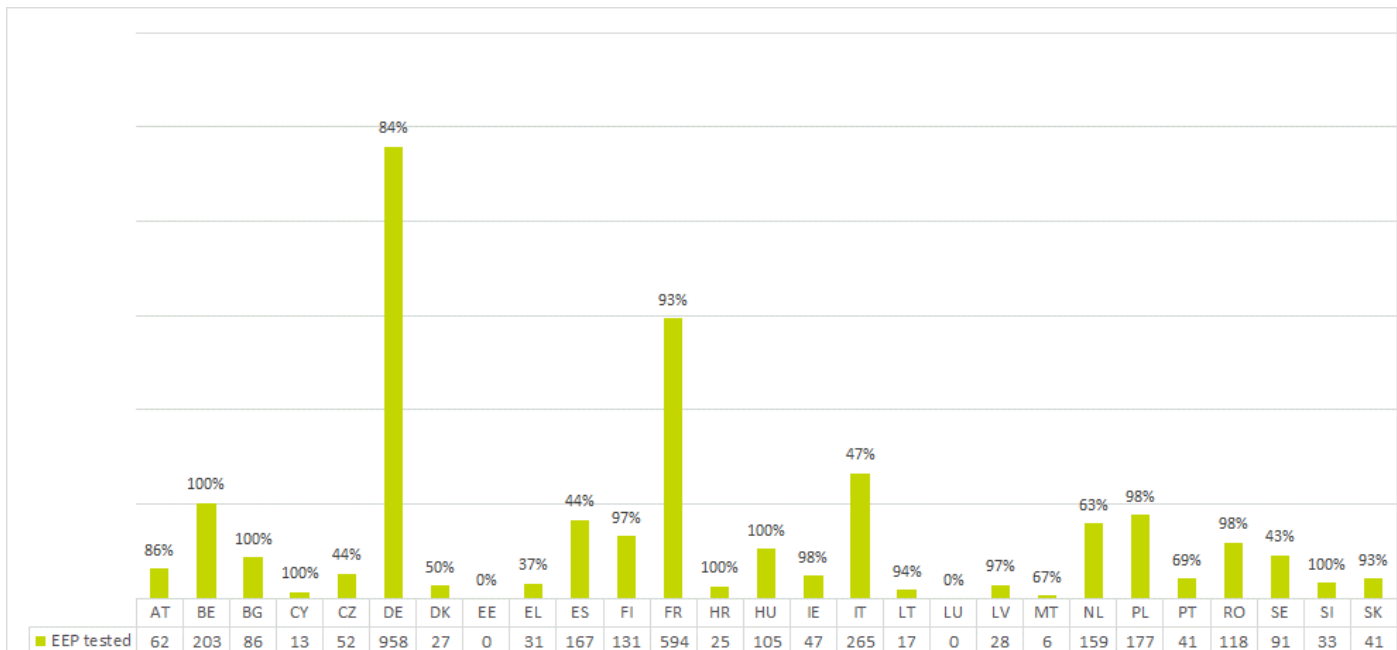
Note 3: Estonia indicated in the 2012-2014 reporting that it adopted one general external emergency plan applicable to all its establishments and was in the process of adopting individual plans hence 100% of the plans considered as not drawn up.

3.4.2.3 Testing of external emergency plans (Question 2(c))

The questionnaire required Member States to provide information on the number of upper-tier establishments for which the external emergency plans had not been tested over the last three years. Overall, in 2014, this concerned 1,214 establishments.

The detailed data on the share of external emergency plans tested during the reporting period is presented below.

Figure 3.9 External emergency plans tested as reported in 2014



Note: The percentage indicates the share of establishments that had their external emergency plans tested

On average, 75% of the external emergency plans were tested during the reporting period. From the chart, it is clear that the proportion of establishments which had their external emergency plans tested during the reporting period varies significantly across the EU28. The share varies at Member State level with two Member States (Estonia and Luxembourg) reporting 100% of plans not tested, and 6 Member States reporting that all external emergency plans were tested (Belgium, Bulgaria, Cyprus, Croatia, Hungary and Slovenia). For the remaining Member States, the results are varied with six Member States (Czech Republic, Denmark, Greece, Spain, Italy and Sweden) reporting between 20% and 60% tested, three Member States between 60% and 70% (Malta, Netherlands and Portugal) while the remaining Member States (Austria, Germany, Finland, France, Ireland, Lithuania, Latvia, Poland, Romania and Slovakia) had more than 70% of external emergency plans tested.

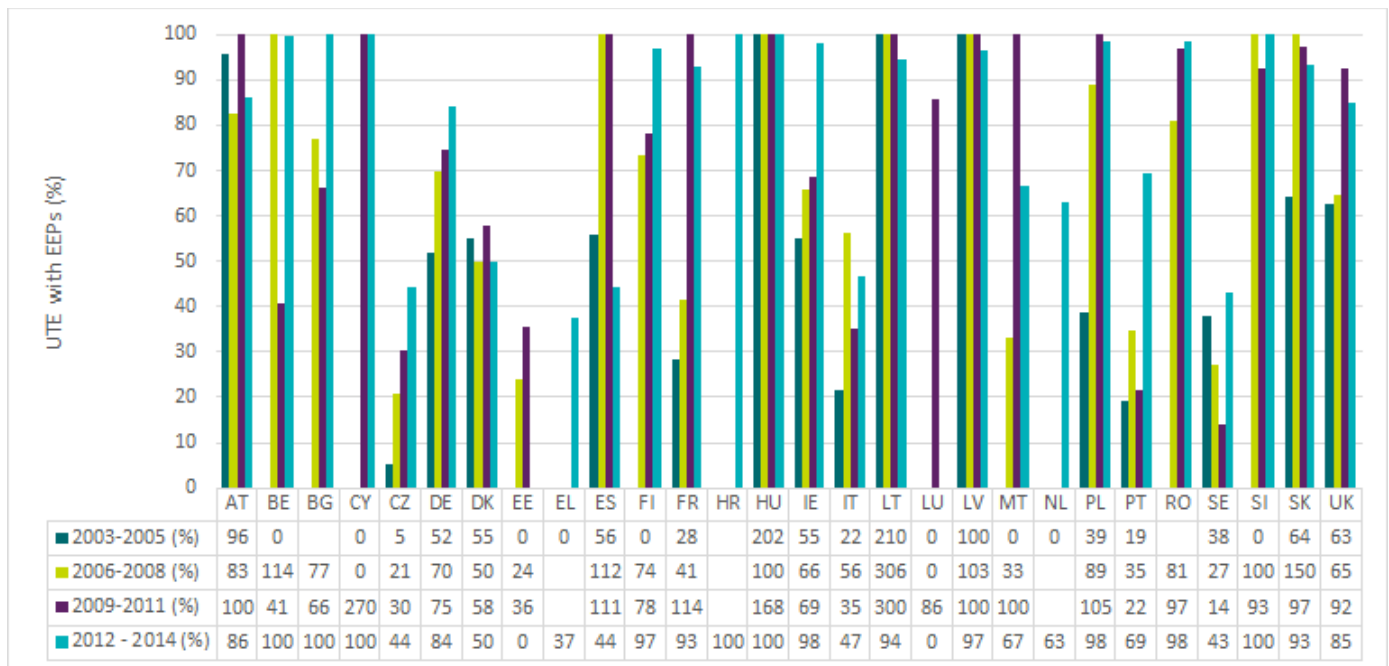
While this was not requested, some Member States provided additional explanations to support these numbers:

- ▶ For those with the lowest share of external emergency plans tested: Luxembourg did not provide explanations and Estonia indicated that as individual external emergency plans were not available for individual establishments these could not be tested. However Estonia added that the general emergency plan covering all Seveso establishments (see Section 3.4.2.2) was tested during 10 crisis exercises during the reporting period and the competent authority carried out smaller exercises in cooperation with individual establishments;
- ▶ For those Member States with a relatively low share of external emergency plans tested, the Czech, Greek and Spanish responses did not include further details to understand the situation of these upper tier establishments. Denmark indicated that its central authorities were investigating this to ensure that the plans are tested as soon as possible. Similarly, Italy indicated that for 302 of its upper tier establishments the external emergency plans were not tested, and the situation of 69 further establishments was being investigated. Furthermore, Italy indicated that a working group involving public authorities had been tasked with elaborating criteria and tools to support Competent Authorities with performing the tests on the external emergency plans. Sweden provided additional information indicating that steps were taken to develop a supporting tool to guide the drafting and testing of external emergency plans. As such it appears that for most of the Member States, improvements should be observed in the next reporting period;

- ▶ Finally, for other Member States with a higher share of external emergency plans tested, the delays were attributed to the following:
 - ▶ Revisions of the plans (Austria);
 - ▶ The three-year deadline to test the plan had not yet expired due to change of classification during the reporting period (Germany and Slovakia);
 - ▶ Impending change in the classification of the establishment was expected (Ireland, Portugal and the UK). The UK added that out of the 53 external emergency plans that were not tested by 2014, 18 were tested early in 2015 with a further 7 planned for tests. For 15 establishments, there were no clear reasons known and the failure to test the plans was being investigated; and
 - ▶ Changes made to the establishments have delayed the testing of the plans (Latvia and Poland).

When compared to previous reporting period, it was found that the latest reporting period is a slight improvement over the past reporting periods and more throughout the reporting under Seveso II Directive. In 2006-2008 reporting period, 60% of the upper tier plans were reviewed and tested during the reporting period, in 2009-2011, this share increased to 73% and had reached 75% by the end of 2014. This seems to indicate that Member States are getting more efficient at reviewing and testing those plans. However, Figure 3.10 shows that for some Member States the overall trend indicates a worsening of the situation, this is the case for Austria, Denmark, France, Lithuania, Latvia, Malta, Poland, Slovakia, Spain and the UK.

Figure 3.10 Evolution of the share of external emergency plans tested in 2005, 2008, 2011 and 2014



Note: Data on establishments for the years 2011, 2008 and 2005 have been provided by Member States in the three-year implementation reports submitted to the Commission.
 Note: Total number of external emergency plans tested in 2003-2005: 1 151, 2006-2008: 2 553, 2009-2011:3 135, 2014: 3 776

3.4.2.4 Criteria for testing of external emergency plans (Question 2(e))

Member States were requested to provide information on the way external emergency plans are tested and considered adequate, as well as on the criteria used for carrying out these tests. This question was asked in previous reporting period and it was noticeable that Member States provided in some instance more concise responses however no significant change could be identified in the way this provision is being implemented.

Similarly to the past reporting period, Member States have reported the use of several methods for testing external emergency plans. Some plans were tested on the basis of theoretical desktop exercises with simulations of procedures and actions, whereas other plans were tested, in whole or in part, through live exercises carried on site. Usually, full-scale live exercises involved the deployment on the ground of appropriate resources (e.g. emergency services, police and operators) in a simulation of their actual response to an incident.

This reporting period, on the spot exercises (field training exercises involving some or all the actors involved) were reported by all Member States. In addition, table-top exercises (office based simulation) were also reported by all Member States with the exception of Austria and Latvia. Furthermore, some simplified exercises were reported in some Member States, involving only some of the resources usually involved in a response to an incident. For example, Belgium reported that since 2012 small-scale 'Minimex' tests have been practiced at local and national level. They test specific aspects of the emergency plans and allow practical lessons to be learned.

In addition to reporting information on the way plans are tested, Member States were requested to provide information on the criteria for considering the plans adequate. Based on the responses received, the following categories of response can be identified:

- ▶ No general criteria for adequateness:
 - ▶ Austria indicated that a general checklist is available but is short and contains mainly demonstrative examples;
 - ▶ Lithuania reported that there are no criteria per se, but rather a qualitative assessment of the results of the exercises; and
 - ▶ Luxembourg and Sweden indicated there are no criteria being used.
- ▶ Criteria are multiple and included in a guidance document:
 - ▶ Belgium has an evaluation checklist available that assess the testing and allows the authorities to check that the objectives have been reached;
 - ▶ Finland has guidance and a collaborative platform tool for competent authorities that is used to review and update external emergency plans;
 - ▶ Portugal indicated that external emergency plans are considered adequate when they comply with the requirements described in the "Guideline for the preparation of external emergency plans" (Technical specification no7 available in www.prociv.pt);
 - ▶ Italy has a checklist that the plan must be verified against, which is part of guidelines on planning for external emergencies in industrial establishments involving major-accident hazards;
 - ▶ Latvia, Slovenia and Slovakia reported that the criteria are included in their national legislation; and
 - ▶ Romania has a list of indicators against which the testing of the plan must be rated.
- ▶ Criteria were described in the response:
 - ▶ Bulgaria's criteria are the completeness, consistency, accuracy of the emergency plan; the adequacy of the equipment and facilities and their operability, especially under emergency conditions; and the competence of the staff carrying out the duties identified for them in the plan;
 - ▶ The Czech Republic's criteria are the completeness, timeliness, accuracy and practical utility of the plan. In particular connectivity testing with regard to alarms and the availability of the services involved (e.g. police, emergency services) and measures included in the plan; the systems and methods of alerting and informing the public and the cooperation among institutions during the test;

- ▶ Germany deems the plans appropriate if they comply with the respective civil protection laws and appear to realistically guarantee to mitigate damages from the relevant accident scenarios;
- ▶ Croatia, Denmark and Ireland assess the plan against legal requirements. As long as it meets the minimum provisions of the legislation in terms of content and is tested frequently then it is deemed adequate;
- ▶ Spain considers that a plan is adequate if it is suitable and operable;
- ▶ France considers that the plan is adequate if the following aspects are functional: population is alerted and safely evacuated; the communications of the operator concerned are rapid and efficient; and the area is secured without interrupting all traffic;
- ▶ Hungary considers that an external emergency plan can be regarded as adequate if it has envisaged adequate action to reduce all the harmful effects identified by the operator in order to protect the public and the environment; if there are sufficient resources and proper means specified in the external emergency plan that are proportionate to the volume and type of the harmful effects of a major accident involving dangerous substances; and if off-site mitigation action can be completed within a realistic timeframe in accordance with the requirements to protect human life, health and the environment;
- ▶ The Netherlands uses the following criteria: completeness, timeliness, accuracy and practical utility;
- ▶ Poland indicated that the adequacy is judged according to whether the testing is done at least once every three years; the systems and methods of alerting and informing the public are adequate; and there is cooperation with other institutions and coordination of the emergency services involved;
- ▶ Portugal assesses the operational availability and the implementation capabilities against the plan; and
- ▶ The UK evaluates the completeness, consistency and accuracy of the emergency plan and other documentation used by organisations responding to an emergency; the adequacy of the equipment and facilities, and their operability, especially under emergency conditions; and the competence of staff to carry out the duties identified for them in the plan, and their use of the equipment and facilities.

Overall, a variety of criteria have been reported being used by Member States, with a general focus on testing that the plans are: fit for purpose and can be applied in practice, allow for sufficient communication and coordination between the emergency services, the operator and the wider population.

3.4.3 Informing the public (Question 2(d))

Member States were asked to provide information on their arrangements for providing the public with information related to alert systems, main response measures and arrangements to cope with any off-site effects from an accident.

The information reported on the types of alert systems are presented in Table 3.1.

Table 3.1 Alarm systems reported by Member States

MS	Signals broadcasted on loud speaker	Local and national alert sirens	Radio broadcast	TV broadcast	Phone based alert systems	Social networks (e.g. Twitter and Facebook)
AT	X	X	X			
BE	X	X	X	X	X	X
BG	X	X				
CY	X		X			
CZ	X		X	X		X
DE	X	X	X	X	X	X
DK	X	X				X
EE	X	X				
EL	X	X				
ES	X	X	X	X	X	X
FI	X	X	X	X		
FR	X	X	X	X	X	
HR	X					X
HU	X	X				
IE	X					
IT	X	X	X	X	X	X
LT	X	X	X	X	X	
LU	X		X	X	X	
LV	X					X
MT	X		X			
NL	X	X	X	X		X
PL	X		X	X	X	X
PT	X		X			
RO	X		X	X		X
SE	X	X	X	X		
SI	X	X	X	X		
SK	X		X	X		X
UK	X		X	X		

Additional information was provided on alert systems, for example Cyprus and Ireland's responses referred only to public alarms installed in the vicinity of Seveso establishments. Greece added that the sirens are tested once a year, the tests are carried out twice a year in Latvia.

Member States provided information on other tools being used. For example in Belgium, the BE ALERT tool has been developed to target the population affected. It sends a message by phone or to mobile phones to alert the population of a danger. The tool was tested during the reporting period and was expected to be available by the end of 2015. Similarly, in Hungary the “MoLaRi” system provides integrated alert and information on potential hazards to support decision making by the competent authorities. Lithuania has had a mobile phone notification system since 2012 that allows message to be sent to all individuals located in the Lithuanian territory.

Austria, Bulgaria, Cyprus, Hungary, Latvia, Netherlands, Poland, Romania, Slovenia and the UK added that information on communication means should be provided prior to any incident or accident. In these Member States the operators are required to provide information on the planned safety measures and behaviour to adopt in case of emergency. This information is either a letter or a leaflet sent to inhabitants around the Seveso establishments. This information must also be available on the website of the operators but also in the external emergency plans.

The responses contained limited details on the arrangements to cope with off-site effects. Member States indicated that these would vary based on the incident or accident specifics and would be described in the internal emergency plans and the establishments’ safety reports. The competent authorities’ websites but also the establishments’ external emergency plans are used to provide information on response measures. A call centre with a dedicated number to call for information is also available in some Member States (Belgium, Netherlands).

When compared with the previous reporting period responses it is noticeable that more phone based and internet based alarm systems are being reported by Member States as being used.

3.5 Question 3: Information on safety measures

3.5.1 Informing the public on safety measures (Question 3(a))

The questionnaire requested Member States to provide general information about their national strategy, concepts and developments in the last reporting period on how the public and persons liable to be affected by a Seveso accident are informed about major accidents hazards, possible consequences and safety measures.

The responses often included information on who is responsible for informing the public. In all cases, the operator has the main responsibility, sometimes shared with the competent authorities.

Some responses described the national strategies regarding information on Seveso establishments. For example in Belgium, a national campaign of information is organised at least once every five years. The latest happened in 2012 and included TV adverts, leaflets, an educative game and a dedicated website with up-to-date information.

Operators are requested to designate persons responsible for providing information on safety measures. The most commonly reported ways for providing information are: leaflets, establishments’ websites, information campaigns and by providing information through local media.

Other ways of engaging with the public were reported such as:

- ▶ Holding ‘open days’ visits for the general public (Austria, Finland and Slovenia);
- ▶ Keeping safety reports available to the public at competent authorities’ offices and within upper-tier establishments (Bulgaria, Lithuania and Luxembourg);
- ▶ Holding public meetings with the general public (Germany, Spain and Italy);
- ▶ Providing information through Twitter and Facebook on conduct to follow in case of accident (Spain);
- ▶ Information on location of establishments and types of hazards available on the competent authority website (Estonia, France, Italy, Netherlands, Poland, Portugal, Slovakia);

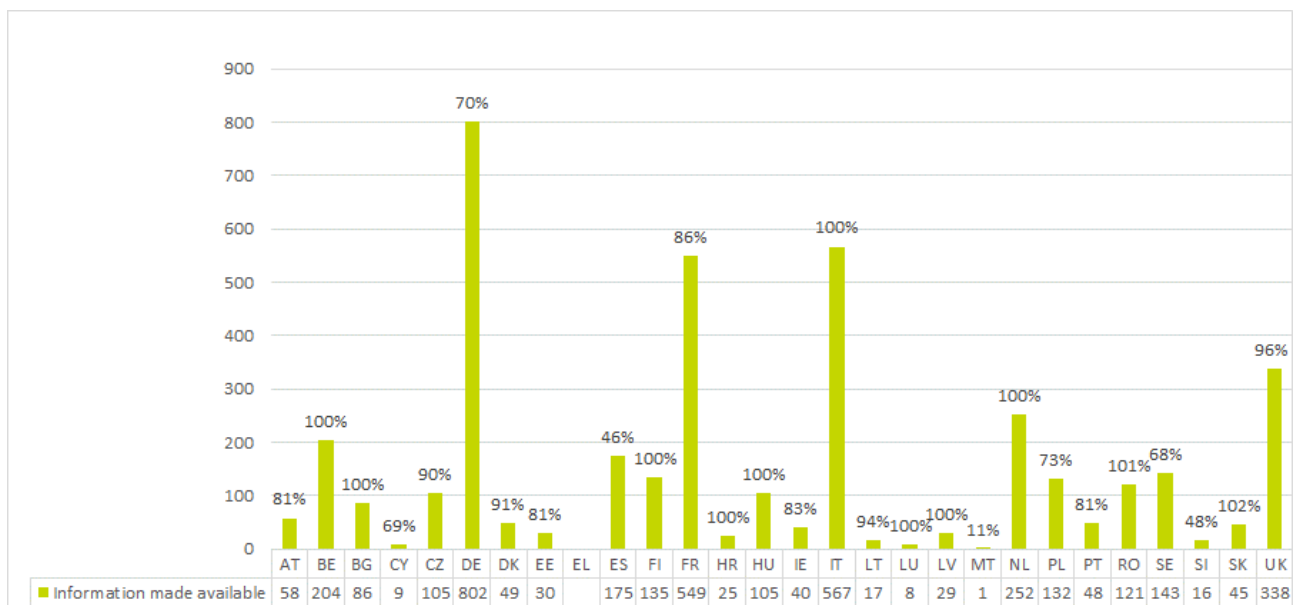
- ▶ Training programmes for schools, healthcare providers and social welfare establishments focusing on risks and methods of coping with hazardous events (Poland); and
- ▶ Integrated system to allow for early detection and disaster management (Hungary). Hungary added that since the system was adopted in 2012, 576 public alert and general information notice have been issued. 250 000 persons can be alerted immediately through the MoLaRi system.

Most Member States indicated some sort of preventive information is provided to the general public, mostly through leaflets. However Luxembourg indicated that public potentially affected by a Seveso accident is not provided information ahead of accident or incidents. Luxembourg reported that information on major accidents, consequences and safety measures are made available during the public consultation procedure prior to the authorisation of the establishment or when the permit needs to be amended following the modification of the establishments' activity, and this information remains available in the competent authority's office. It is recommended that this aspect be verified with the Member States, in particular whether this meet the requirements of Article 13(1) which requires information to be supplied regularly and without having to request it.

3.5.2 Information made available during the reporting period (Questions 3(b) and 3(c))

Member States were requested to provide the number of upper tier establishments for which information was made actively available to the public at least once during the last five years. Overall 81% of the upper tier establishments had information made available and ten Member States (Belgium, Bulgaria, Finland, Croatia, Hungary, Italy, Luxembourg, Latvia, Romania and Slovakia) reported that the information was made available for all upper tier establishments.

Figure 3.11 Information made available for upper tier establishments



Note 1: The percentage indicates the share of upper tier establishments that made information available, some are over 100% (Romania and Slovakia) due to variations in the number of upper tier establishments during the reporting period.

Note 2: Greece (EL) reported that no data was available.

According to the data reported by Member States, only three Member States have made information available for a small share of their upper tier establishments: Malta (11%) and to a lesser extent Spain (46%) and Slovenia (48%).

Some Member States provided explanations as to why information was not made actively available for some upper tier establishments:

- ▶ Cyprus: 3 establishments are in the process of informing the public and 1 became upper tier in 2014;
- ▶ Denmark: 9 establishments had information made available in 2015, for 1 establishment the information was last made available in 2009;
- ▶ Germany: the following situations were present during the reporting period: the absence of people in a wider area that could be actively informed; the deadline for providing information had not yet expired for some establishments; and for others the updating of information took longer than expected and could not be concluded on time. The response does not include information on specific numbers of installations concerned for each of these situations; however it is clear that these should not be considered as failures to make information available;
- ▶ Ireland: This was applicable only to those establishments with an off-site public information zone so this was not applicable for 6 establishments;
- ▶ Lithuania: One establishment whose operations started only in 2015;
- ▶ Malta: The leaflets for four of its upper tier establishments were published and distributed in 2009 but there had been no update because there had been no change to the operations of the establishments. For the other establishments, one operator made leaflets available in 2012, another one is finalising leaflets. The final three upper-tier establishments were classified as such in February 2014 and had not yet prepared information for the public; and
- ▶ UK: 27 establishments do not have to inform the public as they have no off-site risk³¹. 4 establishments did not have external emergency plans in place, and the legislation requires information to be supplied to the public after the external emergency plan has been prepared. For the remaining 10 the information appears to be incomplete and is being investigated.

It appears that there is only a minority of establishments failing to update the information provided to the public, and when this is the case Member States have reported monitoring the situation and pursuing it through inspections.

The questionnaire also requested Member States to provide a statistical breakdown showing by whom and by which means the information was made available.

In Austria, Bulgaria, Cyprus, Ireland, Malta and Slovenia, operators are solely responsible for making information available. Conversely, in Belgium, Denmark, Estonia, Greece, Spain, France, Croatia, Hungary, Latvia, Netherlands, Portugal and Sweden, competent authorities are in charge of making information available. In the remaining Member States, the responsibilities are shared between operators and competent authorities.

The part of the question related to the statistical breakdown of the means (of providing information) was one of the least well responded of the questionnaire with many member States not initially providing a statistical breakdown due to this information not being available. Furthermore, in several instances it was not clear whether the response was in general (e.g. in 10% of cases information is made available by email) or whether it covered the reporting period more specifically. The overview of the means used to make information available is presented below while more information (including statistical breakdown where available) is presented in the Member States summary sheets.

³¹ Note that these 27 establishments were not considered as instances where information was not made available.

Table 3.2 Overview of Member States means for making information available

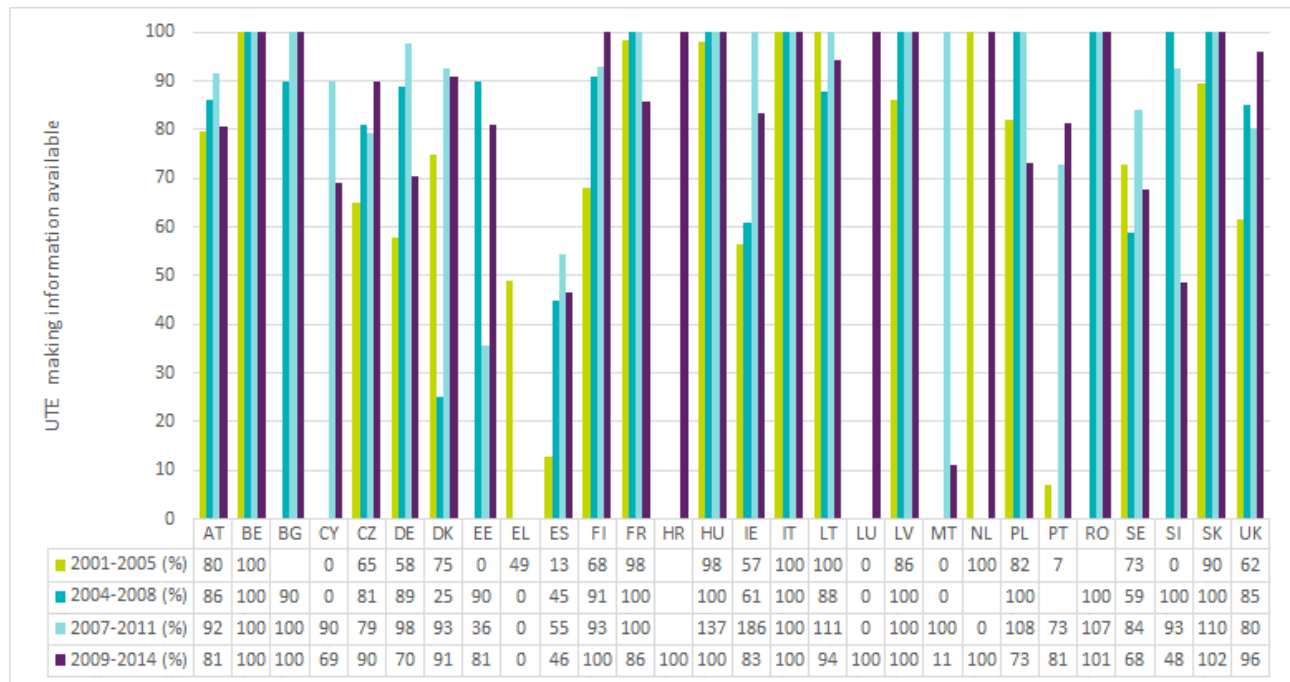
MS	Means reported by Member States
AT	Flyers / leaflets / direct mail Placard at the entrance of the site Web-based information Combination with emergency response tests Local newspaper Open Day
BE	Information meetings where leaflets are distributed National information campaign held in 2012 (website, leaflet, TV adverts, press articles and online game) Belgium provided an estimate of the population reached during this campaign by the different means, 68% were deemed to have been reached by TV information, 29% by the press information and 8% of the population received a leaflet (with a total of 400 000 leaflets sent) Further local initiatives are organised.
BG	Flyers / leaflets / direct mail Website of the establishment
CY	Radios, torches and tape were distributed door-to-door to the citizens liable to be affected alongside an information leaflet.
CZ	Flyers / leaflets / direct mail
DE	Flyers / leaflets / direct mail Public meetings Internet, operator's homepage, placards/bulletins, newspaper advertisements, official register, public display
DK	Competent authority's website Following an assessment leaflets are sent out if relevant
EE	Competent authority's website and leaflets distributed to persons liable to be affected by a major accident.
EL	Flyers / leaflets / direct mail Information given to students in all elementary and high schools in the greater area of Seveso establishments. Leaflets sometimes sent alongside electricity bills
ES	Flyers / leaflets / direct mail Information session/talks Twitter and Facebook Local radio and television
FI	Flyers / leaflets / direct mail from both the operator and the competent authorities
FR	Authorities' websites, access to hard copies in regional and local authorities
HR	Authorities' and operators' websites
HU	Extract of the safety report distributed to public
IE	Flyers / Leaflet / direct mail
IT	'active' communication (public gatherings, meetings or conferences; Surveys and questionnaires); 'passive' communication e.g. information material at municipal offices, in newspapers, on websites and posters
LT	Flyers / leaflets / direct mail
LU	Online information available or can be ordered by the public by phone or mail.
LV	Flyers / leaflets / direct mail
MT	Leaflets and instruction cards are available online on the operators' webpages but also distribute to all premises located within an agreed zone around each site
NL	The regional emergency broadcasters, websites, social media (Twitter) and national pool of crisis communication experts. NL-alert system

MS	Means reported by Member States
PL	Flyers / leaflets / direct mail Website and operators' open days
PT	Flyers / leaflets / direct mail Notices published by authorities Public consultation on external emergency plan
RO	Flyers / leaflets / direct mail
SE	10 county administrative boards, newspapers and radio, operators' and municipalities' websites
SI	Operator's boards in their premises and operators' websites
SK	Flyers / leaflets / direct mail Website Information in the establishment Radio/television
UK	Flyers / leaflets / direct mail Supplying information and supporting this with laminated emergency cards, fridge magnets.

From the information reported a number of observations can be made. First, the diversity of the means reported beg the question of whether some means may be more efficient than others. It is unclear why some Member States rely on some means more than others and there would be value in gaining a deeper understanding of the efficiency of these information means, and the motivations behind the choices made by Member States. Secondly, for some of the means reported by Member States (e.g. information kept available in establishments) it is unclear how this fulfils the condition of article 13(1) that information should be available to the public 'without their having to request it'. Finally, it is unclear whether those Member States reporting mostly using online means are reaching the whole spectrum of the population, in particular older sections of the population that may not be as comfortable with modern technologies and may be more vulnerable to accidents and incidents.

When comparing the information reported over the reporting period, a decrease can be observed for the latest reporting period compared to the data reported during 2009-2011 period where in 2011, 87% of the upper tier establishments had made information available in the preceding five years. The figure below presents the evolution of the data reported on the share of upper tier establishments that made information available.

Figure 3.12 Evolution of the share of upper tier establishments making information available in 2005, 2008, 2011 and 2014



Note: Data on establishments for the years 2011, 2008 and 2005 have been provided by Member States in the three-year implementation reports submitted to the Commission.

3.5.3 Monitoring that information is made available (Question 3(d))

Member States were asked to explain briefly how they confirm that the information has been supplied and is available.

For 15 Member States, this is verified during the inspection. This is the case for Austria, Bulgaria, Germany, Finland, Croatia, Ireland, Lithuania, Luxembourg, Latvia, Malta, Poland, Sweden, Slovenia, Slovakia and the UK.

Other approaches were also reported:

- ▶ In Belgium market research is being conducted in order to verify the efficiency, the quality and the effectiveness of the information campaign;
- ▶ In Germany, internal and external safety audits, and safety reports are checked for this particular point;
- ▶ In Spain the impact and effectiveness of the information provided is measured through surveys and polls. The number of visits to the webpages are also recorded and compared;
- ▶ Ireland and Malta make spot checks that information has been made available in the relevant areas;
- ▶ In Luxembourg, establishments are required to present the information that has been compiled during the inspection of the establishment, including information on major accidents, possible consequences from accidents and safety measures. This allows the Competent Authority to verify it; and
- ▶ France and the Netherlands consider that, as the information is online, it is always available. Both of these Member States have reported other means as being used to make information available (for example in competent authorities' offices), however it is important to consider that not all the population access information online and that availability of information online should be complemented by other means where necessary.

Greece did not have information available to respond to this question which prevented the analysis of the compliance with the requirement of the Seveso II Directive with regards to availability of information.

3.5.4 Information kept permanently available for upper tier establishments (Question 3(e) and 3(f))

This question was optional and was responded to by 11 Member States, of which 9 provided a numerical response (Czech Republic, Spain, Croatia, Ireland, Lithuania, Malta, Netherlands, Poland and Slovakia).

On average, a large share of upper-tier establishments has information available permanently, ranging from 60% of Spain's upper-tier establishments up to 100% for Croatia, Malta, Netherlands and Slovakia.

Linked to this question, Member States were also asked to provide a statistical breakdown showing by whom and by which means the information is kept permanently available. Fewer responses were provided (from Bulgaria, Spain, Finland, Croatia, Ireland, Malta, Netherlands and Poland), and with the exception of Ireland, they all referred to websites being used to permanently provide available information.

3.5.5 Information kept up permanently available for lower tier establishments (Question 3(g))

The last question on information on safety measures was optional and asked Member States to indicate how many lower tier establishments had up to date information kept permanently available.

7 Member States responded:

- ▶ Ireland reported that this information is not available;
- ▶ Croatia, Czech Republic, Malta and the Netherlands indicated this was the case for all their lower tier establishments; and
- ▶ Finland and Poland indicated that this was the case for no lower tier establishments.

3.6 Question 4: Inspections

3.6.1 Overview

Question 4 requested Member States to provide information on their inspections, including whether these are based upon a systematic appraisal of major-accident hazards, the types of actions resulting from inspection but also accidents and incidents and data on the number of establishments.

Member States provided varying responses and often focused on different elements of their inspection strategies (frequency, strategy, legislation, etc.) and, in that context, drawing conclusions on common features or best practices adopted across the EU is not possible. As such, this aspect of the questionnaire could be improved in future reporting periods. However, where possible, information from individual Member States' responses has been integrated and summarised below.

3.6.2 Systematic appraisal of major-accident hazards in inspection programming (Question 4(a))

Member States were asked to indicate, for those where the programme of inspections is based upon systematic appraisal of major-accident hazards, the main criteria on which the systematic appraisal is based.

Based on the information provided it appears that the following Member States have adopted such a system:

- ▶ In Belgium the programme covers upper and lower-tier establishments and is based on a 'rapid ranking technique'. Based on the substance and activities two indicators are used, one for fire and explosion and one for toxicity. The combination of these indicators for each establishment lead to a score which corresponds to a level of danger. Inspections are decided upon in accordance with this score which each score corresponding to a minimum inspection

frequencies of either once per year, once every two years or once every three years, depending on the hazard category of the establishment;

- ▶ In Bulgaria a risk assessment is performed for each establishment before the adoption of the inspection plan. This takes into account data on the activities carried out on the Seveso site, the level of risk and complexity of the sites and the detection systems for preventing accidents and incidents at the establishment. Other criteria considered include the location, the results of previous inspections, the behaviour of the operator and its participation in voluntary schemes (e.g. EMAS), previous complaints or sanctions. As a result of the assessment each establishment is rated with a high, medium or low risk and inspections are prioritised accordingly;
- ▶ In Denmark the programme of inspections takes into account the size of the establishment and risk conditions, the nature of the surroundings and a number of other factors that are specific to the individual establishment;
- ▶ In Germany monitoring programmes are developed, defining the intervals and the extent to which inspections will be undertaken at individual sites;
- ▶ In Finland the criteria used include mainly the results from previous inspections (which are rated on a 0-5 scale) and the general safety of the establishment. In addition, the type and size of establishment and its surroundings are also considered;
- ▶ In Italy, an inspection system based on systematic appraisal of major-accident hazards has been introduced with the revision of the regulatory framework conducted in 2015. However this does not concern the reporting period considered in this report³²;
- ▶ In the Netherlands, the inspection programme is determined based on the number of units, number of activities presenting safety risks, the nature of the substances present, ambient factors and the results of the last inspection;
- ▶ In Portugal, a risk analysis tool is used to support the inspection programming. It considers two sets of criteria: first the quantity of dangerous substances and their effects on physical and environmental health, and second general compliance of the establishment with the legislation, the organisation of the safety management system for preventing major accidents, inspection recommendations, fire safety measures and audits;
- ▶ In Romania, the inspection programme is based on the systematic assessment of accident hazards, the protection against hazards, the condition present in the installation and the surroundings;
- ▶ Sweden's inspection programme incorporates all sites and is based on the outcomes of previous inspections, history of sites and assessment of hazards at the particular establishment; and
- ▶ In the United Kingdom, the plan covers all establishments, with scope for inspections to focus on priority topics. Those are issues identified for priority inspection, complaints, management of ageing plant and process safety performance indicators. Plans for upper-tier establishments cover three year periods and are reviewed annually.

Other Member States' responses indicated that such appraisal is not considered and inspections are based on regular deadlines:

- ▶ Cyprus, Estonia, Greece, France, Latvia, Poland, reported that establishments are inspected every year;
- ▶ In the Czech Republic, Lithuania, Slovakia, upper-tier establishments are inspected annually, while lower tier establishments are inspected once every three years;

³² National legislation transposing the Seveso Directive D.lgs. 105/2015

- ▶ In Latvia, upper-tier establishments are inspected annually, and lower tier establishments twice every three years; and
- ▶ In Hungary and Ireland lower tier establishments are inspected every two years and upper tier establishments annually. Ireland added that resource constraints meant that this was not achieved for the reporting period, and that inspections were prioritised according to the inherent safety of the establishments and the surrounding population.

Finally, Croatia indicated that criteria for the evaluation of establishments are currently being developed using the IRAM tool developed as part of the IMPEL network.

3.6.3 Availability of inspection related information to the public (Question 4(b))

This question was optional asked what information if any from the programme of inspections and from the inspections report is available to the public. It was responded to by 12 Member States. Out of these, the following categories can be identified:

- ▶ Those Member States where such information is not made available to the public: Greece and Malta;
- ▶ Those Member States where this information is fully made available to the public: Germany (upon request), Finland (upon request), France (upon request), Croatia, Latvia (for inspection programme, inspections report must be requested), Netherlands, Poland (upon request) and Slovenia. All these Member States indicated that confidential information can be removed before the report is made available to the public; and
- ▶ One Member State where this information is only partially made available to the public: Slovakia (summary of the annual inspections performed).

3.6.4 Overview of actions resulting from accidents, incidents and non-compliance during reporting period (Question 4(c))

Member States were requested to provide information about the types of actions taken as a result of accidents, incidents and non-compliance during the reporting period. This question was interpreted differently by Member States with some providing general descriptions of types of actions *available* and other reporting information on actions *actually applied* in the reporting period. Our analysis focused on those actions taken during the reporting period which is the focus of the question.

Actions reported by Member States

Belgium issued 13 orders for corrective measures and in 4 instances opened judicial proceedings. This was out of a total of 460-500 inspections conducted annually in the 2012-2014 period

Bulgaria issued fines to establishments during the reporting period. One was for non-compliance with permit conditions (€5,000), another for an establishment that carried out changes without informing the competent authority (€10,000). These actions were taken following inspections. In addition, fines were issued following accidents for two upper tier establishments (€15,000).

The Czech Republic issued some notices in 2013 in response to irregularities concerning documentation or the internal emergency plan. In 2014 administrative proceedings were initiated for fines for two establishments.

Spain adopted several disclosure requirements, 16 disciplinary proceedings, a partial suspension of operation at one establishment and the total suspension of operations at another establishment.

France issued corrective orders for 164 lower tier establishments and 307 upper tier establishments during the reporting period. In addition, activities were limited or suspended in 5 lower tier establishments and 11 upper tier establishments.

Croatia issued administrative notices for 6 lower tier establishments and 13 upper tier establishments.

Italy took 90 'actions' as a result of accidents, incidents and/or non-compliance. 53 of these concerned upper-tier establishments, with most taken as a result of accidents, or following a negative assessment of the safety report or non-compliance with specific instructions imposed on the operators by the competent authorities. Italy added that remedial orders or technical upgrades were mostly decided upon as a result with rare need for penalties. There were two cases of partial restrictions on activity involving a ban on the operation of certain installations and areas of the establishment. The remaining 37 actions concerned lower tier establishments and were cases where the safety management system was found to be inadequate or non-compliant; specific requirements or remedial actions were imposed.

Latvia issued 32 fines for breaches of fire safety provisions, and 4 warnings on the suspension or restriction of operations of an establishment

Poland issued 7 requirements for further testing, 401 corrective decisions for removing irregularities and 7 immediate decisions with suspension of activities until the change was made. In addition, 254 orders were issued for operators to ensure compliance with the legal provisions in force, and 31 penalties were issued.

Portugal issued penalties for 2 upper tier establishments and 5 lower tier establishments.

Romania issued 2,085 coercive actions including 1,537 written notices and 548 financial penalties.

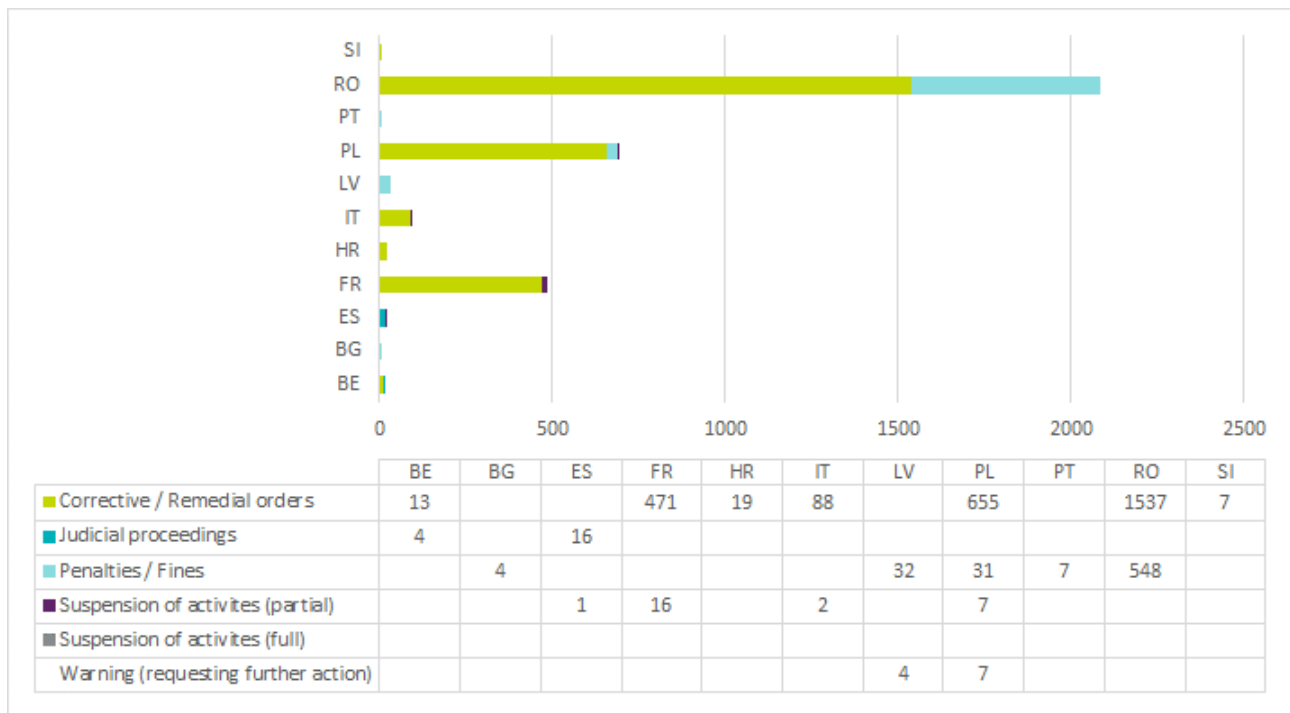
Slovenia took 7 actions in order to ensure operators complied with requirements linked to public information (6 instances) and updating of the environmental permit.

Slovakia issued €38,100 worth of fines during the reporting period. Corrective measures were also taken alongside to remediate the failings (which concerned wrong categorisation of the establishment and failure to appoint a professionally competent person)

Greece, Luxembourg, Malta, reported that no actions were taken in the last reporting period.

The chart below presents the most often used actions during the reporting period. Note that the chart presents both actions taken following inspections and those following incidents and accidents as these were often not clearly distinguished in Member States' responses. As such the data reported by Member States are not fully comparable, and whilst we have grouped similar actions together, it is possible that each Member State's legal system has slightly different features leading to differences in actions available.

Figure 3.13 Overview of most reported actions taken during the reporting period



3.6.5 Overview of inspections during the reporting period (Question 4(d), (e), (f))

Inspection is a key aspect of the implementation of the Directive as it is the opportunity for the competent authority to verify on site that the provisions of the Directive are in practice being applied. The Directive requires that upper tier establishments are inspected at least once per year. However, there is a flexibility included in the Directive which is that annual inspections are not required where the programme of inspections is based on a systematic assessment of major-accident hazards. Member States were requested to provide information on how many of their upper tier establishments were inspected annually, and of those that were not, how many had been inspected in the last three years. Similarly, while the Seveso Directive does not require a minimum frequency of inspections for lower tier establishments, Member States were asked to indicate how many of these establishments were subject to on-site inspections in the last three years. Finally, the questionnaire requested that those Member States where the programme of inspections is based upon a systematic appraisal of major-accident hazards report the criteria on which the systematic appraisal is based.

It would be useful to introduce for future reporting a question requesting whether (i.e. yes/no) the programme of inspections is based upon a systematic appraisal of major-accident hazards as some responses are not as clear on this aspect. From the information reported it is clear that Belgium, Bulgaria, Denmark, Germany, Finland, Netherlands, Portugal, Romania, Sweden and the UK base their inspections' programme on a systematic appraisal of hazards. Conversely, from the responses provided it is clear that Croatia, Cyprus, Czech Republic, Estonia, Greece, France, Hungary, Italy, Lithuania, Luxembourg, Latvia, Malta, Poland, Slovenia have not adopted a programme of inspections based on systematic appraisal of major accidents hazards. Austria's response refers to a generic timetable for inspections which is interpreted here as not being a systematic appraisal.

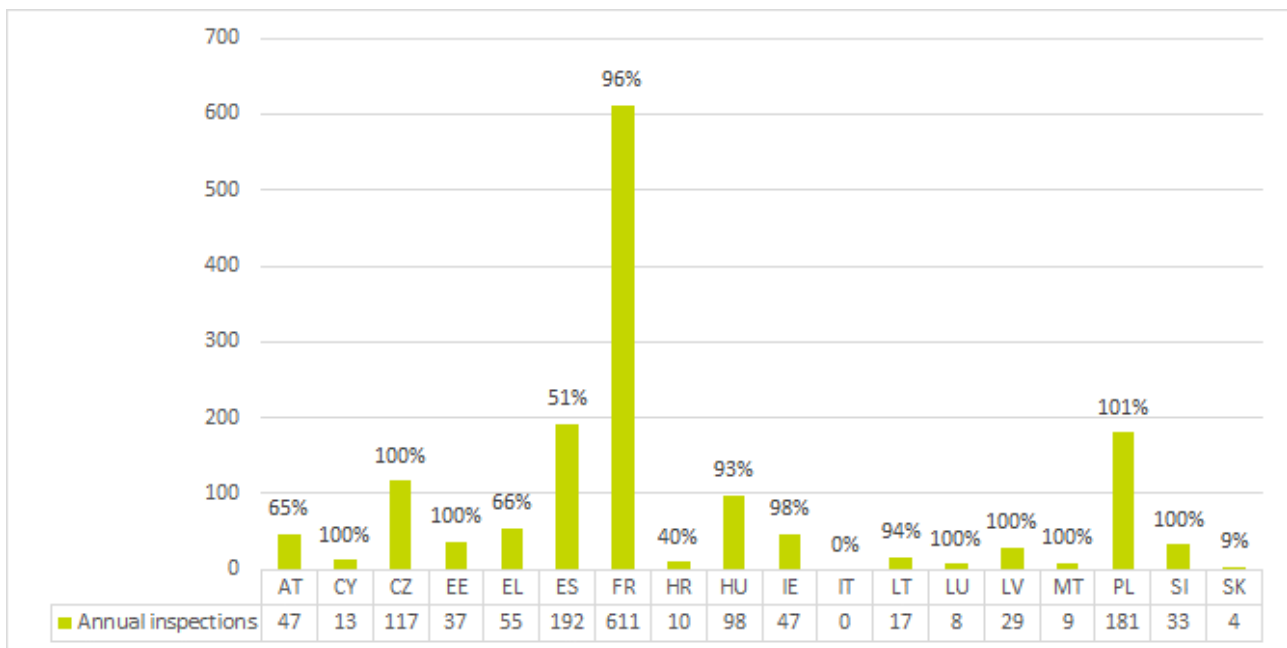
For some Member States there are uncertainties. Spain indicated that due to the competence of its autonomous regions in inspection matters it is unknown whether inspections are based on systematic appraisal or not. Slovakia indicated that legally established time period and systematic appraisals are being used together to decide on programme of inspections. For the purpose of the analysis these were accounted as not relying on systematic appraisal assessments.

All Member States have reported that inspections were undertaken across the upper tier establishments during the reporting period. On average, inspections were undertaken in 58% of the upper tier establishments annually, with 86% inspected over the previous three years. However, this figure does not distinguish, for annual inspections, those Member States that have based inspection on a systematic appraisal of risks. When this is considered (i.e. when those Member States using the systematic appraisal approach are excluded), the percentage of upper tier establishments inspected annually is 79%.

A programme of inspections based on systematic appraisal of major accident hazards means that Member States do not have to inspect establishments annually. However, certain situations were identified where some establishments were not inspected during the whole reporting period, and where the share of annual inspections was low. These are highlighted as possible compliance issues. It will be useful for the European Commission to follow this issue and verify whether more inspections should be encouraged.

The figure below presents the number of annual inspection and the share of upper tier establishments for which annual inspections were held during the reporting period. Those Member States where annual inspections are not required, because they have adopted a system of systematic appraisal, are not included in the chart below.

Figure 3.14 Annual inspection of upper tier establishments during the reporting period



Note 1: BE, BG, DE, DK, FI, NL, PT, RO, SE and UK have adopted a programme of inspections based on systematic appraisal of major accidents hazards and as such annual inspections are not required.

Note 2: The percentage present the share of upper tier establishments with annual inspection during the reporting period.

Note 3: Total is higher than 100% for Poland due to variation in number of upper tier establishments during the reporting period.

It is noticeable that a large number of Member States have successfully applied the requirements of the Directive to undertake annual inspections. In Cyprus, Czech Republic, Estonia, Luxembourg, Latvia, Malta, Poland and Slovenia all upper tier establishments were inspected annually. This is in line with Article 18 of the Directive, stating that Member States are to inspect upper-tier establishments every year, unless the programme for inspections is based on the systematic appraisal of major-accident hazards of establishments.

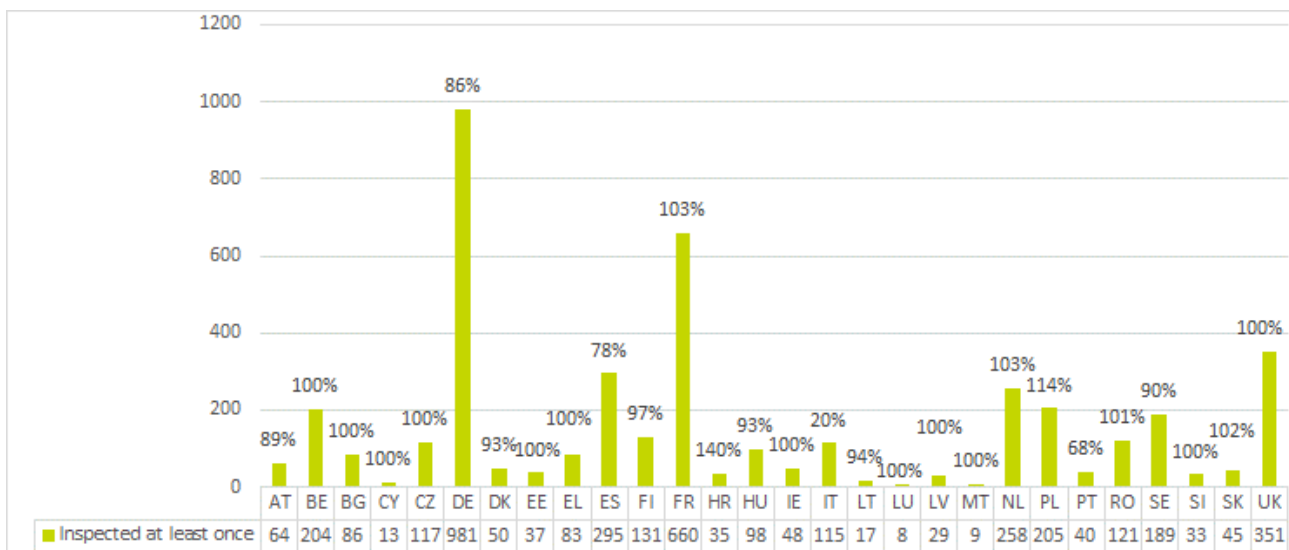
A few Member States (Ireland, France, Lithuania and Hungary) are close to meeting this requirement with above 90% of the upper tier establishments inspected annually. Ireland highlighted staff and financial constraints to explain not having inspected these establishments annually.

However, it is also noticeable that some Member States have reported a very low share of annual inspections, in particular Italy, Slovakia, Croatia and Spain.

For Spain, this might be explained by the fact that some autonomous regions might base the programme of inspections on systematic appraisal of major accidents hazards. While requested, this information had not been provided by several regional authorities. In addition, Italy indicated that the low number of inspections was caused by organisational and financial constraints. Italy indicated that its national legislation was amended in order to address this issue in the future reporting period (i.e. under Seveso III) by redrafting the competence for inspection and by providing financing for the inspections through tariffs paid by the operators. For other Member States the reason for such a low inspection rate is unclear and warrants further investigation.

Member States were required to provide data on the number of establishments inspected at least once during the reporting period. The data are presented in the figure below.

Figure 3.15 Inspection of upper tier establishments at least once during the reporting period



Note: Total is higher than 100% for Croatia, Netherlands, Poland, Romania and Slovakia due to variation in number of upper tier establishments during the reporting period

By the end of the reporting period the majority (86%) of upper tier establishments had been inspected at least once. When removing those Member States using a systematic risk assessment to define inspection programmes, the share of upper tier establishments inspected at least once during the reporting period reaches 97% of the upper tier establishments.

It can also be observed that in some Member States, the share of upper tier establishments inspected at least once in the reporting period are lower than 100%. This is the case in particular for Austria (89%), Denmark (93%), Germany (86%), Finland (97%), Hungary (93%), Italy (20%), Lithuania (94%), Portugal (68%) and Spain (78%). Out of these Member States, Denmark, Germany, Finland and Portugal have reported information that suggest that they have adopted an inspection programme based on systematic appraisal of major accidents, which could explain a lesser frequency than annual. While this is in compliance with the requirements of the Directive, it might be worthwhile to verify that upper tier establishments do not

remain un-inspected for long periods of time. For the other Member States (Austria, Denmark, Hungary, Italy and Lithuania), it is unclear why inspections were not conducted as required.

The question did not request further information from Member States to understand why upper tier establishments were not inspected as required by the Directive. The lack of inspections of every upper-tier establishment in a Member State can be explained by some of the following reasons:

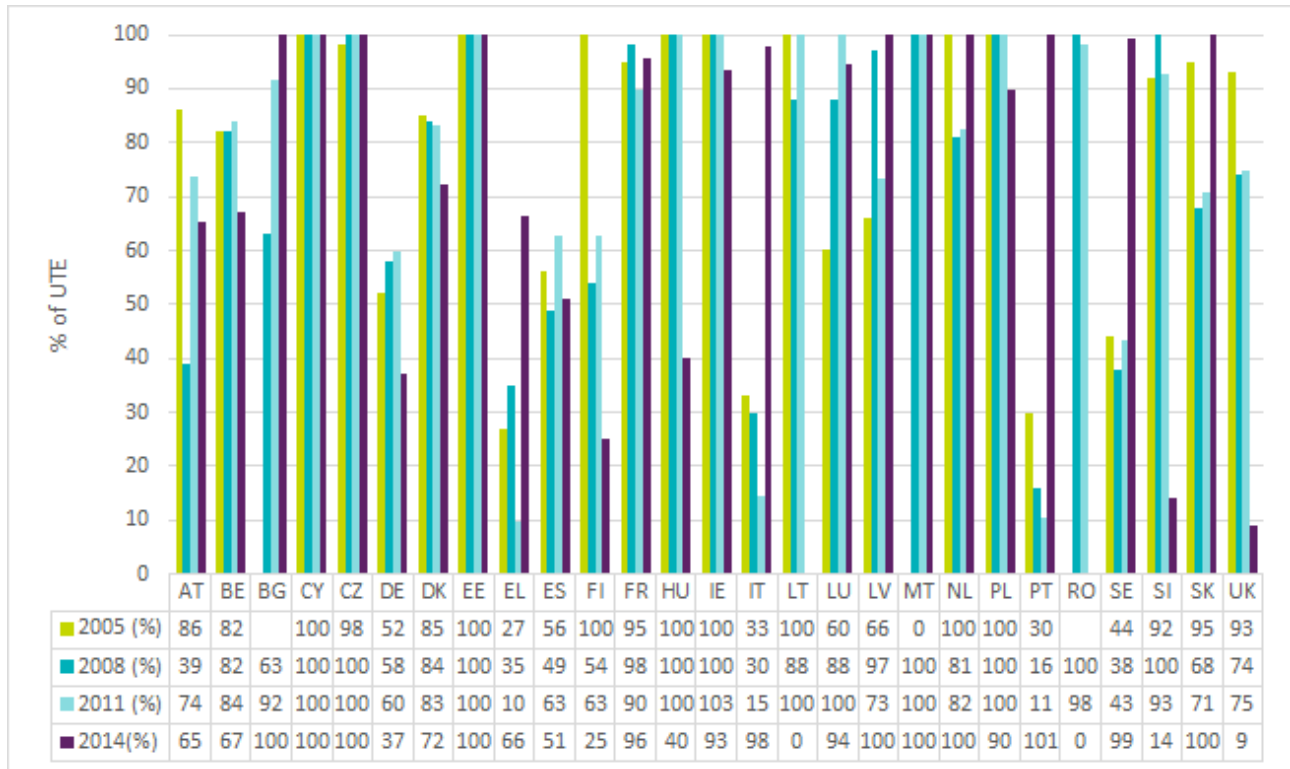
- ▶ Member States establishing a programme of inspections based on a systematic appraisal of major-accident hazards of the particular establishment as provided for in Article 18(2);
- ▶ Time when the upper-tier site became a Seveso establishment – The Directive states that establishments must be inspected every 12 months. Therefore a new upper-tier Seveso site might not have been inspected the same year as it was established. For upper-tier sites which started operating in 2014, this means that they might not have been inspected in this reporting period as the deadline for inspection had not passed; and
- ▶ Establishments not inspected were ceasing to, or did not start to, operate.

It is not straightforward to compare inspections data with data from previous reporting periods. Previously inspections data were requested for each year of the reporting period. However, for the 2012-2014 reporting period data were requested annually and then for the whole period. Furthermore, the analysis distinguishes between those Member States using a systematic risk appraisal to set inspections frequency and others. As a reminder, Belgium, Bulgaria, Denmark, Finland, Germany, the Netherlands, Portugal, Romania, Sweden and the United Kingdom are considered to have adopted such systems.

On average, inspections were undertaken in 65% of upper-tier establishments during the 2009-2011 reporting period. This figure was practically unchanged in comparison with the 2006-2008 period when the figure was 66% or 2005 when it was 69%. In the 2012-2014 period, an average of 58% of upper tier establishments were inspected annually and 86% over the reporting period.

The figure below compares the share of upper tier establishments being inspected annually in each Member States as reported. However, when interpreting the data, care should be taken to bear in mind changes in inspection regimes occurring throughout the years. For example, it is clear that in Finland or Germany the diminution of the share coincides with the adoption of a system based on systematic appraisal.

Figure 3.16 Inspection of upper tier establishments in 2005, 2008, 2011 and 2014 (% of upper tier establishments)

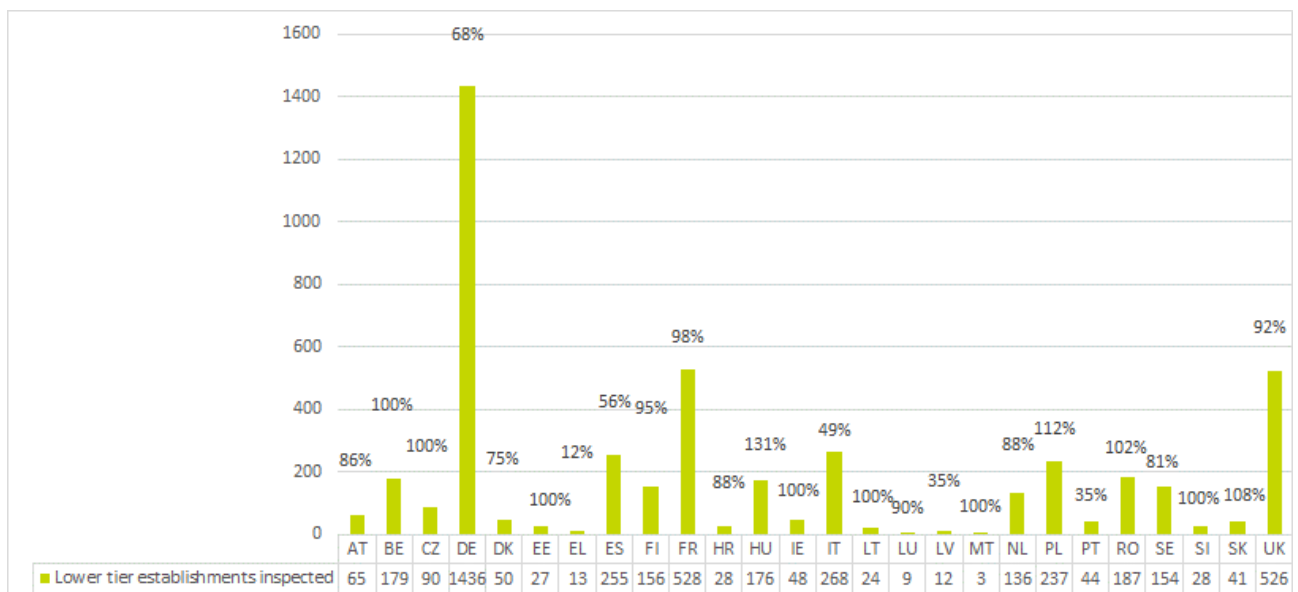


Note: Data on establishments for the years 2005, 2008 and 2011 have been provided by Member States in the three-year implementation reports submitted to the Commission.

All Member States have reported that inspections were undertaken across the lower tier establishments during the reporting period. On average, inspections were undertaken in 77% of the lower tier establishments.

Figure 3.17 presents the number of inspections undertaken at lower-tier establishments in each Member State.

Figure 3.17 Inspection of lower tier establishments during the reporting period



Note 1: Total is higher than 100% for Hungary, Poland, Slovakia and Romania due to variation in number of upper tier establishments during the reporting period.

Note 2: The percentage presents the share of lower tier establishments that were inspected at least once during the reporting period.

A high share of lower-tier establishments were inspected in the last reporting period, with several Member States inspecting all of their lower tier establishments in particular Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Ireland, Lithuania, Malta, Poland, Romania, Slovenia and Slovakia.

In addition, two Member States (France and the UK) have inspected nearly all their lower tier establishments (above 90%).

However, it is also noticeable that some Member States have a low share of lower tier establishments inspected, in particular Greece (12%), Latvia (35%) and Portugal (35%). No information is included in the Member States' reports to understand why this is the case and here also some further investigation might be warranted.

Data are available on lower tier establishments' inspections only for the 2009-2011 period where, on average, 42% of the lower tier establishments were inspected. No data for inspections of lower-tier sites are available for previous reporting periods. As such, the figure of 77% for the 2012-2014 period represents an important improvement on lower tier establishments' inspections.

3.7 Question 5: Domino effects

Article 8 of the Seveso II Directive requires Member States to ensure that the competent authority identifies establishments or groups of establishments where the likelihood and the possibility or consequences of a major accident may be increased because of the location and the proximity of such establishments and their inventories of dangerous substances. The questionnaire requested Member States to provide information on how the objectives of this article were ensured and to share their experience of applying Article 8 during the reporting period.

Several Member States conveyed that the implementation of this article is now well established thanks to past experience. The identity and number of domino establishments are mostly reported as being well known and the requirements and aspects to take into account are also well developed.

Domino establishments are identified during the initial permitting phase, when considering the extent of the risk zones, which are defined in the land use planning policies of several Member States (e.g. Greece, Spain and the UK). Establishments are notified when in proximity to other establishments leading to the possibility of domino effects and are required to exchange relevant information.

The practices and experiences reported by Member States are noteworthy, in particular:

- ▶ Belgium differentiates establishments that could create a domino effect and those that could be affected by a domino effect and organises meetings where operators of the establishments are present to discuss ways to reduce risks and hazards;
- ▶ Bulgaria and Cyprus encourage operators concerned by domino effects to exchange information in writing so that a record can be kept and verified during inspections;
- ▶ Finland has adopted and published guidelines for operators on how to co-operate with other establishments in case of domino effects;
- ▶ France and Germany organise safety exercises for domino establishments and encourage operators to create common leaflets, information meetings and use common alert systems;
- ▶ Lithuania's experience was that for some domino establishments communication can be made more difficult when establishments are located very close and are competing commercially; and
- ▶ Sweden provided an example of a strategy taking into account domino establishments. In an industrial park, in the northern part of Sweden, three upper tier Seveso establishments and other installations located have been designated as relevant for possible domino effects. There are large amounts of dangerous goods transported within the area but also storage facilities and pipelines. The establishments share some of the facilities, but they also display different safety cultures and levels of safety. In order to encourage communication, a forum for consultation on safety matters has been created. The local authorities have been a part of it

and presented their risk analyses. From their experience, it was noted that different operators make different assessments. For example, one operator may have identified possible interactions with several neighbouring operators while the others would not identify possible domino effects at all.

3.8 Question 6: Land-use planning

Article 12 of the Directive foresees that Member States should ensure that the objectives of preventing major accidents are taken into account in their land-use policies and other relevant policies. Member States were requested to provide information on how the objectives of the article were ensured during the reporting period and share their experiences with regards to land-use planning.

All Member States have provided general background information on measures for fulfilling the objectives of Article 12 in general and, in particular, for ensuring the control of new developments around existing sites as well as at new sites. It is clear from the reports that Member States submitted that the objectives of preventing major accidents and limiting the consequences of such accidents are taken into account in their land-use policies. Similarly to domino effects, land use planning policies are well established and Member States are used to applying them. While some Member States provided long responses, often the content was very similar to responses provided in previous reporting period.

In general, the authorisation process for building a new site or modifying an existing Seveso establishment requires the granting of a permit from the competent local authority. The exact procedures are specific to each Member State, but in essence they all focus on assessing the risks posed by the establishment to its surroundings and the environment. A range of authorities has been reported as being involved: environmental experts, fire supervision specialist, territorial planning authority and health authority. The planning procedure also involves actors at national, regional and local level and public consultation and participation was often highlighted as important.

The practices and experiences reported by Member States during the last reporting period are noteworthy, in particular:

- ▶ Cyprus has, during the reporting period, incorporated into development plans some land use provision policies in order to ensure the objectives of preventing major accidents are taken into account. Cyprus has also continued to implement its policy to transfer existing establishments into areas designated for industrial development specifically;
- ▶ Denmark requires prior authorisation for the building, extension or modification of an establishment. Safety zones are defined and used to guide land-use decision. This ensures that land use is considered at any critical stage of the establishment;
- ▶ Greece reported that as part of a pilot project funded by its Ministry of the Environment, a software system has been developed to assist decision making for land use planning associated with the risk of industrial installations. This was tested in the West Thessaloniki region which has many establishments conducting refining, petrochemicals, oil and gas storage and fertiliser and pesticides productions, all near populated areas;
- ▶ Spain indicated that recently, there has been an increase in individual risk assessments based on quantitative risk analysis to support land use planning decisions. This is a change from the general trend which bases decision-making on deterministic risk analysis methods;
- ▶ France adopts plans for preventing technical risks for a determined industrial area (beyond single establishments). Plans are drafted for any area that includes at least one upper tier establishment and are being used for land use planning decisions. The aim of the plans is to manage historical industrial sites but also to prescribe technical measures to reduce the risks on existing infrastructure. The plans identify zones where further building is prescribed and where specific limitations on building can be imposed;
- ▶ Ireland's planning authorities must seek advice from the Seveso competent authority when dealing with land use planning around establishments. There are generic consultation distances that are used to decide on this. Technical advice can then be provided either on a

generic or in a case-specific way. Generic advice is based on a 3-zones system. Ireland added that often environmental issues raised in the context of land use planning relate to appropriate containment measures. Technical advice was given for 696 cases during the reporting period;

- ▶ Italy conducted a survey in 2013-2014 to examine, at national level, urban planning in areas where establishments were located. Some problems were identified which required the update of urban planning regulations and which led to modification of the legislation; and
- ▶ The UK's competent authority has improved the arrangements for providing a quick consultation response and to providing improved early engagement through pre-application discussions during the reporting period. This has allowed the competent authority to support the government's objectives of balancing public safety and protection with the need for growth. Safety zones are defined and used to guide land-use decision. In Northern Ireland, a specific body is consulted for all planning applications that are within a specified distance of a Seveso establishment.

3.9 Question 7: Further information (optional)

3.9.1 Lessons learned from accidents and incidents (question 7(a))

Member States were asked to share lessons learned from accidents and incidents. Only seven Member States provided a response to this question, including Malta which reported no accident or incident during the reporting period. The information shared by others included:

- ▶ Germany has introduced a third category of reportable incidents in addition to accidents and incidents as defined under Seveso II and includes 'serious disturbances of normal operations that have not yet led to serious accident' in accident prevention. This addition was the result of lessons learned. The Central Reporting and Evaluation Office for Accidents and Incidents of the German Federal Environment Agency centrally registers all reported incidents and distributes relevant information to stakeholders and the general public. It analyses the data and provides suggestions for improving safety. The Environment Agency also organises a yearly exchange of experiences among authorities and jointly with the Federal States has initiated a research project on methods of incident reporting and analysis. It is unclear whether these events are reported to the European Commission, but they appear to correspond to the first criteria of Annex VI part II for reporting (i.e. type of substance involved);
- ▶ In Croatia, operators are required to list lessons learned, so as to improve major-accident prevention and safety management. The response does not include information on whether any lessons learned have been shared yet;
- ▶ Latvia noted that many of the accidents that have happened were due to 'human factors' and that this has led to an emphasis on training and exercises for raising awareness of processes and procedures at Seveso establishments;
- ▶ The Netherlands indicated that in order to learn more lessons, the competent authorities also investigate incidents that do not meet the criteria of Annex VI. It added that there are about 30 such incidents each year. It is unclear whether these events are reported to the European Commission, but they appear to correspond to the criteria of Annex VI part II for reporting; and
- ▶ Slovakia's response included a description of a serious incident during the reporting period. The details are presented in the box below.

Lessons learned from serious incident in Slovakia – 2014

On 26 August 2014 in a Seveso establishment with a phenol plant a serious accident occurred. Although it lasted only 4 minutes, the accident resulted in one fatality.

The accident occurred during the drawing off of phenol (heated to about 50°C) from a tanker lorry by pump into a phenol storage tank. After the drawing off started a crack formed in a pipe that was part of the lorry's fittings, causing phenol to spray onto a concrete surface, the vehicle and the walls of the plant (about 12.8 t of phenol). The driver was present in the zone without using personal protective work equipment and could not be saved despite the fact that the emergency medical service was called immediately.

The plant's fire-fighting unit prevented any further leakage of phenol within 4 minutes and any further consequences for the environment, since a substantial part of the phenol leaked onto a concrete surface and then into a chemical drain which emptied into a waste water treatment facility in the industrial site.

The establishment adopted measures to prevent recurrence of this or a similar type of accident, for example:

- familiarising all employees of the company with the findings of the Commission appointed to investigate the accident through an entry in their registration papers on safety and health protection at work,
- including in the Safety Regulation on Performance of Initial Training the "Familiarisation of all outside persons entering the site of the establishment" on the conditions for entering and moving around the site, on the risks and hazards at the site and on the use of personal protective work equipment,
- amending the general Visitors' Entry Book to include the new details and ensure that they are translated into the necessary foreign languages, and
- updating the organisational guideline on safety at work to take account of the incident that occurred in the establishment; adding the possible risks and the methods of eliminating them to the organisational guideline concerning technical documentation.

3.9.2 IT tools for monitoring implementation (question 7(b))

A total of eight Member States responded to this question which requested member states to provide information on IT tools used for monitoring implementation and for sharing data on the Directive.

Malta indicated that no IT tool was available and Latvia reported that IT tools are used without providing further information. Other Member States reported the following:

- ▶ Germany makes information is available to the general public from the Central Reporting and Evaluation Office for Accidents and Incidents as well as a database about the state of safety technology (DoSiS), via the Environment Agency's "InfoSiS" portal³³. Furthermore, various Federal States, sometimes jointly, have developed software systems to monitor the implementation of the Major Accidents Ordinance (which implements the Seveso Directive) and for the sharing of data between the authorities concerned;
- ▶ Estonia does not appear to use a specific IT tool for implementation, but indicated that information on location and hazard type are available on its competent authority website³⁴;
- ▶ Spain has developed and launched a new database during the reporting period: the National Chemical Hazard Database (Base de Datos Nacional de Riesgo Químico - BARQUIM). This database contains information on Seveso establishments and provides the bodies involved in implementing the Directive with the necessary knowledge regarding the parameters that define the danger faced by an establishment containing dangerous substances. At the same time, it serves as a tool for monitoring the measures adopted in order to prevent and control major accident hazards;
- ▶ Croatia has software entitled CENA, designed for the reporting of information in accordance with the Seveso Directive. The data are published in the annual reports, on the website, and provided to European databases (eMARS and eSPIRS);

³³ <http://www.infosis.uba.de/>

³⁴ Board Agency web map page:

http://xgis.maaamet.ee/xGIS/XGis?app_id=MA11A&user_id=at&bbox=337406.132665832,6375000,767593.867334168,6635000&LANG=1

- ▶ In the Netherlands the competent authorities involved share a joint inspection area where they record establishments subject to the Seveso Directive, the results of inspections and any follow-up to incidents or non-compliance events; and
- ▶ Slovakia has an information system on the prevention of serious industrial accidents³⁵ which is a tool used for collecting data and reporting information to relevant agencies. The information system has two versions/interfaces: one for the general public and another for competent authorities. The versions vary mainly in the scope of information, which is more comprehensive and more detailed in the case of the competent authorities.

3.9.3 Seveso-like provisions for activities not under the scope of the Directive (question 7(c))

Four Member States provided a response to this question on Seveso-like provisions applied to activities not falling under the scope of the Directive such as pipelines, ports, marshalling yards and offshore installations. Malta indicated that no Seveso-like provisions are applied to other installations. Other Member States reported the following:

- ▶ Finland indicated that inspections are carried out on some non-Seveso establishments every five years if the amounts of dangerous chemicals exceed about 1/5 of the lower tier threshold amounts. Internal emergency plans must also be drawn up for these installations. External emergency plans must be drafted and tested with operators for Ports and Marshalling Yards through which large amounts of dangerous substances are transported;
- ▶ Hungary reported that, since 2012, its Seveso legislation covers also establishments under the threshold but at least above a quarter of the minimum threshold and which are considered as high priority facilities e.g. facilities transmitting dangerous substances and hazardous waste through pipelines off-site, including transmission lines and pump/compressor/distribution stations but excluding retail gas distribution lines and their facilities as well as hydrocarbon mining collector pipelines below a nominal diameter of 400 mm; establishments engaged in the disposal of hazardous waste, establishments where there is at least 1,000 kg of chlorine or ammonia; and
- ▶ The Netherlands indicated that the safety policy also covers the licensing and spatial planning of other activities, for example pipelines.

3.10 Comparison of reporting with previous reporting cycles

The report on the period 2012-2014 is the last reporting by Member States on their implementation of the Seveso Directive. While our analysis in section 2 includes comparisons and charts showing evolution through reporting periods, this section presents a short summary of the comparison of key aspects of the implementation. Each aspect is compared to the main findings on similar aspects from the 2009-2011 reporting period.

Table 3.3 Overview of implementation status between the current and the previous reporting period

Aspect	Implementation status 2012-2014	Comparison with the previous reporting period (2009-2011)
Overall implementation	The overall implementation of the Directive appears to be satisfactory with limited cases of potential non-compliance identified. Considering this marks the last reporting under the Seveso II Directive, it is not surprising to find that the instrument is by now widely implemented. While there seem to be few outstanding issues (in particular in relation of adoption and testing of external emergency plants and inspections of upper tier establishments), often Member States have indicated that measures were being adopted or that cases were being investigated to ensure the Directive is implemented.	The overall conclusions of the past reporting period was toward an improvement of the information reported which seemed to indicate an improve implementation of the Directive when compared to previous reporting periods.

³⁵ <http://www1.enviroportal.sk/seveso/informacny-system.php>

Aspect	Implementation status 2012-2014	Comparison with the previous reporting period (2009-2011)
External emergency plans	<p>An average of 88% of the upper-tier establishments had an external emergency plan at the end of the 2012-2014 period. This includes 4% of upper tier establishments where the competent authorities considered that an external emergency plan was not required. This marks a worsening since the last reporting period where an average of 93% of the upper tier establishments had an external emergency plan. There are variations between Member States. It is considered that a share of more than 8% of upper tier establishments for which such plans were not drafted indicate implementation issues. This was observed in the reporting period in 10 Member States.</p> <p>On average 75% of the external emergency plans had been tested during the reporting period. This is a slight improvement over the last reporting period. However, the variability between Member States remains high. The information reported seems to indicate that Member States are now more efficient at reviewing and testing those plans.</p>	<p>An average of 93% of the upper-tier establishments had an external emergency plan at the end of the 2009-2011 period. Member States indicated that over 70% of these plans were tested in the period. This is an improvement compared to 2006-2008 (60%) and 2003-2005 (40%) in previous periods. However, the variability between Member States is very high.</p>
Providing information to the public	<p>On average 81% of the upper tier establishments had made safety information actively available during the reporting period. This represents a slight decrease since the last reporting period and the inequalities between Member States remain. Part of the discrepancies are explained by upper-tier establishments being newly classified.</p>	<p>The number of establishments for which information is provided to the public was around 87% of the Seveso upper-tier establishments, an increase from 80% in 2008 and 72% in 2005. However, some Member States are well behind the top performers in this area.</p>
Inspections	<p>Upper tier: On average, inspections were undertaken in 58% of the upper tier establishments annually (2014), and 86% over the three years considered. However, when excluding those Member States that base inspections on systematic appraisal of hazards, the share of annual inspections of upper tier establishments is then 79% which shows an improvement since the end of the last reporting period. However, a direct comparison is not possible as previous reporting did not explicitly distinguish those Member States using systematic appraisal to plan inspections. However, it is important to note that, for some Member States, annual inspections levels were relatively low and there may be a need for more support in this area.</p>	<p>Upper-tier: Inspections were undertaken in 66% of the establishments in the final year of the reporting period (2011). The figure has been very similar since 2005.</p>
	<p>Lower tier: The inspection level of lower tier establishments has improved with on average, inspections undertaken in 77% of the lower tier establishments during the reporting period.</p>	<p>Lower-tier: Inspections were generally less frequent than in upper-tier establishments, with around 40% of them inspected in the 2009-2011 period. These data were not available for previous reporting periods.</p>
Actions taken in case of non-compliance, incidents or accidents	<p>Member States reported that options were available in case of non-compliance and that some cases arose during the reporting period. This included fines, remedial orders and closure orders.</p>	<p>These were used in all Member States, although criminal proceedings were not considered necessary.</p>

3.11 Observations on reporting

In addition to the analysis of the implementation some useful points on improving practical reporting were noted. The questionnaire for the first reporting period under the Seveso III Directive³⁶ (1st June 2015 – 31 December 2018) was reviewed to indicate whether the issues identified are likely to arise in the next reporting period.

³⁶ Commission Decision C(2014/896/EU) establishing the format for communicating information from Member States on the implementation of Directive 2012/18/EU <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014D0896&from=EN>

- ▶ Member States are no longer required to provide separate answers for each of the three years covered by the reporting period. Instead, only data reflecting the situation at 31/12/2014 or covering the whole reporting period are requested. Several Member States have continued to provide data for every year which has led to the need to use average values for comparison purposes:
 - ▶ Data reported for each year of the reporting period allow a better understanding of the variation of data, in particular when reporting numbers of establishments inspected. Where data are reported only for the final year of the reporting period it can be more difficult to make sense of some results, for example the number of establishments inspected annually may not match the total number of establishments due to variation in numbers of establishments during the reporting period;
 - ▶ Another important point is to ensure that all Member States report data in the same way, otherwise this makes comparison of performance between Member States more complicated; and
 - ▶ The questionnaire for the next reporting period requires information 'at the end of the reporting period' however it is likely that some Member States will provide annual statistics, in particular when considering the inspection question.
- ▶ Linked to the first point, the latest (2012-14) questionnaire does not provide Member States with a specific template to provide their numerical response. This has led to some confusion on whether numerical data were expected or not, in particular where questions requested a 'statistical breakdown'. This has also led to some Member States reporting data for each of the year of the reporting period rather than as requested by the end of the reporting period. Inserting a reporting template where numerical data are required would improve consistency in the reporting. The next reporting period questionnaire does not include a reporting template for numerical data, so it is possible that similar issues will arise;
- ▶ A number of questions have been deleted (e.g. sections on safety reports, on internal emergency plans, on exchange of information between Member States and on ports and marshalling yards) or simplified (e.g. no numerical figures are required regarding domino effects and only changes in competent authorities have to be reported). This has reduced the length of the responses, and allowed a focus from some Member States on the practical experiences gained during the reporting period. This was the case in particular for questions relating to land-use planning and domino effects. However, this was not the case for all Member States and some more emphasis on this point might be necessary in the next questionnaire. A possible way to help Member States in understanding the type of information that is requested would be to include examples of possible responses, or a mock response. Another alternative would be to ask Member States to report 'changes in implementation' so that the focus is on new elements;
- ▶ Linked to the issue above, responses from Member States often varied in the details provided and aspects of the implementation they focused on when the question is of a general nature. For example, question 4 asks Member States to provide information on their inspections, and the responses included a range of elements related to inspections such as frequency, strategy, programmes and legislation but these elements were not consistently covered by all responses limiting their comparability. Similarly, the responses to question 4(c) on types of actions taken as a result of accidents, incidents and non-compliance varied with some providing information on actions available in general and others focusing on those actions that were actually applied during the reporting period. The questionnaire should make very explicit the aspects, for example by listing them in brackets that are expected to be covered by the Member States responses;
- ▶ It would be useful to introduce for future reporting a question requesting whether (i.e. yes/no) the programme of inspections is based upon a systematic appraisal of major-accident hazards as some responses are not as clear on this aspect;
- ▶ New topics have been included in the latest version of the questionnaire. For example, Member States are required to provide a statistical breakdown summarising the activities of all Seveso

establishments using the eSPIRS activity list and to report on the number of establishments also covered by the Industrial Emissions Directive (2010/75/EU). This was only partially successful as some provided data based on the NACE classification (also allowed) which limited the ability to provide a comparison. This is also included in the next reporting questionnaire and we expect to note an improvement in the information reported; and

- ▶ Finally, questions requested Member States to comment on their experiences applying the Directive or the lessons learnt. This was something highlighted as a gap in the previous analysis of the reporting (for period 2009-2011) where the quality of the data on lessons learnt was poor. The questions were optional and a minority of Member States responded. However, the content of the responses was noted as relevant and interesting and further exchange should be encouraged. It is positive to note that this is also included in the next reporting period questionnaire.

An interesting feature adopted by the UNECE is that the questionnaire requests Parties to first copy their response to the previous reporting period, and to then respond to the questions and indicate only if there has been a change during the reporting period. This is seen as a way to reduce reporting burden for the Parties but also to make the identification of progress or delays in implementation easier. There might be merit in considering whether such a feature may reduce the reporting burden for Member States but also help improve the content of the information gradually by allowing Member States to reflect and improve upon their previous responses.

