

ANALYSES OF THE TRAINING NEEDS AND REQUIREMENTS IN THE FIELD OF INDUSTRIAL SAFETY IN HUNGARY

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ABSTRACT

As a result of the appearance of New Disaster Management Regulations in the year of 2012, a unified Industrial Safety Authoritative and Supervision System was set fully operational on national, regional and local levels. The aim of this article is to identify and analyse

the industrial safety's training needs and requirements of operators and public authorities. The second part of the series of articles was deal with the introduction and analyses of the foreign and domestic facilities of industrial safety's education and training.

Key words

disaster management, industrial safety, education, training.

Introduction

The Parliament of Hungary has created a uniform legal, institute and tool system for industrial safety by acceptance of Act CXXVIII of 2011 on Catastrophes and on amendment of some related acts (hereinafter: Kat.) on January 1st, 2012 in order to improve the safety of people and the environment and to improve the efficiency of the protection against civilization disasters, to reinforce the disaster management organization system, and to improve the success of protection measures. [1] I will identify and analyze the industrial safety training needs and requirements of the operators and authorities in this article.

Industrial safety training and further education possibilities

In my earlier studies [2] [3] I have described in details and evaluated the foreign and domestic industrial safety training and further education possibilities, whose observations can be summarized as follows.

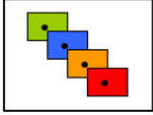
Operability of the uniform industrial safety system was significantly influenced among other things by the availability of the inevitable personnel requirements for effective operation of the authority licensing and supervisory system.

Quality of performing of the special industrial safety task mainly depends on the education and training level of the personnel and on ensuring the means for the procedures and methods.

There are similarities between the foreign and domestic educational institutes delivering disaster management, fire safety and industrial safety education and their trainings in the fields of fire safety, fire prevention and general safety. Engineering and organizer trainings are delivered at basic, and master trainings, offering higher level professional education in the training and further education centers or in the specialist courses of the disaster management (emergency management) organizations.

While industrial safety education is delivered in West-Europe mainly in the civil higher education institutes and police training centers, it is delivered in Middle and East-Europe in the police higher education institutes and training centers. I found specific industrial safety basic and master trainings only in East-European countries. Industrial safety engineer training is available only in these countries.

The domestic trainings on industrial safety already have a 15 years history. The first training programs were formed after enacting the Act on disaster management. Every training on disaster management and fire safety contained subjects of industrial safety such as transportation of dangerous goods, inspection of dangerous establishments, response to nuclear accidents, and damage control of dangerous substances. Critical infrastructure protection training was delivered in the disaster management master training of ZMNE. After creation of the domestic uniform system of laws, institutes and organizations for industrial safety, higher level industrial safety basic studies are available at NKE in full-time and correspondence courses. There is no engineer and master training in Hungary in the field of industrial safety.



General evaluation of the training needs of operators

The scopes of tasks and competences of the industrial safety authority mainly serve the control the compliance of the industrial safety tasks of the operator. Training and education of the people and organizations of economic organizations that belong under the industrial safety laws is a task in the scope of the operator. However, the success of application of organizations requires proving that the prevention, preparation and emergency management (protection) system of organizations in the establishment can perform its special tasks effectively as specified by the plans and reports, according to the requirements of the statutes. [4]

The industrial safety authority inspects the conformity to these requirements through his authority licensing and inspection control system.

The followings belong here, among others:

- concerning *dangerous establishments*, the training requirements for the economic organization assigned to compile the safety documents and the dangerous establishment protection consultant, that are related to the introduction and operation of the safety management system (management system) ;
- training requirement about the safety liaison contact person concerning safety of *vital systems and installations*;
- dangerous goods transportation specialist and consultant trainings and further education about *transportation of dangerous goods*;
- radiation protection course completion requirements for people working in the field of *nuclear accident management*.

I will review below the education and training requirements according to the effective statutes in every field of industrial safety.

a) The specialists of the operators of dangerous establishments

Government decree 219/2011. (X. 20.) on Protection against major accidents involving dangerous substances (regulatory statute) Attachment 7, Point 6 contains the requirements concerning the management system for prevention of major accidents involving dangerous substances and for mitigation of their effects, and the requirements in relation to the operation of the safety management system. [5]

The economical organization assigned to compile the safety report, safety analysis, internal emergency plan and the major emergency management plant is obliged according to the regulatory statute to employ minimum one specialist with higher technical degree, with higher disaster management, civil protection or fire safety qualification, and minimum five years of professional career in the branch. [6] Another requirement is the organization must possess a risk analysis and consequence analysis software approved by the authority. Course training is not a requirement for the application of the software.

