HADMÉRNÖK

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INDUSTRIAL SAFETY OF DEBRECEN CITY WITH COUNTY RIGHTS – WITH PARTICULAR REGARD TO DANGEROUS ESTABLISHMENTS, TRANSPORT AND STORAGE OF DANGEROUS SUBSTANCES IN RELATION WITH NATIONAL AND INTERNATIONAL MEASURES

Abstract

In the last decades, there had been several industrial accidents in Europe that affected many countries, so it took serious international efforts and co-operations to establish the institution of industrial safety. Several legal instruments and administrative bodies had been established within the European Union, which helped to reduce the number and frequency of industrial accidents, as well as to limit their negative impacts. Hungary introduced a new regulation (which is already acting at international levels), called Seveso III. Directive. In this article, we will: examine the vulnerability of Debrecen in the field of industrial safety; detail the international standards the Hungarian regulations and the amendments to be introduced by the regulations of the Seveso III. Directive; and analyse the activities of Hajdú-Bihar County Directorate for Disaster Management in the field of industrial safety. In addition, we will also examine the transport and storage of dangerous substances in the area of Debrecen, and we will make particular suggestions according to the safety measures.

Az elmúlt évtizedekben több olyan ipari baleset történt Európában, mely sok országot érintett, ezért komoly nemzetközi összefogásra volt szükség az iparbiztonság megteremtése terén. Az Európai Unióban több jogszabályt alkottak és különféle egyéb szervezeteket hoztak létre, mely hozzásegített az ipari katasztrófák számának és gyakoriságának csökkenéséhez, illetve károsító hatásuk korlátozásához. Magyarország jelenleg egy új - már nemzetközi szinten működő - szabályozást, a Seveso III. EU irányelvet vezeti be. A cikkünkben vizsgáljuk Debrecen város iparbiztonsági veszélyeztetettségét, részletezzük a nemzetközi normákat és a Magyarországi szabályozást, a Seveso III. irányelv által bevezetésre kerülő módosításokat, valamint elemzzük Hajdú-Bihar Megyei Katasztrófavédelmi Igazgatóság iparbiztonsági tevékenységét. Vizsgáljuk továbbá a veszélyes anyagok szállítási és raktározási tevékenységet Debrecen területén, illetve konkrét javaslatokat teszünk biztonsági intézkedések bevezetésére.

Keywords: *industrial safety, dangerous substances, dangerous establishments, industrial accidents, Seveso ~ iparbiztonság, veszélyes anyagok, veszélyes üzemek, ipari balesetek, Seveso*

INTRODUCTION

In the first part of our present study, we will give a brief historical overview on the changes of the legal regulations of the industrial safety system, regarding the national and international standards and European Union laws.

In the second part, we will: demonstrate the basic definitions of industrial safety; examine the industrial safety of Debrecen, with particular regard to establishments handling dangerous substances, tasks and experiences in connection with the transport of dangerous goods, the protection of these prime necessity establishments-facilities; and demonstrate the activities of Hajdú-Bihar County Directorate for Disaster Management in the field of industrial safety.

Defence Administration

One of the significant tasks of the security policy of Hungary is to defend the safety of its citizens. From the point of view of preventing disasters, it is essential that the tasks in connection with dangerous substances are being performed correctly, and this is the most relevant thing to do at present. The establishment of industrial safety was accelerated by the technical developments that took place decades after World War II, with the unwanted result of these developments being the increased number of industrial disasters in the past 50 years.

Despite the gradually elaborated industrial regulations, several industrial accidents had taken place in the past four decades in Europe:

- 1976. Seveso, Italy: During the production of trichloro-phenol, a toxic gas, tetrachlorodibenzo-paradioxin was formed due to overheating, which was released in the air, resulting the evacuation of two settlements with their population allowed to move back to their homes only a half-year later. 2000 people suffered irreversible impairment due to dioxin-poisoning [1].
- 1984. Bhopal, India: A malfunction occurred during an accident at the pesticide plant of Union Carbide India Limited. Due to the malfunction, 40 tons of highly toxic methyl isocyanate was released. 3135 people died and another 20 000 were injured [2].
- 1984. Mexico City, Mexico: A gas container of an oil company blew up resulting in the leakage of liquid gas. Due to the accident, 400 people died, approx. 1000 people were injured and 300 000 inhabitants had to be evacuated from the direct neighbourhood of the company [3].
- 1986. Basel, Switzerland: A fire occurred in a company storing pesticides. Several citizens suffered from irritation of the respiratory system caused by the smoke [4].
- 1988. Piper Alpha (oil-derrick in the North Sea): 167 people died in the rousing fire caused by an explosion [3].
- Accidents of oil-tankers in the years of 1970-1980 (Exxon Valdez) [3].
- 1998. Coto Donana National Park, Spain: The wildlife of the national park was almost completely killed following an industrial disaster [3].
- 2000. Zazari, Romania: At the site of the Romanian-Australian mining company, Aurul, a dam holding cyanide waste water, got a water load and burst, which resulted in a spill of 100 thousand cubic metres of toxic water, so the rivers Lápos, Somes and Tisza had cyanide concentrations of over 800 times the permitted levels and the wildlife of river Tisza was almost completely killed [3].
- 2000. Enschede, the Netherlands: The explosion occurred in the firework plant near to the city killed 21 people and injured another 1000. The following examination proved that the accident was a result of organizational problems [5].
- 2001. Toulouse, France: A large amount of ammonium-nitrate exploded in a plant producing chemical fertiliser, located 3 kilometres from the city. As a result of the accident, 29 people died, another 2442 were injured, 500 houses became unliveable