A final suggestion would be to request Member States to provide feedback on the questionnaire itself and the reporting process, which might help to identify further ways in which the questions can be improved.

4 Assessment of implementation of the Directive

4.1 Overview

This section draws some conclusions on the implementation of the Seveso Directive, based on the last reporting period, previous reporting period and building on the statistical analysis of eMARS and eSPIRS. The conclusions are also informed by additional sources of information including, infringement cases from the European Court of Justice and conclusions from the Working Group on Implementation of the Industrial Accident Convention.

4.2 Summary of implementation by Member State

This section summarises the implementation in each Member State based on the detailed analysis of the Member State reports for the 2012-2014 period and taking into account the completeness exercise.

The analysis focuses on:

- ▶ Whether the information provided to complete the questionnaire allows a general assessment of the implementation;
- ▶ The number of establishments in the Member States;
- ▶ The proportion of inspected establishments related to the total number reported; and
- ▶ Other relevant quantitative data related to the use of coercive instruments, the provision of information to the public and domino effects.

A detailed summary of responses to the questionnaire submitted by each Member State are provided in Appendix B.

Table 4.1 presents a summary of the implementation status for the reporting period for each Member State. As can be observed, the majority of the Member States (15) are in the 'almost full implementation' category. It is important to highlight that this middle category is a range and includes some Member States with minor implementation issues identified (e.g. only a few external emergency plans not tested) and some with potentially more serious issues. Only three Member States are considered to have more substantial implementation gaps.

Table 4.1 Overview of implementation status for 2012-2014

Implementation status	Member States
Implementation gaps	Croatia, Greece and Italy.
Almost full implementation	Austria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Luxembourg, Netherlands, Portugal, Romania, Slovakia, Spain and Sweden.
Full implementation	Belgium, Bulgaria, Cyprus, Ireland, Latvia, Lithuania, Malta, Poland, Slovenia and United Kingdom.

Table 4.2 presents the issues identified in Member States reporting. The most common are the lack of external emergency plans and the lack of testing of those plans. To some extent these are linked as a missing external emergency plan cannot be tested. The low level of inspections reported was also an issue for eight Member States.

It is important to refer to the respective Member States summaries in the sections below and in Appendix B for further details. For example, some member states lack external emergency plans for some establishments, in some cases this was because the classification of the upper-tier establishment was recent

and that as such the plans were not due yet (e.g. France). This should not be considered as a compliance issue but is flagged here in order to check progress on this specific aspect in future reporting.

Furthermore, with regards to the inspection requirements it is important to consider that for those Member States that rely on a systematic appraisal of hazards to define inspection programmes, the fact that a low share of establishments was inspected annually or during the period as a whole may not be an issue. This is the case in particular for Finland, Germany, Portugal and Spain.

Table 4.2 Overview of the implementation issues per Member States for 2012-2014

External emergency plan not prepared	Croatia, Estonia, France, Germany, Hungary, Italy, Netherlands, Portugal, Romania, Spain.
External emergency plan not tested	Croatia, Czech Republic, Denmark, France, Italy, Luxembourg, Netherlands, Portugal, Romania, Slovakia, Spain, Sweden.
Lack of inspection of upper tier establishments (systematic appraisal of risk)	Finland, Germany, Portugal, Spain
Lack of inspection of upper tier establishments (no systematic appraisal of risk)	Austria, Croatia, France, Italy
Implementation of provisions on domino effect provisions	Croatia
Lack of information made available to the public	Luxembourg

4.2.1 Austria

Overall, the response indicates that the provisions of the Seveso II Directive are mostly implemented, however there remain some issues with respect to annual inspections of upper tier establishments.

In Austria, there were a total of 148 establishments subject to the provisions of the Seveso II Directive in 2014, of which 72 (48% of the total) were upper-tier establishments.

Austria reports that almost all upper-tier establishments apart from 3 were covered by an external emergency plan. In these 3 cases, the authorities decided that an external emergency plan was not needed as permitted by Article 11.6 of the Directive.

At the end of the reporting period, 10 upper tier establishments' external emergency plans had not been tested, Austria indicated that the delays were due to pending revisions of the plans.

Inspections were carried out at least once during the reporting period for 89% of upper-tier sites and 86% of lower-tier sites. Annual inspections were held in 47 upper-tier establishments, representing 65% of total upper-tier establishments.

4.2.2 Belgium

Overall, the provisions of the Seveso II Directive are fully implemented.

In Belgium, there were a total of 383 establishments subject to the provisions of the Seveso II Directive in 2014, of which 204 (53% of the total) were upper-tier.

Belgium reports that almost all upper-tier establishments were covered by an external emergency plan, however, for 18 establishments, no plans had been drawn up by the end of the reporting period which corresponds to 9% of the upper-tier establishments. For 14 of these, the information had been received from the operators but the external emergency plans had not yet been finalised and for the remaining 4 the

assessment of the safety report was still ongoing. As such, it appears that this aspect of the Seveso II Directive is soon to be in compliance.

At the end of the reporting period, 1 upper tier establishments' external emergency plan had not been tested. No information was included in the response on the circumstances of this plan.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. During the reporting period 137 upper tier establishments were inspected annually (representing 67% of total upper tier establishments). Authorities carried out, on average, at least one inspection during the reporting period in 100% of upper-tier sites and lower-tier sites.

4.2.3 Bulgaria

Overall, the provisions of the Seveso II Directive are fully implemented.

In Bulgaria, there were a total of 195 establishments subject to the provisions of the Seveso II Directive in 2014, of which 86 (44% of the total) were upper-tier establishments.

Bulgaria reports that all upper-tier establishments had adopted external emergency plans. At the end of the reporting period, all upper tier establishments' external emergency plans had been tested.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. However, Bulgaria reported that all upper tier establishments were inspected annually. As a result, inspections were carried out at least once during the reporting period for 100% of upper-tier sites. In addition, 100% of lower-tier sites were inspected at least once during the reporting period.

4.2.4 Croatia

The information reported by Croatia on the implementation of the Seveso Directive indicates some gaps in relation to key provisions of the Directive, in particular the number of upper-tier establishments without an external emergency plan is unclear; it is also unclear how these plans are tested; and finally, a large number of upper-tier establishments were not inspected annually.

In Croatia, there were a total of 57 establishments subject to the provisions of the Seveso II Directive in 2014, of which 25 (43% of the total) were upper-tier establishments.

Croatia reports that all upper-tier establishments had to produce an external emergency plan, however, it is unclear how many had actually drafted the plans. The response from Croatia refers to the number of local authorities for which external emergency plans had not been drafted and there is no information on the number of establishments covered by these local authorities.

At the end of the reporting period, Croatia did not have information on the number of external emergency plans that had not been tested.

Inspections are not planned based on a systematic appraisal of major-accident hazards, however Croatia reported that criteria for prioritising inspections are under development. During the reporting period 10 upper tier establishments were inspected annually (representing 40% of upper tier establishments). Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 88% of lower-tier sites. The lack of annual inspection for more than half of the upper-tier establishments constitutes should be further investigated in order to understand whether more support is needed by the Member State.

Finally, the Croatian response was not very detailed on how the domino effects are being considered.

4.2.5 Cyprus

Overall, the provisions of the Seveso II Directive are fully implemented.

In Cyprus there were a total of 22 establishments subject to the provisions of the Seveso II Directive in 2014, of which 13 (59% of the total) were upper-tier establishments.

Cyprus reports that all upper-tier establishments had adopted external emergency plans. At the end of the reporting period, all upper tier establishments' external emergency plans had been tested.

Cyprus reported that all upper tier establishments were inspected annually. Furthermore, inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites.

4.2.6 Czech Republic

From the information provided, the provisions of the Seveso II Directive are mostly implemented. The main issue identified relates to external emergency plans of a large number of upper-tier establishments that have not been tested every three years as required by Article 11.4 of the Directive.

In the Czech Republic, there were a total of 207 establishments subject to the provisions of the Seveso II Directive in 2014, of which 117 (56% of the total) were upper-tier establishments.

The Czech Republic reports that almost all upper-tier establishments apart from 23 had an external emergency plan, the authorities decided that a plan was not needed as permitted by Article 11.6 of the Directive. For an additional 2 upper-tier establishments external emergency plans had not been produced during the reporting period, even though these establishments had not been excluded from the requirement to produce an external emergency plan.

At the end of the reporting period, 65 upper tier establishments' external emergency plans had not been tested; such testing is required under Article 11.4 of the Directive.

Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in all upper tier establishments.

4.2.7 Denmark

The Danish response indicates that the provisions of the Seveso II Directive are almost fully implemented. The main issues identified relate to the fact that a large number of external emergency plans are reported as not having been tested over the period. However, Denmark indicated that it is taking steps toward resolving this issue.

In Denmark there were a total of 121 establishments subject to the provisions of the Seveso II Directive in 2014, of which 54 (44% of the total) were upper-tier establishments.

Denmark reports that almost all upper-tier establishments apart from 2 had an external emergency plan. One establishment without an external emergency plan had only been classified as upper-tier within the last year. As for the second establishment, the central authorities will contact the local authority concerned and ensure that an external emergency plan is drawn up or an assessment is carried out regarding whether a plan is needed.

At the end of the reporting period, 27 upper tier establishments' external emergency plans had not been tested, Denmark indicated that it will investigate this issue with the local authorities concerned in order to ensure compliance.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually.

Inspections were carried out at least once during the reporting period for 93% of upper-tier sites and 75% of lower-tier sites. Annual inspections were held in 39 establishments, representing 72% of total upper tier establishments. Denmark also indicated that local authorities that failed to report inspections were being investigated.

4.2.8 Estonia

The Estonian response indicates that the provisions of the Seveso II Directive are mostly fully implemented. However, one main issue was identified due to the fact that during the 2012-2014 period establishments did not have individual emergency plans but instead were covered by one national emergency plan which is not in compliance with the requirements of the Directive.

In Estonia, there were a total of 64 establishments subject to the provisions of the Seveso II Directive in 2014, of which 37 (57% of the total) were upper-tier establishments.

Estonia reported that up to 2016 there was only one national emergency plan for all Seveso establishments drawn up by the Ministry of the Interior according to the Estonian Emergency Act. In 2015, the Estonian Rescue Board decided to produce regional external emergency plans for all upper-tier establishments. These were planned to be completed in 2016. The national emergency plan was tested during 10 crisis management exercises during the reporting period.

Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in all upper-tier establishments.

4.2.9 Finland

The Finish response indicates that the provisions of the Seveso II Directive are almost fully implemented. The main gap observed relates to the large number of upper-tier establishments that were not inspected annually, however this might not be an issue considering that Finland has adopted a systematic appraisal of major accident hazards to plan inspections.

In Finland, there were a total of 300 establishments subject to the provisions of the Seveso II Directive in 2014, of which 135 (45% of the total) were upper-tier establishments.

Finland reported that all upper-tier establishments had an external emergency plan. At the end of the reporting period, 4 upper tier establishments' external emergency plans had not been tested. Finland explained that these 4 plans had been tested in 2011 and were due to be tested in 2015. As such this does not appear to constitute a lack of compliance with the requirements of the Seveso II Directive.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Inspections were carried out at least once during the reporting period for 97% of upper-tier sites and 95% of lower-tier sites. Annual inspections were held in 34 upper tier establishments, representing 25% of total upper tier establishments. The data reported on annual inspections are lower than in most Member States and it might reflect difficulties encountered in applying the requirements.

4.2.10 France

The French response indicates that the provisions of the Seveso II Directive are mostly fully implemented, with some issues identified with key aspects of the Directive in particular the lack of external emergency plans for 75 establishments, the lack of testing of external emergency plans for 45 establishments and the lack of annual inspection in 28 upper tier establishments.

In France, there were a total of 1 178 establishments subject to the provisions of the Seveso II Directive in 2014, of which 639 (54% of the total) were upper-tier establishments.

France reports that almost all upper-tier establishments apart from 23 had an external emergency plans. For these, the competent authorities decided that an external emergency plan was not needed in accordance with Article 11.6 of the Seveso II Directive.

For an additional 75 establishments, no plan had been drawn up by the end of the reporting period, however the response indicated that the plans were either being produced or pending upon the submission of further information in order to determine the required protective measures. As such, it appears that this aspect of the Seveso II Directive is soon to be in compliance.

At the end of the reporting period, 45 upper tier establishments' external emergency plans had not been tested which does not appear to comply with the requirements of the Seveso II Directive.

Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 98% of lower-tier sites. Annual inspections were held in 611 establishments, representing 96% of total upper tier establishments. The fact that 4% of upper tier establishments were not inspected annually is highlighted as an aspect of the implementation of the Directive that may warrant further investigations.

4.2.11 Germany

The German response indicates that the provisions of the Seveso II Directive are almost fully implemented. The main gap observed relates to the large number of upper-tier establishments that were not inspected annually, with some not inspected at all during the reporting period. Note that Germany uses a systematic appraisal of major accident hazards to plan inspections. As such annual inspections are not required so this does not constitute a compliance issue but rather a potential issue that might need further checks. In addition, for 83 upper-tier establishments external emergency plans had not been produced at the end of the reporting period.

In Germany, there were a total of 3 264 establishments subject to the provisions of the Seveso II Directive in 2014, of which 1 141 (34% of the total) were upper-tier establishments. Germany reported that all upper-tier establishments apart from 165 had an external emergency plan. For 82 upper-tier establishments the German authorities decided that an external emergency plan was not needed based on strict criteria including quantities, properties and state of the hazardous substances and location of the establishment. For an additional 83 upper-tier establishments external emergency plans had not been produced at the end of the reporting period. The main reasons for plans not being produced include cases where establishments recently changed or were recently classified as upper-tier and where the production of the plans or the security report required previously are still in progress. Furthermore, Germany added that it is possible to partially impose upper-tier requirements on establishments which would, according to the Directive, only have to be classified as lower-tier. Such establishments have been listed as upper tier but would not be required to meet all the requirements of an upper-tier establishment, for example it may not be required to produce an external emergency plan.

At the end of the reporting period, 16% of upper tier establishments' external emergency plans had not been tested. Germany explained that for most of these establishments the 3-year deadline had not expired yet, because the establishments became newly classified as upper-tier during the reporting period. For others, the testing was being delayed due to changes to the establishments. As such this does not appear to constitute a lack of compliance with the requirements of the Seveso II Directive.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Inspections were carried out at least once during the reporting period for 86% of upper-tier sites and 68% of lower-tier sites. Annual inspections were held in 422 establishments, representing 37% of total upper tier establishments. While not a compliance issue, the fact that 14% of upper tier establishments were not inspected over the reporting period is highlighted as an aspect of the implementation of the Directive that may warrant further investigations and the German competent authorities confirmed that this point would be investigated further.

4.2.12 Greece

The Greek response indicates that the provisions of the Seveso II Directive are implemented but gaps with regards to key aspects of the Directive were identified. The main gaps observed relates to the large number of upper-tier establishments for which external emergency plans have not yet been produced. Furthermore, a large number of external emergency plans are reported as not having been tested over the 3-year period. From the data reported, a large number of upper-tier establishments were not inspected annually. Further compliance issues cannot be ruled out due to the incompleteness of the response.

In Greece, there were a total of 193 establishments subject to the provisions of the Seveso II Directive in 2014, of which 83 (43% of the total) were upper-tier establishments.

Greece reported that all upper-tier establishments were required to have an external emergency plan. However, for 41 upper-tier establishments the plans had not yet been produced. The Greek response did not indicate the reason. At the end of the reporting period, 52 upper tier establishments' external emergency plans (63% of the total) had been tested. Once again, there were no further information.

Authorities carried out, on average, inspections at least once during the reporting period in 83 upper-tier sites (100%) and in 13 lower-tier sites during the reporting period. However annual inspections were held in only 55 establishments, representing 66% of total upper tier establishments. The data reported on annual inspections are low which might reflect difficulties encountered in applying the requirements.

4.2.13 Hungary

The Hungarian response indicates that the provisions of the Seveso II Directive are mostly fully implemented. The main issue identified is in relation to external emergency plans not being drafted for five establishments.

In Hungary, there were a total of 239 establishments subject to the provisions of the Seveso II Directive in 2014, of which 105 (43% of the total) were upper-tier establishments.

Hungary reported that all upper-tier establishments apart from 18 had an external emergency plan. For 13 upper-tier establishments it was decided that an external emergency plan was not needed. In addition, for 5 upper-tier establishments no external emergency plan has been produced as required by Article 11.1.

At the end of the reporting period, all the emergency plans drafted had been tested.

Authorities carried out, on average, inspections at least once during the reporting period in 176 lower-tier sites during the reporting period. Annual inspections were held in 98 establishments, representing 93% of total upper tier establishments. However, Hungary added that in practice all establishments were inspected annually and that the percentage reflects the fluctuation of the number of establishments throughout the reporting period. For new establishments, the first annual inspection is due the year following the permitting year, so a difference in the total number of establishments and those inspected annually is not to be understood as a lack of compliance with the Seveso II Directive. Lower-tier establishments are inspected every two years and all were inspected at least once during the reporting period.

4.2.14 Ireland

The Irish response indicates that the provisions of the Seveso II Directive are fully implemented.

In Ireland, there were a total of 96 establishments subject to the provisions of the Seveso II Directive in 2014, of which 48 (50% of the total) were upper-tier establishments.

Ireland reported that all upper-tier establishments were required to adopt an external emergency plan and that one establishment had not adopted a plan as required. However, this was being corrected by the time Ireland was reporting on the implementation of the Directive. At the end of the reporting period, 2 upper tier establishments' external emergency plans had not been tested. Ireland indicated that 1 establishment has applied to change category to lower tier and so is not tested anymore; the other is the establishment with the missing plan.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in 47 establishments, representing 97% of total upper tier establishments.

4.2.15 Italy

The Italian response indicates that most of the provisions of the Seveso II Directive are implemented. However, there were issues identified with some of the key provisions of the Directive, related in particular to the large number of upper-tier establishments that were not inspected annually and the number of external emergency plans not adopted or tested.

In Italy, there were a total of 1 112 establishments subject to the provisions of the Seveso II Directive in 2014, of which 567 (50% of the total) were upper-tier establishments.

Italy reported that all upper-tier establishments apart from 4 were required to have external emergency plans. Italy provided additional information to explain that these external emergency plans were not drafted because the competent authorities assessed that major accidents could not be reasonably foreseen (in accordance with Article 11.6 of the Directive). For 66 establishments, the external emergency plans, while required, were not drafted which does not comply with the requirements of Article 11.1.

At the end of the reporting period, 302 upper tier establishments' external emergency plans had not been tested. This represents more than half of the total number of upper-tier establishments in Italy (53%). It is unclear why this requirement of the Seveso II Directive has not been implemented.

Inspections were carried out at least once during the reporting period for 20% of upper-tier sites and 49% of lower-tier sites. Annual inspections were held in none of the upper-tier establishments. The data reported on inspections are particularly low, especially considering that Italy is the Member State with the third highest number of Seveso establishments. It reflects difficulties encountered in applying the requirements of the Directive at national level and it may be necessary to investigate the need for additional support to Italy with these aspects. These difficulties were confirmed by the Member State competent authorities that indicated that steps were taken to address them.

4.2.16 Latvia

The Latvian response indicates that the provisions of the Seveso II Directive are fully implemented.

In Latvia, there were a total of 63 establishments subject to the provisions of the Seveso II Directive in 2014, of which 29 (46% of the total) were upper-tier establishments.

Latvia reported that all upper-tier establishments had an external emergency plan. At the end of the reporting period, only one upper tier establishments' external emergency plan had not been tested. Latvia indicated that this was due to structural changes occurring in the 2012-2014 period and that this plan was tested in 2011 and in 2015. As such this is not understood as a lack of compliance.

Inspections were held at least once in all the upper-tier sites and in 36 of the lower-tier sites during the reporting period (representing 100% of the lower tier establishments). Annual inspections were held in all upper tier establishments.

4.2.17 Lithuania

The Lithuanian response indicates that the provisions of the Seveso II Directive are fully implemented.

In Lithuania, there were a total of 42 establishments subject to the provisions of the Seveso II Directive in 2014, of which 18 (42% of the total) were upper-tier establishments.

Lithuania reported that all upper-tier establishments were required to have an external emergency plan but that one was not drafted for one establishment. This concerned an establishment that started operating in 2015 (after the focus of this analysis) and the plan was in the preparation phase when the implementation report was submitted. At the end of the reporting period, only one upper tier establishments' external emergency plan had not been tested. Although Lithuania did not indicate this explicitly, this is presumably the same establishment for which the plan was not ready at the time of reporting.

Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in all upper tier establishments.

4.2.18 Luxembourg

The response indicates that the provisions of the Seveso II Directive are mostly implemented, however there are some issues with key provisions of the Directive such as the testing of external emergency plans and the level of information provided to the public.

In Luxembourg, there were a total of 18 establishments subject to the provisions of the Seveso II Directive in 2014, of which 8 (44% of the total) were upper-tier establishments.

Luxembourg reported that all upper-tier establishments apart from two had an external emergency plan. For one establishment, it was decided that the external emergency plan was not needed, however for the other establishment the lack of the plan is a gap and Luxembourg added that the plan is being developed.

At the end of the reporting period, none of the upper tier establishments' external emergency plans had been tested. This does not appear comply with the requirements of the Seveso II Directive.

Luxembourg indicated that information on safety measures is only available to the public if they participate in the public consultation for Seveso authorisations or, in certain cases, online, although this does not cover all the information. It is unclear whether this fully responds to the requirements of the Seveso II Directive

Inspections were carried out at least once during the reporting period in all the upper-tier sites and in 9 lower-tier sites. Annual inspections were held in all upper tier establishments.

4.2.19 Malta

The response indicates that the provisions of the Seveso II Directive are fully implemented.

In Malta, there were a total of 12 establishments subject to the provisions of the Seveso II Directive in 2014, of which 9 (75% of the total) were upper-tier establishments.

Malta reported that all upper-tier establishments were required to have an external emergency plan. However, 4 of the 9 upper-tier establishments did not have an external emergency plan as required. Malta provided an explanation for this. Three of them became upper-tier establishments during 2014 and competent authorities have a period of time (2 years) to draw them up. The plan of the other establishment was being finalised when the Maltese authorities filled in the questionnaire. As such this is not understood as a lack of compliance with the requirements of the Directive.

At the end of the reporting period, 3 upper tier establishments' external emergency plans had not been tested. Malta indicated that these are the same establishments that became upper-tier in 2014 and for which the plans were not yet finalised.

Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in all upper tier establishments.

4.2.20 Netherlands

The response indicates that the provisions of the Seveso II Directive are mostly fully implemented. The main gap observed relates to the number of external emergency plans not tested during the reporting period.

In the Netherlands, there were a total of 406 establishments subject to the provisions of the Seveso II Directive in 2014, of which 252 (62% of the total) were upper-tier establishments.

The Netherlands reported that all upper-tier establishments apart from 13 were required to have an external emergency plan. Out of those required to have external emergency plans, all but 10 establishments had a plan. The Netherlands does not systematically draw up specific external emergency plans but rather disaster response plans that cover common accident scenarios. For 13 upper-tier establishments it was decided that an external emergency plan was not needed based on the technical safety data contained in the safety report. In addition, 10 upper-tier establishments were not covered by external emergency plan as required by Article 11.1. For 4 of these, safety reports were submitted which will be used to draw up the external emergency plans. For the remaining 6, the competent authorities were reminded to draw up the plans promptly.

At the end of the reporting period, 93 upper tier establishments' external emergency plans had not been tested. The Netherlands indicated that this is because some competent authorities adopt generic external emergency plans that set out basic scenarios which are then tested. It is unclear whether this meets the requirement of Article 11.4 of the Directive. The Netherlands added that the drawing up and testing of these generic external emergency plans is currently being coordinated at national level.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 88% of lower-tier sites. Annual inspections were held in 90% upper tier establishments.

4.2.21 Poland

The Polish response indicates that the provisions of the Seveso II Directive are fully implemented.

In Poland, there were a total of 392 establishments subject to the provisions of the Seveso II Directive in 2014, of which 180 (45% of the total) were upper-tier establishments.

Poland reported that all upper-tier establishments apart from 10 were required to have an external emergency plan. In addition, external emergency plans for 6 upper-tier establishments were not drafted as required. Poland indicated that this was the case of newly classified establishments for which it was deemed that there were no off-site risks.

At the end of the reporting period, 3 upper tier establishments' external emergency plans had not been tested. The reasons were (i) local floods that led to a delay in the scheduled date; (ii) a request from the operator due to a change to the technological process; and (iii) a delay due to the assessment of the operators' documents. Poland explained that these external emergency plans were tested at a later date.

Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in all upper tier establishments. In addition, 24 additional inspections of upper-tier establishments were carried out due to changes to the activities, substances or owner.

4.2.22 Portugal

The response indicates that gaps were identified in relation to key provisions of the Directive. The main issues were relating to the lack of external emergency plans for 3 establishments and the large number of upper-tier establishments that were not inspected annually, or in some cases at all, during the reporting period.

In Portugal, there were a total of 183 establishments subject to the provisions of the Seveso II Directive in 2014, of which 59 (32% of the total) were upper-tier establishments.

Portugal reported that all upper-tier establishments were required to be covered by an external emergency plan but that three had not been drafted as required. No further information was included on this issue. At the end of the reporting period, 18 upper tier establishments' external emergency plans had not been tested. Portugal has provided an explanation for 8 of these establishments. According to them, 6 establishments have been or will be tested in other years (2 in each of 2011, 2015 and 2016). Also, one establishment became operational during 2014 and another one was in the process of being reclassified as lower-tier. As such the lack of testing of the external emergency plans is not considered to be a compliance issue.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Inspections were carried out at least once during the reporting period for 68% of upper-tier sites and 35% of lower-tier sites. This means that 32% of the upper tier establishments were not inspected at all in the three-year period. Annual inspections were held in none of the upper tier establishments. The data reported on annual inspections are particularly low. It might reflect difficulties encountered in applying the requirements of the Directive at national level and additional support with these aspects may be necessary.

4.2.23 Romania

The response indicates that the provisions of the Seveso II Directive are mostly implemented with the only issue identified in relation to two external emergency plans not being adopted or tested.

In Romania, there were a total of 303 establishments subject to the provisions of the Seveso II Directive in 2014, of which 120 (39% of the total) were upper-tier establishments.

Romania reported that all upper-tier establishments but 3 were required to have an external emergency plan. In addition, 2 establishments are not covered by external emergency plans but no further details were provided to understand why this is the case. At the end of the reporting period, 2 upper tier establishments' external emergency plans had not been tested. It is likely that these are the two missing external emergency plans.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in 119 out of 120 upper tier establishments.

4.2.24 Slovakia

The response indicates that the provisions of the Seveso II Directive are almost fully implemented, the only issue identified was in relation to 3 external emergency plans not being tested and potentially a low number of annual inspections. However, Slovakia indicated that inspections are planned based on a systematic appraisal of major accident hazards and as such this might not be an issue.

In Slovakia, there were a total of 82 establishments subject to the provisions of the Seveso II Directive in 2014, of which 44 (53% of the total) were upper-tier establishments.

Slovakia reported that all upper-tier establishments apart from one had an external emergency plan. For this establishment, it was decided that an external emergency plan was not necessary due to the location of the site. At the end of the reporting period, 3 upper tier establishments' external emergency plans had not been tested.

Inspections are planned based partly on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Slovakia indicated that its objective is to inspect upper tier establishments every 15 months but that in some instances it was increased to 18 months. Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in 4 upper tier establishments representing 9% of the upper tier establishments. The data reported on annual inspections are low and it might be useful to verify whether there are any difficulties encountered in applying the requirements of the Directive at national level. Considering that all upper tier establishments were inspected at least once during the reporting period this might not be the case but rather a reflexion of the inspection programme adopted by Slovakia.

4.2.25 Slovenia

The response indicates that the provisions of the Seveso II Directive are fully implemented.

In Slovenia, there were a total of 61 establishments subject to the provisions of the Seveso II Directive in 2014, of which 33 (54% of the total) were upper-tier establishments.

Slovenia reported that all upper-tier establishments had an external emergency plan, all of which were tested during the reporting period.

Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 100% of lower-tier sites. Annual inspections were held in all upper tier establishments.

4.2.26 Spain

The Spanish response indicates that the provisions of the Seveso II Directive are mostly implemented but gaps were observed in relation to key provisions of the Directive. The main gaps observed relate to the lack of an external emergency plan for 32 establishments, the low level of external emergency plans testing and a large number of upper-tier establishments not inspected annually or indeed at all during the reporting period.

In Spain, there were a total of 832 establishments subject to the provisions of the Seveso II Directive in 2014, of which 377 (45% of the total) were upper-tier establishments.

Spain reported that all upper-tier establishments apart from 4 were required to have an external emergency plan. Plans had not been drafted for 32 establishments. There was no information provided to understand why this is the case.

At the end of the reporting period, 210 upper tier establishments' external emergency plans had not been tested. This does not appear to comply with the requirements of the Seveso II Directive.

It is unclear whether inspections are planned based on a systematic appraisal of major-accident hazards or not. Authorities carried out, on average, inspections at least once during the reporting period in 78% of upper-tier sites and in 56% of lower-tier sites during the reporting period. Annual inspections were held in 192 upper tier establishments, representing 51% of total upper tier establishments. This relatively low number of upper-tier establishments inspected annually may not be an issue (depending on how inspections are planned); however, it might be useful to verify this is the case. However, the fact that 22% of upper tier

establishments were not inspected at all during the reporting period might indicate difficulties encountered in applying the requirements of the Directive at national or regional level.

4.2.27 Sweden

The response indicates that the provisions of the Seveso II Directive are almost fully implemented. The main gap observed relates to the lack of external emergency plans for 9 establishments and the low level of testing of external emergency plans.

In Sweden, there were a total of 400 establishments subject to the provisions of the Seveso II Directive in 2014, of which 211 (52% of the total) were upper-tier establishments.

Sweden reported that all upper-tier establishments were required to have an external emergency plan. However, these were not drafted for 14 upper tier establishments. Sweden added that one of these had closed and four were new establishments. For the remaining nine establishments, this appears to be a lack of compliance with the requirements of the Seveso II Directive. At the end of the reporting period, 120 upper tier establishments' external emergency plans had not been tested, which represents more than half of the upper tier establishment in Sweden. This appears to constitute a lack of compliance with the requirements of the Seveso II Directive.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Inspections were carried out at least once during the reporting period for 89% of upper-tier sites and 81% of lower-tier sites. Annual inspections were held in 30 upper tier establishments, representing 14% of total upper tier establishments.

4.2.28 United Kingdom

The response indicates that the provisions of the Seveso II Directive are fully implemented.

In the UK, there were a total of 924 establishments subject to the provisions of the Seveso II Directive in 2014, of which 352 (38% of the total) were upper-tier establishments.

The UK reported that all upper-tier establishments apart from 7 were required to be covered by an external emergency plan. In addition, for 20 establishments no external emergency plans were produced. The UK explained that 11 of them became upper tier during 2014 and that, for the remaining 9, the plans were due to be completed in 2015. As such this does not appear to constitute a lack of compliance with the requirements of the Seveso II Directive.

At the end of the reporting period, 53 upper tier establishments' external emergency plans had not been tested. Of these, 18 were tested at the beginning of 2015, with the other 7 due to be tested before the end of that year. 11 establishments became upper-tier in 2014 and their plans did not need to be tested until a year later. As such this does not appear to constitute a lack of compliance with the requirements of the Seveso II Directive. UK authorities stated that they were seeking information about the remaining (17) upper-tier establishments and would take the appropriate action once they have more information.

Inspections are planned based on a systematic appraisal of major-accident hazards; as such there is no obligation to inspect upper-tier establishments annually. Inspections were carried out at least once during the reporting period for 100% of upper-tier sites and 92% of lower-tier sites. Annual inspections were held on average in 87% of total upper tier establishments.

4.3 Additional information sources

4.3.1 Overview

A review of additional information sources to support the assessment of implementation was conducted. This includes review of infringement decisions and review of the implementation of the UNECE Convention,

4.3.2 Review of infringement decisions

Infringement decisions during the reporting period were consulted³⁷. A total of 11 relevant proceedings were identified and are listed in the table below. Most of these cases relate to failure from Member States to implement Article 30 of Seveso III Directive that requires an amendment of the wording of Annex I. The remaining three procedures are notifications of closing of cases that were ruled prior to the reporting period. As such, formal compliance with the Seveso II Directive appears to be satisfactory during the reporting period.

Table 4.3 Overview of relevant infringements proceedings

Procedure reference	Date	Member State	Type of infringement proceedings	Topic of the infringement proceeding
0140240	31/03/2014	Germany	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140251	31/03/2014	Croatia	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140267	31/03/2014	Slovenia	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140234	31/03/2014	Cyprus	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140227	31/03/2014	Austria	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140242	31/03/2014	Greece	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140244	31/03/2014	Spain	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140248	31/03/2014	France	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140237	31/03/2014	Czech Republic	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140232	31/03/2014	Bulgaria	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20140258	31/03/2014	Luxemburg	Formal notice Art. 258 TFEU	CHEMICAL ACCIDENTS - SEVESO - Directive 2012/18/EU
20072035	26/04/2012	Portugal	Closing of the case	Seveso – bad application of Article 11 regarding external emergency plans
20074717	27/02/2012	Italy	Closing of the case	Seveso - bad application of Art. 13(1) on information to the public
20072038	26/01/2012	Spain	Closing of the case	Seveso – bad application of Article 11 regarding external emergency plans

Source: http://ec.europa.eu/atwork/applying-eu-law/infringements-proceedings/infringement_decisions/

³⁷ http://ec.europa.eu/atwork/applying-eu-law/infringements-proceedings/infringement_decisions/

4.3.3 Review of the implementation of the UNECE Convention

The UNECE published in 2014 a report looking at the implementation of the Convention for the 2012-2013 period³⁸. The report is based on information submitted by the Parties and activities of the Working Group during the considered period.

Out of the 41 Parties to the Convention, 34 had submitted their national implementation reports including for the EU: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Sweden and the UK. These reports are not available publicly.

The implementation was assessed against several categories:

- ▶ **Policy for implementation of the Convention:** the Working Group note that many Parties struggled with identifying indicators of success for the effectiveness of the policies on the implementation of the Convention and proposed to work on defining those indicators to support future reporting. Weaknesses identified the lack of experts or qualified personnel, the lack of financial and other resources and unclear division of responsibilities between authorities. The report does not single out any country in particular though so it is not possible to know if any Member State is concerned;
- ▶ **Identification and notification of hazardous activities with the potential to cause transboundary effects:** the report notes that 25 Parties have reported having identifying hazardous activities and only 12 have notified their neighbours about it. Czech Republic and Hungary were found to only partly notify neighbours while Slovenia did not notify at all. Finland, Lithuania and the Netherlands did not provide information on this point. This suggested that further efforts were needed to improve the procedures for notification of hazardous activities to neighbouring countries;
- ▶ **Prevention of industrial accidents:** weaknesses in the prevention of accidents were identified such as human resources (Slovenia), the insufficient training of staff in authorities (Romania), missed risk identification and assessment (Estonia and Lithuania), weak quality of safety reports and the lack of coordination between the authorities and the authorities and operators. The report does not provide further details on the weaknesses and whether there is any consequence for compliance with the Seveso Directive;
- ▶ **Emergency preparedness and response:** While testing, updating and reviewing emergency plans seems to be at an acceptable level at national level, the UNECE noted some potential for improvement where it comes to cooperation with neighbouring countries. The Working Group concluded that Parties might benefit from common emergency plan guidelines to improve cooperation between neighbouring countries. Weaknesses identified included crises communication system (Netherlands) and uncertainties in the sharing of capabilities in response to emergencies (the UK). Countries that have addressed the collaboration between central and local government successfully (e.g. Germany) were encouraged to share their good practices with those for which this is still proven difficult (e.g. Lithuania). Here again the report does not provide further details on the weaknesses and whether there is any consequence for compliance with the Seveso Directive;
- ▶ **Mutual assistance:** Most Parties have reported having identified an authority to act as point of contact for mutual assistance;
- ▶ **Scientific and technological cooperation and exchange of information:** The cooperation between countries has been found to increase and Parties were encouraged to further share good practices;

³⁸ UNECE, Seventh implementation report from the Working Group on Implementation of the Industrial Accidents Convention, 2012-2013

http://www.unece.org/fileadmin/DAM/env/documents/2014/TEIA/COP_Gva_3-5_Dec_14/ECE_CP.TEIA_2014.4.E.pdf and

http://www.unece.org/fileadmin/DAM/env/documents/2015/TEIA/WGI/E_cop.teia.2014.INF.1.pdf

- ▶ **Participation of the public:** Parties often have involvement of the public in emergency response and land-use planning procedures. However, the level of availability of procedures for involving the public varies amongst Parties and further efforts were highlighted as needed. The report does not single out any country in particular though so it is not possible to know if any Member State is concerned. The Working Group noted that with the implementation of the Seveso III, a presentation from the European Union on the changes entailed with regards to public information was needed; and
- ▶ **Decision making on siting:** the Working Group noted that land-use planning often does not consider transboundary aspects fully and parties were called to improve their policies on these aspects.

As can be seen from the above, the UNECE identified some weaknesses in Member States' implementation of the Convention, in particular with regards to the availability of trained staff and resources for the prevention of human accident and with communication systems in crisis situations (Netherlands) or with other Member States (Lithuania).

Another relevant conclusion from the Working Group was to recommend that the Parties use elements from the indicators and criteria contained in the document on benchmarks for the implementation of the Convention³⁹ to report on the progress made in the implementation of the Convention. Similar guidance including indicators and criteria to benchmark the implementation of the Seveso III Directive could be developed, thus providing reference material for Member States when assessing their national implementation.

The report also sets the priorities for the next reporting period, to cover 2015-2016. These are the elaboration of criteria or standards for safety and land-use planning incorporating long-term trends, the exchange of experience and good practices on bilateral exercises for preparedness and addressing the risk of complacency in ensuring prevention and maintaining a high level of safety.

4.4 Conclusions on the implementation of the Directive

The 2012-2014 reporting period marks the last implementation period under the Seveso II Directive. As such this provides an opportunity to reflect on the progress made on the implementation of the Directive beyond the latest reporting period.

4.4.1 Number of upper and lower tier establishments, evolution and distribution

At the end of the reporting period there were 11 297 establishments reported by Member States and 9 998 reported in eSPIRS. When comparing the number reported under the two reporting systems, differences can be observed in all Member States with the largest difference for the number of lower-tier establishments in Germany. It can be noticed that the numbers reported by Member States are almost systematically higher than those reported in eSPIRS⁴⁰.

Thus, most of the analysis is based on data reported by Member States to the implementation questionnaire (i.e. reported data).

³⁹ ECE/CP/TEIA/2010/6

https://www.unece.org/fileadmin/DAM/env/teia/doc/AP/AP_Tools/Benchmarks_ece.cp.teia.2010.6.EN.pdf

⁴⁰ The Seveso II Directive (as with the Seveso III Directive) does not require Member States to update their data at specific intervals. As such, the data of Member States presented in eSPIRS could be from any year since 2008 depending on when the last update was conducted. Most Member States do partial updates of their data, which explains further discrepancies. For example, the 2014 reported data for Germany were found to match the latest update made in eSPIRS 2016 by the Member State. Croatia only updated its eSPIRS register late in 2016.

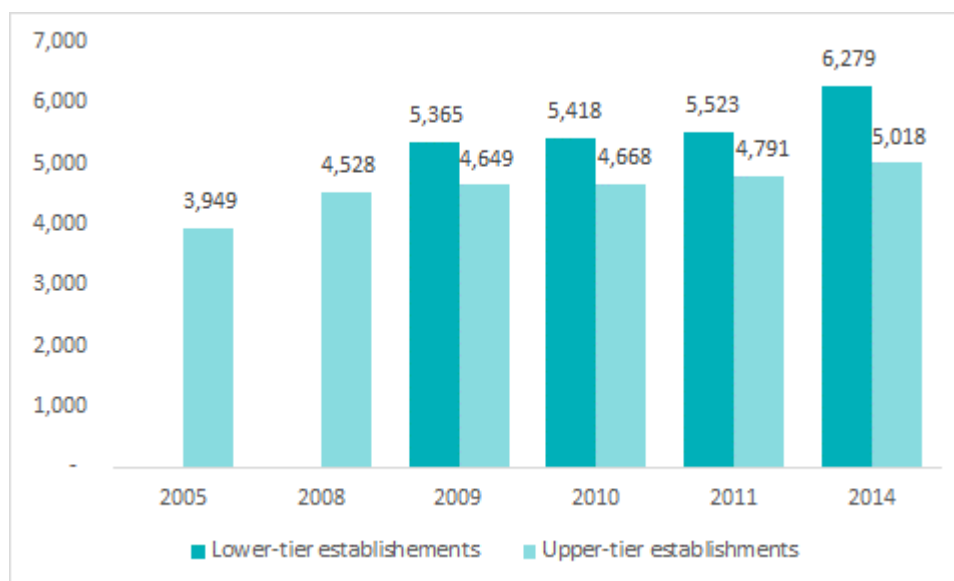
Table 4.4 Difference in total establishments reported in 2014 by Member States under implementation reporting and in eSPIRS

	Lower-tier implementation reporting	Upper-tier Implementation reporting	Lower-tier eSPIRS	Upper-tier eSPIRS
AT	76	72	64	80
BE	179	204	170	202
BG	109	86	105	76
CY	9	13	6	10
CZ	90	117	91	104
DE	2 123	1 141	1 238	1 160
DK	67	54	65	44
EE	27	37	25	25
EL	110	83	135	84
ES	455	377	371	260
FI	165	135	136	128
FR	539	639	553	553
HR	32	25		
HU	134	105	80	64
IE	48	48	47	47
IT	545	567	551	586
LT	24	18	24	17
LU	10	8	9	9
LV	34	29	33	30
MT	3	9	5	6
NL	154	252	174	221
PL	212	180	193	169
PT	124	59	109	58

	Lower-tier implementation reporting	Upper-tier Implementation reporting	Lower-tier eSPIRS	Upper-tier eSPIRS
RO	183	120	182	114
SE	189	211	168	194
SI	28	33	36	24
SK	38	44	39	42
UK	572	352	687	395
Total	6 279	5 018	5 296	4 702

Since 2005, the number of establishments covered by the Seveso Directive has increased. As shown in Figure 4.1, both the number of upper tier and lower tier increased throughout the reporting period. Note that number of lower tier establishments is only reported since 2009.

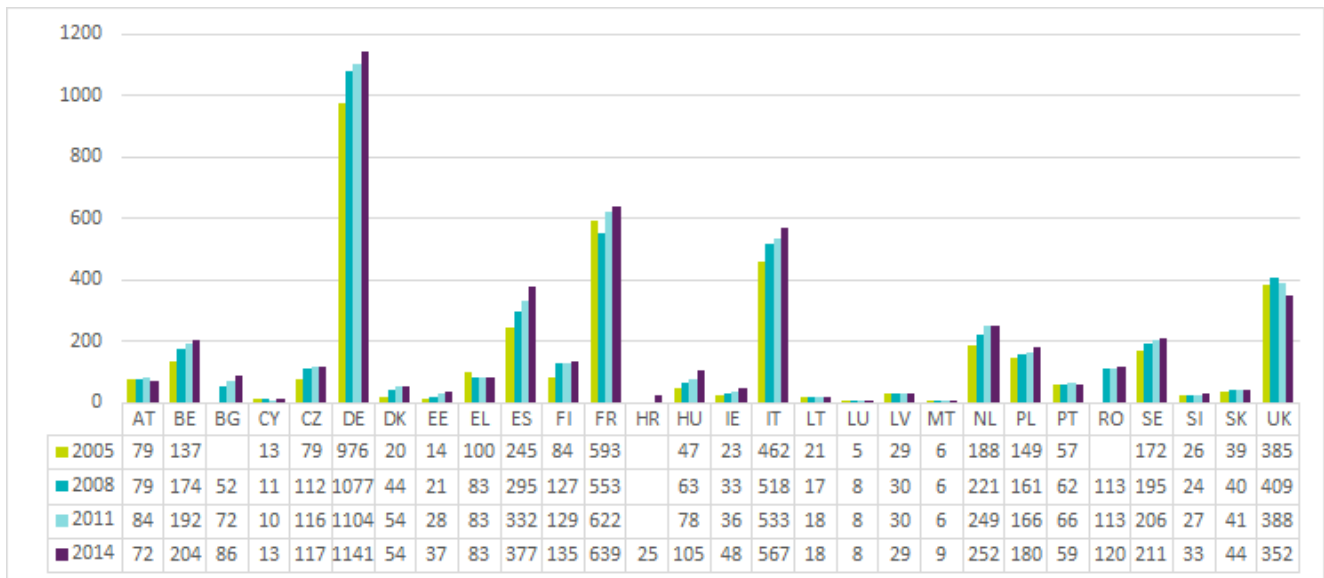
Figure 4.1 Evolution total number of establishments reported under Seveso II Directive



Source: Implementation reports from Member States

Germany, France, Italy and the United Kingdom are the Member States with the most establishments during the latest reporting period but also throughout the reporting period. Data on the number of upper-tier establishments has been reported since the first reporting period. Figure 4.2 presents for each Member State the evolution of the number of upper-tier establishments through the reporting periods and shows that increases can be observed in most Member States.

Figure 4.2 Evolution of the total number of upper-tier Seveso establishments in the EU-28 since 2005



Note: Data on establishments for the years 2005, 2008 and 2011 have been provided by Member States in the three-year implementation reports submitted to the Commission.

As for activities of the Seveso establishments, in 2014, the three most represented categories are: fuel storage, wholesale and chemical installations. The review of the sector of activities of the Seveso establishments shows that the Directive covers a large range of activities, with establishments reported in 38 industrial activities, some of which includes less than 10 establishments (e.g. textiles manufacturing and leisure activities).

More details are provided in section 3.3.3 and in Member States summary sheets in Appendix B.

4.4.2 Incidents, near misses and major accidents

Data on incidents, near misses and major accidents were provided by the Major Accident Hazard Bureau spanning the 2000-2014 period. The analysis here focuses on major accident events which is the only compulsory reporting under Seveso II Directive. Information reported on incidents and near misses is voluntary and as such it is difficult to identify any trends as it reflects more on the reporting tradition of a specific sector or a Member State rather than providing information on the level of safety.

Member States reported a total of 421 major accidents to MAHB between 2000 and 2014, with an additional 69 accidents reported voluntarily for learning purposes (i.e. 'near misses' and 'other') giving a total of 490 accidents reported. Out of the total 490, 389 have been published⁴¹.

The number of major accidents is only partially helpful in understanding the impacts of the Directive. Major accidents are unpredictable, stochastic events, and reported in such small numbers that it is difficult to make statistical sense of the results. However, one possible reading is that the average number of accidents reported during 2012-2014 (39 accidents – unpublished data) is similar to the average number of accidents reported during 2009-2011 (37 accidents – unpublished data). For comparison, figures in previous three-year periods were 29 (2006-2008), 28 (2003-2005) and 30 (2000-2002). However, it is important to mention that this apparent increase is due to the increase in 'near misses' and 'other' events being reported (Table 4.5).

⁴¹ Member States will usually start the reporting process shortly after an accident has occurred but on average it will take 3 or 4 years for reports to be published. Reports are not published until they are confirmed as correct and complete by the Member State. Accident investigation and analysis alone may take some months. In addition, enforcement procedures and litigation may significantly delay finalisation of reports. The need to translate reports into English (that must be ultimately also approved by the reporting country) also incurs some delay.

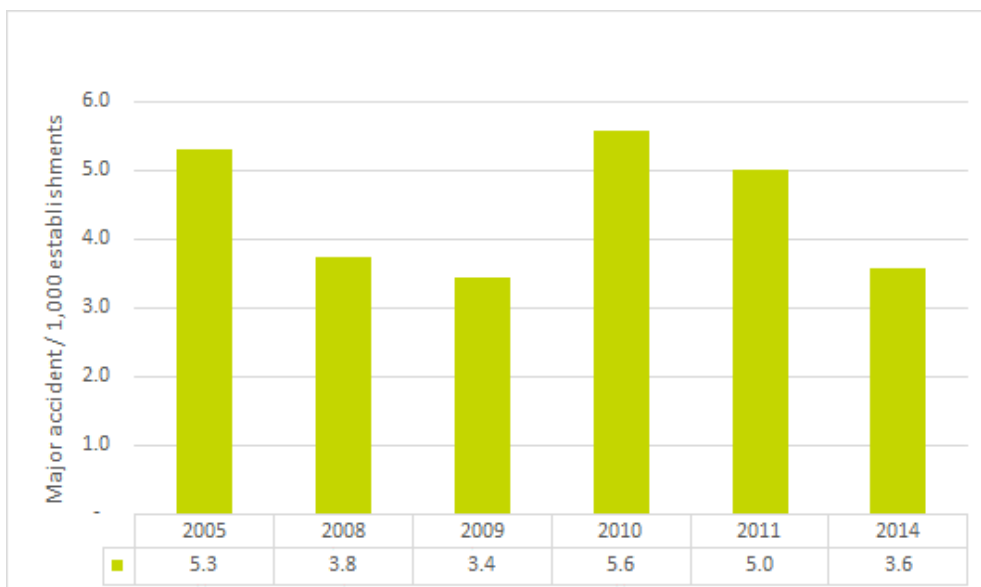
Table 4.5 Number of major accidents and total number of accidents reported in the 2000-2014 period (aggregated in 3-year periods)

Period	Number of major accidents reported	Total number of accidents reported
2012-2014	28	39
2009-2011	30	37
2006-2008	28	29
2003-2005	27	28
2000-2002	27	30

The figure below presents the evolution of the ratio of number of major accidents to the number of upper tier establishments. The chart is based on the data on major accidents recorded in eMARS (unpublished data) and the number of upper tier establishments reported by Member States through the triannual reporting.

Overall, a decrease in the number of major accidents per establishment is noticeable during the 2005-2009 period, followed by an increase in 2010 but it has not been determined that this is a statistically significant trend. The same limitations linked to the nature of major accidents are applicable. Because major accidents are reported in such small numbers, a variation in the number will exaggerate the impact. In addition, the latest data from 2014 are not considered complete so could represent an under-estimate. From the figure below it is also impossible to conclude on whether there is an overall increase or reduction of major accidents, however it is possible to conclude that the numbers are relatively stable.

Figure 4.3 Evolution of the number of major accidents per 1000 upper-tier establishments (2005-2014)



Note: The figure presents only major accidents occurring in upper tier establishments as number of lower tier establishments is not available before 2009. The number of upper tier establishments used are from Member States reporting, number of major accidents from upper tier establishments are from eMARS data including unpublished data.

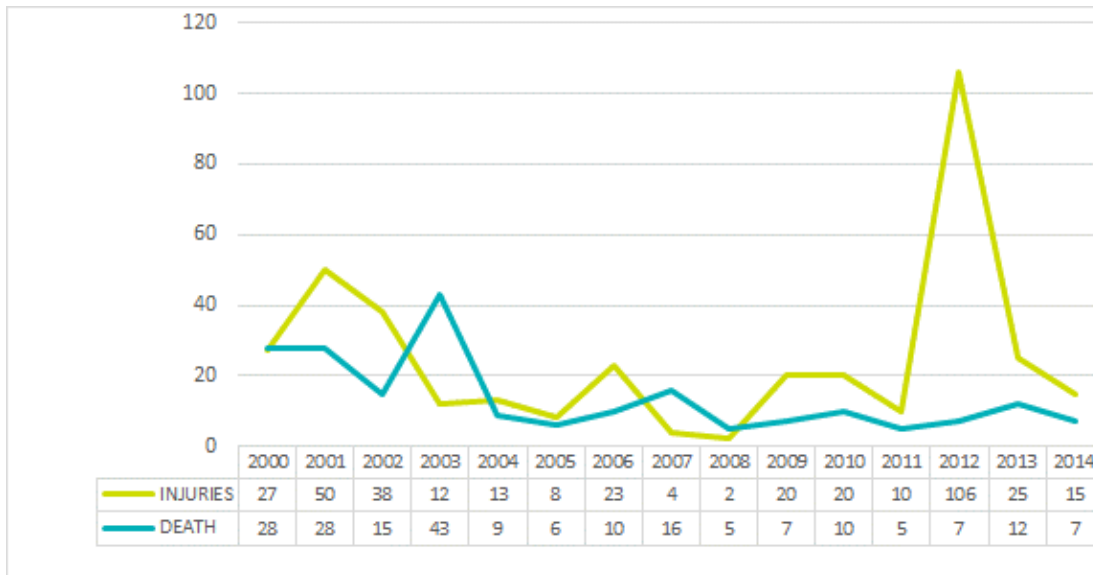
Note 2: A total of 56 major accidents were reported between 2000-2014 as from establishments of 'tier unknown'; these are not included in the figure above. These refer to reports submitted before Seveso II notifications were checked and finalised.

Note 3: The uneven intervals (2005, 2008, 2009, 2010, 2011, 2014) are due to the different way the data was reported by Member States in their reports.

The focus of the Seveso Directive is to prevent major accidents, but also to prevent their consequences when accidents do happen. As such a useful consideration would be to consider the evolution of the data reported to the MAHB on the number of injuries and fatalities from Seveso establishments.

Since 2000, Seveso accidents have led to 208 deaths on site and 12 offsite. Over the same period, 373 injuries were recorded onsite and 865 offsite. The evolution of the number of deaths and injuries is presented in the chart below.

Figure 4.4 Evolution of the number of deaths and injuries on-site since 2000



Note: based on published data only (total 389 reports)

It is noticeable that the number of deaths has peaked and reduced since 2003 while the number of injuries has remained relatively stable apart from a peak in 2012. The high numbers in 2012 are due to two major accidents: one chlorine leak at an electroplating plant leading to 39 injuries and a fire in a fertiliser store leading to 25 injuries.

4.4.3 Article by article conclusions

An overview of the conclusions on the implementation for each of the key article of the Seveso II Directive is presented below.

Table 4.6 Conclusions on implementation by Article

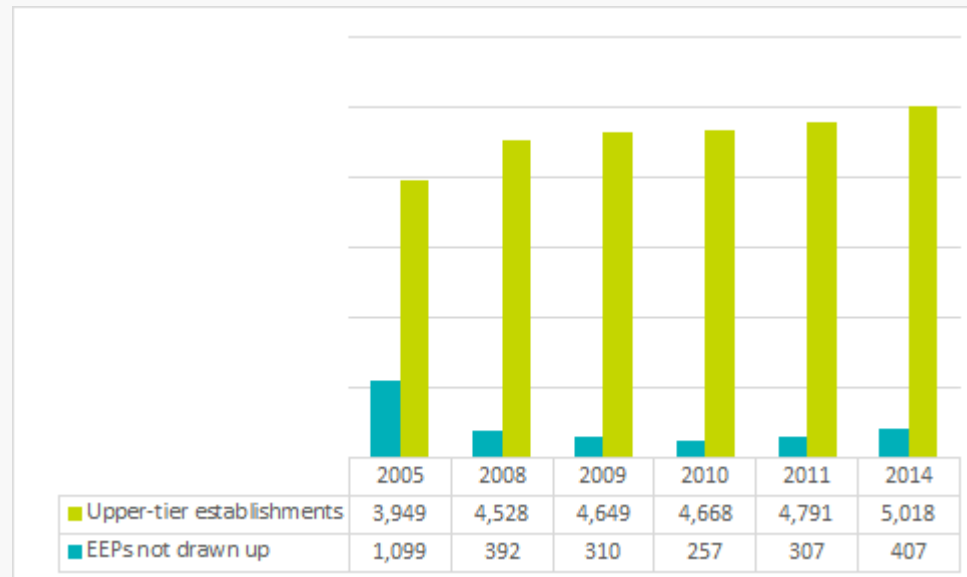
	Article content	Conclusions on implementation
Article 1	The aim of the Directive is the prevention of major accidents which involve dangerous substances and the limitation of their consequences for man and the environment	The statistical analysis does not allow clear conclusions to be drawn on whether the Directive has contributed to an increase or a reduction of major accidents, however it can be observed that while the number of establishments has increased in the European Union and through successive enlargements, the number of major accidents reported annually has remained relatively stable. Furthermore, the number of deaths and injuries both onsite and offsite have gradually reduced since 2000.
Article 8	Possible domino effects are to be identified and information to be exchanged as required between establishments to support cooperation	The information requested on domino effects has been mostly qualitative through the reporting periods. From the information reported, this provision of the Directive appears to be successfully implemented in all Member States.
Article 9	Safety report to be produced to demonstrate that major accident prevention policy and safety management system have been put into effect. Safety report have to be reviewed and updated where necessary at least every five years	No information was requested on safety reports as part of the latest reporting period. The 2009-2011 reporting period concluded that Member States' replies indicate that, by 2011, only 2% (83) of the operators had not submitted a safety report to the competent authorities. This percentage has remained relatively stable over the three years: 2% in 2008, 2% in 2009 and 1% in 2010. This seems to indicate that maximum implementation level has been reached and that the few establishments for which safety reports were not submitted were due to new establishments, or establishments recently classified as upper tier.
Article 11	Internal emergency plans to be drafted for upper-tier establishments External emergency plans to be drafted for upper tier establishments Both are to be reviewed, tested and revised if necessary at least every three years	No information was requested on internal emergency plans as part of this reporting period. However, the previous reporting round (2009-2011) indicated that competent authorities mainly have proof of the existence of such plans through the examination of the safety report. In this sense, by the end of 2011, about 1% (67) of the upper-tier establishments had an internal emergency plan (compared to 1% in 2009). Here again it seems that the maximum implementation level has been reached. On informing the public, when compared with the previous reporting period responses it is noticeable that more phone based and internet based alarm systems are being reported by Member States as being used. While this is not prohibited by the Directive it is important to consider whether this is sufficient to reach all the potentially affected population, in particular elderly people who may be less comfortable with more modern communication means. The number of upper-tier establishments without an external emergency plan has increased since the previous reporting period where 307 establishments were reported in this situation. When compared to the previous reporting period, it is interesting to notice that throughout reporting, the share of upper tier establishments for which external emergency plans had not been drafted by the Competent Authorities has varied, while it corresponds to 8% of the upper tier establishments by the end of the 2012-2014 reporting period, this represented 6% by the end of the 2009-2011

Article content

Conclusions on implementation

period, 9% by the end of 2008 and 28% by the end of 2005. The fact that a gap remains between the number of upper tier establishments and the number of external emergency plans might be explained by the increase in the number of installations with which competent authorities have not caught up. Since 2008, the share of upper tier establishments not having adopted an external emergency plan has stabilised, however it is noticeable that the more recent figures show a clear improvement over the initial data reported in 2005.

Figure 4.5 Evolution of external emergency plans drafting since 2005



Article 12

Land use planning policies must take into account the prevention of major accidents and limit the consequences of such accidents

From the information reported, all Member States land use planning includes to some extent prevention of major accidents and ways of limiting the consequences of such accidents.

Article content	Conclusions on implementation
<p>Article 13 Information on safety measures to be provided regularly to all persons liable to be affected by a major accident originating in an upper tier establishments. Information is to be reviewed every three years. Safety report to be made available to the public</p>	<p>Information has been made available actively at least once during the last five years for 81% of the upper tier establishments. This represents a decrease on the share reported in the last reported period (87%). However, it is important to note that the change in wording of the question may explain this decrease. The Directive requests information to be provided regularly and reviewed every three years and the question requests information on upper tier establishments that have provided information on safety measures in the last reporting period. The fact that they have not does not mean that they do not implement the requirements of the Directive.</p>

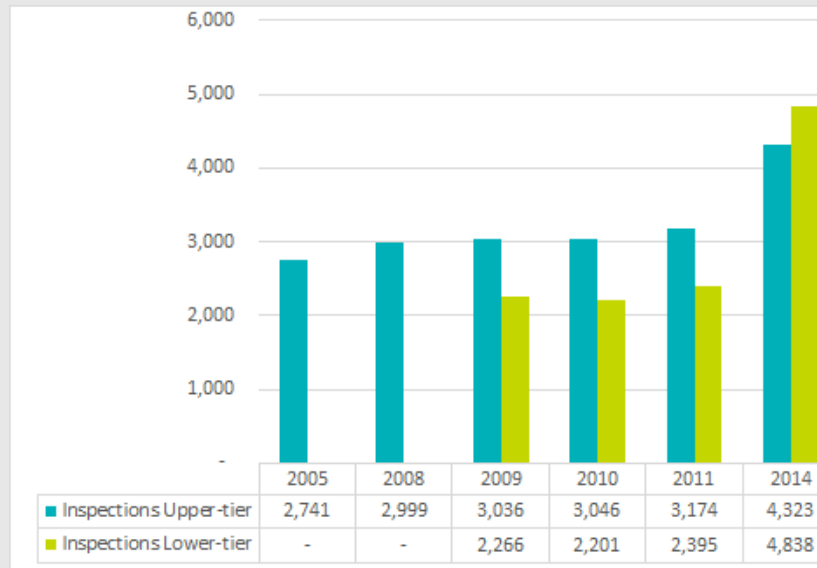
Article content**Conclusions on implementation****Article 18**

Inspections of upper tier establishments annually except for those Member States where the programme of inspections is based on the systematic appraisal of major accident hazard

Inspection is a key aspect of the implementation of the Directive as it is the opportunity for the competent authority to verify on site that the provisions of the Directive are being applied in practice. The Directive requires that upper tier establishments are inspected at least once per year. However, there is a flexibility included in the Directive which is that annual inspections are not required where the programme of inspections is based on a systematic assessment of major-accident hazards.

When comparing the evolution of the number of inspections during the reporting periods, it is noticeable that overall both the number of inspections of upper tier and lower tier increased the number of lower tier establishments inspected increased significantly (more than 50%). Note that the absence of data for lower-tier establishments' inspections in 2005 and 2008 reflects the fact that Member States were not required to report this data.

Figure 4.6 Evolution of number of inspections reported over reporting periods



4.5 Possible areas for improvement

Throughout the review of the implementation, several areas for potential improvement have been identified. In particular:

- ▶ Drafting and testing of external emergency plans has been identified as a potential compliance issue in several Member States (see Table 4.2). Delays were often reported as reasons for this by Member States which may reflect on staff and resources availability. This was also raised in the UNECE reporting, not only for external emergency plans, but as a limitation to the wider implementation of the Convention;
- ▶ Inspections of upper tier establishments may benefit from further support. While Member States are allowed to set an inspection frequency that is less than annual when using systematic risk appraisal to plan inspection programmes, it is also important that upper-tier establishments are not left uninspected for a long time. There might be a need for further guidance on inspections, taking into account the flexibility allowed by the Directive;
- ▶ Data reported to the MAHB are generally useful, but there are limited conclusions that can be drawn from the number of major accidents. As such it is important to consider other possible indicators to use in order to assess the progress made by the implementation of the Directive (and initial proposals are included in Section 7);
- ▶ Furthermore while the Seveso Directive's objective is to prevent major accidents, it also acknowledges that accidents may occur and that in this case, limiting the consequences of such accidents for human health and the environment is important. In order to better understand the progress made with regards to limiting the consequences of industrial accidents, it would be useful to encourage further reporting and research into environmental, human and socio-economic impacts of accidents and to compare how these have evolved;
- ▶ On reporting, it was noticeable that beyond major accidents, the reporting of incident and near-misses are more a reflection of the reporting culture for a specific sector or a specific Member State. As this reporting is voluntary it is difficult to interpret it. A large number of near-misses may reflect on the hazardous practices of a sector but also on the diligence of reporting; similarly a low numbers of reported near-misses does not systematically mean safer practices;
- ▶ When considering the activities of the establishments covered by the Seveso Directive, one interesting conclusion made was that a large number of establishments across all Member States were reported as conducting 'other' activities. Given that the range of categories to choose from is diverse and specific without being restrictive it is worth considering why such a large number of establishments are classified as 'others'. This may highlight difficulties for Member States in identifying the relevant category for their establishments, in which case more guidance could be appropriate; and
- ▶ The 2012-2014 reporting period was the first time when Member States were requested to provide feedback on lessons learnt and experience in applying the Directive. This was found to be a valuable addition, in particular when considering the fact that the reporting of lessons learnt under eMARS was uneven.

5 Analysis of major accident and establishment data

5.1 Analysis of major accident data

5.1.1 Overview

The Major Accident Reporting System (eMARS) operated by the Major Accident Hazard Bureau (MAHB) of the European Commission's Joint Research Centre was established to manage the information on 'major accidents' submitted by Member States of the European Union to the European Commission in accordance with the provisions of the Seveso Directive. The eMARS database resulted from provisions in the first Seveso Directive and has been collecting reports on major accidents from Member States since 1984 by the Member States and other countries⁴². Currently, eMARS has published more than 750 events reported by the Member States as required by the Seveso Directive, and in accordance with the criteria of its Annex VI. The information is collected using either a "short report" or a "full report".⁴³ There are approximately 300 more accident reports that are still awaiting confirmation by the reporting Member States (and there is a lag time of 3-4 years in finalising reports).

The reports typically contain information on the accident type, substances directly involved, sources of accident, immediate causes, immediate effects, emergency measures taken, and immediate lessons learnt, type of accident, the industry where the accident occurred, the activity being carried out, the components directly involved, the causative factors (immediate and underlying), the ecological systems affected and the emergency measures taken.

Our analysis focuses on accidents reported between 2000 and 2014.

5.1.2 Methodology and data limitations

5.1.2.1 Methodology applied

The eMARS data analysed in this report covers the 2000-2014 period⁴⁴, so that the situation for 2012-2014 can be compared to the previous periods corresponding to the 3-year implementation intervals (2000-2002, 2003-2005, 2006-2008 and 2009-2011). For continuity with the previous reports on eMARS, the following analyses have been performed. The period covered for the data provided by the JRC is 2000-2014 unless otherwise mentioned below. In addition, for some analyses, the period covered by the data used is larger, and data available for the period prior to 2000 have been included when relevant and available.

- a) Event types: number of major accidents for upper tier and lower tier establishments over the period 2000-2014;
- b) Reasons for reporting (aligned with Annex VI of the Directive), in the period 2000-2014 and the period 2012-2014;
- c) Number of injuries and fatalities;
- d) Type of hazardous phenomenon involved: release of toxic substances in the atmosphere, fire, explosion, spillage, etc.;
- e) Number of accidents reported with lessons learned;
- f) Number of accidents by named substance or substance category;

⁴² For example, EEA countries and UNECE. https://www.unece.org/fileadmin/DAM/env/teia/doc/COP-7/10.5_EMARS.pdf

⁴³ Now available at <https://emars.jrc.ec.europa.eu>. This location will change later in 2017 to <https://emars.ec.europa.eu>.

⁴⁴ The JRC provided eMARS data for the analysis in this report.

- g) Number of accidents by activity type; and
- h) Number of newly-created reports inserted during the period 2012-2014.

A distinction has been made between accidents in upper-tier and lower-tier establishments for all cases, including a breakdown of accidents by substance categories and by type of establishment. These statistics are available from the year 2000 although some accidents were still not reported in these two categories (i.e. lower and upper tier) in the early 2000s because at this time the status of some sites were uncertain during the transition from the Seveso I to the Seveso II Directive.

5.1.2.2 Limitations and assumptions as provided by MAHB

The statistics presented in this report have been derived from eMARS based on published data from September 2016. In addition, an update of certain unpublished data was provided by the JRC in February 2017, to be used for certain analyses.

The data analysis incorporates the following assumptions and limitations:

Table 5.1 eMARS data analysis assumptions and limitations

Public data	The data provided reflect the eMARS data as of 28/09/2016 The data provided are based on the published data, the JRC indicated that the unpublished data have not been validated and hence cannot be considered as part of the analysis. Published and unpublished data consist of 490 accidents in total, published data consists of 389 accidents.
Time limits:	Data covers the 2000 – 2014 period
Limits on establishments considered:	Data extracted cover only Seveso I + II
Statistics on reason for reporting:	If an accident has more than one reason to be reported, the accident is counted as many times as there are reasons.
Accident data by tiers	"Tier not known" refers to report submitted before Seveso II notifications were checked and finalised. In many countries, this occurred around 2000 or 2001, given that implementation effective date was 1999.
Statistics on Fatalities and Injuries:	Figures based on the free text interpretation of the field "Consequences" in eMARS. Only serious injuries are considered (i.e. hospitalised for at least 24 hours). Consequently, small, light injuries are not counted. Similarly, no 'slight' injuries and hospitalised under observation were counted. Impacts on contractors and external responders (e.g. fire brigades) are counted together as on-site personnel.
Statistics on phenomena involved in accidents	If an accident has more than one hazardous phenomenon involved, the accident is counted as many times as there are hazardous phenomena involved.
Statistics on substance involved	If an accident has more than one substance involved, the accident is counted as many times as there are substances involved.
Socio-economic impact of accidents	Socio economic impact is counted in number of accidents per year and where in the 'consequence' reporting it was indicated that there were either economic effects off-site, a transboundary effect or damage to the environment.

It is important, when considering the statistical analysis, to keep these limitations in mind, in particular that unpublished data have not been validated and could change when the database is further updated.

5.1.3 Analysis of major accident data

5.1.4 Overview

This section presents the analysis of eMARS data for the period 2000-2014. In particular, the analysis has been performed with the intention to detect any trends regarding the types of accidents reported, the substance(s) involved, and the source of the accidents, the extension of the consequences, the measures taken and the lessons learned.

5.1.5 Major accidents, near misses or other events reported in eMARS

Between 2000 and 2014, a total of 490 accidents (including major accidents, near misses and other) were reported to the eMARS database. Out of these 490 reports, the data for 389 reports have been processed, confirmed and published online, while the remaining 101 reports are still being processed and as such are considered as 'unpublished' data. Thus, there are two sets of data available, the 'published' data which include those 389 reports and the 'unpublished' data which also cover the 101 reports for which information is still being verified.

Some data are unpublished because there is no specific deadline for Member States to complete and confirm publication of an accident report (for example legal issues pertaining to the accident can delay confirmation of the information). Hence, some reports are only finalised a few years (sometimes longer) after the accident occurred. It also means that some accidents occurring in 2012-2014, but not confirmed for publication, are not included in the 'published' statistics.

Furthermore, in the 2012-2014 period, there were updates made from the previous 3-year reporting periods on accidents occurring before 2012. As a result, there should be caution when considering the data and trends since 2012. On average, 4 to 5 years are needed before one can expect that most of the reports for that year have been submitted.

Table 5.2 presents the number of reports (major accidents, other events and near misses) each year in eMARS and their status. It can be observed that for the 2012-2014 period, the number of annual reports based on the published data has decreased. However, it is important to note that this decrease could be due to the completeness of the datasets as described above rather than an actual diminution of the number of accidents.

Table 5.2 Number of reports (major, near miss and other accidents) in eMARS since 2000

Year	Newly created	To be confirmed	Confirmed	On-line (published)	Total
2000				29	29
2001				25	25
2002				36	36
2003				27	27
2004				24	24
2005				34	34
2006				33	33
2007	1			27	28
2008	1			24	25
2009	7			23	30
2010	11	2		34	47

Year	Newly created	To be confirmed	Confirmed	On-line (published)	Total
2011	8	6	1	19	34
2012	7	6	1	31	45
2013	14	11		16	41
2014	12	12	1	7	32
Total	61	37	3	389	490

Note: The table presents both published and unpublished data

The table below presents the number of event reported in eMARS between 2000 and 2014 distinguishing their types and from which category of establishments.

Table 5.3 Number of accidents (major, near miss and other) reported in eMARS since 2000

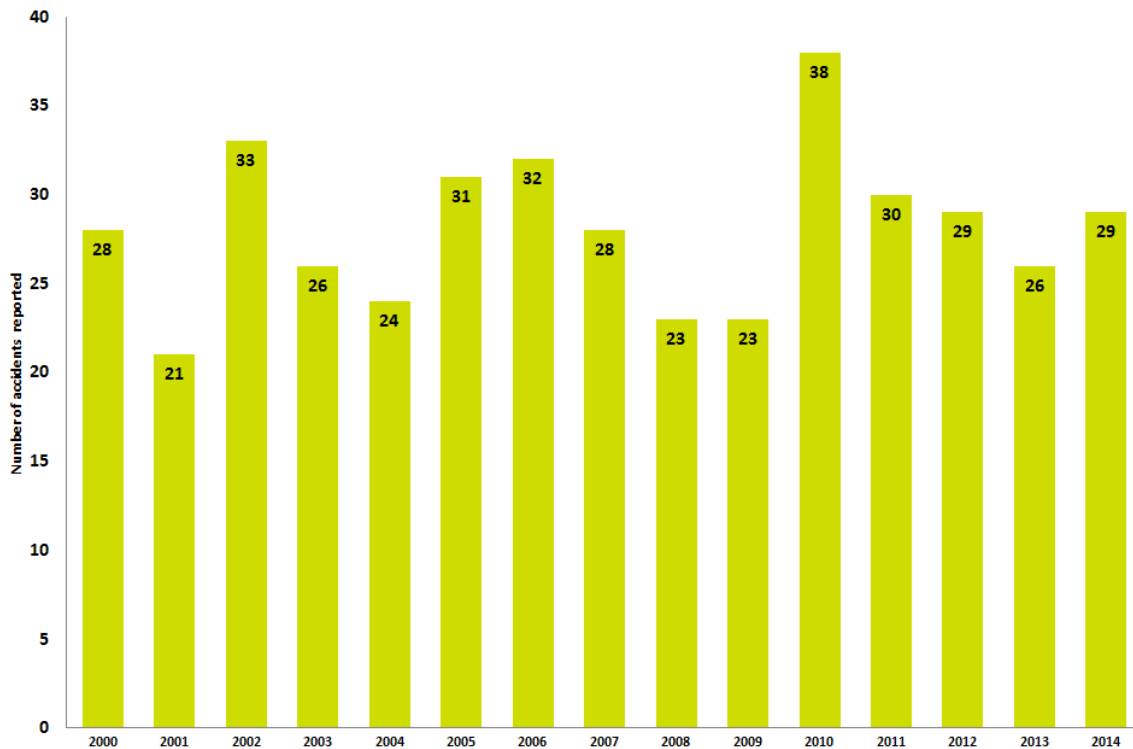
Year	Type	Upper Tier	Lower Tier	Tier not known	Total
2000	Major Accident	16	6	6	29
	Near Miss				
	Other	1			
2001	Major Accident	8	2	11	25
	Near Miss	2			
	Other	2			
2002	Major Accident	21	5	7	36
	Near Miss				
	Other	3			
2003	Major Accident	17	1	8	27
	Near Miss	1			
	Other				
2004	Major Accident	19	1	4	24
	Near Miss				
	Other				
2005	Major Accident	21		10	34
	Near Miss	1			
	Other	1	1		
2006	Major Accident	29	3		33
	Near Miss				
	Other	1			
2007	Major Accident	20	6	2	28
	Near Miss				
	Other				
2008	Major Accident	17	6		25
	Near Miss				
	Other	2			

Year	Type	Upper Tier	Lower Tier	Tier not known	Total
2009	Major Accident	16	6	1	30
	Near Miss	1			
	Other	4	2		
2010	Major Accident	26	9	3	47
	Near Miss	5	2		
	Other	1	1		
2011	Major Accident	24	3	3	34
	Near Miss				
	Other	4			
2012	Major Accident	23	5	1	45
	Near Miss	7	4	1	
	Other	3	1		
2013	Major Accident	19	7		41
	Near Miss	6	2		
	Other	3	3	1	
2014	Major Accident	18	11		32
	Near Miss	1	2		
	Other				

Note: The table presents both published and unpublished data

Figure 5.1 presents the number of reported major accidents in eMARS from 2000 to 2014. During this period 490 events (including major, near misses and others) have been registered, of which 421 (85%) were identified as major accidents meeting the criteria for reporting as specified in Annex VI of the Seveso II Directive.

Figure 5.1 Number of major accidents over the period 2000- 2014

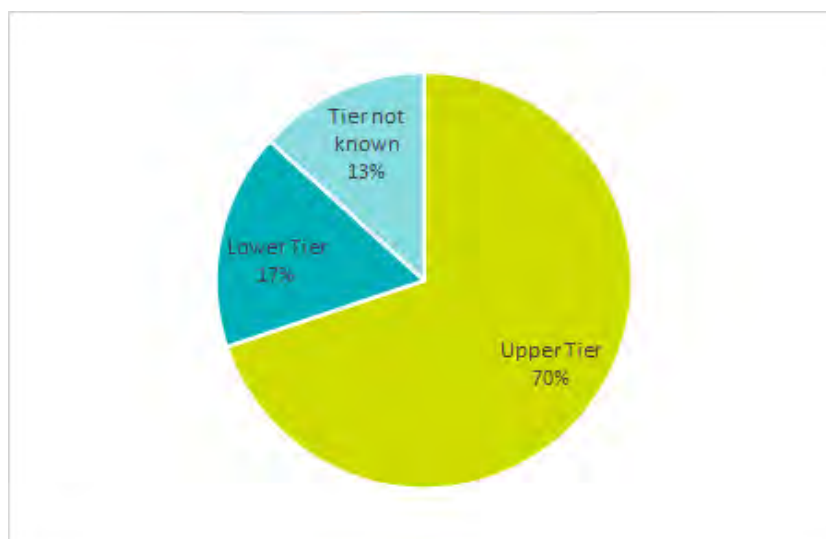


Source: European Commission JRC, 2016

Note: These data are from the unpublished database and as such include a number of accidents reported whose information has not been confirmed.

In addition, data is available on the split between upper tier and lower tier establishments reporting major accidents. This data was averaged for the whole 2000-2014 period and is presented below. In most cases, major accidents were reported by upper tier establishments.

Figure 5.2 Share of upper tier and lower tier establishments reporting major accidents for 2000-2014 period



Note: These data are from the unpublished database and as such include a number of accidents reported whose information has not been confirmed.

Furthermore, every year, the number of reported major accidents is greater for upper tier establishments than for lower tier establishments. This might be due to the fact that the number of upper tier establishments

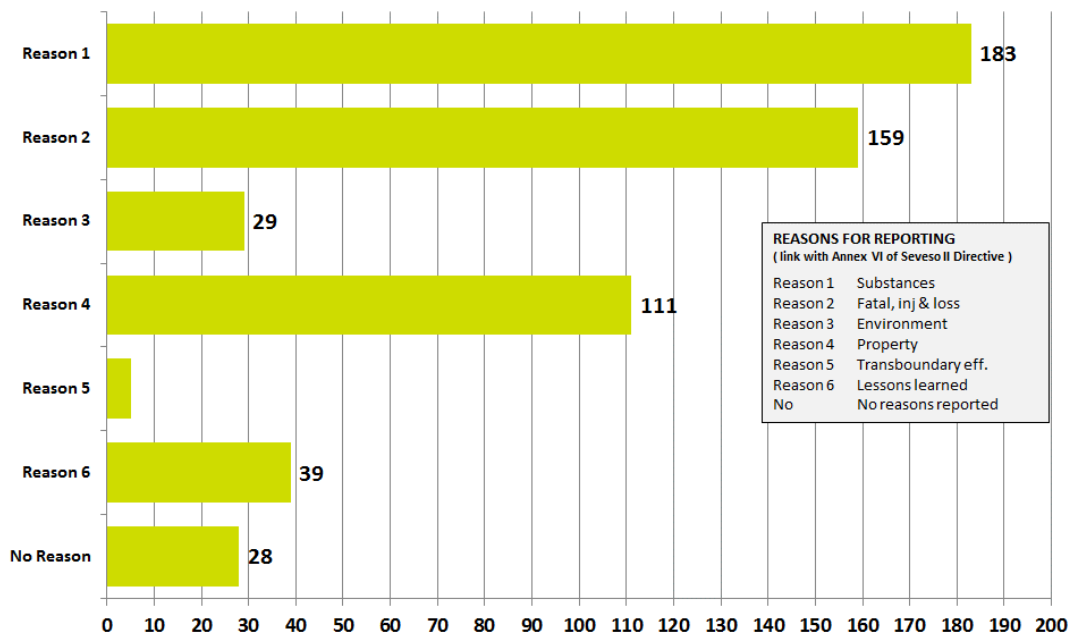
is higher than the number of lower tier establishments, but could also be due to the fact that the hazard potential is likely to be higher in upper tier establishments.

5.1.6 Reasons for reporting (link with Annex VI of the Directive)

The next two figures present the reasons for reporting according to the criteria derived from Annex VI of the Seveso II Directive. The criteria for reporting can be summarized as follows:

- ▶ Reason 1: Substances involved: greater than 5% of quantity in Column 3 of Annex I;
- ▶ Reason 2: Injury to persons: >= 1 fatalities, >= 6 hospitalising injuries etc.;
- ▶ Reason 3: Immediate damage to the environment (according to Annex VI);
- ▶ Reason 4: Damage to property: on-site >2M €, off-site > 0.5M €;
- ▶ Reason 5: Cross-border damage: transboundary accidents;
- ▶ Reason 6: Interesting for lessons learned; and
- ▶ No Criteria: No reason reported.

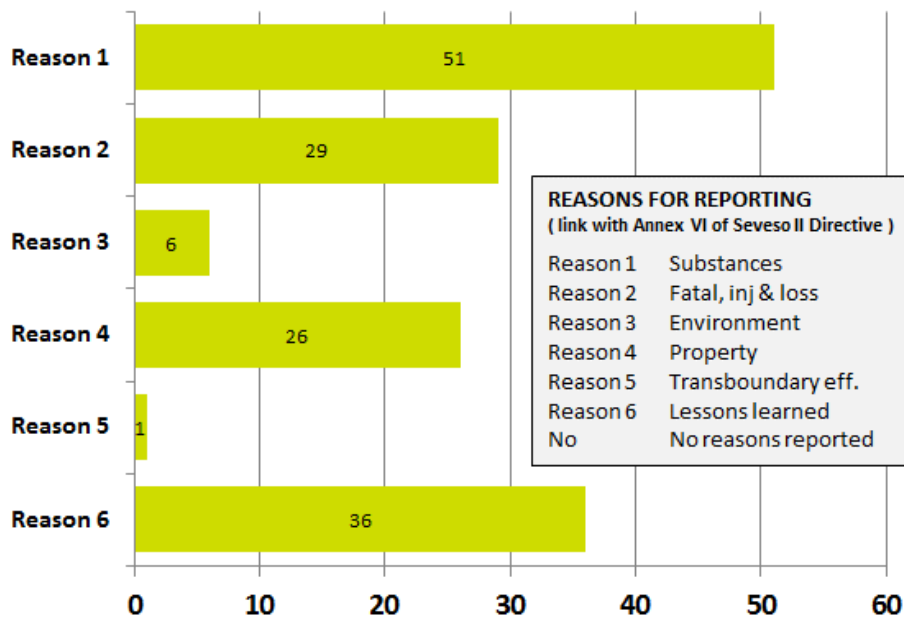
Figure 5.3 Reasons for reporting major accidents in eMARS for the period 2000-2014



Source: European Commission, JRC 2016

Note: These data are from the unpublished databases

Figure 5.4 Reasons for reporting major accidents in eMARS in 2012-2014



Source: European Commission, JRC 2016

Note: These data are from the unpublished databases

For the period 2000-2014, the main reasons for reporting are Reason 1 (substance involved), followed by Reason 2 (injury to persons and fatalities), and Reason 4 (damage to property).

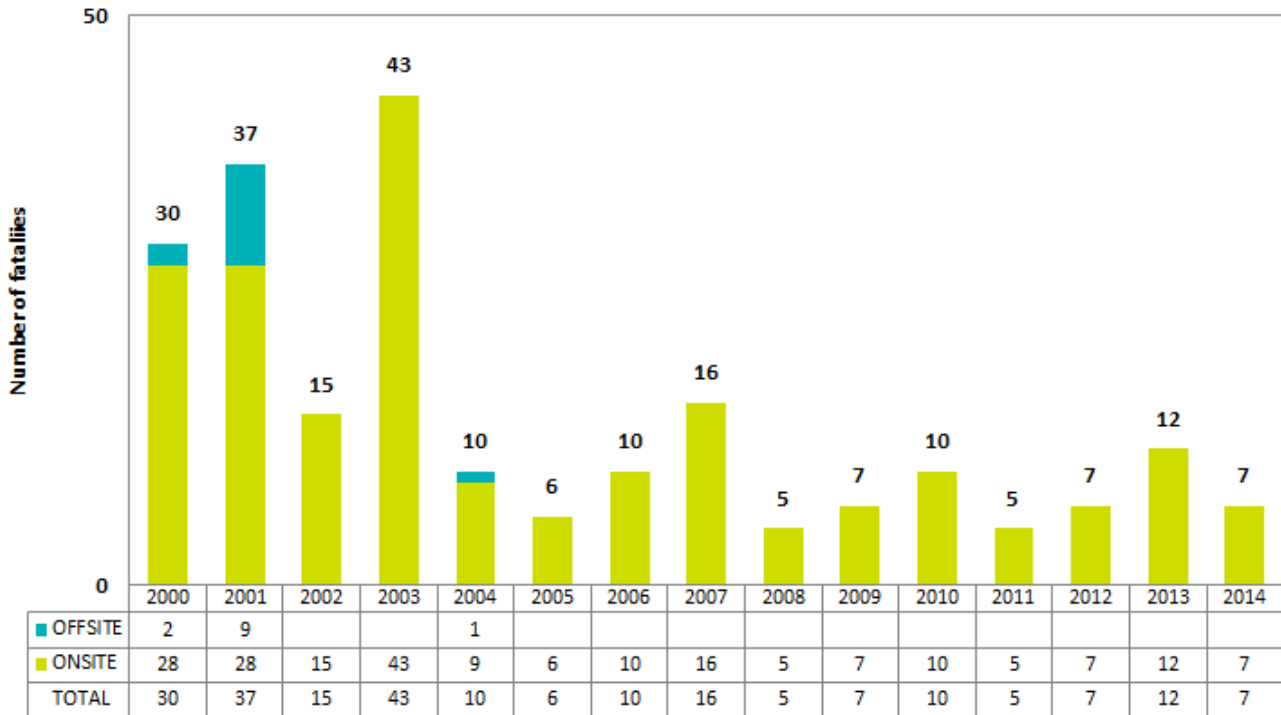
Criterion 1 is the most common selection because the most common type of major accident involves a release of a large volume chemical release that does not have serious impacts. Given that workers and emergency responders onsite are sometimes in close proximity to accident impacts, it is not unexpected that the second most common reasons for reporting are associated with fatalities and injuries.

