ZRINYI MIKLOS NATIONAL DEFENCE UNIVERSITY

LTC. ENG. IMRE VARGA

Prevention and protection activity system of major accidents involving dangerous substances

Thesis and official review of doctoral (PhD) dissertation

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PREVENTION AND PROTECTION ACTIVITY SYSTEM OF MAJOR ACCIDENTS INVOLVING DANGEROUS SUBSTANCES

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Description of scientific problem

One of essential condition for joining the Republic of Hungary to the European Union was introduction of Seveso II. EU Directive, inclusion of content of directive both into the Hungarian administration and into the industrial safety system, to which the complex structure of disaster prevention, protection and restoration of disaster prevention shall be fitted in integrated manner.

Accordingly such solutions shall be searched, reconsidering the methodology of existing disaster protection fire protection, civil protection procedures, application of which ensures using newly developed domestic system reliable execution of major accident prevention and protection activity of major accidents involving dangerous substances approaching the practice of member states of European Union.

Objectives

1. Applied procedures of prevention and protection of industrial accidents in EU member states shall be studied and analysed, and as result of it formulate solutions suggested for domestic adaptation.
2. Examine different phases of domestic introduction work of Seveso II. EU Directive, systematise the prevention and protection activity of major industrial accidents, come forward with a suggestion for optimisation of future execution work.
3. Analyse the complex task system in relation with Helsinki Convention, come forward with a suggestion for possible areas of development in relation with Convention;
4. Explore conformity of internal and external emergency plans through analysis of complex system of prevention and protection activity of major industrial accidents, examine reconsidered opportunities of related civil protection and rescue organisation tasks, come forward with a suggestion for new, EU conform solutions.

Methods of research

I pursued to achieve my objectives by processing, analyse and synthesis with application of methods induction and deduction the referenced literature and other documents. I focused my research work on exploration of real problems, development of new, specific solutions addressing these problems, relaying on my practical experiences.

Performed investigations

I dealt basically in my dissertation with regulation system related to the prevention and protection of major accidents involving dangerous substances, measures associated with protection of inhabitants, systematisation of new procedures, some common aspects of UNECE Helsinki Convention on protection against transboundary effects of industrial accidents and execution of Seveso II. EU Directive.
I restricted my investigation on upper tier plants, because in these regulations appear those obligations, which are in my opinion partly redrawing the map of domestic inhabitant protection. My dissertation is dedicated also to closing down a long process, summarisation of task system related to Seveso II. EU Directive, systematising those arborescent related activity in which I actively took part from very beginning.
I discussed the investigated and analysed themes in harmony with my objectives in prevention and emergency situation control blocks - divided into two chapters – in my thesis.

I examined **in the Chapter 1** the function of Seveso institution system of EU member states, complex tasks associated with Helsinki Convention, I drew conclusions on the basis of this examination in relation with operation and development of system and international authority forum of protection of major accidents.

I analysed in the Chapter 2 regulation system related to the prevention of major accidents in the Republic of Hungary, domestic experiences of introduction of Seveso II. EU Directive and Helsinki Convention, summarising and evaluating these I made recommendations regarding modernisation of existing functional model.

I examined in Chapter 3 organisational structure of activity related to the prevention of major accidents, analysed the external emergency plan preparation tasks, I pointed out

importance of building on each other the external and internal emergency plans, I made recommendations on harmonisation these plans.

I examined in Chapter 4 inhabitant protection and rescue tasks related to prevention of major industrial accidents, organisational and technical system of mitigation of damages, I made recommendations on future directions of legal-, organisational- financial-, technical development of related activities.