and 11 000 houses were damaged. The probable cause of the accident was human error [5].

- 2005. London, England: Several oil tanks at the Buncefield oil-refinary exploded and resulted in an extremely large fire [6]
- 2010. The largest industrial disaster of Hungary occurred after the dam of a reservoir containing red mud had collapsed, claiming the life of 10 people and causing serious damage to property and in the environment.[1]
- 2015. In one of the industrial parts of the North-Chinese town, Tiencsin, a warehouse of a company handling dangerous substances has blown up. At least 140 people died and several hundreds were injured; everything was destroyed in a twenty-thousand square kilometres circle around the explosion. The rescue is still in progress.

The industrial accidents in Europe accelerated the establishment and widening of regional measures. Therefore the following legal regulations were introduced at international level:

- Seveso I. Directive (on the accidental risks of industrial operations). The purpose of this regulation was to minimise the occurrence of industrial accidents in dangerous sites [7].
- Seveso II. Directive was elaborated after the industrial disaster in India ~ Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances, later came its amendment ~ Directive 2003/105/EC of the European Parliament and of the Council, and the UN ECE Convention on the Transboundary Effects of Industrial Accidents.
- In 2012, the European Parliament and the Council accepted the Seveso III. Directive.

The primary purposes of the above mentioned directives are to prevent serious industrial accidents related to dangerous substances, and to ensure the protection of people conducting their lives or staying on the area of emergency, and their environment.

Hungary also did not have an exemption from accidents caused by industrial development, here is a list of them occurred in the past one and a half decades, without being exhaustive:

- 2000. Alongside the river Tisza: The cyanide contamination originated from Romania has spread all way long of the Hungarian section of river Tisza [3].
- 2004. Törökbálint: A pyrotechnical warehouse was blown up.
- 2006. Balatonfűzfő: Likewise, a pyrotechnical warehouse was blown up. No one in the warehouse survived the explosion.
- 2010. Kolontár: One million cubic metres of red mud spilt from the reservoir located near the village, and flooded 3 settlements in the neighbourhood, killing 10 people, 100 people had to go to hospital with various injuries and a lot of buildings were damaged and became unliveable.
- 2012. Aszód-Gödöllő: Dangerous substances were released following a railway accident occurred in the region.
- 2012. Cegléd. A van transporting isotope capsules considered dangerous goods crashed with a train in the vicinity of Cegléd. The van transported 25 kg of haz-ardous goods, according to the papers of the vehicle, 192 pieces of isotope capsules were in a small container. The container was damaged in the accident, but there was no dangerous substance released into the atmosphere, as the capsules did not break [8].

Disaster management and the organization system of defence administration gained a lot of experience by learning from the intervening disasters, therefore they are able to handle emergencies in a more prepared and effective way nowadays.

[1] Muhoray Árpád: A katasztrófavédelem aktuális feladatai. Hadtudomány on-line. 2012. IV. szám.

In compliance with the international standards, Hungary has elaborated its national regulations and laws for preventing and removing industrial emergencies:

- The Parliament and the Government has elaborated the regulation on the protection against major industrial accidents, which came into effect in January, 2002 then this regulation was amended twice, in 2006 and in 2012 [3]. Hungarian authorities had already achieved the national accomplishment of the EU-, and international regulations by the time Hungary joined to the European Union. The 2003 amendment of the directive came into effect in 2006 [3].
- Act CXXVIII. of 2011 concerning disaster management and amending certain related acts (25. & section (1), competence) 219/2011. (X. 20.) Government Decree on the protection against major accidents related to dangerous substances (4. & section (3), competence).
- 234/2011. (XI. 10.) Government Decree of the Government implementing Act No. CXXVIII of 2011 concerning disaster management and amending certain related acts (Annex 1 section a) 9. competence).
- 208/2011. (X. 12.) Government Decree on the detailed rules of disaster management penalty, the inpayment and refund of the disaster management contribution.
- 51/2011. (XII. 21.) Ministry of the Interior Decree on the authority processes subject to administrative service charge in the authority processes of major accident prevention related to dangerous substances, on the administrative-like services and statements, on the amount of charge to be paid, and on other regulations regarding the payment.
- 219/2011. Government Decree on the protection against major accidents related to dangerous substances, entered into force since 1st January, 2012.
- 34/2015 Government decree on the amendment of 219/2011. (X. 20.) Government Decree on the protection against major accidents related to dangerous substances and on the amendments of certain related government decrees on the uniform governmental documentation system.