For the period 2012-2014, the same main reasons for reporting appear again. It is notable that lessons learned increased in this period due to a deliberate effort on the part of the European Commission to encourage reporting of lessons learned from other accidents that do not meet the Seveso major accident criteria.

5.1.7 Injuries and fatalities

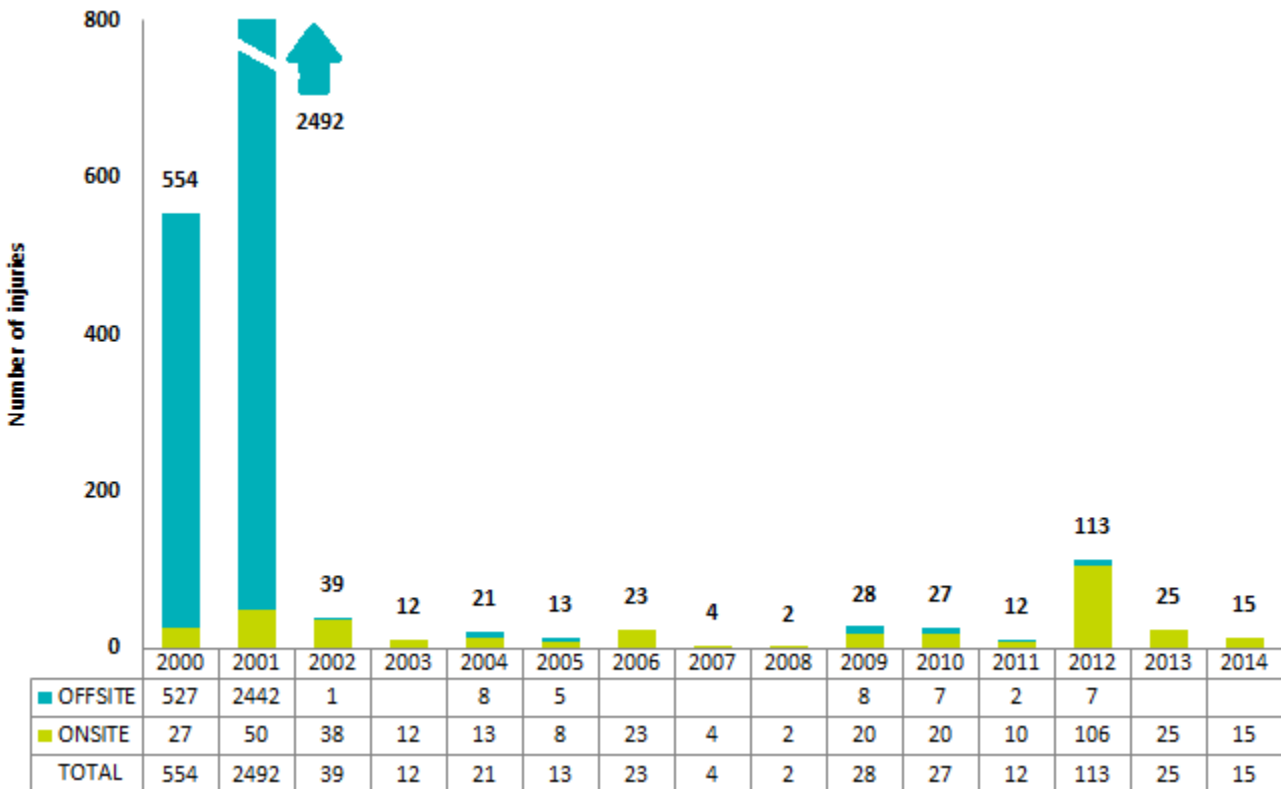
The figures below present the evolution of the number of fatalities reported since 2000. The data are presented distinguishing onsite and offsite. In general, there is no visible trend signalling reduction or increase of accidents. Where certain years have higher fatalities, it generally coincides with the instance of one or two multiple fatality accidents (e.g., Enschede, NL, 2000; Toulouse, FR, 2001; Gornj Lom, BG, 2014).

Figure 5.5 Number of fatalities in 2000- 2014 Onsite and Offsite in public eMARS



Source: European Commission, MAHB, 2016. Note: These data represent data in published accident reports only (389 reports).

Figure 5.6 Number of injuries in 2000- 2014 Onsite and Offsite in public eMARS



Source: European Commission, JRC, 2016. These data represent data in published accident reports only (389 reports)
 Note: The Y-axis has been readjusted for presentational purposes, as the figure was distorted due to the high number of injuries reported in 2001

The figures above show that the numbers of on-site and off-site injuries and fatalities have been high for the period 2000 - 2003. Trends for both injuries and fatalities are similar, with a significant reduction from 2003 for fatalities and from 2001 for injuries. In 2012, a peak can be observed in the number of onsite injuries due to several releases of toxic gas during this year.

In 2014, the number of reported fatalities and injuries is low. However, to some extent this might be due to the data being used which are the published data (i.e. the data available in the eMARS database rather than the raw data reported by Member States).

Also, it is important to mention that the lack of pre-2000 data makes it difficult to analyse the overall trend since the Directive was established. The data since 2000 is also distorted by the fact that there were two major accidents in 2000 and 2001. If the effects of these two accidents were excluded, the number of injuries and fatalities in these two years would have been 8 fatalities and 27 injuries in 2000; and 6 fatalities and 20 injuries in 2001, which are comparable to the figures in 2002.

Even though it is difficult to make a clear statement because of the short period of observation and the relatively small number of events, it seems there is a general reducing trend in the number of fatalities and injuries over the period 2000-14 and since 2004 no report of fatalities offsite.

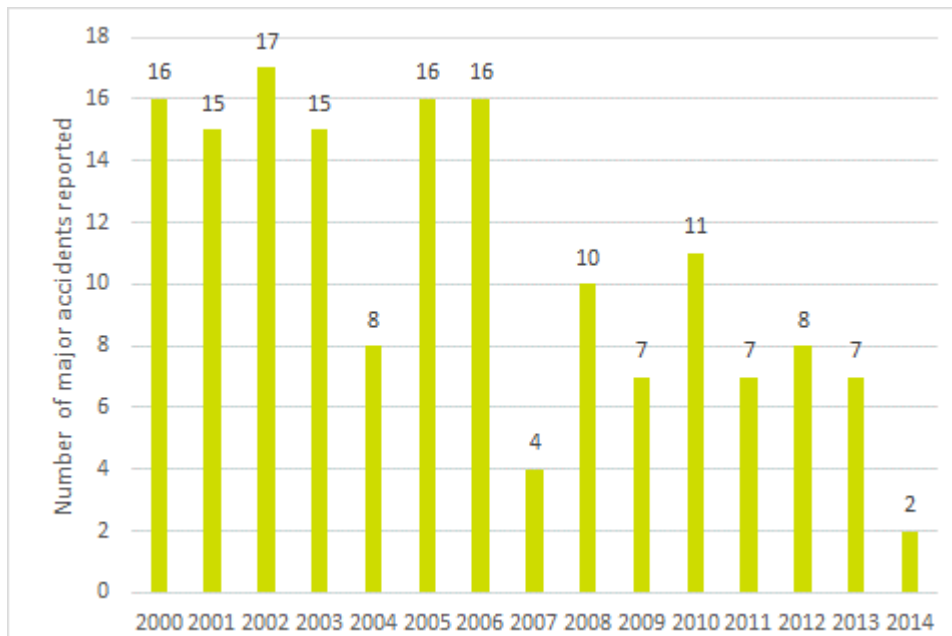
5.1.8 Type of hazardous phenomenon involved

The figures below present the number of hazardous phenomena involved in the reports in the public eMARS in terms of toxic release, fire and explosion (and undeclared).

Note that only published data were used as information on type of hazardous phenomenon involved are not considered complete and reliable until confirmed for publication by the Member State.

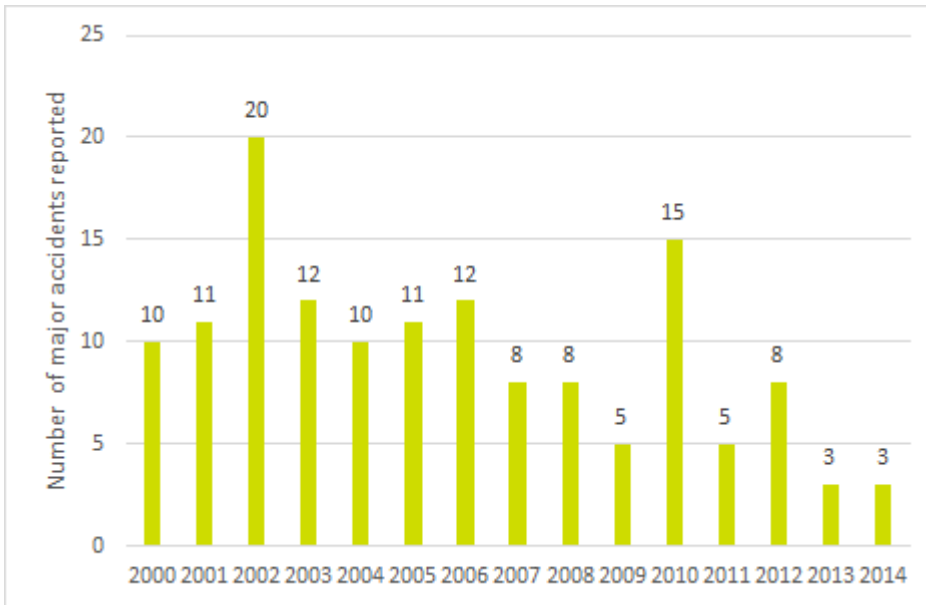
While figures for each hazardous phenomenon are presented in the following pages there is no obvious trend that can be observed. Note that each phenomenon is counted separately if an accident entails more than one phenomenon.

Figure 5.7 Number of fires involved accidents reported in years 2000-2014



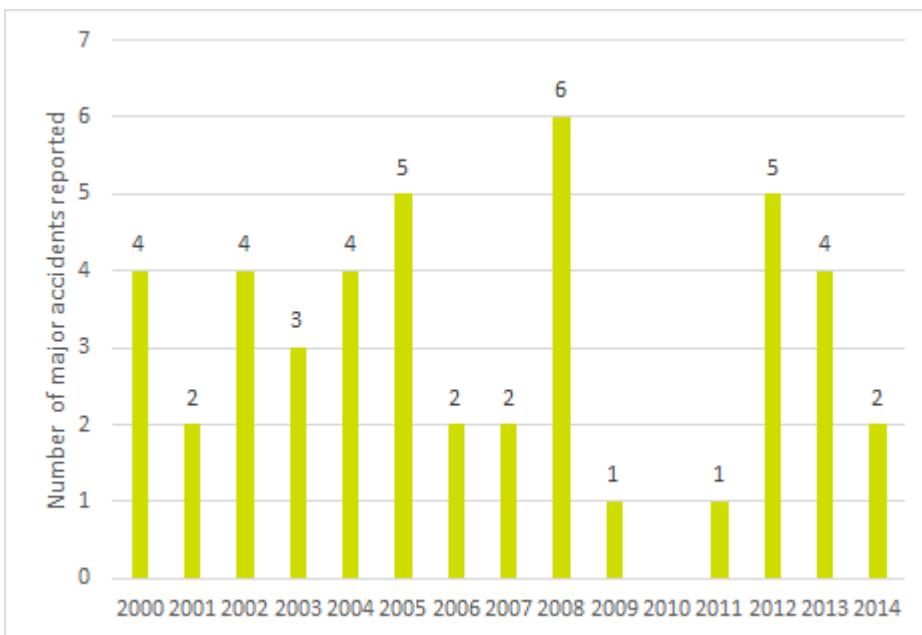
Note: These data represent data in published accident reports only (389 reports).

Figure 5.8 Number of explosions involved in accidents reported in years 2000-2014



Note: These data represent data in published accident reports only (389 reports).

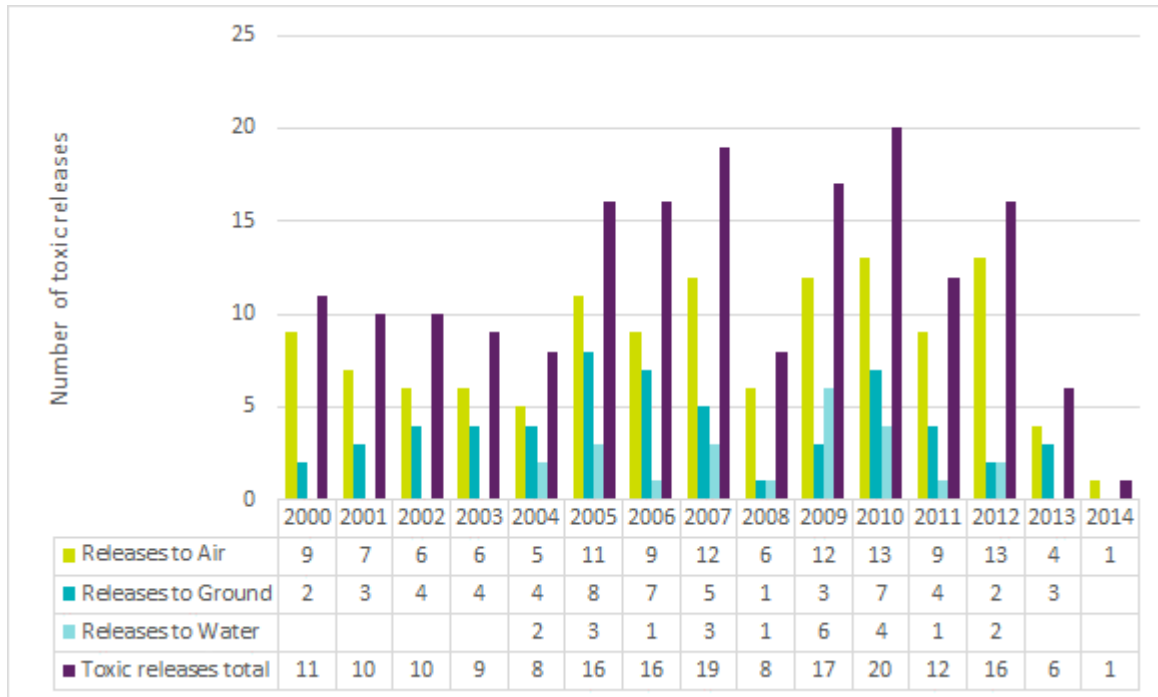
Figure 5.9 Number of undeclared hazardous phenomena involved in accidents reported in years 2000-2014



Note: These data represent data in published accident reports only (389 reports).

A breakdown is provided for the releases of toxic substances to air, ground and water in the next figure.

Figure 5.10 Number of toxic releases involved in accidents reported in years 2000-2014



Note: Each phenomenon is counted separately if an accident entails more than one different phenomenon. These data represent data in published accident reports only (389 reports).

As can be observed, among releases, release to the atmosphere is the most frequently reported.

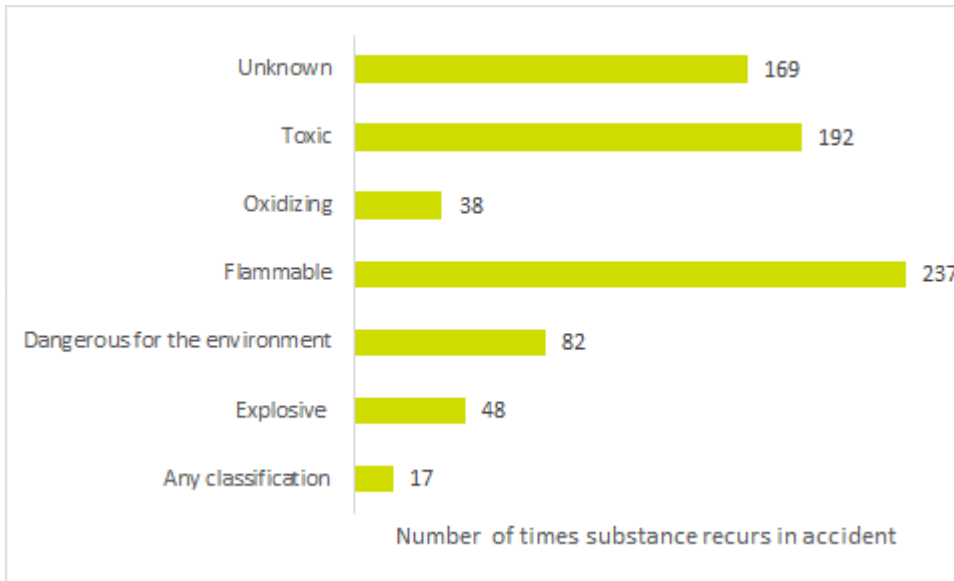
5.1.9 Accidents by substances or substance categories

As part of the reporting to eMARS, information on substances or categories of substances involved in the accident are included. The data reported with regards to substances involved in accidents is presented in the figure below.

Note that only published data were used as information on substances involved are not considered complete and reliable until confirmed for publication by the Member State.

It is not possible to compare the number of major accidents by substances with the number of establishments using these substances because there are no databases listing substances used per establishment that can be used as a reference.

Figure 5.11 Number of times a single type of substance classification, or combination, recurs in a single major accident, in years 2000-2014



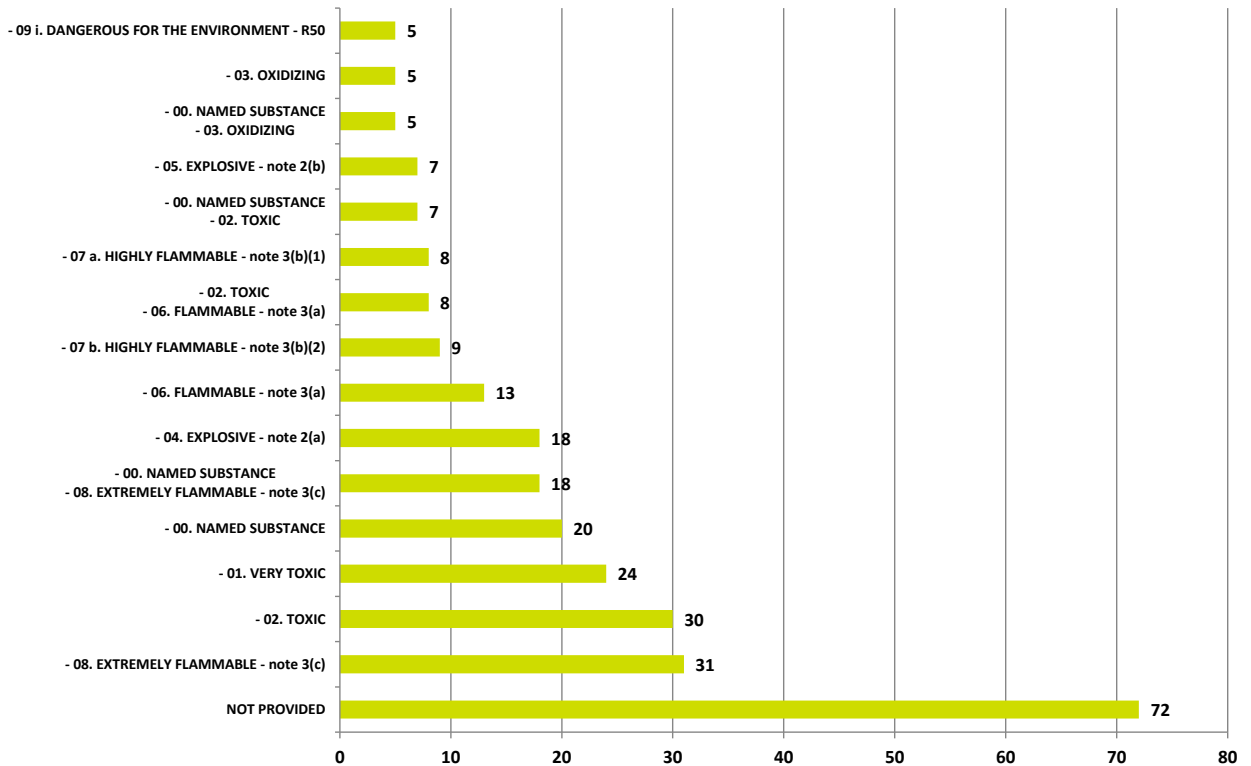
Note: The chart above aggregates several classifications, for example, 'flammable' includes highly flammable and extremely flammable. These data represent data in published accident reports only (389 reports).

In this figure, the bars show the number of times substances, their categories or combinations thereof have been involved in a single event reported in eMARS in the period 2000-2014.

Substances that are flammable were the most reported with 237 single accident reporting flammable substances. It is followed by toxic substances (192 accidents). It is noticeable that 'unknown' substances' classification is involved in a large number of accidents which may indicate a need for a more precise reporting of incidents. When considering the data not aggregated, the category "02 Toxic" was cited the most with 121 events referring to this category followed by "08: Extremely flammable" cited 105 times.

The data related to groups in the above figure is split in the figure below. Each combination of risk category is separated into single categories and each event may be counted many times where many single categories were involved. An event which involved a substance that is for example explosive and toxic is reported twice, once for explosive and once for toxic.

Figure 5.12 Recurrence of substance category classification recurring in accidents reported in years 2000-2014



Source: European Commission, JRC, 2016

Note: These data represent data in published accident reports only (389 reports).

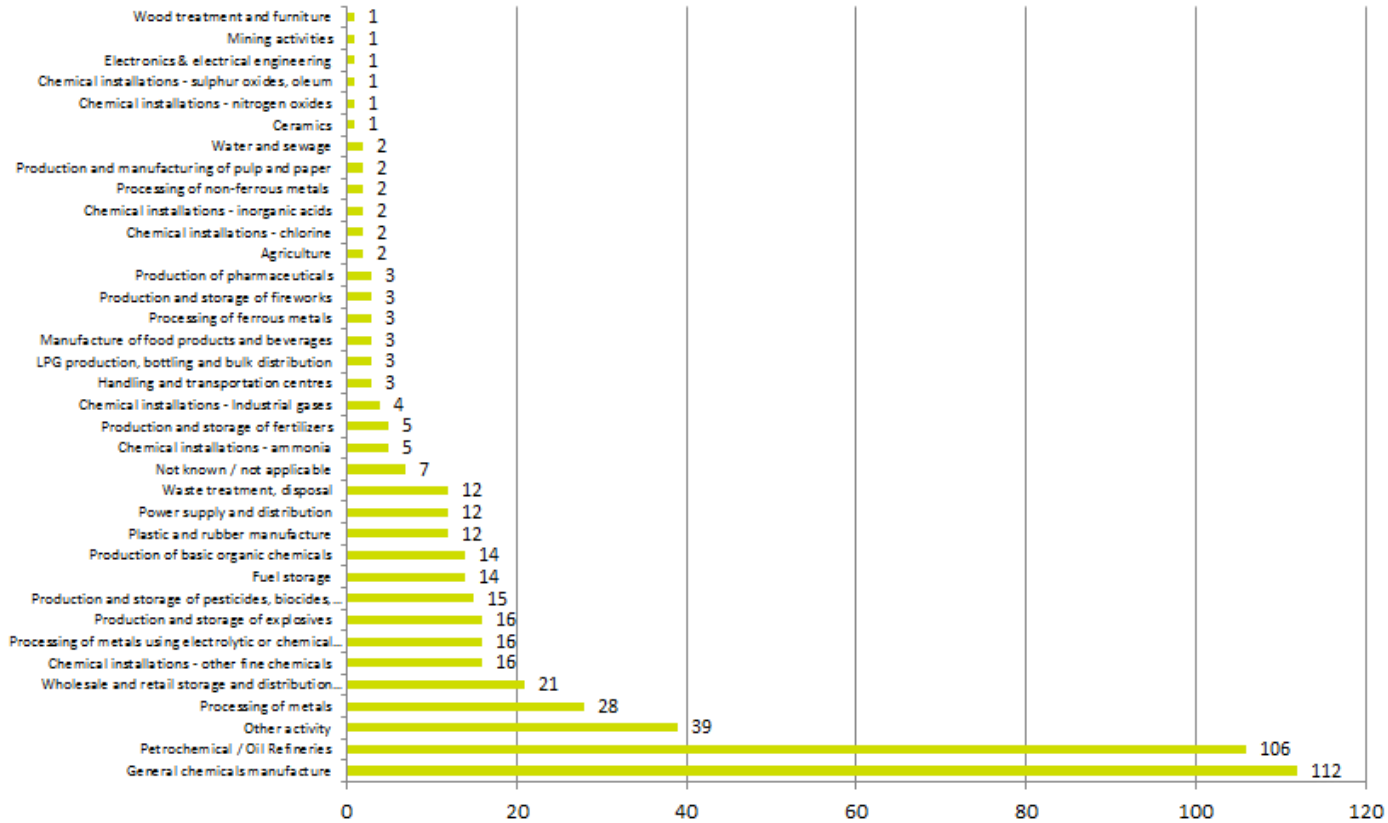
This graph shows that the total of flammable substances (flammable, highly flammable and extremely flammable) represent a total of 87 recurrence. This observation correlates with the data provided in Figure 5.13, that show that most accidents occur in fuel storage and petrochemical industry.

To perform further analysis and identify the substances and the corresponding industry contributing the most to major accidents, it would be necessary to break down the generic categories. Further analysis would be required to review all the information on accidents for each named substance in order to identify why they are named. However, this was beyond the scope of the current study.

5.1.10 Accidents and incidents by activity type

The figure below shows the number of reports in eMARS over the period 2000-2014 by activity type. Note that these data are from unpublished accident reports (490 reports).

Figure 5.13 Number of accidents and incidents by activity type in years 2000-14

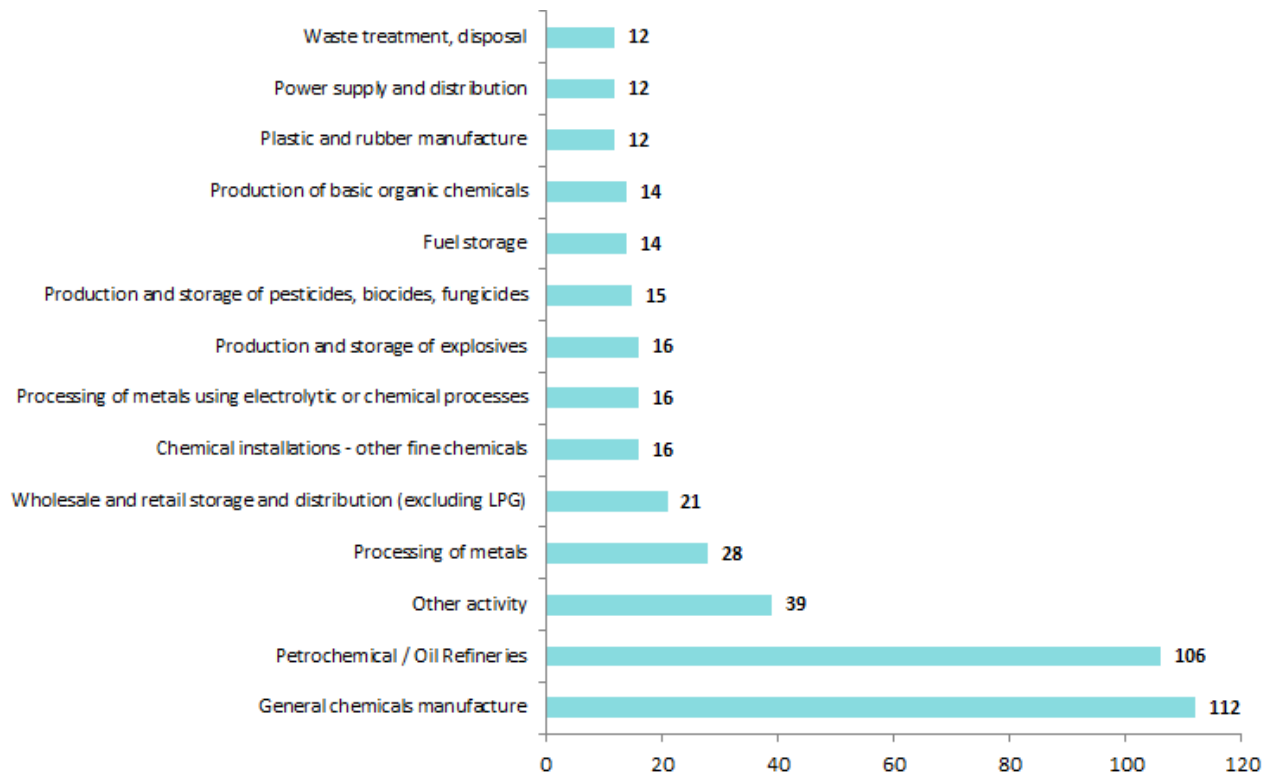


Source: European Commission, 2016

Note: These data represent data in published and unpublished accident reports (490 reports).

The activities “Chemical Installations - other” and “Petrochemical / Oil Refineries” contribute most of the number of events reported. Overall, a total of 9 activity types have contributed to more than 10 events.

The figures below provide a more detailed focus on the number of events reported by activity type, for the most-involved activities and for the least-involved activities.

Figure 5.14 Number of accidents and other events per activity type (for n. acc. ≥ 10) for 2000-2014

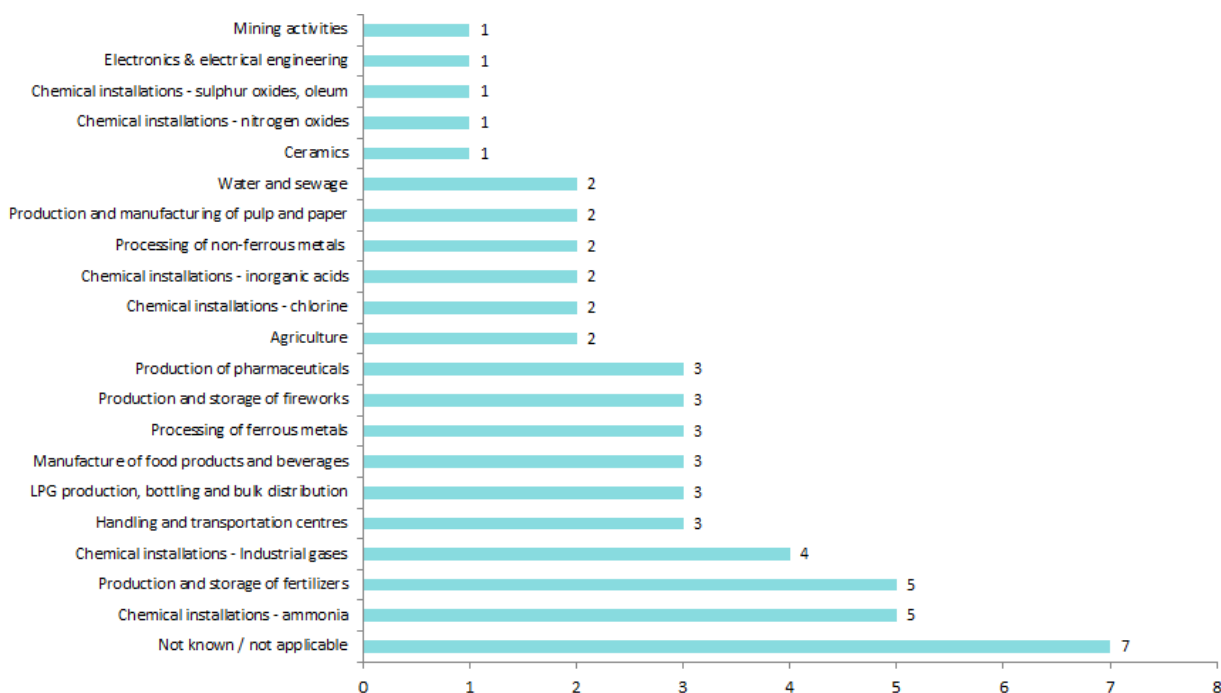
Source: European Commission, JRC, 2016

Note: the category "General chemicals manufacture (not included above)" refers to the general chemicals manufacture not covered by the other categories in the full list. These data represent data in published and unpublished accident reports (490 reports).

It is noticeable that the two categories with the most generic descriptions, that is to say 'general chemicals manufacture' and 'other' activities are two of the top three activities for which most accidents and other events are reported. Due to this high-level description of activities it is impossible to further analyse whether within these generic activities groups there are some recurring activities. Therefore, future reporting might benefit from a more precise reporting of activities and the removal of these 'generic' activities categories. A similar observation was made when reviewing the activities reported by Member States as part of the tri-annual reporting. It might be that those establishments are conducting several activities and are unsure about which one to use as their 'main' reporting activity. If this is the case, it might be valuable to provide Member States with guidance on identifying the main activity of their Seveso establishments

The figure below presents the activities with the least number of major accidents (below 10).

Figure 5.15 Number of accidents and incidents per activity type and class of accident (for n. acc. ≤ 10)



Source: European Commission, 2016

Note: These data represent data in published and unpublished accident reports (490 reports).

It is also important to read this data while considering major accidents separately from other events and near misses but also the total number of establishments in each category. For example, the “wholesale” category accounted for 831 establishments in 2014 and 15 major accidents over the 2000-2014 period, so a ratio of accident per establishment of 0.02. In comparison, the “oil and petrochemical” category accounted for 69 major accidents for the period 2000-2014 out of total 225 establishments in 2014, so a ratio of accident per establishment of 0.30. It can then be concluded that oil and petrochemical category is a higher risk category than wholesale, per establishment, over this period.

The ratios for major accidents reported compared to the total number of establishments reported as part of the triannual reporting are presented in the table below.

Table 5.4 Ratio of major accident per establishment per category of activities

	Total number of establishments in 2014	Number of major accidents in 2000-2014	Major accident per establishment
Wholesale and retail storage and distribution (excluding LPG)	831	18	0,02
General chemicals manufacture (not included above)	698	106	0,15
Processing of metals using electrolytic or chemical processes	472	26	0,06
Production, destruction and storage of explosives	452	12	0,03
Plastic and rubber manufacture	352	10	0,03
Other activity (not included above)	298	34	0,11
Production and storage of pesticides, biocides, fungicides	270	13	0,05

	Total number of establishments in 2014	Number of major accidents in 2000-2014	Major accident per establishment
Petrochemical / oil refineries	225	87	0,39

Note: These data represent data in published and unpublished accident reports (490 reports).

Total number of establishments is in accordance with information reported by Member States to 2012-2014 reporting under Seveso II Directive.

5.1.11 Key statistical findings on reports

The key statistical conclusions that can be drawn from the analysis of the eMARS database for the period between 2000 and 2014 are as follows:

- ▶ The reported events in the eMARS database are mainly those which meet the criteria of Annex VI of the Seveso II Directive, from Seveso establishments (i.e. major accidents). Considering the unpublished data (production database), the average number of accidents (major, near miss and other) for the period 2000-2014 is 33;
- ▶ Most of the accidents reported are major accidents (421 out of the 490 total accidents reported);
- ▶ Near misses and other events are much less reported, unless this information is sought out specifically from the JRC which was the case in year 2010 and 2012. A corresponding increase in the number of near misses reported is observed in 2010, 2012 and 2013, due to increased effort in Member States to report lessons learned from such incidents;
- ▶ More accidents are reported from upper tier establishments than for lower tier establishments in the database for every year between 2000 and 2014. Upper tier establishments have generally higher hazard potential than lower tier establishments. However, it should be noted that the risk equation takes account of exposure, such that a lower tier establishment in a highly populated area may be a higher risk than an upper tier site in an area with a much lower density of inhabitants;
- ▶ There is no clear trend of either an increase or decrease in the number of accidents between 2000 and 2014. In large part, this is because the number of major accidents per year is relatively small. This is a general limitation with all disasters in trying to measure performance by counting the number of major events. Performance measurement often requires not only counting the disasters but to understanding the trends behind why accidents are still happening. The number of accidents may not be changing greatly but the reasons why, or the impacts of the accidents, could be changing. Some clues as to what causes major accidents with different substances and in different industry sectors can be found in the Lessons Learned Bulletins published by the JRC⁴⁵. Among the hazardous phenomena involved in the accidents reported in eMARS, toxic release appears to be the most frequent, and of these, atmospheric releases are the most reported;
- ▶ For the major accidents reported, the main substance categories involved, cited more at least 20 times in a single accident, are:
 - ▶ 08. Extremely flammable – note 3c, cited in 31 accidents;
 - ▶ 02. Toxic, cited in 30 accidents;
 - ▶ 01. Very toxic, cited in 24 accidents; and
 - ▶ 00. Named substances, cited in 20 accidents.
- ▶ There is no further information to understand the number of establishments at which these substances are used and whether some substances appear to be the source of relatively more

⁴⁵⁴⁵ <https://minerva.jrc.ec.europa.eu> (currently) and soon to be <https://minerva.ec.europa.eu> sometime in 2017.

accidents than others. The activities “Petrochemical / Oil Refineries” and “General Chemicals manufacture (not included above)” are the activities most often cited as the source of accidents reported. Similarly, general activity categories such as general chemical manufacture and ‘other activities’ are in the top three activities reporting major accidents. This general classification does not allow for a full appreciation of the activities it encompasses. As a result, no further understanding of the sources of major accidents is possible. This might indicate a need for further guidance to Member States on classifying the activities of their Seveso establishments; and

- ▶ The preparation, on-line publication and approval process of the reports recorded in the eMARS database may take 3 or more years on average. Therefore, statistics from the last 3 years should consider this limitation.

From the data analysis, it became clear that to perform further analysis and identify the substances and the corresponding industry contributing the most to major accidents, it would be necessary to break down the generic categories and gain a deeper understanding on the substances and categories of substances used in different establishments. This was not practicable within the scope of the current study.

5.2 Socio-economic consequences of the reported accidents

5.2.1 Methodology

The aim of this part of the project was to establish a rough estimate of the socio-economic consequences of the reported accidents. Beside the monetary aspects, it was requested to depict the associated fatalities and injuries reported in eMARS.

In the eMARS database, a total of 124 accidents are reported with socio-economic impacts in the published database. Among them, 93 accidents refer to off-site economic impact while the remainder refer to transboundary effects (6 accidents) and environmental damage (25 accidents).

5.2.2 Current situation

The eMARS database includes some fields that enable the collection of information on socio-economic consequences, in the section related to the consequences of the accident.

Good examples are the accident reports for the AZF explosion⁴⁶ and the Buncefield explosion⁴⁷. The AZF explosion accident report clearly includes the costs in the accident report, while for the Buncefield explosion, no figure is reported in the database. The lack of information for Buncefield accident is surprising because several reports and articles mention the costs related to the cleaning, the reconstruction and the value of the fuels that burned during the accident (all together valued at about €100 million⁴⁸). Other indirect costs are also reported for compensation to the companies located close to the plant, the aviation sector, the emergency response and the costs for investigation. The report from the Major Incident Investigation Board reports costs of more than £1 billion (around €1.2 billion).

These two examples show that it is possible to collect more information on socio-economic consequences if sufficient resources are allocated to this task.

⁴⁶

https://emars.jrc.ec.europa.eu/fileadmin/eMARS_Site/PhpPages/ViewAccident/ViewAccidentPublic.php?accident_code=403

⁴⁷

https://emars.jrc.ec.europa.eu/fileadmin/eMARS_Site/PhpPages/ViewAccident/ViewAccidentPublic.php?accident_code=529

⁴⁸ <http://www.hse.gov.uk/comah/buncefield/buncefield-report.pdf>,
<http://www.hse.gov.uk/comah/buncefield/miib-final-volume1.pdf>,

The British Petroleum Oil Rig Explosion (Deepwater Horizon) in 2010 may also be taken as an example⁴⁹. At the time the leak was sealed, the spill had resulted in a net loss of approximately \$61 billion to BP, \$17 billion to partners, \$13 billion to the drilling sub-industry, and \$19 billion to other integrated oil and gas firms around the world including Europe. Besides the oil industry, an important number of local economic activities were badly impacted by the oil spill such as real estate, tourism industry and commercial fishing.

Real estate values in surrounding areas of the Gulf fell to about 10 percent erasing about \$4.3 billion in value and job losses were estimated to be likely to total 1 million by 2017. Thousands of people whose livelihood depended on tourism or harvesting marine life remain unemployed as a moratorium was declared. Additional losses include loss of reputation for those involved in the accident. This and other factors are often not considered in the traditional understanding of socio-economic impacts in European databases.

5.2.3 Initiatives from Member States

France and Germany have both introduced a field to provide information on socio-economic consequences in their database, respectively in ARIA and in ZEMA. Furthermore, the UK has adopted a specific methodology on estimating costs from industrial accidents.

5.2.3.1 France

For example, in the ARIA database, the reported accidents are categorized according to four criteria as shown in Figure 5.16.

Figure 5.16 Categorisation of dangerous accidents in ARIA database



Source: ARIA accident database, BARPI

The four criteria are precisely described and they are useful for the assessment and ranking of the socio-economic impact of the accidents in a consistent manner across Europe.

5.2.3.2 Germany

The ZEMA database used in Germany provides information on the direct cost of the losses incurred as a result of accidents.

5.2.3.3 The UK

The UK Health and Safety Executive has developed a methodology for modelling the economic impacts of an accident at major hazard sites⁵⁰ that takes into account the following components:

⁴⁹ Lee, Y., & Garza-Gomez, X. (2012). Market-based approximation of the cost of non-conformance associated with the 2010 Gulf of Mexico oil spill. *Total Quality Management*, 23(2), 221-236. <http://dx.doi.org/10.1080/14783363.2011.637812>

Aryee, A. (2013). Risks of Offshore Oil Drilling: Causes and Consequences of British Petroleum Oil Rig Explosion. *Aquatic Science and Technology*, Vol. 1, 101-118. <http://dx.doi.org/10.5296/ast.v1i1.2843>

⁵⁰ <http://www.hse.gov.uk/research/rrpdf/rr1055.pdf>

- ▶ Harm to people (non-financial human costs and financial costs);
- ▶ Evacuation (immediate and long-term);
- ▶ Building damage (residential and non-residential);
- ▶ Business disruption (loss of business and relocation); and
- ▶ Emergency services.

The HSE approach can be applied in the context of the major accidents reported in eMARS to obtain a rough estimation of the costs of major accidents in the European Union.

The table below presents an average cost per site for toxic release, fire and explosion as described in the HSE guidance.

Table 5.5 Average cost per site estimated by the HSE

Phenomenon	Toxic release	Fire	Explosion
Cost per site (€ million)	176	83	246

If we take the information provided in the table below and the information reported to MAHB on number of major accidents, we can produce a first rough estimate of the average costs of the various types of accidents per site.

Table 5.6 Major accidents reported in MAHB since 2000

Year	Total Toxic Release	Fire	Explosion	Total
2000	11	16	10	37
2001	10	15	11	36
2002	10	17	20	47
2003	9	15	12	36
2004	8	8	10	26
2005	16	16	11	43
2006	16	16	12	44
2007	19	4	8	31
2008	8	10	8	26
2009	17	7	5	29
2010	20	11	15	46
2011	12	7	5	24

Year	Total Toxic Release	Fire	Explosion	Total
2012	16	8	8	32
2013	6	7	3	16
2014	1	2	3	6

Note: these data are based on the published accident reports only (389 reports)

Table 5.7 Costs associated with hazardous phenomena involved in accidents (€ million)

Year	Toxic Release (million €)	Fire (million €)	Explosion (million €)	Total (million €)	Total (billion €)
2000	1 932	1 324	2 459	5 716	5.7
2001	1 757	1 241	2 705	5 703	5.7
2002	1 757	1 407	4 918	8 082	8.1
2003	1 581	1 241	2 951	5 773	5.8
2004	1 405	662	2 459	4 527	4.5
2005	2 811	1 324	2 705	6 840	6.8
2006	2 811	1 324	2 951	7 086	7.1
2007	3 338	331	1 967	5 636	5.6
2008	1 405	828	1 967	4 200	4.2
2009	2 986	579	1 230	4 795	4.8
2010	3 513	910	3 689	8112	8.1
2011	2 108	579	1 230	3 917	3.9
2012	2 811	662	1 967	5440	5.4
2013	1 054	579	738	2 371	2.4
2014	176	166	738	1079	1.1

As a preliminary conclusion, rough estimate figures can be derived and the cost associated with accidents, involving only those types in the HSE report, is in the order of a few billion Euro per year for the European Union.

As indicated, the HSE data cover only: Harm to people (non-financial human costs and financial costs), evacuation (immediate and long-term), building damage (residential and non-residential), business disruption (loss of Business and relocation) and emergency services.

There are obviously significant uncertainties to keep in mind when considering these estimates such as:

- ▶ The averaging of costs of different phenomena within each group (fire, toxic, explosion);
- ▶ The impact on the activities of companies located in the vicinity of the accident due to cascading effects;
- ▶ All the underlying uncertainties within the model and report by HSE; and
- ▶ No account is taken of other impacts e.g. damage to the environment, the costs of remediation, the indirect impact on economic actors (for example business partners and market shares) and the loss of reputation.

However, these figures show that it is important to try to better understand the socio-economic impact of major accidents and increase the relevance of the information provided by the Member States. With better information on the socio-economic consequences, it will be possible to measure and quantify the benefits of the Seveso Directive and the extent to which these benefits outweigh the costs. This will be of value in any future evaluation of the success of the directive.

5.2.4 Perspectives

The initiatives from Member States such as France and Germany to collect information on socio-economic consequences of accidents, combined with the model provided by UK HSE show that it is possible to learn more on this issue.

The challenge remains the availability of data related to the direct damages and the indirect damages including the post-disaster period as different phases: (a) the emergency phase, (b) the rehabilitation phase and (c) the reconstruction phase.

The “direct damages” refer to the loss of assets sustained directly as a result of the catastrophe.⁵¹ Such information is often relatively simple to obtain or evaluate. However, important disruptive events produce not only immediately-apparent damage, but also unleash after-effects that slowly emerge long after the disaster has occurred. These include “indirect impacts” such as diminished productivity resulting from the loss of infrastructure and assets as well as “secondary impacts” which relate to the degradation of larger macroeconomic aggregates, which manifest themselves in indicators such as GDP and unemployment rates. Estimations of indirect impacts may not be as straightforward, as they involve dynamic flows of effects that occur over time caused by the direct impacts of a disaster⁵². These key data issues further complicate the undertaking of informed rehabilitation and reconstruction efforts.

There exists a growing body of literature devoted to the study of these underlying after-effects, the most widespread of which is the *Handbook for Estimating the Socio-economic and Environmental Effects of Disasters*⁵³ published by the ECLAC (Economic Commission for Latin America and the Caribbean).

The Handbook notes that effects from disaster (to be understood as a wide category including man-made and natural accidents) include damage to economic and social infrastructure, environmental modifications, fiscal and foreign sector imbalances, price increases, modifications to demographic structures and changes in development priorities due to replacement or loss of damaged assets. This can often lead to the delay of planned projects, some of which would have been instrumental in addressing development need.

The Handbook recommends that immediately after the emergency stage, an assessment is conducted of both the direct and indirect effects of the disaster and their consequences on the social well-being and the economic performance of the affected country or area. The methodology included in the latest version of the handbook (2003). It considers direct damages (occurring at the moment of the disaster or within the first few hours) but also notes that for slowly evolving or long-duration events direct damages may occur over an

⁵¹ De Marcellis-Warin N, Peignier I, Mouchikhine V, Mahfouf M, 2013. A Socio-Economic Cost Assessment Regarding Damages to Underground Infrastructures, CIRANO Report, 2013 RP - 21

⁵² Sharma, Suman K, 2010, Socio-Economic Aspects of Disaster's Impact: An Assessment of Databases and Methodologies, Economic Growth Centre, <http://www3.ntu.edu.sg/hss2/egc/wp/2010/2010-01.pdf>

⁵³ United Nations Economic Commission for Latin America and the Caribbean, 2003, Handbook for Estimating the Socio-economic and Environmental Effects of Disasters, http://www.preventionweb.net/files/1099_eclachandbook.pdf

extended period. Direct damages include destruction of infrastructure, buildings, installations, machinery, equipment, transport, damage to farmland and irrigation works and destruction of crops. This also considers value of loss life and injuries that can be based on valuation methods or willingness to pay methods. The Handbook recommends that indirect effects are assessed when estimating damages while noting that these are more difficult to measure in monetary terms. They cover goods and services that will not be produced due to the disaster over a five-year period. The methodology recommends also considering intangible damages such as human suffering, insecurity, solidarity, national security, etc. Finally, it notes that lost opportunities must be considered but are very difficult to calculate.

Furthermore, it would be interesting to consider other source of information such as the data held by operators, trade association, and insurance or reinsurance bodies.

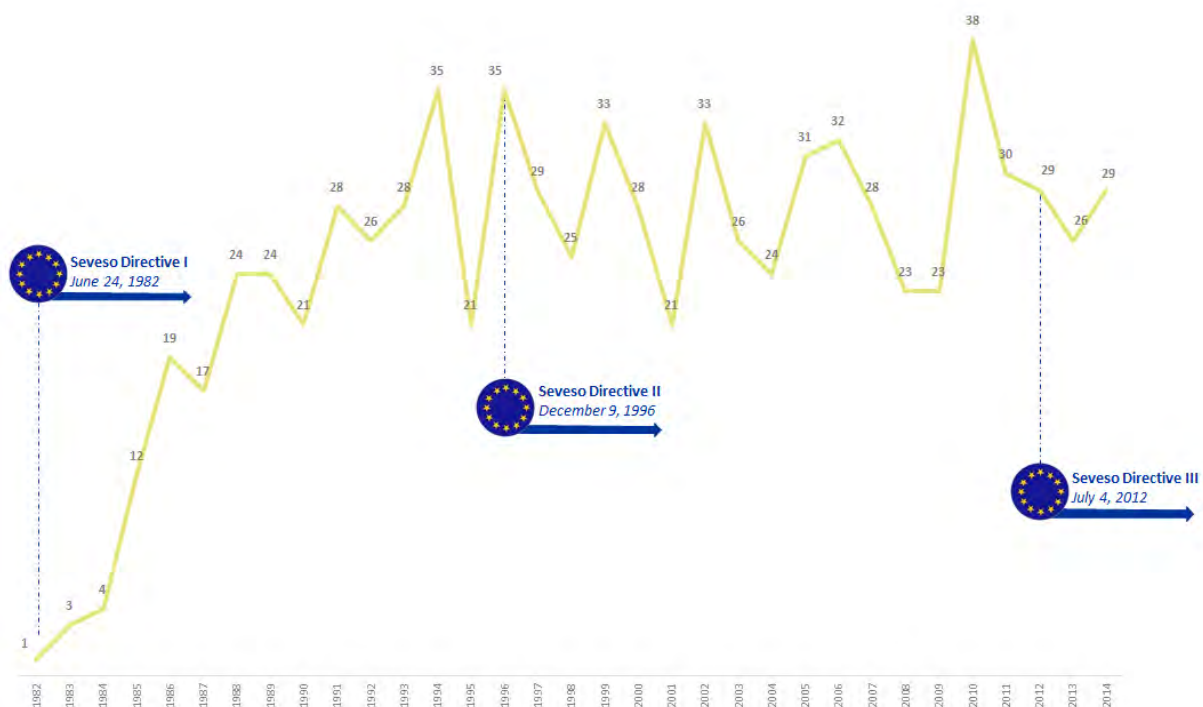
5.3 Impact of the Directive and new trends

5.3.1 Key milestones related to the prevention of major accidents

One of the aims of this project was to go beyond the usual statistical analysis and investigate the impact of the Directive by correlating, if possible, the measures taken with the trends of reported accidents, and by comparing several industry sectors in terms of accidents and fatalities.

A chart presenting the evolution of the number of major accidents over time against the key milestones of the Seveso legislation has been prepared. The chart is illustrative, rather than an accurate representation, and includes a number of uncertainties, especially since the data in 1995 are an estimate only. A correlation between the legislation and the evolution of major accidents cannot be established, due to the fact that the statistical population of major accidents is too small and the period covered is relatively short for measuring events that are in any case not high frequency. As such it is practically difficult to provide statistical evidence that chemical accident risk has been reduced over the evolution of the Seveso Directive. However, more in-depth analysis of selected accident cases, industry sectors and industry changes in industry practices, for example, might offer more insights along these lines.

Figure 5.17 Number of reported major accidents during the period 1982-2014 compared to the evolution of the Directive



Note: Data presented are from the full unpublished database (490 reports)

This chart demonstrates that the simple indicator "number of accidents" is not suitable to depict success of Seveso. It points out that further work on policy indicators is necessary.

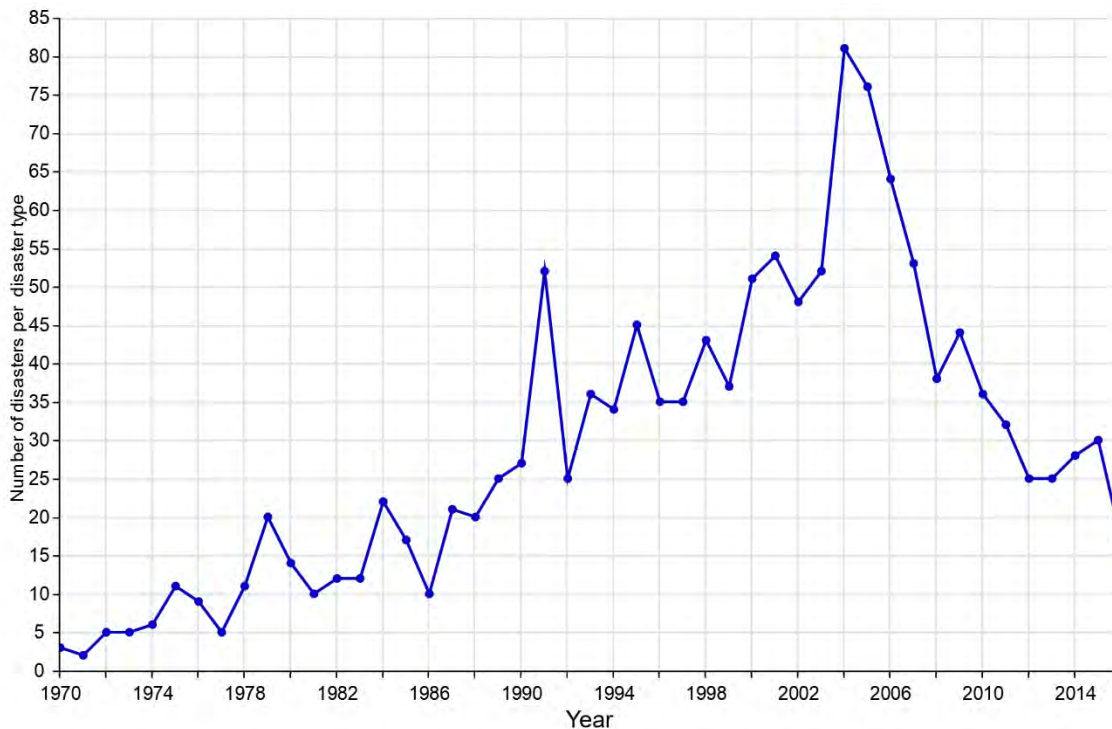
An observation made in 2004 during the PHARE twinning projects in the field of the Seveso Directive is that the first perceptible impact of the adoption of the Seveso Directive was the reduction in the amount of hazardous substances on site. Indeed, before the adoption of the Directive, there was no incentive to limit the amount of hazardous substance present. Following implementation of the Directive, plant operators often reduced quantities on site to escape coverage under the Seveso Directive.

5.3.2 Trends from the EM-DAT database

The EM-DAT database⁵⁴ also provides information on the trends in disasters for different types of disasters, periods and regions of the world.

The data provided in EM-Dat refer to disasters and when technological disasters are selected, they do not strictly correspond to the major accident definition used in the Seveso directive. We have selected the most relevant trends from the database to observe some general trends.

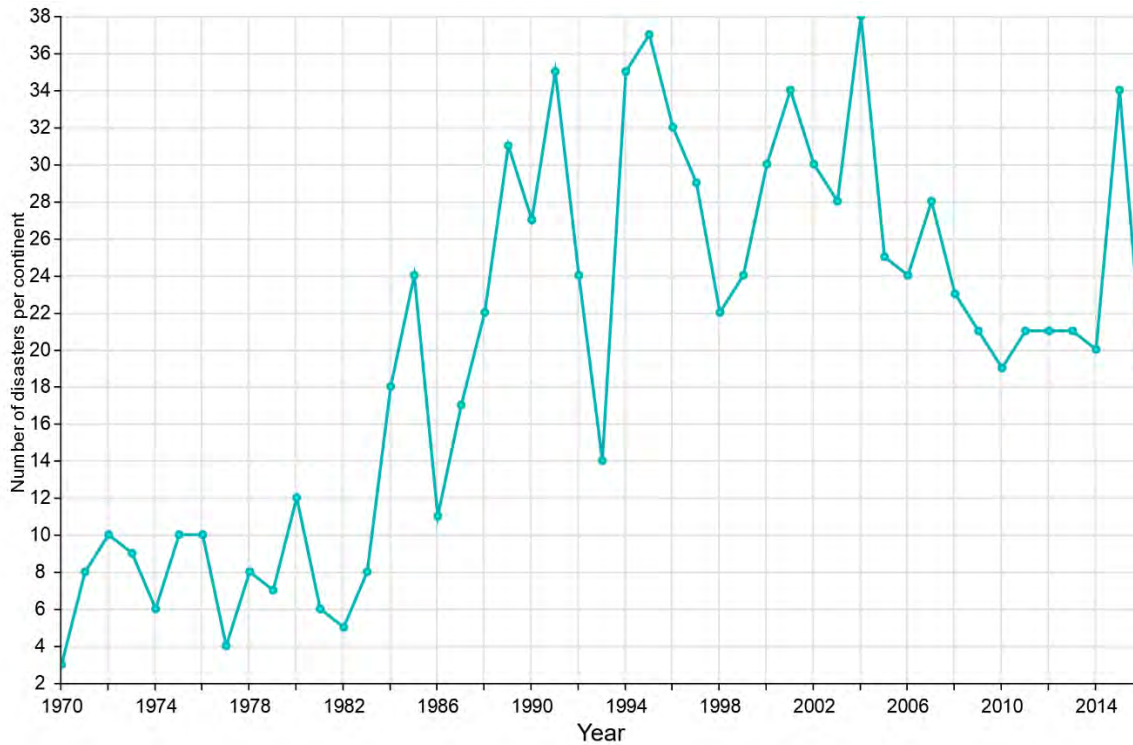
Figure 5.18 Number of reported industrial accidents in the world during the period 1970-2016



Source: EM-Dat

⁵⁴ https://www.emdat.be/disaster_trends/index.html

Figure 5.19 Number of reported industrial accidents in Europe during the period 1970-2016



Source: EM-Dat

Note: Europe includes countries of the European continent so potentially Albania, Austria, Azores Island, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Canary Island, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Lithuania, Macedonia, Moldova, Montenegro, Netherlands, Norway, Poland, Portugal, Romania, Russia, Serbia, Spain, Sweden, Switzerland, Ukraine and the United Kingdom

These data are difficult to interpret and do not suggest any perceptible trends in industrial disasters. We can only observe that after the adoption of the first Seveso Directive the number of disasters reported has increased due to the reporting requirements imposed by the Directive.

The benchmark analysis presented in Chapter 6 provides more in depth information on the trends related to major accident reporting.

5.3.3 Trends in specific sectors: example of biogas

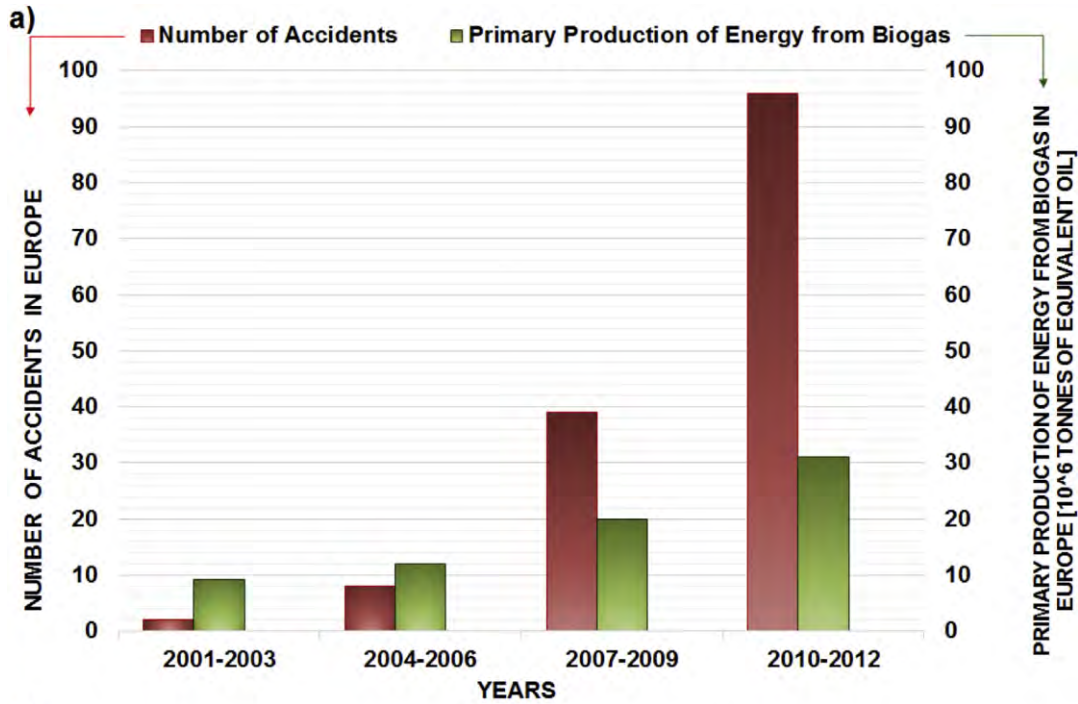
In order to identify new trends in the type of major accidents occurring at Seveso establishments, the analysis of the data provided by eMARS was complemented with the review of the literature and accident analysis performed in specific sectors of the process industry.

A recent study from Valeria Casson Moreno and Valerio Cozzani⁵⁵ presents the trends in bioenergy production. This paper indicates that some recent accidents involving the bioenergy production and feedstock supply chain raised concern over the safety of such technologies. Casson Moreno and Cozzani have performed a survey of major accidents related to the production of bioenergy (intended as biomass, bioliquids/biofuels and biogas). They have built a data repository, based on past accident reports available in the open literature and in specific databases. The data analysis has shown that major accidents have increased in recent years and their number is growing faster than bioenergy production. The results obtained represent an early warning concerning the major accident hazard of bioenergies.

⁵⁵ Valeria Casson Moreno, Valerio Cozzani, Major accident hazard in bioenergy production. *Journal of Loss Prevention in the Process Industries*, Volume 35, May 2015, Pages 135-144

Valeria Casson Moreno et al. have also performed a detailed analysis of the biogas sector⁵⁶. They show that the number of accidents in biogas production and upgrading is growing faster than the biogas production. The figure below illustrates this assertion.

Figure 5.20 Trend of accidents in biogas production and upgrading collected in the present study compared to primary production of energy from biogas

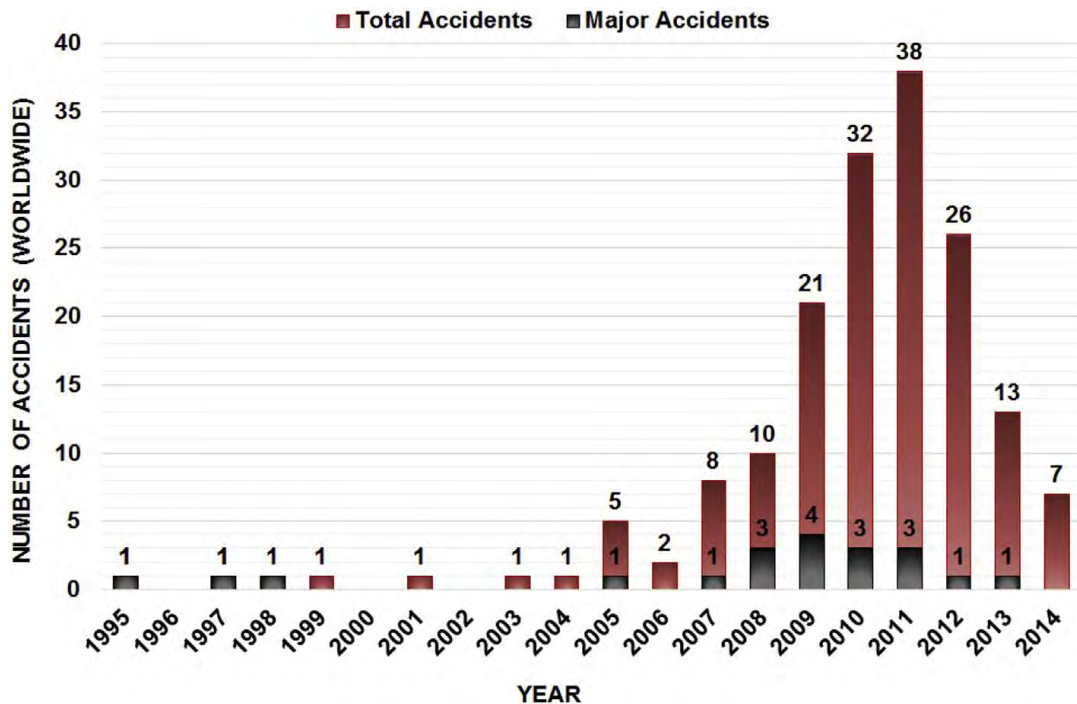


Source: Valeria Casson Moreno et al., 2016

This academic research also mentions that about 12% of the reported accidents in the biogas field should be considered as major accidents according to the Seveso Directive.

⁵⁶ Valeria Casson Moreno, Salvatore Papisidero, Giordano Emrys Scarponi, Daniele Guglielmi, Valerio Cozzani, Analysis of accidents in biogas production and upgrading. *Renewable Energy* 96 (2016), Pages 1127-1134

Figure 5.21 Distribution with respect to time of events



Source: Valeria Casson Moreno et al., 2016

As a conclusion, it is important to follow these trends within the eMARS database and to pay attention to the apparent new trend in the bioenergy sector.

New trends as illustrated with the biogas sector could be also identified for other types of accidents such as Natech accidents⁵⁷, or accidents due to threat or malevolence, but this would need substantial further investigation which is outside the scope of the current study.

5.4 Analysis of establishment data

5.4.1 Overview

This section presents the analysis of the statistical information held in the eSPIRS database. eSPIRS, the database on "Seveso Plants Information Retrieval System", allows easy visualisation of important hazard and risk related information from Seveso establishments in Europe. The information and data are collected from the EU28 Member States and Norway, Iceland and Switzerland in accordance with the Seveso II Directive. The main objective of eSPIRS is to support the Member States in their risk management related decision making processes by giving an insight into the geographical component of risk from Seveso Plants.

Several sets of data have been analysed:

- ▶ The overview of the number of upper/lower tier establishments in the period 2011 to 2014, in each Member State, and for the year 2014, a graph and a map;
- ▶ The number of upper/lower tier establishments in 2014, in each Member State, per Billion € GDP, a graph and a map;
- ▶ The number of Upper/Lower Tier Establishments in 2014, in each Member State, per Million inhabitants, a graph and a map;

⁵⁷ Natural disaster triggering technological disasters

- ▶ The number of Upper/Lower Tier Establishments in 2014, in each Member State, per 1000 km², a graph and a map; and
- ▶ The number of establishments by industry type in 2014, for all Member States.

For the eSPIRS database, the following analyses have been performed as for the analysis on the previous reporting period:

- a) The number of upper/lower tier establishments in each Member State, as a pie-chart on a map of Europe;
- b) The same numbers as a) normalised to GDP and b) to the population of each Member State;
- c) A breakdown of the number of establishments by industry type, using a representation of a pie with increasing size if the number increases; and
- d) Growth in the number of establishments during the period for each activity type, per Member State.

As for accidents statistics, a breakdown between lower tier and upper tier establishments has been given for all statistics. The only exception relates to point b) where the MAHB had indicated that the distinction of GDP per establishment category does not communicate anything meaningful.

5.4.2 Methodology and limitations

Concerning eSPIRS, the following limitations have been highlighted by the MAHB.

Table 5.8 Summary of the limitations highlighted by MAHB for eSPIRS

Data extraction done yearly in late December Comparison data on GDP, POP, and SUP derived from EUROSTAT the 19/09/2016
In the former reporting period, data on lower-tier establishments for Greece were not present
The growing trend should consider also the contribution of the Member States that joined the EU as from 2000 (enlargements in 2004, 2007 and 2013). Croatia did not contribute to the eSPIRS database in 2013. It is unclear why Croatia did not report from the date of its accession in 2013. As such data are only available for 27 Member States.
Chemical activities have been grouped altogether in a single category as 'other'
Some dis-homogeneity in the names has been corrected
The NACE activities for Belgium have been normalised to the eSPIRS table
The activity "Processing of non-ferrous metals (foundries, smelting, etc.)" has been renamed, as in the corresponding 2014 activity "Processing of metals".

5.4.3 Upper and lower tier establishments in the period 2011 to 2014

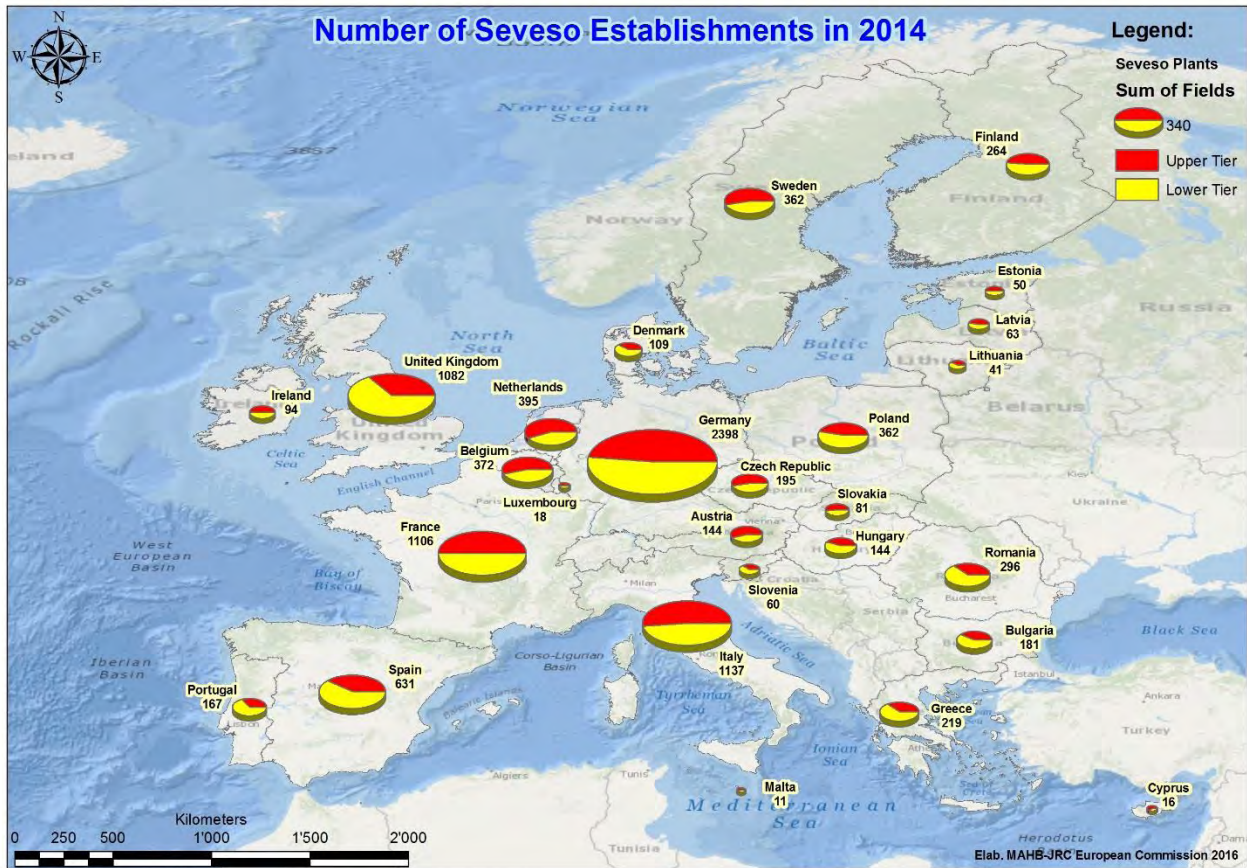
Tables are presented in Appendix D with the number of upper and lower tier establishments for each Member State as reported in eSPIRS, including a weighting by GDP and by population. When compared with the data reported by Member States at the end of the 2014 we noticed that while the number of establishments (lower and upper tiers) are similar, these are not identical. More information on this is presented in Table 4.4.

Data held in eSPIRS on the number of upper tier and lower tier establishments in each Member State is presented below in a map of Europe with pie-charts increasing in dimension with the number of establishments. Germany has the highest number of Seveso establishments, with 1 160 upper tier and 1 238 lower tier establishments. It is followed by France, Italy and the United Kingdom, each with about 1 100 establishments.

The tables with data used for the creation of the maps are presented in Appendix E.

The total number of Seveso establishments in 2014 was 9 998, which is an increase compared to the number in 2011 which was 9 449. Note that these numbers differ compared to those in the member states' reporting, as described earlier in this report. See Figure 4.1 for the evolution of the number of establishments in each Member State.

Figure 5.22 Map for number of Seveso Upper Tier, Lower Tier and total in 2014



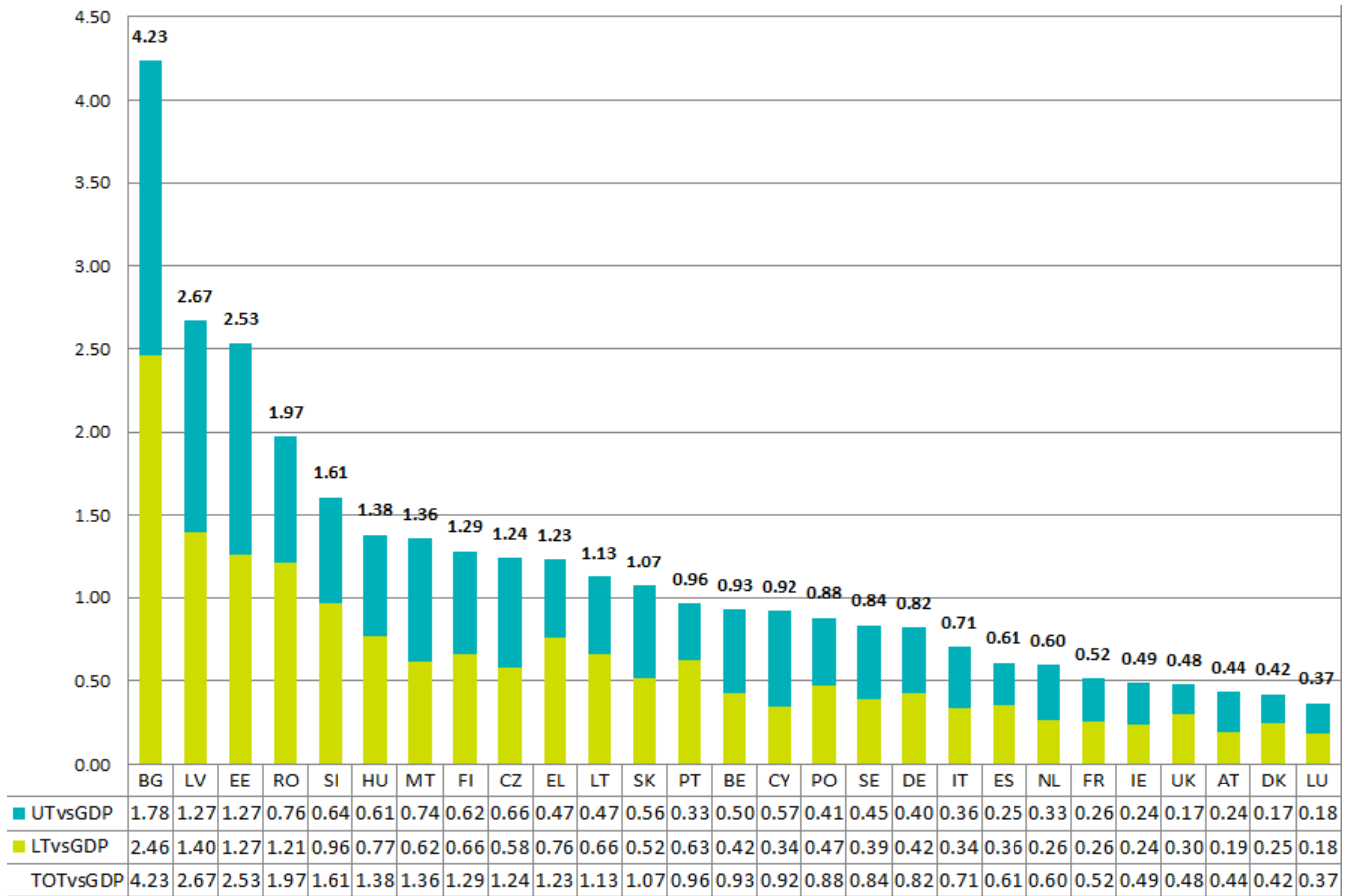
Source: European Commission, JRC, 2016

Note: Map format does not allow to present historic development on number of establishments

5.4.4 Upper and lower tier establishments in 2014, in each Member State, per Billion € GDP

The figure below presents the number of Seveso establishments per billion € GDP at market price in each country.

Figure 5.23 Number of Seveso Establishments in 2014 per Billion € GDP



Source: European Commission, JRC, 2016

Here Bulgaria, Latvia and Estonia lead with respectively 4.23, 2.67 and 2.53 Seveso establishments per billion € GDP at market price. Germany, which has the most establishments overall, is ranked number 18 out of the 27 Member States⁵⁸.

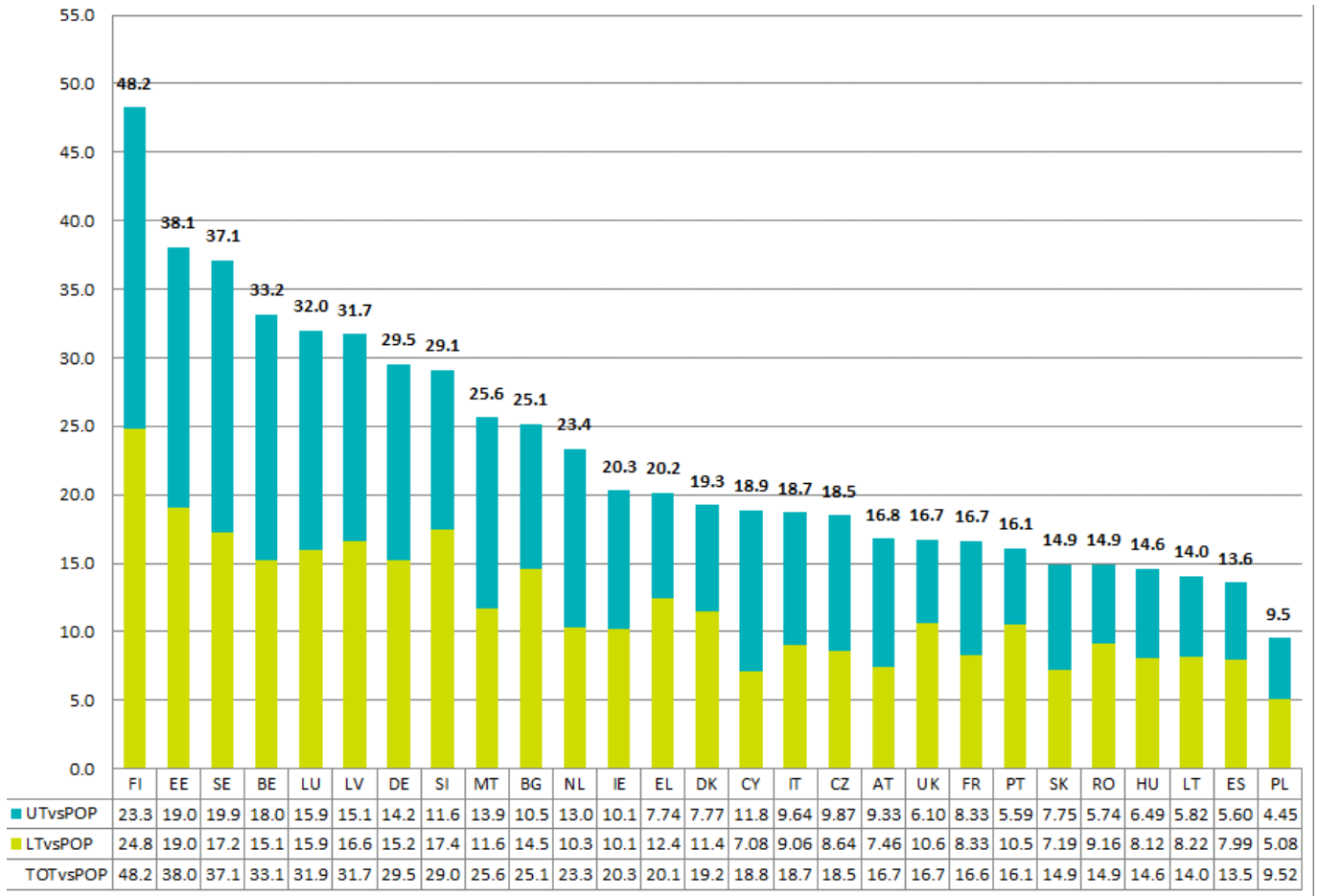
This graph shows that Member States with high GDP (i.e. DE, BE, IT, ES, NL, FR, UK) have proportionally fewer Seveso establishments than the countries with lower GDP. It is not clear why this is the case, one possible explanation would be that the contribution of industrial activities in high GDP countries is relatively less important than the contribution from the service sector hence ranking lower.

5.4.5 Upper and lower tier establishments in 2014, per million inhabitants

The figure below shows number of establishments per million inhabitants distinguishing between upper and lower tier establishments.

⁵⁸ Croatia did not contribute to the eSPIRS database in 2013.

Figure 5.24 Number of Seveso Establishments in 2014 per Million inhabitants



Source: European Commission, JRC, 2016

As can be observed, Finland leads with 48.2 Seveso establishments per million inhabitants, followed by Estonia, and Sweden.

Germany which is the country with the highest number of establishments is ranked 7th. France, Italy and the UK are respectively in positions 20, 19 and 16 among the 27 Member States⁵⁹.

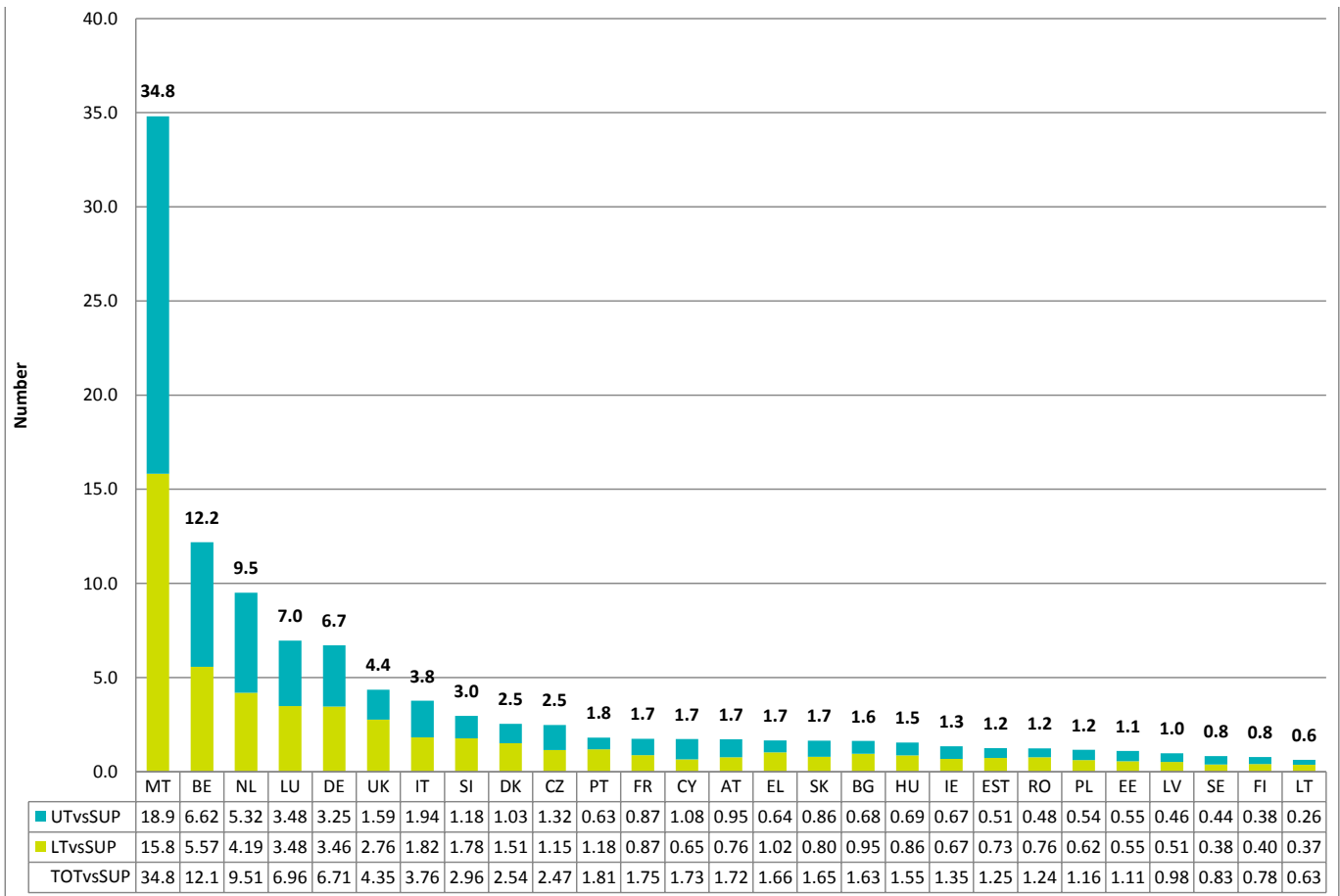
Rather than comparing the establishments to population, it is would be valuable to consider the population density around Seveso plants and in the hazard zones of the plants. This would depict the actual population which is the most exposed to risk from Seveso establishments. However, there is no data available on this aspect.

