

## **DEFINITION OF THE SCIENTIFIC PROBLEM**

The theme of the essay is to elaborate the process and instrument system in protection against the so called external effects endangering hazardous industrial establishments. It is necessary to have such damage prevention measures which the formation of essential disorders can be prevented with or in case of their occurrence at least the consequences can be mitigated.

Among the external factors in one respect the global climate change standing as pre-eminent having a source of hazard in the first decade of XXI century and in other respect the terrorism. In order to reduce the effects of global climate change it is absolutely necessary to examine the effects of extreme weather situations in what follows, the better recognition of the role of certain weather factors, the certain sanitary ends connection with the extreme weather situations.

The weather, the climate and climate politics dealing with their effects increasingly become part of the general safety politics.

In 2004 the Hungarian Government accepted the new national safety strategy, which changed the earlier valid one. The possible higher degree protection of hazardous industrial establishment is part of the general safety politics. In its interest there are such regulations which claim for certain measures to complete of the operator of hazardous industrial establishment.

Such a legal rule is the Directive on the control of major accident hazards involving dangerous substances issued by EU and introduced in Hungary, notoriously the Seveso II. Directive.

Prior to the introduction of Directive there were of course such legal rules which described certain limitations, regulations in relation to dangerous activities. The rules on fire protection basically determine such a requirement system from the beginning of the formulation when without their realization the given activity can not be implemented safely. Likewise in legal system those civil protection rules can be found as well which are closer to the tasks described in Directive. Among them such is the civil protection planning.

The decree No. 20/1998. (IV. 10) by the Minister of Interior regulates the tasks regarding to emergency planning.

The legal rules however do not fix that on basis of which description should the documentation be prepared and the details regarding to the requirement of content are not being elaborated.

The tasks of the approvers is difficult, given that there is no such a guidance which to see through it is controllable that the measures including in the plan are commensurate with the hazard of the settlement.

Calculation methods are not worked out either which can ease the task of analysts.

For the investigation the foreign literature, experiences were of assistance to me, on the basis of them I make proposal for the competent disaster management organs and hazardous activity workers, among them for the method and instrument ensuring the provision of tasks in scope of operators of hazardous industrial establishment falling under the Gov. Decree No. 18/2006. (I. 26.).

## RESEARCH PURPOSES

During the elaboration of the essay I set the following aims:

- a) I examine the reasons which can cause major industrial accident, the extreme weather events which characterize our country, and their possible effects on hazardous industrial establishments and their secondary effects;
- b) I draw up a questionnaire list for the operator of the hazardous industrial establishments and the authority in order to prevent hazards above and mitigate their consequences;
- c) I examine the installation and instruments of neighbouring hazardous industrial establishments (domino effect) by the investigation method of damage caused by the other establishment and set a question list for the examination of domino effect;
- d) I examine the equipment, instruments and tasks of operators and authority in accident prevention and preparation related to protection against terrorism in installations of hazardous industrial establishments and transportation of dangerous goods,
- e) I propose for the analytical method of hazard by external causes of dangerous activities.

Following the appropriate order of my aims I divided my essay into 3 parts where beyond the short introduction of national legal and institutional system I examine the possibility of integration of methodology used for long time in practice.

I considered as a basic point the scientific basic, the system view approach, the formulation of consequences building on analyses and synthesis and the adaption of experiences of research by foreign partner authorities to its necessary degree. My essay was prepared by the usage of basically objective facts and approaches but I applied individual statements, a better way proposal and approach.

## **RESEARCH METHODS**

I used the following research methods during the preparation of my essay:

- part of the specialized literature used in my thesis is legal harmonisation occurred in the specialized field, internal documents, studies, professional articles and presentations prepared during institutional development and legal implementation. The figures and charts in the essay (determined as own resource) are results of my analyst and elaborating work mainly;
- in my research several foreign studies were processed (specialized materials by EU organs, draft of legal rules, guidance);
- I paid attention also to the guidance and fundamental purposes of VAHAVA program examining the effects on nation of climate change;
- during the research work I kept especially important to adapt into the national legal system of the gained knowledge from international meetings;
- I could make use from my practical experience and knowledge gained from consultation with foreign experts of EU Phare Twinning project assisting the implementation of Directive and as a member of international working group.

