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### **A lakosságvédelem időszerű kérdései a veszélyes anyagokkal foglalkozó üzem balesete időszakában**

#### **Actual Questions of Population Protection in the Period of an Accident at a Hazardous Plant**

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**ACTUAL QUESTIONS OF RESIDENTAL DEFENCE  
IN THE PERIOD OF AN ACCIDENT AT A HAZARDOUS PLANT**

**A LAKOSSÁGVÉDELEM IDŐSZERŰ KÉRDÉSEI A VESZÉLYES ANYAGGAL  
FOGLALKOZÓ ÜZEM BALESETE IDŐSZAKÁBAN**

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**Abstract**

*The national system of homeland disaster management has undergone significant changes in Hungary recently. Industrial security has also been added to their area of responsibility, authorizing them with the supervision of the administrative processes of licensing, operation and control of hazardous industries. The goal of industrial security is to guarantee safety against possible effects of hazardous plant accidents. As the territory outside such plants is under the control of civil protection, the aim of the article is to identify some of the key difficulties of external defence planning.*

**Absztrakt**

*A katasztrófavédelem honi rendszere jelentős átalakításon esett át, új szakterületként jelent meg az iparbiztonság, mely a veszélyes üzemek engedélyezésével, működésével kapcsolatos hatósági feladatokat felügyeli. Természetesen akárcsak a másik két szakterületnek, az iparbiztonsági végcélja, hogy az üzem által esetlegesen veszélyeztetett lakosság biztonsága garantálva legyen. Mivel az üzemen kívüli területek a polgári védelmi szakág fennhatósága alá tartoznak, így célom az, hogy a külső védelmi tervezéssel kapcsolatos főbb nehézségeket megfogalmazzam.*

**Key words:**

*Residential defence, civil protection, industrial security, external disaster planning ~  
Lakosságvédelem, polgári védelem, iparbiztonság, külső védelmi tervezés*

## **INTRODUCTION**

The new disaster management system laid the basis of a highly effective residential defence organization to ensure social security by integrating the professional fields.

The professional fields are linked but they supervise sharply demarcated areas while ensuring the execution of organizational tasks. One of the demarcated fields is to guarantee safety of inhabitants living near a hazardous plant as Industrial Security is responsible for licensing and supervising the operation of the plants. In case of an accident, when the hazardous substances get out of the plant, the disaster management is responsible for protection of inhabitants living near the plant.

Certainly, residential tasks have to be handled as a system, of which periodical tasks guarantee safety of the population living in the area affected by the hazardous plant together. This system sets guarantee during the licensing process of hazardous plants, which is a period of residential defence prevention, the section of preparation and prevention. The other period consists of measures done during the remedial period in case of an accident. The third period is the time of reconstruction, which always depends on the case.

The aim of my presentation is not to demonstrate the whole system but a segment of it, which is the schematic demonstration of residential defence in the remedial period based on the external disaster planning, particularly the choice of the appropriate method to alert the inhabitants and the related preparation for the preventive period. In my presentation I do not analyse the possible issues of the remedial period as the inhabitants are out of the hazardous zone by this time and they can be let to return only after the danger has passed away.

## **DISTINCTION OF HAZARDOUS INDUSTRIAL PLANTS**

The Hungarian regulation based on the SEVESO II. principles is declared in the disaster management law [1], and its government regulation [2].

In brief, based on the rules, the hazardous substances and the identification procedure we can distinguish three kinds of hazardous plants:

- with high threshold,
- with low threshold,
- below threshold

The significant modification of the new Hungarian regulation is that the disaster management or authority can decide about the identification of the plant. During the remedial period, not depending on the level of the hazardous substances, they are also entitled to force the settlements to make external planning, the plan to make internal disaster planning, the plants can be obliged to plan how to avoid a serious accident or they can even be absolved.

Basically, a plant with high threshold has got an internal disaster plan (IDP) and a settlement concerned with a threatening disaster has an external disaster plan (EDP). The plants with low threshold have inner disaster plans, while the ones below threshold have a severe damage recovery plan (SDRP), it can happen though based on the remedial, according to my previous paragraph that the settlement has to make an external plan to protect the population affected by a plant below threshold.

In case of a high threshold plant, the settlement can be absolved from execution of the external disaster plan. The government regulation give details about the exemption rules, the regulation severity decision of the authority is based on the social and individual analysis, which is also detailed in the regulation.

## **RESIDENTIAL DEFENCE BY EXTERNAL PLANNING**

Concerning the newly established hazardous plants the legal background guarantees the preventive residential defence as the released disaster management licence should be the basis of the spatial planning. However, there are many plants, which were established before the Hungarian naturalization of SEVESO II principles and there are some people living near them. To protect them, the external disaster plan has to declare three significant tasks:

- the alert of the inhabitants,
- defining the residential defence method,
- preparation of inhabitants

Before starting to analyse the three mentioned tasks I think it is essential to clarify what effects threaten the inhabitants living or staying near the hazardous plants.

Basically not only the risk of a fire or explosion caused by the hazardous plant but the environment is also threatened by the toxic contamination.