It can be stated, that the protection against the emergencies developing in the area of safety and the industrial accidents can be accomplished with a wide range of measures, in a well-organized defence administration system, and a well-constructed co-operation between the bodies of disaster management and public administration, and that the old and the newly arisen risks should be monitored continuously during this process.

To understand the process of the protection against major industrial accidents, it is required to define the concepts of dangerous substance, and establishment handling dangerous substances.

Establishment handling dangerous substances

Establishment handling dangerous substances is an establishment in which dangerous substances are produced, used, transported, or stored.

A dangerous establishment itself poses a danger to its environment and those citizens living in its environment, considering the possibility of emerging an industrial accident [9].

Dangerous substances

A substance or an object is dangerous, if it is harmful to the lives, health and natural environment of humans and animals and to property during its production, packaging, loading, storage, transport/carriage and application.

In Hungary, the definition of dangerous substance is partly regulated in the chemical safety act [10]. The chemical act details the dangerousness of substances to humans and to the

environment, classification and packaging of dangerous substances, regulations for labelling, the reporting of dangerous substances, registration certificate of new substances and the risk assessment of dangerous substances. It also regulates the effect of the act and the measures of enforcement. The definition of dangerous substance can be found in several laws; the establishments were classified as lower- or upper-tier establishments [11] according to the threshold value amounts (critical quantity) determined in the annex of the implementing decree of the disaster management act [12].

Classification of dangerous substances

Classification and labelling of dangerous substances and products can be made as follows:

1. Based on their physical-chemical basic characteristics
1.1. Explosive
1.2. Contributing to combustion, oxidising
1.3. Highly flammable
1.4. Flammable
1.5. Less flammable
1.6. Other factors

2. Based on their toxic properties
2.1. Highly toxic
2.2. Toxic
2.3. Harmful
2.4. Corrosive
2.5. Irritative
2.6. Irritable (allergenic, sensibilizing)
2.7. Specific negative impacts to the health: organ-specific or organ system-specific effects in, or following an acute, subacute or chronic poisoning, which can be serious and no-serious, reversible or irreversible
2.8. Carcinogenic
2.9. Mutagenic
2.10. Reprotoxic (having a toxic effect on the process of reproduction)
2.11. Other specific properties (absorbs through the skin, cumulative, etc.)

3. Based on their impacts on the environment
3.1. Highly toxic
3.2. Toxic
3.3. Harmful [13].

Causes of industrial accidents

Based on statistic data, it can be stated, that the industrial accidents occurred in the past years were mainly caused by human error. Another causes were malfunctions of industrial equipment, or the inconvenient inspection of these equipment.

Based on the above mentioned facts, it can be stated, that the causes of accidents may be:

- human error;
- technical malfunction;
- chemical reactions that became uncontrollable;
- external factors.

The most important future target of governmental bodies and operators is to minimise the risk of industrial accidents [3].

Effects of industrial accidents

Industrial accidents could have the following effects on humans:

- physical effects: fires and uncontrollable chemical reactions could lead to explosions with the result of rubbish dispersing for several hundreds of metres;
- heat-effect: spreading of flammable liquids and steams, that could occur burning lesions;
- poisoning: toxic substance gets into the human system by breathing, absorbing through the skin or swallowing, which could cause burning lesions or respiratory problems [3]

For preventing industrial accidents, dangerous substances are classified into a disaster management classification, and identified.

The three phases of the defence against industrial accidents

The defence against industrial accidents – alike to the periodic dividing of the defence against disasters – can be divided into the periods of prevention, preparedness-protection and elimination-restoration.

1. *prevention:* The main task~~s~~ of prevention are the completion of the safety documentation. Such as safety reports, safety analysises and accident-prevention policies, as well as approvals and inspections of the authority. Safety analysis: According to the disaster management act and the 219/2011. Gov. Decree, the operator of establishments handling dangerous substances shall produce a safety analysis and a safety report demonstrating the main targets regarding protection, if the quantities of the dangerous substances present equal to or in excess of the lower-tier or upper-tier quantities. Major-accident prevention policy (MAPP): an operational document of a lower-tier establishment including the analysis of the risk factors of the establishment and the executive order and conditions of the measures for preventing major accidents in connection with dangerous substances, and reducing their effects [14]. The operator regularly inspects the MAPP, and conducts a training annually where some parts of the organizations assigned in the plan, and a training once in every three years where the whole organization assigned in the plan are being trained.
2. *preparedness*: Preparing internal emergency plans and settlement management by the establishment handling dangerous substances, preparing and inspecting external emergency plans by the authorities. Internal Emergency Plan: The operators of every establishment handling dangerous substances has to prepare an internal emergency plan considering the safety report, for preventing potential emergencies. The target of the internal protection is to protect the health and lives of people working at the dangerous establishment. For the drill of the plan, the establishment annually conducts a training where some parts of the organizations assigned in the plan, and a training once in every three years where the whole organization assigned in the plan are being trained. The inspection of the Internal Emergency Plan shall be accomplished once in every 3 years, and its feasibility should be inspected regularly. External Emergency Plan: In case there is a risk of an establishment handling upper- and lower-tier dangerous substances, and there is a risk of an establishment obliged to prepare a major-accident prevention policy, the establishment and the authority prepare the plan together, at least in every 3 years. Its target is to protect the inhabitants and their property living near to the establishment, to protect the natural environment, and to