Summarised conclusions

In relation with prevention of major accidents involving dangerous substances

1. As fundamental principle of strategic approach to disaster prevention complex activity it can be stated, that the prevention has priority in comparison with intervention and restoration considering the systemic approach and superposition.
2. It can be stated that in line with implementation practice of determinant EU member states it was an ideal decision to assign the authority rights to the National Directorate General for Disaster Management of the Ministry of the Interior. It means, that the authority responsibility of prevention is coinciding with state competence of effective intervention in emergency case, therefore the significant part of complex activity of prevention of major industrial accidents is concentrated in one hand.
3. In connection with amendment of Seveso II. EU Directive the number of hazardous industrial establishments would increase approximately 20%. As a result of it some plants would become upper tier establishments, which mean more strict obligations, considerably increasing the administration and financial burden of operators.
4. It can be stated regarding the Helsinki Convention that there are further development opportunities in increasing effectiveness of bilateral and multilateral relationship, enhancement of mutual information supply, increasing operability of alerting – notification, organisation common emergency prevention trainings, harmonisation of emergency plans.
5. The cyanide and heavy metal contamination directed the international attention on issue of responsibility for prevention of transboundary environmental effects and

occurred damages, necessity for creating appropriate legal background, enhancement effectiveness of legal claims.

6. Experience of introduction of Seveso II. EU Directive until now shows that part of establishments instead of implementation of regulations were oriented to logistical solution, which resulted in other type of mobile insecurity.
7. According to domestic union administration conceptions it is not reasonable to assign primary authority rights, which require significant institutional and human development, to lower level.

In relation with protection activity of major accidents involving dangerous substances

1. It can be established as result of examination of management model of protection activity of major accidents involving dangerous substances that considering operation of Goverment Coordination Committee, Industrial Protection Working Committee - including operation of complex protection system in relation with Seveso establishments – relocation to competence of Ministry of Interior was justified and reasonable.
2. Protection of inhabitants and environment primarily is realised through system of measures created in external emergency plan.
3. After finalisation of safety reports and subsequent periodical revision of safety reports it is necessary to perform actualisation, revision of external emergency plans, accordingly it is necessary to reconsider previously determined inhabitant protection measures.
4. Conformity of external and internal emergency plans is essential condition of complex protection system of major industrial accidents, it is necessary to develop a cooperation model, which connects the activity of plant alarm levels and inhabitant protection measures determined in external emergency plan.
5. It shall be considered as fundamental principle in protection activity of major accidents involving dangerous substances that occurred events shall be handled at possible lowest level and if the human – material-technical resources of given protection level is insufficient, then in this case the next higher level condition system shall be activated in the protection.
6. A centrally controlled siren system shall be established at national level – in line with Western-European practice - which is reasonable to install in case of

hazardous industrial establishments that it should be able to cooperate with any type and system of monitoring network.

7. The relocation cannot be planned and rescuing can be executed only in case when enough time is available. In line with practice of EU member states the primary protection of inhabitants resident in vicinity of hazardous industrial establishment in case of catastrophe – outflow of toxic material – is performed by isolation. This method is preferable applicable in the future in the domestic practice, which would redraw the related regulations, and change professional and protection technical establishment of inhabitant protection measures.
8. Individual protection equipment (escape hood) – in line with European Union practice – basically can be used as rescue tool for escaping affected inhabitants from contaminated area.
9. In agreement with opinion of official professional experts that in short term it is not reasonable in Hungary to follow mechanically the EU practice in respect of neglecting personal protection equipment, i.e. total elimination of existing supply system of protection equipment shall not be implemented, therefore the safety feeling of inhabitants shall not decrease in the transfer time period.
10. As result of examination of organisation framework of rescue apparatus it can be established, that in line with practice of some North EU member states – a rescue station based on association of self governments would be a intermittent and economic solution between local and regional emergency situation management levels.
11. The most important key organisation of protection activity of major industrial accidents, mitigation of potential damages, as primary intervention is the firebrigade. From point of view of chemical exploration and reliable data supply the role of Emergency Exploration Groups is determinant. These organisations are basically capable with available resources and equipment for performing related fire fighting and exploration tasks, but it will be necessary the expedient development their equipment in near future and appropriate preparation their staff for more operative and effective response to industrial accident.