5.4.6 Upper and lower tier establishments per 1000 km²

The figure below shows the number of Seveso establishments per 1000 km² per Member State.

⁵⁹ Croatia did not contribute to the eSPIRS database in 2013.

Figure 5.25 Number of Seveso Establishments in 2014 per 1 000 km²



Source: European Commission, MAHB, 2016

Malta has by far the highest concentration of Seveso establishments, with 34.81 establishments per 1 000 km². It is followed by Belgium, The Netherlands, Luxembourg and Germany. For the majority of Member States (20 out of 27⁶⁰) there are fewer than 3 Seveso establishments per 1 000 km².

Looking at Finland which was the country with the highest number of Seveso establishments in 2014 per million inhabitants, we see that here they are among the countries with the lowest density of Seveso establishments. Thus, it is difficult to derive from these statistics where people are most exposed to risk from Seveso sites. This would require a deeper analysis with a Geographic Information System (GIS) looking at the population in the hazard zones around Seveso establishments.

5.4.7 Breakdown of the number of establishments by industry type

The table below presents the number of establishments per activity. The top 6 activities contribute more than 5% each, and together contribute almost 50% of the number of establishments.

Table 5.9 Number of Seveso establishments in 2014 by Industry Type (Activity)

Industry Type	Number of establishments	%
Fuel storage (including heating, retail sale, etc.)	1 238	12.38%
Wholesale and retail storage and distribution (excluding LPG)	831	8.31%

⁶⁰ Croatia did not contribute to the eSPIRS database in 2013.

Industry Type	Number of establishments	%
Chemical installations	804	8.04%
General chemicals manufacture (not included above)	698	6.98%
LPG storage	662	6.62%
Power generation, supply and distribution	630	6.30%
Production of basic organic chemicals	479	4.79%
Processing of metals using electrolytic or chemical processes	472	4.72%
Production, destruction and storage of explosives	452	4.52%
LPG production, bottling and bulk distribution	420	4.20%
Plastic and rubber manufacture	352	3.52%
Other activity (not included above)	298	2.98%
Production and storage of pesticides, biocides, fungicides	270	2.70%
Petrochemical / Oil Refineries	225	2.25%
Handling and transportation centres (ports, airports, lorry parks, marshalling yards, etc.)	220	2.20%
Production and storage of fertilizers	219	2.19%
Processing of ferrous metals (foundries, smelting, etc.)	206	2.06%
Manufacture of food products and beverages	204	2.04%
Waste storage, treatment and disposal	181	1.81%
Production of pharmaceuticals	142	1.42%
LNG storage and distribution	134	1.34%
General engineering, manufacturing and assembly	125	1.25%
Agriculture	116	1.16%
Production and manufacturing of pulp and paper	111	1.11%
Production and storage of fireworks	107	1.07%
Processing of metals	80	0.80%
Water and sewage (collection, supply, treatment)	69	0.69%
Electronics & electrical engineering	44	0.44%
Ceramics (bricks, pottery, glass, cement, etc.)	43	0.43%
Manufacture of glass	41	0.41%
Wood treatment and furniture	29	0.29%
Mining activities (tailings & physicochemical processes)	23	0.23%
Medical, research, education (including hospitals, universities, etc.)	22	0.22%
Building & works of engineering construction	15	0.15%

Industry Type	Number of establishments	%
Manufacture of cement, lime and plaster	14	0.14%
Shipbuilding, shipbreaking, ship repair	12	0.12%
Textiles manufacturing and treatment	7	0.07%
Leisure and sport activities (e.g. ice rink)	3	0.03%
Total	9998	100.00%

Source: European Commission, JRC, 2016

A comparison was undertaken between the data held in eSPIRS database and those reported by Member States as part of the triannual report. As shown below, the numbers reported as part of the triannual reporting are consistently lower than those from the eSPIRS database but generally within the same range. The differences are thought to be from those Member States that chose the option to report activities using NACE categories rather than Seveso categories in their response to question 1.c (see further details in Section 3.3.3). Indeed, NACE reporting was opted for by Belgium, Croatia, Germany, Netherlands, Sweden and the UK which account all together for more than 5 400 establishments.

Table 5.10 Comparison of number of establishments held in eSPIRS database and reported to the 2012-2014 reporting

Industry Type	Number of establishments eSPIRS	Number of establishments reporting using eSPIRS classification for 2012-2014 reporting
Fuel storage (including heating, retail sale, etc.)	1 238	650
Wholesale and retail storage and distribution (excluding LPG)	831	553
Chemical installations	804	298
General chemicals manufacture (not included above)	698	763
LPG storage	662	233
Power generation, supply and distribution	630	312
Production of basic organic chemicals	479	53
Processing of metals using electrolytic or chemical processes	472	207
Production, destruction and storage of explosives	452	242
LPG production, bottling and bulk distribution	420	233
Plastic and rubber manufacture	352	120
Other activity (not included above)	298	851
Production and storage of pesticides, biocides, fungicides	270	156
Petrochemical / Oil Refineries	225	142
Handling and transportation centres (ports, airports, lorry parks, marshalling yards, etc.)	220	99

Industry Type	Number of establishments eSPIRS	Number of establishments reporting using eSPIRS classification for 2012-2014 reporting
Production and storage of fertilizers	219	156
Processing of ferrous metals (foundries, smelting, etc.)	206	64
Manufacture of food products and beverages	204	96
Waste storage, treatment and disposal	181	123
Production of pharmaceuticals	142	75
LNG storage and distribution	134	57
General engineering, manufacturing and assembly	125	44
Agriculture	116	46
Production and manufacturing of pulp and paper	111	56
Production and storage of fireworks	107	97
Processing of metals	80	52
Water and sewage (collection, supply, treatment)	69	62
Electronics & electrical engineering	44	19
Ceramics (bricks, pottery, glass, cement, etc.)	43	29
Manufacture of glass	41	20
Wood treatment and furniture	29	17
Mining activities (tailings & physicochemical processes)	23	26
Medical, research, education (including hospitals, universities, etc.)	22	1
Building & works of engineering construction	15	3
Manufacture of cement, lime and plaster	14	12
Shipbuilding, shipbreaking, ship repair	12	5
Textiles manufacturing and treatment	7	7
Leisure and sport activities (e.g. ice rink)	3	0
Total	9 998	5 979

Source: European Commission, JRC, 2016

The table below presents the evolution of the number of Seveso establishments in 2012, 2013 and 2014 by Industry Type (Activity).

Table 5.11 Number of Seveso establishments in 2012, 2013 and 2014 by Industry Type (Activity)

Industry Type	Nb 2012	% 2012	Nb 2013	% 2013	Nb 2014	% 2014	Variation 2012/2014
Agriculture	68	0.72%	113	1.13%	116	1.16%	71%
Building & works of engineering construction	16	0.17%	41	0.41%	15	0.15%	-6%
Ceramics (bricks, pottery, glass, cement, etc.)	50	0.53%	47	0.47%	43	0.43%	-14%
Chemical installations	792	8.37%	810	8.12%	804	8.04%	2%
Electronics & electrical engineering	51	0.54%	45	0.45%	44	0.44%	-14%
Fuel storage (including heating, retail sale, etc.)	1083	11.45%	1231	12.34%	1238	12.38%	14%
General chemicals manufacture (not included above)	600	6.34%	694	6.95%	698	6.98%	16%
General engineering, manufacturing and assembly	131	1.39%	122	1.22%	125	1.25%	-5%
Handling and transportation centres (ports, airports, lorry parks, marshalling yards, etc.)	149	1.58%	167	1.67%	220	2.20%	48%
Leisure and sport activities (e.g. ice rink)	2	0.02%	3	0.03%	3	0.03%	50%
LNG storage and distribution	124	1.31%	132	1.32%	134	1.34%	8%
LPG production, bottling and bulk distribution	429	4.54%	420	4.21%	420	4.20%	-2%
LPG storage	696	7.36%	666	6.67%	662	6.62%	-5%
Manufacture of cement, lime and plaster	12	0.13%	13	0.13%	14	0.14%	17%
Manufacture of food products and beverages	205	2.17%	202	2.02%	204	2.04%	0%
Manufacture of glass	46	0.49%	39	0.39%	41	0.41%	-11%
Medical, research, education (including hospitals, universities, etc.)	24	0.25%	21	0.21%	22	0.22%	-8%
Mining activities (tailings & physicochemical processes)	20	0.21%	22	0.22%	23	0.23%	15%
Other activity (not included above)	276	2.92%	285	2.86%	298	2.98%	8%
Petrochemical / Oil Refineries	238	2.52%	234	2.34%	225	2.25%	-5%
Plastic and rubber manufacture	368	3.89%	362	3.63%	352	3.52%	-4%
Power generation, supply and distribution	479	5.07%	625	6.26%	630	6.30%	32%
Processing of ferrous metals (foundries, smelting, etc.)	104	1.10%	112	1.12%	206	2.06%	98%
Processing of metals	184	1.95%	174	1.74%	80	0.80%	-57%
Processing of metals using electrolytic or chemical processes	396	4.19%	457	4.58%	472	4.72%	19%
Production and manufacturing of pulp and paper	113	1.19%	112	1.12%	111	1.11%	-2%
Production and storage of fertilizers	219	2.32%	217	2.17%	219	2.19%	0%
Production and storage of fireworks	106	1.12%	107	1.07%	107	1.07%	1%

Industry Type	Nb 2012	% 2012	Nb 2013	% 2013	Nb 2014	% 2014	Variation 2012/2014
Production and storage of pesticides, biocides, fungicides	268	2.83%	270	2.71%	270	2.70%	1%
Production of basic organic chemicals	482	5.10%	479	4.80%	479	4.79%	-1%
Production of pharmaceuticals	147	1.55%	143	1.43%	142	1.42%	-3%
Production, destruction and storage of explosives	398	4.21%	423	4.24%	452	4.52%	14%
Shipbuilding, shipbreaking, ship repair	12	0.13%	12	0.12%	12	0.12%	0%
Textiles manufacturing and treatment	6	0.06%	7	0.07%	7	0.07%	17%
Waste storage, treatment and disposal	171	1.81%	179	1.79%	181	1.81%	6%
Water and sewage (collection, supply, treatment)	70	0.74%	69	0.69%	69	0.69%	-1%
Wholesale and retail storage and distribution (excluding LPG)	892	9.43%	895	8.97%	831	8.31%	-7%
Wood treatment and furniture	30	0.32%	29	0.29%	29	0.29%	-3%
Total	9 457	100.00%	9 979	100.00%	9 998	100.00%	6%

Source: European Commission, JRC, 2016

In total, between 2012 and 2014, there has been an increase of 541 new establishments included in the eSPIRS database. The activities where the number of establishments is growing are (variation in %, and variation in absolute number):

- ▶ Processing of ferrous metals (foundries, smelting, etc.): +98% (+102)⁶¹;
- ▶ Agriculture: +71% (+48);
- ▶ Fuel storage (including heating, retail sale, etc.): +14% (+155);
- ▶ Production, destruction and storage of explosives: +14% (+54);
- ▶ Handling and transportation centres (ports, airports, lorry parks, marshalling yards, etc.): +48% (+71); and
- ▶ Power generation, supply and distribution: +32% (+151).

The activities where the number of establishments is reducing are:

- ▶ Processing of metals: -57% (-104)⁶³;
- ▶ Ceramics (bricks, pottery, glass, cement, etc.): -14% (-7);
- ▶ Electronics & electrical engineering: -14% (-7); and
- ▶ Manufacture of glass: -11% (-5).

From the above figures and data, it appears that the new Seveso establishments that have been created are mainly related to the production of energy (fuel storage and power generation) and agriculture. This in part reflects ongoing technological and legislative development of new energy sources such as biogas. In some Member States (e.g. Germany) recent legislation has contributed to the development of biogas

⁶¹ These figures may not represent a substantive change, but rather are more likely to be a re-classification of existing installations from "Processing of metals" to "Processing of ferrous metals" by one or more countries.

establishments which may be reflected in these data. Other factors will also affect the changes, including not only changes to the industry sectors themselves, but also changes to reporting.

5.4.8 Analysis of a typical Seveso establishment

Part of the scope of work for this report is an analysis of the typical size of Seveso establishments, i.e. whether they are small, medium, large or multi-national enterprises. The primary objective of this is to allow for a better assessment of whether more specific or different measures are necessary for SMEs and to better assess the related administrative burden. It was originally envisaged that this data would be available from a centralised database; however, in practice no such database exists and therefore an alternative approach was required.

There are few data available on the number of employees or financial data (e.g. turnover) of Seveso establishments. Neither of these are included in the reporting under eSPIRS or in other reporting.

Undertaking a detailed survey of Seveso establishments was not considered feasible within the resources available for this study. In any case, the practicalities of identifying an appropriate sample of establishments (across sectors, member states, etc.) and of obtaining information on their company size (employees, turnover, etc.) were identified as barriers to obtaining relevant information within the scope of this study. Therefore, a review of existing literature was undertaken in order to identify existing estimates.

While no EU-wide information was identified, some sector-specific or Member State specific data were found on typical sizes of Seveso establishments.

In 2008, a study led by EU-VRi on the effectiveness of the Seveso II Directive performed a survey of competent authorities and Seveso establishments⁶². The survey is thought to have covered around 800 Seveso sites. It found that:

- ▶ 68% of operators responding were part of a large company with multinational sites;
- ▶ 16% of operators were SMEs; and
- ▶ 16% of operators were independent (i.e. not a multinational) but not SMEs.

These data were used as part of the Impact Assessment prior to the adoption of the Seveso III Directive. This indicated that generally there was no link allowing one to conclude that lower tier establishments are typically or more likely to be SMEs. However, for the metal finishing industry, data was available from the industry association to show that most of these are upper tier and SMEs⁶³.

In the UK, an impact assessment was conducted in 2015 to assess the changes from the Seveso III Directive⁶⁴. As part of the impact assessment a survey was conducted throughout the UK to understand the share of sites that were small, medium or large businesses. The survey found the following:

- ▶ 47% of the Seveso establishments are small (1-49 employees);
- ▶ 33% of the establishments are medium sized (50 – 249 employees); and
- ▶ 21% of the establishments are large sized (250 + employees).

However, 72% of the sites surveyed also indicated that they were part of an organisation rather than being a unique site. As such, the UK refined the results of the survey and concluded that:

- ▶ 13% of the sites were genuinely small operators, with others being small sites but part of a multiple site business;
- ▶ 9% of the sites are genuinely medium sized, with others being medium sites part of a multiple site business; and

⁶² http://ec.europa.eu/environment/seveso/pdf/seveso_report.pdf

⁶³ http://ec.europa.eu/environment/seveso/pdf/Seveso%20IA_Final%20report.pdf

⁶⁴ <http://consultations.hse.gov.uk/gf2.ti/f/19778/527557.1/PDF/-/cd266.pdf>.

- ▶ 78% of the sites are from large companies.

The above data appear to be in reasonable agreement, i.e. that around 80% of establishments are large companies and around 20% are small or medium sized. However, more comprehensive data would allow for a more robust estimate of this.

It is recommended that criteria related to the size of the Seveso establishments could be considered for inclusion in the new template for data collection for eSPIRS, so that exact figures might be derived from the future eSPIRS database.

5.4.9 Potential impact of Seveso III Directive on number of establishments

The impact assessment conducted when revising the Seveso II Directive and prior to the adoption of the Seveso III Directive considered potential impacts⁶⁵. It concluded that the impact of Seveso III was expected to be quite limited and that the number of establishments affected by the change in classification ranges from 400 to a maximum of 650 firms. In addition, it was estimated that a maximum of 350 new sites could be covered, and around 400 could fall out of scope.

Unfortunately, there is no complete dataset available to understand the impact of the Seveso III Directive on the number of establishments across all Member States.

Some partial estimates were identified in a recent study on 'Analysis of the likelihood, risks and consequences of major accidents involving category acute toxic 3 dermal substances and assessment of the impact of covering this category under Seveso'⁶⁶. The study attempted to estimate the number of these installations that were already covered by the Seveso II Directive and those that would be covered in addition due to the extension of the scope of the Directive. As part of the study data was requested from Member States and stakeholders which reported the following:

- ▶ For Germany, an industry estimated 110 additional establishments could come under the scope of the Directive split evenly between lower and upper tier establishments; and
- ▶ For UK, the competent authorities estimated that 55 establishments could come under the scope of the Directive.

Furthermore, a recent study conducted on the evaluation of the CLP Regulation⁶⁷ as part of the Fitness Check of the chemical legislation (except REACH) focused a case study on the Seveso Directive. Stakeholders were asked to share information on the impact of the changes made by the Seveso III Directive. Most reported that it was impossible to indicate whether there will be significant changes to the number of installations due to the introduction of CLP into Seveso III, while some stated that it is more likely that there will be an increase (rather than a decrease) due to new data on substances from REACH-registrations resulting in reclassifications of some substances.

5.4.10 Key statistical findings from eSPIRS

The key statistical conclusions that can be drawn from the analysis of eSPIRS data for 2014, keeping in mind the important remarks made by MAHB, are as follows:

- ▶ There were 9 998 Seveso establishments in the 27 Member States in 2014; of these 5 296 were lower tier establishments and 4 702 were upper tier establishments;

⁶⁵ Commission Staff Working Paper Impact Assessment Accompanying document to the Proposal for a Directive of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances COM(2010) 781 final SEC(2010) 1591 final, /* SEC/2010/1590 final */ <http://eurlex.europa.eu/legal-content/EN/ALL/?uri=CELEX:52010SC1590>

⁶⁶ <http://ec.europa.eu/environment/seveso/pdf/final%20report.pdf>

⁶⁷ Study on the regulatory fitness of the legislative framework governing the risk management of chemicals (excluding REACH), in particular the CLP Regulation and related legislation, report by RPA for the European Commission DG Environment, 2017.

- ▶ Germany is the country with the highest number of Seveso establishments, with 1 160 upper tier and 1 238 lower tier establishments. It is followed by France, Italy and the United Kingdom, each with about 1 100 establishments;
- ▶ If one takes the number of Seveso establishments per billion € GDP at market price in each country, Bulgaria, Latvia and Estonia lead with respectively 4.23, 2.67 and 2.53 Seveso establishments per billion € GDP. Germany, which has the most establishments overall, is ranked number 18 out of the 27 Member States;
- ▶ Considering the number of Seveso establishments per million inhabitants, Finland has the most, with 48.2 Seveso establishments per million inhabitants, followed by Estonia, and Sweden; and
- ▶ In terms of density of Seveso establishments, Malta has the highest concentration of Seveso establishments, with 34.81 establishments per 1000 km². Then follow Belgium, The Netherlands, Luxembourg and Germany. 20 of 27 countries have fewer than 3 Seveso establishments per 1000 km².

Among the 49 activities used to categorise the Seveso establishments, 6 activities contribute almost 50% of the number of Seveso establishments. These 6 categories are:

- ▶ Fuel storage (including heating, retail sale, etc.): 12.38%;
- ▶ Wholesale and retail storage and distribution (excluding LPG): 8.31%;
- ▶ Chemical installations: 8.04%;
- ▶ General chemicals manufacture (not included above): 6.98%;
- ▶ LPG storage: 6.62%; and
- ▶ Power generation, supply and distribution: 6.30%.

6 Benchmarking

6.1 Overview

The purpose of this section is to assess the broader context of major accidents, by providing a brief comparison of the current situation and progress made in the European Union related to major-accident-hazard policies and in particular prevention, with those in other major and emerging economies

Within the OECD, and in particular the working group on Chemical Accidents, Europe has often been a pioneer and a leader for the development of legislation and the promotion of good practices for the prevention of major-accident-hazards. In that context, it is interesting and useful to review the progress made by the European Union in comparison to the progress made by other countries (including from the OECD).

The assessment of European policy has to be put in the context of wider international legislation in order to assess the ambition and achievements of EU policies against those of similar economies and other countries that have developed rapidly in recent decades. Also, the general approach of the Seveso III Directive can be compared with that of other policies (i.e. goal setting and/or description of prevention/response techniques). This is of utmost relevance, especially considering that industrial accidents occurring in the EU may affect other countries and vice versa. In this respect, benchmarking EU policy on industrial accidents with other countries of the world facilitates the alignment with international initiatives such as the Convention on the Transboundary Effects of Industrial Accidents.

This Task presents background research based on literature review and similar activities. The objective is to allow the Commission to have an initial idea of where European policy on the prevention of industrial accidents stands and to identify potential priority areas of attention for future work.

6.2 Description of the methodology

The benchmarking of major accidents within the EU and in other developed or developing countries required a high quality of data processing. However, the eMARS database is not exhaustive for the EU and such a database does not exist in other countries or regional federations. For comprehensiveness, the data from different accident databases have been cross-checked and compared.

The methodology applied consisted of five steps:

- ▶ 1st step: Identification of the accident databases;
- ▶ 2nd step: Cleaning and compilation of the data;
- ▶ 3rd step: Compilation of the number of reported major accidents;
- ▶ 4th step: Building meaningful statistics; and
- ▶ 5th step: Analysis of the statistics.

6.2.1 1st step: Identification of the accident databases

The main industrial accident databases throughout the world were reviewed and consulted. The most relevant criteria for describing an industrial accident database were selected, such as: the name and the acronym, the date of creation, the URL link of the database's website, the author, the editor, the sources of information, the period of the data collection, the amount and the type of data.

In total, nine industrial accident databases were selected and further considered for the study, because they provide data for the countries selected for the benchmarking. These nine databases are presented in the table below.

Table 6.1 Overview of the databases identified

Name of the databases	Description	Geographical coverage
	The Analysis, Research and Information on Accidents Database (ARIA) operated by the French Bureau for Analysis of Industrial Risks and Pollutions (BARPI); http://www.aria.developpement-durable.gouv.fr/rechercher-un-accident	Mainly France and Europe, but well documented for accidents anywhere worldwide
	The Chemical Safety and Hazard Investigation operated by the US Chemical Safety Board (CSB); http://www.csb.gov/investigations	Mainly USA
	The Major Accident Reporting System (eMARS) operated by the EU Major Accident Hazards Bureau (MAHB); https://emars.jrc.ec.europa.eu/?id=4	Mainly European Union and some OECD countries
	The Emergency Events Database (EM-DAT) operated by the Centre for Research on the Epidemiology of Disasters (CRED); http://www.emdat.be/database	Worldwide
	The Failure and Accidents Technical Information System (FACTS) operated by Unified Fire Department (GB); http://www.factsonline.nl/browse-chemical-accidents-in-database	Worldwide
	The Failure Knowledge Database (FKD) operated by Japan Science and Technology Agency (JST); http://www.sozogaku.com/fkd/en	Mainly Japan
	The Relational Information System for Chemical Accidents Database operated by National Institute of Advanced Industrial Science and Technology(AIST); https://riscad.aist-riss.jp/?lang=en	Mainly Japan
	The Process Safety Incident Database (PSID) operated by the Center for Chemical Process Safety (CCPS). http://www.psidnet.com/	Mainly USA
	The Central Reporting and Evaluation Office for Accidents and Incidents in Process Plant (ZEMA) operated by the German Federal Environment Office. http://www.infosis.uba.de/index.php/de/site/12981/zema/index.html	Mainly Germany

6.2.2 2nd step: Cleaning and compilation of the data

In order to obtain statistics on major accidents in the EU and the benchmarked countries between 2000 and 2014, data from the selected industrial accident databases were collected.

In order to allow the benchmark on reported major accidents in Europe (based on eMARS) and in the other countries, the key issue was to identify in the selected databases the major accidents.

A “major accident” is defined according to Article 3.12 of the Seveso III Directive as:

‘major accident’ means an occurrence such as a major emission, fire, or explosion resulting from uncontrolled developments in the course of the operation of any establishment covered by this Directive, and leading to serious danger to human health or the environment, immediate or delayed, inside or outside the establishment, and involving one or more dangerous substances’.

Practically, the quantitative criteria that are used to notify a major accident, as mentioned in Annex VI of the Seveso III Directive, are commonly used to characterise a major accident.

Excerpt from the Seveso III Directive
ANNEX VI
Criteria for the notification of a major accident to the Commission as provided for in Article 18(1)
I. Any major accident covered by paragraph 1 or having at least one of the consequences described in paragraphs 2, 3, 4 and 5 must be notified to the Commission.
1. Dangerous substances involved
Any fire or explosion or accidental discharge of a dangerous substance involving a quantity of at least 5 % of the qualifying quantity laid down in Column 3 of Part 1 or in Column 3 of Part 2 of Annex I.
2. Injury to persons and damage to real estate:
(a) a death;
(b) six persons injured within the establishment and hospitalised for at least 24 hours;
(c) one person outside the establishment hospitalised for at least 24 hours;
(d) dwelling(s) outside the establishment damaged and unusable as a result of the accident;
(e) the evacuation or confinement of persons for more than 2 hours (persons × hours): the value is at least 500; and
(f) the interruption of drinking water, electricity, gas or telephone services for more than 2 hours (persons × hours): the value is at least 1 000.
3. Immediate damage to the environment:
(a) permanent or long-term damage to terrestrial habitats:
(i) 0,5 ha or more of a habitat of environmental or conservation importance protected by legislation;
(ii) 10 or more hectares of more widespread habitat, including agricultural land;
(b) significant or long-term damage to freshwater and marine habitats:
(i) 10 km or more of river or canal;
(ii) 1 ha or more of a lake or pond;
(iii) 2 ha or more of delta; and
(iv) 2 ha or more of a coastline or open sea.
(c) significant damage to an aquifer or underground water:
1 ha or more.
4. Damage to property:
(a) damage to property in the establishment: at least EUR 2 000 000; and
(b) damage to property outside the establishment: at least EUR 500 000.
5. Cross-border damage
Any major accident directly involving a dangerous substance giving rise to effects outside the territory of the Member State concerned.

These criteria are only applied in the EU. So, a specific methodology has been developed for selecting only the major accidents from the other databases to compare with the content of eMARS.

It is important to note that the major accidents reported in eMARS are the accidents corresponding to the criteria for reporting (Annex VI of the Directive) and that take place at industrial establishments that are in the scope of the Seveso Directive.

6.2.2.1 eMARS

eMARS (<https://emars.jrc.ec.europa.eu/?id=4>)

The MARS (Major Accident Reporting System) database is held by the MAHB (EU Major Accident Hazards Bureau) and centralises major industrial accidents involving dangerous substances from the Member States of the European Union as defined by the SEVESO II directive in the EU.

The Major Accident Reporting System (MARS and later renamed eMARS when it became available online) was first established by the EU's Seveso Directive 82/501/EEC in 1982 and has remained in place with subsequent revisions to the Seveso Directive in effect today. The purpose of the eMARS is to facilitate the exchange of lessons learned from accidents and near misses involving dangerous substances in order to improve chemical accident prevention and mitigation of potential consequences.

eMARS contains reports of chemical accidents and near misses provided to the Major Accident and Hazards Bureau (MAHB) of the European Commission's Joint Research Centre from EU, OECD and UNECE countries (under the TEIA Convention). Reporting an event into eMARS is compulsory for EU Member States when a Seveso establishment is involved and the event meets the criteria of a "major accident" as defined by Annex VI of the Seveso III Directive (2012/18/EU). For non-EU OECD and UNECE countries reporting accidents to the eMARS database is voluntary. The information of the reported event is entered into eMARS directly by the official reporting authority of the country in which the accident occurred.

The Major Accident Reporting System (eMARS) has been used as our reference database for the benchmark. The access to the eMARS data was straightforward and easy since the database can be consulted online.

The published data were used for the purpose of this analysis.

Since eMARS is focusing on major accidents as part of the implementation of the Seveso Directive, it is straight forward to identify this type of accident. For the other databases, there is a need to apply criteria to extract the major accidents.

6.2.2.2 ARIA

ARIA (<http://www.aria.developpement-durable.gouv.fr/find-accident/?lang=en>)

The ARIA (Analysis, Research and Information on Accidents) database operated by the BARPI (Bureau for Analysis of industrial Risks and Pollutions), an entity within the French Ministry of Ecology, Sustainable Development and Energy that is in charge of operating the Aria Database. Engineers and technicians are collecting, analysing and publishing information on industrial accidents.

The French Ministry of Ecology, Sustainable Development and Energy lists the accidental events which have, or could have damaged health or public safety, agriculture, nature or the environment. These events are mainly caused by industrial or agricultural facilities that have been or are likely to be classified as hazardous, but also by transportation of hazardous materials and other events with lessons that also apply in this context. The list of accidents and incidents in France and abroad, which cannot be seen as exhaustive, together with analysis of them, has been in place since 1992.

With all activities taken together, this database lists over 40,000 accidents and incidents, of which about 37,000 are in France. Foreign accidents are listed mainly due to the seriousness of their consequences or their value in terms of experience feedback.

The inventory of French and foreign accidents is not exhaustive. Consequently, the ARIA database must not be used for "statistical" treatments without precaution.

It was not easy to collect data relative to the major accidents especially for ARIA, because of the search criteria and the huge quantity of data (16 101 events in the benchmarked countries between 2000 and 2014). That is why a systematic analysis has been performed:

- ▶ Firstly, the list of events "CLASSIFIED INSTALLATION (IC) - Accidents / Incidents inside a classified installation (or likely to be)" between January 1st, 2000 and December 31st, 2014, was created for each of the 34 benchmarked countries;
- ▶ From this list of events, the selection of the "major accidents" was undertaken as follows:
 - ▶ ARIA uses its own "European scale of industrial accidents" which does not match with the criteria of Annex VI of the Seveso II Directive. So, the parameters of the European scale have been compared with the criteria of Annex VI of the Seveso II Directive; and
 - ▶ In the following figures, the criteria that do not correspond to a major accident according to the Seveso Directive have been crossed in red (✘). The criteria that require the reading of the description of the accident are framed in red dotted line (⋯) and the criteria that might correspond to a major accident are framed in red line (▭).

Figure 6.1 European scale of industrial accidents

European scale of industrial accidents Graphic presentation used in France

This scale was made official in 1994 by the Committee of Competent Authorities of the member States which oversees the application of the Seveso directive. It is based on 18 technical parameters designed to objectively characterise the effects or consequences of accidents: each of these 18 parameters include 6 levels. The highest level determines the accident's index.

Further to difficulties which stemmed from the attribution of an overall index covering the consequences that are completely different according to the accidents, a new presentation of the European scale of industrial accidents with four indices was proposed. After having completed a large consultation of the various parties concerned in 2003, this proposal was retained by the Higher Council for Registered Installations. It includes the 18 parameters of the European scale in four uniform groups of effects or consequences:

- 2 parameters concern the quantities of dangerous materials involved,
- 7 parameters bear on the human and social aspects,
- 5 concern the environmental consequences,
- 4 refer to the economical aspects.

This presentation modifies neither the parameters nor the rating rules of the European scale.

The graphic charter:

The graphic charter adopted for the presentation of the 4 indices is as follows:



When the indices are yet explained elsewhere in the text, a simplified presentation, without the wordings, can be used:



The parameters of the European scale:

						3	4	5	6
	Dangerous material released								
Q1	Quantity Q of substance actually lost or released in relation to the « Seveso » threshold *	$Q < 0,1 \%$	$0,1 \% \leq Q < 1 \%$	$1 \% \leq Q < 10 \%$	$10 \% \leq Q < 100 \%$	$100 \% \leq Q < 10 \text{ fois le seuil}$	10 fois le seuil	10 fois le seuil	10 fois le seuil
Q2	Quantity Q of explosive substance having actually participated in the explosion (equivalent in TNT)	$Q < 0,1 \text{ t}$	$0,1 \text{ t} \leq Q < 1 \text{ t}$	$1 \text{ t} \leq Q < 5 \text{ t}$	$5 \text{ t} \leq Q < 50 \text{ t}$	$50 \text{ t} \leq Q < 500 \text{ t}$	500 t	500 t	500 t

* Use the higher "Seveso" thresholds. If more than one substance are involved, the higher level should be adopted.

Source: ARIA⁶⁸

⁶⁸ See: <http://www.aria.developpement-durable.gouv.fr/information-tools/european-scale-of-industrial-accidents/?lang=en>

Figure 6.2 European scale of industrial accidents (continued)

Human and social consequences		1	2	3	4	5	6
H3	Total number of death: including - employees - external rescue personnel - persons from the public	- - - -	1 1 - -	2 – 5 2 – 5 1 -	6 – 19 6 – 19 2 – 5 1	20 – 49 20 – 49 6 – 19 2 – 5	≥ 50 ≥ 50 ≥ 20 > 6
H4	Total number of injured with hospitalisation ≥ 24 h: including - employees - external rescue personnel - persons from the public	1 1 1 -	2 – 5 2 – 5 2 – 5 -	6 – 19 6 – 19 6 – 19 1 – 5	20 – 49 20 – 49 20 – 49 6 – 19	50 – 199 50 – 199 50 – 199 20 – 49	≥ 200 ≥ 200 ≥ 200 > 50
H5	Total number of slightly injured cared for on site with hospitalisation < 24 h : including - employees - external rescue personnel - persons from the public	1 – 5 1 – 5 1 – 5 -	6 – 19 6 – 19 6 – 19 1 – 5	20 – 49 20 – 49 20 – 49 6 – 19	50 – 199 50 – 199 50 – 199 20 – 49	200 – 999 200 – 999 200 – 999 50 – 199	≥ 1000 ≥ 1000 ≥ 1000 ≥ 200
H6	Total number of homeless or unable to work (outbuildings and work tools damaged)	-	1 – 5	6 – 19	20 – 99	100 – 499	≥ 500
H7	Number N of residents evacuated or confined in their home > 2 hours x nbr of hours (persons x hours)	-	N < 500	500 ≤ N < 5 000	5 000 ≤ N < 50 000	50 000 ≤ N < 500 000	N ≥ 500 000
H8	Number N of persons without drinking water, electricity, gas, telephone, public transports > 2 hours x nbr of hours (persons x hours)	-	N < 1 000	1 000 ≤ N < 10 000	10 000 ≤ N < 100 000	100 000 ≤ N < 1 million	N ≥ 1 million
H9	Number N of persons having undergone extended medical supervision (≥ 3 months after the accident)	-	N < 10	10 ≤ N < 50	50 ≤ N < 200	200 ≤ N < 1 000	N ≥ 1 000

Environmental consequences		1	2	3	4	5	6
Env10	Quantity of wild animals killed, injured or rendered unfit for human consumption (t)	Q < 0,1	0,1 ≤ Q < 1	1 ≤ Q < 10	10 ≤ Q < 50	50 ≤ Q < 200	Q ≥ 200
Env11	Proportion P of rare or protected animal or vegetal species destroyed (or eliminated by biotope damage) in the zone of the accident	P < 0,1 %	0,1% ≤ P < 0,5%	0,5% ≤ P < 2 %	2 % ≤ P < 10 %	10 % ≤ P < 50 %	P ≥ 50 %
Env12	Volume V of water polluted (in m ³) *	V < 1000	1000 ≤ V < 10 000	10 000 ≤ V < 0.1	0.1 Million ≤ V < 1 Million	1 Million ≤ V < 10 Million	V ≥ 10 Million
Env13	Surface area S of soil or underground water surface requiring cleaning or specific decontamination (in ha)	0,1 ≤ S < 0,5	0,5 ≤ S < 2	2 ≤ S < 10	10 ≤ S < 50	50 ≤ S < 200	S ≥ 200
Env14	Length L of water channel requiring cleaning or specific decontamination (in km)	0,1 ≤ L < 0,5	0,5 ≤ L < 2	2 ≤ L < 10	10 ≤ L < 50	50 ≤ L < 200	L ≥ 200

* The volume is determined with the expression Q/C_{lim} where:

- ✓ Q is the quantity of substance released,
- ✓ C_{lim} is the maximal admissible concentration in the milieu concerned fixed by the European directives in effect.

Economic consequences		1	2	3	4	5	6
€15	Property damage in the establishment (C expressed in millions of € - Reference 93)	0,1 ≤ C < 0,5	0,5 ≤ C < 2	2 ≤ C < 10	10 ≤ C < 50	50 ≤ C < 200	C ≥ 200
€16	The establishment's production losses (C expressed in millions of € - Reference 93)	0,1 ≤ C < 0,5	0,5 ≤ C < 2	2 ≤ C < 10	10 ≤ C < 50	50 ≤ C < 200	C ≥ 200
€17	Property damage or production losses outside the establishment (C expressed in millions of € - Reference 93)	-	0,05 < C < 0,1	0,1 ≤ C < 0,5	0,5 ≤ C < 2	2 ≤ C < 10	C ≥ 10
€18	Cost of cleaning, decontamination, rehabilitation of the environment (C expressed in millions of € - Reference 93)	0,01 ≤ C < 0,05	0,05 ≤ C < 0,2	0,2 ≤ C < 1	1 ≤ C < 5	5 ≤ C < 20	C ≥ 20

6.2.2.3 FKD and RISCAD

FKD (<http://www.sozogaku.com/fkd/en/>)

On March 23, 2005, the Japan Science and Technology Agency (JST) started providing on its website an open reference resource, the "Failure Knowledge Database". The database showcases analyses of accidents and failures in science and technology fields, sorted into 16 categories that reflect the type of lessons learned from these failures. Its aim is to prevent similar accidents and failures from happening and to improve the reliability and safety of technology in society. As of May 13, there have been 1,135 case studies presented from the four industrial fields of machinery, materials, chemistry and construction. Points of interest can be searched for using key words, from the 16 categories of lessons learned, and also looked up through a "Failure Mandala" that systematically organises a failure scenario to show causes, action, and results. The JST database aims to help in preventing similar accidents or failures, as well as for technological education and training purposes.

RISCAD (<https://riscad.aist-riss.jp/?lang=en>)

The Relational Information System for Chemical Accidents Database (RISCAD) was developed and operates using data collected from the aftermath of fire, explosion, and leakage accidents related to chemical substances, chemical processes, high-pressure gas, and explosives. In RISCAD, some of the accident data are linked to the "Accident Progress FlowChart" (APFC), which shows the timeline and the cause analysis of each accident. In order to create these APFCs, an accident analysis called "Progress Flow Analysis" (PFA) is conducted. This analysis method is also useful for increasing company safety awareness. In this paper, the outline and development process of RISCAD are introduced, and the procedures and application related to PFA industrial safety are reported.

For Japan, FKD (Failure Knowledge Database) and RISCAD (Relational Information System for Chemical Accidents Database) were consulted.

Regarding FKD, the data were collected by reading the website pages related to the accidents in the "Chemistry", "Food", "Metals", "Oil", "Petrochemistry" categories. Eight major accidents were identified between 2000 and 2003 for Japan, and FKD did not collect data after 2003.

The RISCAD database is operated by the Japanese Institute AIST and compiles several official data sources. We were able to use the data from these two databases for the accidents in Japan.

6.2.2.4 CSB

CSB (<http://www.csb.gov>)

The CSB is a US federal independent agency charged with investigating industrial chemical accidents. Headquartered in Washington, DC, the agency's board members are appointed by the President and confirmed by the Senate.

The CSB conducts root cause investigations of chemical accidents at fixed industrial facilities. Root causes are usually deficiencies in safety management systems, but can be any factor that would have prevented the accident if that factor had not occurred. Other accident causes often involve equipment failures, human errors, unforeseen chemical reactions or other hazards. The agency does not issue fines or citations, but does make recommendations to plants, regulatory agencies such as the Occupational Safety and Health Administration (OSHA) and the Environmental Protection Agency (EPA), industry organizations, and labour groups. Congress designed the CSB to be non-regulatory and independent of other agencies so that its investigations might, where appropriate, review the effectiveness of regulations and regulatory enforcement.

The CSB investigative staff includes chemical and mechanical engineers, industrial safety experts, and other specialists with experience in the private and public sectors. Many investigators have years of chemical industry experience.

After a CSB team reaches a chemical incident site, investigators begin their work by conducting detailed interviews of witnesses such as plant employees, managers, and neighbours. Chemical samples and equipment obtained from accident sites are sent to independent laboratories for testing. Company safety records, inventories, and operating procedures are examined as investigators seek an understanding of the circumstances of the accident.

Over a course of several months, investigators sift through evidence, consult with Board members, and review regulations and industry practices before drafting key findings, root causes and recommendations. During the process, investigators may confer with plant managers, workers, labour groups, and other government authorities. The investigative process generally takes six to twelve months to complete, and a draft report is then submitted to the Board for consideration. Reports may be adopted through a written vote of the Board or in a formal public meeting near the incident site or in Washington, DC.

In addition to investigations of specific accidents, the Board is authorized to conduct investigations of more general chemical accident hazards, whether or not an accident has already occurred. In 2002, the Board's first hazard investigation on reactive chemicals reviewed more than 150 serious accidents involving uncontrolled chemical reactions in industry. This investigation led to new recommendations to OSHA and EPA for regulatory changes.

In 2003, the CSB launched investigations of three major industrial explosions involving combustible powders. These explosions - in North Carolina, Kentucky, and Indiana - cost 14 lives and caused numerous injuries and substantial property losses. The Board responded by launching a nationwide study to determine the scope of the problem and recommend new safety measures for facilities that handle combustible powders. The CSB issued its final report at a public meeting in Washington, DC, on November 9, 2006, calling for a new OSHA regulatory standard designed to prevent combustible dust fires and explosions.

Both accident investigations and hazard investigations lead to new safety recommendations, which are the Board's principal tool for achieving positive change. Recommendations are issued to government agencies, companies, trade associations, labour unions,

and other groups. Implementation of each safety recommendation is tracked and monitored by CSB staff. When recommended actions have been completed satisfactorily, the recommendation may be closed by a Board vote.

While some recommendations may be adopted immediately, others require extensive effort and advocacy to achieve implementation. Board members and staff work to promote safety actions based on CSB recommendations. In many cases, the lessons from CSB investigations are applicable to many organizations beyond the company investigated. Many CSB recommendations have been implemented in industry, leading to safer plants, workers, and communities.

CSB (Chemical Safety Board in the USA) available data were collected for the accidents in the USA, since the accidents recorded and investigated by the CSB are closer to the definition of major accidents for Seveso establishments. As mentioned in the description of the CSB database, the mission of CSB is not to collect data about all accidents that occur in the USA, but it is to provide recommendations and improve lessons learned. Therefore, the exhaustiveness of the data is not an objective of CSB. Other sources might be combined, such as the US OSHA and US EPA data on accidents, in particular those related to the Risk Management Programme. There is no legislative requirement to report chemical accidents to the CSB.

6.2.2.5 ZEMA

ZEMA (<http://www.infosis.uba.de/index.php/de/site/12981/zema/index.html>)

The ZEMA database (Zentrale Melde- und Auswertestelle für Störfälle und Störungen in verfahrenstechnischen Anlagen) centralises information on accidents in Germany. The database is in German.

It gathers the data on accidents reported according to the legal requirements related to the transposition of the Seveso III Directive. The content of the database is organised in a way that is similar to the eMARS database, with information provided on the consequences of the accident on-site and outside the establishment.

ZEMA (Evaluation Office for Accidents and Incidents in Process Plant in Germany) database was used to collect on major accidents for Germany. The reporting of accidents is mandatory according to the German regulation (12. BImSchV). Therefore, there is a high level of confidence in the exhaustiveness of the information available in ZEMA.

6.2.2.6 EM-DAT

EM-DAT (<http://www.emdat.be>)

In 1988, the Centre for Research on the Epidemiology of Disasters (CRED) launched the Emergency Events Database (EM-DAT). EM-DAT was created with the initial support of the World Health Organisation (WHO) and the Belgian Government.

The main objective of the database is to serve the purposes of humanitarian action at national and international levels. The initiative aims to rationalise decision making for disaster preparedness, as well as provide an objective base for vulnerability assessment and priority setting.

EM-DAT contains essential core data on the occurrence and effects of over 22,000 mass disasters in the world from 1900 to the present day. The database is compiled from various sources, including UN agencies, non-governmental organisations, insurance companies, research institutes and press agencies.

Development and relief agencies have long recognized the crucial role played by data and information in mitigating the impacts of disasters on vulnerable populations. Systematic collection and analysis of these data provides invaluable information to governments and agencies in charge of relief and recovery activities. They are also crucial in the integration of health components into development and poverty alleviation programmes.

Yet there is still no international consensus regarding best practices for collecting these data. Together with the complexity of collecting reliable information, there remains huge variability in definitions, methodologies, tools and sourcing.

EM-DAT provides an objective basis for vulnerability assessment and rational decision-making in disaster situations. For example, it helps policymakers identify the disaster types that are most common in a given country and that have had significant historical impacts on human populations. In addition to providing information on the human impact of disasters - such as the number of people killed, injured or affected - EM-DAT provides disaster-related economic damage estimates and disaster-specific international aid contributions.

EM-DAT available data were collected at the end of November 2016 and analysed with the same methodology as described for ARIA to identify the major accidents as defined in the Seveso III Directive. The main inputs from this database were for the accidents in China.

6.2.2.7 FACTS and PSID

FACTS (<http://www.factsonline.nl/browse-chemical-accidents-in-database>)

The Failure and Accidents Technical information System (FACTS) is an accident database which contains information on more than 25,700 industrial incidents involving hazardous materials or dangerous goods that have happened all over the world during the past 90 years.

The main objective of the FACTS chemical accident database is to learn from accidents or incidents and to prevent them in the future.

Not only analysed and documented accidents involving severe damage or danger, such as BLEVES, major spills, huge explosions and derailments, are included, but also near-misses. The quality of the information on recorded accidents is also related to their seriousness and impact. For the most serious accidents detailed information is known; 300,000 pages of background information is stored, most of it electronically and remains available for further research purposes.

The FACTS chemical accident database was a product of TNO Industrial and External Safety.

The exploitation of the database is no longer be done by TNO. The maintenance and exploitation of the database are continued by the Unified Industrial & Harbour Fire Department in Rotterdam-Rozenburg.

PSID (<http://www.psidnet.com/>)

The centre for Chemical Process Safety (CCPS) developed the Process Safety Incident Database to collect and share process safety incident information and experiences among participating companies.

The CCPS also publishes each month the CCPS Beacon.

PSID tracks, pools, and shares process safety incidents among participating companies so process safety professionals can learn from the experiences of others, while minimizing the consequences of failures and corporate liability.

PSID contains important lessons to be learned from incidents that did or could have resulted in fire, explosion, fatality, multiple injuries, significant release of hazardous materials, and other unique process safety incidents (including near misses).

The websites of the FACTS and PSID databases did not provide useful data. The owners of the databases were contacted but, despite several attempts, we have not been able to access the data to include them in the analysis.

6.2.3 3rd step: Consolidation of the number of reported major accidents

The data collected have been consolidated by cross checking the number of reported major accidents in the various databases.

The objective was to create a unique database of the reported major accidents representing the merging, i.e. the union (\cup) of the databases (according to set theory). A detailed review of the data was done in order to make sure that the same accident does not appear several times. Each major accident was identified in each database by its location and its date in order to remove any duplication. This work was very time consuming but it was the only approach to verify the exhaustiveness of the databases.

The figure below presents the consolidation of the database that was conducted to prepare the graphs presented in section 6.2.5.

Figure 6.3 Consolidation of the databases for the benchmarked countries⁶⁹

Database for Europe = ARIA \cup eMARS \cup ZEMA

Database for Australia = ARIA

Database for Brazil = ARIA

Database for Canada = ARIA

Database for China = ARIA

Database for India = ARIA

Database for Japan = ARIA \cup FKD \cup RISCAD

⁶⁹ The database for countries were derived by combining (\cup) available database while removing duplicates as much as possible. For example the EU database comprises ARIA, eMARS and ZEMA (with duplicates removed).

Database for New Zealand = ARIA

Database for Russia = ARIA

Database for South Korea = ARIA

Database for USA = ARIA U CSB

6.2.4 4th step: Building of statistics

The number of major accidents is interesting information on which to base the comparison of countries, however it does not allow for variations due to level of industrialisation or size of the population. So in order to better compare the countries, the data had to be normalised.

At first, in order to normalise the data, we tried to identify the number of establishments handling hazardous materials in the selected countries. However, this information was not available. Therefore, we have used other parameters reflecting the level of industrialisation, which are more readily available. Therefore, number of major accidents has been normalised with **population** and with **GDP** for the EU and the benchmarked countries, for each period: 2000-2002, 2003-2005, 2006-2008, 2009-2011 and 2012-2014.

We applied the following equations:

Number of reported major accidents normalized with the population

$$= \frac{\text{Number of reported major accidents}}{\text{Population of the country}} \times 10^6$$

Number of reported major accidents normalized with the GDP

$$= \frac{\text{Number of reported major accidents}}{\text{GDP}} \times 10^{12}$$

The GDP and the population for the benchmarked countries were exported from the World Bank Open Data database⁷⁰ which is the only database covering all countries selected for the benchmark.

It would have been meaningful not only to consider the number of reported accidents but also their severity. Unfortunately, the information on the severity is presented in very disparate formats and is therefore not easy to incorporate. This work could be performed in a consequent study with more resources available.

The full tables are presented in Appendix F.

Important remarks on the statistics on the reported major accidents:

- 1) The work carried out to prepare the data was substantial. Despite the effort to collect and process the data, the exhaustiveness of the identification of all major accidents that have occurred in the considered countries is not guaranteed. This limitation is due to:
 - 2) The quality of the reporting in the countries considered is difficult to analyse because the legal requirements for reporting major accidents to the authorities is different from those in force in the EU.
 - 3) The application of the same criteria as those used in the EU to qualify an accident as a "major accident" is subject to interpretation of the information available. The definition of "major accident" in the context of the Seveso Directive refers to the type of establishment covered by the Seveso Directive; if an accident has consequences matching the criteria of annex VI of the Directive but if the establishment is not covered by the Seveso Directive, the accident is not considered as a "major accident" reported in eMARS. Some EU Member States record accidents that occur in establishments that are classified and monitored according to the national legal system, but that are below the threshold (or otherwise outside the scope) of the Seveso Directive. This is the case for France and Germany. This explains why the merging of the data recorded in the ZEMA, ARIA and eMARS databases gives a higher number of major accidents than the number of major accidents notified in eMARS

⁷⁰ <http://data.worldbank.org/>

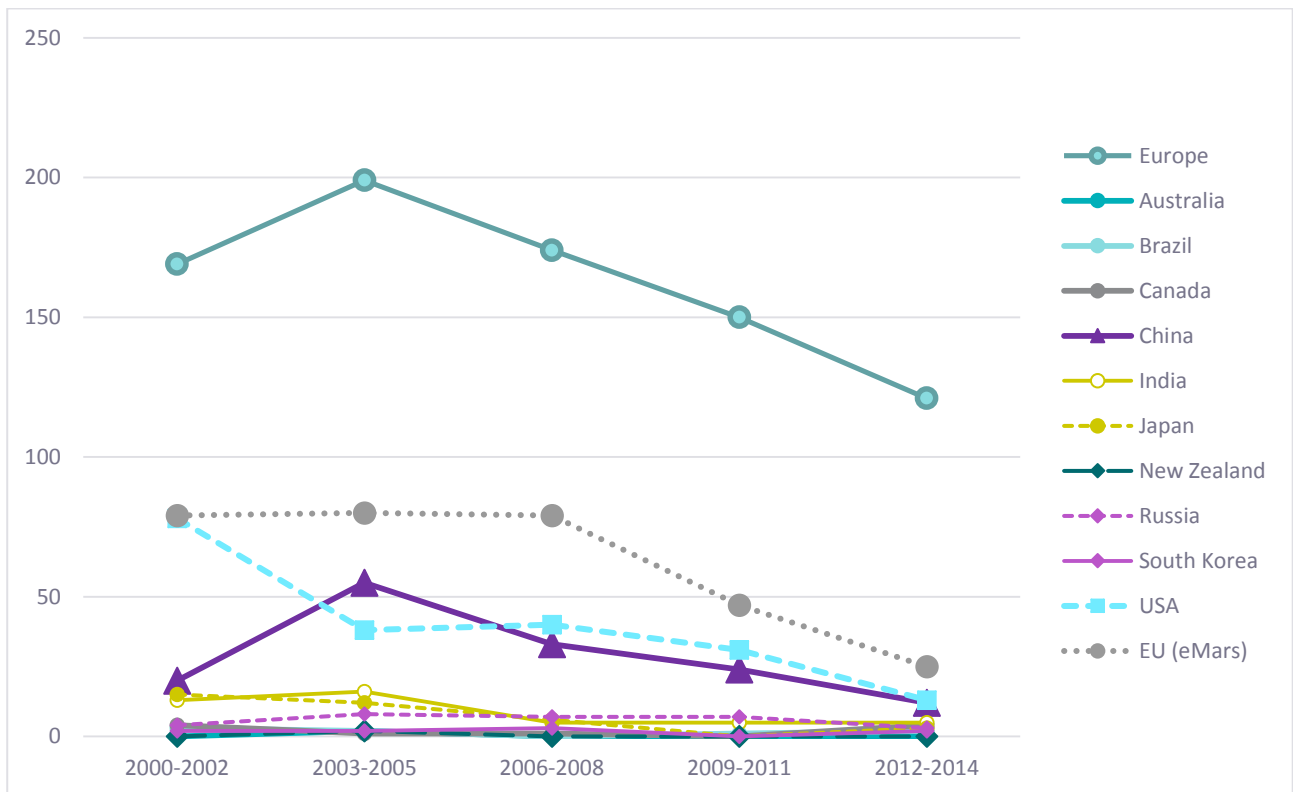
6.2.5 5th step: Analysis of the statistics

Graphical representations have been generated from the statistics prepared in the 4th step. As explained in section 6.2.3 there is a distinction between the data corresponding to “Europe” and “EU (eMARS)”.

“Europe” data correspond to the collation and merging of the data from eMARS, ARIA and ZEMA concerning major accidents for the countries from the European Union, after the consolidation and cleaning as described in 6.2.3.

“EU (eMARS)” data include only the data from the eMARS database (published data).

Figure 6.4 Number of reported major accidents by period

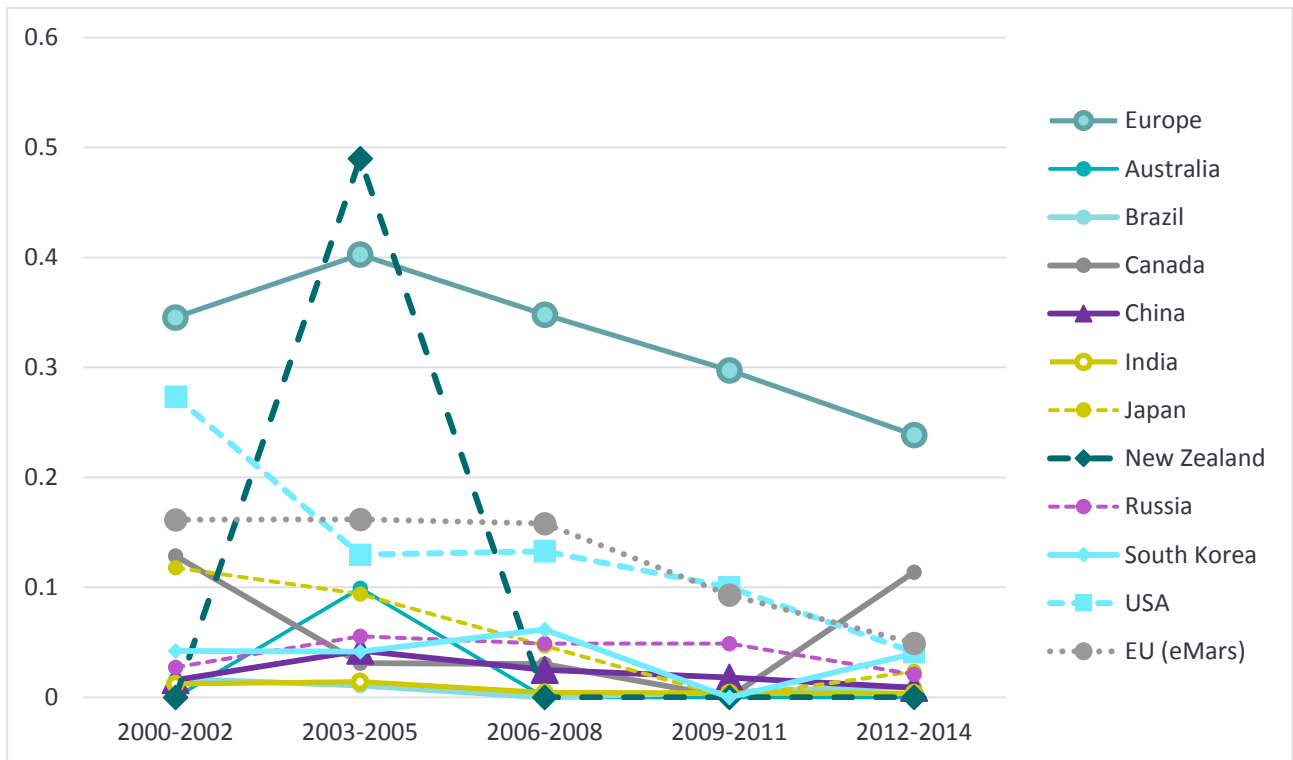


The number of reported accidents is higher for the Europe and EU (eMARS) data than for the other benchmarked countries, i.e. both with the data obtained from the merging of the consulted databases and from eMARS alone. This observation is believed to be the result of the more systematic and exhaustive accident reporting in the EU than in the other benchmarked countries, rather than there being more major accidents.

For several data sets, there is a peak for the period 2003-2005 that cannot be explained easily. More investigation would be required to identify the reasons for this peak.

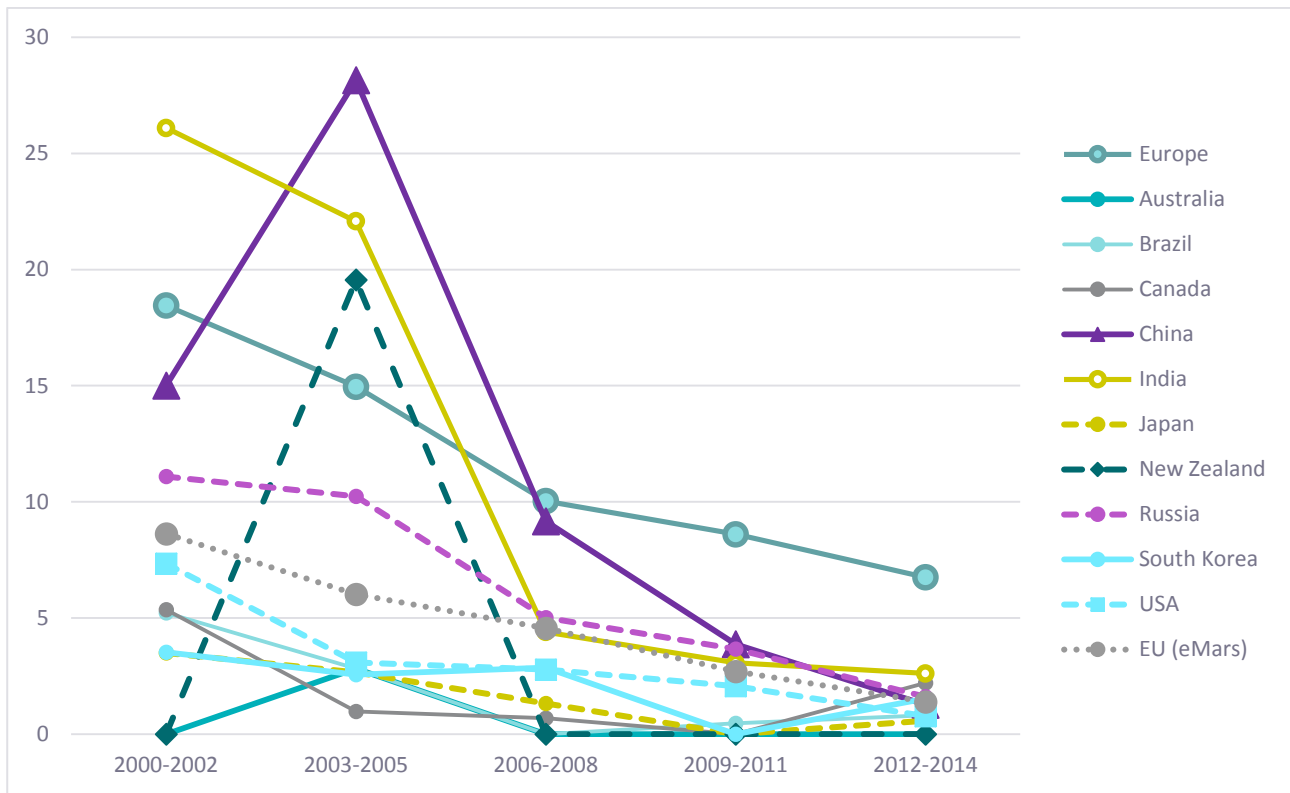
This figure also shows a trend of a decrease in the number of reported major accidents in the EU; the same trend can also be observed in the other benchmarked countries, even if it is not so marked due to the low number of accidents reported. This trend has been further analysed by comparing with other indicators including population and GDP, since the number of reported major accidents is not very meaningful on its own.

Figure 6.5 Number of reported major accidents per million population per period



This figure presenting the number of major accidents per million population confirms the overall trend of a decrease of reported major accidents in the EU and in most of the benchmarked countries. However, we see an increase of reported major accidents for South Korea, Japan and Canada during the last period. Again the higher numbers for the EU may be the result of more extensive data availability (and reporting) rather than an indication of there being more accidents in practice.

Figure 6.6 Number of reported major accidents per GDP (thousands of billions of \$) per period



This figure presenting the number of major accidents per GDP better reflects the level of economic activity in the countries than the ratio with the population. This figure also show a trend of decrease of the reported major accidents.

For the EU (data from eMARS), the decrease is significant and continuous, while the GDP in the EU during the last three considered period was slightly increasing.

With the ratio per GDP, we can observe that the number of reported major accidents in China and India were above all other countries for the period until 2008.

For the last period, the increase of reported major accidents is confirmed for South Korea, Japan and Canada.

6.3 Results of the review of the database for the benchmarked countries and discussion

The figures and tables were analysed in order to derive the key conclusions that are presented in this section:

- ▶ Remark #1: It is impossible to compare objectively the reported major accidents in the EU with the other countries based on the data available.

It is impossible to compare the number of reported major accidents in the EU with the other countries because:

- ▶ The lack of common definition of a major accident with the other countries; and
- ▶ The difficulty to access the data in national language from the other countries.

Regarding the first point, the comparison with other countries requires one to first treat the data to consider only the accidents that can be considered as major accidents according to the criteria of Annex VI of the Seveso II Directive (or other common metric). As an example, if we consider the data collected from the

USA, it tends to show the same decrease of reported major accidents as in Europe. However, it is almost certain that the number of accidents collected by CSB and ARIA for the USA is not exhaustive. Consequently, the comparison of the data collected in the European Union with the data concerning other countries is not possible.

Regarding the second point, most of the national databases are available only in national language. For example, the Chinese database operated by the State Administration of Work Safety (SAWS) can be consulted only in Chinese. This was a limitation given the resources available for the current study:

- ▶ Remark #2: There is a significant and continuous decrease of the number of reported major accidents in the EU.

Looking at the figures and graphs, the number of reported major accidents in Europe shows a significant trend to decrease with the ratio per GDP, which reflects the evolution of the level of economic activity. This is particularly interesting because for other countries such as South Korea, Japan and Canada we can observe an increase of reported major accidents during the last period.

This significant and continuous decrease in relation to the EU GDP is highly likely to have been driven, at least in part, by the implementation of the Seveso Directive:

- ▶ Remark #3: There is need to clarify the differences of reporting of major accidents in eMARS and the other databases.

Considering that the eMARS database collects fewer data, while the number of major accidents reported in the other databases is not significantly less, it is suspected that for the last period, not all data are available. For the period 2000-2002, eMARS has 79 accidents reported, which is more than ARIA and ZEMA with respectively 73 and 77 accidents reported, and which represents 46% of the merged databases. For the period 2012-2014, there were some differences in the number of accidents reported in eMARS (published data) and the ARIA and ZEMA databases. This is due to differences in the reporting criteria of these databases. The consultation of the MAHB on this issue has confirmed that there is a delay in having the data available in eMARS for the last period because the data have to be checked before they are made available in the eMARS online database. Another explanation is that there are accidents corresponding to the criteria of major accidents that are included in the databases like ARIA and ZEMA that are not Seveso establishments, and which are only covered by the national regulation (declaration or authorisation regimes):

- ▶ Remark #4: There is a deficit of reporting of the major accidents for the other benchmarked countries.

The figures show that more major accidents are reported in the EU than in other countries considered in this study. However, the potential deficit of reporting in all databases has to be taken into account. Indeed, the other databases provide very low statistics either due to the difficulty to access the databases themselves and/or because of the less extensive reporting into these databases:

- ▶ Remark #5: The absence of a common definition at an international level of major accidents makes the comparison between countries very difficult.

In order to compare the trends and the impact of the policies for the prevention of major accidents, it would be necessary to adopt a common definition and enable the classification of the accidents and incidents according to this definition in the accident databases.

7 Monitoring indicators

7.1 Overview

Article 29 of the Seveso III Directive requires that, by 2020, the Commission considers the implementation and efficient functioning of the Directive, including information on major accidents that have occurred within the Union and review whether there is a need to amend the scope of the Directive. As such, the main objective of this section is to provide initial thoughts on indicators that could set the grounds of a long-term monitoring system in line with the Better Regulation requirements. The objectives of such indicators are not to measure the safety performance of individual establishments or sectors covered by the Seveso Directive but rather to satisfy the requirements of the Better Regulation guidelines that mandate the use of indicators to monitor the implementation but also the effectiveness, efficiency, coherence, relevance and EU added value of any EU legislative intervention.

7.2 Methodology

Regulatory performance assessment addresses both the very process of regulation elaboration as well as its impacts on the targeted system and is a common policy process adopted for EU policies (known as ex-post evaluation or simply "evaluation").

Evaluations are an essential part of the Commission's policy cycle and decision-making process as highlighted in the Commission's 2015 Communication on "Better regulation for better results - An EU agenda". The Better Regulation strategy emphasises the importance of assessing and evaluating after a policy or measure has been implemented to ensure it stays fit for purpose and delivers, at minimum cost, the desired changes and objectives.

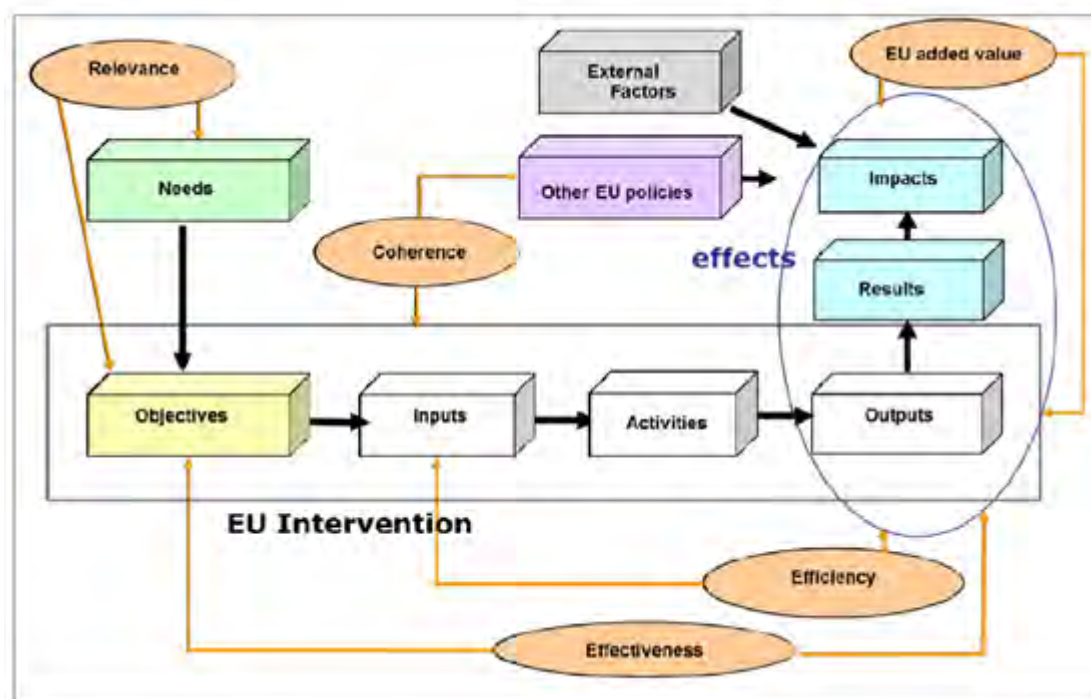
The evaluation of policies and measures and comparison against ex-ante estimates (e.g. impact assessments) is an important step in making future interventions more realistic and accurate, while understanding the factors that have made policies more or less effective and cost-efficient. The review of legislation can provide indications to policy makers of the types of instrument that proved to be most successful and most cost-effective in delivering the intended benefits. The EU Better Regulation guidelines⁷¹ define a set of five evaluation criteria: effectiveness, efficiency, relevance, coherence and EU-added value that each focus on a specific aspect of an EU intervention (i.e. an EU policy or instrument, for example the Seveso III Directive) assessed.

- ▶ **Effectiveness:** To what extent did the Directive cause the observed changes/effects? To what extent can these changes/effects be credited to the Directive? To what extent do the observed effects correspond to the objectives?
- ▶ **Efficiency:** Were the costs involved justified, given the changes/effects which have been achieved? What factors influenced the achievements observed?
- ▶ **Coherence:** To what extent is the Directive coherent with other interventions which have similar objectives? To what extent is the Directive coherent internally?
- ▶ **Relevance:** To what extent do the (original) objectives (still) correspond to the needs within the EU? and
- ▶ **EU added value:** What is the additional value resulting from the Directive, compared to what could be achieved by Member States at national and/or regional levels?

Relevance and *coherence* criteria are meant to assess the regulation content by respectively evaluating needs and objectives adequacy as well as complementarity with other EU regulations whereas *EU added value*, *efficiency* and *effectiveness* criteria focus on regulation results and impacts. The figure below presents the approach to evaluation as defined in the Better Regulation Toolbox.

⁷¹ http://ec.europa.eu/smart-regulation/guidelines/toc_guide_en.htm

Figure 7.1 Intervention logic for evaluation in EU policy



This section aims at presenting an overview of available indicators and potential new ones that could be further explored when considering the upcoming evaluation of the Seveso III Directive.

The preliminary nature of this work is to be highlighted, and in several instances more work is necessary to understand whether indicators can be derived for specific aspects of the Seveso III Directive. It is possible that for some aspects, future work would conclude that it is neither possible nor meaningful to use indicators.

Based on the review of the literature available, we selected a set of representative guidelines and documents addressing both safety as well as regulatory performance assessment to analyse further. Out of this analysis, we suggested:

- ▶ A set of recommended indicators;
- ▶ A set of optional ones; and
- ▶ Potential future developments on indicators.

7.3 Review of technical requirements including Better Regulation guidelines

7.3.1 General considerations on regulatory performance assessment / evaluations

Regulatory performance assessment is interested in understanding the extent to which a given regulatory intervention has been conceived through efficient processes and achieves its objectives without generating secondary adverse effects. Correctly framing and performing this evaluation raises the following challenges:

- ▶ Implementation: Transposition into national laws of the member states;
- ▶ Application: changes observed in the realisation of the main policy objectives;
- ▶ Compliance and enforcement: extent of compliance by the different stakeholders; and
- ▶ Contextual information: Any development that is not intentionally related to the policy intervention but is influenced by it.

For all these aspects evidence will have to be gathered. This evidence can be assessed by linking objectives with indicators. The Better Regulation guidelines define three types of indicators:

- ▶ Output indicators: relating to the specific deliverables of the intervention, for example reporting under eMARS and eSPIRS, adoption of MAPP;
- ▶ Outcome / result indicators: matching the immediate effects of the intervention with the direct addressees, for example the number of upper tier establishments inspected annually; and
- ▶ Impact indicators: these are related to the intended outcome of the intervention in terms of impact on the wider economy, for example the reduction in the number and intensity of major accidents, incidents and near misses from industrial establishments.

When considering future evaluations of the Seveso Directive, a first step in order to define relevant indicators will be to develop a tailored intervention logic. Its aim is to identify:

- ▶ What 'needs' the legislation is intended to address;
- ▶ What 'objectives' does the legislation put in place to try and help address the needs;
- ▶ What 'actions' are undertaken to meet the objectives;
- ▶ What 'consequences' (impacts and results) come from the actions; and
- ▶ What are the 'expected results' which should fully resolve the needs.

A full intervention logic should also consider external influences – other factors that influence the consequences that are outside the scope of the policy / legislation in question.

The development of an intervention logic is out of the scope for this task, however it is useful to consider the context within which our preliminary investigation on possible monitoring indicators is being conducted.

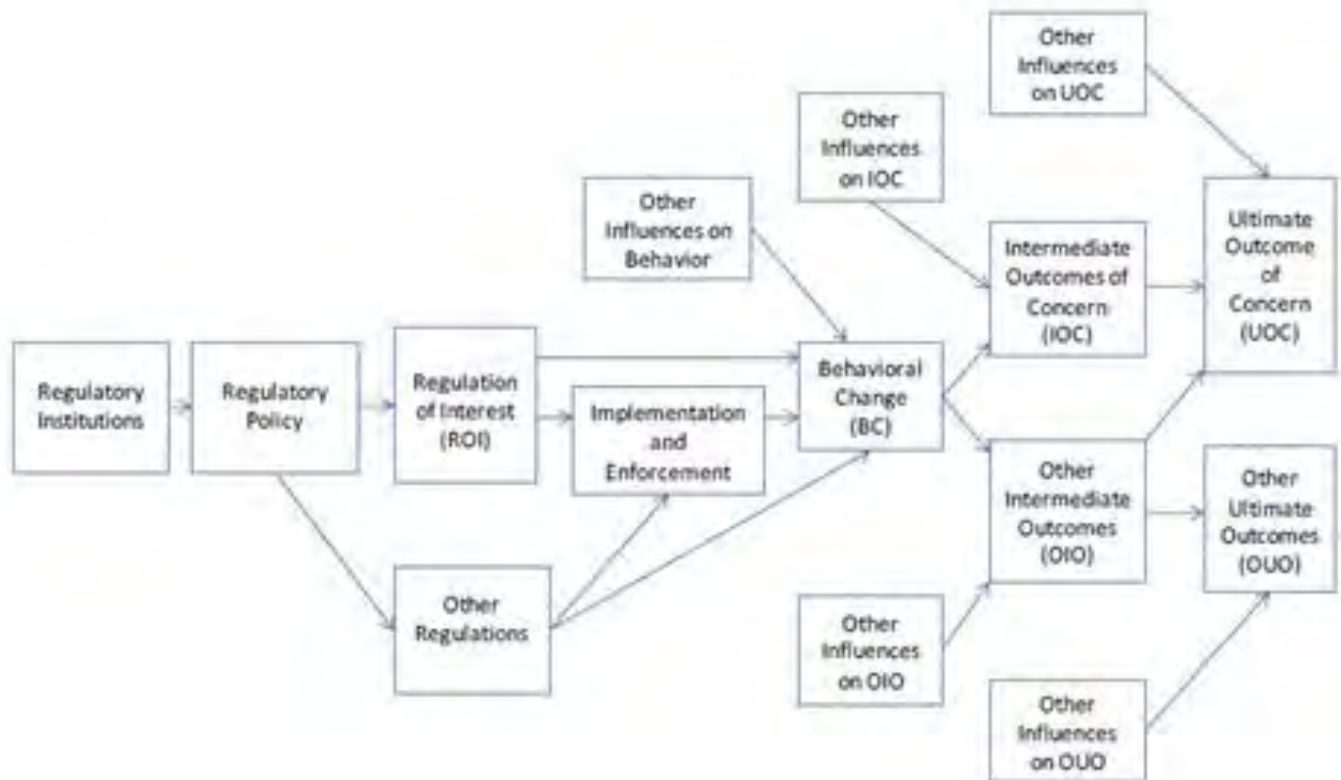
In addition to the Better Regulation guidelines, other literature sources are useful to consider. In particular the OECD (Coglianese, 2012) provides a detailed account of the various stages through which a regulatory intervention achieves its objectives.

Figure 7.2 shows that a legislative intervention goes through a series of administrative procedures and practices leading to the proposal of the regulation of interest (ROI)⁷². The first impact expected is to influence the impacted stakeholders by triggering new behaviours. This evolution will in turn lead to intermediate and final outcomes. Some of these outcomes will be the very objectives expected by the regulator (Ultimate outcomes of concern) while others may be either positive or negative but definitely out of the initial regulator's objectives (Other ultimate outcomes of concern). Taking the example of the Seveso III Directive, behavioural changes expected are for instance the development of expertise on public information among impacted industries and Member State competent authorities. An intermediate outcome of concern will be the increase of information available on Seveso establishments whereas the final outcome could be the improvement of safety through better sharing of information among stakeholders including the populations.

In addition, considering that this process is being conducted in open systems, external influences are to be expected with impacts on every phase from behavioural change to final outcomes of concerns.

⁷² Note that 'regulation' is used generically to designate legislative intervention rather than a specific legislative instrument

Figure 7.2 A causal map of regulation and its effects



Source: Coglianese, 2012

In addition to these elements, our literature review identified the following set of best practices:

- ▶ If the focus is on assessing the level of objectives achievement, indicators will be exclusively oriented towards **observable results** (e.g. reduction in environmental impact of major accidents). However, if the decision maker is interested in understanding why the objectives have or have not been achieved, it is necessary to focus also on **intermediate outcomes and behavioural changes** within impacted stakeholders through well calibrated indicators. For instance, indicators described in Figure 3.13 (overview of the most reported actions taken during the reporting period) and in Figure 3.15 (Number of inspections of upper-tier establishments during the reporting period) are intermediate indicators that discuss behavioural evolutions against the requirements of the directive in terms of number and content of Member States enforcement and inspections. For this, the interpretation of the results requires the combination of different types of indicators, some focusing on objectives achievement while others on the intermediate stages described in Figure 7.2;
- ▶ Systems subject to regulations can also be impacted by other existing regulations either at EU or at national level. It may therefore become difficult to attribute any success or failure to a specific regulation rather than a combination of regulations. For instance, following the Toulouse catastrophe in 2001, France issued (in 2003) a regulation whose scope and objectives are very close to those of the Seveso II and III Directives. It is therefore important to consider, extent to which the legislation considered has contributed to (qualitatively and quantitatively) the achievement of the objectives. This aspect is considered under the 'effectiveness' criterion and to some extent under the 'coherence' criterion; and
- ▶ Regulations may have impacts that go far beyond the targeted objectives. In the case of Seveso III, impacts on companies' competitiveness or regulatory agencies staffing for instance may be significant. Accordingly, a thorough evaluation of a legislative instrument not only addresses achievement of targeted objectives, it also needs to detect and monitor other

unintended outcomes including costs to various stakeholders. This aspect would be considered under both the 'effectiveness' criterion (unintended effects) but also the 'efficiency' criterion.

7.4 Review, selection and analysis of guidelines on safety indicators

7.4.1 Review and selection of the guidelines

A wide range of guidelines was screened and reviewed including review of safety indicators guidelines, which has focused on the following sources: OECD⁷³, UNECE⁷⁴, CCPS⁷⁵, the UN and INERIS⁷⁶. Out of these, only a few were selected for a more in-depth review as detailed in Table 7.1.

A first observation is that, with the exception of the OECD documents, none of these sources tackles the issue of evaluating a safety oriented regulation. They either discuss the terms of regulation monitoring (UNECE) or of safety monitoring (CCPS and INERIS). As a result, instead of looking into each of these documents to review "ready for use" indicators for Seveso III, our analysis considered whether each of these sources could provide a relevant piece of knowledge to guide our recommendations.

Table 7.1 Overview of documents reviewed and their usefulness

Publishing organism	Title of the guideline	Description of the guideline	Judgement on suitability for further analysis
OECD	OECD guiding principles for chemical accident prevention, preparedness and response (OECD, 2003)	Guidance on the relevant content each industrial safety policy should include. No indicators suggested.	The quality control process through which Seveso III content is evaluated being out of the scope of our work, this document has not been selected for further analysis.
	OECD guidance on developing safety performance indicators for public authorities and communities/public (OECD, 2008).	Dedicated guidelines on industrial safety indicators for regulatory bodies.	Document selected for further analysis.
	Measuring Regulatory Performance. Evaluating the impact of regulation and regulatory policy. (Cognilanes, 2012).	No indicators suggested. It is rather an expert paper setting the methodological grounds for regulatory performance evaluation.	Document selected for further analysis.
UNECE	Benchmarks for the implementation of the convention on the Transboundary effects of industrial accident (UNECE, 2010b)	Self-evaluation approach to assess how countries have included transboundary issues in their industrial safety policies. Examples of indicators: - Existence of a mechanism for the collection of data; - Existence of a mechanism for the analysis and validation of the data; and - A mechanism for the review/revision of data.	This benchmark is interested in ensuring that member states' policies incorporate best practices like the identification of hazardous activities or public information and inclusiveness. These aspects relate to the content of regulations which goes beyond the scope of this work. As such, this document has not been selected for further analysis.
	Guidelines on the setting of targets, evaluation of progress and reporting (UNECE, 2010a).	Methodology for identifying targets and indicators in the case of water policy. Indicators suggested are oriented towards water policy evaluation. Example of indicators:	Full methodology of indicator development in the case of water policy. Hardly reusable in the case of industrial safety. This document has thus not been selected for further analysis.

⁷³ Organisation for Economic Co-operation and Development

⁷⁴ United Nations Economic Commission for Europe.

⁷⁵ Center for Chemical Process Safety

⁷⁶ Institut National de l'Environnement Industriel et des Risques.

Publishing organism	Title of the guideline	Description of the guideline	Judgement on suitability for further analysis
		<ul style="list-style-type: none"> - Population coverage with access to improved water supply and sanitation technologies; and - Existence of country-wide monitoring system that covers major pollutants. 	
	<p>UNECE online Guidelines for the Application of Environmental Indicators. http://www.unece.org/env/indicators.html</p>	<p>Detailed set of <i>ready for use</i> environmental indicators. Aspects of environmental policies covered are:</p> <ul style="list-style-type: none"> - Air pollution and ozone depletion; - Climate change; - Water; - Biodiversity; - Land and soil; - Agriculture; - Energy; - Transport; - Waste; and - Environmental financing. 	No dedicated work on industrial safety indicators so not selected for further analysis.
	<p>UNECE Strategy for education for sustainable development (ESD). Guidance for reporting (UNECE, 2007b) UNECE Indicators for education for sustainable development (ESD). Annex 1 (UNECE, 2007a)</p>	<p>Two complementary documents providing a full account of: the typology of indicators used for policy evaluation and the type of targets to be addressed in policy evaluation.</p>	<p>Although ESD remains far from Seveso III concerns, this work comprises a general reflection on the use of indicators for policy evaluation that we believe is useful. Documents selected for further analysis.</p>
INERIS	<p>Process safety performance indicators. Guidelines for industry (INERIS, 2016).</p>	<p>In depth analysis of methodological frameworks associated with the use of indicators for industrial safety. Examples of indicators suggested:</p> <ul style="list-style-type: none"> - Percentage of satisfactory sub-contractors audit; and - Evolution of total maintenance budget within the establishment. 	<p>Indicators suggested are industry oriented. However, the methodological background regarding the development and use of industrial safety indicators is relevant for the study. The document is therefore selected for further analysis.</p>
CCPS	<p>Process Safety Leading and lagging Metrics (CCPS, 2011)</p>	<p>Development and use of indicators for process safety. Examples of indicators suggested:</p> <ul style="list-style-type: none"> - Percentage of safety related procedures reviewed and updated; and - Percentage of individuals who successfully completed Process Safety management training sessions. 	<p>Indicators suggested are industry oriented. However, the methodological background regarding the development and use of industrial safety indicators is relevant for the study. The document is therefore selected for further analysis</p>
UN	<p>Sendai Framework for Disaster Risk Reduction (DDR) 2015-2030 Report of the open-ended intergovernmental expert working group on indicators and terminology relating to disaster risk reduction⁷⁷</p>	<p>Work through the open-ended intergovernmental expert working group: indicators⁷⁸. Indicators are defined in accordance with the global target of the Sendai framework. For example, for target g: Substantially increase the availability of and access to multi hazard early warning systems and disaster risk information assessment to the people by 2030 the indicators considered are:</p> <ul style="list-style-type: none"> - Number of countries that have multi-hazard early warning systems; 	<p>Only draft work initiated, however interesting to consider the development of indicators being undertaken.</p>

⁷⁷ http://www.preventionweb.net/files/50683_oiewgreportadvanceuneditedversion.pdf

⁷⁸ <http://www.preventionweb.net/drr-framework/open-ended-working-group/indicators/>

Publishing organism	Title of the guideline	Description of the guideline	Judgement on suitability for further analysis
		<ul style="list-style-type: none"> - Number of countries that have multi-hazard monitoring and forecasting systems; and - Number of people per 100,000 that are covered by early warning information through local government or through national dissemination mechanisms. 	
UN	Sustainable Development Goal indicators ⁷⁹	No guideline available yet but recently there have been discussions on increasing the coherence between the Sendai DRR and the Sustainable Development Goals (SDGs) indicator frameworks. Indicators are being developed under the SDG framework	Would be interesting to consider whether indicators on Seveso III Directive could contribute to the SGD indicators development.

