

UDC 349.6

doi: 10.15330/jpnu.5.2.218-222

## PREVENTION OF INDUSTRIAL ACCIDENTS IN THE EU LEGISLATION

*DARIUSZ MATERNIAK*

**Abstract.** The development of civilization and technology is associated with the growing risks to the natural environment, primarily from the risks posed by industrial plants that use hazardous substances or production processes in process of production. The experience of the last few decades shows that such failures cause serious damage to the environment and material or human losses. To prevent such accidents and limit their possible consequences, legal regulations known as Seveso Directives have been developed within the European Union. They were adopted also in Poland as a EU member.

**Keywords:** industrial plants, failure, accident, Poland, European Union, Seveso Directives, State Fire Department.

### 1. INTRODUCTION

The issue of preventing major industrial accidents that pose a potentially significant risk to the natural environment is increasingly gaining in importance. Alongside the rising level of industrialisation and technological advancement of industrial plants, the risk of accidents and failures is also growing. Depending on the type and location, not only the staff at the plant but also residents of the neighbouring areas as well as the natural environment may find themselves in the danger zone. The most tragic disaster of this kind happened in 1984 in an Indian city of Bhopal. The leakage of more than 40 tonnes of methyl isocyanate from a pesticide manufacturing plant (owned by an American company Union Carbide) resulted in 15,000 deaths, a large number of people suffering from serious health damage and more than 500,000 residents coming in contact with the hazardous substance. Industrial accidents also happened in Europe. In 1976 in Seveso, a town in northern Italy, an explosion in a plant manufacturing artificial fertilisers led to the contamination of the environment (the atmosphere, the ground as well as ground and surface waters) with significant amount of toxic and carcinogenic substances. The disaster affected more than 2,000 people.

The danger related to industrial accidents and their scale imposes the necessity to take preventive action on the national as well as on the international level. The consequences of accidents, especially for smaller states, could be unpredictable not only for them but also for their entire regions as national borders provide no protection at all.

## 2. ANALYSIS AND DISCUSSION

### Poland: What are ZDRs and ZZRs?

Like EU member states, Poland pays a lot of attention to the issue of preventing industrial accidents. Even more so, because the economic development of our country increases the number of industrial plants that – were the accident to occur – pose a potential threat to the environment and the people. In terms of the number of plants posing a potential threat, Poland ranks 8<sup>th</sup> in the EU. In 2005, there were 1062 such plants across Poland, in 2008 – 1173 [1].

The legislation covering the issue of serious industrial accidents in Poland is the Environment Protection Act of 27 April 2001, and in particular Title IV: ‘Major Accidents’. Depending on the type, category and quantity of a dangerous substance article 248 of the Act mentions ‘increased-hazard establishments’ (Zakłady Zwiększonego Ryzyka (ZZR)) and ‘high-hazard establishments’ (Zakłady Dużego Ryzyka (ZDR)). Whether a plant is categorised as ZZR or ZDR is a decision of the minister of economic affairs announced in a regulation following consultations with ministers responsible for health, home affairs and administration, and the environment. Especially dangerous substances include materials that are: toxic, highly toxic, oxidising, explosive, combustible, highly combustible, extremely combustible and exceptionally dangerous for people and the environment [2; Art. 248]. An operator of a high-hazard of increased-hazard establishment is obliged to register it with the State Fire Service at least 30 days before the launch [3]. The application should include the location of the plant as well as its type, category, amount and physico-chemical characteristics, fire and toxic specification of the dangerous substances used as well as specification of the area where the plant is located with particular focus on factors that could contribute to increasing the risk of an industrial accident or increase its consequences [4; p.40]. At least once every year the plant should be checked by the State Fire Service [2; Art. 250].

The Act also introduces the definition of a major industrial accident. It is understood as an incident, in particular emissions, fire, or explosion occurring in the plant and emerging in the course of an industrial process, storage and transport involving one or more dangerous substances, leading to immediate or delayed danger to human health or life, or the environment [2; Art. 3].

Most potentially dangerous plants in Poland are located in the Silesia province. There are 38 such establishments, out of which 15 are ZDR category and 23 ZZR category (6). Across Poland there are about 160 establishments classified as ZDR and about 200 classified as ZZR, according to the State Fire Service. What is more, the results of checks carried out in 2007 showed that 43% of plants did not follow the rules of dealing with dangerous substances [5].

