Development of SEVESO Directive and Its Implementation in the Slovak Republic in the Area of Prevention Major Industrial Accidents

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Abstract: - The industrial accidents as in Seveso (1976) or that of the firm Union Carbide in Bhopal (1984) and the Mexico City (1984) as well as a whole range of others showed failure of technology, health consequences, not speaking about the losses of material values and environment which can be of a long-term character or even irreversible. Therefore the issue of prevention and resulting implementation and stating the rules in the industrial environment take the leading role. Also the EU attempts to regulate this environment and to state rules for enterprises which from the point of view of hazardous substances concentration are the most dangerous. The SEVESO I, II and III Directives are one of these tools whose bases are the subject of this article. Its transposition in Slovakia – one of the EU member states - is also analysed in this work.

Key-Words: - major industrial accident, SEVESO I, SEVESO II, SEVESO III, prevention, Slovak Republic, European Union, Seveso establishment.

1 Introduction
The effort of people to achieve higher and higher standard of living reflects in the dynamic development of technologies which are on the other hand more and more complicated and can lead to industrial accidents. On 10th July 1976 in the surroundings of the Milanese suburb Seveso the air filled with a toxic cloud of the very dangerous dioxin which leaked to the air due to overheating of one of the reactors and the consequent explosion in the factory. The six kilometres long cloud which was one kilometre wide hit a densely populated area. Approximately 700 people were evacuated; however, it happened after two weeks when the first signals of striking by dioxin began to appear. Until today the consequences on health, lives, property and environment, especially from the point of view of the long term effect, have not been quantified.[13]

After this accident, six years later, the Directive of the European Union called SEVESO I was adopted. It dealt with prevention and preparedness for overcoming major industrial accidents and was emended in certain time intervals:
- in 1996 SEVESO II 96/82/EC,
- in 2003 SEVESO II 2003/105/EC.

2 Development of the SEVESO Directive from 1982 to 2011
Due to the fast technological development and globalisation worldwide also the updating of the European SEVESO I Directive in concrete time intervals is carried out. The SEVESO I Directive and its bases concerned the provisions for protecting not only the employees inside the industrial enterprises but also the general public which can be threatened due to the industrial accidents. Its basic aim is to reduce the probability of developing an industrial accident in the Seveso companies to minimum. At that time the directive defined only four terms – the industrial activity, the manufacturer, the major accident and dangerous substances. The company notified the competent authorities about handling with hazardous substances and the method and type of the used preventive measures for avoiding the rise of an industrial accident. This first directive does not exactly state all deadlines for observing the obligations resulting from the EU requirements as well as no sanctions which threaten for not observing of these provisions. The information about accidents and their registration was directly covered by the European Union which also archived them. This corresponded with the requirements
necessary at that time as a primary attempt in the area of the industrial security in handling with hazardous substances; however, due to the technological progress it was inevitable to amend this directive.

The SEVESO II Directive from 1996 arose as a need to make the SEVESO I Directive implementation more effective, for disseminating its objectives and more extensive information exchange among the member states. Also the industrial accidents in Bhopal and Mexico City played an important role in amending this material.\cite{2,12} There was one important fact - after the rise of these accidents populated zones being close to these facilities were affected. For the first time the directive mentions accidents that cross the frontiers of countries and the need to solve them also from the legislative point of view. The problem which was to be solved was the harmonisation of the documents and providing information not only in the framework of the EU countries but also from the enterprise towards the public. Based on this requirement the directive defined and characterised the following facts again:

- the directive terminology was completed, for the first time the term risk is mentioned here,
- they were obliged to work out new documents (safety report, major accident prevention policy, emergency plans – both internal and external),
- the domino effects and the necessary information exchange about them and informing the public about their consequences and the protection method,
- due to the problems in Bhopal and Mexico City the importance of the territorial planning and locating the new and existing facilities in the largest possible distance from habitations was emphasised,
- the duty to carry out inspections by competent bodies in the Seveso companies in the individual EU states,
- creating the register and information system in the area of prevention of major industrial accidents and their implementation into the practice of the individual EU states,
- establishing a committee whose members are the representatives of all member states.