mitigate the possible intervening damage. The External Emergency Plan is part of the emergency response plan of the settlement [14]. If more dangerous establishments (lower-, upper-, or below-tier) can be found in the settlement, also no more than one External Emergency Plan is needed. To check its feasibility, a drill should be performed annually, and an External Emergency Plan drill should be performed in every 3 years, where all participating bodies of the External Emergency Plan should take part [15].

3. *Elimination-restoration:* To eliminate the emergency being formed, and to restore the essential life conditions needed to begin and perform reconstruction. In that case, a proposal for taking actions should be elaborated and matured.

Identifying dangerous establishments

According to the disaster management act of 2011, there are seven settlements in Class I, fifty-two in Class II and twenty-three in Class III. Debrecen is classified as a Class I, being one of the highest, most critical settlements.

Dangerous establishments could be

- Upper-tier establishments;
- Lower-tier establishments;
- Below-tier establishments;
- Below-tier economic entities handling dangerous substances.

During the process of identifying establishments handling dangerous substances, it should be determined, whether the establishment falls within the scope of the disaster management act, and that the establishment is a upper-tier, lower-tier or below-tier establishment.

Dangerous establishments in Debrecen

With regard to the fact that the operations of a dangerous establishment and its sites could have an impact on the health of people working in the establishments and to those living around it, it is highly important to enforce the proper safety measures. Close co-operation between government authorities and law enforcement offices is essential for safe operation and performing the required inspections, particularly the participation of the authority of disaster management-industrial safety.

Upper-tier establishments in Debrecen

e.g.: Teva Pharmaceuticals Zrt.

Obligations of upper-tier establishments handling dangerous substances:

- operating a safety management system;
- co-operating in the preparation of the external emergency plan and fulfilling the obligation of providing data in connection with it;
- preparing a safety report.

Lower-tier establishments in Debrecen

e.g.: FAG Hungary Ltd.; E.ON Hungária Co.; Kristály-99 Ltd.

Obligations of lower-tier establishments handling dangerous substances:

- preparing an internal emergency plan;
- preparing a safety analysis;
- fulfilling the obligation of providing data in connection with the preparation of the settlement management plan;
- preparing an action plan for preventing major accidents.

Below-tier establishments

Below-tier establishments should prepare an emergency plan for preventing emergencies, and must provide data for the external emergency plan.

Number of dangerous establishments in county Hajdú-Bihar and in Debrecen:

	County Hajd-Bihar	**Debrecen**
Upper -tier establishment handling dangerous substances	6	5
Lower -tier establishment handling dangerous substances	10	7
Below-tier establishment – on MAPP	31	17
Sum-total	**47**	**29**

1. table. Number of dangerous establishments [16]

DANGEROUS ESTABLISHMENTS REGARDING HAJDÚ_BIHAR COUNTY DIRECTORATE FOR DISASTER MANAGEMENT

Periodical inspections of establishments handling dangerous substances and drillings of internal protection- and major-accident prevention policy performed by the operators had been accomplished as planned by the relevant authorities.

A total of 74 inspections had been accomplished at identified establishments, and at economic entities handling dangerous substances by the authority, which did not find any incomplition or irregularities.

In 1 case, the drill of major-accident prevention plan had to be repeated by the obligation of the authority, due to its insufficiency.

A malfunction had occurred at a site of a below-tier establishment resulted in a release of ammonia. 10 people suffered slight injuries. Further operation of the technology had been banned until the completion of safe operational conditions.

The highest risk in Debrecen regarding major accidents related to dangerous substances is represented by Teva Pharmaceuticals Zrt.

According to 23 § of Government Decree 219/2011. (X.20.) a drill of External Emergency Plan was performed at the Debrecen site of Teva Pharmaceuticals Zrt.on 10th November, 2014. The subject of the drill was to prepare rescue tasks and the protection of inhabitants in case that a probable major accident occurs.

The hypothetical situation during the drill of External Emergency Plan was as follows:

A barrel containing flammable fluid was damaged, and its content was partly or completely released. The released fluid formed a pool, which resulted in a fire. As a result of a malfunction in the extinguishing system, the fire spread further, which affected the nearby houses, and caused injuries. The headcount participated in the drill involved 25 people.

