NATIONAL
UNIVERSITY OF PUBLIC SERVICE
Doctoral Council

AUTHOR'S PRESENTATION OF DOCTORAL (PhD) DISSERTATION

ZOLTÁN MESICS

doctoral (PhD) author's presentation and official referee's reports
of doctoral (PhD) dissertation titled:

Developement of the requirements for the safety management system to improve the efficiency of the prevention of and response to major accidents involving dangerous substances

Budapest
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Budapest

DEFINITION OF THE SCIENTIFIC PROBLEM

Hungary can perform her industrial safety responsibilities on high level – in harmony with her international and EU obligations. Officers holding responsibilities in the domestic implementation of regulations on protection against major accidents involving dangerous substances have already acquired a 16-year long experiences in application of law. The disaster management authority began to implement the tasks related to the audit of the carriage of dangerous goods by road already in 2001.

Based on the existing experiences of operators and the process and tool system of the authorities 1-től a new „industrial safety" legal and authority system has been developed since January 1, 2012. The renewed disaster management legislation implements also the tasks related to industrial safety laws in a standardised disaster management structure and system of tasks. The group of establishments dealing with dangerous substances has been enlarged under the aegis of industrial safety, and licensing and supervising activity of the sub-tier establishments has been also realised.

The industrial safety activity can cover the implementation of systems and facilities of vital importance and the performance of tasks of the nuclear accident response disaster management, as well as the development of the related law enforcement activity. The industrial safety organisation is implementing major efforts to improve safety in the carriage of dangerous goods by road, rail, inland waters and by air and in the audit of establishments and facilities related to the carriage of dangerous goods. In addition to the licensing, supervising and auditing activities the tasks of establishment and community emergency planning, information to the public and community development had to be also implemented.

Safety of dangerous establishments can these days form integral part of the public safety. Quantity and hazard portfolio of dangerous substances in place at various sites, innovative technologies appearing through global business collaboration, permanently changing technical environment and efforts aiming at satisfying the continuously growing production demands require for rigorous restrictions for the organisation and management of dangerous activities and maintenance of enhanced supervision over these activities by the authorities.

Major accidents have occurred recently and they could clearly demonstrate that maintaining the risks related to process safety at acceptable level, appropriate organisation and management of dangerous activities, and the operators' commitment towards safety provide the supporting pillars for the protection of people living in the vicinity of dangerous establishments, for the material assets and values of nature, thus this is these days an undoubtedly burning issue.

In conformity with the 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 (Seveso III. Directive) Chapter IV of the Act CXXVIII. of 2011 on the disaster management for the operators of dangerous establishments and on the amendment of certain related laws (hereinafter referred to as the: Kat.) prescribes, subject to the status of the given establishment, for the operation of a safety management system or a management system. The purpose for operating such systems is to implement a safety policy aiming at the prevention of major accidents and risk mitigation. A safety management system is a „quality management" system which is not based on any voluntary commitment but on the performance of an obligation arising from law and its operation can help in reaching and sustaining the appropriate safety against major accidents. Regarding its goal, structure and main elements a management system is identical with a safety management system, but regarding the content and documentation of certain elements of the system it defines less detailed regulations than the Government Decree nr. 219/2011. (X.20.) on the protection against major accidents involving dangerous substances, issued as the Kat. implementation law (hereinafter referred to as: D.). Keeping in view that analysis of the Major Accident Hazard Office operating in the European Community Research Centre could prove that the cause of 85% of accidents is human error and deficiencies in the management systems, and a successfully and efficiently operated safety management system or management system (hereinafter referred to as: safety management system) is one of the most critical tools for preventing major accidents.

There are nearly 700 dangerous establishments in Hungary and their operators meet the requirements specified in the D. and apply various solutions depending on the organisational and technological specifications, often by expanding the operated integrated corporate management systems focusi9ng onto disaster management. Experts working at the authority department of the regional and local units of the professional disaster management agency are responsible – as part of the licensing process - for auditing the compliance of safety management system established by the operators, and deciding within their supervisory authority whether these systems are properly operational or not. Both the industrial players as stakeholders and the industrial safety authorities demand that detailed professional and methodology recommendations should be prepared aiming at the standardised implementation of the relevant legal requirements in every dangerous establishment.