7.4.2 Analysis of the guidelines

7.4.2.1 Criteria used for the analysis

Each of the documents indicated as selected for further analysis in Table 7.1 has been analysed according to the following items:

- ▶ Is the document suitable for public users which are the expected users of the guidelines?
- ▶ What is the typology of indicators? The very meaning and the way indicators are suggested to be used can vary from one guideline to another; and
- ▶ Targets and what is being measured? The set of aspects or dimensions each guideline suggests to monitor when it comes to regulatory ex-post evaluation. In other terms, targets discuss the issue of “what should be monitored through indicators?”

The analysis of each guideline is presented in the tables below.

Table 7.2 OECD (2008) guidelines analysis

OECD GUIDANCE ON DEVELOPING SAFETY PERFORMANCE INDICATORS FOR PUBLIC AUTHORITIES AND COMMUNITIES/PUBLIC, 2 nd EDITION. (OECD, 2008)	Description of the guidelines	Relevance for our work
Public	Public authorities, elected officials, emergency response personnel, general public.	Yes
Typology of indicators	Two categories of indicators <u>Leading or activity indicators</u> Assess whether organisations are taking actions believed necessary to lower risks. <u>Lagging or outcome indicators</u> Assess whether safety related actions are achieving their desired results.	Usually deployed for industrial systems. Poorly informative when it comes to regulatory assessment
Targets	<u>Internal organisation and policy</u> Assessment of the organisation internal capabilities (readiness, staffing...) to elaborate a safety regulation.	Assessment of EU capabilities to elaborate relevant policies is out of the scope of the study.

⁷⁹ <http://unstats.un.org/sdgs/>

OECD GUIDANCE ON DEVELOPING SAFETY PERFORMANCE INDICATORS FOR PUBLIC AUTHORITIES AND COMMUNITIES/PUBLIC, 2 nd EDITION. (OECD, 2008)	Description of the guidelines	Relevance for our work
	<u>Legal framework</u> Propensity of the regulation to address all aspects of chemical accident prevention and preparedness including land use planning, safety reports, permits...	The evaluation of Seveso III content is out of the scope of the study.
	<u>External cooperation</u> Cooperation and communication among public and private stakeholders interested in / impacted by the regulation.	Could be of interest when it comes to discuss behavioural changes triggered by Seveso III.
	<u>Accident/near miss reporting and investigation</u> Mechanisms to detect, analyse and learn from incidents and accidents.	Although already in place before Seveso III implementation, this may be a relevant target to assess the final level of industrial safety in Europe (ultimate outcome of concern).

Table 7.3 UNECE Guidelines analysis

UNECE Strategy for education for sustainable development (ESD). Guidance for reporting (UNECE, 2007b); UNECE Indicators for education for sustainable development, Annex 1 (UNECE, 2007a).	Description	Relevance for our work
Public	Regulators, inspection authorities.	Yes
Typology of indicators	Four categories of indicators <u>Checklist indicators</u> Information on initial policy, legislation and governance structures taken by government in order to implement the strategy. <u>Input indicators</u> Information about activities taking place (money invested, staffing...). <u>Output indicators</u> Results of the regulation. <u>Outcome indicators</u> Impacts of the regulation on the outcomes of concern.	This typology is fully adapted to regulatory purposes.
Targets	Ensure that governance structures exist at national levels to support the promotion of the policy.	Governance structures in charge of Seveso III implementation are well identified in all EU member states. Out of the scope of the study
	Promote =sustainable development through formal, non-formal and informal learning	Not relevant for this work.
	Equip educators with the competence to include sustainable development in their teaching.	Competence development issues may be of interest for the implementation of Seveso III directive.
	Ensure that adequate tools and materials are accessible for users.	National level tools may be required for updating plants classification according to CLP.
	Research on sustainable development is promoted.	Not relevant for this work.

Table 7.4 INERIS guidelines analysis

Process safety performance indicators. Guidelines for industry (INERIS, 2016).	Description	Relevance for our work
Public	Industries	Partial.
Typology of indicators	Three categories of indicators <u>Results indicators</u> Information on objectives achievement. <u>Functioning indicators</u> Information on activities deployed to achieve objectives. <u>Eco-system indicators</u> Information on the human and organisational context within which activities are deployed.	Relevant proposals in terms of combining different types of indicators to develop not only descriptive abilities (objective achieved or not?) but also comprehensive ones (why did we succeed or fail?)
Targets	The guidelines suggest a method to support each organisation investigating its own targets. No predefined targets suggested.	No relevant contribution to this work.

Table 7.5 CCPS guidelines analysis

Process Safety Leading and lagging Metrics (CCPS, 2011)	Description	Relevance for our work
Public	Industries	Partial.
Typology of indicators	Two categories of indicators <u>Leading or activity indicators</u> Assess whether organisations are taking actions believed necessary to lower risks. <u>Lagging or outcome indicators</u> Assess whether safety related actions are achieving their desired results.	Very similar to OECD typology. More adapted to industrial needs than to regulatory applications.
Targets	CCPS suggests focusing monitoring on Loss of Primary Containments (LOPC) and classifies their leading and lagging capacities according to the level of consequences (the lower are the consequences the more leading is the LOPC with regard to a possible major accidental release).	LOPC is a widely used indicator within industry to assess process safety performance. This information being available, it may be interesting to consider it in monitoring evolutions of safety levels under Seveso III regulation.

The OECD and UNECE guidelines display both differences and complementarities with European Better Regulation guidelines. Differences are particularly visible when it comes to the targets to be monitored. These differences can be explained by the extremely large variety of countries that the OECD and UNECE address in terms of cultures, languages and governance structures. For instance, the variety of governance structures and maturity that the UNECE can experience within its members fully justifies the need to question and monitor the existence of nationally dedicated capabilities to translate and implement international policies. These issues are of a lesser interest at the European level where a much higher uniformity can be observed in terms of governance structures and reasonable hypotheses can be drawn on their positive capabilities to transpose EU legislation.

In terms of complementarities, it may be noted that the Better Regulation guidelines do not discuss the issue of combining different types of indicators so to enhance decision makers' abilities to achieve comprehensive analysis of observed results. All other guidelines, including OECD and UNECE, tackle this issue by suggesting various typologies.

Despite its industry oriented approach, the CCPS guideline provide a noteworthy contribution by inviting one to go beyond counting major accidents which are statistically hardly representative of any reality. In fact, safety levels may decrease long before a major accident occurs, thanks to human abilities to compensate for systems deviation or simply because of luck (i.e. aleatory aspects of accidents). It is therefore recommended when evaluating safety levels to rely on small events monitoring so to detect safety deteriorations before major accidents occur.

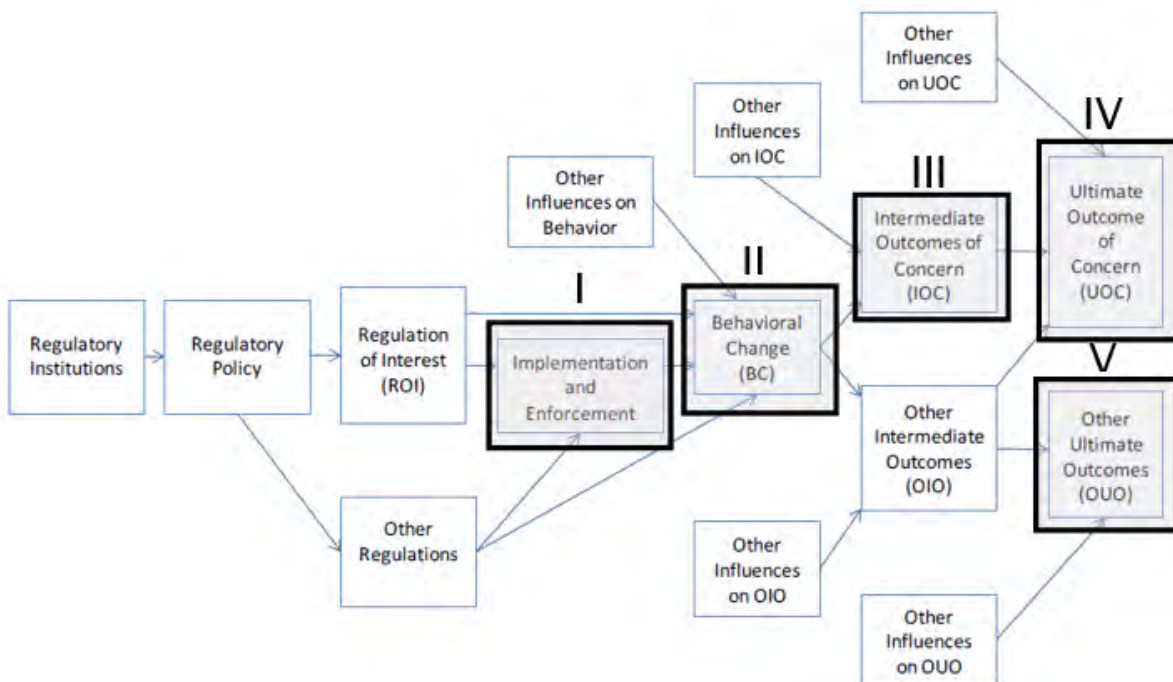
A very similar approach is already implemented at the European level through the accident severity index which may also serve as a metric of safety. Still, and as already discussed, this measure needs to be combined with other indicators to help the decision maker in getting the global picture.

If the UNECE and OECD (2008) documents are of little help to select targets, the OECD model presented in Figure 7.3 (Coglianese, 2012) is much more informative at this level. One may easily retrieve the targets already suggested by the Better Regulation guidelines while offering a much broader view to those interested in deepening performance evaluation.

Finally, Figure 7.3 presents all elements suggested by Better Regulation guidelines:

- ▶ Implementation (box I);
- ▶ Application (boxes III and IV in the sense that application relates to the changes observed in the realisation of the objectives or outcomes of concern; either intermediate or ultimate);
- ▶ Compliance (box II that discusses how new behaviours have emerged among impacted/interested stakeholders to comply with the regulation); and
- ▶ Contextual information (box V describes other ultimate outcomes of concerns referring to the consequences that were not intentionally related to the regulation).

Figure 7.3 Mapping of the Better Regulation elements on OECD model



7.4.2.2 Further considerations

The selection of indicators relies on two basic constraints:

- ▶ The specificities of the object one wants to measure, in this case, the effectiveness, efficiency, relevance, coherence and EU-added value of the Seveso III Directive; and
- ▶ The limited resources one may invest on such monitoring and the limited availability of data to conduct this measurement.

Regarding the first constraint, our analysis has led us to suggest the model in Figure 7.3 with a selection of indicators that fit the Better Regulation requirements. These are to be considered as the minimum set of indicators to consider if one wants to address all the requirements of the Better Regulation guidelines. The others suggested in the model may serve as guidelines for further investigation based on the priorities of the European Commission. Accordingly, we used the following category of indicators for our analysis:

- ▶ **Implementation and enforcement.** This first category addresses the extent to which the Seveso III Directive has been transposed into Member States national legislation and how capacity building (especially well trained inspectors staffing) is achieved to support implementation. This is transient in the sense that it remains relevant as long as not all Member States achieved its transposition and its full implementation. When both are achieved, this target can be removed, or its priority can be lowered;
- ▶ **Compliance (behavioural change).** This second category focuses on the extent to which the Seveso III Directive has generated expected changes in terms of behaviour amongst the concerned stakeholders. Comparatively to Seveso II, we have identified the following expected changes:
 - ▶ Changes in industrial status with establishments moving in and out of the two Seveso categories (upper and lower tiers);
 - ▶ Introduction of exemption procedures (article 4);
 - ▶ Development of public information to meet the requirements of the Aarhus Convention;
 - ▶ Additional requirements applicable to lower tier establishments (e.g. Major Accident Prevention Policy and internal emergency plans); and
 - ▶ Minimal requirements for inspection plans by Member States Competent Authorities.
- ▶ **Intermediate outcomes of concern.** While the ultimate outcome of concern is the improvement of industrial safety in Europe, it is also interesting to consider the evolution of incidents and materials release as an intermediate outcome of concern. An increase of incidents, both in terms of numbers or severity, is a signal of safety deterioration, even if the number of major accidents did not significantly evolve.

At this level, this may be one among many various possible outcomes of concern. However, an exhaustive analysis of such a list goes beyond the scope of this work and should probably be considered as a candidate for future analysis⁸⁰; and

- ▶ **Final outcomes of concern.** As stated previously, the Seveso III Directive final outcome of concern is the improvement of industrial safety in Europe.

7.4.2.3 Metrics: How to measure targets

Depending on expectations and available resources for data collection and indicators interpretation, each and every category described above may be approached by a more or less large number of indicators.

⁸⁰ This list could include for instance but not exhaustively: impacts on employment, access of population to risk information, impacts on public health and minimised environmental impacts

As an example, transposing Seveso III seems to be a straightforward target to measure. A simple metric based on the percentage of countries having achieved full transposition of Seveso III Directive can be used. However, this metric does not provide the decision maker with the following information:

- ▶ If the percentage is below 100%, why do some countries still struggle with the transposition of this Directive? Is it a matter of political choice, of resources availability or of regulation's effectiveness?

This simple example shows how several metrics may be required to explore one specific target. However, this can lead to complexity making the whole assessment unmanageable.

In order to shape a set of balanced, applicable and cost effective indicators, we suggest to move from the classical typology of leading/lagging indicators that had been widely criticised⁸¹ in literature in particular for the purpose of industrial installations (Hopkins, 2009) to the following best practices synthesized in INERIS⁸² (2016).

- ▶ Engage in an exercise where possible indicators are explored without any consideration for constraints of resources or information availability. This first step is vital as it informs the decision maker of the large variety of possible metrics and the consequences of adopting or rejecting some of them on overall monitoring capabilities;
- ▶ Select a subset of metrics that complies with the following criteria:
 - ▶ Privilege metrics requiring already available input data and/or easy to calculate;
 - ▶ The metrics considered altogether should cover as much as possible all the selected categories of indicators. This implies that each is informed by at least one indicator. Such a practice is suggested to counter some natural inclination of organisations to favour easy-to-get indicators (because they are already available for other purposes or because input data collection is more affordable) instead of relevant but costly indicators;
 - ▶ In our case, it is for instance particularly important to combine indicators of final outcomes (have levels of safety evolved?) with compliance ones (is the regulation well implemented in practice?). The cross interpretation of these metrics should allow the decision maker to understand whether the levels of safety have evolved or not and why this evolution did or did not occur;
 - ▶ This second criterion is a complement to the first one. It implies that to better balance the set of selected indicators, it may be necessary to engage in using indicators which may require modifications to information system to collect new data;
 - ▶ Each of the metrics selected should be described according to an informative model⁸³ (INERIS, 2016) that provides the decision maker with extensive information on the strengths and limitations of the selected metric; and
 - ▶ The relevance of a set of indicators evolves. What is considered informative and applicable today may become useless or even misleading in the future. Indicators should be regularly reviewed to ensure they still meet expectations.

⁸¹ Two particular critics have been raised in literature regarding the leading/lagging indicators. The first is the ambiguous character of the leading/lagging distinction which raises several interpretations depending on the safety model one may have in mind. The second is the idea that one may anticipate accidents (through leading indicators) which conflicts with the complex and to some extent aleatory character of accidental mechanisms.

⁸² Based on a large literature review and a compilation of best practices when it comes to indicators identification.

⁸³ The set of descriptive variables that should be used to ensure that the indicator is fully characterized. These variables could be the formula, interpretation terms, input data required, stakeholder(s) in charge of providing input data, terms of communication associated to the indicator...

7.4.3 Preliminary set of indicators identified

Table 7.6 provides an account of suggested candidate indicators for each category of indicators and organised according to the Better Regulation evaluation criteria. This proposal is a starting point that will require several iterations in order to reach the optimal indicators' list taking into account preferences and priorities. Further work after the completion of the present study is therefore recommended.

Table 7.6 Synthesis of the set of indicators suggested to approach Seveso III monitoring

Possible candidate indicators	Quantitative / Qualitative	Associated comments (e.g. data availability, assessment of the indicator)	Data sources
Effectiveness			
1 - Implementation and enforcement			
Percentage of Member States having achieved full transposition of Seveso III Directive (with transposition check being completed).	Quantitative	Easy to collect input data and to calculate.	Information from EUR-Lex and National Implementation Measures
Court cases against Member States due to non-transposition	Quantitative	Easy to collect input data and to calculate.	Information from Curia
Level of implementation of the Directive in Member States	Qualitative	Judgment on the basis of the expert analysis implementation of the provision of the Directive in each Member States and at EU level. Consideration of evolution of the Directive	Information from implementation reports
Court cases against Member States due to incorrect implementation	Quantitative	Easy to collect input data and to calculate.	Information from Curia
Number of upper tier establishments and evolution since adoption of the Directive	Quantitative	Easy to collect input data and to calculate.	Information from implementation reports Information from eSPIRS
Number of lower-tier establishments and evolution since adoption of the Directive	Quantitative	Easy to collect input data and to calculate.	Information from implementation reports Information from eSPIRS
2- Compliance			
Percentage of safety reports updated (by the operator) and examined (by the competent authority) safety reports	Quantitative	Assess the amount of upper tier establishments satisfying safety reports requirements. Emergency planning	Information from implementation reports
Percentage of external emergency plans achieved by competent authorities	Quantitative	Assess competent authorities' abilities to satisfy regulatory requirements regarding external emergency plans.	Information from implementation reports

Possible candidate indicators	Quantitative / Qualitative	Associated comments (e.g. data availability, assessment of the indicator)	Data sources
Number of external emergency plans exercises performed per year divided by the number of upper tier establishments in the Member State	Quantitative	Assess efforts deployed by authorities to ensure emergency plans are operational and effective.	Information from implementation reports
Percentage of Lower tier establishments with MAPP examined (by the competent authority)	Quantitative	Assess the amount of lower tier establishments satisfying MAPP requirements	Information from implementation reports
Quality of MAPP implementation means adopted by lower tier establishments	Qualitative	This issue should be treated qualitatively by adding a specific item in the questionnaire filled every four years by Member States and fostering Member State exchanges of best practices Information held by competent authorities	No data source identified
Total number of substances for which Article 4 procedures have been triggered (ongoing and closed) multiplying the average time required to close an exemption procedure (from its reception to its closure by the European Commission).	Quantitative	Assess the amount of efforts as well as administrative congestion generated by the procedure. Does not include time spent by industries. Data held by competent authorities and the European Commission	No data source identified
Percentage of assessment procedures under Article 4 being successful.	Quantitative	Investigate the more or less complex character of such a procedure and the opportunity to modify it. Based on data being provided	No data source identified
Percentage of Seveso establishments for which competent authorities have ensured that the information referred to in Annex V is made available and updated to the public	Quantitative	Depends on Member States abilities to monitor and report on these elements. Data held by competent authorities	No data source identified
Quality of information made available to the public.	Qualitative	Hardly appreciable through an indicator Better approaches through complementary analysis (through sampling for instance). Data held by competent authorities	Information from implementation reports
Number of inspection staff fully trained on Seveso III Directive per establishment in each Member State	Quantitative	Assess the adequacy of staffing availability and training required for full and successful implementation. This metric considers the availability level of inspectors per establishment.	No data source identified

Possible candidate indicators	Quantitative / Qualitative	Associated comments (e.g. data availability, assessment of the indicator)	Data sources
Share of upper tier establishments inspected annually (taking into account those Member States using systematic appraisal for defining inspection programme)	Quantitative	Assess that a core requirement of the Directive is being met	Information from implementation reports
Share of lower tier establishments inspected once over three years (taking into account those Member States using systematic appraisal for defining inspection programme)	Quantitative	Ensure that minimal number of inspections are performed for each establishment.	Information from implementation reports
Suitability of the information available to guarantee comparable inspections are made throughout the EU	Qualitative	Better addressed through annual questionnaire to member states. Question more particularly (i) the availability of national guidelines on upper and lower tier inspections and (ii) the way inspection items are selected and performed (so to enhance collective learning and exchange of experience among Member States). Data held by competent authorities	No data source identified
3- Intermediate outcomes of concern			
Number of Loss of Primary Containment incidents multiplying their respective severity level as calculated by CCPS (2011)	Quantitative	Relying on incidents reporting prevents the European Commission from relying on weak statistical significance of extremely rare major accidents.	No data source identified
Number of incidents/accidents multiplying their level of consequences per type of effects (human, environment, dangerous materials released, monetary) according to the EU accident severity scale.		CCPS related metric will provide a global index that aggregates all type of consequences. The metric based on the EU severity index will provide a calculation per type of effect (no final score aggregated).	No data source identified
Number of major accidents reported in eMARS database and evolution throughout the Directive's lifetime	Quantitative	Provide another view on accident and incidents. Absolute number to be contextualised by number of establishments / sector information	No data source identified
Number of incidents reported in eMARS database and evolution throughout the Directive's lifetime	Quantitative	Provide another view on accident and incidents. Absolute number to be contextualised by number of establishments / sector information	Data from eMARS
Number of near misses reporting in eMARS database and evolution throughout the Directive's lifetime	Quantitative	Provide another view on accident and incidents. Absolute number to be contextualised by number of establishments / sector information	Data from eMARS

Possible candidate indicators	Quantitative / Qualitative	Associated comments (e.g. data availability, assessment of the indicator)	Data sources
4 - Ultimate outcomes of concern			
Achievement of a high level of protection of human health	Qualitative	Combination of data / information to assess the achievement of the objectives of the Directive	No data source identified
Achievement of high level of protection of the environment	Qualitative	Combination of data / information to assess the achievement of the objectives of the Directive	No data source identified
Link between the implementation of the Directive and the achievements of its objectives	Qualitative	Combination of data / information to assess the achievement of the objectives of the Directive	No data source identified
Matching of the achievements observed and the original objectives of the Seveso Directive	Qualitative	Combination of data / information to assess the achievement of the objectives of the Directive	No data source identified
Efficiency			
Overall costs associated with the implementation of the Directive	Quantitative	A key aspect of the efficiency of the legislation is its capacity of meeting the objectives within proportionate costs.	No data source identified
Distribution of the costs between operators and competent authorities	Quantitative	In particular important to verify that the burden is not overly on operators or on competent authorities	No data source identified
Overall benefits (monetary and non-monetary) of the implementation of the Directive	Quantitative / Qualitative	Requires one to quantify / monetise the benefits, a possible approach is to monetise 'avoided costs' of accidents by estimating the socio-economic costs of accidents.	Some initial data in this report and in some Member States
Proportionality (cost-effectiveness) of costs and benefits from the Seveso III Directive	Quantitative	Costs and benefits are balanced	No data source identified
Affordability of the costs when considering different stakeholder groups, for example SMEs.	Quantitative / Qualitative	Important to consider that the Directive does not affect disproportionately a specific group of stakeholders	No data source identified
Differences between costs and benefits observable throughout Member States	Quantitative	Require a level of detail of costs and benefits data at Member State level. Several factors could influence both costs and benefits, for example geographic area, additional national requirements, additional uses made from the information generated.	No data source identified

Possible candidate indicators	Quantitative / Qualitative	Associated comments (e.g. data availability, assessment of the indicator)	Data sources
Good practices for the efficient implementation of the Directive	Qualitative	Examples from Member States	Some initial information in implementation reports
Comparability of the costs of the Seveso regime with other regimes	Quantitative / Qualitative	Comparability with other UNECE / OECD countries and the costs incurred for their equivalent regimes	No data source identified
Elements of the Directive to be simplified	Qualitative	Indication on the regulatory burden	No data source identified
Element of the Directive to be optimised (e.g. getting more from existing information reported under eMARS on lessons learnt)	Qualitative	Indication on the regulatory burden	No data source identified
Relevance			
Current needs addressed by the Directive	Qualitative	Assess that a core requirement of the Directive is being met	Impact assessment reports
Comparison of the current needs with the original needs of the Directive	Qualitative	Assess that a core requirement of the Directive is being met	Impact assessment reports
Flexibility allowed in the Directive to adapt to technical and scientific progress	Qualitative	Assess that a core requirement of the Directive is being met	Impact assessment reports
Elements where adaptation to progress has been made	Qualitative	Assess that a core requirement of the Directive is being met	Impact assessment reports
Relevance of the Seveso Directive in the wider international context e.g. UNECE and OECD	Qualitative	Assess that a core requirement of the Directive is being met	Initial information from UNECE ad hoc working group
Provisions of the Directive which are outdated and irrelevant	Qualitative	Assess that a core requirement of the Directive is being met	Impact assessment reports
Coherence			
Elements of the Seveso Directive that are not internally coherent	Qualitative	Assess that the Directive is fully coherent	No data source identified

Possible candidate indicators	Quantitative / Qualitative	Associated comments (e.g. data availability, assessment of the indicator)	Data sources
Elements of the Seveso Directive that are not externally coherent (considering other industrial emissions legislation and wider environmental legislation)	Qualitative	Assess that the Directive contributes to wider EU objectives	No data source identified
Elements of the Seveso Directive that are not externally coherent (considering international legislation and guidance)	Qualitative	Assess that the Directive contributes to wider EU objectives	No data source identified
Contribution of the Directive to supporting the EU internal market	Qualitative	Assess that the Directive contributes to wider EU objectives	No data source identified
Contribution of the Directive to supporting competition	Qualitative	Assess that the Directive contributes to wider EU objectives	No data source identified
Contribution of the Directive to supporting industrial innovation (e.g. number of employees in research and development for industrial health and environmental safety)	Quantitative / Qualitative	Assess that the Directive contributes to wider EU objectives	Possible data in Eurostat
Contribution of the Directive to supporting employment (number of employees in Seveso establishments)	Quantitative / Qualitative	Assess that the Directive contributes to wider EU objectives	Possible data in Eurostat
EU added value			
Additional benefits delivered by the Seveso Directive in comparison to national initiatives	Qualitative	Assess that an EU level Directive is still justified	No data source identified
Value of the continued action under the Seveso Directive	Qualitative	Assess that an EU level Directive is still justified	No data source identified
Consequences of stopping / repealing Seveso Directive	Qualitative	Assess that an EU level Directive is still justified	No data source identified

The set of indicators presented in the table above prompt the following complementary remarks:

- ▶ Usually, the act of building a set of indicators requires several rounds of interactions with the decision maker and experts involved in the implementation of the legislation so to gradually refine the proposals according to preferences and specific agenda. This is why this work needs to be considered as a first step that may help the decision maker to better formulate expectations and launch accordingly a better oriented analysis;
- ▶ Out of this analysis, we suggested a range of qualitative and quantitative indicators. Several are considering similar aspects but from different point of views; and
- ▶ We indicated where possible current sources of data / information we were aware of, note that for those where no information or data is readily available this does not necessarily prevent the indicator from being selected. Rather this indicates area where additional data collection, through review of literature, consultation of stakeholders concerned, is necessary.

In terms of further possible developments, we suggest the following recommendations:

- ▶ The term “candidate indicators” refers to the need to further refine this first suggestion by exploring how the suggested metrics adequately balance final users’ needs on the one hand and available input data on the other hand. This process is inclusive in nature as it should ensure that both data providers, data users and stakeholders impacted fully understand and agrees on the meanings and terms of interpretations to be associated to the final set of selected indicators;
- ▶ The long-term and incremental nature of the indicator development should be highlighted. It might be found useful to start working on a set of basic indicators, using readily available data while noting further data needs to work on more elaborated indicators and continue development over time should more data become available;
- ▶ Adequate incentives should be put in place to encourage data collection. However it is also important to understand how the data will be used. An absolute number of major accidents (as already highlighted in section 5) is not statistically significant and does not allow conclusions to be drawn on the effectiveness of the Directive. Wider information on incidents and near misses would be useful, providing a more complete picture and here mechanisms to ease the reporting of such events in possibly anonymous ways and across wide industrial sectors will provide an improved means of assessing the Seveso III Directive and identifying means of improvement; and
- ▶ Adequate resources and staffing should be dedicated to cross interpretation of indicators as well as other performance assessment means. In practice, numbers are rarely self-explaining and should never be considered as fully representative of a reality for which complexity remains intractable by simple figures. Accordingly, we recommend information collected through indicators or Member State questionnaires to be used as means to discuss Seveso III performance with all affected stakeholders and collectively explore means of improvement and collective cooperation. In doing so, we move performance assessment from a perspective of conformity to standards and objectives to one of a collective learning dynamic where constant improvement is the collective shared objective of all parties.



Appendix A

Questionnaire for reporting period 2012-2014



EUROPEAN COMMISSION

Brussels, 30.6.2011
C(2011) 4598 final

COMMISSION IMPLEMENTING DECISION

of 30.6.2011

on the questionnaire 2012-2014 relating to Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances

(Text with EEA relevance)

COMMISSION IMPLEMENTING DECISION

of 30.6.2011

on the questionnaire 2012-2014 relating to Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances¹ and in particular Article 19(4) thereof,

Whereas:

- (1) Article 19(4) of Directive 96/82/EC requires the Member States to report on the implementation of this Directive on a three-year basis.
- (2) This report has to be established on the basis of a questionnaire or outline drafted by the Commission in accordance with the procedure set out in Article 6 of Directive 91/692/EEC of 23 December 1991 on standardising and rationalising reports on the implementation of certain Directives relating to the environment.
- (3) The three-year period should cover the years 2012 to 2014 inclusive.
- (4) The measures envisaged by this Decision are in accordance with the opinion expressed by the Committee in accordance with Article 6 of Directive 91/692/EEC.

HAS ADOPTED THIS DECISION:

Article 1

The questionnaire 2012-2014 relating to Council Directive 96/82/EC is hereby adopted.

Article 2

Member States shall draw up a report covering the period 2012 to 2014 in accordance with the questionnaire set out in the Annex.²

¹ OJ L 10, 14.1.1997, p.13

Article 3

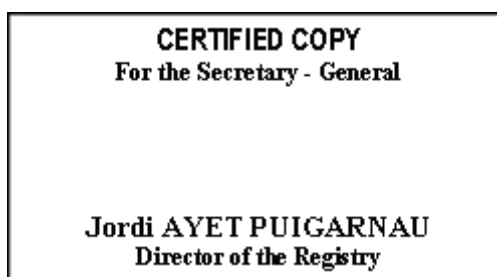
Member States shall provide the Commission with that report by 30 September 2015 at the latest.

Article 4

This Decision is addressed to the Member States.

Done at Brussels, 30.6.2011

For the Commission
Janez POTOČNIK
Member of the Commission



ANNEX

² Available also at this website of the European Commission: <http://ec.europa.eu/environment/seveso/>

ANNEX

Part 1 -Questionnaire 2012-2014

Questionnaire for the three year report referred to in Article 19(4) of Directive 96/82/EC on the control of major-accident hazards involving dangerous substances (SEVESO II)

1. General information

- a) Have any significant changes been made to the main competent authorities responsible for the enforcement of the SEVESO II Directive or to their main tasks?
- b) On 31/12/2014, how many establishments were subject to the provisions transposing Article 6 and 9 (all Seveso establishments), which of those to the provisions transposing Article 6 (so-called lower-tier establishments), and which of those to Article 9 (so-called upper-tier establishments)?
- c) Provide a statistical breakdown summarising the activities of all Seveso establishments as at 31/12/2014 using the SPIRS activity list in Part 2 of this Annex³.
- d) **This question is optional:** How many of the Seveso establishments are covered by or consist of installations covered by Directive 2010/75/EU (IED) succeeding Directive 2008/1/EC? Where establishments or parts thereof fall under both Seveso and IED, what impact in practice does this have on the way Seveso is applied by the competent authorities for the establishments concerned?

2. Emergency Plans

- a) For how many upper-tier establishments have the Competent Authorities decided, in view of the information contained in the safety report, that the requirements to produce an external emergency plan should not apply, as foreseen by Article 11.6?
- b) For how many upper-tier establishments (of those to which the requirements to produce an external emergency plan apply) the designated Authorities have not drawn up an external emergency plan, as referred to in Article 11.1 (c)?
- c) On 31/12/2014, for how many upper-tier establishments has the external emergency plan not been tested over the last three years as required by Article 11.4?
- d) Provide information about the main arrangements for providing the public with specific information (alert systems, main response measures and arrangements to cope with any off-site effects from an accident).
- e) Give a brief explanation of the way external emergency plans are tested (e.g. part test, full test, involving emergency services, desk top etc.) and considered adequate.

³ A reply to this question can be fully or partially replaced by referring to and attaching a SPIRS report for 31/12/2014 (Reporting obligation under Article 19 1a). Member States that use for this SPIRS report the NACE codes for classification of type of industry may continue to use these codes to describe the activities instead of the SPIRS activity list.

Specify the criteria used for considering that an external emergency plan is adequate and that an external emergency plan has been tested.

3. Information on safety measures

- a) Provide general information about your national strategy, concepts and developments in the last three years on how the public and persons liable to be affected by a Seveso accident are informed about major-accidents hazards, possible consequences and safety measures.
- b) For how many upper tier establishments has information been made actively available to the public, at least once during the last five years (2010-2014)?
- c) Provide a statistical breakdown showing by whom (operator, authorities) and by which means (for example operators' or authorities leaflets, flyers, emails, SMS) the information under 3b) is made available.
- d) Please provide a brief explanation of the systems in place to monitor that the information has been supplied/is available.
- e) **This question is optional:** For how many upper-tier establishments is up to date information kept permanently available, at 31/12/2014?
- f) **This question is optional:** Provide a statistical breakdown showing by whom (operator, authorities) and by which means (for example operators' or authorities notices, websites) the information under 3e) is kept permanently available.
- g) **This question is optional:** For how many lower tier establishments is up to date information kept permanently available, at 31/12/2014.

4. Inspections

- a) For those Member States where the programme of inspections is based upon a systematic appraisal of major-accident hazards, what are the main criteria on which the systematic appraisal is based?
- b) **This question is optional:** What information if any from the programme of inspections and from the inspections report is available to the public?
- c) Please provide general summarising information about the types of actions (e.g. prohibitions of use, sanctions or other measures) taken as a result of accidents, incidents and non-compliance during the reporting period.
- d) How many upper tier establishments were subject to on-site inspections every twelve months?
- e) How many upper tier establishments not covered by 4d) were subject to on-site inspections in the last three years?
- f) How many lower tier establishments were subject to on-site inspections in the last three years?

5. Domino Effects

Please provide non-numerical answers on how the objectives of Article 8 on Domino Effects have been ensured and describe your experience of applying this Article during reporting period 2012-2014.

6. Land-Use Planning

Please provide non-numerical answers on how the objectives of Article 12 on Land-Use Planning have been ensured and describe your experience of applying this Article during reporting period 2012-2014.

7. Further information

This question is optional: Please provide any additional Seveso-related general information, implementation experience, reports etc. that could be of interest and can be shared with the public, other Member States and the Commission on the following points

- a) Lessons learned from accidents and incidents to prevent a recurrence;
- b) IT tools used for monitoring the implementation of the Directive and for data sharing;
- c) If relevant, any Seveso-like provisions applied to installations and activities not covered by this directive, for example on pipelines, ports, marshalling yards, offshore installations, gas exploration, exploitation, etc.

Part 2 - List with Seveso Activities

- 1 Agriculture
- 2 Building & works of engineering construction
- 3 Ceramics (bricks, pottery, glass, cement, etc.)
- 4 Chemical installations - ammonia
- 5 Chemical installations - carbon oxides
- 6 Chemical installations - chlorine
- 7 Chemical installations - fluorine or hydrogen fluoride
- 8 Chemical installations - hydrogen
- 9 Chemical installations - Industrial gases
- 10 Chemical installations - inorganic acids
- 11 Chemical installations - nitrogen oxides
- 12 Chemical installations - other fine chemicals
- 13 Chemical installations - sulphur oxides, oleum
- 14 Electronics & electrical engineering
- 15 Fuel storage (including heating, retail sale, etc.)
- 16 General chemicals manufacture (not included above)
- 17 General engineering, manufacturing and assembly
- 18 Handling and transportation centres (ports, airports, lorry parks, marshalling yards, etc.)
- 19 Leisure and sport activities (e.g. ice rink)
- 20 LNG storage and distribution
- 21 LPG production, bottling and bulk distribution
- 22 LPG storage
- 23 Manufacture of cement, lime and plaster
- 24 Manufacture of food products and beverages
- 25 Manufacture of glass

- 26 Medical, research, education (including hospitals, universities, etc.)
- 27 Mining activities (tailings & physicochemical processes)
- 28 Other activity (not included above)
- 29 Petrochemical / Oil Refineries
- 30 Plastic and rubber manufacture
- 31 Power generation, supply and distribution
- 32 Processing of ferrous metals (foundries, smelting, etc.)
- 33 Processing of metals
- 34 Processing of metals using electrolytic or chemical processes
- 35 Processing of non-ferrous metals (foundries, smelting, etc.)
- 36 Production and manufacturing of pulp and paper
- 37 Production and storage of fertilizers
- 38 Production and storage of fireworks
- 39 Production and storage of pesticides, biocides, fungicides
- 40 Production of basic organic chemicals
- 41 Production of pharmaceuticals
- 42 Production, destruction and storage of explosives
- 43 Shipbuilding, shipbreaking, ship repair
- 44 Textiles manufacturing and treatment
- 45 Waste storage, treatment and disposal
- 46 Water and sewage (collection, supply, treatment)
- 47 Wholesale and retail storage and distribution (excluding LPG)
- 48 Wood treatment and furniture




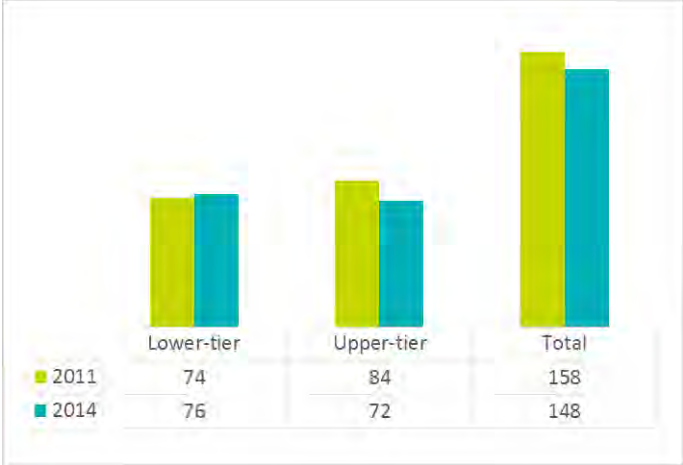

Appendix B

Member State summary sheets

Member State summary sheets have been prepared for each Member State and based on the information reported for the 2012-2014 reporting period. The summary sheets present some of the key features of the implementation of the Seveso II for the reporting period. For more details, the complete reports from Member States are available on CircaBC¹.

¹ <https://circabc.europa.eu/w/browse/53cad98-1907-414d-82d5-d25308b7886e>

1. Member State summary sheet – Austria

												
<p>AUSTRIA</p>												
<p>Overview of Austria</p>												
<p>Austria provided a complete response.</p>												
<p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; background-color: #FFD700;"> <p>The Austrian response indicates that the provisions of the Seveso II Directive are almost fully implemented.</p> </div>												
<p>Main issues identified: A large number of upper-tier establishments were not inspected annually.</p>												
<p>Number of establishments:</p>  <table border="1"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>74</td> <td>84</td> <td>158</td> </tr> <tr> <td>2014</td> <td>76</td> <td>72</td> <td>148</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	74	84	158	2014	76	72	148
	Lower-tier	Upper-tier	Total									
2011	74	84	158									
2014	76	72	148									
<p>Overview of the information reported</p>												
<p>Question 1 - General information</p>												
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by Austria.</p>												
<p>1.b) Establishments subject to Seveso There were 148 Seveso establishments in Austria at the end of 2014, down from 158 in 2011. This is due to a decreasing number of upper-tier establishments.</p> <p>As shown in the chart to the right, Austria exhibits fewer establishments per capita and fewer establishments per km² than the EU average.</p>  <table border="1"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>173</td> <td>176</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	173	176	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²										
MS	173	176										
EU	222	253										
<p>1.c) Activities of Seveso establishments The activities with the highest number of establishments at the end of the reporting period in Austria were</p> <ul style="list-style-type: none"> - "Other activities" (10%); - Fuel storage (9%); - LNG production, bottling and bulk distribution (7%); and - LPG storage (7%). <p>"Other activities" and fuel storage are the two most common activity amongst EU Seveso establishments (14% and 12% of all establishments respectively). LNG production, bottling and bulk distribution; and LPG storage represent 8% and 4% of all EU establishments respectively.</p>												
<p>1.d) Seveso establishments covered by the IED (optional) Austria has not answered this optional question.</p>												

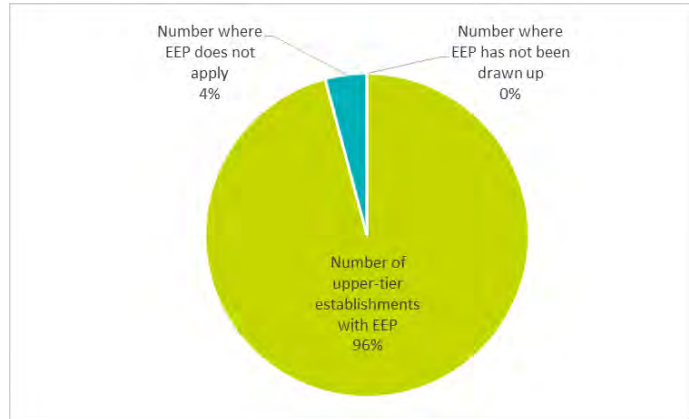


AUSTRIA

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

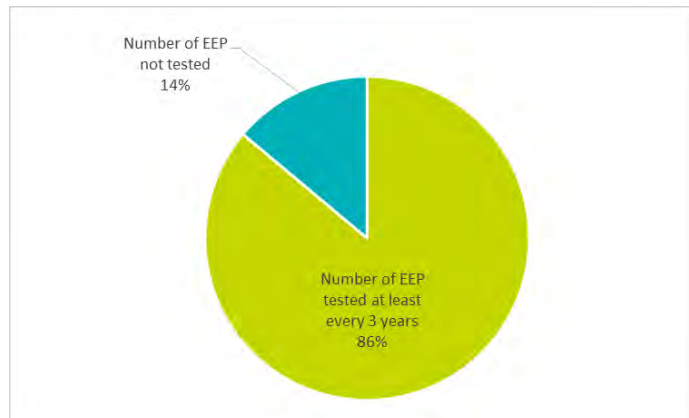
For 3 upper-tier establishments the Austrian authorities decided that an external emergency plan was not needed as permitted by Article 11.6 of the Seveso II Directive, however the specific reason was not specified in the Austrian response. This corresponds to 4% of upper-tier establishments, the same percentage as across the whole EU-28. For all upper-tier establishments for which external emergency plans are required, these have been drawn up by the designated Authorities in Austria.



Note: Total 72 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, 10 upper-tier establishments' external emergency plans had not been tested (14% of the upper-tier establishments in Austria), mostly due to pending revisions of the plans.



2.d) Arrangements for providing information to the public:

- There is a federal siren alarm system with consistent signals for the whole country. The public is kept informed about these alarm signals. Furthermore local sirens at the establishment may be used;
- Those liable to be affected by a Seveso accident are contacted individually by the operator which provides information according to the specific hazards; and
- Information is provided by radio information initiated by the alarm chain or in local newspapers or similar means.

2.e) Testing external emergency plans

Tests are carried out according to the specific local situation and cover in most cases certain parts of the structure. Local governmental bodies (community and region) are responsible for external emergency plans so there is a widespread variation of practices. National guidance published in 2008 serves as checklist for evaluation and defines minimum criteria, in addition to expert judgement afterwards. Emergency plans are tested using:

- On-the-spot exercises to test the technical or organisational measures;
- Staff communication exercises; and
- Emergency response services assume own scenarios for their purposes.

AUSTRIA



Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Austria the operator is responsible for informing the public. The usual strategy is to offer basic information on-site with access for the public, supplemented by other means such as “open days” and nomination of responsible persons to give more information if requested. In most cases web-based information is also provided. In 58 upper-tier establishments (over 80% of total number of upper-tier establishments in Austria) information has been made actively available to the public at least once during the reporting period (2010-2014). The following shows a statistical breakdown of the means that have been used:

- Mailed leaflets or similar: 50%;
- Placard at the entrance of the site: 75%;
- Web-based information: 40%;
- Combination with emergency response tests: 20%;
- Local newspaper: 20%; and
- "Open Day": 10%.

Note that usually the information is provided in more than one way. Therefore the sum of percentages of the various means is more than 100%.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Not answered.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

In Austria a generic table for defining the inspection intervals was in use during the reporting period (2010-2014).

4.b) Programme of inspections available to public (optional)

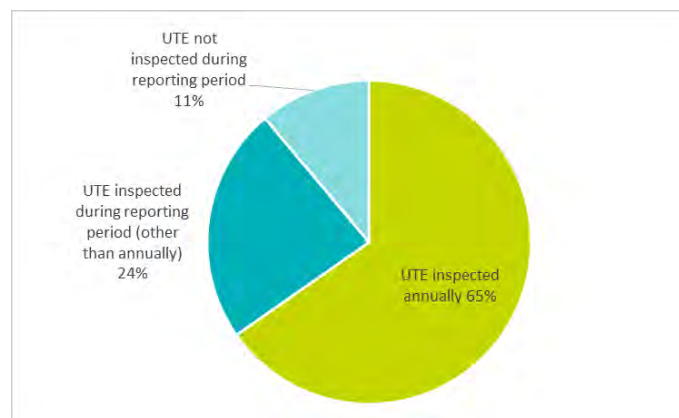
Not answered.


4.c) Actions taken in the event of accidents, incidents and non-compliance

The instruments comprise administrative fines (financial penalties) and in severe cases prohibition of activities. However, so far the degree of non-compliance has mostly not been significant enough to make use of these instruments.


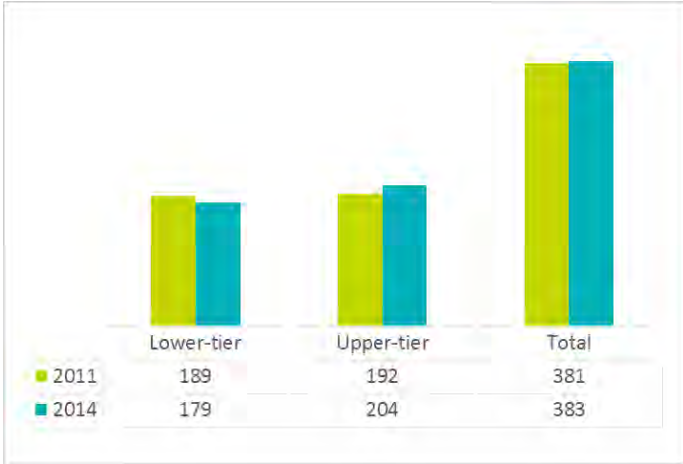
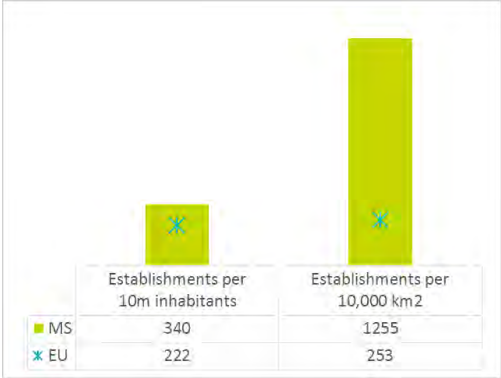
4.d), 4.e), 4.f) Data on on-site inspections

47 upper-tier establishments (65% of the total number of upper-tier establishments) were inspected annually. Another 17 (24%) were inspected at least during the last reporting period, but the remaining upper-tier establishments weren't inspected at all during 2012-2014. In addition to this, 65 lower-tier establishments were inspected (86% of the total number of lower-tier establishments).



<p>AUSTRIA</p>	
<p>Question 5 – Domino effects</p>	
<p>There were six groups of establishments exhibiting risks of domino effects during the reporting period (2012-2014) in Austria. In all of these cases the establishments within the group had previously been one establishment that was subsequently split into different establishments with different owners. The respective requirements on domino effects were therefore reportedly well-established and included in the relevant documents (safety reports etc.) and taken into account in emergency response tests and provision of information to the public.</p>	
<p>Question 6 – Land-use planning</p>	
<p>The Communities are the Authorities responsible for Land-Use planning in Austria. They are provided with the locations of Seveso establishments by their Permitting Authorities and additional relevant information from the operators as required by regional building legislation.</p> <p>There are slight differences amongst the various regional provisions but in general any proposed planning in the vicinity of a Seveso site is subject to a consultation process. Based on an assessment of substance properties of concern, the amount present and the threshold quantity of the Seveso II Directive, a consultation distance is defined in the planning documents and the local building plan concept. In complicated cases, a case-by-case study is carried out, based on a table of agreed scenarios. The decision as to what is allowed within the distance depends on specific criteria, respecting the principles of Article 12 of the Seveso II Directive. Certain forms of development are allowed and thus there is no zone without any allowed use at all.</p> <p>Experiences so far showed that the relevance of Article 12 was sometimes misinterpreted by local authorities and by the public in the vicinity. No further details on the nature of this misinterpretation was provided in Austria's response, but then it was indicated that nevertheless the general direction of reducing the residual risk around major accident sites is respected.</p>	
<p>Question 7 – Further information (optional)</p>	
<p>No response was provided to this optional question.</p>	

2. Member State summary sheet – Belgium

													
<p>BELGIUM</p>													
<p>Overview of Belgium</p>													
<p>Belgium provided a complete response.</p> <p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p style="background-color: green; color: white; padding: 2px;">B6</p> <p>The Belgian response indicates that the provisions of the Seveso II Directive are fully implemented.</p> </div> <p>Main issues identified: None</p>	<p>Number of establishments:</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>189</td> <td>192</td> <td>381</td> </tr> <tr> <td>2014</td> <td>179</td> <td>204</td> <td>383</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	189	192	381	2014	179	204	383
	Lower-tier	Upper-tier	Total										
2011	189	192	381										
2014	179	204	383										
<p>Overview of the information reported</p>													
<p>Question 1 - General information</p>													
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by Belgium.</p>													
<p>1.b) Establishments subject to Seveso There were 383 Seveso establishments in Belgium at the end of 2014, just two more than in 2011. During this interval, the number of lower-tier establishments has decreased, while the number of upper-tier establishments has increased.</p> <p>As shown in the chart to the right, Belgium exhibits more establishments per capita and especially much more establishments per km² than the EU average. Hence, there is a particularly high density of Seveso establishments in Belgium.</p>	 <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>340</td> <td>1255</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	340	1255	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²											
MS	340	1255											
EU	222	253											
<p>1.c) Activities of Seveso establishments The activities with the highest number of establishments at the end of the reporting period in Belgium were:</p> <ul style="list-style-type: none"> - General chemicals (38%); - Wholesale and retail (23%); and - "Other activities" (20%). <p>While these activities are also common throughout the EU-28, they account for much smaller shares of the total number of total EU establishments (12%, 9% and 14%, respectively), than in Belgium.</p>													
<p>1.d) Seveso establishments covered by the IED (optional) Belgium has not answered this optional question.</p>													



BELGIUM

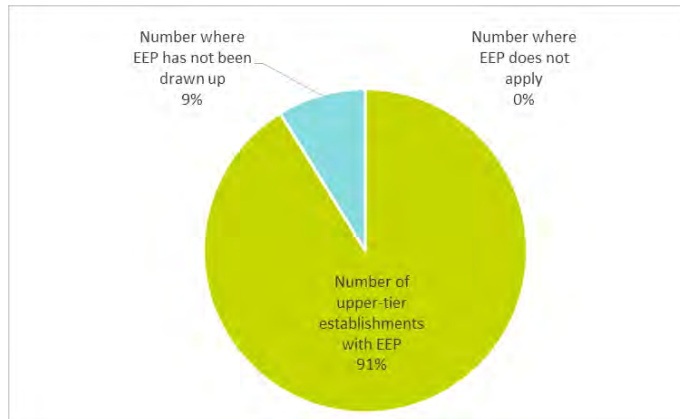
Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

The Belgian authorities decided that the requirement to produce an external emergency plan applied to all upper-tier establishments. However, for 18 establishments, no plan had been drawn up by the end of the reporting period (31/12/2014). This corresponds to 9% of upper-tier establishments, compared to 11% across the whole EU-28.

In Belgium, the information required for the emergency plan has to be submitted, with the safety report, by the operator. The external emergency plan is not produced until after the safety report has been assessed.

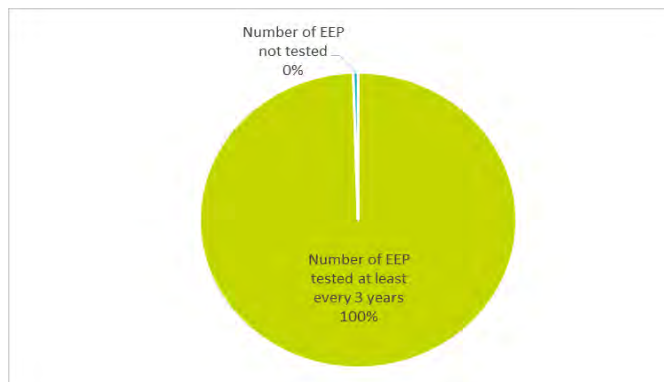
For 14 of the 18 establishments without an external emergency plan, the information had already been received from the operators, but the external emergency plans had not been finalised. For the other 4 establishments, the assessment of the safety report had not been finalised or not all necessary information had been submitted as of 31/12/2014.



Note: Total 204 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, external emergency plans had been tested for all but one upper-tier establishment during the previous three years. This corresponds to less than 1% of emergency plans not tested, compared to 27% on average in all Member States.



2.d) Arrangements for providing information to the public:

- There is a network of electric sirens managed by the federal authority and made available to local authorities;
- Information can be provided via the following means: police, fire or civil protection vehicles with loudspeakers, radio, television, websites and social media, call centres, telephone, teletext; and
- Currently, the system “BE ALERT” is being tested. It has been developed by the federal authority to directly warn and better inform the population affected in cases of emergency. It allow the authority responsible for crisis management to send alarm messages via multiple channels, such as voice messages to phones, SMS, e-mails, fax, twitter and facebook. Launch of the system was scheduled for the end of 2015 (<http://be-alert.be/>).

2.e) Testing external emergency plans

Provincial authorities are responsible for testing external emergency plans in Belgium. The extent of tests can range from only key crisis management staff to all the emergency services and their resources in the field. Furthermore, there are tests on a strategic level, for instance regarding alert sirens and multidisciplinary alert systems, as well as partial tests (“minimex”) focusing on a specific component of the external emergency plans.

Tests are assessed by the security unit and their frequency is specified in the external emergency plans, unless it is subject to specific legislation in some cases. A multidisciplinary working group has laid down the general rules for the tests in a manual, which includes assessment lists, specifications of stakeholders’ roles and a typology of tests.

In summary, the types of tests used are:

- Table top exercises;
- Command post exercises ; and
- Field training exercises.



BELGIUM

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

A comprehensive information campaign under the responsibility of the interior ministry was launched in Belgium in 2012. The campaign has covered all upper-tier establishments and included multiple means of communication. While due to the nature of the holistic campaign, a breakdown of which means has been used for how many establishments is not possible, detailed figures on how many people have been reached by the different means is available:

- National TV spots and documentaries: 68% of the population reached;
- Print media: 12 daily newspapers, 29% of the population reached;
- Leaflets: 400,000 distributed, 8% of the population reached;
- Website Seveso.be (in 4 languages): 33,142 visitors in the first two months online ;
- Educational game “Seveso The Game : Be The Ultimate Survivor”: no figures on reach available;
- Information in schools: no figures on reach available; and
- Local information sessions and leaflets: no figures on reach available.

3.e), 3.f), 3.g) Information kept permanently available (optional)

No information was provided.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

In Belgium, all establishments (lower and upper-tier) are classified in one of three danger categories based on the “Rapid Ranking Technique” developed by TNO on the basis of the Dow Fire and Explosion Index. Two indicators (“fire and explosion” and “toxicity”) are calculated from the substances’ flammability, toxicity, reactivity and conditions of use (pressure, temperature, chemical reaction, etc.). Based on the indicators, equipment is assigned a danger category. Frequency of inspections ranging from yearly to once every three years is then assigned to each establishment based on the highest danger category of any of its equipment.

4.b) Programme of inspections available to public (optional)

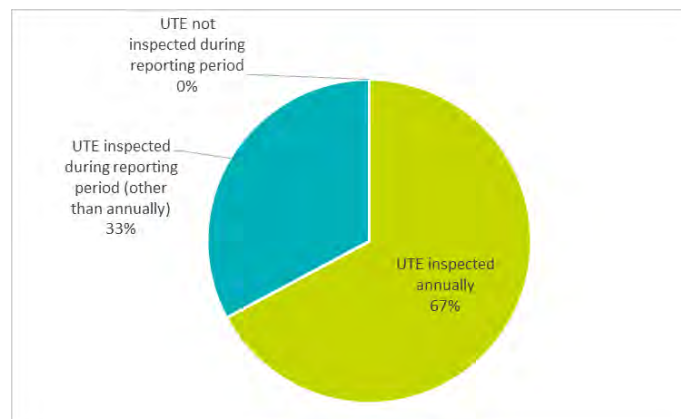
Not answered.

4.c) Actions taken in the event of accidents, incidents and non-compliance

The inspection teams are authorised to issue verbal and written suggestions, warnings and orders in case of potential violations. In case such warnings etc. are not followed by corrective measures, or in cases of gross shortfalls, more severe actions can be taken. In 2012-2014, in 13 cases orders of corrective actions were issued and in 4 cases legal proceedings were opened, all of which were due to non-compliance (i.e. not due to accidents).

4.d), 4.e), 4.f) Data on on-site inspections

137 upper-tier establishments (73% of the 187 establishments that were upper tier for the whole reporting period) were inspected annually. Note that Belgium applies systematic appraisal to determine inspection schedules (see 4.a) and as such it is not required to inspect all establishments annually. The remaining upper-tier establishments were inspected at least once during the last reporting period. In addition to this, all lower-tier establishments were inspected.





BELGIUM



Question 5 – Domino effects

Domino effects between establishments are systematically analysed semi-quantitatively in the safety reports (upper-tier) and in the framework of permit requests (upper and lower-tier). The main effects analysed include heat radiation and overpressure. In case domino effects appear possible according to the semi-quantitative analysis (Flemish region) or quantitative analysis (Wallonia and Brussels-Capital regions), the need for additional safety measures and daily information exchange are assessed.

Question 6 – Land-use planning


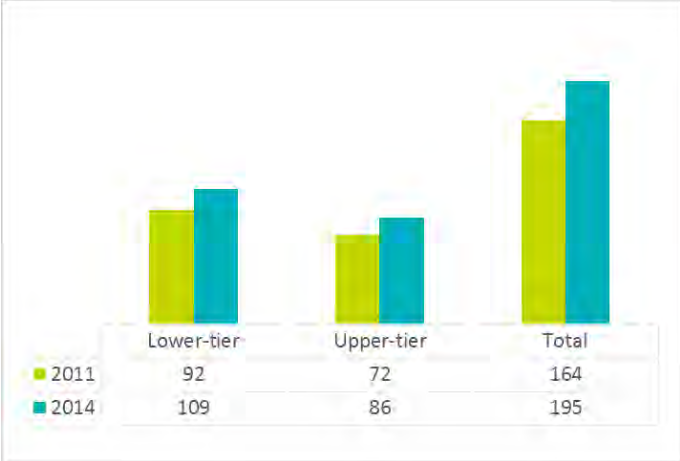
New establishments and changes to existing establishments are regulated through the environmental permitting procedure.

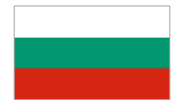
The Flemish spatial planning and environmental regulation specifies that external safety has to be assessed for every spatial implementation that includes industrial land on which new Seveso establishments can be created or that is in the vicinity of existing establishments. Permitting procedures follow advice from the coordinating public services and consider information from safety reports and studies. In Wallonia, and Brussels, zones vulnerable to risks are defined around Seveso establishments. All permit procedures in such zones must be advised by the Risk and Major Accident Unit in Wallonia and the Bruxelles Environment (IBGE) in Brussels. These take into account the risk posed by the Seveso installation and the consequences of any development of that risk. Risks from Seveso-establishments are then included in the respective decisions regarding the spatial developments to limit consequences of any potential major accidents.

Question 7 – Further information (optional)

No response was provided to this optional question.

3. Member State summary sheet – Bulgaria

	<p>BULGARIA</p>												
<p>Overview of Bulgaria</p>													
<p>Bulgaria provided a complete response.</p>													
<p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p style="background-color: green; color: white; padding: 2px;">The Bulgarian response indicates that the provisions of the Seveso II Directive are fully implemented.</p> </div>	<p>Number of establishments:</p>  <table border="1" style="margin-top: 10px;"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>92</td> <td>72</td> <td>164</td> </tr> <tr> <td>2014</td> <td>109</td> <td>86</td> <td>195</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	92	72	164	2014	109	86	195
	Lower-tier	Upper-tier	Total										
2011	92	72	164										
2014	109	86	195										
<p>Main issues identified: None</p>													
<p>Overview of the information reported</p>													
<p>Question 1 - General information</p>													
<p>1.a) Significant changes made to competent authorities or their tasks</p> <p>Some significant changes regarding the responsible authorities have taken place according to the Bulgarian Environmental Protection Act (hereinafter "EPA") in 2013. An overview of competent authorities and their tasks in Bulgaria is provided in the table below.</p>													
<table border="1"> <thead> <tr> <th>Authority</th> <th>Key tasks and responsibilities related to Seveso as of 2013</th> </tr> </thead> <tbody> <tr> <td>Ministry of Environment and Water</td> <td> <ul style="list-style-type: none"> in charge of the coordinated implementation and enforcement of Directive 2012/18/EC ["Seveso III"] at national level; designated as a central body of the state administration in the area of major accidents prevention; evaluates safety reports for permitting of upper-tier establishments; evaluates the final reports on the occurrence and consequences of major accidents; evaluates the results of inspections; transboundary effects of industrial accidents; and domino effects. </td> </tr> <tr> <td>Ministry of the Interior</td> <td> <ul style="list-style-type: none"> internal emergency plans, safety measures on explosives, ammunitions and pyrotechnics; emergency planning at national level; evaluates the documentation for permitting of upper-tier establishments; and keeps records of written notifications and final reports on occurrences and consequences of major accidents. </td> </tr> <tr> <td>Executive Agency "General Labour Inspectorate" under the Ministry of Labour and Social Affairs</td> <td> <ul style="list-style-type: none"> safety at work aspects; and evaluates the documentation of the operators submitted for permitting of upper-tier establishments. </td> </tr> <tr> <td>Regional Inspection of Environment and Water (RIEW)</td> <td> <ul style="list-style-type: none"> environmental aspects, in charge of the coordinated enforcement, incl. preparation of inspection plans and reports, interlinkages with environmental impact assessment and strategic environmental assessment procedures, and land-use planning requirements; evaluates the documentation submitted for permitting of upper-tier establishments; evaluates the major accident prevention policy reports of lower-tier establishments; and organises, coordinates, participates in and reports on inspections of all Seveso establishments. </td> </tr> <tr> <td>Local Authorities</td> <td> <ul style="list-style-type: none"> preparation and testing of the external emergency plans; and evaluates the documentation submitted for permitting of upper-tier establishments and takes part in inspections of all establishments. </td> </tr> </tbody> </table>	Authority	Key tasks and responsibilities related to Seveso as of 2013	Ministry of Environment and Water	<ul style="list-style-type: none"> in charge of the coordinated implementation and enforcement of Directive 2012/18/EC ["Seveso III"] at national level; designated as a central body of the state administration in the area of major accidents prevention; evaluates safety reports for permitting of upper-tier establishments; evaluates the final reports on the occurrence and consequences of major accidents; evaluates the results of inspections; transboundary effects of industrial accidents; and domino effects. 	Ministry of the Interior	<ul style="list-style-type: none"> internal emergency plans, safety measures on explosives, ammunitions and pyrotechnics; emergency planning at national level; evaluates the documentation for permitting of upper-tier establishments; and keeps records of written notifications and final reports on occurrences and consequences of major accidents. 	Executive Agency "General Labour Inspectorate" under the Ministry of Labour and Social Affairs	<ul style="list-style-type: none"> safety at work aspects; and evaluates the documentation of the operators submitted for permitting of upper-tier establishments. 	Regional Inspection of Environment and Water (RIEW)	<ul style="list-style-type: none"> environmental aspects, in charge of the coordinated enforcement, incl. preparation of inspection plans and reports, interlinkages with environmental impact assessment and strategic environmental assessment procedures, and land-use planning requirements; evaluates the documentation submitted for permitting of upper-tier establishments; evaluates the major accident prevention policy reports of lower-tier establishments; and organises, coordinates, participates in and reports on inspections of all Seveso establishments. 	Local Authorities	<ul style="list-style-type: none"> preparation and testing of the external emergency plans; and evaluates the documentation submitted for permitting of upper-tier establishments and takes part in inspections of all establishments. 	
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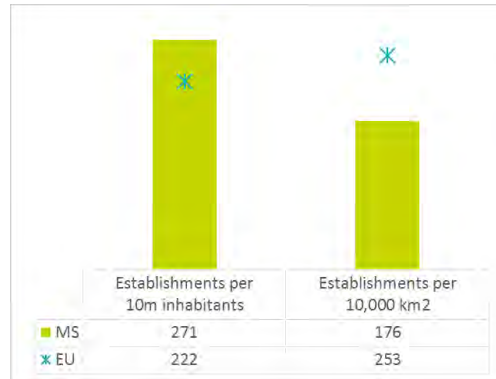


BULGARIA

1.b) Establishments subject to Seveso

There were 195 Seveso establishments in Bulgaria at the end of 2014, up from 164 in 2011.

As shown in the chart to the right, there are more establishments per capita but fewer establishments per km² in Bulgaria compared to the EU average.



1.c) Activities of Seveso establishments

The activities with the highest number of establishments at the end of the reporting period in Bulgaria were

- Fuel storage (24%);
- Production, destruction and storage of explosives (16%); and
- LPG storage (14%).

These activities are also common among the EU average, but they account for much smaller shares of the total number of total EU establishments. Fuel storage is the third most common activity amongst the EU Seveso establishments (11% of all establishments), destruction and storage of explosives and LPG storage represent 4% of EU establishments each.

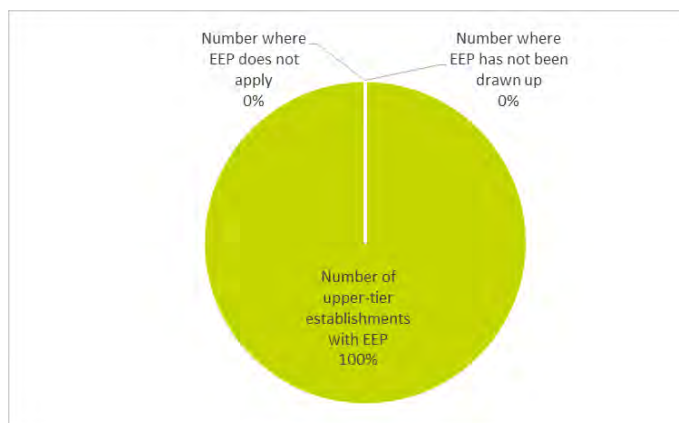
1.d) Seveso establishments covered by the IED (optional)

19 upper-tier and 19 lower-tier establishments are covered by (or consist of installations covered by) Directive 2010/75/EU (IED), accounting for 22% of all upper-tier and 17% of all lower-tier establishments. For these establishments, the competent authority sets conditions for safety measures and emergency planning in the IED (or formerly IPPC) permit.

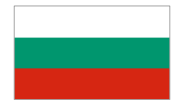
Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

The Bulgarian authorities decided that the requirement to produce an external emergency plan applied to all upper-tier establishments and during the reporting period emergency plans have been produced for all upper-tier establishments.



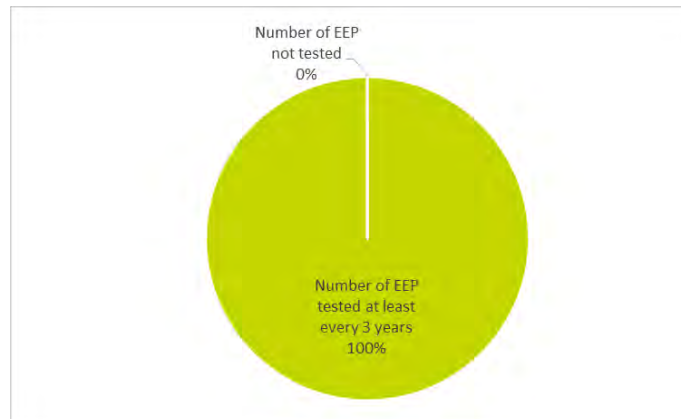
Note: Total 86 upper-tier establishments



BULGARIA

2.c) Upper-tier establishments without external emergency plan tested

No deviations from the testing requirements have been reported by the local authorities.



2.d) Arrangements for providing information to the public:

- Operators are obliged to build and maintain local alert systems for warning the population in the potentially endangered settlements and to integrate them with the National Early Warning System. No further information on the nature of the alert system was provided by the response; and
- Letters to the mayor with information on the planned safety measures and actions in case of emergency and to the neighbouring establishment(s) on the level of the expected effects/damages in case of major accident, as well as brochures, leaflets and information on the website of enterprises.

2.e) Testing external emergency plans

The types of tests used in Bulgaria are:

- Full test (participation of establishment employees, rescue forces, state and local administration and general public);
- Part test (establishment employees, rescue forces and part of the state and local administration);
- Desk top exercises (only few staff from the Seveso site and the emergency services participate); and
- Planning discussions and exercises may also be sufficient.

Criteria according to which the external emergency plan is considered appropriate and according to which option is selected for testing are: real accidents occurred in enterprises in past years; permits issued to establishments to perform production activities; reported errors in real simulation of the plan with the participation of emergency workers in the enterprise; and adjustments made in the inspections carried out by interagency committees in the enterprise.

If necessary, the emergency plans need to be updated according to findings from the tests.

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Bulgaria, the operators are responsible for informing the public and have actively done so for all upper-tier establishments at least once during the reporting period.

Information on the safety measures planned and on the requisite behaviour in the event of an accident has to be submitted by the operators to all sites that serve public purposes (hospitals, schools, kindergartens, hospices, etc.); it has not been further specified in the response by which means) and via one or more of the following channels: mail, placards/bulletins, operator's website, mass media. The following shows a statistical breakdown of the means that have been used:

- Website of the establishment: 75%;
- Official letters: 10 %;
- Leaflets 10%; and
- Flyers 5%.

The quality and accuracy of the information as well as its submission are controlled during the inspections.

3.e), 3.f), 3.g) Information kept permanently available (optional)

All upper-tier establishments are required to keep permanently available up to date information on recommended safety measures and behaviour in case of emergency. This has to be provided through copies in paper or electronically and publication of information on the website of the company and/or the operator. The place on the premises where this information is available has to be publicly announced. Compliance with these specifications is controlled during inspections.



BULGARIA

Question 4 – Inspections

4.a) Systematic appraisal of major-accident hazards

Regional Inspectorates for Environment and Water are responsible for the planning, preparation, execution and reporting of inspections. By the end of each calendar year an inspection plan for each of the districts is prepared and endorsed by the Minister of Environment and Water. Risk assessment is performed for each establishment during preparation of the inspection plan and programmes based on the following criteria: Activities carried out; quantity and type of hazardous chemicals; the level of risk due to the processes' complexity; detection systems in terms of prevention of accidents and/or incidents; and location.

4.b) Programme of inspections available to public (optional)

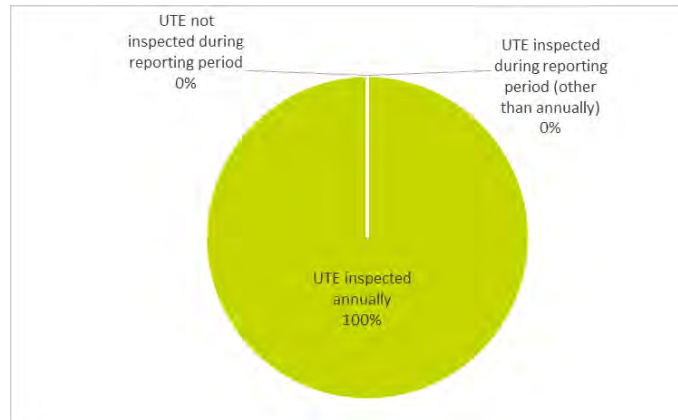
Not answered.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Proportionate to the risk from the site, formal orders can be issued to prohibit of use any site in order to prevent or stop emergency situations, hazards for the environment or human health and breaches of the legislation. These orders can be appealed in court, but the appeal does not stop their implementation. In case of non-compliances detected during inspections, all inspectors issue compliance notices which include the actions to be undertaken in order to achieve compliance. In case of non-compliance with the notices or violations to other provisions of the Seveso legislation, fines of up to €10,000 can be imposed. If an operator is running a Seveso site without a permit the penalty can be fines up to €50,000 or criminal prosecution. During the reporting period, fines between €5,000 and €15,000 have been imposed on a small number of establishments (at least 4).

4.d), 4.e), 4.f) Data on on-site inspections

All upper-tier establishments were subject to on-site inspections every twelve months and lower-tier at least once during the reporting period in Bulgaria.



Question 5 – Domino effects

For the operators of upper tier establishments, the competent authority sets permit conditions related to potential domino effects, for example - the operator is obliged to exchange information about the nature and extent of the danger of an accident with subsequent "domino effect" for emergency planning and evacuation routes with sites located in close proximity to the establishment.

The establishments or groups of establishments where domino effects could occur are identified by the Ministry of Environment on the basis of risk assessment data submitted by the operators of all Seveso establishments, especially on the calculations/predictions for the aerial distribution of the expected negative consequences, particularly explosions and fires (overpressure, missile and thermal radiation effects).



BULGARIA




Question 6 – Land-use planning

The Bulgarian Law on Spatial Planning stipulates that the Minister of Environment and Water is asked for consent when development projects are evaluated by the competent authorities. For developments around existing sites, land development plans are developed as measures to prevent major accidents and limit their consequences for human health and the environment.

Question 7 – Further information (optional)

No response was provided to this optional question.

4. Member State summary sheet - Croatia



CROATIA

Overview of Croatia

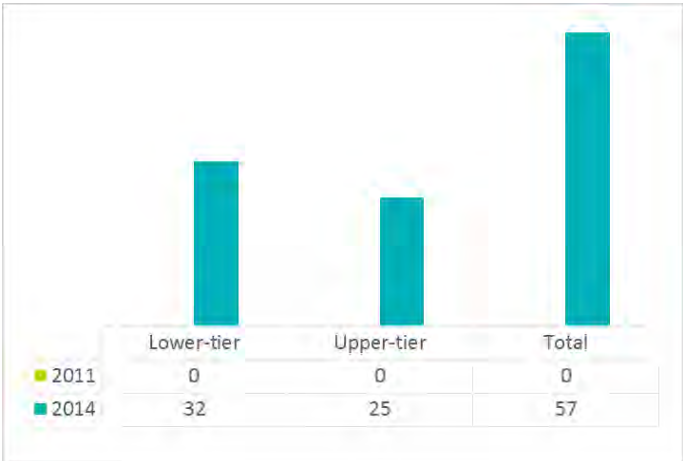
Croatia's response was almost complete but unclear with regards to a number of key issues, which are summarised below.

Status of overall implementation:

The response submitted by Croatia indicates that while most of the provisions of the Directive have been implemented, there are gaps regarding key provisions of the Directive

Main issues identified:
 The number of upper-tier establishments without an external emergency plan is unclear. It is also unclear how these plans are tested. A large number of upper-tier establishments were not inspected annually. It is not entirely clear how compliance with the specifications regarding domino effects is ensured.

Number of establishments:



	Lower-tier	Upper-tier	Total
2011	0	0	0
2014	32	25	57

Overview of the information reported

Question 1 - General information


1.a) Significant changes made to competent authorities or their tasks
 Croatia became a member of the EU during the reporting period (1st July 2013). As a result, it is the first implementation report submitted by Croatia. The country has provided a detailed overview of the Competent Authorities responsible for the implementation and enforcement of the Directive and their tasks. This indicates that the following Croatian competent authorities:

- Ministry of Environmental and Nature Protection (MENP);
- National Protection and Rescue Directorate (NPRD); and
- Croatian Agency for the Environment and Nature (CAEN); formerly: Croatian Environmental Agency (CEA).

Furthermore there are cooperating institutions: The Ministry of Construction and Physical Planning (MGPU) and the local governments and regional government.

1.b) Establishments subject to Seveso
 The number of establishments covered by the Seveso II Directive in Croatia on 31 December 2014 was 57. As Croatia joined the EU only in 2013, no comparison to numbers from previous reporting periods can be made.

As shown in the chart to the right, Croatia exhibits a low density of establishments with fewer establishments per capita and much fewer establishments per km² than the EU average.



	Establishments per 10m inhabitants	Establishments per 10,000 km ²
MS	135	101
EU	222	253



CROATIA

1.c) Activities of Seveso establishments

No statistical breakdown using the SPIRS categories was available.

1.d) Seveso establishments covered by the IED (optional)

Croatia reported that 19 establishments were also covered by the IED. The Competent Authorities responsible for both Directives have agreements for conducting coordinated inspections.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

Croatia reported that all upper-tier establishments are obliged to have an external emergency plan. The number of them that had not drafted such a plan at the end of the reporting period is unclear, as Croatia has only reported the number of “self-Government divisions” (6) for which external emergency plans had not been drafted.

The figure cannot be represented as the data is unavailable

2.c) Upper-tier establishments without external emergency plan tested

Croatia stated that the majority of external emergency plans were drafted during 2014. Croatia does not have data on the plans that have been tested yet.

The figure cannot be represented as the data is unavailable

2.d) Arrangements for providing information to the public:

- Internal operator warning systems, public warning system (not described);
- Information broadcasted in the media about measures to take in case of a major accident; and
- General measures in case of a major industrial accident are available online².

2.e) Testing external emergency plans

Croatia has indicated external emergency plans have to be tested at least once every three years. Also, Croatia stated that external emergency plans are tested alongside the potential participants (emergency services) in the case of a major accident. However, the methods for testing and determining whether a plan is adequate have not been stated.

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

The safety reports of all Seveso establishments of Croatia are available on the website of the Ministry of Environmental and Nature Protection³. The Croatian EA publishes the location of all establishments online alongside other relevant information. There are quarterly and annual reports that are also available to the public (though it is unclear how). Upper-tier establishments are also obliged to provide the public potentially affected by a major accident in their establishment with a copy of the external emergency plan. These potentially affected persons can participate in the approval of these plans through public consultation. Operators are also obliged to publish relevant information on their websites. Croatian Authorities ensure that this information is provided as part of their inspections of Seveso establishments.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Information on all establishments (upper and lower tier) is kept up to date and permanently available through a website that the competent authorities are in charge of maintaining. Also, operators have to publish relevant information on their websites, along with keeping the information provided to the Competent Authorities up to date.

² <http://www.duzs.hr/news.aspx?newsID=14637&pageID=134>

³ <http://www.mzoip.hr/hr/okolis/rizicna-postrojenja.html>



CROATIA

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The inspection system in Croatia is not based on a systematic appraisal. Croatia reported that the criteria for establishing inspection priorities were under development in 2015.

4.b) Programme of inspections available to public (optional)

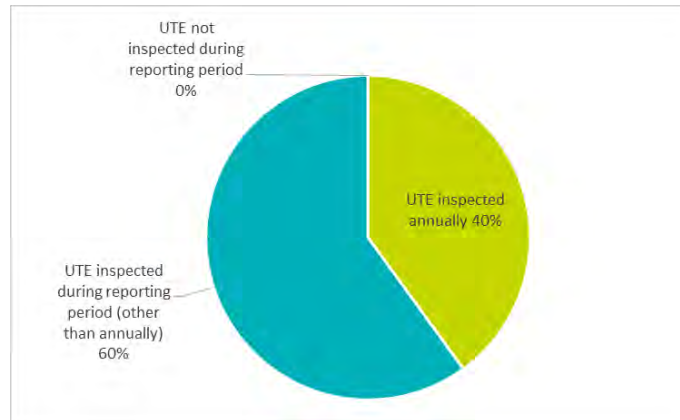
The results of the inspections for individual operators are published quarterly on the MENP website. An annual report is also published in the same website.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Croatia reported taking measures in relation to non-compliance of 6 lower-tier establishments and 13 upper-tier establishments. Croatia did not specify which measures were taken, but provided the range of measures that may be imposed in general, namely: order to cease the operation of the installation of part of it, cease of the activities, cease a specific manufacturing process, cease handling dangerous substances, order to take preventive and remedial measures, draft a safety report as obliged by the law.

4.d), 4.e), 4.f) Data on on-site inspections

10 upper-tier establishments (40% of the total number of upper-tier establishments) were inspected annually. All upper-tier establishments were inspected at least in the last reporting period and 28 lower-tier establishments were subject to on-site inspections in the last three years (88%).



Question 5 – Domino effects

Establishments relevant for consideration of domino effects are designated by the competent authority. These establishments are informed of this and of the requirements they have to comply with as part of a Domino Group. No further information as to how this is achieved has been provided by the Croatian response.

Question 6 – Land-use planning

Competent Authorities draft and approve spatial planning documents with special conditions in the process of issuing site permits in accordance with threat assessments and protection and rescue plans.

Local and regional (regional) governments in a special excerpt from the assessment, entitled "protection and rescue requirements in spatial planning documents", identify and prescribe preventive measures the implementation which will mitigate the consequences and effects of the natural and anthropogenic disasters and major accidents at critical infrastructure and increase the level of safety of the population, material goods and the environment. This excerpt forms an integral part of spatial planning documents of local and regional self-government units, as required by the Rules on the methodology for the preparation of threat assessments and protection and rescue plans.

**CROATIA****Question 7 – Further information (optional)****7.a) Lessons learned from accidents and incidents**

Croatia reported that the legislation requires operators reporting a major accident to provide a list of "lessons learned". This is used by operators and Competent Authorities to improve major accident prevention and mitigation measures.

7.b) IT tools used for monitoring the implementation and data sharing

The Croatian Environment Agency has a reporting tool that is used by operators. The data obtained is fed into the annual reports on Seveso establishments published in the country and the information reported to e-MARS and e-SPIRS.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

Croatia has not replied to this optional question.

5. Member State summary sheet – Cyprus

CYPRUS													
Overview of Cyprus													
<p>Cyprus provided a complete response.</p> <p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; background-color: #008000; color: white; display: flex; align-items: center;"> <div style="width: 50px; height: 50px; background-color: #008000;"></div> <div style="padding-left: 10px;"> <p>The Cypriot response indicates that the provisions of the Seveso II Directive are fully implemented.</p> </div> </div> <p>Main issues identified: None</p>	<p>Number of establishments:</p> <table border="1"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>6</td> <td>10</td> <td>16</td> </tr> <tr> <td>2014</td> <td>9</td> <td>13</td> <td>22</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	6	10	16	2014	9	13	22
	Lower-tier	Upper-tier	Total										
2011	6	10	16										
2014	9	13	22										
Overview of the information reported													
Question 1 - General information													
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by Cyprus</p>													
<p>1.b) Establishments subject to Seveso</p> <p>There were 22 Seveso establishments in Cyprus at the end of 2014, a significant increase compared to 2011 (16).</p> <p>As shown in the chart to the right, Cyprus exhibits more establishments per capita but fewer establishments per km² than the EU average.</p>	<table border="1"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>260</td> <td>238</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	260	238	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²											
MS	260	238											
EU	222	253											
<p>1.c) Activities of Seveso establishments</p> <p>There are 6 fuel storage and LPG storage establishments each in Cyprus. Together these establishments account for more than half of the establishments in Cyprus. These activities are also common among the EU average with fuel storage being the third most common activity amongst the EU Seveso establishments (11% of all establishments) and LPG storage representing 4% of EU establishments.</p> <p>Further activities in Cypriot Seveso establishments are:</p> <ul style="list-style-type: none"> - Mining, power generation (3 establishments each); - Production, destruction and storage of explosives (2 establishments) as well as; and - Industrial chemicals and wholesale and retail (1 establishment each). 													