### International legislation: Seveso II and Seveso III

The issue of industrial accidents is recognized as vital so it requires separate regulation at the EU level. The first piece of dedicated legislation was the Council Directive 82/501/EEC of 24 June 1982 on the major-accident hazards of certain industrial activities, known as Seveso-Directive. Its amended version was passed on December, 9, 1996, and is known as Seveso II: Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances, and completed by the Directive 2003/105/EC.

Seveso III was adopted in 2012 as a Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC [7].

In Poland the above-mentioned legislation is implemented by the already mentioned Environment Protection Act of 27 April 2001. Article 1 specifies the basic objective of the directive, which is the prevention of major accidents which might result from certain industrial activities involving dangerous substances and with the limitation of their consequences for people and the environment as well as providing high-quality prevention against hazards in the European Community [6; Art.1]. Substances defined as “dangerous” are listed in the annexes. Article 4, on the other hand, includes a specification of threats and plants out of the scope of the directive. These are:

- military establishments, installations or storage facilities;

- hazards created by ionizing radiation;
- the transport of dangerous substances and intermediate temporary storage by road, rail, internal waterways, sea or air, outside the establishments covered by this directive, including loading and unloading and transport to and from another means of transport at docks, wharves or marshaling yards;
- the transport of dangerous substances in pipelines, including pumping stations, outside establishments covered by this directive;
- the mining industry, including such activities as exploration, extraction and processing of minerals in mines, quarries, or by means of boreholes;
- waste land-fill sites [6; Art.4].

A similar specification is included in the Environment Protection Act in article 248. An operator of a plant under the directive is obliged to notify authorised bodies before the launch of such a plant (as already mentioned in Poland the authorised body is the State Fire Service). The operator is also obliged to take actions to secure a high-level of protection for people and the environment through creating the right procedures and mechanisms of actions [6; Art.7]. Article 9 of the Directive (and parallel Article 253 of Environment Protection Act) imposes on the operator a duty to produce a safety report. It should be updated at least once every five years (or more often if the circumstances require) and include the following:

- the operator of a high-hazard establishment is prepared to apply the accident-prevention program and to respond to industrial accidents;
- the establishment meets the requirements for the implementation of the safety management system referred to in Article 252 (safety training, the instructions on the safe operation, monitoring and review of the safety system);
- the possibility of the occurrence of an industrial accident has been analyzed and the necessary measures to prevent it have been taken;
- the design, construction and operation of the installation where the dangerous substance is present ensures its safety;
- internal emergency plans have been developed and information has been provided for the development of external emergency plans [6; Art.253].

Regarding accidents preventions, the Directive focuses on the creation of a program for preventing accidents and a plan in case an accident occurs. Accidents Prevention Program (PZA) includes:

- the likelihood of an industrial accident;
- rules on preventing, and tackling the consequences of industrial accidents that should be implemented;
- the ways of limiting the consequences for people and the environment in case of an accident;
- the frequency of analysis, review and updates [3].

In case on an accident an internal operation and rescue plan is needed. It is described in Article 11 of the directive. Such plans are required for newly established plants, as well as plants already in operation but falling out of the scope of the 1982 directive [6; Art.11]. The plan has to include in particular:

- the proposed measures to limit the effects of the industrial accident on people and the environment;
- the proposed methods and means of protecting people and the environment against the effects of an industrial accident;
- information on existing hazards, the preventive measures taken and on the response measures to be taken in the event of an industrial accident, to be provided to the public and the competent authorities;
- an indication of the ways wherein the effects of an industrial accident will be eliminated and the previous state of the environment restored;
- an indication of the measures to prevent the transboundary impact of an industrial accident [2; Art.260].

The tasks under the directive and the Environment Protection Act should be carried out, for ZDE, by the Provincial Commandant of the State Fire Service, and for ZZR, by Regional Commandant of the State Fire. These bodies are also responsible for the preparation of the external operation and rescue plan in case the consequences of an industrial accident spill into the areas beyond the plant. Rescue plans for regions and provinces are developed based on delivered data. If the projected danger zone includes residential buildings or public buildings (offices, schools, institutions, etc) evacuation plans have to be developed. Residents and staff from the buildings located in the potential danger zone are informed well in advance about how to behave in case an accident occurs [7]. External rescue plan should be kept up to date and tested in a form of a regular drill at least every three years. Changes in the plant and in the structures of rescue teams must be taken into account [8]. EU member states are obliged to create, or transfer powers to, relevant bodies responsible for implementation and control if the rules in the directive are obeyed [6; Art.16]. In case the plant operator does not fulfill their duties specified in the directive, the member state may ban the use of the dangerous substance or installations in the scope of the directive [6; Art.18]. In order to secure the implementation of the rules there is a possibility to conduct inspections. Every three years EU member states are also obliged to present reports on the progress of the implementation of the directive [6; Art.19].