Investigating the causes of unexpected events in dangerous establishments may provide key information for identifying the directions of development for the operated safety management system and the relevant legal regulatory system.

Discovering the direct and indirect causes of major accidents can sometimes present a great challenge towards the safety experts of authorities and industrial facilities due to complexity of the integrated corporate management systems, the related organisational and personal structure, and the system of responsibilities, tasks, competences and authorisations. Further recommendations in investigation methodology should be developed in order that correlation of cause and consequence leading to the accident can be clarified on system-level, and the background factors causing the event can be discovered in addition to the direct triggering causes of the event, and also the complete range of the root causes that exist in the organisation's management system and the operator's safety culture.

Renewing the system of protection against major accidents, commissioning of the new industrial safety tools, developing the process system, standardising the preventative activity, and founding the methodology for the activity present the key technical task. Professionally standardised management and further development will be required in order that prevention and mitigation of effects of major accidents can be more efficient, and this may establish a nation-wide, standardised, high-level safety culture regarding the safety of dangerous activity performed among establishments engaged in various dangerous substances.

So the goal of the research is to find an answer to challenges that emerge during the development and operation of safety management system operated in the dangerous establishments by the operators, audit of the systems by the authorities, and during the investigation of major accidents and incidents (hereinafter referred to as: incidents) through the preparation of professional recommendations that can improve the efficiency and success rate of the processes in order that safety of people and values of nature in the vicinity of dangerous establishments can be improved.

THE RESEARCH POLICY

The most important research policy is to prepare specific technical recommendations in conformity with the scientific policy described below in order that the system of domestic laws, institutions, processes and tools as well as the industrial safety tasks can be harmonised and further standardised, optimised and developed.

C1: To study the EU and domestic laws related to incidents investigation, to conduct a deep analysis on the characteristics of recent incidents in Hungary, to analyse and evaluate experiences gained from related audits performed by the operators and authorities, and then, using the conclusions, to define the opportunities of further development for laws and regulations and tools of the professional methodology.

C2: Using the conclusions available as the result of the analysis, and through the synthesis of the key elements of audit methods recognised in the international practice to identify methodology recommendations in order that audits can be held more efficiently and successfully. The goal is to prepare law amending proposals for reducing the scope of event reportable to the authority from safety aspects only onto the key events – thus to reduce the administrative burden of industrial players related to statutory reporting –, and at the same time the depth of the investigation and its content elements will be defined more precisely than they are at present, thus facilitating the implementation of investigations within short deadline and with appropriate professional content. The goal during the preparation of professional methodology recommendations is to incorporate the investigation activity into a standardised scientific system, and to define the law amending proposals adjusted to such system.

C3: Summary and evaluation of experiences gained by domestic and international authorities and operators and the legal requirements presently applied for the development of safety management systems and their audit by authorities and related to their implementation, and, based on the results, to define methodology recommendations in order that various management system elements specified by laws can be more efficiently developed and operated and audited by the authorities. There is a further goal, to prepare and operate further detailed guidelines for the management of safety management system elements that regulate the monitoring and maintenance activity of technical status, and to collect the related good operating practices.

RESEARCH HYPOTHESIS

In harmony with the definition of the scientific problem and relating to in certain research policy the research is aiming at the analysis of the following hypothesis.

1. The author assumes that when the unexpected event occurred and was investigated, the operators do not discover the root causes when identifying the background of the event, and do not fully identify all the factors that contributed to the occurrence of the event and are present in the operator's safety culture and organisation's management system. Consequently, it is supposed that investigations cannot provide for the operator the wide range of information that could be the basis for continuous improvement of the safety in the establishment.

2. The author assumes that the synthesis of the key elements of international investigation approaches can help in preparing a professional methodology guideline to facilitate efficient and successful investigation of incidents by the operators and authorities – this is not available at present in Hungary. He also assumes that existing requirements prescribed by laws can be relaxed, the administrative burdens imposed upon the authorities and operators can be reduced by disregarding some of the unexpected events that can meet the relevant criteria of the legal system.