CYPRUS

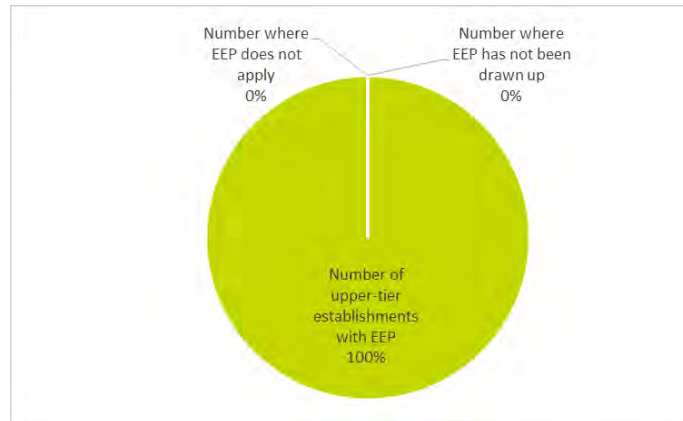
1.d) Seveso establishments covered by the IED (optional)

2 lower-tier establishments and 2 upper-tier establishments in Cyprus are also covered by Directive 2010/75/EU (IED). There is no significant impact on the way Seveso is applied by the competent authorities for the establishments concerned.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

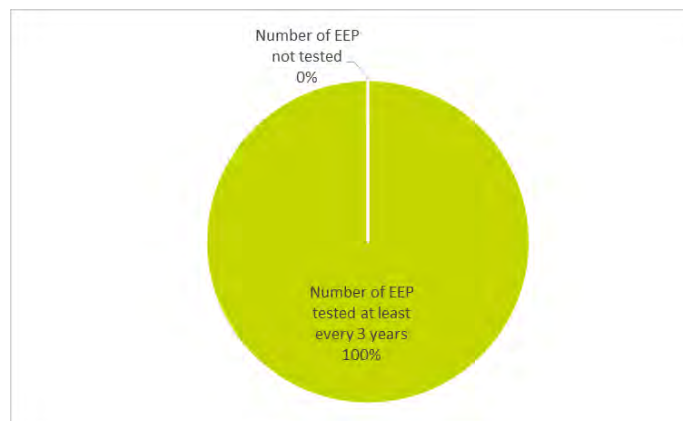
The Cypriot authorities decided that the requirement to produce an external emergency plan applied to all upper-tier establishments and during the reporting period Cyprus' Civil Defence has drawn up emergency plans for all the upper-tier establishments, following the instructions of the Department of Labour Inspection.



Note: Total 13 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

Cyprus Civil Defence tested all the external emergency plans through an exercise during the reporting period.



2.d) Arrangements for providing information to the public:

- Specific information is transmitted by a local radio station in case of emergency. Small radios have been distributed to the public for free; and
- In the context of a national information campaign, leaflets were distributed.

2.e) Testing external emergency plans

- Table top exercises (main test method); and
- Full scale exercises including Seveso establishments and all the services involved.

Before every exercise, independent observers/ evaluators are identified to assess the exercise and its outcomes. Upon the completion of the exercise an evaluation meeting is organised, coordinated by the observers/ evaluators. The outcomes of this meeting are recorded in order to help the competent authorities take any corrective measures.



CYPRUS

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Cyprus, operators of each upper-tier establishment are obliged to supply (e.g. by hand, by mail, by e-mail) the necessary information. The safety report of each upper-tier establishment is available to the public at the offices of the Department of Labour Inspection or at the offices of each upper-tier establishment. Compliance with these specifications is monitored in the inspections of the establishments and the Department of Labour Inspection actively participates in the information campaigns.

In 9 of 13 upper-tier establishments information has been made actively available to the public at least once during the reporting period (2010-2014). The remaining establishments are in the process of informing the public and persons liable to be affected by a Seveso accident, or have recently been classified as upper-tier establishment (and hence this action is pending).

The means used to inform the public are listed below:

- Door-to-door distribution of operators' leaflets as well as radios, torches, tape etc. to the citizens liable to be affected by a Seveso accident: 100%.

3.e), 3.f), 3.g) Information kept permanently available (optional)

No response was provided to this optional question

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

All establishments are inspected at least once a year by the inspectors of the Department of Labour Inspection. Besides planned inspections, site visits may be initiated for a number of purposes, for example investigation of accidents or complaints, thematic inspections, formal assessment of safety reports, interim assessment of performance and so on.

4.b) Programme of inspections available to public (optional)

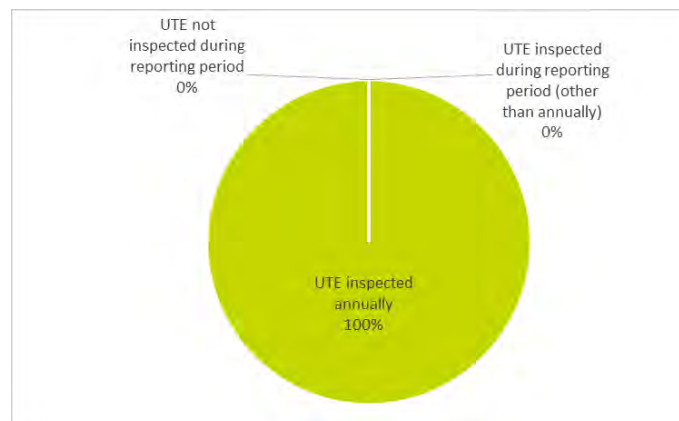
No response was provided to this optional question

4.c) Actions taken in the event of accidents, incidents and non-compliance

Improvement notices, prohibition notices and prosecutions can be issued or initiated in case of violations. However, no such cases were identified during the reporting period except for minor breaches, for which about 50 letters have been sent to operators across all Seveso establishments. No further information with regards to why such a large number of letters (considering there are 22 establishments) has been sent was provided by the response.

4.d), 4.e), 4.f) Data on on-site inspections

All establishments are inspected at least once a year in Cyprus, both upper and lower tier.





CYPRUS

Question 5 – Domino effects

In Cyprus, establishments are considered part of a domino group either if they share a common boundary, or if a buffer zone subject to potential impact from thermal, overpressure or toxic effects of one establishment overlaps with the physical boundaries of others. Affected establishments are obliged to exchange relevant information in writing and review or take measures to limit the consequences for their site. Compliance is checked by the authorities through inspections and review of safety reports (upper-tier establishments) or major accident prevention policy (lower-tier establishments).

Question 6 – Land-use planning

The Cypriot Town and Country Planning Law ensures prevention of major accidents and limitation of their consequences during the preparation or amendment of development plans and for the examination of planning applications.

Development plans need to consider risks from major accidents as well as appropriate distances between existing establishments and other establishments, residential areas, buildings, other areas of public use and major transport routes, recreational areas and areas of particular natural sensitivity or interest.

Planning applications for new developments around existing establishments implement strict conditions regarding distances between establishments and other developments, and have to undergo a consultation procedure with the Department of Labour Inspection and other responsible governmental departments. As a result there have been cases during the reporting period in which applications were rejected or subjected to strict conditions.



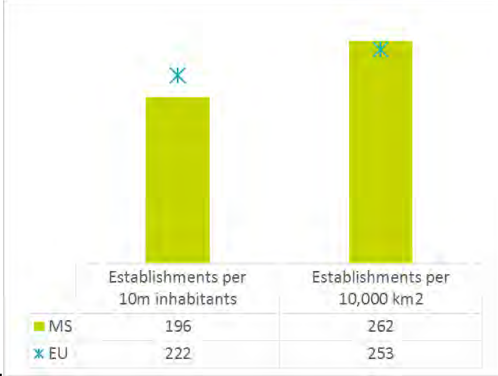
New establishments and modifications to existing establishments additionally require a technical report on the risk from the establishment and public notification of the application. New establishments will be sited in areas designated for industrial development which are separated into categories and sub-areas able to accommodate such developments.

Question 7 – Further information (optional)

.7.a) Lessons learned from accidents and incidents
No information was provided.

No response was provided to this optional question.

6. Member State summary sheet – Czech Republic

													
CZECH REPUBLIC													
Overview of Czech Republic													
<p>Czech Republic provided a complete response.</p> <p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; background-color: #FFD700;"> <p>The Czech Republic response indicates that the provisions of the Seveso II Directive are almost fully implemented.</p> </div> <p>Main issues identified: According to the response, external emergency plans of a large number of upper-tier establishments have not been tested every three years as required by Article 11.4 of the Directive.</p>	<p>Number of establishments:</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>81</td> <td>116</td> <td>197</td> </tr> <tr> <td>2014</td> <td>90</td> <td>117</td> <td>207</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	81	116	197	2014	90	117	207
	Lower-tier	Upper-tier	Total										
2011	81	116	197										
2014	90	117	207										
Overview of the information reported													
Question 1 - General information													
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by the Czech Republic.</p> <p>1.b) Establishments subject to Seveso 207 Seveso establishments were reported for the Czech Republic at the end of 2014, up from 197 in 2011. This is mostly due to a decreasing number of lower-tier establishments.</p> <p>As shown in the chart to the right, Czech Republic exhibits fewer establishments per capita and just slightly more establishments per km² than the EU average.</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>196</td> <td>262</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>			Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	196	262	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²											
MS	196	262											
EU	222	253											
<p>1.c) Activities of Seveso establishments The dominant activities of Seveso establishments in the Czech Republic are:</p> <ul style="list-style-type: none"> - General chemicals manufacture (17% of all establishments); - Production, destruction and storage of explosives (12% of all establishments); and - Fuel storage (12% of all establishments). <p>General chemicals manufacture and fuel storage are also among the most common activities across all of the EU representing 12% and 11% of EU establishments, respectively. Production, destruction and storage of explosives is less common making up 4% of EU establishments.</p>													
<p>1.d) Seveso establishments covered by the IED (optional) No information was provided for this optional question.</p>													

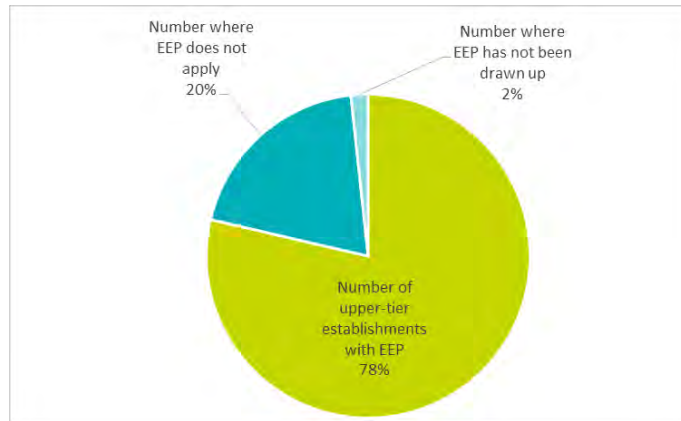


CZECH REPUBLIC

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

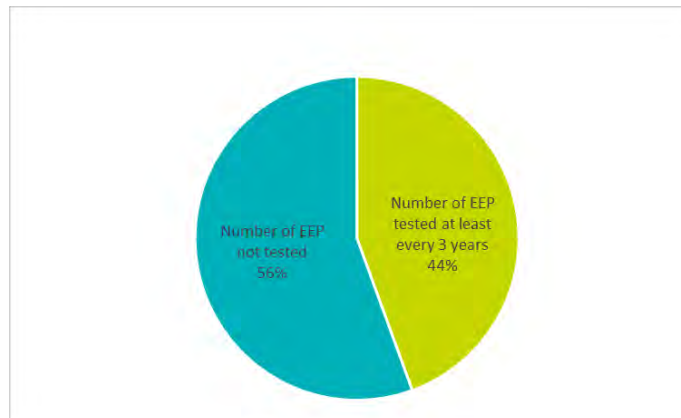
The Czech authorities decided that an external emergency plan was not required for 23 upper-tier establishments in view of the information contained in the safety report. No further information on the specific reasons why such a relatively high number of establishments had been excluded from this requirement was provided by the response. For an additional 2 upper-tier establishments external emergency plans have not been produced during the reporting period, even though these establishments had not been excluded from the requirement to produce an external emergency plan.



Note: Total 117 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

According to the Czech response, external emergency plans of 65 upper-tier establishments (56% of all upper-tier establishments) have not been tested every three years as required by Article 11.4 of the Directive.



2.d) Arrangements for providing information to the public:

- Links with the mass media such as texts or recordings containing information to be provided by television and radio in the event of an emergency; and
- All of these measures are specified in each emergency plan, alongside further information such as ways to verify whether emergency information has been received, alternative means of informing the public, the distribution of responsibilities for communicating, as well as organisational and material support.

2.e) Testing external emergency plans

Types of tests used in Czech Republic are:

- Field exercises, in which all rescue services work together; and
- Desktop exercises and exercises at the site of the accident.

The results of the exercises are used to improve the external emergency plans. This is based on the criteria of the completeness, timeliness, accuracy and practical utility of the plans. The criteria used for carrying out tests on external emergency plans include mainly connectivity testing with regard to alarms and the availability of the measures included in the plan; the systems and methods of alerting and informing the public; and the cooperation among institutions in case of an accident.



CZECH REPUBLIC

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In the Czech Republic, the regional authority is required to prepare and provide information on the risk of occurrence of a major accident to the public situated in the emergency planning zone. Subject to negotiations, the operator is involved in the information process. Information includes the possibility of a domino effect on preventive safety measures, mitigation measures and behaviour in the event of a major accident. For 90% of upper tier establishments in the Czech Republic, information has been actively distributed in the five years from 2010 to 2014.

The means used to inform the public are listed below:

- Brochures or flyers and to businesses or public buildings via data boxes if available; and
- Otherwise in paper form.

A statistical breakdown was not available.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Up to date information on safety measures has been kept permanently available for all establishments (upper and lower-tier) during the reporting period in the Czech Republic, but no information regarding how it has been permanently kept available was provided.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The programme of inspections is not implemented on the basis of a systematic appraisal of major accidents in the Czech Republic, but in accordance with the control plan: Upper-tier establishments are inspected annually, lower-tier establishments every three years.

4.b) Programme of inspections available to public (optional)

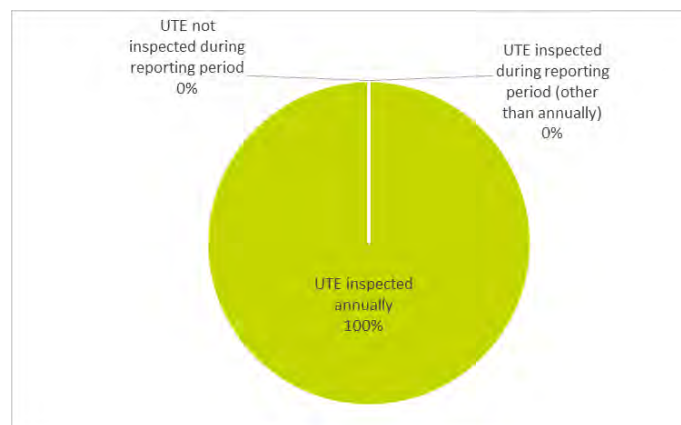
Not answered.

4.c) Actions taken in the event of accidents, incidents and non-compliance

In 2013, a number of shortcomings were detected. These related to irregularities concerning documentation or the internal emergency plan. Some establishments did not have insurance policies in force and measures were imposed to rectify this situation. In 2014, administrative proceedings were initiated in four cases on the grounds of the infringement of the provisions of this Act on the basis of checks carried out in 2013. In three cases fines of about EUR 2 000 were imposed, and in one case a fine of about €13,000.

4.d), 4.e), 4.f) Data on on-site inspections

All upper-tier establishments were subject to on-site inspections every twelve months and lower-tier at least once during the reporting period in the Czech Republic.





CZECH REPUBLIC

Question 5 – Domino effects

Where the probability of occurrence or consequences of a major accident may be increased due to a domino effect is determined by the regional authority on the basis of the notifications and protocols of the classification of establishments as lower or upper tier. The regional authority then obliges operators of identified establishments to provide the necessary information for risk management in the establishment. The operator is required to use this information for the risk assessment, the safety programme for the prevention of major accidents, safety reports, the internal emergency plan and the documentation for drafting the external emergency plan.

Question 6 – Land-use planning

The regional authority ensures that the objectives of preventing major accidents and limiting the consequences of such accidents are taken into account in relation to the siting of new establishments and facilities, modifications to existing establishments and maintaining safe distances between the establishments and residential areas, buildings and locations frequented by the public, major transport routes, recreational areas and areas protected under special laws. In the case of existing establishments and facilities, the regional authority will, if necessary, adopt additional measures on reducing the risk of a major accident.

Upon initiation of the land-use proceedings, the regional authority contacts the building authority, which conducts the land-use proceedings and carries out an analysis and assessment of the risk of a serious accident based on information to be submitted by the operator.

Question 7 – Further information (optional)

No response was provided to this optional question.

7. Member State summary sheet – Denmark



DENMARK

Overview of Denmark

Denmark provided a complete response.

Status of overall implementation:



The Denmark response indicates that the provisions of the Seveso II Directive are almost fully implemented.

Main issues identified:

A large number of external emergency plans are reported to not having been tested over the last 3 years. The central authorities will contact the local authorities concerned and either obtain confirmation that the emergency plans were tested or ensure that they are tested as soon as possible.

Number of establishments:



Overview of the information reported

Question 1 - General information

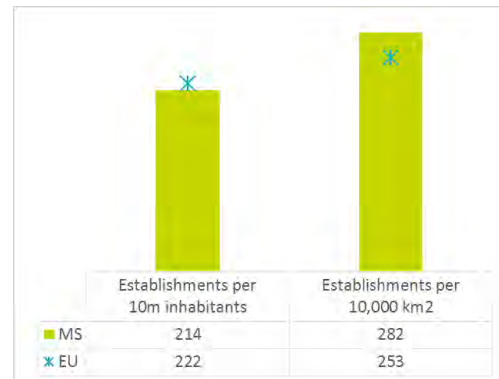
1.a) Significant changes made to competent authorities or their tasks

None were reported by Denmark.

1.b) Establishments subject to Seveso

There were 121 Seveso establishments in Denmark at the end of 2014, almost the same number as in 2011.

As shown in the chart to the right, Denmark exhibits almost the same number of establishments per capita as the EU average, but more establishments per km² than the EU average.



1.c) Activities of Seveso establishments

Fuel storage establishments account for 36% of all establishments in Denmark. This activity is also one of the most common activities across the EU, though it is not as dominating in an EU-wide context, accounting for 11% of all establishments.

Other common activities in Denmark include:

- Chemical installations manufacturing ammonia and industrial gases (6% of installations each); and
- "Other activities" not included in any other category (7%).

1.d) Seveso establishments covered by the IED (optional)

No information was provided for this optional question.

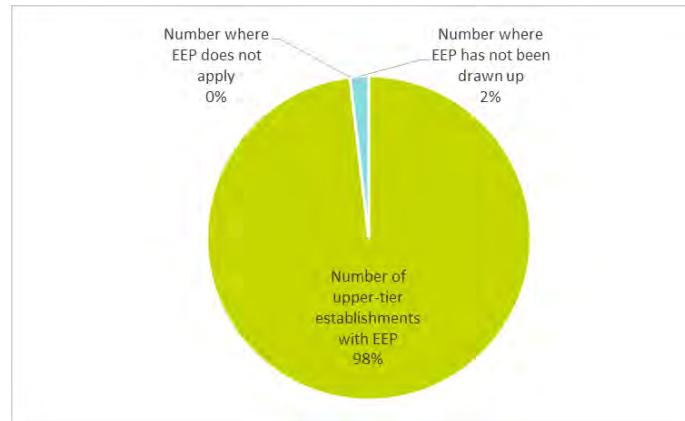


DENMARK

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

52 upper-tier establishments have an external emergency plan, while two do not. One establishment without an external emergency plan has only been classified as upper-tier within the last year. As for the second establishment, the central authorities will contact the local authority concerned and ensure that an external emergency plan is drawn up or an assessment is carried out regarding whether one is needed.



Note: Total 54 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

27 emergency plans were not tested over the three-year period. 41 establishments have tested their emergency plan at some point in time. It is possible that inaccurate reports were submitted by local authorities. The central authorities will contact the local authorities concerned and either obtain confirmation that the emergency plans were tested or ensure that they are tested as soon as possible.



2.d) Arrangements for providing information to the public:

If a major incident occurs at a risk establishment which could have consequences for the local population and risk establishments nearby:

- Information will be provided to the public via the local police force's website;
- If necessary, via an emergency warning accompanied by a siren; and
- When the risk has passed, the all-clear will be given.

2.e) Testing external emergency plans

Emergency plans are tested using:

- Theoretical desktop exercise; and
- Physical exercise in whole or in part.

It is assessed locally whether the minimum provisions of the law are met with respect to the content of the plan and testing frequency.

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Denmark, the municipal council (as the local emergency service) and the police draw up the external emergency plans for upper-tier establishments. The police also informs the public of safety measures and the requisite behaviour in the event of incidents. The police made information available to the public for about 49 of the 54 upper-tier establishments during the last five-year period (2010-2014). In 9 of these cases, the information was actually provided in 2015. In one of the other cases, the information was last made available to the public in 2009. The information is available on the local police force's website, and a



DENMARK

specific assessment is also made regarding whether the information about the particular establishment should be made available by other means, e.g. by sending out leaflets. A statistical breakdown of the means used was not available.

In the case of lower-tier establishments, the police also evaluates whether there is a specific need to draw up an external emergency plan.

There is a guide for the police and the emergency services regarding drawing up the plans, which, amongst other things, outlines how the work should be coordinated. In order for the Environmental Protection Agency to be able to compile its reports to the EU, every authority concerned must also report on their publishing of information.

3.e), 3.f), 3.g) Information kept permanently available (optional)
Not answered.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The inspection of establishments is organised jointly by the risk authorities based on a systematic appraisal taking into account the establishments' production and risk conditions, the nature of the surroundings and a number of other factors that are specific to the individual establishment.

4.b) Programme of inspections available to public (optional)

Not answered.

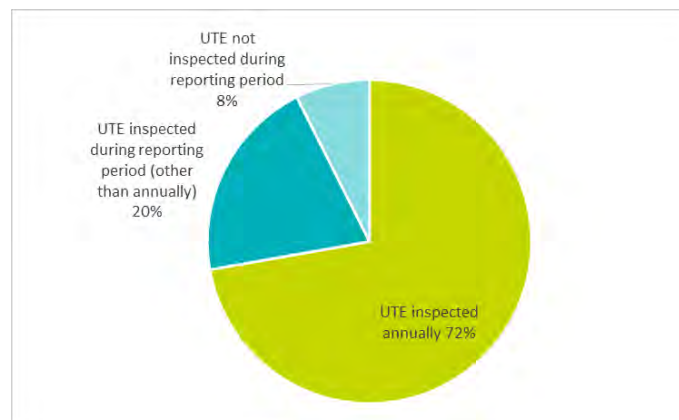
4.c) Actions taken in the event of accidents, incidents and non-compliance

In Denmark the following sanctions can be applied: Recommendations and warnings where the legal circumstances remain unchanged, and enforcement notices and prohibitions where there are changes to the legal circumstances, e.g. the notification of new conditions of risk. Non-compliance with conditions or legislation may lead to prosecution by the police or the courts, whereby fines or custodial sentences may be imposed.

4.d), 4.e), 4.f) Data on on-site inspections

39 upper-tier establishments (72% of the total number of upper-tier establishments) were inspected annually. Note that Denmark applies systematic appraisal to determine inspection schedules (see 4.a) and as such it is not absolutely required to inspect all establishments annually. Another 11 (20%) upper-tier establishments were inspected at least during the last reporting period. In addition to this, 50 lower-tier establishments were inspected (75% of the total number of lower-tier establishments).

The relevant local authorities of the establishments that were not inspected have been contacted by the national authority.



Question 5 – Domino effects

Based on the safety documentation submitted by an establishment, the local risk authorities assess whether domino effects might occur. The risk authorities may also become aware of factors that could trigger domino effects when inspecting an establishment's surroundings. The inspection of establishments is organised jointly by the risk authorities and takes account of the establishments' production and risk conditions. This ensures that possible domino effects are taken into account in the establishment's safety work.



DENMARK



Question 6 – Land-use planning


Under Danish law, an establishment may not be set up, extended or modified in a way that leads to increased risk without prior authorisation. Under the Planning Act, the municipal councils, which are responsible for overall planning in the municipality, must review the general planning document, referred to as the municipal plan, every four years. The location of a new establishment is, as a rule, subject to local land use planning and an environmental impact assessment.

In Denmark, the issue of land use planning is addressed in a circular from the Minister for the Environment to all municipal councils. It requires municipal councils to take into account the risk of a major incident before any land use provision is made in a municipal or local plan affecting areas within 500m of an establishment. Furthermore, the local planning authority must issue an opinion before the notification for an establishment is sent by the coordinating environmental authority to the other authorities.

Question 7 – Further information (optional)

No response was provided to this optional question.

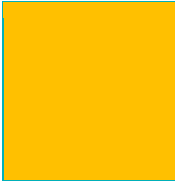
8. Member State summary sheet – Estonia

ESTONIA 

Overview of Estonia

Estonia provided a complete response.

Status of overall implementation:

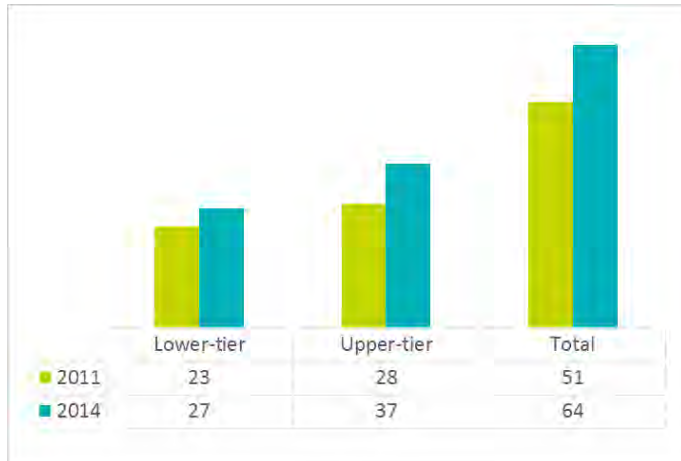


The Estonian response indicates that the provisions of the Seveso II Directive are almost fully implemented.

Main issues identified:

Estonia indicated that establishments do not have individual emergency plans but instead are covered by one national emergency plan which is not in compliance with the requirements of the Directive.

Number of establishments:



Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks

No significant changes have been made to the main competent authorities, nor to their main tasks. However, the name of one of the main competent authorities has changed from Technical Surveillance Authority to Technical Regulatory Authority. The other competent authority is, as previously, the Rescue Board.

1.b) Establishments subject to Seveso

There were 64 Seveso establishments in Estonia at the end of 2014, up from 51 in 2011. Especially the number of upper-tier establishments has increased significantly during that period from 28 to 37.

As shown in the chart to the right, Estonia exhibits much more establishments per capita but fewer establishments per km² than the EU average. This means while the average density of establishments in Estonia is fairly low, there are a lot of Seveso establishments in Estonia for a country of this population.



1.c) Activities of Seveso establishments

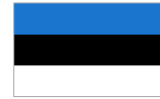
28 establishments in Estonia are classified as fuel storage establishments, far more than any other category. They account for 42% of all establishments. This activity is also one of the most common activities across the EU, though it is not as dominant in an EU-wide context, accounting for 11% of all establishments.

Other common activities in Estonia include:

- General chemicals manufacturing (6 establishments);
- Power generation (5 establishments), as well as; and
- Production and storage of fertilisers (5 establishments).

1.d) Seveso establishments covered by the IED (optional)

No information was provided for this optional question.

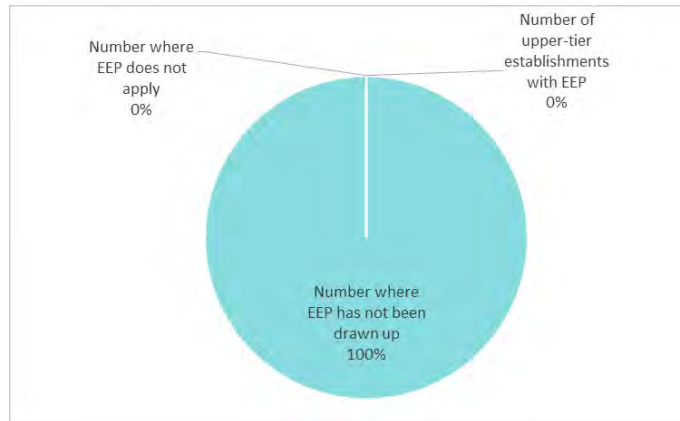


ESTONIA

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

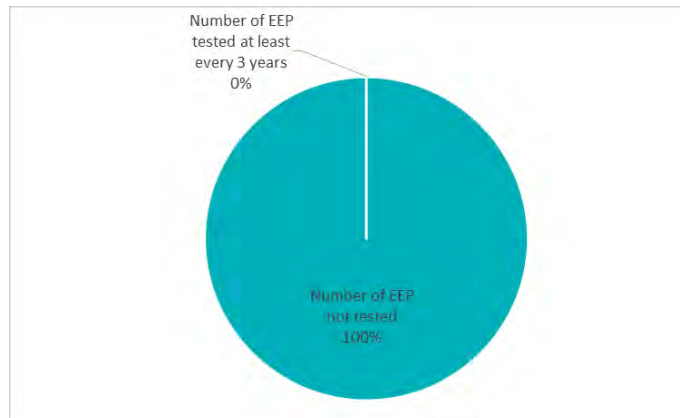
In Estonia, currently there is one national emergency plan for all Seveso establishments drawn up by the Ministry of the Interior according to the Estonian Emergency Act. In 2015, the Estonian Rescue Board decided to produce regional external emergency plans for all upper-tier establishments. These are planned to be completed in 2016.



Note: Total 37 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

The Emergency Act emergency plans were tested in 10 crisis management exercises between 2012 and 2014. Additionally, the Rescue Board carried out smaller exercises in cooperation with establishments.



2.d) Arrangements for providing information to the public:

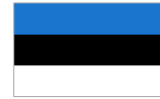
- Upper-tier establishments have sirens and some towns have municipal siren systems;
- People in the affected areas have been trained on response measures when sirens start to sound through leaflets, information on the establishments' webpages and on local governments' webpages. All Seveso establishments have to provide information to the public; and
- The Estonian Rescue Board is responsible for crisis communication at the time of an accident.

2.e) Testing external emergency plans

Emergency plans are tested using:

- Desk top exercises; and
- Field exercises.

According to the Emergency Act, emergency plans are tested in crisis management exercises that include desk top and/or field exercises and all responsible authorities. All exercises are evaluated and the evaluation report that also includes a budget report is submitted to the Crisis Commission and the Ministry of the Interior. Additionally, the Rescue Board carry out smaller exercises in cooperation with the establishment operators.



ESTONIA

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Estonia, informing the public and people liable to be affected by major accidents is the responsibility of the operators of all establishments, upper and lower-tier. The Rescue Board controls compliance with the information requirements. 30 of the 37 upper-tier establishments have made all required information publicly available and handed it out to persons liable to be affected by major accidents during the last five years (2010-2014). A statistical breakdown of the means used was not available. Furthermore, guidance for the public and operators' information links are available on the Rescue Board webpage. Information about the location, the hazard type and possible hazardous area of all establishments, upper and lower-tier, are presented in a map on the Land Board Agency webpage.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Information about the hazards and adequate behaviour in case of an accident needs to be permanently available on the establishment and operator's webpage.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

All upper-tier establishments are subject to on-site inspections every twelve months.

4.b) Programme of inspections available to public (optional)

Not answered.

4.c) Actions taken in the event of accidents, incidents and non-compliance

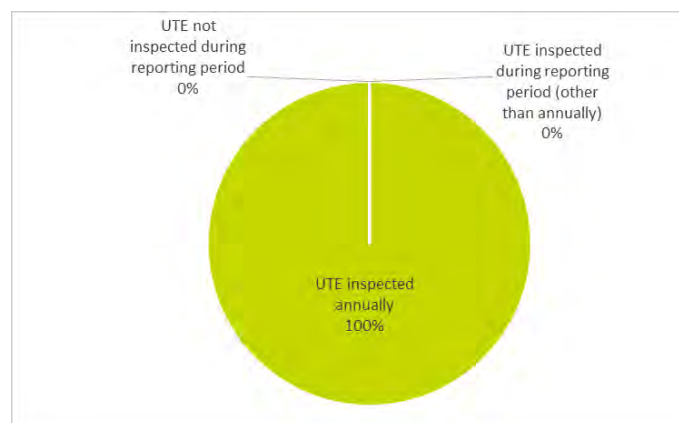
In case of infringement, compliance orders are issued according to the Administrative Procedure Act. If the order is not complied with in time, a coercive measure (substitutive enforcement or penalty payment) may be applied according to the Substitutive Enforcement and Penalty Payment Act.

In case of a severe infringement or stopping the authorities' inspection, the Code of Misdemeanour Procedure can be applied imposing penalty payments or detention.

When operators provide false information, repeatedly infringe safety requirements causing acute accident hazard, fail to give notice of significant changes to the establishment or their activity has substantially damaged the public interest, the Technical Surveillance Authority can prohibit the operation of the establishment by cancelling the operator's permit according to the Chemicals Act.

4.d), 4.e), 4.f) Data on on-site inspections

All upper-tier establishments were subject to on-site inspections every twelve months and lower-tier establishments at least once during the reporting period in Estonia.



Question 5 – Domino effects

Information about the neighbourhood of Seveso establishments and their notification system in case of an accident needs to be included in an establishment’s risk analysis, safety report and internal emergency plan. These documents are submitted to and assessed by the competent authorities. Information exchange among establishments is ensured by the competent authorities’ inspections.

In practice, additional information exchange and cooperation is also initiated by the port management as the identified groups of establishments with the risk of domino effects are located in port territory.

Question 6 – Land-use planning

The Estonian Chemical Act and Planning Act requires that preventing major accidents and limiting the consequences of such accidents are taken into account land-use planning.

For planning and constructing processes for new establishments, modifications to existing establishments and developments in the area around establishments, local governments have to consult with the Rescue Board. The Rescue Board assesses the developments’ impact on the probability and consequences of major accidents and planned safety measures and gives recommendations. The recommendations are based on the risk assessments from the establishment, environmental impact assessments, and an approach defining zones in which specific developments may or may not be allowed.

Public notification, consultation and participation are required throughout the planning process.

Question 7 – Further information (optional)

7.a) Lessons learned from accidents and incidents

No information was provided.


7.b) IT tools used for monitoring the implementation and data sharing

Information about the location, the hazard type and the possible hazardous area for all establishments (upper and lower tier) are publicly available on the Land Board Agency web map page.⁴

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

No information was provided.

9. Member State summary sheet - Finland

FINLAND 

Overview of Finland

Overall, Finland provided a complete response.

Status of overall implementation:

The Finish response indicates that the provisions of the Seveso II Directive are almost fully implemented with only minor aspects outstanding.

Main issues identified:

A large number of upper-tier establishments were not inspected annually. Note that Finland uses a systematic appraisal of major accident hazards to plan inspections, as such annual inspections are not required so this does not constitute a compliance issue but rather a potential issue that might need further checks.

Number of establishments:



Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks

None were reported by Finland.

1.b) Establishments subject to Seveso

There were 300 Seveso establishments in Finland at the end of 2014, up from 276 in 2011.

It is worth noting that Finland exhibits the highest number of establishments per capita but the second lowest number of establishments per km² (after Lithuania) of all EU Member States.



1.c) Activities of Seveso establishments

According to the statistical breakdown provided by Finland, the most common activities among the establishments covered by the Seveso II Directive were:

- "Fuel storage" (12%);
- "Production, destruction and storage of explosives" (11%); and
- "Power generation" (11%).

Fuel storage is one of the most common activities at EU level (12% of all Seveso establishments in Europe). On the other hand, power generation and production, destruction and storage of explosives are relatively uncommon (5% and 4% of all Seveso establishments in the EU, respectively). In fact, Finland is the EU Member State with the highest number of Seveso establishments in the "production, destruction and storage of explosives" category; and the second highest number of establishments in the "power generation" category, after Spain.



FINLAND

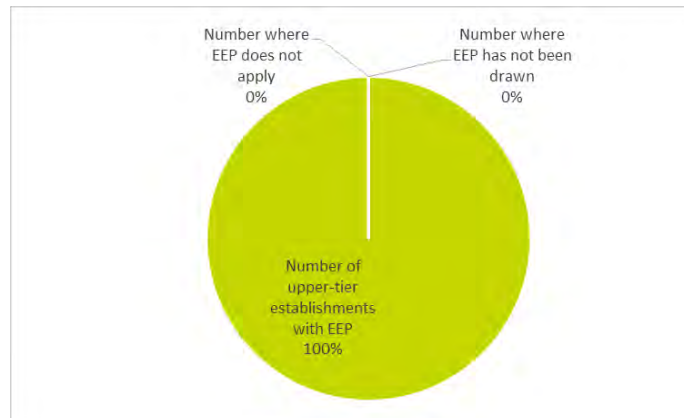
1.d) Seveso establishments covered by the IED (optional)

Finland has not replied to this optional question.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

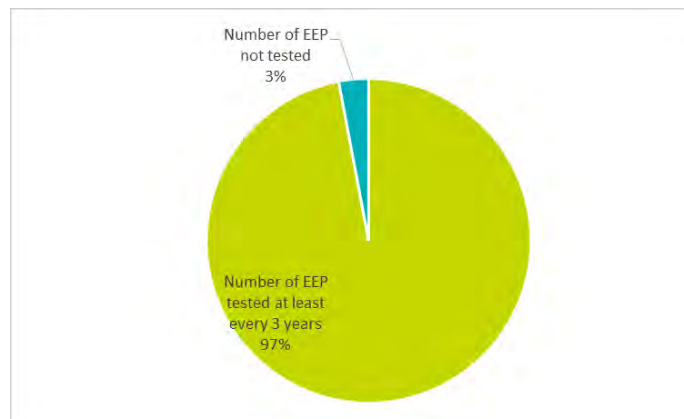
Finland has reported that all the upper-tier establishments in the country have an external emergency plan.



Note: Total 135 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

Finland stated that 4 upper-tier establishments' external emergency plans had not been tested at the end of the reporting period. Finland has explained that these 4 plans had been tested in 2011 and were due to be tested in 2015. This represents 3% of the upper-tier establishments of the country. By comparison, the EU average is 25%.



2.d) Arrangements for providing information to the public:

- Public warning siren network (the public has been given instructions on how to act when this siren is activated);
- Dynamic and static high volume loudspeakers (i.e. installed in rescue vehicles or at the site where the accident has occurred); and
- Information given via radio and TV.

2.e) Testing external emergency plans

External emergency plans are tested using full tests, which can be:

- Field exercises involving part or all the authorities that would take part in case of an accident; and
- Desk-based exercises involving part or all authorities as above.

The lessons learned from the results are used to improve external emergency plans. The Ministry of Interior published a guide and a platform for external emergency plans in 2010 to support the review of the plans. Another guide was published in 2014 on how to test the plans. The Regional States' administrative agencies are in charge of ensuring that the plans have been drafted and tested. These agencies report on the testing of external emergency plans to the Ministry of Interior once a year.



FINLAND

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Finland, information is made actively available using two main channels: operators (leaflets to people in the surroundings of their upper-tier establishments and open days) and authorities (leaflets). Finland has reported that information was made available for all of the upper-tier establishments, A statistical breakdown of how this was done is presented below:

- Operators' leaflets: 85%; and
- Authorities' leaflets: 15%.

Competent authorities make sure that the information is provided as part of inspections.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Finland stated that information is kept permanently available for “only some” of their upper-tier establishments, without specifying a number. This is done via the operators' websites.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Finland reported having an inspection programme based on a systematic appraisal of major-accident hazards based on the following criteria:

- The results of previous inspections (with a rating system from 0-5);
- Occurrence of previous accidents;
- Type and size of the plant; and
- Surroundings.

4.b) Programme of inspections available to public (optional)

Inspection reports are available to the public on request with the exception of confidential information.

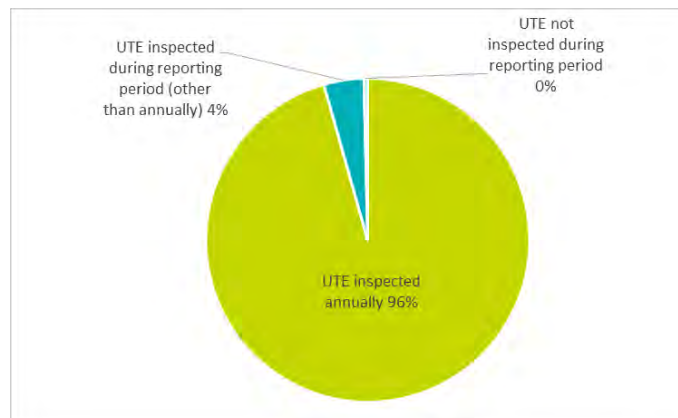
4.c) Actions taken in the event of accidents, incidents and non-compliance

In the case of “severe non-compliance (i.e. in cases of a significant danger of an accident), competent authorities prohibit the use of part or the whole of the plant. Competent authorities also decide upon the remedial action to be taken by the operator. Should the operator refuse to take action, a penalty is imposed. Operators are also obliged to take remedial action in case of accidents, which may be followed by an inspection before restarting operation

4.d), 4.e), 4.f) Data on on-site inspections

The Finnish authorities reported that 25% of their establishments were inspected annually during the last reporting period. Note that Finland applies systematic appraisal to determine inspection schedules (see 4.a) and as such it is not absolutely required to inspect all establishments annually. Nevertheless, the numbers of inspections of upper-tier establishments appear relatively low. 97% of upper-tier establishments were inspected at least once during the 2012-2014 period.

As regards lower-tier establishments, 95% were inspected at least once during the 3-year reporting period.



**FINLAND****Question 5 – Domino effects**

Finland reported having identified all the establishments with possible Domino Effects. Competent authorities have also prepared guidelines for operators explaining how to cooperate in such cases. The cooperation includes exchanging information on the risks and potential accidents and include the risks of the other establishments of the Domino Group when preparing external emergency plans and safety reports.

Question 6 – Land-use planning

All Seveso establishments are surrounded by a so-called consultation zone (0.5-2 km). In case of any developments within this zone, spatial planners have to request competent authorities' opinion about the possible risks and take this into account.

Question 7 – Further information (optional)**7.a) Lessons learned from accidents and incidents**

Finland did not respond to this optional question.




7.b) IT tools used for monitoring the implementation and data sharing

Finland did not respond to this optional question.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

Finland reported that periodic inspections are carried out on certain non-Seveso establishments (those which exceed 1/5 of the lower-tier threshold) every 5 years. These non-Seveso establishments are required to have an internal emergency plan. Also, the operators of those Ports and Marshalling Yards through which large amounts of dangerous substances are transported need to draw up internal emergency plans and safety reports, and the emergency services are required to draft external emergency plans.

10. Member State summary sheet – France

													
<p>FRANCE</p>													
<p>Overview of France</p>													
<p>France provided a complete response.</p> <p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>The French response indicates that the provisions of the Seveso II Directive are almost fully implemented.</p> </div> <p>Main issues identified: External emergency plans for 45 upper tier establishments have not been tested during the reporting period. For 75 establishments no plan had been drawn up by the end of the reporting period.</p>	<p>Number of establishments:</p>  <table border="1"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>574</td> <td>622</td> <td>1196</td> </tr> <tr> <td>2014</td> <td>539</td> <td>639</td> <td>1178</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	574	622	1196	2014	539	639	1178
	Lower-tier	Upper-tier	Total										
2011	574	622	1196										
2014	539	639	1178										
<p>Overview of the information reported</p>													
<p>Question 1 - General information</p>													
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by France.</p> <p>1.b) Establishments subject to Seveso France is the country with the second largest number of Seveso establishments in the EU. It accounts for about 10% of all establishments in the EU. There were 1178 Seveso establishments in France at the end of 2014, which is slightly less than the 1196 reported for 2011. This is due to a decreasing number of lower tier establishments, while upper-tier establishments have increased in numbers.</p> <p>As shown in the chart to the right, France exhibits fewer establishments per capita and fewer establishments per km² than the EU average. Hence, despite the large overall number of establishments in France, the number is relatively low for a country of France's size.</p>  <table border="1"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>177</td> <td>186</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table> <p>1.c) Activities of Seveso establishments The activities of most of the establishments in France are classified as "other activities" (i.e. not included in any of the more specific categories). They account for 42% of all establishments. At an EU-wide level, "other activities" account for 14% of all establishments.</p> <p>Other common activities in France include:</p> <ul style="list-style-type: none"> - Wholesale and retail (8% of establishments, compared to 9% across EU); and - General chemical manufacturing (7% of establishments, compared to 12% across the EU). <p>1.d) Seveso establishments covered by the IED (optional) No information was provided for this optional question.</p>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	177	186	EU	222	253				
	Establishments per 10m inhabitants	Establishments per 10,000 km ²											
MS	177	186											
EU	222	253											

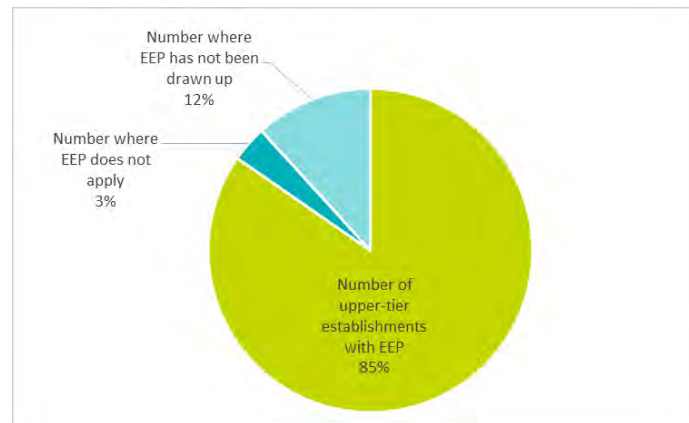


FRANCE

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

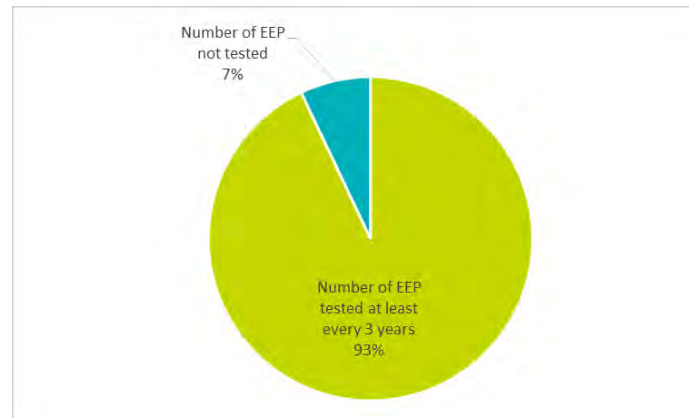
For 23 upper-tier establishments the French authorities decided that an external emergency plan was not needed as permitted by Article 11.6 of the Seveso II Directive. However, for an additional 75 establishments no plan had been drawn up by the end of the reporting period (31/12/2014). This corresponds to 12% of upper-tier establishments, compared to 11% across the whole EU-28. According to the response, the plans were in the process of being produced, pending the submission of further information in order to determine the required protective measures.



Note: Total 639 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

According to the French response, external emergency plans of 45 upper-tier establishments (3% of all upper-tier establishments) have not been tested every three years as required by Article 11.4 of the Directive.



2.d) Arrangements for providing information to the public:

- Industrial and municipal sirens sounding the national alarm signal; and
- If necessary, further information can be transmitted by other means through automated calls, text messages and emails, alerts from vehicles of the civil security services, radio and television broadcasts and various signs and messages in publicly visible spaces.

2.e) Testing external emergency plans

External emergency plans are tested in the framework of exercises of the civil security services and assessed by the prefect of the respective Department (French administrative division) in accordance with the methodological guide on the management of general civil security and crisis management from 2009. A formal evaluation is required for every exercise, aimed at improving the emergency plans. Tests can take the shape of:

- General (full) exercises; and
- Thematic (part) exercises.

Specific areas tested include warning of the public, especially for the case of rapid impacts from accidents, the sheltering of the population, cooperation and coordination with the operator, as well as the implementation of the road closures without necessarily interrupting traffic.



FRANCE

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In France, the public and persons liable to be affected by a Seveso accident are informed about major-accidents hazards, possible consequences and safety measures mainly by means of public consultations and websites.

Permits, inspection and monitoring reports, minutes of relevant meetings, and general information about establishments (including their address, risk classification, activity and substances used) are available at the dedicated national government websites “L’inspection des Installations Classées” and “Géorisques”. Furthermore, the website Prim.net hosts information on risks and technological risk prevention that has to be provided in every real-estate transaction.

Permit requests for Seveso establishments (including impact assessments), external emergency and technological risk prevention plans are subject to public consultations. Public consultations are organised locally and may include for instance leaflets, “open days” and public debates. The relevant information is also published on regional or local government websites, such as those of the Regional Environment Departments, the Prefectures or the municipalities.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Not answered.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Upper-tier establishments are inspected at least once every year, lower-tier establishments at least once every three years.

4.b) Programme of inspections available to public (optional)

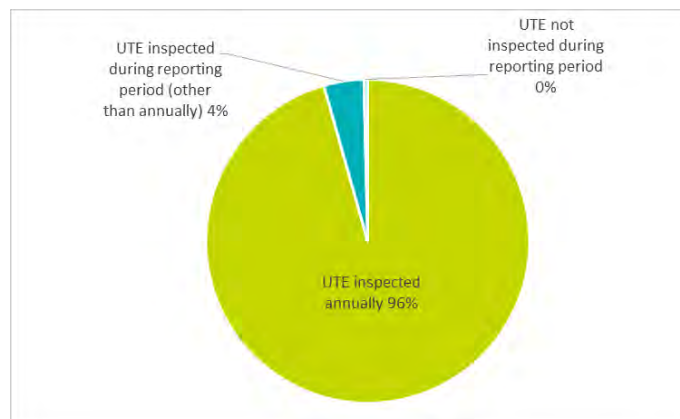
Information on the latest inspection for each establishment is available upon request from the responsible Regional Environment Department.

4.c) Actions taken in the event of accidents, incidents and non-compliance

French authorities can take a range of corrective actions, including issuing orders (for instance, order to comply, suspension orders, closing or suppression orders), imposing administrative fines, closing and sealing establishments and penalties to be paid until compliance is achieved. However, in 2012-2014, compliance orders were the main action taken (over a hundred cases per year), with consignment orders (13 cases, operators have to provide a deposit until compliance is achieved) and suspension orders (3 cases) having occurred occasionally during these three years.

4.d), 4.e), 4.f) Data on on-site inspections

611 upper-tier establishments (96% of the total number of upper-tier establishments in France) were inspected annually. All remaining upper-tier establishments were inspected at least during the last reporting period in France.⁵ In addition to this, 528 lower-tier establishments were inspected (98% of the total number of lower-tier establishments).



⁵ The number of upper-tier establishments inspected during the last reporting period reported in this question exceeded the total number of upper-tier establishments reported in other questions above. Therefore, it is assumed that all upper-tier establishments were inspected during the last reporting period.

**FRANCE****Question 5 – Domino effects**

The identification of domino effect risks is achieved mainly through inspections, based on the inspectors' knowledge of the establishments and their environment. Communication between neighbouring establishments is required by a ministerial decree from 2000, which specifies that any relevant information on the risks and hazards of major accidents has to be submitted by the operators to the neighbouring establishments and the authorities. This information is also included in the permits issued by the regional prefectures and in internal emergency plans.

In addition, operators communicate through meetings and correspondence and in the framework of site monitoring committees and permanent secretariats for the prevention of Industrial pollution. Operators can cooperate on alert systems, intervention measures, informing the public and testing of external and internal emergency plans.

Question 6 – Land-use planning

Around industrial areas containing at least one upper-tier establishment, so-called plans for the prevention of technological risks are implemented. According to these plans, first every possible measure to minimise the risk posed from the establishment is considered. If vulnerable populations are still at risk and no other means are available to reduce that risk, the plans allow different zones to be defined in which a right of first refusal or right of abandonment can be established, new construction can be prohibited, buildings can be expropriated, or technical protective measures can be prescribed for the affected buildings. 398 plans for the prevention of technological risks have been elaborated to date, 84% of which are approved so far.

For creating new upper-tier establishments, the French law provides a method of analysis and control of risks in which all zones potentially affected by the risk from the establishment, even if owned by the operator, are subject to the rules specified in the spatial plans in place. For lower-tier establishments, the French authorities inform the planning authorities of areas subject to technological risks in which new developments shall be prohibited or regulated, based on information from the establishments' safety reports.

Question 7 – Further information (optional)

No response was provided to this optional question.

11. Member State summary sheet – Germany



GERMANY

Overview of Germany

Germany provided a complete response.

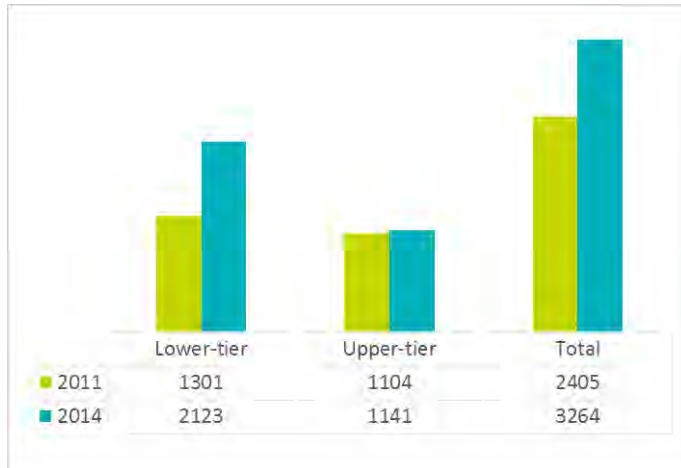
Status of overall implementation:

The German response indicates that the provisions of the Seveso II Directive are almost fully implemented with only minor aspects outstanding

Main issues identified:

No compliance issue has been identified, rather it was unclear why a share of upper tier establishments (14%) were not inspected during the reporting period. Note that Germany uses a systematic appraisal of major accident hazards to plan inspections, as such annual inspections are not required so this does not constitute a compliance issue but rather a potential issue that might need further checks. For an additional 83 upper-tier establishments external emergency plans had not been produced at the end of the reporting period.

Number of establishments:



Overview of the information reported

Question 1 - General information

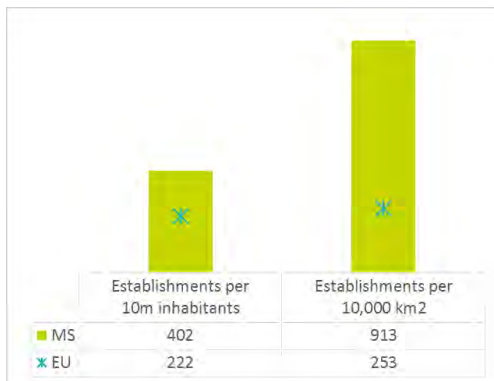
1.a) Significant changes made to competent authorities or their tasks

None were reported by Germany.

1.b) Establishments subject to Seveso

29% of all Seveso establishments in the EU-28 were located in Germany at the end of the reporting period, far more than any other Member State. The number of establishments in Germany increased rapidly from 2 405 in 2011 to 3 264 in 2014, mostly due to a rapid increase of lower-tier establishments.

As shown in the chart to the right, Germany exhibits much more establishments per capita and especially much more establishments per km² than the EU average. Hence, there is a particularly high density of Seveso establishments in Germany.



1.c) Activities of Seveso establishments

Germany has opted for presenting activities using the NACE codes classification rather than using the Seveso Plants Information Retrieval System (SPIRS) classification of activities. Therefore a presentation of activities by SPIRS codes and a comparison with the EU averages is not available. The NACE breakdown shows that the majority of establishments belong to the manufacturing sector and the energy supply sector (“Electricity, Gas, Steam and Air Conditioning supply”). These two sectors each account for 34% of all establishments.



GERMANY

1.d) Seveso establishments covered by the IED (optional)

Quantitative data about the share of Seveso establishments that are also covered by the IED are not available for Germany as a whole. However, the German response indicated that a large share of establishments is affected, especially of upper-tier establishments.

This has practical consequences for the implementation of both Directives in these establishments, including permitting, public consultation, monitoring and inspection processes. These consequences vary significantly across Federal States, but include at least coordination and information exchange between the relevant authorities. Further cooperation, such as e.g. common inspections, depends on the potential synergies evaluated on a case-by-case basis and varies by Federal State.

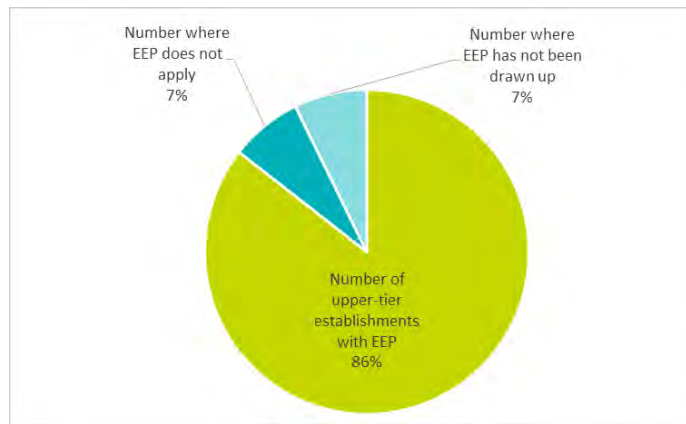
Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

For 82 upper-tier establishments the German authorities decided that an external emergency plan was not needed based on strict criteria including for instance quantities, properties and state of the hazardous substances and location of the establishment. This corresponds to 7% of upper-tier establishments, which is higher than the 4% EU average.

For an additional 83 upper-tier establishments external emergency plans had not been produced at the end of the reporting period, which is a lower share of upper-tier establishments (7%) than the EU average (11%).

Main reasons for plans not being produced include cases where establishments recently changed or were recently classified as upper-tier, where the production of the plans or the security report required previously are still in progress. Furthermore, it is possible to partially impose upper-tier requirements on establishments which would according to the Directive only have to be classified as lower-tier. Such establishments have been listed as upper tier but may not be required to produce an external emergency plan.

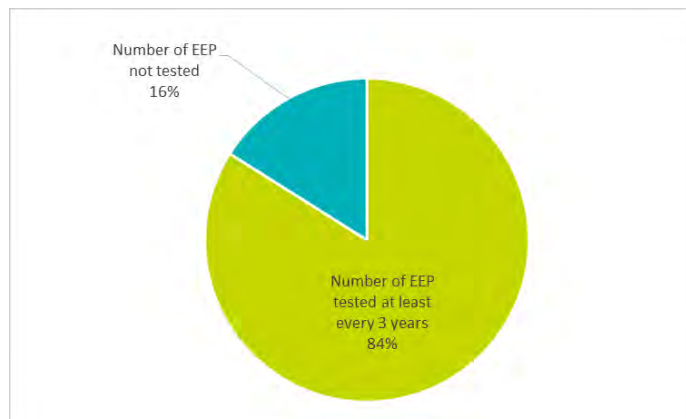


Note: Total 1141 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, for 16% of the upper-tier establishments in Germany the external emergency plans had not been tested (compared to 27% across the EU).

Main reasons include the 3-year deadline for testing not having passed yet because establishments have been changed during the reporting period, testing being delayed by changes to the establishments, or establishments being decommissioned but still counting as Seveso establishments.





GERMANY

2.d) Arrangements for providing information to the public:

- Arrangements vary regionally, but typically consist of some type of alarm signal that prompts citizens to behave in a certain way, e.g. to turn on the radio for further information. Sirens owned by the communities exist in some Federal States and can be used to broadcast messages such as "turn on radio". In other states the civil protection agencies have their own warning systems available; and
- Possible means to provide information include: Radio and loudspeaker (on police and fire fighter vehicles) announcements, telephone hotlines, internet announcements, prepared print media, social media, warning apps for smart phones and SMS.

2.e) Testing external emergency plans

Testing of external emergency plans is planned and carried out usually by the counties (Landkreise und Kreisfreie Städte) based on the civil protection laws of the Federal States. The lower civil protection authorities are responsible for their evaluation and use (for instance) the following criteria: functioning of alarm channels; accessibility of accident sites; extent and intensity of safety measures of establishments; availability of relief units and materials; and information exchange across various stakeholders. External emergency plans are deemed appropriate if they comply with the respective civil protection laws and appear to realistically guarantee to mitigate damages from the relevant accident scenarios. Emergency plans are tested using:

- Full exercise: Cooperation of all management levels and practical testing of emergency measures, rescuing, medical care, communication and reporting;
- Staff exercise: Cooperation of all management levels and manufacturers or managers of communication and reporting; assessment of required material, staff and other conditions; and
- Plan discussions and exercises: Analysis and evaluation of enacted or fictitious scenarios using e.g. maps or models, assessment of required material, staff and other conditions across relevant agencies and authorities.

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Germany the operator is responsible for informing the public. However, the information is coordinated with the civil protection and other relevant authorities and can cover multiple Seveso establishments at once. The following shows a statistical breakdown of the means that have been used:

- Operator's leaflets: 82%;
- Authorities' leaflets: 3%;
- Flyers: 7%;
- Direct mail to citizens, public meetings: 10%; and
- Internet, operator's homepage, placards/bulletins, newspaper ads, official register, public display: 3%.

In addition to the above, sometimes announcements via local radio stations and/or "open days" in Seveso establishments are used. Hospitals, medical practices, schools and kindergartens are targeted specifically for information and sometimes information booths are placed in public places on weekends. Furthermore, safety reports can be viewed in the establishments. In one Federal State, information is distributed via a comprehensive brochure for all establishments in the state.

In 802 upper-tier establishments (over 70% of total number of upper-tier establishments in Germany, compared to 76% EU-wide) information has been made actively available to the public at least once during the reporting period (2010-2014). Note that this is lower than the sum of percentages listed in the statistical breakdown of the means of information above, because usually the information is provided in more than one way. Main reasons for information to not have been made actively available include no public to be informed being present, even in the wider vicinity of the establishment; the 5-year deadline for informing not having passed yet because establishments have been changed during the reporting period; and establishments that are only partially classified as upper tier, as mentioned under question 2.a) and 2.b).

Content, quality and distribution of the information is ensured through internal and external security audits, as part of the on-site inspections or assessment of the security report. Furthermore, as the information is coordinated with the relevant authorities, it is also given final approval by the authorities prior to publication.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Not answered.



GERMANY

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Inspection schedules are based on systematic appraisal based mainly on the following criteria:

- Establishment-related criteria such as quantity and type of hazardous substances, type and complexity of the process and the handling of hazardous substances, accident-relevant operating parameters, safety-related standard of Seveso operation and possibility of detection of releases;
- Sensitivity of the local environment; and
- Operator-related criteria such as quality and organisation of self-monitoring, substantiated complaints, compliance history as well as results and evaluation of past inspections and EMAS certification.

4.b) Programme of inspections available to public (optional)

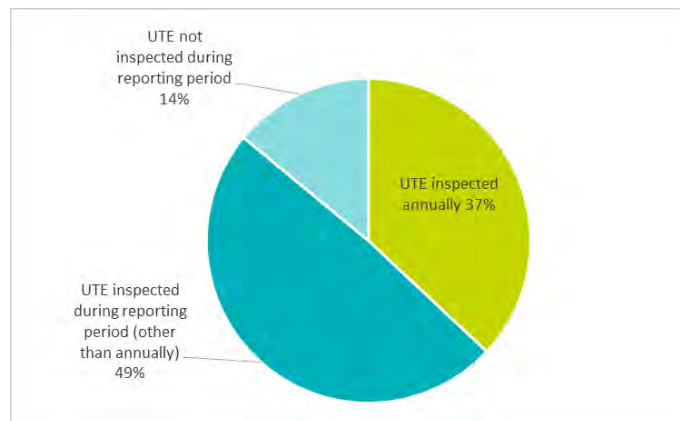
The inspection programmes and reports have not been published but are accessible to the public upon request subject to the specifications of the Environmental Information Act.

4.c) Actions taken in the event of accidents, incidents and non-compliance

There is a high degree of cooperation between operators and authorities. Ordering follow-up actions from operators when any deficiencies are detected is the only action that has been taken. However, the law provides a range of more severe actions that can be taken by authorities, including fines, prohibitions, withdrawal of permits, imprisonment, withdrawal of EMAS certification and others.

4.d), 4.e), 4.f) Data on on-site inspections

422 upper-tier establishments (37% of the total number of upper-tier establishments) were inspected annually. Another 559 (49%) were inspected at least during the last reporting period, while the remaining upper-tier establishments were not inspected at all during 2012-2014. Note that Germany applies systematic appraisal to determine inspection schedules (see 4.a) and as such it is not absolutely required to inspect all establishments annually. Nevertheless, the numbers of inspections of upper-tier establishments appear relatively low. In addition to this, 1436 lower-tier establishments were inspected (68% of the total number of lower-tier establishments).



**GERMANY****Question 5 – Domino effects**

Groups of establishments posing a risk of domino effects are identified by the relevant authorities in two steps in Germany:

1. All upper-tier establishments not further than 500m away or lower-tier establishments 200m away from any installations or activities of another establishment, as well as establishments where there are any specific indications of a risk of domino effects are taken forward for step 2.

2. On a case-by-case basis, additional information is analysed such as location and environment of the establishment, specific risks from activities and installations of the establishment and the hazardous substances present.

When a risk of domino effects is identified, safety concepts, safety management systems, safety reports and internal emergency plans are exchanged between the affected establishments to establish a common risk management approach. Regular safety meetings and joint exercises are held. The exchange of information is coordinated by the major accidents officers of the establishments, or a common officer is established. Some establishments prepare a common emergency plan or coordinate their plans. Some plans also have a common alarm centre, or in the case of industrial areas with a high density of establishments working groups on factory manager level. Compliance is checked and supported by the relevant authorities in inspections.

Question 6 – Land-use planning

The German Immission Act contains a segregation principle, according to which spatial planning zones dedicated primarily to living and other areas in particular need of protection are as much as possible to be segregated from areas at risk of being affected by major accidents. Furthermore guidelines for the implementation of this segregation in both spatial planning and permitting have been published in 2010 and updated regularly since. The emission authorities are involved in any spatial planning or relevant construction projects and they determine the required distance between zones or construction projects and establishments based on the above guidance and inform the construction permitting and planning authorities.

Question 7 – Further information (optional)**7.a) Lessons learned from accidents and incidents**

Due to lessons learned, Germany has introduced a third category of reportable incidents in addition to accidents and incidents as defined under Seveso II, in order to include serious disturbances of normal operations that have not yet led to serious accident in accident prevention. The Central Reporting and Evaluation Office for Accidents and Incidents of the German Federal Environment Agency centrally registers all reported incidents and distributes relevant information to stakeholders and the general public. It analyses the data and provides suggestions for improving safety.

The Environment Agency also organises a yearly exchange of experiences among authorities and jointly with the Federal States has initiated a research project on methods of incident reporting and analysis.

The German government also has an Advisory Board on Plant Safety which includes a wide range of relevant stakeholders and two committees regularly discussing reported incidents and experiences to provide suggestions for improvement of safety.

7.b) IT tools used for monitoring the implementation and data sharing

Information is available to the general public from the Central Reporting and Evaluation Office for Accidents and Incidents as well as a database about the state of safety technology (DoSiS), via the Environment Agency's "InfoSiS" portal (<http://www.infosis.uba.de/>).

Furthermore, various Federal States, sometimes jointly, have developed software systems to monitor the implementation of the Major Accidents Ordinance (which implements the Seveso II Directive) and for the sharing of data between the authorities concerned.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

No information was provided.

12. Member State summary sheet – Greece



GREECE

Overview of Greece

Greece provided a partially incomplete response with the following gaps observed:

Criteria used for considering that an external emergency plan is adequate and that an external emergency plan has been tested.

Number of establishments for which information has been made available to the public and how the distribution of information is monitored.

Actions taken against operators in the event of accidents, incidents and non-compliance.

Lack of clarity on the frequency of inspections in upper-tier establishments.

How the objectives of Article 12 on Land-Use Planning have been ensured nation-wide.

Status of overall implementation:

The Greek response indicates that the provisions of the Seveso II Directive are not fully implemented.

Main issues identified:

For a large number of upper-tier establishments, external emergency plans have not yet been produced.

A large number of external emergency plans are reported as not having been tested over the last 3 years.

A large number of upper-tier establishments were not inspected annually.

Further compliance issues cannot be ruled out due to the incompleteness of the response.

Number of establishments:



Overview of the information reported

Question 1 - General information

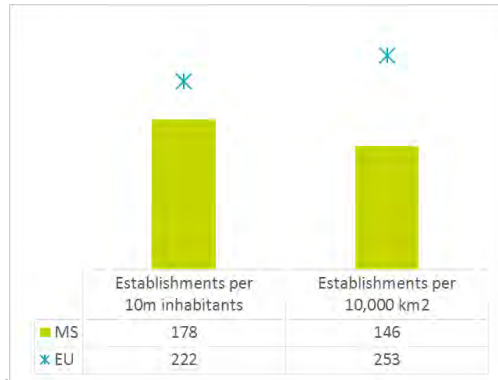
1.a) Significant changes made to competent authorities or their tasks

None were reported by Greece.

1.b) Establishments subject to Seveso

There were 193 Seveso establishments in Greece at the end of 2014, significantly less than in 2011 (223). This is due to a decreasing number of lower-tier establishments.

As shown in the chart to the right, Greece exhibits fewer establishments per capita and fewer establishments per km² than the EU average.



1.c) Activities of Seveso establishments

The activities with the highest number of establishments at the end of the reporting period in Greece were:

- Fuel storage (28% of total number of establishments); and
- LPG storage (18%).

Across the rest of the EU, fuel storage is also the third most common activity (11% of all establishments), while LPG storage represents 4% of EU establishments.

Other common activities in Greece include:

- Production, destruction and storage of explosives (10%); and
- Power generation (9%).

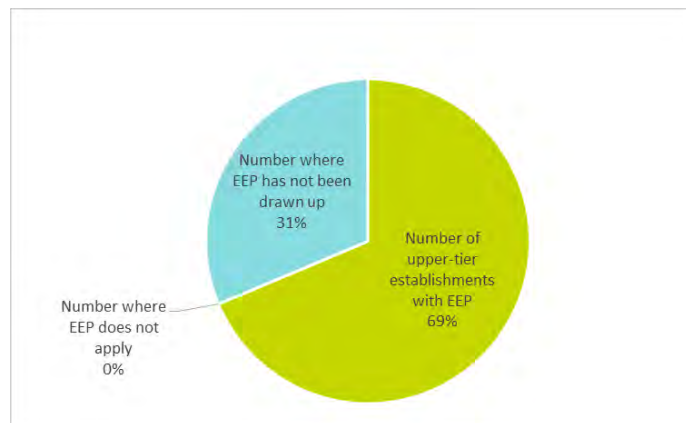
1.d) Seveso establishments covered by the IED (optional)

Greece has not answered this optional question.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

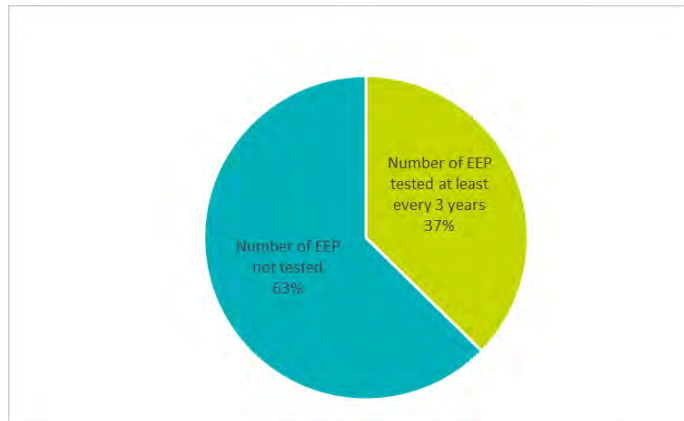
The Greek authorities decided that an external emergency plan was needed for all upper-tier establishments in Greece. However, for 26 upper-tier establishments (31% of the total number of upper-tier establishments) the plans have not yet been produced. The Greek response did not indicate the reason.



Note: Total 83 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

There are 52 upper-tier establishments (63% of the total number of upper-tier establishments) that have had an external emergency plan tested over the last three years. The Greek response did not indicate the reason.



2.d) Arrangements for providing information to the public:

- Sirens are available to alert the public in case of a major accident. These are tested by the General Secretariat of Civil Protection once a year; and
- Main response measures are referred to in many electronic and hard copy publications of the General Secretariat of Civil Protection authority, which have not been specified further in the response.

2.e) Testing external emergency plans

There are specific accident scenarios (fully described in the existing Safety Report) taken into consideration for every test. Authorities participating in each test are: the local fire brigade, ambulances, the local hospitals, police, as well as the regional and municipal authorities. The nature of the tests has not been further specified in the response.

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

Regional Civil Protection Authorities request short reports (2-3 pages) from operators, containing all relevant information for the public according the Seveso II Directive. This information is then distributed to all Regional and Municipal Councils to distribute it to citizens in the neighbourhood. A statistical breakdown of the means used is shown in the following:

- Leaflets and flyers by the authorities in the envelopes with electricity bills to houses in the neighbouring area of Seveso establishments: 100%; and
- Information given to students in all elementary and high schools (in each class) in the area of Seveso establishments: 100%.

This only refers to establishments for which information has been made available at least once during the reporting period. No information was provided in the Greek response on the number of establishments for which information has been made available and how the distribution of information is monitored.

Additionally one Regional Civil Protection Authority distributed a publication of the Ministry of Environment providing guidance on what to do in case of an industrial emergency situation to the citizens living in the neighbourhood of a petroleum refinery.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Not answered.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

In Greece, the programme of inspections is not based upon a systematic appraisal of major-accident hazards, but on a yearly basis.

4.b) Programme of inspections available to public (optional)

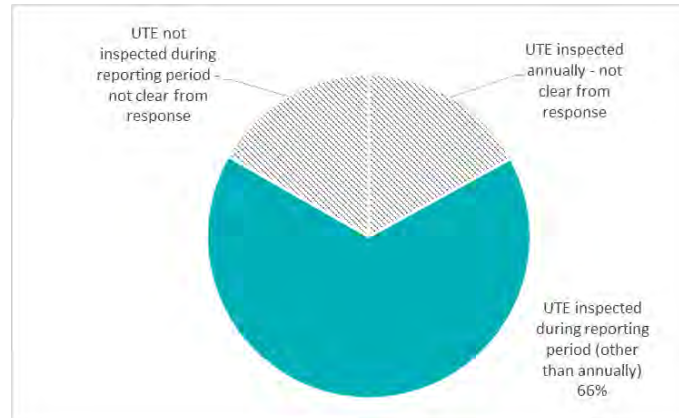
So far, no information has been given to the public from the programme of inspections and from the inspection reports.

4.c) Actions taken in the event of accidents, incidents and non-compliance

During the 2012-2014 period there was not any major industrial accident in Greece, so no actions had to be taken in response. No information on what the possible actions in the event of accidents would be, or on actions in the event of other incidents and non-compliance, was provided by the Greek response.

4.d), 4.e), 4.f) Data on on-site inspections

The Greek response is inconsistent with regards to the frequency of inspections in upper-tier establishments. However, it appears that 55 inspections in upper-tier establishments have been carried out between 2012 and 2014. 13 lower-tier establishments were inspected in the same timeframe.



Question 5 – Domino effects

To determine groups of establishments at risk of domino effects, in the accident scenarios for each establishment three protection zones and one domino zone in the form of concentric circles are estimated and drawn on a map of the establishment and its neighbourhood.

The permitting authority informs all the neighbouring establishments about the results of the Safety Report by sending copies of the results including the domino zones of all accident scenarios, in order to allow for the consideration of all existing hazards of the specific establishment.

Question 6 – Land-use planning

A pilot project called "Industrial Risk and Planning - Spatial Intervention" funded by the Ministry of Environment developed a software system to assist decision-making in land use planning associated with the risk of Seveso establishments. The system is based on a Geographic Information System (GIS) and a computational module incorporating the results of multi-criteria analysis and calculating risk and vulnerability indicators where appropriate.

The pilot project is being implemented in a selected region of Western Thessaloniki where many Seveso establishments (petroleum refinery, petrochemicals, oil and gas storage establishments, fertiliser and pesticides) are very near to densely populated areas. The Greek response has not indicated how preventing major accidents and limiting the consequences of such accidents are taken into account in their land-use and/or other relevant policies.

Question 7 – Further information (optional)

7.a) Lessons learned from accidents and incidents

No information was provided.

7.b) IT tools used for monitoring the implementation and data sharing

An application called "e-per" has been uploaded on the web site of the Ministry of Environment. All upper and lower-tier Seveso establishments in Greece are presented on a Geographic Information System (GIS).


There is also an application with all existing information about all the establishments (addresses, contact information, dangerous substances, Seveso compliance issues, Safety Report, External Emergency Plan, public information, inspections, evaluation of the Safety Reports, Notifications, etc.).

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

No information was provided.

13. Member State summary sheet - Hungary

HUNGARY



Overview of Hungary

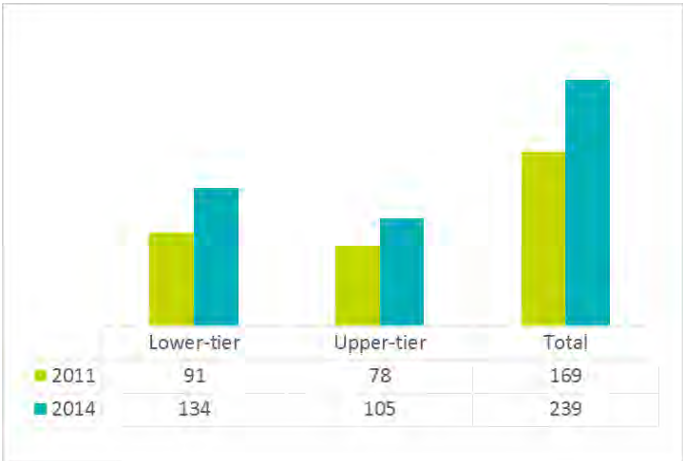
Overall, Hungary provided a complete response

Status of overall implementation:

Hungary's response indicates that the provisions of the Seveso II Directive are almost fully implemented.

Main issues identified:
Five establishments have failed to adopt an external emergency plan as per Article 11.1

Number of establishments:



	Lower-tier	Upper-tier	Total
2011	91	78	169
2014	134	105	239

Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks
During the reporting period, the two Competent Authorities that performed implementation and enforcement duties in Hungary changed. The inspection duties that used to be carried out by a specialised agency were integrated into the other Competent Authority (National DG for Disaster Management of the Ministry of Interior). Then, the duties of the latter were transferred to the Regional Governments, in order to simplify procedures and make them more efficient.

1.b) Establishments subject to Seveso
There were 239 Seveso establishments in Hungary at the end of 2014, a significant increase from 169 in 2011. This is due to an increase in the numbers of both lower and upper-tier establishments.

As shown in the chart to the right, Hungary now exhibits more establishments per capita and slightly more establishments per km² than the EU average.



	Establishments per 10m inhabitants	Establishments per 10,000 km ²
MS	243	257
EU	222	253

1.c) Activities of Seveso establishments
At the end of the reporting period, the most common activities among the establishments covered by the Seveso II Directive in Hungary were:

- Wholesale and retail (13%);
- Production and storage of fertilisers (11%); and
- Fuel storage (8%).

Whereas fuel storage and wholesale and retail are relatively common (11% and 9% of the Seveso establishments of the EU, respectively), production and storage of fertilisers only accounts for 3% of the establishments covered by the Seveso II Directive. Hungary has the second highest number of establishments in this category.

HUNGARY



1.d) Seveso establishments covered by the IED (optional)

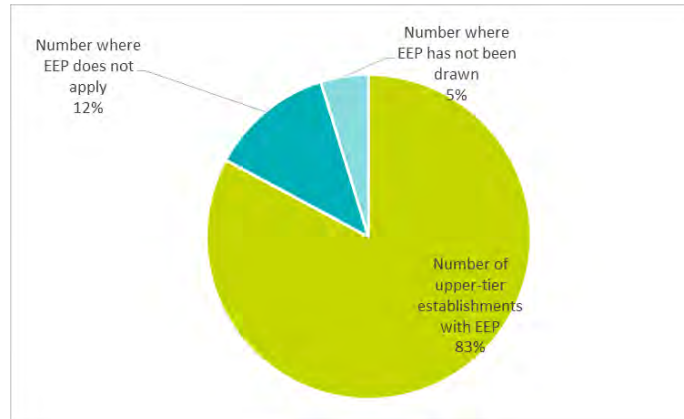
Hungary has not replied to this optional question.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

For 13 upper-tier establishments it was decided that an external emergency plan was not needed. In addition, 5 upper-tier establishments failed to produce an external emergency plan as required by Article 11.1.

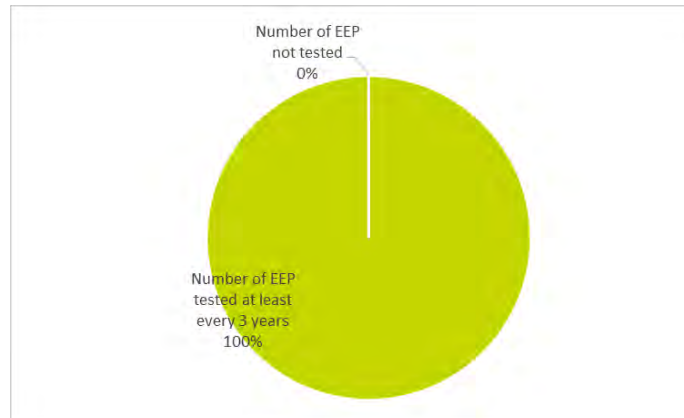
Hungary has reported that these were under review at the end of the reporting period.



Note: Total 105 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

The only upper-tier establishments without external emergency plan tested were those mentioned in 2.a) and 2.b) above. Therefore, all the plans that have been drafted have been tested in Hungary.



2.d) Arrangements for providing information to the public:

- Monitoring and public alert and information system (the 'MoLaRi system') in the vicinity of establishments; and
- National risk map, safety region website, municipality website, regional emergency broadcasters, Twitter.

2.e) Testing external emergency plans

In Hungary, external emergency plans are tested as follows:

- Partial practical exercises every year; and
- Full tests every three years.

The practical exercises are preceded by training. The plans are considered adequate if the actions envisaged are suitable for reducing the harmful effects identified in the safety report.

HUNGARY



Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

According to Hungary, the information for all upper-tier establishments has to be made available during the 5-year period stated in question 3b (2010-2014). Competent Authorities are in charge of providing information on Seveso establishments in Hungary. "Active" provision of information includes leaflets prepared by the Competent Authority and the mayors of the municipalities likely to be affected. In the case of upper-tier establishments, the publication of the leaflet is the responsibility of the mayors of these municipalities. The leaflet has to be updated with modifications at least within 3 years of these modifications and in any case every 5 years. "Passive" information is provided in the form of public notices when the safety reports are drafted. Competent Authorities must make the report available to any interested party within 21 days of publication of the notice. The information provided to the public is also available online on the websites of each regional authority. Also, brochures are disseminated to each household in the areas potentially endangered by upper-tier establishments. Hungary has also described the MoLaRi (abbreviation of monitoring and public alert and information system, in Hungarian) alert system, which can warn up to 250,000 people immediately of a major accident. The National Competent Authority is also in charge of checking that this information is provided.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Hungary has not provided this optional information.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The length and frequency of inspections are not based on a systematic appraisal, but are pre-defined. Lower-tier establishments are inspected every two years and upper-tier establishments at least annually.

4.b) Programme of inspections available to public (optional)

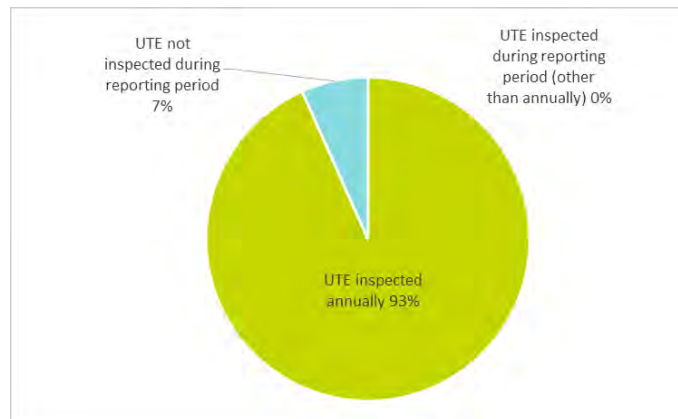
Hungary has not provided this information.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Hungary has provided a very detailed breakdown of the actions taken annually during the reporting period. These were: restricting a hazardous activity (8 establishments during the period 2012-2014), procedural fines (1), disaster management fines (12), removal and disposal of dangerous substances (1), orders to revise the safety report (12).