New scientific results

1. **I systematised prevention and protection activity** of major accidents involving dangerous substances **in uniform system on the basis of my foreign and domestic experience and pointed out** problems, which occurred during introduction of Directive and future effects thereof, new situation occurring as result of amendment of Directive, I **developed concrete recommendations** for optimisation of described authority licensing and inspectoral activity.
2. **Proving** the necessity of cooperation model between external emergency plan and internal emergency plan planning tasks – on the basis of my practical experience and professional investigation – I established concrete directives of modernisation of external emergency plans.
3. **I made first concrete recommendations –** in line with European Union practice – on efficient execution of specific inhabitant protection tasks of major industrial accidents, on technical solutions, which can be implemented in practice.
4. Examining rescue organisation issues of protection tasks of major industrial accidents and its effects, **I pointed out EU conform reorganisation** of rescue system, and made concrete recommendations for more operative and effective intervention on development of resources and equipment of organisations participating in operation of the system.

Recommendations of dissertation

1. My dissertation can be used as work-help after performing appropriate structural edition modifications primarily in the education system of professional disaster protection, in Zrínyi Miklós National Defence University and Police Officer College.
2. My dissertation can be used – within framework of some disciplines –in different educational institutes of non defence related and constabulary education dealing with Seveso II. EU Directive.
3. My theses would serve as basis for:
   - Strategic establishment of inhabitant protection tasks of protection activity of major accidents and detail work out thereof;

- Performing continuous modernisation tasks of external emergency plans, and harmonisation with internal emergency plans within it;
- Determination of modernisation and development directions of organisations participating in protection activities of major industrial accidents;
- Planning and execution of technical solutions of mitigation of effects of major industrial accidents;
- Theoretical and practical establishment of preparedness of public.

4. My dissertation would serve as basis for amendment of several regulations, and elaboration of new internal regulators.
5. My dissertation would contribute to determination of priority of objectives of prevention and protection tasks of protection activity of major accidents and elaboration of appropriate ratio of development areas.

List of own publications

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2. Imre Varga: Planning of civil defence in Republic of Italy, Magyar Polgári Védelem, vol. XLI. No. 6. (8. page).
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4. Imre Varga: Disaster protection, A Munkaadó lapja, vol. VII., No. 2000. 8. (24.-28. page).
5. Imre Varga: Prevention of industrial accidents. A Munkaadó lapja, Vol. VII., 2000. No. 12. (52.-54. pages).
6. „Methodological guide" to domestic introduction of SEVESO II. Directive (co-author). Issued for professional regional and local organs of disaster protection, BM OKF internal publication, June 2001. co-author.
7. Imre Varga: presentation of selected theme – „Doctorands and their research thenmes", ZMNE website (http://www. zmne. hu/tudtev_uj/doktorand/vargaimi. htm)
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9. Imre Varga– Gábor Cseh: Elaboration of uniform regulation of hazards of major industrial accidents in connection with requirements of prevention and protection, Doctorands in service of Science, Disaster Management Magister Books (Katasztrófavédelmi Magiszter Könyvek) - BM OKF publication (137.-158. pages), ISBN: 1587-7663.
10. Presentation in English language in „FÁTRA 2001." International workshop and training in Bratislava" Comparison of regulations for external protection plans set out in the SEVESO II. EU Directive with the current domestic protection planning structure and Helsinki Convention" (A hazai veszélyelhárítási tervek kapcsolódása a SEVESO II. Irányelvben előírt külső védelmi tervekkel és a Helsinki Egyezménnyel)– which was issued in form of „CD" in Republic of Slovakia, ISBN: 80-89051-00-6.

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Professional-scientific curriculum vitae

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1986 -1989 Miklós Zrínyi Military College, Technical department

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Positions held:

2001- MOI NDGDM[1]– senior executive referent

2000-2001. MOI NDGDM – senior executive

1998-1999. MOI CCPS[2] – planning department manager

1997-1998. MOI CCPS – senior executive

1993-1996. MOI CFCPS[3] – executive

1989-1993. HA Technical – Supply Centre, Chief of Staff (Deputy Commander)

1985-1989. Zrínyi Miklós Military College (1. year „K" class)

1983-1985. 4. Military Major Building Engineering, deputy manager

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1980-1982. 2. Military Major Building Engineering - foreman

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1987. Russian medium level „C"

1993. German medium level „C"

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Scientific membership:

2000. Hungarian Association of the Art of War*, Civil Defence Department, secretary*

2004. Hungarian Association of Surveillance

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[3] Ministry of Interior Command of the Fire and Civil Protection Service