In case of a major accident, the plants operator is obliged to immediately inform the relevant authority (here the State Fire Service and the Environmental Protection Inspector) and provide these bodies with the following information:

- the circumstances of the accident;
- dangerous substances involved;
- review of consequences for people and environment;
- rescue actions taken, and other actions taken to limit the consequences of the accident.

In case of a major industrial accident in a neighboring country with consequences impacting on the territory of Poland, the environment minister immediately informs the Chief Commandant of the State Fire Service, who launches relevant rescue actions. When, on the other hand, such accident occurs in Poland the environment minister informs the European Commission giving the details of the accident, its consequences, analyses and plants that pose potential danger [2; Art.271].

### 3. CONCLUSIONS

The level of safety in Polish industrial plants is satisfactory: the factors related to accidents and failures are on the compatible level with such countries as France or Spain [9]. On the other hand, advancing industrial development of industrial plants and an increase in their numbers across Poland requires constant monitoring of their safety. The most serious shortcoming of the industrial accidents prevention system in Poland includes the lack of a defined accident prevention policy. However, according to specialists the introduction of the Environment Protection Act, which implemented the Seveso II Directive, in Poland improved the safety of ZDRs and ZZSs.

### REFERENCES

- [1] Available at: [www.money.pl](http://www.money.pl)
- [2] Environment Protection Law. The Act adopted of 27 April 2001. Available at: [https://esdac.jrc.ec.europa.eu/Library/Themes/Contamination/workshop\\_Nov2003/legislation/PolandEnvironmentalProtectionAct.pdf](https://esdac.jrc.ec.europa.eu/Library/Themes/Contamination/workshop_Nov2003/legislation/PolandEnvironmentalProtectionAct.pdf)
- [3] Porowski R. System zapobiegania poważnym awariom przemysłowym w Polsce [The system of prevention of major industrial accidents in Poland]. Available at: [www.straz.gov.pl](http://www.straz.gov.pl) (in Polish)

- [4] Rękas A. Zapobieganie awariom przemysłowym [Prevention of industrial failures]. In: *W Akcji – Technika, Taktyka, Profilaktyka*, 4 (2009), 41–49. (in Polish)
- [5] Available at: [www.polskathetimes.pl](http://www.polskathetimes.pl) (in Polish)
- [6] Council Directive 96/82/EC of 9 December 1996 on the control of major-accident hazards involving dangerous substances. Available at: <http://data.europa.eu/eli/dir/1996/82/2012-08-13>
- [7] Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC Text with EEA relevance. *Official Journal of the European Union*, 24.7.2012, L 197/1. Available at: <http://data.europa.eu/eli/dir/2012/18/oj>
- [8] Podgórski M. Zapobieganie poważnym awariom przemysłowym - Nowe regulacje - Nowe zadania państwowej straży. Available at: <http://zb.eco.pl/inne/prawo/psp.htm> (in Polish)
- [9] Markowski A.S. Zapobieganie awariom w zakładach chemicznych. Available at: [http://www.atest.com.pl/article.php?id=aa0307\\_2](http://www.atest.com.pl/article.php?id=aa0307_2) (in Polish)

**Address:** Dariusz Materniak, Police Academy in Szczytno, 111, Marszałka Józefa Piłsudskiego, Szczytno, 12-100, Poland.

**E-mail:** [dariusz.materniak@gmail.com](mailto:dariusz.materniak@gmail.com)

**Received:** 23.01.2018; **revised:** 27.06.2018.

---

Матерняк Даріуш. Запобігання промисловим аваріям у законодавстві ЄС. *Журнал Прикарпатського університету імені Василя Стефаника*, 5 (2) (2018), 218–222.

Розвиток цивілізації та технологій пов'язаний з зростаючими ризиками для навколишнього природного середовища, що виникає, в першу чергу, з ризиків, спричинених промисловими підприємствами, які використовують небезпечні речовини або виробничі процеси. Досвід останніх десятиліть показує, що такі аварії завдають серйозної шкоди навколишньому середовищу, матеріальні та людські втрати. Щоб запобігти подібним аваріям та обмежити їхні можливі наслідки, в рамках Європейського Союзу були розроблені правові норми, відомі як директиви Seveso.

**Ключові слова:** аварія, промисловий завод, Польща, Європейський Союз, директива СЕВЕСО, пожежна служба.