However, the directive still did not solve several important facts and therefore in 2003 the Directive SEVESO II 2003/105 EC was created. The occurrence of other accidents, e.g. Baia Mare in Rumania (leakage of cyanide slick that polluted the river Danube), the explosion in the factory for producing fertilisers in Toulouse in 2001 and the studies of carcinogen substances and materials hazardous for the environment aroused the need to amend the directive again. Based on this the directive solved the following areas which the SEVESO II Directive from 1996 did not contain:

- stating the minimum cycles for reporting, implementing new procedures for preventing major industrial accidents, safety regulations and emergency plans,
- the changes in defining exceptions from the directive in two points,
- disseminating information introduced in the safety report,
- strengthening the position of the civil protection in the area of fulfilling the goals of the external emergency plans,
- incorporating the sub-suppliers to the instructions about the possibilities of the rise of industrial accidents in the framework of protection of health at work,
- the protection of the public against the consequences of major industrial accidents as well as correct informing the public about the possibility of the rise of the industrial accidents was emphasised even in a greater extent.

In spite of all the changes there are still objections against this revised and currently valid directive. They concern especially the fact that the directive does not adjust the transportation of the hazardous substances. Then there happens that the inventories are stored in mobile storages and the railway stations serve as unlawful storing places for hazardous substances while the pipelines, ship transport and roads are properly checked. The directive does not solve the legal interpretation and responsibility in the case that an industrial accident develops and this is a big shortage. Similarly a bigger attention should be paid to prevention and especially assessing the risks – activities carried out in its framework.

We should not forget about the REACH when speaking about the European chemical legal standards. REACH means the compulsory registration of all chemical substances on the EU market (with certain exceptions) no matter if it concerns import or manufacturing, or assessing the substances and here most obligations are borne by the private sector and authorisation for very
hazardous substances. It strongly strengthens the pressure on the information accessibility about the properties of the chemical substances from the point of view of their potential environmental and health risks. The Safety Data Card and with it connected exposition scenarios that began to appear in practice during 2010 is the basic document in the business chain.

Currently further amendment of the SEVESO II Directive is being prepared and a new document under the name SEVESO III Directive will arise. The directive is to be changed and amended due to the EU system changes for classifying the hazardous substances to which they refer in the material. Based on this fact it was decided in 2008 that a more extensive investigation of the directive will be carried out because its basic structure and main requirements had remained essentially unchanged since its adoption. Although the investigation showed that the existing provisions fulfilled their purpose as a whole, several areas were determined for suitable limited alterations and completions with the goal to clarify and update certain provisions and to improve the performance and performability and at the same time to preserve or moderately increase the level of the health and environment protection. The main reason for the revision of the SEVESO II Directive is to harmonise its appendix I with the regulation (EC) No. 1272/2008 about classification, marking and packaging the substances and mixtures (furthermore only “KOB directive”) which changes and amends and voids the directive 67/548/ECC and the directive 1999/45/EC to which it is currently referred in the SEVESO II Directive. The rules of the KOB directive will become effective on 1st June 2015.

3 Problem solution connected to transposition of SEVESO directive in Slovak republic

The implementation of the SEVESO Directive began in Slovakia after its entering the European Union. Around 2000 the Ministry of the Environment of the Slovak Republic began to send questionnaires to enterprises with the aim to carry out their categorisation into individual groups according to the directive. The directive provisions were transmitted into the legal standards in the area of preventing major industrial accidents – see the figure 1.

![Fig. 1 Transposition of the SEVESO Directive into the legal standards of the Slovak Republic](image)

In the fig. 1 we can see that SEVESO I is crossed out because this standard was never implemented into the legal standards of the Slovak Republic due to the time when Slovakia entered the EU. The SEVESO III Directive is depicted by an interrupted line due to the fact that it has not been published so far, but it will certainly be implemented in the Slovak legal standards. Already currently the experts from the Ministry of the Environment participate in its preparation. They take part in regular meetings and give their comments in Brussels.