3. As the author assumes safety can be further enhanced by systematic development of professional and methodology recommendations related to the preparation and operation of safety management systems by the operators and their audit by the authorities, because the basic cause of most incidents and major accidents involving dangerous substances that have recently occurred in our country is human error and deficiencies in the safety management systems.

RESEARCH METHODOLOGY

To implement the scientific policy and verify the hypothesis the author applied modern research methods, like analysis, synthesis, comparative critical analysis and site survey.

a) During his research work he analysed the documents and experiences that became available as a result of investigations of incidents that have recently occurred in Hungary and investigated by operators and authorities, and evaluated the results of this analysis applying an inductive method.
b) Based on the evaluation of experiences of investigations he defined law amending proposals for the closing deadline and content elements of investigations, and prepared professional methodology recommendations for their successful performance through the

analytical evaluation of investigation approaches that are recognised and applied in the international practice and the through the synthesis of their key elements.

c) He studies and analysed the domestic and international professional literature available in the topic of safety management systems, internal regulation of disaster management, available methodology materials, and evaluated various domestic and international approaches with comparative critical analysis applied for investigation of such systems. Based on domestic and international experiences gained by authorities and conclusions drawn from the recently occurred incidents he identified the areas in safety management systems that require further development.
d) He held continuous consultations with experts of the National Directorate General for Disaster Management of the Ministry of the Interior and its regional directorates, and lecturers of the Disaster Management Institute and the Military Technical Postgraduate Institute of the National University of Public Service.
e) During his research work he collected the available best operating practices related to the research areas through consultations held with the operators at sites of establishments involving domestic dangerous substances.
f) He prepared the statistical analysis of the results of law enforcement by operators and authorities using the Microsoft Office Excel software.
g) He used the publications of the Technical Military Bulletin, Artificer Officer and Bolyai Review and the presentation published at the referred domestic scientific conference for preparing his doctoral thesis.

BRIEF DESCRIPTION OF THE INVESTIGATION FOR EVERY CHAPTER

In the first chapter of the thesis the author presented the correlations between the investigations of incidents involving dangerous substances and occurring in sub-tier establishments and the preparation and implementation of safety management systems. He highlighted and presented the development of regulations covering the above two areas and the strengthening synergies between them regarding both the EU and domestic laws.

He presented an overview the legal background and the applied methodology approaches of event investigation as one of the most important tools for continuous improvement of safety in the establishments. Then he presented the most critical conclusions drawn from the analysis of experiences gained from the recently occurred incidents, evaluated the investigation activity performed by the operators and the authorities.

Keeping the available experiences of domestic and international authorities in view and

recommendations of internationally respected scientific professional literature he pointed to the partial areas of the investigation activity incorporating the opportunities for further developments both for operators and authorities.

In the second chapter of the thesis he presented specific proposals for the further developments in domestic investigation practices through providing a comparative critical analysis of methodology approaches recognised and applied in international professional practices and the synthesis of key elements. He summarised his methodology proposals and their application opportunities in a draft guideline presenting practical examples taken from recent past.

Further he presented proposals for further developing the existing tools of the current legal and regulatory system primarily in order that existing uncertainties in the current law enforcement system that affect the depth and closure of investigations, their closing dates and the content elements of documents prepared on investigations can be eliminated. He set up a standardised system for the investigation activity through preparing proposals for a legal definition.

In the third chapter of the thesis he presented in details the provisions of domestic laws relevant to the preparation of safety management systems and presented their evolution driven by the introduced Seveso III. Directive, covering also the practical opportunities for implementation of the requirements, provided an overview of the methodology approaches that are available in international professional practice for evaluating the safety management systems. He presented the experiences of domestic and international authorities related to the evaluation of systems.

Referring to experiences gained from investigations of incidents held by authorities and investigations of recently occurred incidents he identified the content elements of safety management systems and their preparation and operation can now present the biggest challenge for domestic operators, however as their preparation and operation is at present not satisfactory, and this can significantly add to the occurrence of incidents.