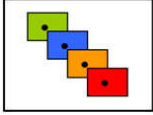
Attachment 7, Point 6.2 of the regulatory statute regulates the employment and education requirements of the safety manager of the dangerous industrial establishment. The safety manager of the dangerous industrial establishment maintains continuous contact with the authority, and he follows the changes of the applicable regulations, c) in case of a major accident or incident involving dangerous substances, he makes a report and information about the occurred event, he makes sure they are sent to the authority, he organizes and evaluates practices about the contents of the internal emergency plan, and he makes a protocol about correction, revision and practicing of the internal emergency plan, and he sends it to the authority.

A person can be employed or assigned as a dangerous establishment safety administrator who has minimum intermediate level technical education and intermediate level disaster management, civil protection or fire safety professional education, or dangerous establishment safety administrator training.

b) The specialists employed by the operators of vital systems and establishments

Act CLXVI. of 2012 on identification, assignment and protection of the vital systems and establishments (Lrtv.) requires in its paragraph 6. § (7) that the operator of an European vital system element and a national vital system element shall employ the safety liaison manager and ensure the conditions of his activities continually. The safety liaison contact person shall maintain contact between the operator and the authorities and specialist authorities participating in the assignment procedure. Only a such a person can be appointed as a safety liaison contact person who has a clean criminal record and has the abilities specified by the government decree. [7]

In my opinion, this person can perform a safety manager post (e.g.: safety director, health, safety and environment manager, etc.) at his economical organization.



Chapter 5 of the 65/2013. (III. 8.) Government Decree (Lrtv. Vhr.) on execution of the Lrtv. handles the training requirements of the safety liaison contact person. According to paragraph 6. § (2) of the decree, the safety liaison contact person must have special education according to the involved branch. [8]

The Safety liaison contact person must have special education according to the involved branch.

- university education in emergency management or police management faculty,
- fire safety, industrial safety, civil protection professional organizer specialist training or equivalent education,
- Industrial safety specialist course completion,
- university education in industrial safety faculty, or
- with minimum 5 years practice at professional disaster management organizations in the field of industrial safety.

A person with higher education employed earlier for minimum five years to perform basic activities of the police organization, is exempt from the above education requirements. Based on paragraph 13. § (3) of the decree, the education requirement according to 17. § will take effect on July 1, 2018 that says the safety liaison contact person must have higher education in industrial safety faculty in addition to the specialist education according to the actual branch, or he must have minimum 5 years practice at professional disaster management organizations in the field of industrial safety.

c) The specialists of the economic organizations performing transportation of dangerous goods

The following laws of the transportation branch contain the training requirements of the road transportation of dangerous goods:

- 179/2011. (IX. 2.) Government Decree on General rules of training and examinations of vehicle drivers and road traffic specialists;
- 24/2005. (IV. 21.) GKM Decree on Detailed rules of training and examinations of vehicle drivers and road traffic specialists;
- 61/2013. (X. 17.) NFM Decree on domestic application of Attachments „A” and „B” of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR)
- and the regulations of the 25/2014. (IV. 30.) NFM Decree on the Dangerous substance transportation safety consultant. [8]

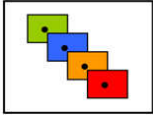
Paragraph 3. § (1) of the NFM Decree on the Dangerous substance transportation safety consultant says the person authorized to manage a company performing railway, road or inland water transportation of dangerous goods is obliged to appoint minimum one consultant in writing according to the contents of the decree. The educational requirements of the consultant are specified by the above training and examination statutes of the branch.

Application requirements to basic safety consultant courses are higher education and minimum two years career performing a job involving dangerous substance transportation tasks; intermediate level education and minimum five years career performing a job involving dangerous substance transportation tasks, or performing ADN, ADR or RID related authority tasks.

Additionally let me mention the ADR dangerous goods transport coordinator training what what has been taken out from the range trainings registrated in National Training List's. The dangerous goods consultant training has additional versions for railway and inland water consultant branches, that are governed by the same training and examination rules.

d) Workers in the field of nuclear emergency management

The 16/2000. (VI.8.) EüM Decree on execution of some regulations of Act XCIII of 1996, Attachment 4. stipulates that the ones working in the area of application of nuclear energy and the ones working here based on any other legal relationship shall receive radiation protection training bound to obligatory examination with the following levels, and further education every five years, depending on the magnitude of risks posed by the activity. The ones obliged to perform trainings shall receive elementary level, extended level and overall level radiation protection training depending on their activities.