At present among the parties that participate in fulfilling the requirements of the SEVESO II in Slovakia belong:
- the “Seveso companies” (they have to fulfil the legal standards depicted in the figure 1),
- the evaluators (professionally capable persons in the companies or authorised legal entities and natural persons who assess the risk as suppliers),
- the evaluators (the Ministry of the Environment of the Slovak Republic checks the method of fulfilling the legal requirements of the corresponding laws, thus also the results and methods of the risk assessment).

There are currently 80 Seveso companies in Slovakia; out of which 38 possess the A category and 42 are of the B category. The company layout is depicted in the figure.
Even when the SEVESO Directive was not valid in Slovakia an industrial accident happened on 27th October 1995 in the company VSZ, a.s. in Košice. The leakage of the blast furnace gas caused deaths of 11 people (9 as fatal injuries at work and two deaths of people who were not authorised to enter the space), 320 persons were treated or hospitalised due to breathing in the carbon monoxide. The conclusions from the investigation of the industrial accident showed several shortages. Here belonged especially the shortages in coordinating the individual units between the plants, the inability to manage a crisis situation by the plant employees, incorrectly worked out documentation fulfilled only a formal function based on which it was impossible to solve the accident, etc. The analysis of the industrial accident showed also lacks in the then valid standards (the SEVESO I Directive was not valid in Slovakia). At that time the agreement MOP No.174 about prevention of major accidents was valid, however, there was no law that would have solved the prevention of major industrial accidents in a principal way. The competent persons agreed there were missing systematic lawful requirements for preventing major industrial accidents as it was solved at that time by the EU directives and the regulations of the international organisation of work.

The information system for preventing major industrial accidents provides today records of three other major industrial accidents that occurred in the factories after the SEVESO II Directive became effective in Slovakia. They were the major industrial accidents in the company US Steel Košice (former VSŽ Košice) in 2005 and 2006, furthermore in the Chemical Plants in Nováky (at the moment gone bankrupt) in 2005 and in Duslo Šaľa, a.s. in 2010.

4 Conclusion

The safety of the state and its citizens in each country is not only the object of practical steps, but also of theoretic elaboration of these issues and scientific research of the essence of security itself, its methods and tools by which it is being achieved. [11] The need of a legislative adjustment of the area of the major industrial accidents seems inevitable in the current era of the technological progress and globalisation. The SEVESO II Directive is currently valid in the European Union. However, a lot of surveys show the need to amend it or to issue new documents that are to explain some of its parts and provisions. Based on the “Report Assessing the Progress Made with the Implementation of the Seveso II Directive” from 2006 – 2008 in which all 27 countries participated it is claimed that 20 – 35 major industrial accidents occur in the framework of the EU every year. The frequency of the accidents per the total number of the companies is currently three accidents per 1,000 enterprises. The effort of the European Union is to reduce this number to be close to the value of 2. The problem still remains the information rate of the public and this creates the biggest doubts concerning the fulfilment of the directive, i.e. how to behave in the case of an accident and how to deliver the security measures to those persons who could be endangered by the accident. The years 2009 – 2011 will be the further time period in the framework of which the effectiveness of the directive will be checked and the results will be known in 2012.

In spite of its good economic growth and relatively stable economy even during the economic crisis the Slovak Republic has not enough financial means for making control and assessing the Seveso companies and their documentation more effective. On the other hand some companies attempt to simplify their work as much as possible (e.g. utilising the simple methods for calculating the risk) which is understandable on one hand (from the point of view of finance and time, etc.) but on the other hand major industrial accidents can arise due to these hesitations.

The University of Žilina in Žilina is the main solver of the project with the name COMPLEX MODEL FOR RISK ASSESSMENT IN INDUSTRIAL PROCESSES in which we attempt to implement the routine European approach for the risk assessment ARAMIS to those procedures that are used at
present and in this way to unify the rules for all enterprises in the Slovak Republic.

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[9] SEVESO II 2003/105/ EC, European Commission, European parliament and of the