The leadership of the drill involved the Notary of Debrecen City with County Rights, the sub-office leader, the civil protection supervisor and the industrial safety supervisor of the Debrecen Sub-office for Disaster Management. The deputy-manager of Hajdú-Bihar County Directorate for Disaster Management and the civil protection supervisor also participated in the inspection.

The target of the drill was: to drill the

- participation of rescue with the experts involved in the planning and performing;
- tasks need to be performed during a release of a dangerous substance with the help of technical and safety experts;
- the organization and performing of alarming, informing and isolating tasks;

– to elaborate the task of informing the inhabitants and the media in case of an emergency.

Things that had to be inspected during the drill:

– the effectiveness of the co-operation;
– alarming properties and preparednes of participants, the accuracy of the measures being issued;
– the status of the implementation of professional tasks [15].

The performance of the External Emergency Plan was successful, and provided a lot of useful experiences. Its detailed analysis, the drawning of expert conclusions and the implementation of the required amendments are highly important, because in case of a real major accident, the immediate implementation of this plan has to be ordered by the mayor.

It can be well seen, that the examination of establishments handling dangerous substances, the inspections held at their sites, the drill of External Emergency Plan, the Safety analysis and the Internal Emergency Plan - with the maximum keeping of the relevant measures - could highly promote the prevention of major accidents in establishments handling dangerous substances, and, in case of an accident occurs, the minimization of damage.

Transport of dangerous goods

Hungary was obliged by various international treaties to elaborate measures for the transport of dangerous goods. During this procedure, conditions for road transportation, transport by rail, inland water transport and air carriage were detailed in individual laws. Among the transportation ways listed above, I would emphasize road transportation, as the most dangerous transportation method.

Through the elaboration of measures and adoption of international convention:

– a European convention on the inland transport of dangerous goods, or as it called, the ADR-convention [17], was established on 30th September, 1957, in Geneva, Europe, to which Hungary joined in 1979. ADR details all measures which promote transportation tasks to be performed in a safer way. A complete amendment of the annexes was performed between 1992 and 2000, with the first version of it, ADR 2001, was applied from 1st July, 2001 till 30th June, 2003. This was replaced by the second, third and fourth versions (ADR 2003, ADR 2005, and ADR 2007), with the latest version was being in force from 1st July, 2007 till 30th June, 2009. Regulations of ADR 2007 are not valid from 1st July, 2009; the new edition is called ADR 2009 (promulgated by Act LVIII of 2009). The enforcement of ADR in the European Union was ordered by Directive 2008/68/EC of the European Parliament and of the Council of 24 September 2008 on the inland transport of dangerous goods. The annex of this directive includes what kind of exemptions can be specified by the individual member states. The inland application of ADR is lightened by Annex 2. of 38/2009 (VIII. 7.) Decree of the Ministry of Transport, Communications and Water. Transportation of dangerous goods within the European Union is regulated by the repeatedly amended Council Directive 94/55/EC, the so-called "ADR-frame directive" [18]. ADR is under a continuous amendment and update, therefore the regulations in Annex A and B of ADR should be taken into consideration for the transport of dangerous goods within the European Union since 1st January, 1997.
– The process of transporting dangerous goods was controlled by Switzerland and Germany in 1983, then, in 1984, came the establishment of RID, the regulation on the international carriage of dangerous goods by rail, which became Annex C of the Convention concerning international carriage by rail, signed in 3rd June, 1999.

- The safety problems of transporting dangerous goods are also a concern of the UN since 1945, with its organs ECOSOC and its sub-committee, the Experts on the Transport of Dangerous Goods. The International Road Transport Union (IRU) was established in 1948.
- The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN) was established in 26th May, 2000.
- The transport of dangerous goods by air carriage is included in the Convention on International Civil Aviation [3].

The most dynamic developing industry in Hungary is the chemical industry. Supplies for the chemical industry can be ensured by transport, both within the country and from abroad. The quality, structure and permeability of the road-network is slowly changing, therefore the endangeredness of the transports is increasing and the probability that a disaster will occur is bigger [19].

Based on the destination of the dangerous goods, there could be:

- transports from abroad to inland;
- transports from inland to abroad;
- inland transports.

The transport of dangerous goods is also inspected by the disaster management since 2001. To perform an inspection, it is required to have at least an ADR-administrator certificate on at least OKJ-level (National Register of Education). The inspection was carried out together with the police and the traffic authority. With the continuous broadening of tasks and power of the authority, it became possible to divide the tasks of disaster management, so the act on road traffic was amended from 1st May, 2007 and the above mentioned authorities handed over the inspections to the experts of disaster management.

ADR-inspection activities regarding Hajdú-Bihar County Directorate for Disaster Management

The implementation of the inspection happened in accordance with plan, and in compliance with the relevant measures and standards. To achieve the effectiveness of the inspection, we focused on the border crossing point at Ártánd, considering that non-Hungarian transport organizations doesn't comply with even the basic conditions, thereby endangering traffic and public safety. 69% of the penalty originated from the irregularity of non-Hungarian transport companies.