1. *Table Radiation protection trainings[8]*

Course on radiation protection:	The ones obliged to training and further education
Basic level 8 hours	The persons working in relation to activities with radiation hazard but do not work with radiation sources.
Extended level 24 hours	a) The persons working in industrial, medical, radiology workplaces that apply ionizing radiation sources (including the users of open or closed radiation sources) but handle the radiation sources independently, or who supervise such jobs, b) The persons working in health workplaces using ionizing radiation sources occasionally.
Overall level 40 hours	a) The persons working in independent jobs under an increased risk of radiation load of ionizing radiation, or their managers or supervisors, or the ones who inspect them from radiation protection aspects, b) The persons who plan radiation protection of workplaces under hazard of radiation or the ones who judge such plans from radiation protection aspects. c) The persons who plan, control, or supervise therapeutic procedures from radiation protection aspects that apply ionizing radiation source for health workplaces, d) The persons performing authority inspections of workplaces under a hazard of radiation, e) The persons performing radiation-health and radiation protection expert activity, f) The persons who teach in extended or higher level radiation protection courses and who deliver their exams. g) The managers authorized to take measures in the field of nuclear accidents who can order activities to be performed in emergency situations.

The training and education requirements of operators shall be equal with the ones required from the specialists of the authorities, therefore it is useful for the economical organizations (according to the safety targets) to participate in higher level specialist trainings (organizer training) or also in basic and master trainings of higher education.

General evaluation of the training and education needs of authorities

I also study the industrial safety training and education requirements concerning the four basic branches of industrial safety. I do not separate the training requirements of the persons working in industrial safety supervisor and manager posts because the specialist tasks belong to the managers and employees as well. Naturally, a kind of professional specialization is necessary in every branch and in some specific supervisor positions.

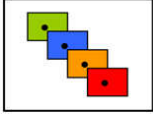
In the followings I will study only the basic training and education requirements against the specialists of industrial safety branch. BM OKF Human Service checks the conformity to these requirements.

a) Employees of the dangerous establishments branch, authority supervisors of dangerous establishments

The employees of the dangerous establishments branch, and the authority supervisors of dangerous establishments shall have the following competences in order to fulfill the authority and disaster management tasks specified by the statutes evaluated in chapter 3 of this study.

He must know the rules of identification of the dangerous substances and goods that are present in the dangerous industrial establishments and during transportation of dangerous goods, and based on this he must be able to

- identification of a certain establishment according to the regulations on protection against major accidents involving dangerous substances, handling of the databases used for interventions in presence of dangerous substances released during a dangerous goods transportation incident, and initiation of the necessary emergency management and population protection measures.
- Additionally, the supervisor shall be able to perform the following special technical tasks:
- inspection, evaluation of the classification of the hazards caused by the dangerous industrial establishment described by the operator in the safety report (analysis) and of the consequences of a possible major industrial accident by means of authority risk analysis tool, and to define the risk reduction measures and to record the inspection results according to the rules of an authority procedure.
- performing site inspections to check the truthfulness of the hazards described by the safety report (analysis), caused by the dangerous industrial establishment, and to perform authority inspection about the (safety) management system of the plant and the feasibility of the internal emergency plan, and to record the inspection results according to the rules of an authority procedure.
- qualification of the internal emergency plan of a dangerous industrial establishment based on every major industrial accident (scenario) sequence of each dangerous substances, according to the legal requirements and to record the inspection results according to the rules of an authority procedure.



- compilation the external emergency plan of a settlement endangered by a certain dangerous industrial establishment and to prepare and manage a practice to check its application, and to inspect and qualify its performance.
- revealing an overt act (omission) against the regulations that control dangerous goods transportation by an authority inspection, application of the related authority control means, methodology and databases, and to perform it according to the legal and authority regulations on sanctioning procedure, and to judge an submitted appeal according to the authority procedure.

Instructions were given about the training and education requirements of authority supervisors and authority specialists of a dangerous establishment were specified first time by the *96/82/EC Phare Twinning „A” Project to support approximation of the directive of the committee (98/IB/EN-01-SP 5)*.