The fire and explosion can be kept inside the plant by enforcing and complying with rules so the main source of danger to the population is if the hazardous substances get into the environment.

The gaseous hazardous substances can get out of the plant the easiest and its spreading it the least recognizable so in case of some liquid hazardous substances, like ammonium, the gas formation is the most dangerous toxic effect. No doubt, a huge amount of hazardous substance is also able to cause a disaster, like the red mud in Devecser in 2010.

The alert of the inhabitants is adjusted in details in the disaster management regulation [3]. The settled systems give the basis of the alert but it is also possible to involve the media and info-communicational devices extensively. The settled systems in our country can be divided into two groups. In many places, near the high threshold plants new systems came to exist, which are appropriate for not only alert but also broadcasting information.

Their main advance is that they are able to recognize the amount of the hazardous substances and alert inhabitants without human intervention and they issue the residential defence by the release of the pre-stored information. This system is called MRAS, which is an acronym of Monitoring and residential alarm system.

The people living in the area protected by the MRAS are in safe but there will be some problem in residential defence in the areas where the system has not been set properly.

In the first sub-heading I mentioned that in case of a low threshold or below threshold hazardous plant, by analysing social and individual risks, such a decision can be made where the given settlement is forced to make an external disaster plan to solve the problem of residential alert.

The residential alert system, which was set up in the 70s is not appropriate for this purpose in its present form as most of its terminus are unable to work and in most cases they are not centrally but individually operated devices. The operation is done manually in the boxes in the bottom of the bars.



Installed residential alert terminus, disaster management powered siren  
Source: Szentés Civil Protection Branch

Let's check the factors of the residential tasks. The time factor can be divided into three components:

- 1.** The recognition of an even in the plant or the fact that the event will have an effect on the people.
- 2.** The residential alert, broadcasting information, reaction and the safety position, which guarantee a temporary defence against the hazardous substances.
- 3.** The time needed for the dangerous amount of hazardous substance to get out to the environment.

The residential defence is done when time factor of the first and second part together is lower than the time of the event described in the third point.

Taking into consideration that the powered sirens have been settled to alert in case of an air raid and the disaster management tasks were given to them later, the rarely settled sirens often are not in the area of the hazardous plants thus there would be too many causeless alerts if it was possible to operate them centrally and if they would work at all. I mean the sirens settled near the plants should be operated centrally. The residential alert by these devices can be announced locally by the mayor.

The time factors of his announcement and decisions affect the realization of residential defence negatively. In some cases, depending on the type of the hazardous substances the residential alert and defence can be based on forces of the disaster management and police but in general, the main target should be to settle a system, which is appropriate for the above mentioned time criterion not depending on the apparatus of the given plant.

This means the solution for the residential alert tasks related to the external disaster plan can be the terminus of MRAS system because without any information from the plant, the system itself is able to alert and set up residential defence arrangements depending on the amount of the hazardous substances.

When defining the residential defence method, from the three methods (removal of population, evacuation and sheltering) evidently the sheltering has to be planned with the proviso that based on disaster management rules the removal of evacuated people also has to be planned. If the alert is done on time the inhabitant can hide in the bathroom with small doors and windows, which can be stopped up by wet towels and the person can get some water to drink can be enough shelter until the evacuation.

At the arrival of the expert from the disaster management the sheltered people can be evacuated from their houses by breathing protection. However, it needs strength so it is essential to plan resources depending not only on the happened disaster but the people who need to be evacuated also have to be taken into consideration.

In case of sheltering, there is one more difficulty, which is giving information to the people. After turning of electricity it is possible by sending SMS to the mobile phones, by radio broadcast or by a loudspeaker. A loudspeaker on a car is dangerous because of the breather air but the MRAS system could solve this problem as well by the pre-recorded text. This way the people get information about the happened disaster, the need or acceptable arrangements and the expected behaviour.

The concerned people have to be prepared for the recognition of the alert and the needed arrangements. As the difficulties of the residential defence are reflected in alerts and broadcasting information, after their release the execution of residential defence is provided by preparations with active and passive information as detailed in the regulations. It is useful to study the questions of sheltering with the inhabitants to be able to perform automatically, without any precipitance in case of an alert.

### **Summary**

To sum up, it can be determined that the new regulatory basis accomplished a significantly more effective system for protection of inhabitants than the previous ones. As for the newly established plants, there is an appropriate statutory authority existing in the preventive section to minimize the effects of the hazardous accidents. However, concerning the existing plants, if a new external emergency planning obligation is set, the powered sirens of the settlements cannot be used to alert the population in need. The suggestion for the solution is to think over installation of each terminus of MRAS system in case of each plant.

### **Abbreviations**

IDP – Internal disaster plan  
EDP – External disaster plan  
SDRP – Severe damage recovery plan  
MRAS – Monitoring and residential alarm system

## **Bibliography**

- [1] 2011. Government regulation of disaster management and the related amendments in year CXXVIII.
- [2] 219/2011. (X. 20.) Government regulation for the prevention of serious accidents caused by hazardous plants
- [3] 234/2011. (XI. 10.) Government regulation for execution of disaster management law and the related amendments in year 2011. CXXVIII.