4.d), 4.e), 4.f) Data on on-site inspections

In Hungary, all (105 at the end of 2014) upper-tier establishments should be inspected annually. During the last reporting period, there were 98 annual inspections (93%). Hungary has clarified that the number of these establishments fluctuates every year and that new upper-tier establishments are not included in the statistics. As for lower-tier establishments, there were 176 inspections during the reporting period (55 in 2012, 50 in 2013 and 71 in 2014). However, it is not clear whether some lower-tier establishments were inspected more than once. Hungarian authorities reiterated (4a) that the frequency of inspections for lower-tier establishments is every 2 years.



HUNGARY

**Question 5 – Domino effects**

Establishments relevant for consideration of domino effects are designated by the competent authority, following the information available in the safety reports, which have to designate domino effects using the “Belgian/Walloon” method*. These establishments are required to exchange information on the effects of accidents and information on emergency plans. If they decide not to cooperate, Competent Authorities can enforce this requirement by issuing an order.

“*”=‘Methodology, guidelines and technical appendices to the study of domino effects’, in: C. Delvosalle, F. Benjelloun, C. Fiévez, Ministère Fédéral de L’emploi et du travail (Belgique), Administration de la sécurité du travail, Inspection technique, CRC/WPS/07/97

Question 6 – Land-use planning

The land-use planning provisions of the Directive are implemented based on the general regulations on urban planning and in accordance with the specific rules laid down in the legislation implementing it. Under the Hungarian legislation, in order to limit the consequences of major accidents, on the basis of the safety report or the safety analysis, the authority demarcates a danger zone around the establishment (the operator may propose what that zone should be).

Question 7 – Further information (optional)**7.a) Lessons learned from accidents and incidents**

Hungary did not answer this question.


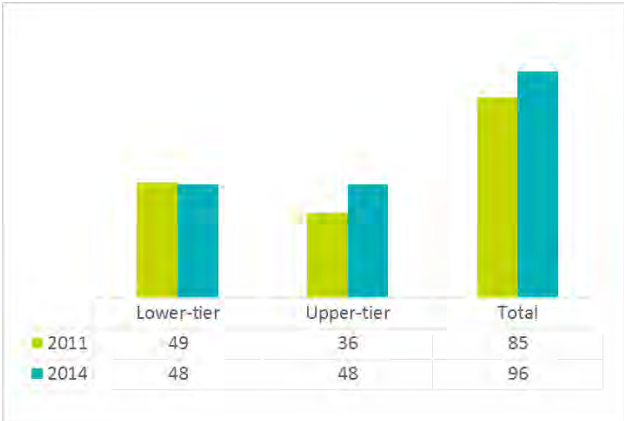

7.b) IT tools used for monitoring the implementation and data sharing

Hungary did not answer this question.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

During the last reporting period, Hungary extended the coverage of the legislation implementing Seveso to establishments under the threshold (those with high priority facilities or those at or “above a quarter of the minimum threshold”). These have provisions that are less strict but may be obliged by authorities to prepare certain documents or implement certain measures.

14. Member State summary sheet - Ireland

												
<p>IRELAND</p>												
<p>Overview of Ireland</p>												
<p>Ireland provided a complete response.</p>												
<p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p style="background-color: green; color: white; padding: 2px;">Ireland's response indicates that the provisions of the Seveso II Directive are fully implemented.</p> </div>												
<p>Main issues identified: None</p>												
<p>Number of establishments:</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>49</td> <td>36</td> <td>85</td> </tr> <tr> <td>2014</td> <td>48</td> <td>48</td> <td>96</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	49	36	85	2014	48	48	96
	Lower-tier	Upper-tier	Total									
2011	49	36	85									
2014	48	48	96									
<p>Overview of the information reported</p>												
<p>Question 1 - General information</p>												
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by Ireland.</p>												
<p>1.b) Establishments subject to Seveso There were 96 Seveso establishments in Ireland at the end of 2014, up from 85 in 2011. This is due to an increasing number of upper-tier establishments.</p> <p>As shown in the chart to the right, Ireland exhibits slightly fewer establishments per capita and much fewer establishments per km² than the EU average.</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>207</td> <td>138</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	207	138	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²										
MS	207	138										
EU	222	253										
<p>1.c) Activities of Seveso establishments According to the Irish implementation report, the most common categories were:</p> <ul style="list-style-type: none"> - Fuel storage (19%); - Production of pharmaceuticals (18%); and - Power generation (11%). <p>Whereas fuel storage is a common activity at EU level (11% of all establishments), the other two activities are relatively uncommon (1% and 5%, respectively). In the case of production of pharmaceuticals, Ireland is the country with the highest number of establishments in this category in the EU.</p>												
<p>1.d) Seveso establishments covered by the IED (optional) Ireland reported that 42 establishments were also covered by the IED. As the Competent Authorities responsible for the implementation and enforcement of Seveso are different to those responsible for the IED, there is not reported to be any impact of this. No further information has been provided by Ireland.</p>												

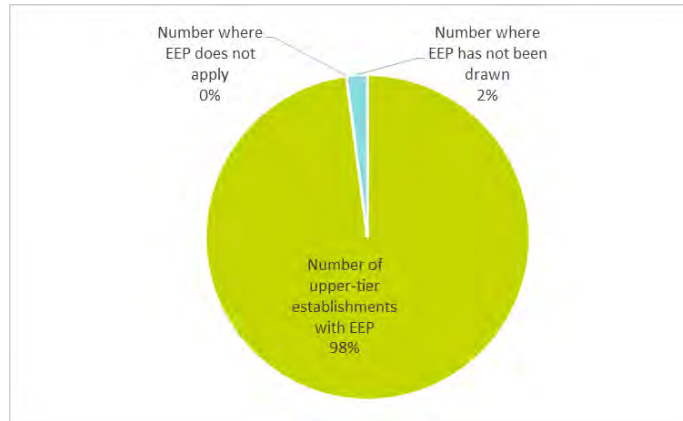


IRELAND

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

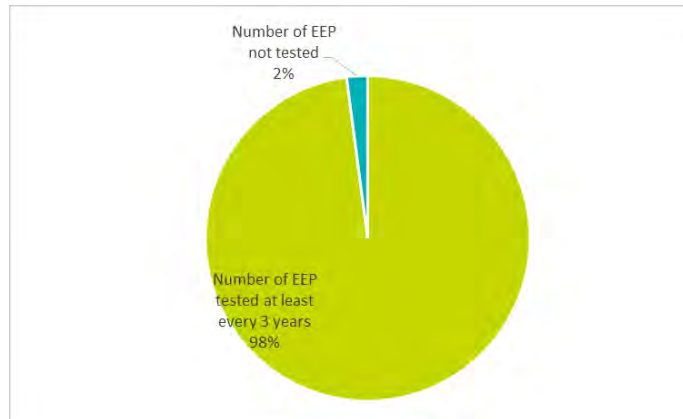
All upper tier establishments were required to adopt an external emergency plan. Competent Authorities reported that one upper-tier establishment did not have a plan drafted as required. It is stated that a draft was being prepared at the time of completion of the implementation report.



Note: Total 48 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

Ireland stated that all plans have been tested except in one case where the upper-tier establishment has applied for a change of category (to lower-tier). This seems to be a different establishment than the one mentioned in 2.b) above. As a result, the external emergency plans of 46 out of 48 establishments were tested during the reporting period.



2.d) Arrangements for providing information to the public:

- Siren system;
- Leaflets within designated areas, consultation when the external emergency plans are drafted; and
- Consultation of the off-site arrangements when external emergency plans are drafted.

2.e) Testing external emergency plans

External emergency plans are tested as follows:

- Desk based exercises when the external emergency plans are drafted and as part of the standard tests;
- Multidisciplinary field exercises; and
- Exercises conducted at the establishment by the disaster management coordinating teams.

Inspectors and Competent Authorities are sometimes invited to the tests. Plans are considered adequate when they comply with the criteria set out in the government publication "A Framework for Major Emergency Management"⁶

⁶ <http://www.mem.ie/guidancedocuments/a%20guide%20to%20seveso%20obligations.pdf>



IRELAND

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Ireland, operators inform the persons liable to be affected directly, by leaflet. The Competent Authority carries out 'spot checks' with the potentially affected public to confirm that this information has been received. The information content of the leaflet is assessed as part of the evaluation of the safety report and adoption of the external emergency plan, and following confirmation that the local competent authorities are satisfied with the contents. Irish authorities indicated that this information is actively available for those establishments with public within their area of potential influence (40 out of 48, 83%).

3.e), 3.f), 3.g) Information kept permanently available (optional)

Ireland indicated that the information is not kept permanently available for any establishment.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Ireland aims at inspecting all upper-tier establishments once a year and all lower-tier establishments once every two years. When this is not possible, they follow a systematic appraisal based on the nature of the hazard, surroundings of the establishments and the quality of the safety management system in place.

4.b) Programme of inspections available to public (optional)

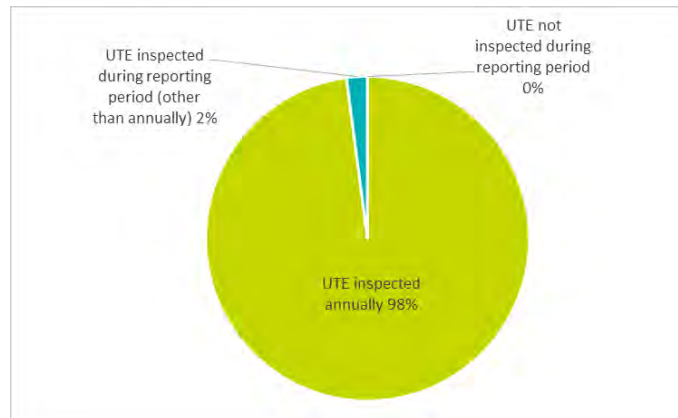
Ireland has not answered this question.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Ireland reports the use of written advice (321 cases), notices imposing requirements or restrictions (17 cases), prohibitions (5 cases) and prosecutions (5 cases). Prosecutions may involve fines up to €3,000 and/or 12 months imprisonment.

4.d), 4.e), 4.f) Data on on-site inspections

47 out of 48 upper-tier establishments were inspected annually, the remaining one at least once during the reporting period. Additionally, all lower-tier establishments were inspected at least once over the 3-year reporting period.



Question 5 – Domino effects

Establishments relevant for domino effects were identified based on an assessment by the Competent Authorities of the information contained in the notification and the safety report and feedback from inspectors. Inspectors ensured appropriate information was exchanged between operators and encouraged operators to cooperate in informing the public and local competent authorities.

**IRELAND****Question 6 – Land-use planning**

In Ireland, Competent Authorities provide technical advice to planning authorities on request. These requests are compulsory within the “consultation distance” i.e. safety distances from the establishments (or the potential location of new establishments), called. The advice can be generic or specific. Generic advice is based on a 3-zone risk-based system⁷. A total of 696 requests for technical advice have been reported by Ireland during the 2012-2014 period.

Question 7 – Further information (optional)**7.a) Lessons learned from accidents and incidents**

Ireland has not responded to this question.

7.b) IT tools used for monitoring the implementation and data sharing

Ireland has not responded to this question.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

Ireland has not responded to this question.

⁷ A detailed description is available in:

http://www.hsa.ie/eng/Your_Industry/Chemicals/Control_of_Major_Accident_Hazards/Approach_to_LUP_under_Comah_Regs.pdf

15. Member State summary sheet - Italy

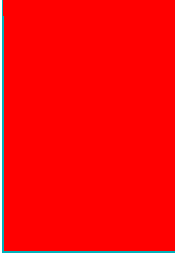
ITALY 

Overview of Italy

Overall, Italy provided a complete response.

Number of establishments:

Status of overall implementation:



Italy's response indicates that most of the provisions of the Seveso II Directive have been implemented but issues with some key aspects of the Directive are noticeable

Main issues identified:

Low level of testing of external emergency plans.

Low level of inspections. Only 20% of the upper-tier establishments were inspected during the whole period and none were inspected once a year.



Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks

None were reported by Italy.

1.b) Establishments subject to Seveso

Italy is the Member State with the third highest number of Seveso establishments after Germany and France, with almost 10% of the Seveso establishments in the EU. There were 1112 Seveso establishments in Italy at the end of 2014, a marginal increase from 1101 in 2011. While the number of lower-tier establishments has decreased during that period, upper-tier establishments have increased in numbers.

As shown in the chart to the right, Italy exhibits fewer establishments per capita but significantly more establishments per km² than the EU average.



1.c) Activities of Seveso establishments

The most common activities in Italy are:

- LNG production, bottling and distribution (24% of the establishments);
- General chemicals (24%); and
- Processing of metals with electrolytic or chemical processes (11%).

Italy is the Member State with the highest number of Seveso establishments in these three activities. Two of them are relatively common (general chemicals with 12% of all Seveso establishments in Europe and LNG production, bottling and distribution with 8%), whereas "processing of metals with electrolytic or chemical processes" accounts for 3% of EU establishments (above half of them are located in Italy).



ITALY

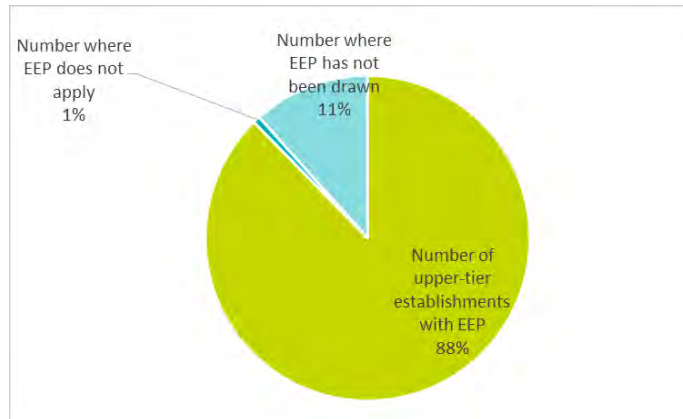
1.d) Seveso establishments covered by the IED (optional)

Italy has not provided an answer to this optional question.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

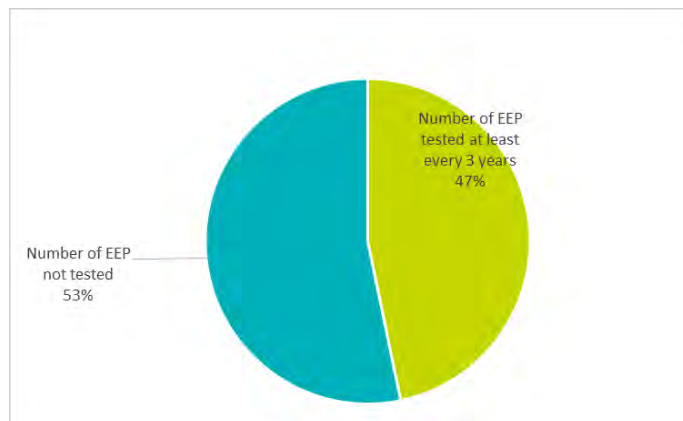
For 4 upper-tier establishments the Italian authorities decided that an external emergency plan was not needed considering that major accidents with effects outside the boundary of the establishments were not reasonable foreseen. Also, 66 establishments' external emergency plans were not drafted as required.



Note: Total 567 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, 302 establishments' external emergency plans had not been tested as required. That is more than half of the total number of upper-tier establishments in Italy. Furthermore, it represents a significant proportion (above a fifth) of the establishments without an external emergency plan in the EU. Italy has a significantly weaker testing system compared to the average proportion of upper-tier establishments without an external emergency plan tested at EU level (25%), Italian authorities stated that 69 more cases were under review for verification. Furthermore, Italy indicated that a working group involving public authorities had been tasked with elaborating criteria and tools to support Competent Authorities with performing the tests on the external emergency plans.



2.d) Arrangements for providing information to the public:

- Sirens in the upper-tier establishments;
- Alert via TV, radio, SMS, email, social media. Where relevant, local amateur radio associations are also warned and asked to cooperate; and
- Communication from operator to the Fire Brigade, communication from the Mayors of the potentially affected municipalities to the population, communication of the accident to the central Governments. These are done through the channels described above (TV, radio, SMS, etc.).

2.e) Testing external emergency plans

External emergency plans are tested as follows:

- 'Joint' trials (on-site, with the involvement of operational staff but not the general public);
- 'Full-scale' trials (on-site, with the involvement of operational staff and the general public);
- 'Command-post' trials (without the involvement of staff, facilities and the general public); and
- Trials to check the audibility of alarm systems (with the involvement of staff, civil protection officials and the general public).

External emergency plans must include the following: analysis of land vulnerability, the outline of the intervention model, the location and functioning of alarm systems and availability of information to the public.

ITALY



Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Italy, municipalities are in charge of distributing information on hazards of Seveso establishments to the public and workers potentially affected. There are guidelines with criteria on the most appropriate way of disseminating this information, but the ultimate decision is made by the Mayor. This information is submitted to the provincial Government for updating the external emergency plans, at least once every 5 years. Normally, the forms of communication are brochures, posters and manuals, and in some cases through dedicated web pages, organisation of public meetings or the use of public information spaces and local radio or television channels. The costs are borne by municipalities, with collaboration from operators in some cases. Italy stated that this is done for all (567) upper-tier establishments in the country. The statistical breakdown provided by Italy is as follows:

Municipalities (100%)	
“Active way”	“Passive way”
40% (gatherings and meetings or completing a questionnaire distributed by municipalities)	60% (brochures, posters and manuals, webpages, flyers)

As municipalities are in charge of providing this information, the Government is responsible for making sure that this is actually the case. Italy mentions a survey in which the Government assessed this alongside other issues (such as the active/passive communication split mentioned above).

3.e), 3.f), 3.g) Information kept permanently available (optional)

Italy did not answer these optional questions.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Italy reported that their inspection system is not based on a systematic appraisal. Italy has not specified the timescales of their inspection system but judging by their response to other questions, less than half of the upper-tier and lower-tier establishments were inspected during the 3-year period.

4.b) Programme of inspections available to public (optional)

Italy has not provided this information

4.c) Actions taken in the event of accidents, incidents and non-compliance

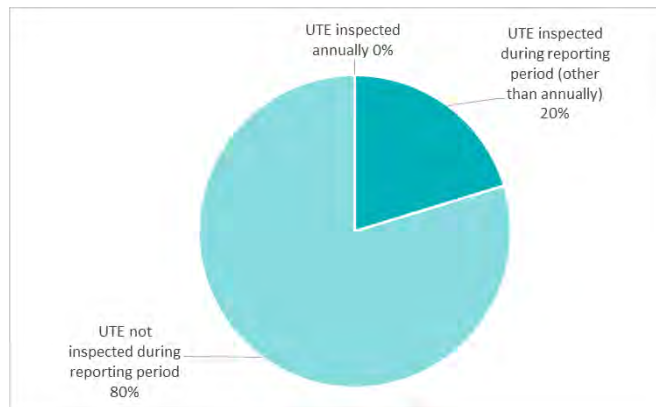
Italy took action on 90 cases, 53 of which were related to upper-tier establishments and the rest to lower-tier establishments. In the case of upper-tier, most of the actions were orders imposing technical upgrades or changing procedures within a specific deadline. In four cases, there were formal notices (2 of which resulted in partial restrictions and one in a full suspension of activities). As for lower-tier, the non-compliances were deemed as not critical. Italy has provided some examples to explain this.



ITALY

4.d), 4.e), 4.f) Data on on-site inspections

Italy reported that none of the upper-tier establishments is inspected once a year. Around 20% of the upper-tier establishments and 49% of the lower-tier establishments were inspected during the 3-year period. This is particularly low, especially considering that Italy is the Member State with the third highest number of Seveso establishments. Italy indicated that the low number of inspections was caused by organisational and financial constraints. Italy indicated that its national legislation was amended in order to address this issue in the future reporting period (i.e. under Seveso III) by redrafting the competence for inspection and by providing financing for the inspections through tariffs paid by the operators.



Question 5 – Domino effects

The Ministry of Environment identifies groups of establishments which are potentially subject to “domino effects” using the information provided by the Competent Authorities in each region. These Regional Authorities have the opportunity of assessing this in two instances: evaluation of safety reports (every 5 years), or for assessments related to changes at establishments that are deemed to increase the level of risk. The Ministry ensures that Regional Competent Authorities have all the necessary information to enforce measures to prevent domino effects in these establishments, such as facilitating information exchange, drafting contingency plans or conducting integrated safety studies.

Question 6 – Land-use planning

Italy has specific legislation which requires all land use planning to take into account the risk associated with establishments handling dangerous substances. Among other measures, it defines the safety distances between these establishments and residential areas. A risk assessment has to be undertaken and operators are not given authorisation to build and operate the site if they do not comply with all the requirements. The legislation also identifies the Competent Authorities and the role of the central, regional, province and local Governments. The Italian Government stated that it conducted a survey to identify land-use planning issues related to Seveso establishments and implemented legislative measures following the findings of the survey.

Question 7 – Further information (optional)

No response was provided to this optional question.

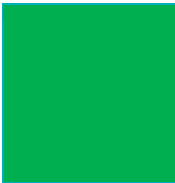
16. Member State summary sheet - Latvia

LATVIA 

Overview of Latvia

Latvia provided an almost complete response with a few minor gaps.

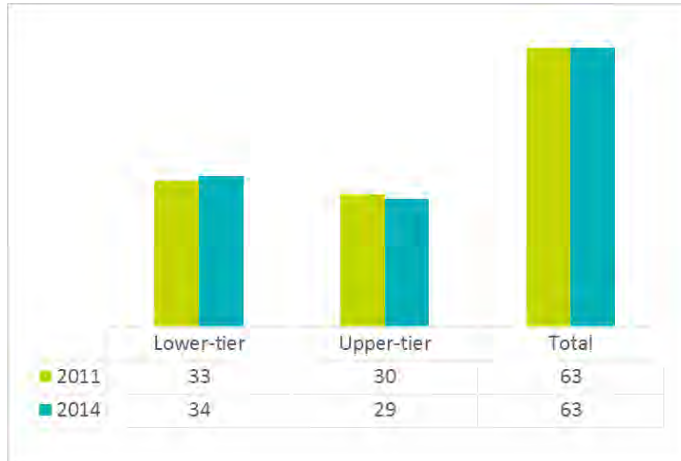
Status of overall implementation:



According to their response, Latvia has fully implemented the provisions of the Seveso II Directive.

Main issues identified:
None

Number of establishments:



Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks

None were reported by Latvia.

1.b) Establishments subject to Seveso

There were 63 Seveso establishments in Latvia at the end of 2014, the same number as in 2011.

As shown in the chart to the right, Latvia exhibits more establishments per capita but much fewer establishments per km² than the EU average.



1.c) Activities of Seveso establishments

The most common activities in Latvia are:

- Fuel storage (51%);
- LPG storage (13%); and
- Production and storage of fertilisers (8%).

Whereas fuel storage is one of the most common activities at EU level (11%), LPG storage and storage and fertilisers are infrequent (4% and 3%, respectively). Latvia is not a significant contributor to any of the categories.

1.d) Seveso establishments covered by the IED (optional)

Latvia did not reply to this optional question.

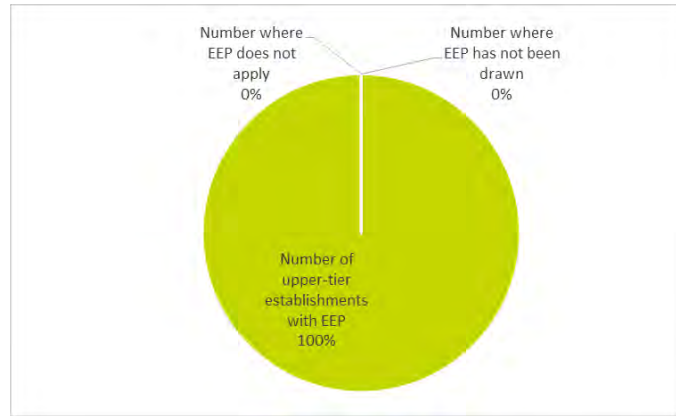


LATVIA

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

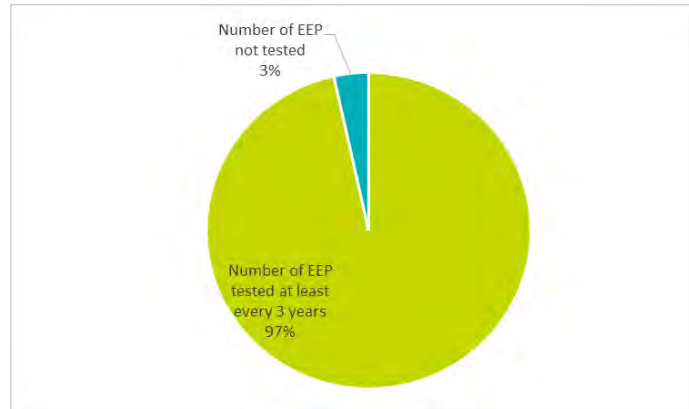
Latvia indicated that all upper-tier establishments have an external emergency plan.



Note: Total 29 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, Latvian competent authorities had tested the external emergency plans of all establishments except one. Latvia stated that the establishment was not tested due to the structural changes occurring in it during the 2012-2014 period. That establishment was tested in 2011 and 2015.



2.d) Arrangements for providing information to the public:

- Civil alert and notification system tested twice a year (the implementation report does not provide a description of this system, only that it is regulated by Cabinet Regulation No 530 of 7 August 2007/ The text implies that sirens are one of the components but no additional detail was provided); and
- Public consultation on the external plans; information on what the public has to do in case of alert; publication of external emergency plans on the local authority webpage.

2.e) Testing external emergency plans

- Practical civil protection exercises in compliance with the legislation.

The criteria for evaluating the exercises are described in Annex 3 of Cabinet Regulation No 772 of 22 September 2008 on types of civil protection exercises and the procedures for organising them. However, the implementation report does not enumerate or describe the actual criteria.

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

Operators prepare and distribute publications for residents with safety measures and what to do in case of an accident. However, it is not stated how this is done (e.g. leaflets, flyers, visits...). Public consultations on the establishments' civil protection and external emergency plans are run. Also, local authorities publish the external emergency plans online. Monitoring of how the information material is distributed is conducted by the State Fire and Rescue Service as part of annual fire safety and civil protection inspections.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Latvia has not provided information on this.



LATVIA

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Latvia has partially answered this question but it seems that it does not use a systematic appraisal of major-accident hazards. All upper-tier establishments have to be inspected at least once a year, whereas the rest have to be inspected at least twice every 3 years.

4.b) Programme of inspections available to public (optional)

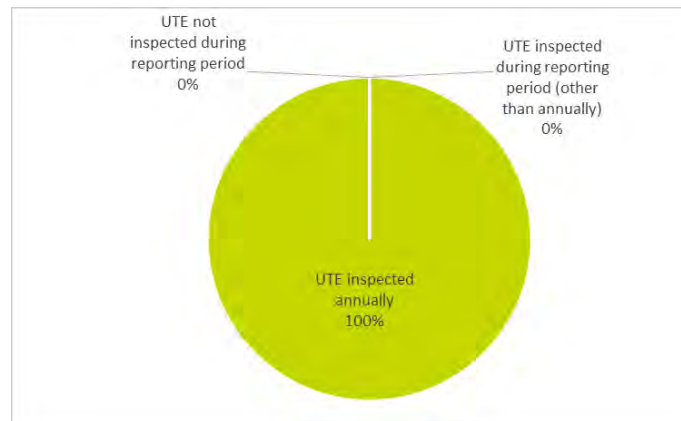
Not answered.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Latvia stated that between 2012 and 2015, administrative penalties were imposed 32 times. Also, four warnings were issued during the same period.

4.d), 4.e), 4.f) Data on on-site inspections

Latvia indicated that all upper-tier establishments (29) are inspected once a year. Also, a total of 36 inspections of lower-tier establishments were undertaken (an average of 12 per year).



Question 5 – Domino effects

The groups of establishments or installations where domino effects could be produced are identified by the Competent authorities on the basis of the information provided in establishments' submissions, prevention programmes and safety reports. Authorities take into account the characteristics of those hazardous substances present at the establishments, staff, equipment technical plan, other risk factors (e.g. other establishments which do not fall under Seveso II but involve the handling of hazardous substances).

Question 6 – Land-use planning

Requirements on land use planning related to the establishments covered by Seveso II are laid down in Latvian regulations covering land use planning (in general) as well as other laws covering buffer zones (the names and codes are available in the implementation report submitted by Latvia). Land use planning procedures also cover the organisation of public consultations as part of a specific planning process. The Law on buffer zones lays down specific requirements limiting the development of residential areas and the planning of other activities in the vicinity of dangerous establishments, and placing restrictions on dangerous activities close to vulnerable zones. Latvia has provided a real example of how land use planning around Seveso establishments is managed with a link to the relevant documents.



LATVIA



Question 7 – Further information (optional)

7.a) Lessons learned from accidents and incidents

Latvia has reported that many accidents occurred due to a human error. As a result, it was highlighted that training is very important so that staff comply with procedures and are also aware of all the internal protocols in place.


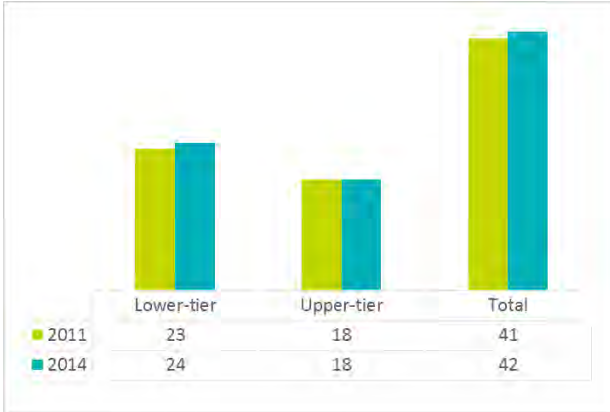

7.b) IT tools used for monitoring the implementation and data sharing

Latvia reported the use of IT tools for monitoring the implementation of the Directive and for data sharing. The characteristics or format of these tools has not been explained.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

Latvia has not replied to this question.

17. Member State summary sheet – Lithuania

												
<p>LITHUANIA</p>												
<p>Overview of Lithuania</p>												
<p>Lithuania provided a complete response.</p>												
<p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>The response submitted by Lithuania indicates that the provisions of the Seveso II Directive are fully implemented.</p> </div>												
<p>Main issues identified: None</p>												
<p>Number of establishments:</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>23</td> <td>18</td> <td>41</td> </tr> <tr> <td>2014</td> <td>24</td> <td>18</td> <td>42</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	23	18	41	2014	24	18	42
	Lower-tier	Upper-tier	Total									
2011	23	18	41									
2014	24	18	42									
<p>Overview of the information reported</p>												
<p>Question 1 - General information</p>												
<p>1.a) Significant changes made to competent authorities or their tasks Lithuania reported one significant change during the reporting period. In 2014, a new authority was established (State Environmental Protection Service), which is currently responsible for implementing and enforcing Seveso II.</p>												
<p>1.b) Establishments subject to Seveso There were 42 Seveso establishments in Lithuania at the end of 2014. Except for one more lower-tier establishment, there has been no change in numbers compared to 2011.</p> <p>As shown in the chart to the right, Lithuania exhibits fewer establishments per capita and much fewer establishments per km² than the EU average. In fact, Lithuania has the lowest density of Seveso establishments per km² of all EU Member States.</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>144</td> <td>64</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	144	64	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²										
MS	144	64										
EU	222	253										
<p>1.c) Activities of Seveso establishments The most common activities in Lithuania are:</p> <ul style="list-style-type: none"> - Fuel storage (26%); - Handling and transportation centres (14%); and - Production and storage of fertilisers (14%). <p>Whereas fuel storage is one of the activities with the highest number of Seveso establishments (11%), the other 2 are relatively minor, with 2% and 3% of EU establishments, respectively.</p>												
<p>1.d) Seveso establishments covered by the IED (optional) Lithuania stated that 11 Seveso establishments fall under the IED and that the inspection systems are integrated (inspections inform the implementation of several Directives at the same time) and that increases the efficiency of implementation of all the Directives involved.</p>												

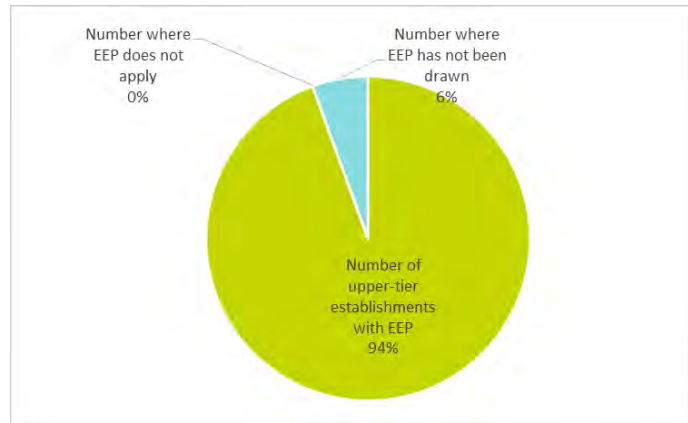


LITHUANIA

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

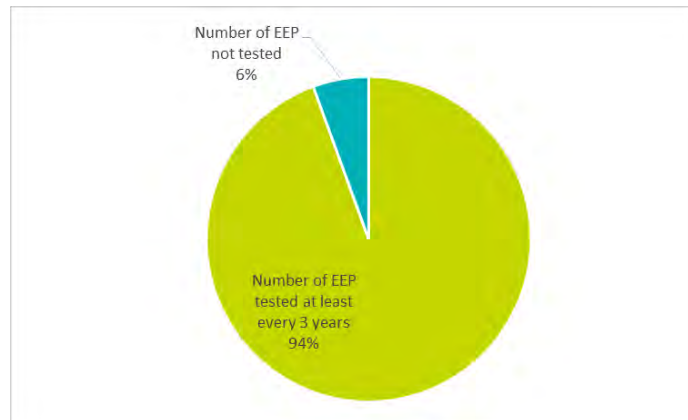
Lithuania did not exempt any upper-tier establishment from having an external emergency plan. However, an external emergency plan was not drafted for one establishment. This is an establishment that started operating in 2015 and the plan was in the preparation phase when the implementation report was submitted.



Note: Total 18 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

For one establishments the external emergency plan had not been tested during the reporting period. Although Lithuania did not indicate it, this is presumably the same establishment for which the plan is not ready (see above).



2.d) Arrangements for providing information to the public:

- Sirens installed in state institutions, relevant and tall buildings;
- A Cell Broadcasting system for residents near to Seveso establishments has recently been put in place (which sends a message to mobile phones without the need for registration); and
- Announcements through the local radio and TV channels.

2.e) Testing external emergency plans

External emergency plans are tested as follows:

- Full exercises (every 3 years);
- “Functional” exercises (every 2 years, without coinciding with full exercises); and
- Table top exercises (every year except when the above are organised).

There are criteria on how these exercises should be organised, but there are not established criteria for determining that a plan is adequate.

LITHUANIA



Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

The information was made actively available for 17 out of 18 upper-tier establishments. In Lithuania, operators and municipalities (those municipalities where establishments are and those bordering them) are obliged to prepare informative materials about the activities, possible hazards of an establishment, and recommendations on safety measures in case of a major accident. The information was provided as leaflets/flyers in all cases and online (operators' and/or municipalities' websites). Also, the Competent Authority publishes non-confidential information on Seveso establishments. Lithuania provided a statistical breakdown of how the information is provided:

Authorities monitor that this is done through inspections and continuous monitoring of its quality and accuracy.

3.e), 3.f), 3.g) Information kept permanently available (optional)

The information for 17 out of 18 upper-tier establishments is permanently available. Lithuania has provided a statistical breakdown of how this is done:

Operator	Competent Authority	Notice	Emails	Websites (Op)	Websites (CA)
29%	94%	18%	-	100%	76%

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The inspection system is not based on a systematic appraisal. Upper-tier establishments are inspected once a year, whereas lower-tier establishments are inspected once every 3 years

4.b) Programme of inspections available to public (optional)

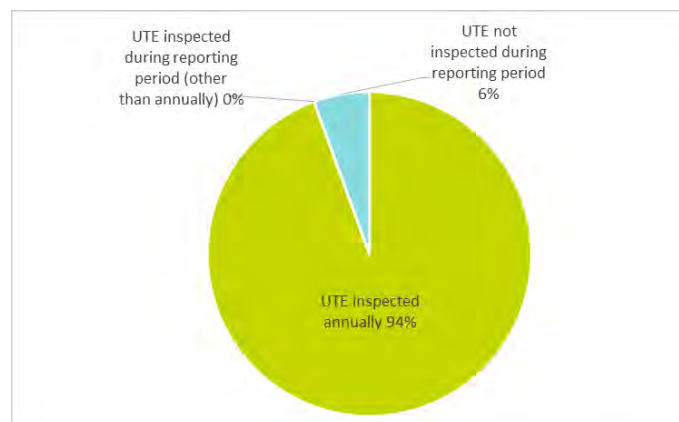
The inspection programme is a legal document and is therefore publicly available. Inspection reports are available upon request.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Lithuania has provided data on the type and number of actions taken in each of the years of the reporting period. These have been mandatory instructions (179 in total), notices (27 in total), financial penalties (144 in total), and prohibition of use (2). The use of all instruments decreased or was the same in 2014 compared to 2012, except "mandatory instructions", which increased around 40%.

4.d), 4.e), 4.f) Data on on-site inspections

In line with their reply to question 4.a), Lithuania stated that all upper-tier establishments were inspected at least once a year, with the exception of one, which became operational in 2015 and was due to be inspected then. All lower-tier establishments were inspected at least once during the 2012-2014 period (higher than the EU average of 74%).





LITHUANIA



Question 5 – Domino effects

Competent authorities are responsible for identifying domino effects. Currently, there is only one domino group identified (3 establishments). Although they have exchanged information on the substances and possible hazards (which is monitored by competent authorities), Lithuania highlighted that operators have not been proactive in cooperating with each other (e.g. arranging joint exercises). According to Lithuania, this is complicated due to the commercial conflict of interest between the establishments involved.

Question 6 – Land-use planning



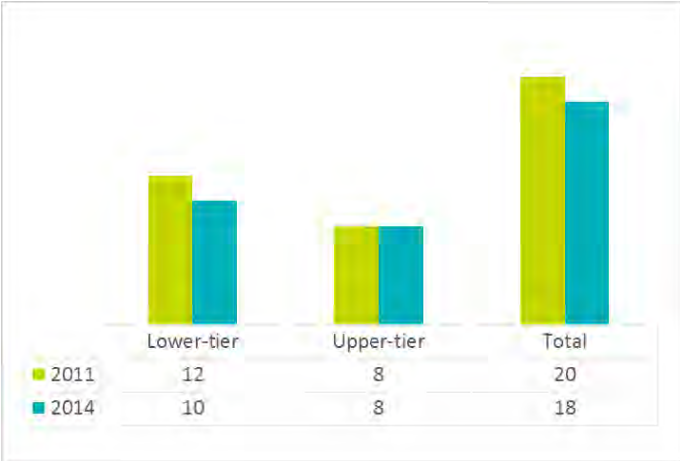
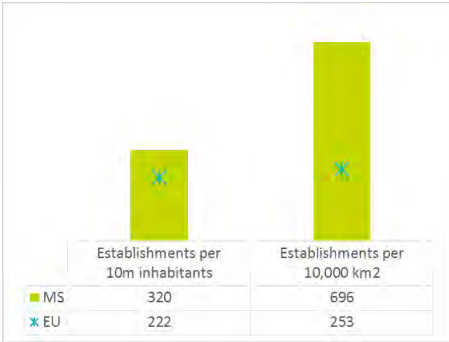
Land use planning with regard to Seveso establishments is implemented by separate legislation. Two main laws control the location of Seveso establishments, the stakeholders to be involved in spatial planning, and the process to be followed, including the authorisation process (which involves a risk assessment and a public consultation). Lithuania has provided an example of where this has been done in practice.

Question 7 – Further information (optional)

**No response was provided to this optional question.7.a) Lessons learned from accidents and incidents
Lithuania has not responded to this question.**

No response was provided to this optional question.

18. Member State summary sheet - Luxembourg

												
<p>LUXEMBOURG</p>												
<p>Overview of Luxembourg</p>												
<p>Overall, Luxembourg provided an almost complete response with a few minor gaps.</p>												
<p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px;">  <p>Luxembourg's response indicates that there are issues with key provisions of the Seveso-II Directive.</p> </div>												
<p>Main issues identified: No tests of any external emergency plan in the whole reporting period. Luxembourg stated that the majority of its emergency staff are volunteers. Although this is not an issue in itself, it is uncertain whether they are adequately prepared to respond to a Seveso accident.</p> <p>Luxembourg does not make available information on safety measures for the public likely affected by a major accident. Also, the information is only available to the public if they participate in the public consultation for Seveso authorisations or, in certain cases, online, although this does not cover all the information.</p>												
<p>Number of establishments:</p>  <table border="1"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>12</td> <td>8</td> <td>20</td> </tr> <tr> <td>2014</td> <td>10</td> <td>8</td> <td>18</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	12	8	20	2014	10	8	18
	Lower-tier	Upper-tier	Total									
2011	12	8	20									
2014	10	8	18									
<p>Overview of the information reported</p>												
<p>Question 1 - General information</p>												
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by Luxembourg.</p>												
<p>1.b) Establishments subject to Seveso There were 18 Seveso establishments in Luxembourg at the end of 2014, two (lower-tier) establishments less than in 2011.</p> <p>As shown in the chart to the right, despite the low overall number there are more establishments per capita and much more establishments per km² in Luxembourg than the EU average. Thus Luxembourg exhibits a high density of Seveso establishments.</p>												
 <table border="1"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>320</td> <td>696</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	320	696	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²										
MS	320	696										
EU	222	253										
<p>1.c) Activities of Seveso establishments Luxembourg has indicated all relevant activities, for each establishment, instead of indicating only the main activity, resulting in a number (30) that is higher than the total number of establishments (18). The most common activities are:</p> <ul style="list-style-type: none"> - Fuel storage with 7 establishments; - "Other facilities" (4 establishments); and - A number of activities with 3 establishments each. 												

LUXEMBOURG



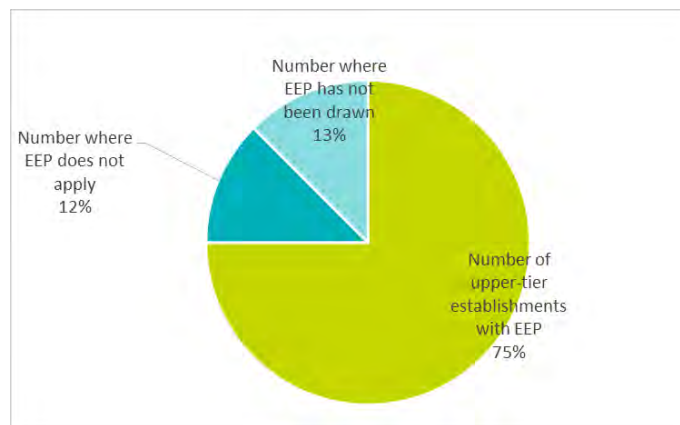
Both fuel storage and “other activities” are common activities at EU level, with 11% and 14% of all Seveso establishments in the EU.

1.d) Seveso establishments covered by the IED (optional)
Luxembourg has not answered this (optional) question.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

For one establishment it was decided that an external emergency plan was not needed. Also, the external emergency plan was not prepared for another establishment as required. Luxembourg authorities are aware of the latter and stated that the plan is under development.



Note: Total 8 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

Luxembourg indicated that it had not tested any of the external plans. The reason behind this is explained in 2.e)



2.d) Arrangements for providing information to the public:

- Communication via radio, SMS or sirens in vehicles.

e- Arrangements to cope with off-site effects from an accident are specific to each establishment and depend on the type of substance.

2.e) Testing external emergency plans

Whereas Luxembourg states that internal emergency plans are tested by the operators in coordination with local emergency services, external emergency plans are not tested. Most of the emergency services are composed by volunteers in Luxembourg and this makes it difficult for tests to be organised, according to the Luxembourg authorities. The fact that the emergency services are composed by volunteers is not an issue in itself, since it depends on their formation as emergency staff. The way the answer to the questionnaire is written implies that competent authorities are unsure of the preparedness of emergency services. Therefore, this would need to be assessed. Luxembourg stated that there are no defined criteria for determining whether the plans are adequate because the number of upper-tier establishments with such plans is low (7). The plans are assessed on a case by case basis.

LUXEMBOURG



Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

Information on the safety measures taken by operators, dangers and possible consequences of a major accident is made available as part of the authorisation of a new Seveso establishment or the modification of an existing one. This information is available online on the competent authority webpage alongside the inventory of hazardous substances and other documents such as the safety reports. Sometimes, the online information may be available to the general public and other times it may only be available in the operators'/Authorities' intranet. If the latter is the case, the information can be made available upon request. The provision of this information is monitored via inspections and also when any Seveso establishment is opened or modified (authorisation). It should be noted that the public likely to be affected by a major accident is not preventatively informed of the appropriate security measures in Luxembourg.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Luxembourg has not answered these questions.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Luxembourg stated that inspections are done regularly (once a year for upper-tier) for all establishments. As a result, there is not a systematic approach to inspections.

4.b) Programme of inspections available to public (optional)

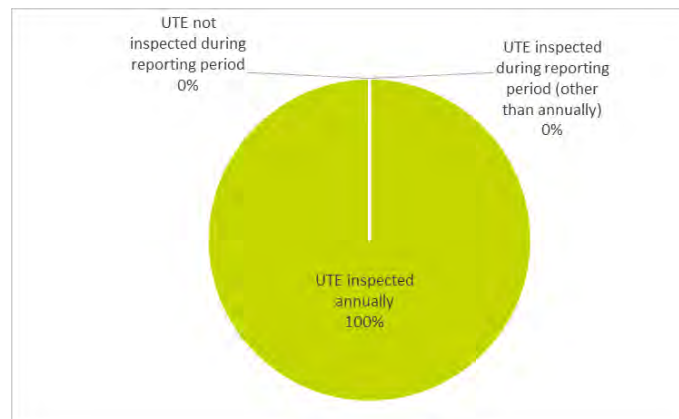
Luxembourg has not answered this question.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Luxembourg has provisions for administrative sanctions (operating ban) and criminal sanctions (fines or imprisonment). During the reporting period, Luxembourg indicates that the only non-compliance issue was an operator that had purchased inadequate equipment. The operator was requested to change this equipment.

4.d), 4.e), 4.f) Data on on-site inspections

All upper-tier establishments were inspected annually and 9 out of 10 lower-tier establishments were subject to on-site inspections in the 2012-2014 period.



Question 5 – Domino effects

All new establishments and all modifications of existing establishments go through an authorisation process, in which domino effects are assessed. The operators of neighbouring establishments have to assess the impact of these new or modified establishments on their premises. . The Luxembourg authorities recognise that they have a good overview of the domino effects in the country since the number of Seveso establishments is very low.



LUXEMBOURG



Question 6 – Land-use planning


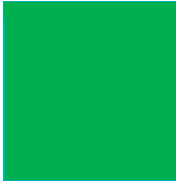

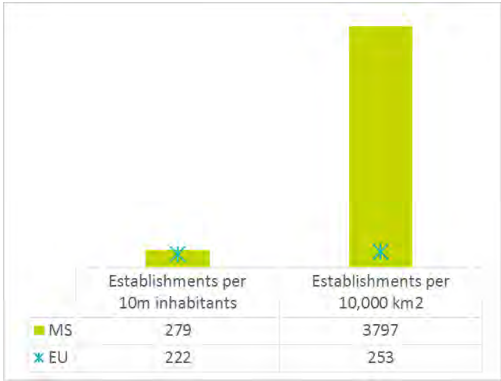
For all Seveso establishments that may have an impact on their vicinity, safety distances have been defined and communicated to the competent authorities. These are taken into account by competent authorities when authorising new or modifications of Seveso establishments or neighbouring establishments.

Question 7 – Further information (optional)

**No response was provided to this optional question.7.a) Lessons learned from accidents and incidents
Luxembourg did not respond to this optional question.**

No response was provided to this optional question.

19. Member State summary sheet - Malta

													
MALTA													
Overview of Malta													
<p>Malta provided a complete response with answers to all the compulsory and optional questions.</p> <p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px;">  <p>Malta's response indicates that the provisions of the Seveso II Directive are fully implemented.</p> </div> <p>Main issues identified: None</p>	<p>Number of establishments:</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>5</td> <td>6</td> <td>11</td> </tr> <tr> <td>2014</td> <td>3</td> <td>9</td> <td>12</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	5	6	11	2014	3	9	12
	Lower-tier	Upper-tier	Total										
2011	5	6	11										
2014	3	9	12										
Overview of the information reported													
Question 1 - General information													
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by Malta.</p> <p>1.b) Establishments subject to Seveso There were 12 Seveso establishments in Malta at the end of 2014, one more than in 2011. While the number of lower-tier establishments decreased during that period, upper-tier establishments increased in number.</p> <p>As shown in the chart to the right, Malta exhibits more establishments per capita and especially much more establishments per km² than the EU average, which reflects a very high density of establishments in Malta.</p>  <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>279</td> <td>3797</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table> <p>1.c) Activities of Seveso establishments Only four activities are reported as the main activities for the Seveso establishments in Malta. These are:</p> <ul style="list-style-type: none"> - fuel storage (7 establishments); - power generation (2); - LNG production, bottling and bulk distribution (2); and - LNG storage (1). <p>Two of these activities (fuel storage and LNG production, bottling and bulk distribution) are relatively common amongst European Seveso establishments (11% and 8%, respectively of all the Seveso establishments in the EU).</p> <p>1.d) Seveso establishments covered by the IED (optional) Malta reported that 2 establishments are also covered by the IED, with no impacts reported in practice.</p>			Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	279	3797	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²											
MS	279	3797											
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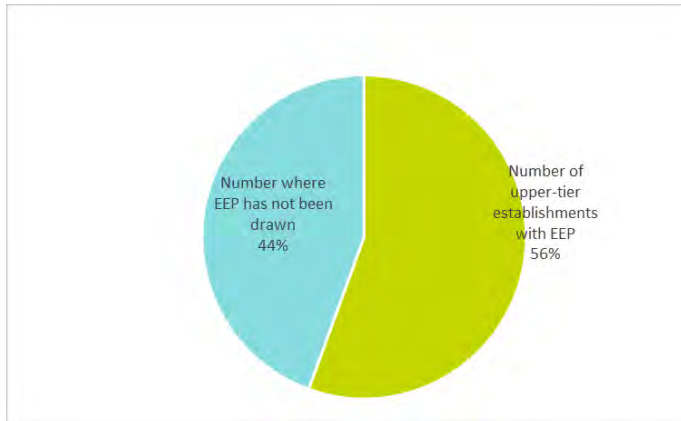


MALTA

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

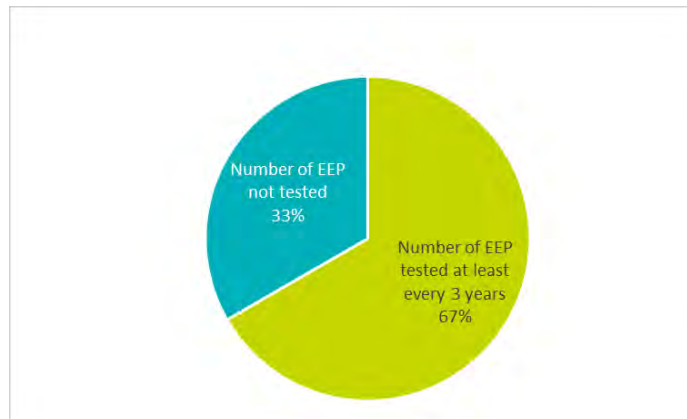
For none of the upper-tier establishments in Malta was it decided that an external plan was not needed. However, 4 of the 9 upper-tier establishments did not have an external emergency plan as required. Malta provided an explanation for this. Three of them became upper-tier establishments during 2014 and competent authorities have a period of time (2 years) to draw them up. This is period is longer in Malta than in other Member States. The plan of the other establishment was being finalised when Maltese authorities filled in the questionnaire.



Note: Total 9 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, the external emergency plans of three establishments had not been tested. This represents 33% of the upper-tier establishments in Malta (compared to 25% at EU level). According to Malta, these are the same three establishments that became upper-tier in 2014 and have 2 years to complete their external emergency plans.



2.d) Arrangements for providing information to the public:

- Most upper-tier establishments (number not stated) have a siren. Radio alerts; and
- Leaflets with measures in case of emergency are distributed in the areas that could be potentially affected by a major industrial accident. The leaflets also include contact numbers and radio frequencies.

2.e) Testing external emergency plans

External emergency plans are tested as follows:

- Multidisciplinary field exercises involving the different rescue services; and
- Desk based exercises.

An analysis is carried out after each exercise with inputs from the entities taking part. Recommendations for improvements based on lessons learnt are made.



MALTA

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

The information (electronic and printed) was agreed with the members of the Competent Authority. Once agreed, it was distributed to the public by means of leaflets that were distributed door to door. The operators of 4 upper tier establishments publish the information on their websites. The leaflets for 4 upper-tier establishments were finalised and distributed during 2009. Malta stated that it has not been necessary to change them since the information is still valid. One operator published a leaflet during 2012 and another one was preparing a leaflet in 2014. Finally, three upper-tier establishments were classified as such during 2014 and have not published leaflets. Operators are in charge of distributing this information and bear the costs. Competent authorities are in coordination with operators when they are preparing the leaflets. Also, they make spot checks to monitor whether these leaflets have been distributed.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Information for all establishments' (upper and lower tier) is kept up to date and permanently available through the competent authorities. Also, four operators publish the information on their webpages.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Malta does not apply systematic appraisal of major accident hazards for inspections as all establishments (upper-tier and lower-tier) are inspected at least once a year.

4.b) Programme of inspections available to public (optional)

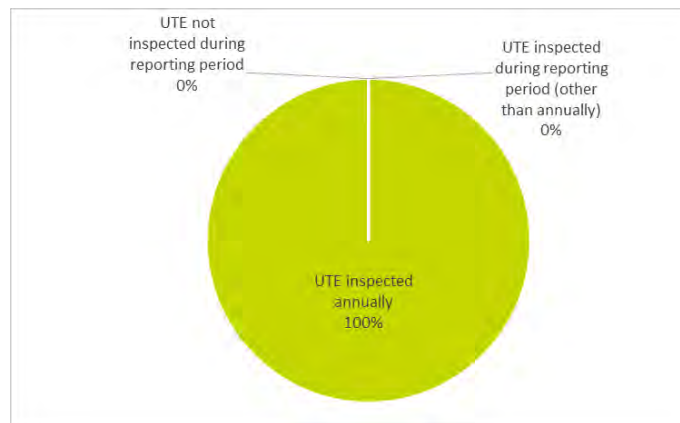
The inspection programme was not made available to the public during the reporting period. According to Malta, there were no disclosure requests.

4.c) Actions taken in the event of accidents, incidents and non-compliance

There were no major accidents during the period 2012-2014. No 'prohibition of use' orders were issued. Following each inspection, a detailed report listing all the findings is prepared and agreed upon by the Competent Authority. A letter is then sent to the operator, giving a description of the issues identified, the measures to be taken and target dates for implementation.

4.d), 4.e), 4.f) Data on on-site inspections

All upper-tier and lower-tier establishments were inspected at least once a year in the last reporting period.



Question 5 – Domino effects

Establishments relevant for consideration of domino effects are designated by the competent authority if their consultation zones overlap. These establishments are required to exchange information on the effects of potential accidents and information on emergency plans. Malta's implementation report describes an example of one of the cases.

**MALTA****Question 6 – Land-use planning**

The provisions of Article 12 are fulfilled through supplementary guidance regarding accident hazard and hazardous substances. These guidelines set out policies on new hazardous installations, modifications to existing establishments and developments in the vicinity of existing establishments. The Land-Use Planning requirements are mainly based on the UK's land-use planning methodology. For four specific establishments which have storage facilities of hazardous substances, three zones were established (inner, middle and outer), with different level of urbanisation/developments permitted and different control levels.

Question 7 – Further information (optional)**7.a) Lessons learned from accidents and incidents**

No accidents were reported.


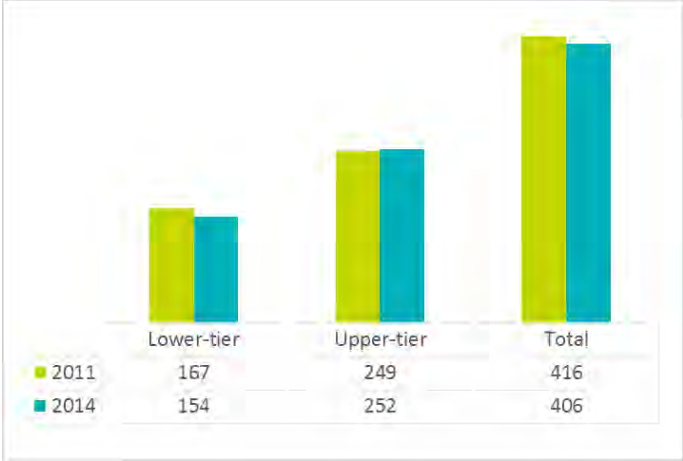
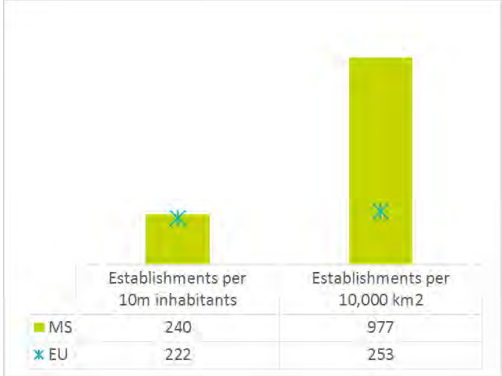
7.b) IT tools used for monitoring the implementation and data sharing

No specific IT tool was used during the reporting period.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

No Seveso-like provisions were applied to other installations not falling under Seveso II.

20. Member State summary sheet - Netherlands

													
<p>NETHERLANDS</p>													
<p>Overview of the Netherlands</p>													
<p>Overall, the Netherlands provided an almost complete response with a few minor gaps.</p> <p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p style="background-color: orange; width: 100px; height: 60px; display: inline-block; vertical-align: middle;"></p> <p>The Netherlands response indicates that the provisions of the Seveso II Directive are almost fully implemented.</p> </div> <p>Main issues identified: The external emergency plans of 37% of the upper-tier establishments were not tested during the reporting period. Also, the Netherlands did not provide a statistical breakdown of Seveso establishments.</p>	<p>Number of establishments:</p>  <table border="1"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>167</td> <td>249</td> <td>416</td> </tr> <tr> <td>2014</td> <td>154</td> <td>252</td> <td>406</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	167	249	416	2014	154	252	406
	Lower-tier	Upper-tier	Total										
2011	167	249	416										
2014	154	252	406										
<p>Overview of the information reported</p>													
<p>Question 1 - General information</p>													
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by the Netherlands.</p> <p>1.b) Establishments subject to Seveso There were 406 Seveso establishments in the Netherlands at the end of 2014, down from 416 in 2011. This is due to a decreasing number of lower-tier establishments, while upper-tier establishments have slightly increased in numbers during that period.</p> <p>As shown in the chart to the right, the Netherlands exhibit slightly more establishments per capita and much more establishments per km² than the EU average, reflecting a high density of establishments.</p>  <table border="1"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>240</td> <td>977</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	240	977	EU	222	253	<p>1.c) Activities of Seveso establishments No statistical breakdown using the SPIRS categories was available. The Netherlands applies a national classification of establishments. A statistical summary is not available.</p> <p>1.d) Seveso establishments covered by the IED (optional) The Netherlands does not have detailed data on this, but considers that 'many' establishments are also covered by the IED. However the competent authority considers safety and emissions control to be distinct aspects.</p>			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²											
MS	240	977											
EU	222	253											



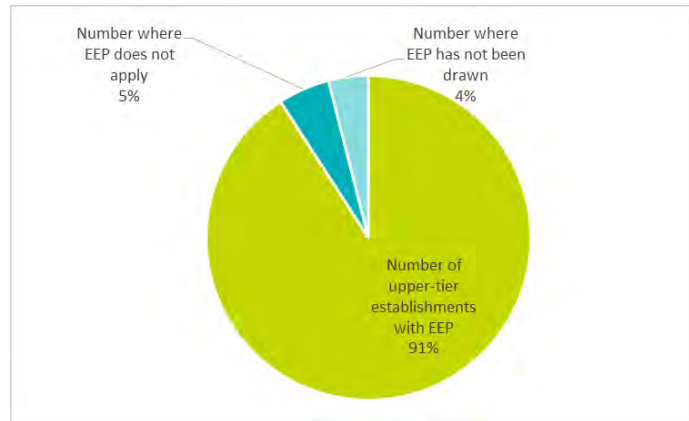
NETHERLANDS

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

For 13 upper-tier establishments it was decided that an external emergency plan was not needed based on the technical safety data contained in the safety report. In addition, 10 upper-tier establishments failed to produce an external emergency plan as required by Article 11.1.

For 4 of these, safety reports were submitted which will be used to draw up the external emergency plans. For the remaining 6, the competent authorities were reminded to draw up the plans promptly. The Netherlands does not systematically draw up specific external emergency plans but rather disaster response plans that cover common accident scenarios.

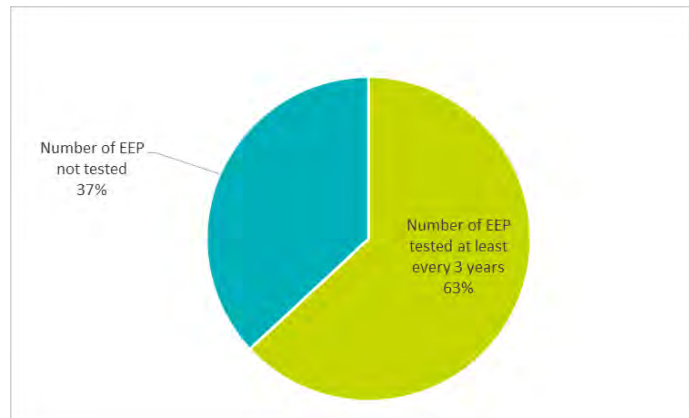


Note: Total 252 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, 93 upper-tier establishments' external emergency plans had not been tested (this represents 37% of the upper-tier establishments in the Netherlands, which compares to 25% at EU level).

This is because some competent authorities adopt generic external emergency plans that set out basic scenarios which are then tested. The drawing up and testing of these generic external emergency plans is currently being coordinated at national level



2.d) Arrangements for providing information to the public:

- Operational crisis communication preparedness plans based on a regional crisis plans; national siren network (WAS); nationwide system for alerting public via mobile phone alert (NL-alert);
- Information to the public on risks and options for action are available through the national risk map available on www.risicokaart.nl, the competent authorities websites and municipal websites; and
- Information through the regional emergency broadcasters, regional and municipal websites and social media (Twitter). National pool of crisis communication experts.

2.e) Testing external emergency plans

External emergency plans are tested using:

- Multidisciplinary field exercises involving the different rescue services;
- Desk based exercises; and
- Exercises conducted at the establishment by the disaster management coordinating teams.

The results of these exercises are used to improve the external emergency plans. Their adequacy is assessed taking into account the completeness, timeliness, accuracy and practical utility of the external emergency plan.

NETHERLANDS



Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

The location of all Seveso establishments is available online⁸ including safety advice to the public. In case of accident, the public is warned by the competent authority by means of sirens and mobile phone alerts. Information on safety measures is also provided.

Between 2010 and 2014, information from upper-tier establishments was actively made available to the public during 13 instances of major accidents reported via eMARS. No further information was provided on the approach taken with regard to other instances of major accidents.

The Netherlands did not include any statistical breakdown as requested in the questionnaire nor information on 'by whom' the information on upper-tier establishments is made available. Based on previous responses, it is assumed to be the competent authorities. The information means used for informing the public and persons liable to be affected by a Seveso accident has been described in question 2.d) above. Furthermore online information is permanently available and competent authorities are in charge of keeping the websites updated.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Information on all establishments (upper and lower tier) is kept up to date and permanently available through a website that the competent authorities are in charge of maintaining.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The length and frequency of inspections are based on the systematic appraisal of the following criteria:

- Number of units;
- Number of activities presenting safety risks;
- Nature of the substances present on site;
- Ambient factors; and
- Results from the previous inspection.

4.b) Programme of inspections available to public (optional)

The inspection programme is made available to the public online⁹ and summaries of inspection reports have been published since 2014.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Remedial actions and penalties can be imposed. In immediate risk situations, the authority can order partial or complete cessation of activities. However the response from the Netherlands does not indicate whether any of these actions were taken during the reporting period.

4.d), 4.e), 4.f) Data on on-site inspections

90% of upper-tier establishments were inspected once every 12 months. The Netherlands reported data for each of the years of the reporting period.

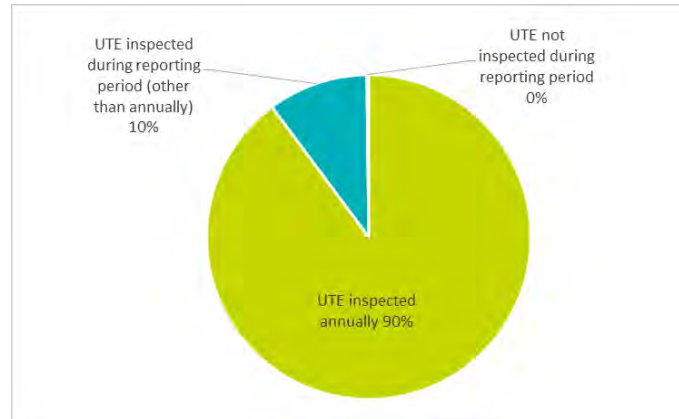
	2012	2013	2014
Upper-tier annual inspection	224	229	226
Total upper-tier	250	254	252
Percentage of upper-tier with annual inspection	90%	90%	90%

Note that The Netherlands apply systematic appraisal to determine inspection schedules (see 4.a) and as such it is not absolutely required to inspect all establishments annually. The remaining 32 upper-tier establishments were inspected at least once in the 2012-2014 period. In addition, 136 lower-tier establishments (88% of the total number of lower-tier establishments) were subject to on-site inspections in the last three years.

⁸ www.risicokaart.nl

⁹ www.brzoplus.nl

NETHERLANDS



Question 5 – Domino effects

Establishments relevant for consideration of domino effects are designated by the competent authority. These establishments are required to exchange information on the effects of accidents and information on emergency plans.

Question 6 – Land-use planning

The Netherlands indicated that its national legislation on spatial consideration for the purpose of land use planning is perceived as being complex and is based on safety perimeters around Seveso establishments. The competent authority (Ministry of Infrastructure and Environment) is currently working on simplifying the spatial considerations in the decision making process.

Question 7 – Further information (optional)

7.a) Lessons learned from accidents and incidents

The Netherlands reports that all incidents are examined even those that do not meet the criteria of Annex VI, as lessons can be learned from them and recurrence can be prevented. Approximately 30 such incidents occur every year. No further information was provided.

7.b) IT tools used for monitoring the implementation and data sharing

The Netherlands has a joint IT platform used by competent authorities facilitating their collaborations (Gemeenschappelijke Inspectieruimte). On the platform they record upper-tier establishments and their inspections as well as any coercive and follow-up actions.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

Pipelines and other non-Seveso activities are covered by the Dutch safety policy. No other activities was included in the response

21. Member State summary sheet - Poland

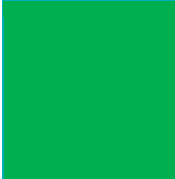
POLAND 

Overview of the Poland

Overall, Poland provided a complete response.

Number of establishments:

Status of overall implementation:



Poland's response indicates that the provisions of the Seveso II Directive are fully implemented.

Main issues identified:
None



Overview of the information reported

Question 1 - General information

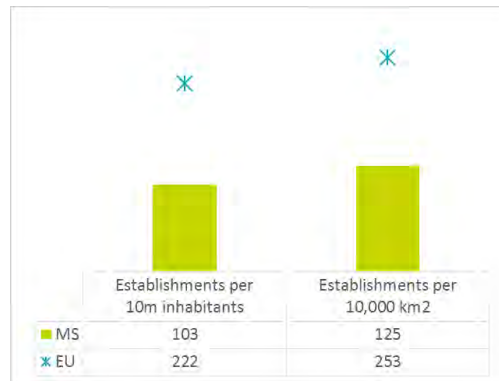
1.a) Significant changes made to competent authorities or their tasks

None were reported by Poland.

1.b) Establishments subject to Seveso

There were 392 Seveso establishments in Poland at the end of 2014, up from 360 in 2011. This is due to an increasing number of both lower and upper-tier establishments.

As shown in the chart to the right, Poland exhibits much fewer establishments per capita and much fewer establishments per km² than the EU average, reflecting a relatively low density of Seveso establishments. In fact, Poland exhibits the lowest number of establishments per capita of all EU Member States.



1.c) Activities of Seveso establishments

The most common activities in Poland were:

- Wholesale and retail storage and distribution (45%);
- General chemicals (18%); and
- Petrochemicals / oil refineries (7%).

1.d) Seveso establishments covered by the IED (optional)

Poland stated that 135 of the 392 Seveso establishments are also covered by IED. Poland states that major accident prevention is assessed as part of the inspection of the integrated permits and there are no conflicts between the implementation of the IED and that of Seveso.

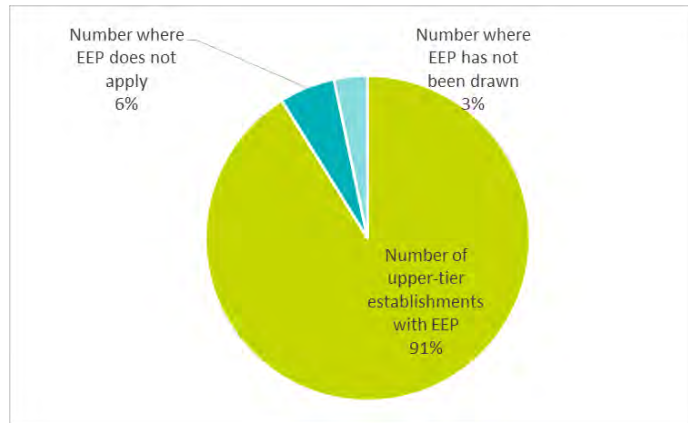


POLAND

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

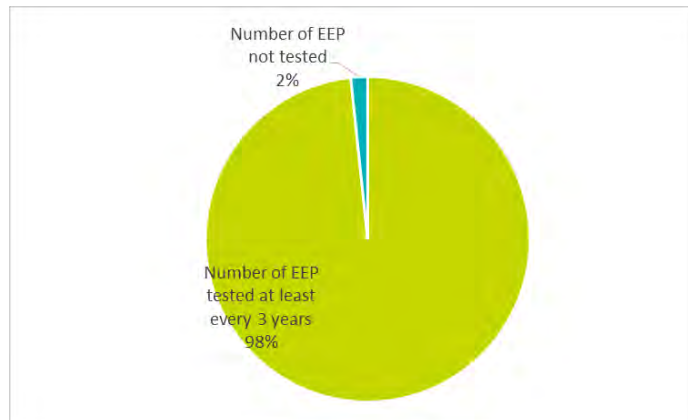
For 10 upper-tier establishments Poland decided that an external emergency plan was not needed. Poland has not commented on this (6% of all the upper-tier establishments in Poland and 5% of all the establishments in this situation in the EU. This compared to 4% at EU level). Also, the external emergency plans of 6 other upper-tier establishments were not drawn up as required (3% of the upper-tier establishments in Poland, which compares to 9% at EU level). Poland has explained that this has happened in the case of new establishments and for those for which it was deemed that there were no off-site risks.



Note: Total 180 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, 3 upper-tier establishments' external emergency plans had not been tested (2% of the upper-tier establishments in Poland, which compares to 25% at EU level). The reasons were local floods that led to a delay in the scheduled date, a request from the operator due to a change to the technological process and a delay due to the assessment of the operators' documents, respectively. Poland explained that these external emergency plans were tested at a later date.



2.d) Arrangements for providing information to the public:

- Alert system based on mobile telephones (text message system) and mass media, in connection with warning systems on the premises of the establishments; and
- Other arrangements are regular updates: Information on safety measures and methods of coping with major accidents to educational and social welfare institutions, healthcare establishments and other entities specified in the list included in the internal emergency plan of the establishment, as well as to other entities and institutions serving the public, which may be affected by the consequences of such accidents and to make this information available to the public.

2.e) Testing external emergency plans

In Poland, external emergency plans are tested as follows:

- Tactical exercises with the involvement of emergency services and local governments; and
- Follow-up assessment on the basis of the results of the tests.

These tests are carried out at least once every three years. The areas assessed are the suitability of alert systems, the cooperation with other institutions during an accident, the availability of emergency services and measures included in the plan. The results are used to improve the plans. Costs are borne by Competent Authorities and operators.

POLAND



Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

The information for 48 of 59 (81%) upper-tier establishments was made actively available during the reporting period. The regional Fire Service, Competent Authorities and the operators are in charge of providing information to the public and persons likely to be affected by a Seveso accident. Each regional representative of the State Fire Service has to provide an annual list of upper-tier establishments and dangerous substances in each of them within their territorial jurisdiction. Other information made available by the State Fire Service on its webpage is the decisions taken with regard to Seveso establishments, information on approved safety reports and external emergency plans, and instructions on emergency procedures. Operators are also obliged to inform those persons and institutions likely to be affected by a major accident at their establishments, usually in the form of open days, brochures and publications on their websites. Finally, local governments are obliged to inform the public (safety measures in the case of an accident), usually in the form of official announcement. Some local governments submit information on the risks and possible measures to schools, healthcare and social welfare institutions. Poland has not provided a statistical breakdown. Authorities check that the information is provided as stated above through inspections and when external emergency plans are tested (as the way the public is informed is described in them).

3.e), 3.f), 3.g) Information kept permanently available (optional)

Poland stated that up-to-date information is permanently available for 87% of the establishments. The information is provided by the State Fire Service (notices, websites) and the operators (website, notices on the establishments' boards and in writing if requested by any member of the public).

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

In Poland, the frequency of inspection is fixed and is therefore not based on a systematic appraisal of major accident hazards. Upper-tier establishments are inspected once a year and lower-tier establishments are inspected once every two years.

4.b) Programme of inspections available to public (optional)

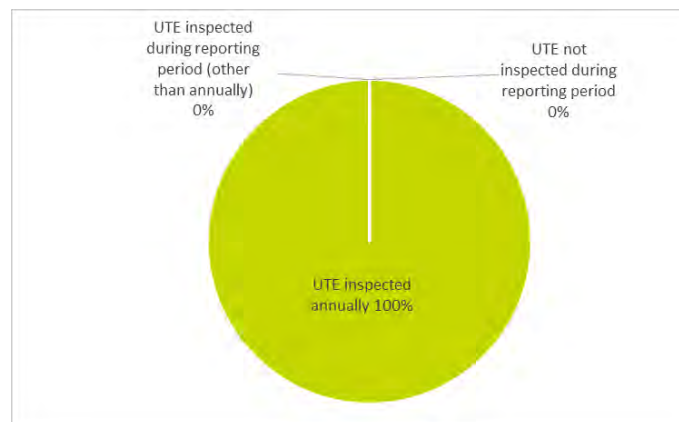
The information on inspection results, except data subject to the protection of personal data or constituting company secrets, is made available upon request.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Poland reported that the following actions were taken during the reporting period: decisions ordering tests (7), decisions ordering the removal of irregularities detected within a period of time (401), immediately enforceable decisions (7), orders to ensure operating compliance (254), cautions (133), financial penalties (31) and post-inspection recommendations.

4.d), 4.e), 4.f) Data on on-site inspections

All upper-tier establishments were inspected in the last reporting period on an annual basis. Also, 24 additional inspections of upper-tier establishments were carried out due to changes to the activities, substances or owner. The total number of inspections reported is higher than the total number of upper-tier establishments. Polish authorities have clarified that this happened because the total number of these establishments during the reporting period was higher than at the end. As regards lower-tier establishments, they were all inspected annually.





POLAND



Question 5 – Domino effects

Competent authorities designate groups of establishments on the basis of the extent of the hazard and consequences described in the major accident scenarios built with the information obtained from the establishments (safety reports and notifications). Ten establishment groups were designated during the last reporting period.

Question 6 – Land-use planning



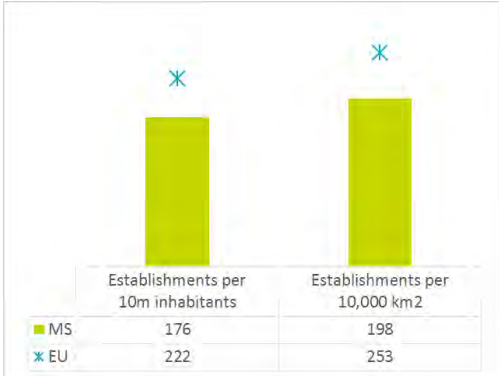
The Polish Environmental Protection Law includes the consideration of Seveso establishments in spatial planning. As a result, the location of new establishments must comply with local land use plans, which prohibits their construction in the vicinity of inhabited areas. The expansion of existing facilities is limited to areas where it is deemed that there is no risk. All establishments must have a certain distance to residential areas. Also, the Competent Authorities regularly inform local governments of the existence of these establishments so they can consider it in spatial planning.

Question 7 – Further information (optional)

**No response was provided to this optional question.7.a) Lessons learned from accidents and incidents
Poland has not provided information on this.**

No response was provided to this optional question.

22. Member State summary sheet - Portugal

												
<p>PORTUGAL</p>												
<p>Overview of Portugal</p>												
<p>Overall, Portugal provided a complete response.</p>												
<p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px;"> <p>Portugal's response indicates that most of the provisions of the Seveso II Directive are implemented but gaps are observed with regards to key provisions of the Directive.</p> </div>												
<p>Number of establishments:</p>  <table border="1"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>123</td> <td>66</td> <td>189</td> </tr> <tr> <td>2014</td> <td>124</td> <td>59</td> <td>183</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	123	66	189	2014	124	59	183
	Lower-tier	Upper-tier	Total									
2011	123	66	189									
2014	124	59	183									
<p>Main issues identified: A large number of upper-tier establishments were not inspected annually or during the reporting period. 3 external emergency plans were not adopted.</p>												
<p>Overview of the information reported</p>												
<p>Question 1 - General information</p>												
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by Portugal.</p>												
<p>1.b) Establishments subject to Seveso There were 183 Seveso establishments in Portugal at the end of 2014, slightly less than in 2011 (189). This is due to a decreasing number of upper-tier establishments.</p> <p>As shown in the chart to the right, Portugal exhibits fewer establishments per capita and fewer establishments per km² than the EU average.</p>  <table border="1"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>176</td> <td>198</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	176	198	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²										
MS	176	198										
EU	222	253										
<p>1.c) Activities of Seveso establishments The most common activities in Portugal at the end of the reporting period were:</p> <ul style="list-style-type: none"> - LPG storage (20%); - general chemicals (19%); and - LNG storage and distribution (15%). <p>Two of these activities (LPG storage and LNG storage and distribution) are not particularly common in the EU (4% and 1%, respectively of the EU establishments). In fact, Portugal has over 40% of the EU establishments dedicated to LNG storage and distribution. As for general chemicals, it is a relatively common activity (12% of all EU establishments).</p>												
<p>1.d) Seveso establishments covered by the IED (optional) No information was provided.</p>												

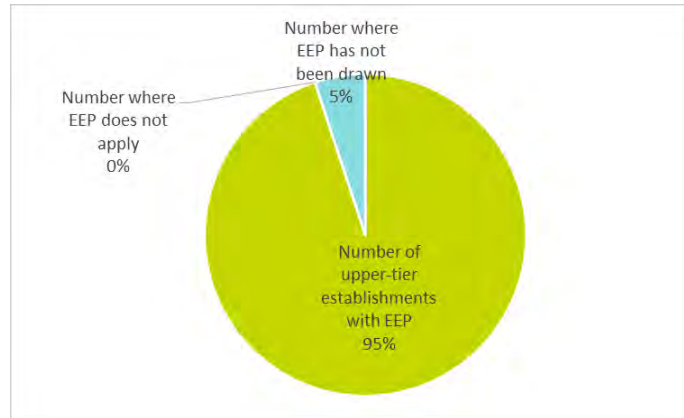


PORTUGAL

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

Portugal did not decide to exclude the requirement for preparing an external emergency plan for any of the establishments. Three establishments (5% of the upper-tier establishments) failed to produce an external emergency plan as required. Portugal has not provided an explanation of why this is.

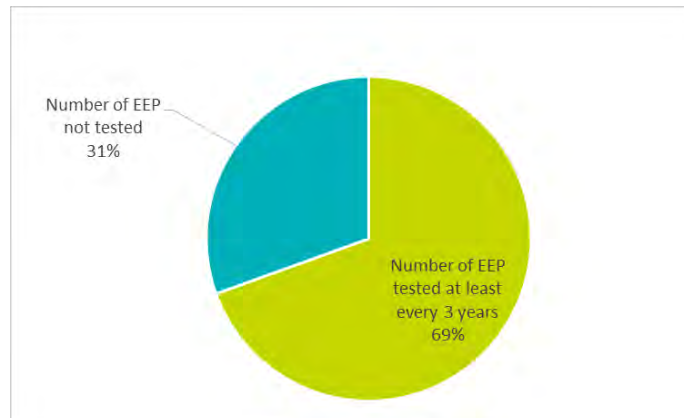


Note: Total 59 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, 18 upper-tier establishments' external emergency plans had not been tested (31% of total, slightly higher than the 25% at EU level).

Portugal has provided an explanation for 8 of these establishments. According to them, 6 establishments have been or will be tested in other years (2 in each of 2011, 2015 and 2016). Also, one establishment became operational during 2014 and another one was in the process of being reclassified as lower-tier.



2.d) Arrangements for providing information to the public:

- System with sirens;
- Cars with megaphones; and
- Announcements on the radio.

2.e) Testing external emergency plans

External emergency plans are tested as follows:

- Multidisciplinary field exercises involving the different rescue services; and
- Desk based exercises which aim at assessing the plans without mobilising staff and equipment on the ground.

External emergency plans are considered adequate when they comply with the requirements described in the "Guideline for the preparation of external emergency plans" (Technical specification no7 available in www.prociv.pt). This is assessed by the Municipal Commission of Civil Protection and the National Civil Protection Authority. Plans are approved by the National Commission for Civil Protection.



PORTUGAL

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

In Portugal, the municipal civil protection service produces and sends information regarding the steps to be taken after an accident to the persons potentially affected by an accident in upper-tier establishments. Also, municipalities inform citizens via their websites and through awareness campaigns at schools. Additionally, approved external emergency plans are published online. Operators also provide leaflets and reports with information, in connection with the testing of external emergency plans. During the last reporting period, the information from 81% of the upper-tier establishments was made available. Portugal has not provided any statistical breakdown of how the information is provided, but stated that authorities are in charge of doing so via public consultations (when preparing external emergency plans), their websites, official boards and campaigns at schools.

3.e), 3.f), 3.g) Information kept permanently available (optional)

No information was provided.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The length and frequency of inspections are based on the systematic appraisal of the following criteria:

- Results of previous inspections or establishments not previously inspected;
- Higher frequency for upper-tier establishments.
- Number of previous accidents;
- Priority given by Competent Authority due to the location, type of substances or quantities; and
- Existence of significant changes to the establishments.

Also, Portugal has developed a new tool which will derive inspection priorities for 2016 and beyond. This is based on the quantity of dangerous substances, surroundings, domino effects, complexity of the facilities, compliance, inspection results, staff training and availability

4.b) Programme of inspections available to public (optional)

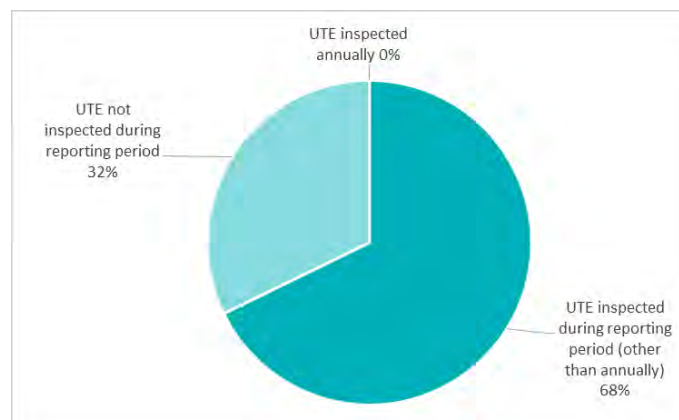
Portugal has not answered this optional question.

4.c) Actions taken in the event of accidents, incidents and non-compliance

During the reporting period, Portugal imposed penalties on two upper-tier establishments and five lower-tier establishments.

4.d), 4.e), 4.f) Data on on-site inspections

Portugal has reported that none of the upper-tier establishments were inspected annually. 40 (68%) upper-tier establishments and 44 (35%) of the lower-tier establishments were inspected during the last reporting period (2012-2014). Note that Portugal applies systematic appraisal to determine inspection schedules (see 4.a) and as such it is not absolutely required to inspect all establishments annually. Nevertheless, the numbers of inspections of upper-tier establishments appear relatively low.





PORTUGAL



Question 5 – Domino effects

Portuguese authorities identify establishments which are potentially subject to domino effects on the basis of the distance between them, quantity and hazard of substances and scenarios for potential major accidents.

These establishments are obliged to exchange information on the activities they undertake, the substances handled and how hazardous they are, and mapping of the upper-tier establishment's accident scenarios.