## **SHORT DESCRIPTION OF THE PERFORMED INVESTIGATION**

In Chapter 1 I wrote about the harmful effects of extreme weather falling on hazardous industrial establishments. I felt necessary to introduce which secondary effects of the extreme weather events as primary effects can touch the hazardous industrial establishments causing major accident involving dangerous substances there. Following it I chose that secondary effect that can characterize Hungary the most, so the flood occurrence. I determined the notion of flood risk because its explanation became necessary for the punctual introduction of the chosen event. I worked out such a questionnaire related to the flood occurrence which determines in advance those problems, when eliminating them in time, can prevent the occurrence of major accident in the territory of hazardous industrial establishment. The given questionnaire can support the operator of hazardous industrial establishment and experts of authorities as well.

In Chapter 2 I examined the domino effect as a hazard being also an external effect on the operation of hazardous industrial establishment. My primary aim was to prepare such a guide for the operators of hazardous industrial establishment which means as a support in the analyses of domino effect. In accordance with it I grouped those events which can cause a newer major accident involving dangerous substances in case of a major accident. During the analyses work I paid attention to the fact that certain hazardous industrial establishments are different as regard as their activities therefore I have not provided concrete values concerning to the effects caused by certain events but I wished to show a comprehensive, systematize work. In addition I described the theoretical scheme of examination of domino effect.

In Chapter 3 I examined the terrorism and its consequences among external effects being hazard on the hazardous industrial establishment. My fundamental aim was to assist the operator of hazardous industrial establishment and the interventors in rescue. It was important for me as well to provide a guide for the authority which helps during the inspection of safety management system of hazardous industrial establishment to throw light on the not yet regulated or not appropriately regulated fields. Due to it I compiled a questionnaire and an intervention order keeping in of my sight the pattern of the already regulated fields.

## **SUMMARIZED CONCLUSIONS**

I touched upon in my thesis that how the external effects can cause major accident in the territory of hazardous industrial establishment, but independently of it it is important to stress that these effects can have mutual effect to each other. The natural events, human and technical deficiencies or beyond direct hazard of terrorists or crimes the critical infrastructure expose itself to direct hazard also which can be due to the extended analysis of needs for protection.

It is about such a type of domino effect which rises when the external effects eg: events occurring in the neighbouring industrial establishment, surroundings or in the traffic territory can influence the establishment. So such distance events like flood, earthquake, swelling back, overflow of carrier routes can have influence on the operational ability of the establishment.

The disorders in the neighbouring establishment, especially those which have high hazard degree can damage the establishment ( eg: ruins, remains because of fire spread, explosion). Because of other major accident or disaster outside the establishment can rise disorder in the supply units, such as energy and water supply, or in the fulfillment of carriers.

Events occurring in close temporal coherence, disorders rising in more time simultaneous different place or an explosion happening for second detention can cause such an exponential effect which prevent the rescue or reconstruction work or influence in such a way of the prevention activity which can cause other disorders.

The aim of harmful effect on the hazardous industrial establishment of external effects was to be aware of the all kind of possible effects of establishment which are capable to cause major accident involving dangerous substances in the territory of the establishment. It is also important for the authority that the during the fulfillment of tasks determined in law to be aware of those new threats either which can endanger people living in the surroundings of the hazardous industrial establishment.

## **SCIENTIFIC RESULTS**

1. I pointed out the role of extreme weather events in formulation of major accidents involving dangerous substances, and among their secondary effects I worked out process and questionnaire for the mitigation of effects of floods.
2. I created a method for the determination of creation probability of domino effect.
3. I worked out a questionnaire and an intervention order for the recognition and prevention of terrorism as hazard caused by external causes.

## **PRACTICAL USAGE OF SCIENTIFIC RESULTS, PROPOSALS**

1. The ideas described in my thesis can further support the development of the national institutional and task system of Seveso II Directive and can serve as a base to the further examination.
2. My research can be a base of the enhancement of safety level by a question list compiled by myself of establishments not falling under the scope of Gov. Decree No. 18/2006. (I. 26.) but fulfilling dangerous activity, and establishments using dangerous substances during technology.
3. The examinations and evaluations completed in my essay can be used as a base of defining further research directions and areas in the field of industrial safety and environment safety.
4. My essay can be utilized at Miklós Zrínyi National Defence University, in education system of the professional disaster management and other higher educational institutes.