RID-inspection activities regarding Hajdú-Bihar County Directorate for Disaster Management

The railway stations of Debrecen and Püspökladány handle a great deal of service regarding the carriage of dangerous goods by rail. The inspections of the authority have also focused on these two sites. There was no accident in relation with transporting dangerous goods by rail. The inspection has found out 5 irregularities in 1 case, which resulted in paying a penalty.

Speciality of transporting dangerous goods regarding Hajdú-Bihar County Directorate for Disaster Management

	ADR	RID	Sum-total
Number of inspections	127	38	165
Number of inspected vehicles / railway cars	1362 (296 of it was ADR)	305	1667
Number of irregularities	18	5	23
Number of fines levied	10	1	11
Number of accidents	0	0	0

Table 2. A overview on the transportation of dangerous substances [20]

Disaster management act

For protecting the life-and property safety of the inland population, the safe operation of dangerous establishments, the storage and transport of dangerous substances, the prevention of disasters related to civilization, the co-ordination and increase of defence measures the Parliament of Hungary, with the adoption of Act CXXVIII of 2011, has elaborated and on 1st January, 2012 enforced the uniform task- and procedure system for industrial safety authorities, which provides authority inspections [14]. The new regulations applied from 1st January, 2012, extends the definition of establishments handling dangerous substances, defines the conditions required from these establishments (the rules of inspection, informing the population, administrative service charges).

From 1st January, 2012, with the enforcement of the disaster management act, the inspections (on waters and rail) are carried out by the disaster management, as an independent authority. In several cases, the individual regional disaster management bodies carry out the inspections together with other county administrative bodies.

During the inspections, their primary task is to examine the keeping of the regulations of the ADR-, RID- and ADN-measures. Since irregularities can be prevented before the beginning of the transport, disaster management authorities also perform inspections on sites. They prepare a detailed, monthly inspection schedule from the inspections.

In most cases, the following imperfections were found during the inspection:

- incorrect filling of the freight documentations,
- improper fastening of cargos,
- insufficient fire extinguishers,
- irregular labelling of goods,
- lack of rescue appliances and protecting apparatus.

Factors that help in the inspections of the transport of dangerous substances:

- Penalizing. Due to the lack of measures, it was not possible to penalize improper transports, so an individual measure was elaborated for establish the possibility of penalizing, and parallel to that, the number of inspections was increasing, so thanks to all of that, the keeping of the transport conditions was continuously improving. After the levying of penalties, suppliers of dangerous substances perform their work in a more formular way, therefore the morality of transportation has improved.
- Creating emergency stations. Several technical emergency stations were created in the country, where there are chemical and technical containers. Identifying dangerous substances is the task of firemen at the site, which could be difficult in many cases if the UN- and the hazard symbols fall down, and in that case, the Emergency Exploration Unit is called to the site. To fulfil this task, the EU established an emergency response system, ICE. In Hungary, the Chemical Response and Information Centre performs similar services [21].

- Introducing truck driver trainings. Due to the propylene disaster in Spain, a special training was introduced for drivers transporting dangerous substances. These trainings were introduced in Hungary from 1977. Later ADR-trainings were integrated at the suggestion of IRU, which resulted in an obligation of exam from 1985. Examinations are the right of the Traffic Control.
- Operation of Mobile Disaster Management Laboratories.
- Within the frame of unitary disaster management system, County Fire Departments were merged with County Civil Protection Departments, and the National Fire Department was merged with the National Civil Protection Department. In several cases during emergency responses and rescues, fire-fighters meet chemical substances that they had to identify and had to carry out a chemical exploration process. After the merging of fire protection- and civil protection tasks, further organizational units were created for the more effective and safer performance of these emergency response tasks, e.g. Mobile Disaster Management Laboratories were established after 1st April, 2012, which has a big part in performing damage assessments, decontamination and other civil protection (alarming) duties.

Activities of Mobile Disaster Management Laboratories regarding Hajdú-Bihar County Directorate for Disaster Management

Gas leakage, breaking of gas-connections	2
ADR-accident	0
RID-accident	0
Road accident	2
Suspected anthrax consignment	2
Event in a dangerous establishment	2
Accident in working	1
Detecting and identifying an unknown substance	3
False alarm	2
Total number of responses	**14**

Table 3. Activities of Mobile Disaster Management Laboratories [22]

Suggestion for improving the safer transport of dangerous substances

Transport of dangerous substances would be safer if the GPS-based transport tracking system was introduced in Hungary, because the routes and the keeping of resting time would be checkable. There would be a continuously updated data about the quantity and regional distribution of dangerous substances present in the country. Damage prevention and damage elimination would be more easily plannable and organizable, inspections would be also plannable. [23]

In our opinion, it would be practical to increase the number of inspections regarding transport of dangerous substances. It would be important that the organization of disaster management performs an even more increased number of inspections in the future, based on the regulations of ADR, RID and ADN, including the preparations and storage of transports and the inspection of rules and documentation. This would make the occurrence of major accidents during the transport of dangerous substances much more preventable so the protection of the safety of inhabitants and the environment would be much better.