According to the project report, employment as a supervisor of a dangerous establishment requires engineer education, risk analysis course, auditor course of environment management courses (KIR), and 5 years authority practice in dispensation of justice.

Employment and training of supervisors has been done in the implementation period of the regulations according to these requirements. Accordingly, the supervisors are employed with technical university or fire safety engineer degree. In addition to the 3 week long "protection against major accidents" course, the supervisors attend a 3 week long risk analysis, a 1 week long risk analysis software operator and a 1 week long KIR auditor training. In total about 30 people had such education at the authority and the special authority. Most of the supervisors and authority specialists employed at the organizations of BM OKF did not even have such level of education in 2012, and they did not have a 3-5 years long professional (authority) practice what is necessary for safe performance of the tasks. In my opinion, they do not give adequate quality skills without organizer type basic engineer education to perform these mainly engineer tasks to handle extremely complicated technology systems.

Compliance to the authority level education requirements for operators is a minimum requirement, as applicable for operation of the safety management system. Accordingly, the authority specialists shall conform to the training and actual practice requirements as specified to the economic organizations who prepare safety documents. It is suggested for the supervisors employed in a new position to attend a basic course equivalent to the "safety manager of the dangerous industrial establishment" training.

Based on the above points, the training requirements of authority supervisors of dangerous industrial establishments are defined as follows:

- university level technical education;
- university level education on disaster management, civil protection or fire safety, and
- minimum five years professional practice in the competence field of the authority
- 3-week long risk management and analysis specialist course; 1-week long KIR auditor training; 1-week long risk analysis software operator course, or
- a certificate obtained at the industrial safety faculty of the disaster management branch of NKE, or at the industrial safety faculty of the police organization branch of KOK.

The ones with higher level technical education, shall complete a special course, or shall also complete a school system education. Additionally, completion of a one-week long risk analysis software operator course is also important in every case. Employing disaster management specialists without a technical education, for performance of industrial safety tasks may pose significant risks. [8]

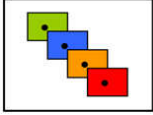
b) The authority specialists managing vital systems and establishments

Performance of the tasks determined by the Lrtv. and its regulatory statutes for disaster management requires mainly organizer type skills. The training requirements of the safety liaison contact person can be applied excellently. But if the tasks are performed at branch authorities then special education according to the actual branch is absolutely necessary, what is specified exactly in the regulatory statute of the branch.

After July 1, 2018, the authority managers shall have higher level education obtained in industrial safety faculty in addition to the special education of the branch, or minimum 5 years' experience in the field of industrial safety at the official organizations of disaster management. [8]

c) The specialists of the economic organizations performing control and fines of transportation of dangerous goods

Performance of dangerous goods transportation authority activities (based on the internal regulations applied by BM OKF since 13 years) require the earlier OKJ "ADR dangerous goods transport manager" training". The educational



requirements are mainly defined by the prerequisites specified in the KOK dangerous goods transportation disaster management inspector training, what requires minimum school leaving certificate and intermediate level firefighting, civil protection or disaster management education and professional service legal state. Naturally, it means a reduction of the previously applied practices that required higher education from the inspectors.

Based on the experiences of the authority dispensation of justice, in addition to this education, the specialist manager staff of the central organization, the superintendents and the authority organizations shall consist of minimum 1-1 person with a dangerous substance transportation safety consultant training for railway, road and domestic waterway branches. The trainers and examiners shall conform to these requirements.

Each authority personnel shall conform to the above mentioned requirements, not only the ones performing inspections but also the ones performing authority administration. [8]

d) Workers in the field of nuclear emergency management

Training of the industrial safety specialists is performed at the moment by extended level courses on protection against radiation, what offer adequate skills for the tasks of disaster management. Additionally, completion of a general quality course is recommended for the chief inspectors and trainers. [8]

Conclusions in relation to the training requirements

I identified the training requirements of operators and authorities primarily based on the legal requirements, an analysis of the tasks and scopes of competence, and based on the practice of dispensation of justice, and concerning that I will define the following general requirements:

- The training and education requirements of operators shall be equally high with the ones required from the specialists of the authorities, therefore it is useful for the appointed specialists of the economic organizations (in the extent according to the safety targets) to participate in higher level specialist trainings (organizer training) or also in basic and master trainings of higher education.
- higher technical (engineer) education is necessary for the position of a supervisor of a dangerous industrial establishment, and also the industrial safety training of NKE and KOK, what can be substituted by individual specialist courses of BM OKF in lack of a specific legal requirement.
- the staff performing control of dangerous goods transportation shall have an "ADR manager of dangerous goods" level education, while the head inspectors and secondary authority specialist shall obtain safety consultant education. The dangerous goods transportation inspector training replaces the earlier OKJ training.
- The training level of the authority specialists managing vital systems and installations shall be adjusted to the training level of the safety liaison contact person.
- Exceptions can be the KOK specialist course before July 1, 2018, and after that only the industrial safety training of NKE or the 5 years long industrial safety professional practice.
- The staff working in the field of nuclear accident management shall complete an extended level course on protection against radiation, and overall level course completion is also recommended for the chief authority specialists and trainers. [8]

Requirements on the institutes and persons delivering the trainings

Based on the analysis performed in this article concerning the training requirements of dangerous establishments and transportation, the following table contains the basic prerequisites from the institutes and persons performing such trainings.

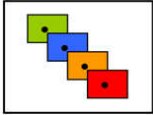


Table 2. Requirements against the participants of industrial safety trainings[8]

Educational area	Personnel prerequisites of training and examinations	Objective prerequisites of training	Professional adequacy of the organization delivering the trainings
Dangerous establishments	<ol style="list-style-type: none"> 1. Minimum 3 trainers with higher level technical education, with minimum 5 years practice as a professional and trainer in the field of dangerous industry (or authority practice). 2. Phast Risk 6.53. risk and consequence analyzer software operator course, applied by the disaster management authority. 3. Higher level education on disaster management, civil protection or fire safety for minimum 1 person. 	<p>Training materials compiled by the organization delivering the trainings for every participant in electronic and hard printed form, what contains the Hungarian laws in force and the internal regulations, inspection guides of the disaster management authorities, and the user manual of the authority software (PhastRisk 6.53.)</p>	<p>Organization of minimum one risk and consequence analysis course and examination that conforms the subject of the training. Safety documents of minimum 10 dangerous establishments, approved by the disaster management authority.</p>
Transportation of dangerous goods	<ol style="list-style-type: none"> 1. Minimum 3 full time trainers with higher education, who have - dangerous goods transportation safety consultant education certified by an effective certificate for the goods ranges of road, railway and inland water transportation (classes 1-9), or - minimum 5 years professional (or authority) and training experience as a dangerous goods transportation consultant in the involved traffic branch. 2. Minimum 1-1 persons with higher level education as a traffic engineer, teacher, with course manager authorization and with school manager education. 	<ol style="list-style-type: none"> 1. Training materials compiled by the organization delivering the trainings for every participant in electronic and hard printed form, what contains the Hungarian laws in force and the internal regulations, inspection guides of the disaster management authorities, and the user manuals of the authority inspection software. 2. The dangerous goods transportation regulations in force for every participant of the specialist course (of the actual transportation branch) in electronic and hard printed form (ADR; RID; ADR; SZMG SZ; ICAO-TI and IMDG Code). 	<ol style="list-style-type: none"> 1. NKH license about the goods ranges of road, railway and inland water transportation (classes 1-9) concerning training course and examination organizer for dangerous goods transportation consultants. 2. A valid license about IATA-DGR 1-12 Cat. air cargo transportation course and examination organizing authorization in case of dangerous goods air transportation trainings. 3. A valid license about IMDG-Code sea transportation course and examination organizing authorization in case of dangerous goods inland water transportation trainings. 4. Successful organization of a dangerous goods transportation safety consultant course and examination for the involved traffic branch with minimum 10 participants in each transportation branch.

In case of trainings about vital systems and installations, it is useful if the trainers of the organization delivering the trainings conform minimum to the legal training requirements specified for the safety liaison contact person. Due to the special nature of trainings on nuclear accident management, a special requirement may be an overall training about protection against radiation and higher level special education (radio- chemist engineer). [8]

Systematization of the industrial safety training needs and requirements

The figure below contains the training needs and requirements occurring in the operator and authority side of industrial safety.