Question 6 – Land-use planning

Portugal indicated that spatial planning legislation includes the concept of “compatibility of the site” for operators that wish to establish a new Seveso establishment or make changes to an existing one. The system is designed to maintain an adequate distance between existing establishments and vulnerable elements. Also, the EIA and SEA laws have incorporated the consideration of Seveso establishments. Municipal spatial planning strategies are also required to take this into account, for which they are provided with technical support.

Question 7 – Further information (optional)

No response was provided to this optional question.

23. Member State summary sheet - Romania



ROMANIA

Overview of Romania

Overall, Romania provided a complete response.

Status of overall implementation:

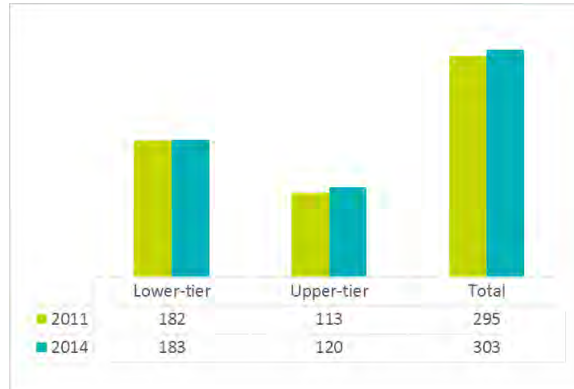


Romania's response indicates that the provisions of the Seveso II Directive are mostly implemented.

Main issues identified:

The only issue identified in relation to two external emergency plans not adopted nor tested

Number of establishments:



Overview of the information reported

Question 1 - General information

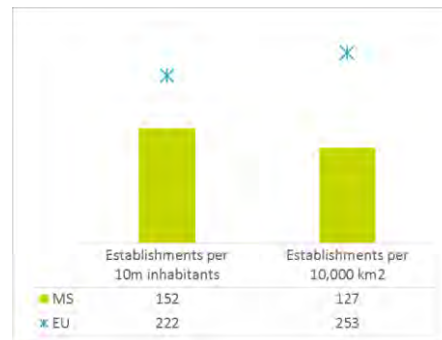
1.a) Significant changes made to competent authorities or their tasks

The two competent authorities in charge of Seveso implementation and enforcement were abolished and replaced. The implementation and enforcement of the Seveso II Directive is the responsibility of County Environmental Protection Agencies and by the County Commissariat of the National Environmental Guard as of 2014.

1.b) Establishments subject to Seveso

There were 303 Seveso establishments in Romania at the end of 2014, slightly up from 295 in 2011.

As shown in the chart to the right, Romania exhibits fewer establishments per capita and much fewer establishments per km² than the EU average.



1.c) Activities of Seveso establishments

The most common Seveso activities in Romania at the end of 2014 were:

- Fuel storage (15%);
- LNG production, bottling and bulk distribution (13%); and
- Production, destruction and storage of explosives (11%).

Fuel storage is also one of the three most common activities among Seveso establishments in the EU (11% of the EU total). As regards LNG production, 8% of EU establishments were dedicated to this activity at the end of the reporting period. Romania is the EU Member State with the third highest number of establishments in this activity (8% of all EU establishments in this activity). A similar trend was observed for the production, destruction and storage of explosives. 4% of EU establishments belonged to this activity, while Romania is the country with the second highest number of establishments dedicated to this (13% of all EU establishments in this activity).

1.d) Seveso establishments covered by the IED (optional)

Romania did not reply to this optional question.

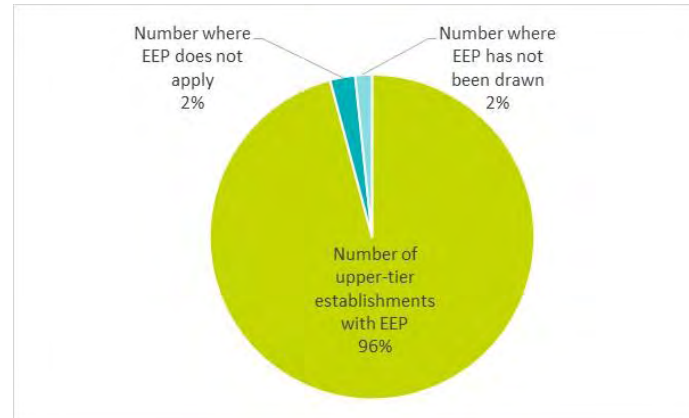


ROMANIA

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

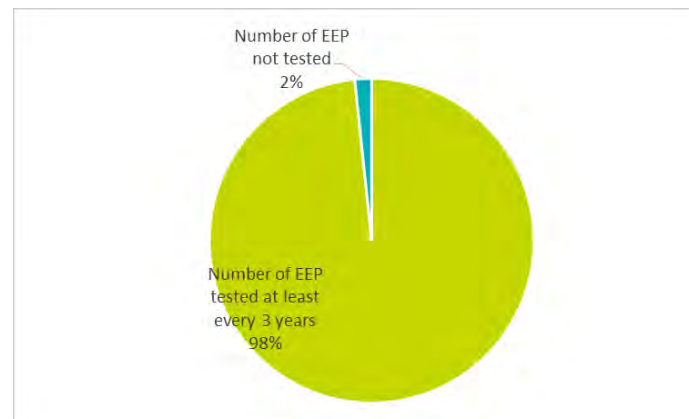
For 3 upper-tier establishments (2%) it was decided that an external emergency plan was not needed based on safety reports and internal emergency plans (it was deemed that there would not be consequences beyond the establishments' boundaries). Also, 2 establishments (2%) that should have prepared one have not done so. Romania did not provide further details on the latter.



Note: Total 120 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, 2 upper-tier establishments' external emergency plans had not been tested. This is 2% of Romanian upper-tier establishments, which can be considered a low proportion compared to the EU average of 25%. Romania has not provided further comment.



2.d) Arrangements for providing information to the public:

- TV, radio announcements; and
- Specific response measures are described in each external emergency plan. Romania did not provide any example of this.

2.e) Testing external emergency plans

In Romania, external emergency plans are tested as follows:

- Notification exercises;
- Partial tests with emergency services and decision makers; and
- Full tests at least once every 3 years involving authorities, public forces, private staff from the establishments, other operators (domino effect).

Romanian authorities apply criteria to test establishments based on periodicity (at least once every 3 years), risk at source, and training of staff or population. The suitability of the plan is evaluated assessing the following: informational flow, authorities' compliance with their duties, inter-institutional collaboration, operators' cooperation, response from the emergency services forces, availability of the resources required for intervention and organisation of public information.



ROMANIA

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

During the reporting period, the Romanian National Environmental Protection Agency developed and started operating the Integrated Environment System through which any interested person may obtain information on major accident risks, possible consequences and safety measures. As a result, this information is available for all the upper-tier establishments in Romania. A statistical breakdown of how this information was made available was provided by Romania:

- Operator's leaflets (47.28%);
- Authorities' leaflets (48.53%);
- Operator's flyers (43.41%);
- Authorities' flyers (45.59%);
- Operator's E-mails (9.31%);
- Authorities' E-mails (3.67%); and
- Authorities' SMS (2.21%).

Note that usually the information is provided in more than one way. Therefore the sum of percentages of the various means is more than 100%.

The Romanian Government has a system in place for operators and authorities to report annually on this matter. Also, local authorities are in charge of monitoring Seveso operators monthly, including the submission of this information.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Romania has not replied to this question.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The length and frequency of inspections are based on the systematic appraisal of the following criteria:

- Characteristics of a possible accident.
- Available protection against hazards
- Conditions of the installation
- Surroundings

4.b) Programme of inspections available to public (optional)

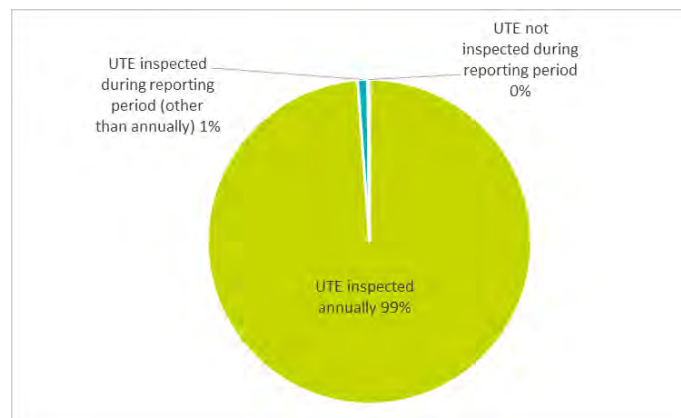
Romania has not replied to this question.

4.c) Actions taken in the event of accidents, incidents and non-compliance


During the reporting period the Competent Authorities applied 2085 coercive instruments: 1537 written notices and 548 financial penalties. Romania has not reported prohibitions of use or suspending of regulatory acts for Seveso establishments.

4.d), 4.e), 4.f) Data on on-site inspections


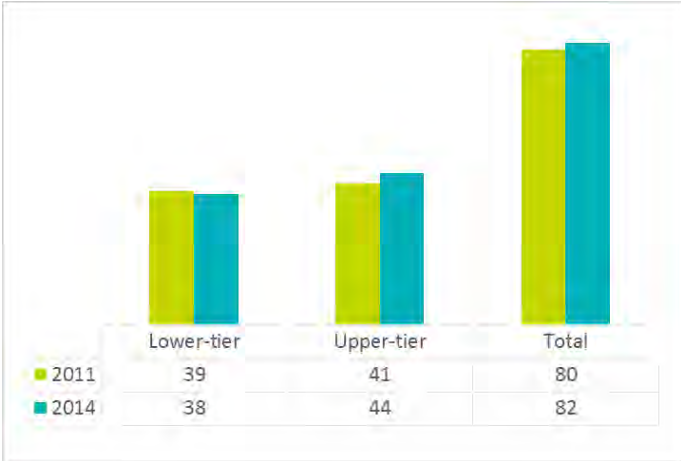
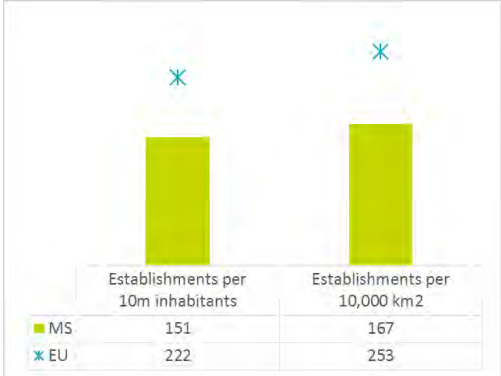
119 out of 120 upper-tier establishments were inspected annually in Romania during the last reporting period. Another 2 (Romania has reported that it had 121 upper-tier establishments at some point during the period) were inspected at least once from 2012 to 2014. Also, all lower-tier establishments were inspected in the 2012-2014 period.





ROMANIA	
Question 5 – Domino effects	
<p>Based on the information received from the operators, competent authorities designate the establishments that are considered to have potential for domino effects. There are organised common exercises for testing the external emergency plans with all operators belonging to the same Domino group. There are protocols in place between operators in these groups for common intervention in case of emergency situations and for the provision of public information. Competent authorities request operators to exchange relevant information between themselves. This is monitored via inspections.</p>	
Question 6 – Land-use planning	
<p>Romanian land use planning laws take into account the location of Seveso establishments. Also, land use planning authorities are informed of the location and legal obligation of Seveso establishments. The issue is also taken into account during the EIA procedure, in which authorities, the Technical Committee for Analysis and the public participate.</p>	
Question 7 – Further information (optional)	
No response was provided to this optional question.7.a) Lessons learned from accidents and incidents No Information was provided	
<p>No response was provided to this optional question.</p>	

24. Member State summary sheet - Slovakia

<p>SLOVAKIA</p> 													
<p>Overview of Slovakia</p>													
<p>Overall, Slovakia provided a complete response.</p> <p>Status of overall implementation:</p> <div style="border: 1px solid black; padding: 5px; background-color: #FFD700; display: inline-block; width: 100px; height: 60px;"></div> <p>Slovakia's response indicates that the provisions of the Seveso II Directive are almost fully implemented</p> <p>Main issues identified: 3 external emergency plans not tested and potentially low number of annual inspections. However Slovakia indicated that inspections are planned based on a systematic appraisal of major accident hazards and as such these might not be an issue</p>	<p>Number of establishments:</p>  <table border="1"> <thead> <tr> <th></th> <th>Lower-tier</th> <th>Upper-tier</th> <th>Total</th> </tr> </thead> <tbody> <tr> <td>2011</td> <td>39</td> <td>41</td> <td>80</td> </tr> <tr> <td>2014</td> <td>38</td> <td>44</td> <td>82</td> </tr> </tbody> </table>		Lower-tier	Upper-tier	Total	2011	39	41	80	2014	38	44	82
	Lower-tier	Upper-tier	Total										
2011	39	41	80										
2014	38	44	82										
<p>Overview of the information reported</p>													
<p>Question 1 - General information</p>													
<p>1.a) Significant changes made to competent authorities or their tasks None were reported by Slovakia.</p>													
<p>1.b) Establishments subject to Seveso There were 82 Seveso establishments in Slovakia at the end of 2014, compared to 80 in 2011.</p> <p>As shown in the chart to the right, Slovakia exhibits fewer establishments per capita and fewer establishments per km² than the EU average, reflecting a relatively low density of establishments in Slovakia.</p>	 <table border="1"> <thead> <tr> <th></th> <th>Establishments per 10m inhabitants</th> <th>Establishments per 10,000 km²</th> </tr> </thead> <tbody> <tr> <td>MS</td> <td>151</td> <td>167</td> </tr> <tr> <td>EU</td> <td>222</td> <td>253</td> </tr> </tbody> </table>		Establishments per 10m inhabitants	Establishments per 10,000 km ²	MS	151	167	EU	222	253			
	Establishments per 10m inhabitants	Establishments per 10,000 km ²											
MS	151	167											
EU	222	253											
<p>1.c) Activities of Seveso establishments The most common activities in Slovakia were:</p> <ul style="list-style-type: none"> - Wholesale and retail (30%); - Fuel storage (10%); and - General engineering (9%). <p>Fuel storage is also one of the three most common activities among Seveso establishments in the EU (11% of EU total). However, the other two activities with the highest number of establishments in Slovakia are relatively less common in the EU. Slovakia has 9% of the establishments categorised as "wholesale and retail" in the EU.</p>													
<p>1.d) Seveso establishments covered by the IED (optional) Slovakia indicated that 31 establishments (38% of total) are also covered by the IED. No negative impact has been reported in the implementation of either Directive in these cases.</p>													

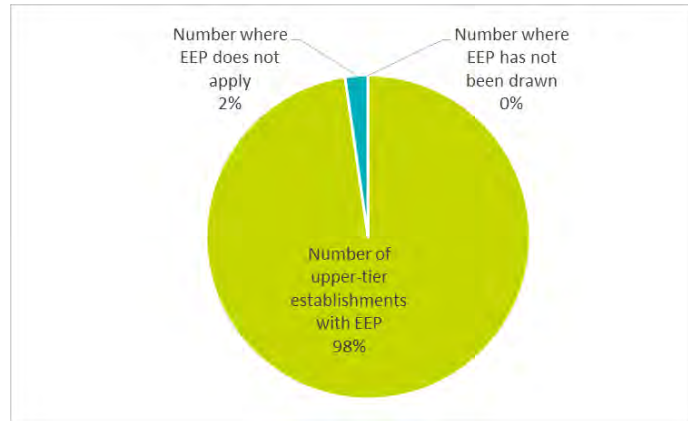


SLOVAKIA

Question 2 - Emergency plans

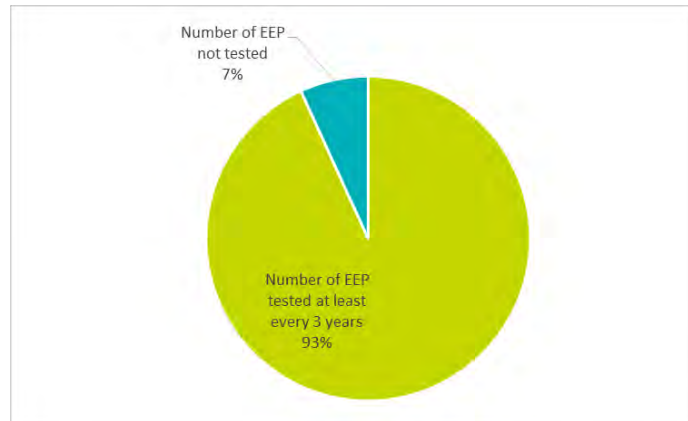
2.a) & 2.b) Upper-tier establishments without external emergency plan

For only one upper-tier establishment the Authorities decided that an external emergency plan was not necessary. The explanation provided is that the site is far from the population and any potentially damageable structure and that appropriate security measures are in place. The other 43 upper-tier establishments had an external emergency plan.



2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, three upper-tier establishments' external emergency plans had not been tested, which is 7% of the upper-tier establishments in the country (as opposed to 25% at EU level).



2.d) Arrangements for providing information to the public:

- Siren system in relevant locations;
- Local TV/radio and an "Information Point"; and
- Online inventory of information for the general public, notice board, leaflets. The information to be provided includes the source, scope and characteristics of the accident as well as measures to be taken and communication procedures. Although this last point was included as an answer to this question, it does seem to refer to preparatory or preventive information rather than response measures.

2.e) Testing external emergency plans

Plans are tested once every three years. These involve:

- Staff and practical tests (part or full tests) based on selected scenarios, which may involve testing the emergency services.

Tests are set up according to defined priorities in each region, although Slovakian Authorities have not specified what these are. Slovakia stated that the Regulation implementing the Seveso II Directive includes the figure of the "Analysis Group", which is in charge of evaluating external emergency plans and draft an "evaluation document", the content of which is defined in the Regulation.



SLOVAKIA

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

All upper-tier establishments' operators have to inform the potentially affected public about the nature of their operations, the possible risks and measures for reducing them. The public potentially affected is also informed of actions to be taken in case of an accident. The operator shall send this information to the district authority, state administration authority in the field of fire protection and the municipality potentially affected. Operators must also ensure the permanent availability of information to the public, including an up-to-date list of dangerous substances of the establishment. District Authorities may choose to inform the public themselves if there are several upper-tier establishments located in a threatened area.

Up to date safety information¹⁰ is available to the public. Confidential data is not included in this information. Slovakia has provided a statistical breakdown of the information provided:

- Website: 100.00%;
- Official notice board of urban/municipal authority: 88.00%;
- Information in the establishment (e.g. information board at the entrance to the establishment): 62.50%;
- Leaflets: 62.50%;
- Written information (by post to the public affected): 37.50%; and
- Radio/television: 37.50%.

Note that usually the information is provided in more than one way. Therefore the sum of percentages of the various means is more than 100%.

Authorities verify that the information is actually available through inspections.

3.e), 3.f), 3.g) Information kept permanently available (optional)

All upper-tier establishments' information is kept up to date and permanently available through a website.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Slovakia has a mixed approach with legally-established inspection periods and a systematic approach based on major accident hazards. The inspection periods established are once a year for upper-tier (once every 1.5 years if authorities deem it necessary) and once every 3 years for lower-tier.

The systematic approach is agreed between the environmental inspectorate and the competent authorities, with priorities being:

- The conclusions of previous risk assessments, documents and inspections; and
- The quality management system of the establishment.

4.b) Programme of inspections available to public (optional)

The inspection programme is made available to the public online. The results of inspections may also be downloaded from the website. Although a link has not been provided, previous responses (3a) indicate that it could be the one provided in footnote 10.

4.c) Actions taken in the event of accidents, incidents and non-compliance

During the reporting period, fines were imposed (the amounts are available in the implementation report). Also, corrective measures were imposed for administrative irregularities (i.e. documents not drawn up to the required standard)

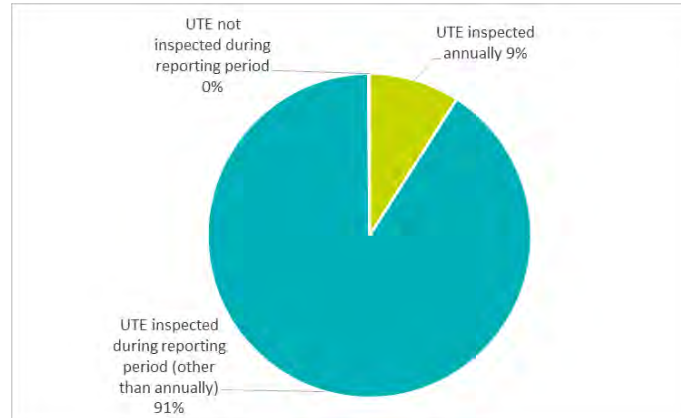
4.d), 4.e), 4.f) Data on on-site inspections

Four upper-tier establishments (9%) were inspected once every 12 months. The rest were inspected at least once during the reporting period. The average interval between two inspections at an upper-tier establishments was therefore 15 months (1.25 years). As stated above, Slovakia aims at undertaking annual inspections. However, authorities may reduce the frequency to once every 1.5 years (18 months). In addition to that, 41 lower-tier establishments were also inspected. The number of lower-tier establishments inspected is higher than the total number of these establishments at the end of the reporting period. The Slovak authorities have clarified that this is because the number of lower-tier establishments was higher during the period than at the end.

¹⁰ <http://www1.enviroportal.sk/seveso/informacny-system.php>



SLOVAKIA



Question 5 – Domino effects

Domino effects are prevented in Slovakia through several instruments:

- Distribution of the safety reports submitted by the upper-tier establishments' operators to all authorities relevant to industrial accident prevention for their review. These reports shall include information on other establishments in the surrounding area;
- Competent authorities have the option of reassigning the category of establishments (lower-tier to upper-tier) if they consider that the proximity of those sites to others increases the risk of an accident. Also, they can impose additional measures to reduce the risk, including the exchange of information; and
- Consideration of cumulative effects in the testing of external emergency plans. In this sense, seven of the emergency external plan tests involved including other establishments in the vicinity of the one being tested to assess the possibility of a domino effect.

Question 6 – Land-use planning

Slovakia stated that current spatial planning legislation includes the requirement to consider Seveso establishments. Also, authorities may require this when a permit is requested. Finally, when an operator intends to establish a new Seveso establishment or modify an existing one, an expert and public assessment is undertaken as per the relevant legislation on industrial accidents.

Question 7 – Further information (optional)

7.a) Lessons learned from accidents and incidents

Slovakia reports an accident in a Seveso establishment in which a person died. A wide range of prevention measures was developed after that (full version available in the implementation report):

- The staff was updated with the results of the commission investigating the issue;
- Training;
- Informing all carriers that any person in the establishment had to know about these findings;
- Ensuring the control of vehicles weighting more than 3.5 tonnes;
- Securing the removal of selected contaminated soil from the plant; and
- Updating the organisational guideline on occupational safety.

7.b) IT tools used for monitoring the implementation and data sharing

The information system referred to in footnote 10 (question 3.a) is an IT platform operated by the Ministry of Environment and provides information on the Seveso establishments to the general public.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

No response was provided.

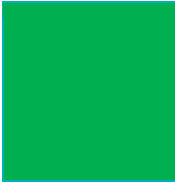
25. Member State summary sheet - Slovenia

SLOVENIA 

Overview of the Slovenia

Slovenia provided an almost complete response with only a minor gap.

Status of overall implementation:



The Slovenian response indicates that the provisions of the Seveso II Directive are fully implemented.

Main issues identified:
None

Number of establishments:



Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks

Slovenia reported changing one of the two Competent Authorities that have been mainly responsible for Seveso II implementation and enforcement. Due to a reorganisation in the Government, this will now be the Ministry of Environment and Spatial Planning (previously: Ministry of Agriculture and the Environment). The other Authority is the Ministry of Defence (it has been assumed this has not changed, although it is not specifically stated). The questionnaire response also lists the tasks for which both Authorities are responsible. Nothing indicates that this has changed during the reporting period.

1.b) Establishments subject to Seveso

There were 61 Seveso establishments in Slovenia at the end of 2014, the same number as in 2011. However, while in 2011 more than half of the establishments belonged to the lower tier, the balance has shifted to upper tier in 2014.

As shown in the chart to the right, Slovenia exhibits a relatively high density of establishments with more establishments per capita and more establishments per km² than the EU average.



1.c) Activities of Seveso establishments

The activities with the highest number of establishments at the end of the reporting period were:

- LPG storage (20%);
- Fuel storage (18%); and
- "Other activities" (11%).



SLOVENIA

“Other activities” is the category with the highest number of Seveso establishments in the EU (14%). Also, fuel storage is the third most common activity within the EU Seveso establishments (11% of all establishments). Also, the other main categories of activities in Slovenia is among the most common in the EU, as LPG storage represents 4% of EU establishments.

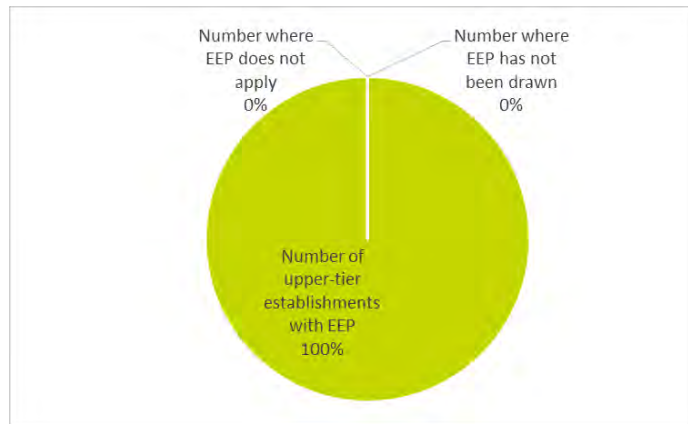
1.d) Seveso establishments covered by the IED (optional)

Slovenia stated that 25 Seveso establishments are also covered by the IED, without any reported impact.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

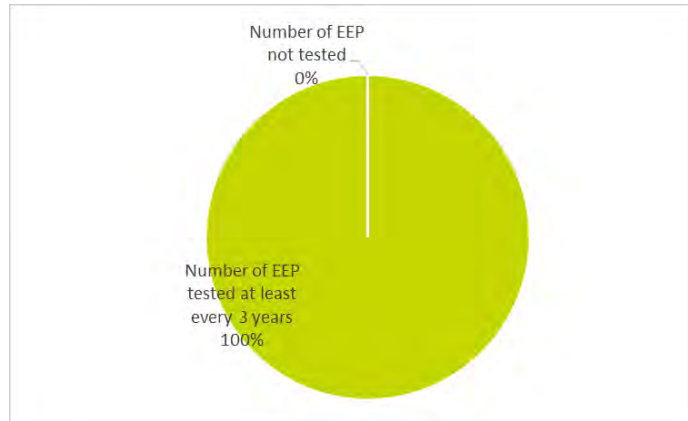
Slovenia reported that all upper-tier establishments (33) have an external emergency plan.



Note: Total 33 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

Slovenia stated that all external emergency plans were tested during the reporting period.



2.d) Arrangements for providing information to the public:

- A national public alarm system is in place in case the public cannot be warned by other systems;
- General instruction on how to act is available via the website of the Administration for Civil Protection and Disaster Relief (www.urszr.si). Also, national and regional information and notification centres ensure there is up-to-date information in case of an event through information bulletins and other media (TV, radio); and
- Procedures on how the public will be alerted are defined in the emergency plans of each establishment.

2.e) Testing external emergency plans

All plans have to be tested at least once every three years. The tests can be theoretical, practical or both and may cover one or more parts of the plans. Testing methods include:

- Rescue and relief tests involving emergency response staff; and
- Review/testing of contents according to the Regulation implementing the Seveso II Directive in Slovenia.

The scope can be small (small number of staff covering something specific) or large (international exercises, defence protection exercises).

SLOVENIA



Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

Operators of upper-tier establishments are responsible for informing the public potentially affected. They do so by sending information to them by post. Operators also organise open days for the public to visit their premises. These two ways of direct communication between the public and operators are believed to be effective by Slovenia. Because of this, competent authorities have not prepared nor distributed any other material about Seveso establishments during the last reporting period. In addition to direct communication, the operators' websites and announcement boards (at their premises) also contain this information. As such, the statistical breakdown provided by Slovenia indicates that 100% of the information is provided by operators (leaflets sent to affected persons, website, and announcement boards). Slovenia stated that this information was made available for around half of the upper-tier establishments (that is, around 16). The supply of this information is monitored as part of the inspection controls in place.

3.e), 3.f), 3.g) Information kept permanently available (optional)

This question was not answered by Slovenia.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Slovenia stated that their inspection system is not based on a systematic appraisal. In fact, all upper-tier establishments are inspected at least once a year, whereas lower-tier establishments are inspected once every 3 years.

4.b) Programme of inspections available to public (optional)

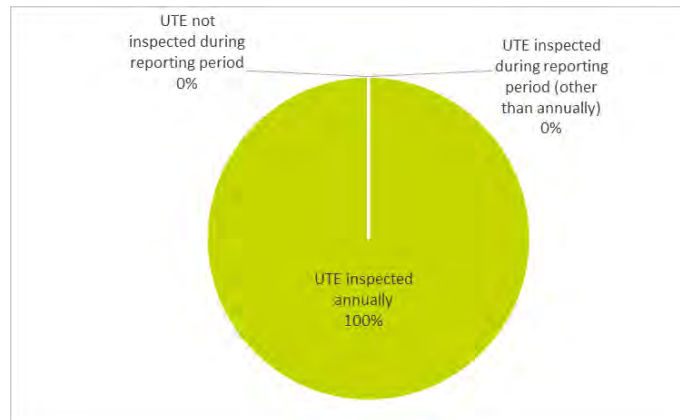
Inspection authorities publish an annual report which is available to the public.

4.c) Actions taken in the event of accidents, incidents and non-compliance

Slovenia reports having taken "corrective measures" against seven operators of Seveso establishments. These were requests to the operators to comply with certain administrative requirements, mainly related to the availability of information to the public. No action was taken as a result of accidents/incidents.

4.d), 4.e), 4.f) Data on on-site inspections

All upper-tier establishments were inspected at least once a year in the last reporting period. Additionally, all lower-tier establishments were subject to on-site inspections in the three year period.



Question 5 – Domino effects

Establishments relevant for consideration of domino effects are designated by the Competent Authority based on data from the safety reports prepared by operators. Establishments within a distance of 700 m from each other are considered to have potential for domino effects. These establishments are required to exchange information on the potential effects of accidents and information on emergency plans, as well as on information provision to the public. This is monitored during inspections.

**SLOVENIA****Question 6 – Land-use planning**

Slovenia included the minimisation of the effects of major industrial accidents in its spatial planning policy. According to national legislation, there is a buffer distance between Seveso establishments and residential areas called the "influence zone". Scenarios to define this zone (and possible sub-zones therein) are described in the decree on criteria to determine minimum distance between an establishment and locations, frequented by the public, and infrastructure. The decree categorises types of buildings and establishes their vulnerability, which is then assessed alongside the influence zone of each establishment.

Question 7 – Further information (optional)**7.a) Lessons learned from accidents and incidents**

No information was provided.

7.b) IT tools used for monitoring the implementation and data sharing

No information was provided.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

No information was provided.

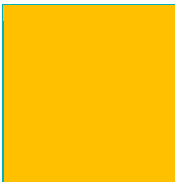
26. Member State summary sheet - Spain

SPAIN 

Overview of Spain

Spain has replied to the majority of the questions. However, it did not provide an answer to question 4a on inspections.

Status of overall implementation:

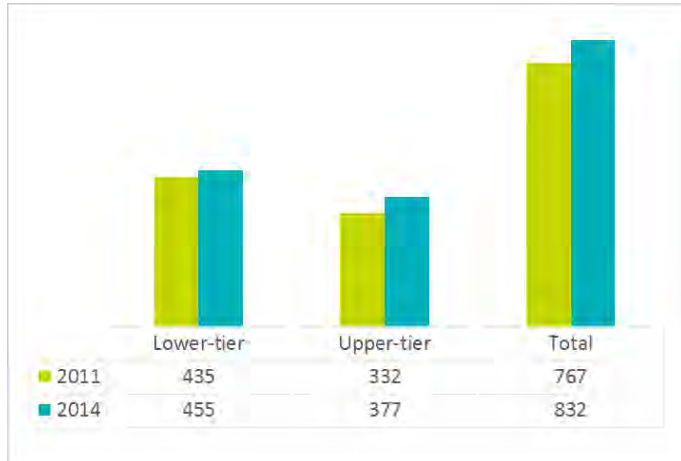


Spain response indicates that the majority of the provisions of the Seveso II Directive are implemented.

Main issues identified:

The level of external emergency plans testing is low with more than half of the plans have not been tested during the reporting period. A large number of upper-tier establishments were not inspected annually or during the reporting period.

Number of establishments:



Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks

None were reported by Spain.

1.b) Establishments subject to Seveso

There were 832 Seveso establishments in Spain at the end of 2014, up from 767 in 2011. Both lower and upper-tier establishments increased in numbers during that period.

As shown in the chart to the right, Spain exhibits fewer establishments per capita and fewer establishments per km² than the EU average. Hence, despite the large overall number of establishments in Spain, the number is relatively low for a country of Spain's size.



1.c) Activities of Seveso establishments

Spain has provided a statistical breakdown of the activities covered by its Seveso establishments. This does not add up to 100% because 9% of the establishments are unclassified (Regional authorities did not provide this information to the national Competent Authority). The most common activity among Seveso establishments in Spain are:

- "Other activities" (16% of the total number of establishments covered by Seveso in Spain);
- LNG production (12%); and
- Bottling and bulk distribution and fuel storage (12%).

These activities are relatively common at EU level. "Other activities" are the most common category in the EU with 14%, whereas fuel storage and LNG production, bottling and bulk distribution cover 11% and 8% of European establishments, respectively. In the case of LNG production, bottling and distribution, Spain is the second Member State with the highest number of establishments (19% of them) after Italy.



SPAIN

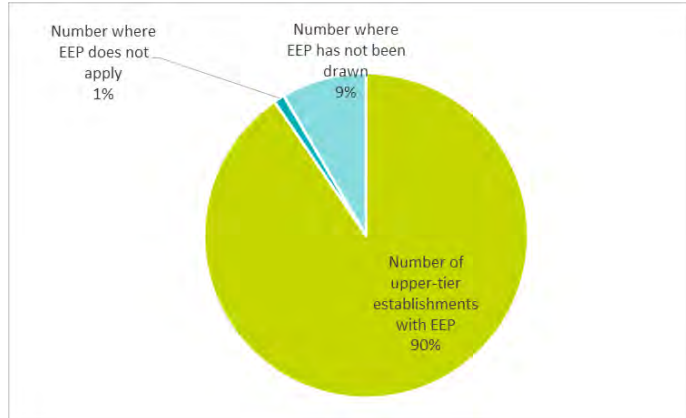
1.d) Seveso establishments covered by the IED (optional)

Spain has not replied to this optional question.

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

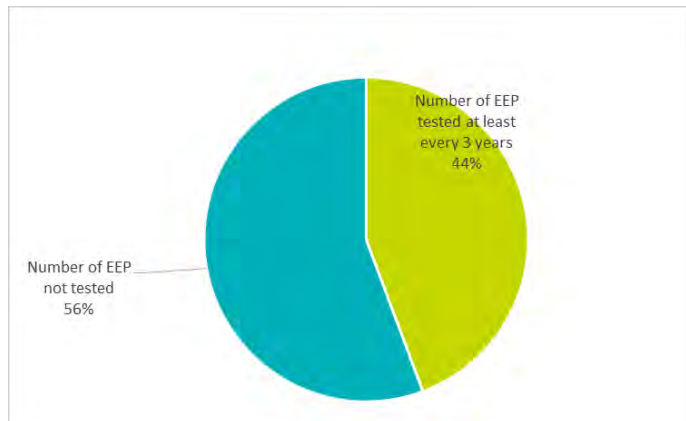
For 4 upper-tier establishments Spanish authorities decided that an external emergency plan was not necessary. Also, a plan was not drafted for 32 other upper-tier establishments. Therefore, the total amount of upper-tier establishments without an external emergency plan is around 10%. Spain did not provide an explanation for this.



Note: Total 377 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, the external emergency plans of 210 upper-tier establishments had not been tested. This is above half of the total number of upper-tier establishments in Spain. This compares to 25% at EU level.



2.d) Arrangements for providing information to the public:

- Multi-tonal sirens controlled by the Emergency Coordination Centre of each Region;
- Fixed public address systems and portable loudspeaker equipment belonging to public intervention services; and
- Warnings through radio and TV programmes as well as social media.

2.e) Testing external emergency plans

External emergency plans are tested as follows:

- Desk-based analysis and assessment prior to approval of the plans; and
- Partial or full exercises involving part or all the rescue services.

The suitability and operability of the plans is assessed after each exercise in evaluation sessions attended by all participants and observers. These sessions highlight areas for improvement and corrective measures.



SPAIN

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

Competent Authorities are responsible for informing the public in Spain. This is done through face-to-face campaigns targeted at specific sectors of the public within the potentially affected area. These campaigns also include leaflets and audio-visual material. Spain indicated that there are efforts to keep this information permanently available through the websites of the civil protection bodies of each region. As such, the information for 175 (47%) of the upper-tier establishments was made actively available to the public at least once during the reporting period. Given that 100% of the information is provided by Competent Authorities, Spain has reported a further statistical breakdown of the information provided on the 175 establishments:

- Leaflets/posters: 95%;
- Sessions/talks: 95%;
- Local TV/radio: 35%;
- Social media: 30%; and
- Personal letters: 20%.

Note that usually the information is provided in more than one way. Therefore the sum of percentages of the various means is more than 100%. The Authorities in charge of distributing the information assess its impact and effectiveness by means of surveys and polls. Also, they carry out an analysis of the number of visits to the web pages where the information is held and to the social media used.

3.e), 3.f), 3.g) Information kept permanently available (optional)

The information for 225 upper-tier establishments (60%) is kept permanently available. As indicated above, Competent Authorities are in charge of publishing and maintaining this information in their websites.

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

Spain stated that each Regional Competent Authority has its own inspection programme. Most of them did not provide information on the appraisal to inspections. As a result, Spain cannot confirm whether any of the Regions are using a systematic approach.

4.b) Programme of inspections available to public (optional)

Spain has not replied to this optional question

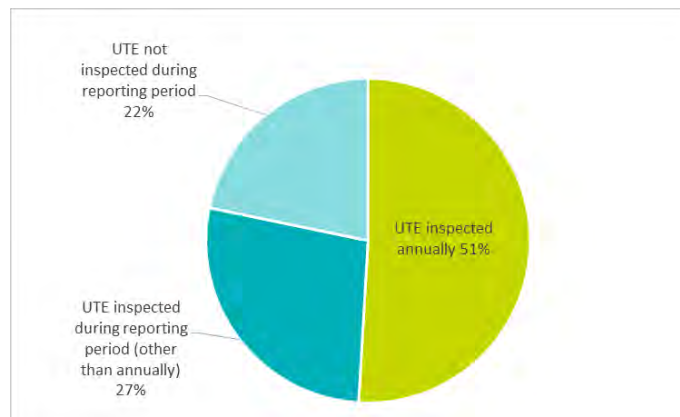
4.c) Actions taken in the event of accidents, incidents and non-compliance


Spain has adopted the following measures: disclosure requirements, disciplinary proceedings (16 in progress), partial operating ban of the establishment (1), and total suspension of operations of the establishment (1).

4.d), 4.e), 4.f) Data on on-site inspections

192 upper-tier establishments (51% of the total number of upper-tier establishments) were inspected annually. Another 103 (27%) were inspected at least during the last reporting period. Note that while some of the Regional Competent Authorities in Spain may apply systematic appraisal to determine inspection schedules (see 4.a) in which case it would not be absolutely required to inspect all establishments annually, the numbers still appear relatively low.

As for lower-tier establishments, Spain reported inspecting 255 (56%) during the 3-year reporting period.



<p>SPAIN</p>	
<p>Question 5 – Domino effects</p>	
<p>Establishments relevant for consideration of domino effects are identified by the competent authority in each Regional Government, based on information from the establishments' safety reports and on criteria established in the Spanish legislation (for details see the implementation report submitted by Spain). They communicate this to the Central Government and establishments in question. These establishments are required to exchange information on the effects of accidents and information on emergency plans. Also, the Regional Governments have promoted the creation of committees among operators involved in domino effects, in order to encourage information exchange and participation in joint exercises.</p>	
<p>Question 6 – Land-use planning</p>	
<p>In Spain, the Regional Governments adopt strategies or publish a report on spatial planning which covers this subject, the content of which is legally binding. The reports/strategies include risks that can be caused by new Seveso establishments located in populated areas and that of growing populations near industrial areas with Seveso establishments, as well as compatibility criteria. The criteria is stated to be based on international benchmarks and European guidelines on the subject matter, but no further details have been provided</p>	
<p>Question 7 – Further information (optional)</p>	
<p>7.a) Lessons learned from accidents and incidents None were reported by Spain</p> <p>7.b) IT tools used for monitoring the implementation and data sharing Spain reported the launch of an IT database called the National Chemical Hazard Database. This contains information on Seveso establishments and provides Competent Authorities with knowledge regarding risk parameters; preventive and control measures; provision of information to the public; external emergency plans; and lessons learned.</p> <p>7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore) None were reported by Spain</p>	

27. Member State summary sheet - Sweden

SWEDEN 

Overview of Sweden

Overall, Sweden provided a complete response.

Status of overall implementation:

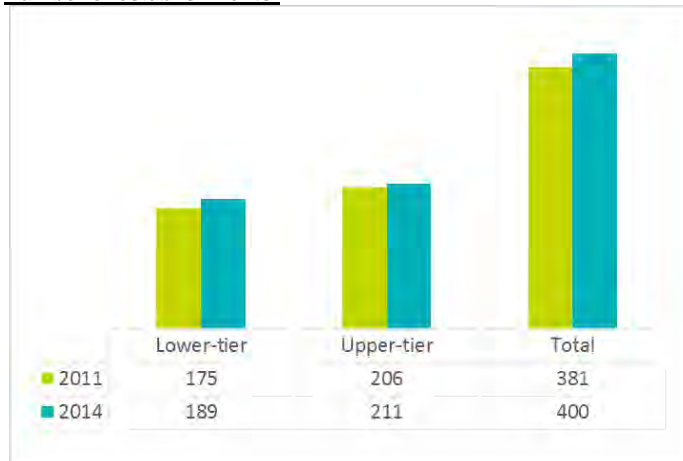


Sweden's response indicates that most of the provisions of the Seveso II Directive are fully implemented.

Main issues identified:

- Missing external emergency plans for 9 establishments
- Low level of tests of external emergency plans

Number of establishments:



Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks

None were reported by Sweden.

1.b) Establishments subject to Seveso

There were 400 Seveso establishments in Sweden at the end of 2014, up from 381 in 2011. This is due to an increasing number of lower tier and to a smaller extent upper-tier establishments.

As shown in the chart to the right, Sweden exhibits much fewer establishments per capita but much more establishments per km² than the EU average.



1.c) Activities of Seveso establishments

No statistical breakdown using the SPIRS categories was available.

1.d) Seveso establishments covered by the IED (optional)

No information was provided.

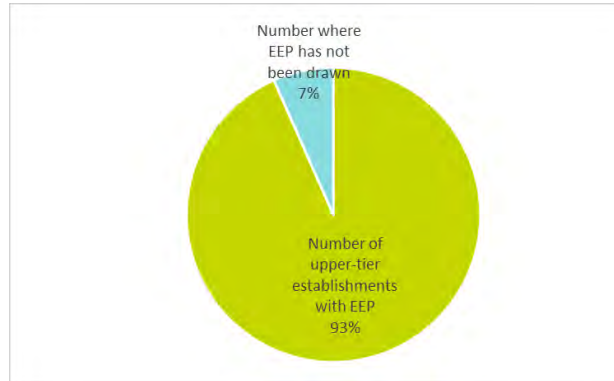


SWEDEN

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

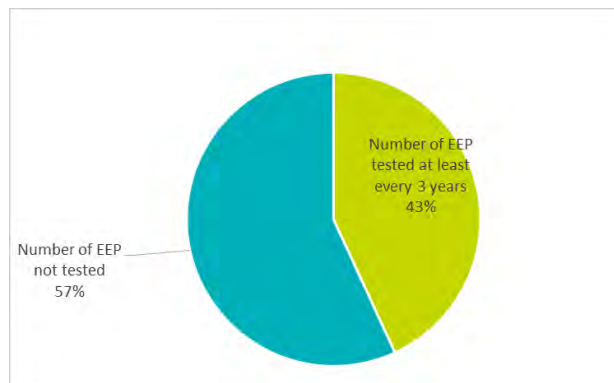
Swedish Competent Authorities did not decide that external emergency plans were not necessary in any case. However, these plans were not drawn up for 14 upper-tier establishments (7% of all upper-tier establishments in Sweden, as opposed to 9% at EU level). Sweden stated that one of them closed down and four were new, whereas the other nine should have met this requirement. Sweden did not indicate taking enforcement measures against them.



Note: Total 211 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, 120 upper-tier establishments' external emergency plans had not been tested (57% of the upper-tier establishments in Sweden, as opposed to 25% at EU level). Sweden did not provide any comment on this issue.



2.d) Arrangements for providing information to the public:

- Announcements on TV and radio, alarms. There are three types of messages: information, warning and 'all clear'.

2.e) Testing external emergency plans

All plans are meant to be tested at least once every three years. Type of tests reported:

- Partial and full practical tests involving emergency response staff. Sometimes, these are at large scale, involving several establishments; and
- Partial and full desk based exercises reviewing decision routes and management.

Small scale exercises may not be reported to Authorities, hence Sweden believes that the data on testing may be underestimated. There are not established criteria at national level to decide whether plans are adequate. Sweden is making efforts to improve its knowledge of inspection systems in order to improve and standardise these.

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

Municipalities are in charge of providing information to the public that may be affected by a major industrial accident, although costs have to be borne by the operators. Brochures are sent to the public, and announcements are made in local newspapers and the radio. Information about what to do in the case of such an accident is permanently available online (operators' and municipalities' websites). In total, the information was made available for 143 upper-tier establishments (68%). Although a specific statistical breakdown was not provided, it can be calculated. In 100% of cases, authorities (municipalities) provided the information to the public, whereas operators contributed to 26%. This was complemented by announcements in 10 county administrative boards and permanent information on the operators' and municipalities' websites. The submission of information is verified as part of the inspection procedures.

3.e), 3.f), 3.g) Information kept permanently available (optional)

Information not provided.



SWEDEN

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The length and frequency of inspections are based on the systematic appraisal of the following criteria:

- Administrative data;
- Characteristics of the surrounding area;
- Type of substances and quantities handled;
- Risk conditions;
- Existence of preventive measures;
- Information supplied to the public;
- Date of external and internal emergency plans;
- Date of the last inspection; and
- Occurrence of accidents.

4.b) Programme of inspections available to public (optional)

No information was provided.

This information is obtained from the safety reports.

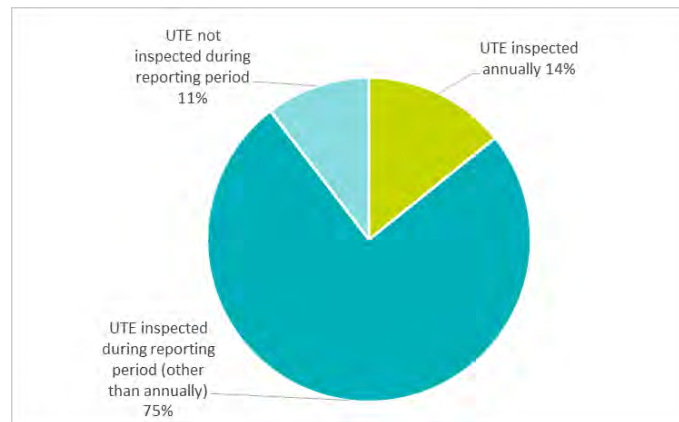
4.c) Actions taken in the event of accidents, incidents and non-compliance

The main types of actions are injunctions and prohibitions. These can be combined with fines or penalties. The response does not indicate whether any of these actions were taken during the reporting period.

4.d), 4.e), 4.f) Data on on-site inspections

30 (14%) of the upper-tier establishments were inspected at least once every 12 months. Another 159 were inspected at least once between 2012 and 2014. Note that Sweden applies systematic appraisal to determine inspection schedules (see 4.a) and as such it is not absolutely required to inspect all establishments annually.

In addition to that, 154 lower-tier establishments were inspected during the reporting period (81% of the 189 lower-tier establishments at the end of 2014).



Question 5 – Domino effects

Operators are obliged to consider domino effects. These shall be identified in the environmental impact assessment (prior to the establishment of the site) and safety report. Inspection authorities can assist operators in identifying domino effects. In order to do this, authorities use safety reports and other general information. In the case of EIA, the EIA Regulations are linked with the regulations implementing the Seveso II Directive, ensuring that operators take domino effects into account when drafting the EIA, which has to be approved. The implementation report contains an example of how information on possible domino effects was exchanged between various upper-tier Seveso establishments and how local authorities were also involved. An issue identified in the example is the operators' different risk awareness, as some may identify domino effects while others may not consider the existence of potential issues.



SWEDEN



Question 6 – Land-use planning

Sweden stated that its national legislation on spatial planning and environment contains basic requirements for the consideration of suitable locations for each purpose. This is complemented by additional guidance on appropriate safety distances between major hazard sites and other developments prepared by the National Board on Housing, Building and Planning supported by other Authorities.

Question 7 – Further information (optional)

No response was provided to this optional question.

28. Member State summary sheet – United Kingdom

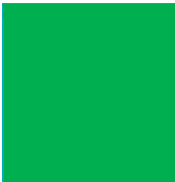


UNITED KINGDOM

Overview of the United Kingdom

Overall, the United Kingdom provided a complete response.

Status of overall implementation:



The United Kingdom response indicates that the provisions of the Seveso II Directive are fully implemented.

Main issues identified:
None

Number of establishments:



Overview of the information reported

Question 1 - General information

1.a) Significant changes made to competent authorities or their tasks

Two relevant changes were reported by the United Kingdom, namely the introduction of a new agency in Wales (Natural Resources Wales) and the transfer of the Health & Safety enforcement responsibility at nuclear licensed sites to the Office for Nuclear Regulation (ONR).

1.b) Establishments subject to Seveso

There were 924 Seveso establishments in the UK at the end of 2014, down from 1086 in 2011. This is due to a decreasing number of lower-tier and to a lesser extent upper-tier establishments.

As shown in the chart to the right, the UK exhibits fewer establishments per capita but more establishments per km² than the EU average.



1.c) Activities of Seveso establishments

No statistical breakdown using the SPIRS categories was available. The UK has used a classification system based on NACE codes. 56% of the establishments in the UK were classified in the “manufacturing” section. 17% were classified under “wholesale and retail trade, repair of motor vehicles and motorcycles. A further 12% were classified in “transportation and storage”. More specifically:

- 15% (132) of establishments were classified under NACE class 46.71 (wholesale of solid, liquid and gaseous fuels);
- 9% (85) of establishments were classified under NACE code 20.59 (manufacture of other chemicals); and
- 9% (83) of establishments were classified under NACE class 52.10 (warehousing and storage).

1.d) Seveso establishments covered by the IED (optional)

The United Kingdom has not answered this optional question.

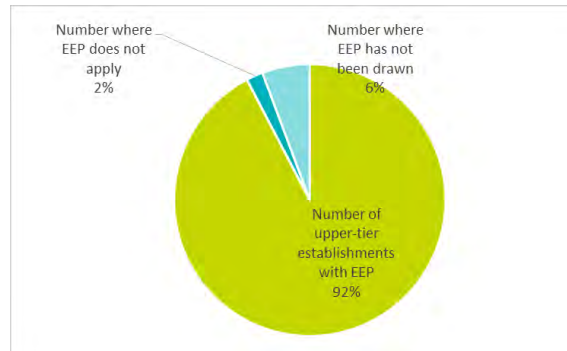


UNITED KINGDOM

Question 2 - Emergency plans

2.a) & 2.b) Upper-tier establishments without external emergency plan

For 7 upper-tier establishments the UK authorities decided that an external emergency plan was not needed because their safety reports indicated that the consequences of a major accident would not extend beyond the sites' boundaries. In addition to this, 20 upper-tier establishments failed to produce an external emergency plan. According to UK authorities, 11 of these establishments became upper-tier during 2014 and have one year to complete the plans. The remaining 9 establishments were due to complete them during 2015.

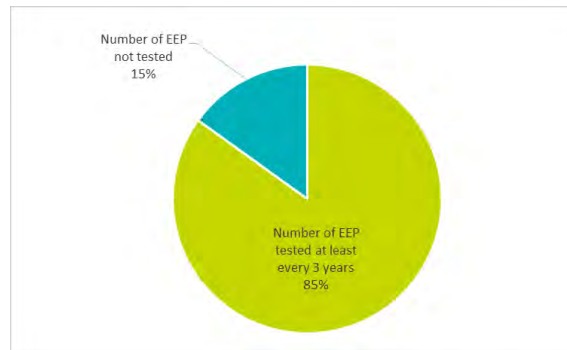


Note: Total 352 upper-tier establishments

2.c) Upper-tier establishments without external emergency plan tested

At the end of the reporting period, 53 upper-tier establishments' external emergency plans had not been tested (15% of the upper-tier establishments in the UK and 4% of the total number of upper-tier establishments in this situation in the EU).

Of these, 18 were tested at the beginning of 2015, with other 7 due to be tested before the end of that year. 11 establishments became upper-tier in 2014 and did not need to draft these plans until a year later. UK authorities stated that they were seeking information about the remaining upper-tier establishments and would take the appropriate action once they have more information.



2.d) Arrangements for providing information to the public:

- There is no centralised alert system in the UK. The UK stated that its guidelines recommend the use of on-site alarms;
- Local TV and radio companies distribute information in an event of an accident;
- The police is responsible for warning and informing the public in the initial stages. Arrangements for response are integrated in local emergency plans (the description of alert systems could be done at that level);
- Those liable to be affected by a Seveso accident (i.e. all addresses within a "public information zone") are provided with information via a letter and leaflet sent to their addresses. This contains information on what action to take in case of a major accident (although this was responded under 2.d), it is a preparatory measure rather than a response measure); and
- Arrangements for coping with off-site effects from accidents are integrated with wider emergency planning, which involves the participation of various authorities, namely the police, firefighters, Local Authority Emergency Planners, hospitals, Public Health Authorities. Each authority has a different role in an event of an accident.

2.e) Testing external emergency plans

In the UK, external emergency plans are tested as follows:

- Full tests (live exercises);
 - Table-top exercises based on scenarios identified in the safety report;
 - Walk-through exercises including visiting appropriate facilities such as emergency control centres (ECCs);
 - Seminars facilitating discussion about the different organisations' responses in particular circumstances during an emergency; and
 - Control post exercises testing the communication arrangements during an emergency.
- Testing is agreed locally to maximise the benefit of Local Authorities. UK authorities expect each of the elements above to be tested at least once every three years, recognising that some (e.g. 'control post exercises') should be tested more frequently.

The elements to be tested are the completeness, consistency and accuracy of the plans as well as the adequacy and competence of the equipment, facilities and staff involved. Criteria used to consider whether the plans are adequate are: whether the plan complies with the relevant article and annex of the Directive, whether it is informed by the major hazard scenarios provided by the operator, whether the relevant statutory consultees have been consulted, and whether it is coherent with the internal emergency plan. Also, it is assessed whether local authorities have followed the best practice guidelines.



UNITED KINGDOM

Question 3 – Information on safety measures

3.a), 3.b), 3.c), 3.d) Information made actively available

Information on actions to be taken in the event of a Seveso accident are provided to all addresses in the public information zones (PIZ), which are determined according to the likelihood and effects of potential accidents at Seveso establishments. The information is supplied by the operator, which is informed by the authorities of the extension of its PIZ. Also, Local Authorities may distribute this information if agreed with the operator. The form and content is not specified, but it is expected that the text will be simple, understandable and accompanied by illustrations. If it is deemed necessary, authorities advise operators of the need for translating the information into other languages.

The UK has stated that almost 90% of its upper-tier establishments provide information within their PIZ. The UK has provided explanations for the 41 that have not done so. 27 do not have to inform the public (as there is no off-site risk or no population within their PIZ), 4 did not have external emergency plan at the end of the reporting period, and for 10 it was not clear whether the information had been provided. The UK has provided a statistical breakdown of how the information was provided:

- Operator's leaflets/flyers: 34%;
- Email / SMS / Telephone Alert: 5%;
- Safety Booklet / Newsletter: 33%; and
- Other: e.g. Emergency/Safety Card, calendars etc.: 28%.

UK authorities ensure that this information is actually provided through their inspection procedures.

3.e), 3.f), 3.g) Information kept permanently available (optional)

No information was provided

Question 4 - Inspections

4.a) Systematic appraisal of major-accident hazards

The length and frequency of inspections are based on the systematic appraisal of the following criteria:

- Follow-up issues identified in the safety report or in a previous inspection; and
- Parameters such as the age of a plant, safety performance indicators, the prevention of loss of containment of dangerous substances or competence issues.

Competent authorities have a system to assist local authorities in deciding inspection priorities and define the establishments that will be inspected. Plans assess operators' risk management by sampling and testing in critical areas.

4.c) Actions taken in the event of accidents, incidents and non-compliance

The main actions used were prosecution (in the most serious cases), prohibition notices (which may be immediate or deferred), and improvement notices issued by inspectors. For minor breaches, verbal warnings, followed by a letter were used.

4.d), 4.e), 4.f) Data on on-site inspections

Between 86% and 89% of upper-tier establishments were inspected annually during the last reporting period. The majority (>99%) of the upper-tier establishments were inspected at least once during 2012-2014. In addition to this, 526 lower-tier establishments were inspected. Data was provided for each year in the reporting period.

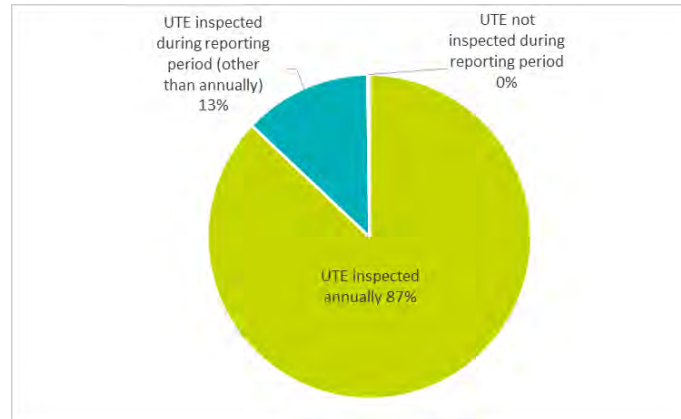
4.b) Programme of inspections available to public (optional)

Not answered.

	2012	2013	2014
Upper-tier annual inspection	312	303	306
Total upper-tier	352	352	352
Percentage of upper-tier with annual inspection	89%	86%	87%



UNITED KINGDOM



Question 5 – Domino effects

Domino sites are designated by the Health & Safety Executive (HSE) on behalf of each Competent Authority. A contour (consultation distance, CD) is allocated to each establishment for land use planning purposes and is the basis for defining domino groups where its physical boundaries overlaps with the CD of other sites. Authorities inform all 'domino' operators and encourage them to exchange information, often advising of the type of information that should be exchanged. The information should be incorporated in the safety report. Compliance with this is checked during the safety report assessment process. Also, authorities may require operators to inform them of the information that has been circulated to other members of the 'domino' group. Operators shall check whether action should be taken according to the new information received from other domino sites. Authorities shall check if the information has been incorporated in the review of the safety reports (upper-tier) and during inspections (lower-tier). The system has been in place for a number of years and is now being updated to incorporate additional requirements from Seveso III.

Question 6 – Land-use planning

Major accident prevention policy has been incorporated in land use planning through different Regulations applicable to each of the regions of the UK (England and Wales, Scotland, Northern Ireland). In all cases, this was incorporated before 1996. Administration and enforcement lies with Hazardous Substances Authorities, which are often the Local Planning Authorities. They are in charge of giving consent to establishments willing to keep hazardous substances as well as to anyone interested in developing the land in the vicinity of Seveso establishments. HSE alone or with the relevant environmental authority (EA, NRW, SEPA, and NIEA) depending on the issues to be assessed determine the compatibility of the developments with their proposed location. For the developments, zones of influence of each establishments are defined (inner, middle, outer) and HSE has defined criteria of which are compatible within each zone. Authorities introduced an additional Development Proximity Zone (DPZ) at all sites with large-scale petrol storage tanks.

Question 7 – Further information (optional)

7.a) Lessons learned from accidents and incidents

No information was provided.

7.b) IT tools used for monitoring the implementation and data sharing

No information was provided.

7.c) Seveso like provisions applied to other installations and activities (e.g. pipelines, ports, marshalling yards, offshore)

No information was provided.

Appendix C

Remaining gaps in Member States' reports

The following gaps were identified as remaining and no response was received from Member States at time of reporting.

Table C.1 Remaining gaps and clarifications

Question	Completeness level	Justification	Information requested	Impact of the gap
Greece				
1.c		Greece has provided a list of all establishments based on the eSPIRS categories, however two establishments listed as: 'chemical installations – solvents' which category could not be match with eSPIRS.	Can Greece check this and clarify to which eSPIRS sector	Low
2.e		The response does not include information / criteria used in order to assess that the external emergency plan are deemed adequate.	Can Greece clarify its response to question 2.e?	Medium
3.b		Greece response is 'no information available so far', it is unclear whether this indicates that there is no information on how many upper tier establishments had information been made actively available or whether this is the response to the question indicating that no been made actively available.	Can Greece clarify the meaning of its response to question 3.2	Medium
3.c		Greece has not provided a statistical breakdown as required in the question	Can Greece provide statistical breakdown as requested for: <ul style="list-style-type: none"> the entities (by whom) making information available and the means by which the information is made available 	Medium
3.d		Greece indicated that no information is available on the systems in place to monitor that information has been supplied. We will assume that this means there is no systems in place to monitor that the information has been supplied	Can Greece indicate whether this assumption is not correct?	Low
4.c		Greece response indicates this is not applicable because they were no major accidents, however the question also asks about incidents and non-compliance events.	Can Greece confirm that there were no accident, incident or non-compliance during the reporting period	Medium
4.d		Greece's response indicates the number of upper tier establishments and the number of inspection carried out during the reporting period but not the number of establishments' subject to on-site inspection every twelve months as requested.	Can Greece indicate how many establishments' were subject to on-site inspection every twelve months?	Medium
4.e		The answer seems to respond to question 4.d, but also contradicts the information presented in response to 4.d (i.e. all upper tier establishment inspected, but 55 inspections for 83 upper tier establishments).	Can Greece clarify this response and the response to 4.d	Medium

Question	Completeness level	Justification	Information requested	Impact of the gap
6		The response from Greece describes a pilot project, however it does not include information on how the objectives of article 12 are usually ensured	Can Greece complete its response to the question by adding information on how the objectives of article 12 are usually ensured	Medium
Croatia				
2.a		The wording of the response is unclear, Croatia indicated that the need for external emergency plan applied to all upper tier installations. As a result we interpreted this as meaning the response to 2.a is:0	Can Croatia confirm that our understanding is correct?	Low
2.b		The response from Croatia indicates the number of regional authorities that have not drafted plans yet but not the number of upper tier establishments concerned.	Can Croatia indicate the number of upper tier establishments for which the external emergency plan has not been drafted?	Medium
2.d		The response does not contain information on alert systems.	Can Croatia indicate whether it has any alert systems as part of arrangements for providing the public with specific information?	Low
2.e		The response does not include information on the criteria used for adequacy of the way external emergency plans in incomplete.	Can Croatia indicate how the test is being considered adequate?	Medium
4.d / 4.e		The total numbers reported in response to 4.d and 4.e (35) is higher than the total number of upper tier establishments (25).	Can Croatia verify the data provided in response to question 4.d and 4.e	Medium
Latvia				
2.e		The response indicates that the external emergency plans are tested according to a legislation.	Can Latvia provide details on the provisions of the legislation which are relevant to this question, including examples of criteria being used	Medium
4.a		The response indicates that the criteria used are contained in the national legislation with no reference on the content of the legislation.	Can Latvia provide details on the provisions of the legislation which are relevant to this question, including examples of criteria being used	Medium
Sweden				
3.c		The response provides data on information made available, however it is not clear whether this is information made available by the entity listed. Furthermore there is no information on the means by which the information is made available	Can Sweden provide statistical breakdown as requested for: <ul style="list-style-type: none"> the entities (by whom) making information available and the means by which the information is made available 	Medium
4.d/ 4.e		The total numbers reported in response to 4.d and 4.e (189) matches the number of lower tier establishments whilst it leaves 22 upper tier establishments not accounted for.	Can Sweden check that the data indicated in response to questions 4.d and 4.e relate to upper-tier establishments?	Medium



Appendix D

Data reported by Member States

The data reported by Member States in response to question 1(b) of the implementation questionnaire are presented in the table below.

Table D.1 Data reported by Member States on number of establishments in 2014

Member State	Lower-tier establishments	Percentage of lower-tier establishments	Upper-tier establishments	Percentage of upper-tier establishments	Total establishments
AT	76	51%	72	49%	148
BE	179	47%	204	53%	383
BG	109	56%	86	44%	195
CY	9	41%	13	59%	22
CZ	90	43%	117	57%	207
DE	2 123	65%	1 141	35%	3 264
DK	67	55%	54	45%	121
EE	27	42%	37	58%	64
EL	110	57%	83	43%	193
ES	455	55%	377	45%	832
FI	165	55%	135	45%	300
FR	539	46%	639	54%	1 178
HR	32	56%	25	44%	57
HU	134	56%	105	44%	239
IE	48	50%	48	50%	96
IT	545	49%	567	51%	1 112
LT	24	57%	18	43%	42
LU	10	56%	8	44%	18
LV	34	54%	29	46%	63
MT	3	25%	9	75%	12
NL	154	38%	252	62%	406
PL	212	54%	180	46%	392
PT	124	68%	59	32%	183
RO	183	60%	120	40%	303
SE	189	47%	211	53%	400



Member State	Lower-tier establishments	Percentage of lower-tier establishments	Upper-tier establishments	Percentage of upper-tier establishments	Total establishments
SI	28	46%	33	54%	61
SK	38	46%	44	54%	82
UK	572	62%	352	38%	924
EU-28	6 279	56%	5 018	44%	11 297

Appendix E

Data on establishments – eSPIRS

The tables below present the figures used to develop the charts describing the distribution of Seveso establishments, upper and lower tiers, per Member State.

Table E.1 Number of Upper-tier (UT) and Lower-tier (LT) Establishments for 2012

MS	2012					
	LT_12	UT_12	TOT_12	GDP_2012*	POP_12*	SUP_12
Austria	64	80	144	317 117,0	8 451 860	83 879
Belgium	189	192	381	387 447,0	11 161 642	30 528
Bulgaria	59	37	96	41 693,3	7 284 552	110 900
Cyprus	6	10	16	19 468,9	865 878	9 251
Czech Republic	91	104	195	161 434,3	10 516 125	78 866
Denmark	65	44	109	252 915,2	5 602 628	42 895
Estonia	25	25	50	17 934,9	1 320 174	45 227
Finland	136	128	264	199 793,0	5 426 674	338 432
France	553	553	1106	2 086 929,0	65 600 350	632 834
Germany	1060	1081	2141	2 758 260,0	80 523 746	357 137
Greece	135	83	83	191 203,9	11 003 615	131 957



MS	2012					
Hungary	80	64	144	98 972,8	9 908 798	93 024
Ireland	53	34	87	175 753,6	4 591 087	69 797
Italy	562	538	1100	1 613 265,0	59 685 227	301 336
Latvia	33	30	63	21 982,7	2 023 825	64 562
Lithuania	24	17	41	33 334,7	2 971 905	65 300
Luxembourg	12	9	21	43 574,1	537 039	2 586
Malta	5	6	11	7 208,8	421 364	316
Netherlands	163	221	384	645 164,0	16 779 575	41 540
Poland	194	166	360	389 273,3	38 062 535	312 679
Portugal	109	58	167	168 398,0	10 487 289	92 212
Romania	162	115	277	133 511,4	20 020 074	238 391
Slovakia	41	41	82	72 420,0	5 410 836	49 036
Slovenia	36	24	60	36 002,5	2 058 821	20 273
Spain	371	260	631	1 039 758,0	46 727 890	505 991
Sweden	168	194	362	423 340,7	9 555 893	438 576
UK	687	395	1082	2 065 736,8	63 905 297	248 528
			9457		500 904 699	

Source: European Commission, JRC, 2016

Table E.2 Number of upper-tier (UT) and lower-tier (LT) Establishments for 2013 and 2014

MS	2013						2014					
	LT_13	UT_13	TOT_13	GDP_2013*	POP_13*	SUP_13	LT_14	UT_14	TOT_14	GDP_2014*	POP_14*	SUP_14
Austria	64	80	144	322 539,2	8 506 889	83 879	64	80	144	330 417,6	8 576 261	83 879
Belgium	179	196	375	392 675,0	11 203 992	30 528	170	202	372	400 408,0	11 208 986	30 528
Bulgaria	97	72	169	41 911,8	7 245 677	110 900	105	76	181	42 750,9	7 202 198	111 002
Cyprus	6	10	16	18 064,6	858 000	9 251	6	10	16	17 393,7	847 008	9 251
Czech Republic	91	104	195	157 741,6	10 512 419	78 866	91	104	195	156 660,0	10 538 275	78 867
Denmark	65	44	109	255 235,4	5 627 235	42 916	65	44	109	260 581,6	5 659 715	42 921
Estonia	25	25	50	18 890,1	1 315 819	45 227	25	25	50	19 758,3	1 313 271	45 227
Finland	136	128	264	203 338,0	5 451 270	338 435	136	128	264	205 364,0	5 471 753	338 435
France	553	553	1106	2 115 256,0	65 889 148	632 834	553	553	1106	2 139 964,0	66 415 161	633 187
Germany	1238	1160	2398	2 826 240,0	80 767 463	357 168	1238	1160	2398	2 923 930,0	81 197 537	357 340
Greece	135	84	219	180 389,0	10 926 807	131 957	135	84	219	177 559,4	10 858 018	131 957
Hungary	80	64	144	101 273,3	9 877 365	93 024	80	64	144	104 239,1	9 855 571	93 024
Ireland	53	34	87	180 209,3	4 605 501	69 797	47	47	94	193 159,6	4 628 949	69 797
Italy	555	588	1143	1 604 477,9	60 782 668	302 073	551	586	1137	1 611 884,0	60 795 612	302 073
Latvia	33	30	63	22 805,2	2 001 468	64 573	33	30	63	23 580,9	1 986 096	64 573
Lithuania	24	17	41	34 962,2	2 943 472	65 300	24	17	41	36 444,4	2 921 262	65 300



	2013						2014					
Luxembourg	12	9	21	46 541,1	549 680	2 586	9	9	18	48 897,5	562 958	2 586
Malta	5	6	11	7 671,3	425 384	316	5	6	11	8 092,9	429 344	316
Netherlands	163	221	384	652 748,0	16 829 289	41 540	174	221	395	663 008,0	16 900 726	41 540
Poland	194	166	360	394 601,8	38 017 856	312 679	193	169	362	410 856,3	38 005 614	312 679
Portugal	109	58	167	170 269,3	10 427 301	92 212	109	58	167	173 446,2	10 374 822	92 225
Romania	183	114	297	144 253,5	19 947 311	238 391	182	114	296	150 230,1	19 870 647	238 391
Slovakia	39	42	81	73 835,1	5 415 949	49 036	39	42	81	75 560,5	5 421 349	49 035
Slovenia	36	24	60	35 917,1	2 061 085	20 273	36	24	60	37 332,4	2 062 874	20 273
Spain	371	260	631	1 025 634,0	46 512 199	505 991	371	260	631	1 037 025,0	46 449 565	505 970
Sweden	168	194	362	435 752,1	9 644 864	438 576	168	194	362	432 691,1	9 747 355	438 574
UK	687	395	1082	2 048 328,0	64 351 155	248 528	687	395	1082	2 260 804,8	64 767 115	248 528
			9979		502 697 266				9998	13942040	504 068 042	4 407 477

Source: European Commission, JRC, 2016

Table E.4 Number of Seveso upper tier (UT) and lower tier (LT) establishments in 2014 per 1000 km²

State	LT_14	UT_14	TOT_14	SUP_14	LTvsSUP	UTvsSUP	TOTvsSUP
Malta	5	6	11	316	15,82	18,99	34,81
Belgium	170	202	372	30 528	5,57	6,62	12,19
Netherlands	174	221	395	41 540	4,19	5,32	9,51
Luxembourg	9	9	18	2 586	3,48	3,48	6,96
Germany	1238	1160	2398	357 340	3,46	3,25	6,71
United Kingdom	687	395	1082	248 528	2,76	1,59	4,35
Italy	551	586	1137	302 073	1,82	1,94	3,76
Slovenia	36	24	60	20 273	1,78	1,18	2,96
Denmark	65	44	109	42 921	1,51	1,03	2,54
Czech Republic	91	104	195	78 867	1,15	1,32	2,47
Portugal	109	58	167	92 225	1,18	0,63	1,81
France	553	553	1106	633 187	0,87	0,87	1,75
Cyprus	6	10	16	9 251	0,65	1,08	1,73
Austria	64	80	144	83 879	0,76	0,95	1,72
Greece	135	84	219	131 957	1,02	0,64	1,66
Slovakia	39	42	81	49 035	0,80	0,86	1,65
Bulgaria	105	76	181	111 002	0,95	0,68	1,63
Hungary	80	64	144	93 024	0,86	0,69	1,55
Ireland	47	47	94	69 797	0,67	0,67	1,35
Spain	371	260	631	505 970	0,73	0,51	1,25
Romania	182	114	296	238 391	0,76	0,48	1,24
Poland	193	169	362	312 679	0,62	0,54	1,16
Estonia	25	25	50	45 227	0,55	0,55	1,11
Latvia	33	30	63	64 573	0,51	0,46	0,98
Sweden	168	194	362	438 574	0,38	0,44	0,83
Finland	136	128	264	338 435	0,40	0,38	0,78
Lithuania	24	17	41	65 300	0,37	0,26	0,63

Source: European Commission, JRC, 2016

Appendix F

Major accidents database results

The table below presents the data from the analysis of the database and compared to EU data.

Table F.1 Statistics for Europe

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	489 121 176	494 228 687	499 931 464	504 416 388	507 164 733	
GDP (thousands of billions of \$)	9,158	13,298	17,337	17,429	17,917	
Number of major accidents eMARS	79	80	79	47	25	310
Number of major accidents ARIA	73	97	67	76	54	367
Number of major accidents ZEMA	77	78	74	57	56	342
Number of major accidents EM-DAT	4	2	1	1	1	9
Merged databases*	169	199	174	150	121	813
Merged databases per million population	0,346	0,403	0,348	0,297	0,239	
Merged databases per GDP (thousands of billions of \$)	18,454	14,964	10,037	8,606	6,753	

Note *: this excludes duplicates as far as possible

The table above shows that:

- ▶ The numbers of major accidents reported in eMARS and reported in the other databases is not the same. There are major accidents recorded in ARIA and ZEMA that are not reported to eMARS. This observation might be explained by remark (2) on the previous page; and
- ▶ There is a decrease in the number of reported major accidents since the 2003-2005 period, with a significant reduction of about 25 major accidents less reported during the three periods 2006-2008, 2009-2011 and 2012-2014 if we consider the consolidated database. It seems that for the two last periods in the eMARS database not all data collected have been made available.

Table F.2 Statistics for Europe (only eMARS database considered)

Population	489 121 176	494 228 687	499 931 464	504 416 388	507 164 733	
GDP (thousands of billions of \$)	9,158	13,298	17,337	17,429	17,917	
eMARS	79	80	79	47	25	310
eMARS per million population	0,162	0,162	0,158	0,093	0,049	
eMARS per GDP (thousands of billions of \$)	8,626	6,016	4,557	2,697	1,395	

Table F.3 Statistics for Australia

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	19 405 800	20 139 200	20 924 900	22 021 158	23 103 231	
GDP (thousands of billions of \$)	0,574	0,706	1,400	2,163	2,448	
Number of major accidents ARIA	0	2	0	0	0	2
Merged databases*	0	2	0	0	0	2
Merged databases per million population	0,000	0,099	0,000	0,000	0,000	
Merged databases per GDP (thousands of billions of \$)	0	2,831	0	0	0	

Note *: this excludes duplicates as far as possible



Table F.4 Statistics for Brazil

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	178 417 143	186 074 314	192 750 819	198 611 030	204 246 286	
GDP (thousands of billions of \$)	0,574	0,706	1,400	2,163	2,448	
Number of major accidents ARIA	2	2	0	1	2	7
Number of major accidents EM-DAT						0
Merged databases*	0	2	0	0	0	2
Merged databases per million population	0,000	0,099	0,000	0,000	0,000	
Merged databases per GDP (thousands of billions of \$)	0	2,831	0	0	0	

Note *: this excludes duplicates as far as possible

Table F.5 Statistics for Canada

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	31 071 200	31 994 333	32 901 402	33 992 208	35 150 211	
GDP (thousands of billions of \$)	0,746	1,028	1,443	1,591	1,815	
Number of major accidents ARIA	4	1	1	0	4	10
Number of major accidents EM-DAT			1			1
Merged databases*	4	1	1	0	4	10



Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Merged databases per million population	0,129	0,031	0,030	0,000	0,114	
Merged databases per GDP (thousands of billions of \$)	5,365	0,972	0,693	0,000	2,204	

Note *: this excludes duplicates as far as possible

Table F.6 Statistics for China

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	1 271 631 667	1 296 065 000	1 317 853 333	1 337 698 333	1 357 448 333	
GDP (thousands of billions of \$)	1,333	1,953	3,604	6,197	9,434	
Number of major accidents ARIA	17	29	17	16	3	82
Number of major accidents EM-DAT	14	32	23	13	10	92
Merged databases*	20	55	33	24	12	144
Merged databases per million population	0,016	0,042	0,025	0,018	0,009	
Merged databases per GDP (thousands of billions of \$)	15,002	28,156	9,157	3,873	1,272	

Note *: this excludes duplicates as far as possible

Table F.7 Statistics for India

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	1 071 852 873	1 126 371 730	1 179 614 682	1 230 870 899	1 279 460 019	
GDP (thousands of billions of \$)	0,498	0,725	1,137	1,630	1,910	
Number of major accidents ARIA	12	13	2	3	3	33
Number of major accidents EM-DAT	4	8	3	2	2	19
Merged databases*	13	16	5	5	5	44
Merged databases per million population	0,012	0,014	0,004	0,004	0,004	
Merged databases per GDP (thousands of billions of \$)	26,095	22,078	4,396	3,068	2,618	

Note *: this excludes duplicates as far as possible

Table F.8 Statistics for Japan

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	127 145 667	127 750 667	127 972 667	127 978 092	127 343 970	
GDP (thousands of billions of \$)	4,291	4,510	4,521	5,481	5,154	
Number of major accidents FKD	4	4	0	0	0	8
Number of major accidents ARIA	4	3	1	0	3	11
Number of major accidents RISCAD	9	3	6	0	0	18

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Merged databases*	15	12	6	0	3	36
Merged databases per million population	0,118	0,094	0,047	0,000	0,024	
Merged databases per GDP (thousands of billions of \$)	3,496	2,661	1,327	0,000	0,582	

Note *: this excludes duplicates as far as possible

Table F.9 Statistics for New Zealand

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	3 895 567	4 082 867	4 222 733	4 345 767	4 453 300	
GDP (thousands of billions of \$)	0,058	0,102	0,127	0,145	0,189	
Number of major accidents ARIA	0	2	0	0	0	2
Merged databases*	0	2	0	0	0	2
Merged databases per million population	0,000	0,490	0,000	0,000	0,000	
Merged databases per GDP (thousands of billions of \$)	0,000	19,552	0,000	0,000	0,000	

Note *: this excludes duplicates as far as possible



Table F.10 Statistics for Russia

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	145 959 562	144 077 945	142 865 655	142 865 220	143 509 385	
GDP (thousands of billions of \$)	0,361	0,782	1,394	1,909	1,863	
Number of major accidents ARIA	3	7	4	7	1	22
Number of major accidents EM-DAT	1	2	3	1	2	9
Merged databases*	4	8	7	7	3	29
Merged databases per million population	0,027	0,056	0,049	0,049	0,021	
Merged databases per GDP (thousands of billions of \$)	11,090	10,235	5,020	3,667	1,611	

Note *: this excludes duplicates as far as possible

Table F.11 Statistics for South Korea

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	47 329 217	48 012 268	48 639 432	49 457 281	50 216 022	
GDP (thousands of billions of \$)	0,568	0,781	1,046	1,066	1,313	
Number of major accidents ARIA	2	2	3	0	2	9
Number of major accidents EM-DAT			1		1	2
Merged databases*	2	2	3	0	2	9



Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Merged databases per million population	0,042	0,042	0,062	0,000	0,040	
Merged databases per GDP (thousands of billions of \$)	3,522	2,560	2,869	0,000	1,523	

Note *: this excludes duplicates as far as possible

Table F.12 Statistics for USA

Data	2000-2002	2003-2005	2006-2008	2009-2011	2012-2014	2000-2014
Population (inhabitants)	284 918 853	292 809 943	301 235 028	309 279 083	316 479 140	
GDP (thousands of billions of \$)	10,628	12,293	14,351	14,967	16,722	
Number of major accidents CSB	26	23	21	18	7	95
Number of major accidents ARIA	60	27	34	18	9	148
Number of major accidents EM-DAT	3	3		2	3	11
Merged databases*	78	38	40	31	13	200
Merged databases per million population	0,274	0,130	0,133	0,100	0,041	
Merged databases per GDP (thousands of billions of \$)	7,339	3,091	2,787	2,071	0,777	

Note *: this excludes duplicates as far as possible



Appendix G Leaflet

Major Accident Hazards

from disasters to success



The use of large amounts of dangerous chemicals is unavoidable in some industry sectors which are vital for a modern industrialised society.

There are around **12 000 establishments** in the EU subject to the legislation on major accidents involving dangerous chemicals

Major industrial accidents can cause death or injury to people and can harm the environment



60% of EU citizens consider that biodiversity is threatened by man-made disasters such as industrial accidents



Major accidents cause several **billions of Euros of damage** every year



77% of EU citizens consider that **man-made disasters could have negative impacts on the economic** situation in their region

To minimise the associated risks, measures are necessary to prevent major accidents and to ensure appropriate preparedness and response should such accidents nevertheless happen.



Every year there are around **30 major accidents** in the EU

EU policy makes your life safer

Since 1982 the so-called Seveso Directive (named after the catastrophic accident in the Italian town of Seveso) has provided EU wide rules on the prevention of major accidents and the limitation of their effects. It was last updated by Directive 2012/18/EU.

Considering the very high rate of industrialisation in the EU the Seveso Directive has contributed to achieving a low frequency of major accidents even

though the current Directive covers more establishments than ever. Fewer accidents with accidents and lower impacts also contribute to sustainable economic and green growth and avoid loss of jobs.

As there are around 30 major accidents in the EU each year continued efforts are necessary to prevent major accidents and to limit their impacts on people's health, the environment and the economy. EU action is also necessary because the impacts of major accidents do not stop at borders.

Did you know?

EU legislation is widely considered as a benchmark for industrial safety policy and has influenced legislation in many countries world-wide.

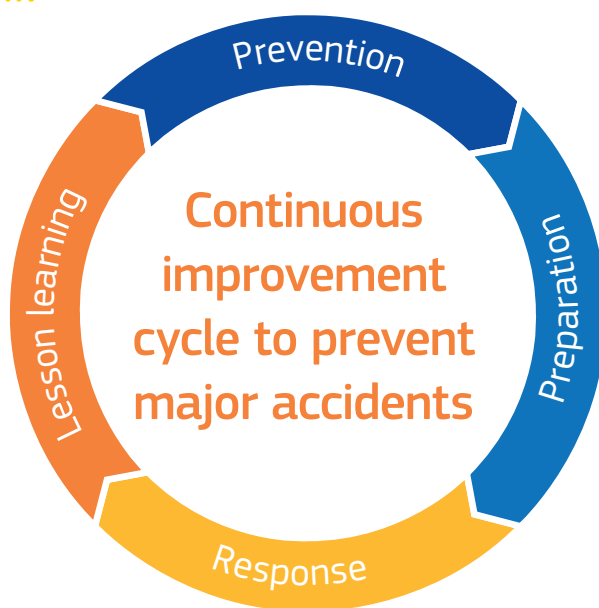


Establish rules

e.g. Legislation for establishments, inspection regimes and sharing of information

Learn from information generated

e.g. Accident reporting and data analysis



Limit risk

e.g. Identification and management of risks through safety measures and land-use planning

Limit impact

e.g. Adoption and testing of emergency plans, communication of safety measures to the public



Have your say!

If you live in an area potentially affected by a major accident involving dangerous substances, EU legislation requires that you are involved in the decision making, even if the establishment concerned is located in a neighbouring EU country.

You will be consulted when:

- new establishments are planned
- significant modifications are made to existing ones
- new developments are planned around existing establishments
- external emergency plans are drawn up for high risk establishments

Information on how you can protect yourself in case of an emergency needs to be made available by operators and the authorities.

ADDITIONAL INFORMATION

Major accident hazards policy:
<http://ec.europa.eu/environment/seveso>



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