Seveso III. Directive

Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC called Seveso III. Directive - was published on 24th July, 2012 by

the European Parliament, therefore Hungary must introduced it at the latest of the end of May, 2015. The directive addresses the establishments handling dangerous substances, below-tier establishments and every public administrative bodies, that participate in the prevention against accidents related to dangerous substances.

Based on the above, amendments made in the Seveso III. Directive are followed by Hungarian regulations. According to that, Act CXCII of 2013 on amending certain laws to increase the effectiveness of disaster management and the Government decree 34/2015 (II. 27.) on the amendment of 219/2011. (X. 20.) Government Decree on the protection against major accidents related to dangerous substances and on the amendments of certain related government decrees on the uniform governmental documentation system (hereinafter: Amending decree) are completely covers the elements amended by the European Union. The amending decrees will enter into force – in accordance with Seveso III. Directive – uniformly on 1st June 2015, and will include the following new elements.

Compared to Seveso II. Directive, Seveso III. Directive has been changed in several parts:

Changes in the process of identifying establishments

The elaboration and reformation of Seveso III. was primary motivated by the changing of the classification of dangerous substances, in particular its regulating to the Regulation No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures (CLP), which resulted in the creation of Seveso III. Directive and therefore Annex 1. (establishment identification) of Government Decree 219/2011. (X. 20.) on the protection against major accidents related to dangerous substances (hereinafter: Decree) has been changed, but the method of identification remained. Through the amendment, hazard classification has changed, new, individual classes has been created (health, physical, environmental and others), therefore "R" risk-sentences has been changed into "H"-sentences. An important change is the extension of the group of nominated mineral oil products with the including of heavy oil-fuels, alternative fuels, and 14 other new dangerous substances were also included besides the two mentioned products [24].

To determine the quantity of dangerous substances present, the standard should be the storage capacity of containers and technological equipment, until the operator proves in a certified way that it was being reduced through a technical solution resulting limitation. New part that during the determination of the quantity of dangerous substances present, the retrievalable electronic record documented, operated and recorded by the operator of the dangerous establishment can be taken into consideration.

Another amendment that in case of an agricultural below-tier establishment, liquefied propane-butane gas stored in containers or pressure-bottles should not be taken into consideration in the application of the summerization rule during the identification process of dangerous operations. Based on the membership practice of the European Union, the definition of storage includes the exemption of the transshipment process of containers for the combined transport of road transport, carriage by rail and inland water-carriage.

Amending the content elements of safety documentations

During the change of the regulation, the content elements of the safety report, safety analysis and interior emergency plan also had to be changed in accordance with the regulations of Seveso III. and considering the experiences of the Hungarian application of the law. In compliance with the requirements of the EU, the amending decree ensures that the operator could submit certain content elements of the safety documentation together with other relevant documents that comply with the EU and Hungarian laws.

The safety report must include every malfunctions and major accidents related to dangerous substances that occurred in the establishment previously, after 1st January, 2002, the measures taken, and must examine the consequences for preventing the occurrence of similar events. The safety documentation must lay special emphasis on the demonstration of factors and its impacts and risks that had been taken into consideration during the analysis of the domino effect.

The greatest change in Seveso III. is the more detailed development of the requirements for the safety management system (SMS). During the establishment of the SMS, the operator must consider the available information in connection with the related best practises, together with the measures taken for the necessity of continuous improvement and the increasment of awareness. A particular consideration should be taken on the indication and management of technological emergencies, and it is also required to detail the activities performed through a sub-contractor system. The operator should elaborate in details the strategy and methodology for tracking and inspecting technological equipment, ensure the performance of the proper monitoring measures and the necessary improving measures, and must determine the performance indexes applied during the processes of estimating safety performance.

Another significant change is the appearance of the adoption criteria of endangeredness originated from a major accident causing environmental load; and to comply with that, the operator must prove in the safety documentation the existance of the required technical regulators, financial-, technical- and personal conditions and the preparedness of the damage prevention technological team, based on the regulations of the Amending decree.

Operators of lower-tier establishments, similarly to the safety report of upper-tier establishments shall prepare an abstract of the safety analysis required for the preparation of the public information issue.

The authority must ensure that a variety of the safety report/analysis made by the operator without any confidential data and the abstract of the safety report/analysis, if there is such, would be available for the public on the website of the authority, and that the mayor has the documentation in a printed form to view [24].

Review of safety documentation

Besides the general requirements, operators must review the safety report out of turn, following a major accident in connection with dangerous substances. The review of the interior emergency plan should be performed in at least three years, and together with the actual or out of turn review of the safety report or safety analysis, in which process the authority has a 30-day administrative closing date [24].