Figure 1: Summary of the training needs and requirements [8]

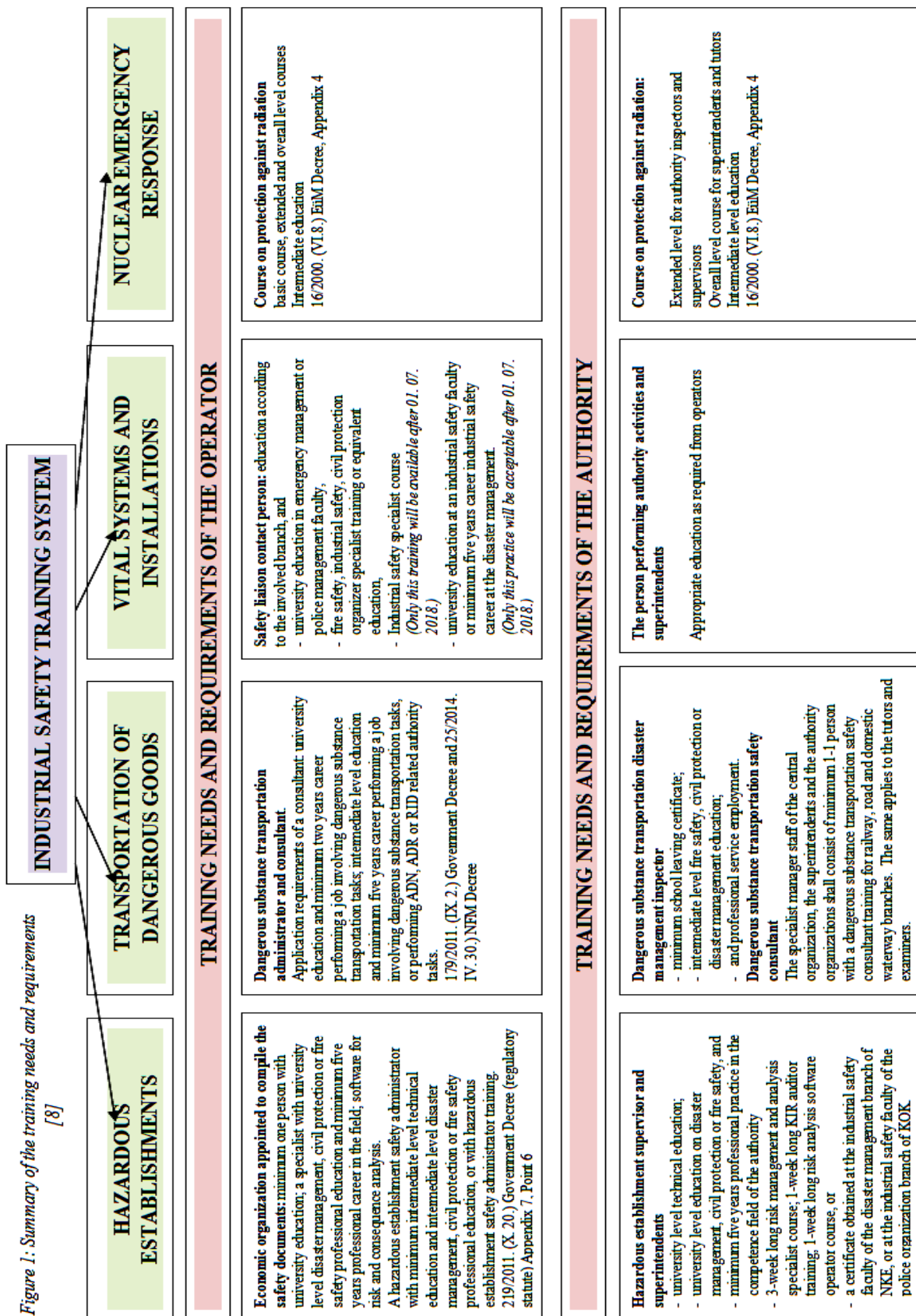
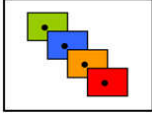
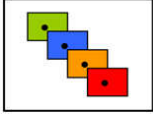


Figure 1: Summary of the training needs and requirements [8]



Summary and conclusions

In this article, after identification of the personnel requirements necessary for efficient operation of the system of laws, institutes and tools of industrial safety, I systematized the training and further education necessary for high level skills of the staff of industrial safety and the specialists of operators. On one hand, I made recommendations concerning the educational requirements of the staff employed in the field of industrial safety, and on the other hand about the educational and qualification requirements of the staff delivering trainings for further improvement of the quality control of the industrial safety training system. The results can be used both by the professional activities of disaster management and by the training and further education system.

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