Amendments in connection with land-use planning

Based on the safety report and safety analysis, and after its unconditional acceptance, the authority shall determine the safety distances around establishments handling dangerous substances in an individual order. Mayors must take the borders of the safety distance into consideration during the occurrent developments on the area, independently whether it has been included into the settlement construction plan.

Before permitting any developments within the safety distance, mayors in every case must initiate the formation of a comittee including the representatives of public health authority, environmental authority, nature conservation authority, mining authority, water conservation authority, water management authority concerned, the representatives of the establishment handling dangerous substances and representatives of the local government of the settlement concerned. The possibility of having a statement from the disaster management authority was ceased. The mayor must ensure that the statement of the committee and the comments of the public concerned will be taken into proper consideration during the decision-making related to the development and during the establishment of the development [24].

The system of the authority inspections

According to Seveso III. Directive, the authority shall inspect lower-tier establishments at least once in every three years as a periodical authority inspection, which does not exclude the possibility of maintaining the former practice of performing an inspection in every two years. If an inspection has identified a serious deficiency, an additional inspection shall be carried out within six months. Furthermore, the authority is obliged to perform an authority inspection following a major accident or malfunction related to dangerous substances immediately after getting knowledge about it, but within a maximum of 3 days.

NDGDM shall prepare an annually inspection plan regarding authority inspections. The plan must include the area concerned, the general evaluation of the relevant safety matters, the list of establishments handling dangerous substances and the establishments concerned by the domino effect, the policies and methods of periodical inspections and inspections performed together with the partner authorities for the examination of major accidents and malfunctions related to dangerous substances [24].

Other changes

A new obligation, that the operators of dangerous establishments must report the employment or assignment of an officer responsible for dangerous industrial protection issues.

The regulation enables that the operators of an establishment transporting dangerous substances through pipelines can perform annually a uniform, merged training, where all of the organizations indicated in the safety documentations of the establishments concerned can drill together. It is optimalizing the order of drillings, so in the case of more establishments under the control of one operator, it is enough to perform one drilling per year, in case every organization concerned in the protection are involved.

The possibilities ensured by the former rules of exemptions were abolished by the relevant body of the European Union, and determined a new exemption system by bonding the exemption of dangerous substances from the effect of Seveso III. Directive to itself.

The exemption system has been changed: if an operator decides that, instead of its classification, any of the dangerous substances or mixes does not have the danger of causing a major accident, the operator shall send the information listed in annex 13. for the evaluation of the properties related to posing a danger to the health and the environment. According to the regulations on the Hungarian participation in the decision-making of the EU, and according to 31/A. &, the central organization of the authority will send to the European Committee, if the information is established [24]

According to the request of the organizations concerned, in case of an on-going processes at the time of the enforcement of the Amending decree, the authority will not examine their compliance, because the compliance shall be examined only after the enforcement of the decree.

There are also new definitions in the regulation. Such as "The public concerned" means the public living in the settlement endangered by the establishment handling dangerous substances, or natural persons, legal entities, or unincorporated business associations which are affected or having an interest in the process concerned [24]. For the purposes of this definition, organizations promoting environmental protection and meeting any applicable requirements under the relevant law shall be deemed to have an interest [24].

Tasks of the operator and of the authority

- The operators of establishments fallen within the scope of the regulation after 1st June, 2015. must conduct an establishment identification process until 1st September, 2015.
- The operator of an already operating below-tier establishment shall amend its major accident prevention plan during the next out of turn inspection, or during its actual, 3-year inspection.
- The authority will judge the records of out of turn reviews submitted until 1st September, 2015. by the establishments amending its classifications, and will oblige the operators of lower- and upper-tier establishments to prepare safety documentations until 1st June, 2016., and the operators of below-tier establishments until 31st December, 2015.
- After 1st September 2015., the authority will oblige those dangerous establishments which are not changing their classifications to revise their safety documentations until 1st June, 2016., then judge the revised documentations.
- In parallel with the judgement of safety analysis and safety reports, the authority is obliged to secure the public and to determine a safety distance.
- According to the regulations of the revised safety documentations, local organizations must review external emergency plans and public information issues, and modify them if necessary [24].

As it can be seen from the above mentioned statements, Seveso III. Directive has a lot of changes, but following the changes of the measures, practice will show how it will affect the development of industrial safety.

SUMMARY AND CONCLUSIONS

Overall, it can be stated that regarding industrial safety, the personnel in Debrecen is well-trained and has theoretical and practical experience.

Among the professional protective organizations, disaster management has a significant role in the inspection of the tasks of industrial safety. Disaster management experts have several abilities and experiences, therefore the effectiveness of responses during accidents related to dangerous substances and establishments is successfully improvable.

By getting the laws observed, Hajdú-Bihar County Directorate for Disaster Management perform its duties expertly and effectively, and the continuous improvement of the quality of its operation can be experienced. We will listen to the introduction of Seveso III. Directive with great interest in the future. We look forward to see to what extent will the effectiveness of industrial safety prevention be increased by the introduction of the directive.

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