Regarding the identified areas, as a result of the analysis of sources in the professional literature recognised and applied in international and domestic professional practices, evaluation of the relevant experiences of operators and authorities, and conclusions drawn from unexpected events he prepared proposals for ensuring successful preparation and operation for the relevant system elements. As part of the research work he prepared professional recommendations for certain areas and collected good operating practices and presented them in one-one professional guideline draft.

SUMMARY OF CONCLUSIONS

I. Regarding the analysis and evaluation of experiences of the legal and methodology tools of incidents investigation and experiences gained from the actual events

1. At the beginning of the research **he overviewed the relevant regulations of Seveso III. Directive and domestic laws related to incident investigation**. As a result of the analysis of laws he came to the conclusion that the domestic legal system provides stricter provisions for the scope of events to be reported and investigated than the EU laws do.

2. **He analysed and evaluated in details the available experiences in law enforcement gained by the operators and authorities** in order that the analysis of law enforcement practice can be successfully analysed.

When he analysed the investigations held by operators **he came to the conclusion that** during the investigation of unexpected events **the operators do not discover the total background of events down to their root causes**, and do not fully identify all the background factors that contribute to the occurrence of the event and are present in the operator's safety culture and in the organisation's management system.

During the analysis of investigations held by authorities he found that the authority **is in the position to more efficiently supervise the investigation through systematic documentation of proofs and recording information that can improve the efficiency of investigation subsequently held by the operators**.

3. He also concluded that **awareness should be further improved regarding the depth of investigations both for authorities and operator and better differentiation is required between triggering and root causes through providing the better relevant definitions.**

4. He concluded that the investigation activity, content elements of reports presenting the key content elements for operator investigation and starting and closing dates of investigations should be defined on legislation level.

5. During his analysis he identified the key issues that require further methodology developments in operator investigation practice, like collecting information and proofs, discovering the cause and consequence relations, and defining preventative and correcting measures. When he evaluated the tasks related to authority investigation he also identified the issue of surveying and documenting the conclusions and effects, as an area that required further development.

6. He came to the conclusion that the identified uncertainties in law enforcement and the discovered deficiencies in professional methodology can be eliminated with the following solutions:

- **Performance of investigation tasks can be facilitated through implementing active awareness improving measures**.
- **Uncertainties in law enforcement affecting the content and the implementation date of investigations can be significantly reduced through developing a legal and regulatory environment that clearly define the content elements.**
- **Deficiencies affecting the depth of investigation, discovery of consequential correlations and introduction of counter-measures can be successfully managed through the preparation of a professional methodology guideline.**

II. Regarding the development of legal and regulatory and methodology tools for incidents investigation

1. Applying investigation **approaches** recognised and applied in the international practice **using the comparative critical analysis method he identified the key momentums of the investigation process and the key elements of methodology approaches that can be best applied to such momentums**.

2. **He prepared a professional guideline draft where he presented detailed professional guidelines for the identified issues that require methodology development through the synthesis of the key elements in internationally recognised and applied investigation approaches**, **and based on conclusions drawn from the evaluation of documents prepared for domestic investigations.**

The identified guidelines form the deficiencies of the domestic investigation tools presently available in the area of protection against major accidents, because the operators has so far had no access to a professional guideline that presented the specific issues of incident investigation in details, while the authorities have access only to a comprehensive criteria system in the form of a checklist as the relevant internal regulation.

3. During the research aiming at the evaluation of efficiency of the present legal framework **it was concluded that there are some unexpected events that fail to meet the criteria of the present legal requirements should not be monitored as an issue of priority**. **Proposals were presented to modify the definition of incidents described in laws**.

4. Proposals were presented to further development the legal framework regarding the definition of investigation activity, content elements, depth and timeframe of investigation, and if it is approved the existing uncertainties can be eliminated between the law enforcement by operators and law enforcement by the authorities.

5. **As the result of the research he highlighted the key deficiency of the presently applied investigation approaches, the lack of the detailed criteria system which is indispensable for discovering the deficiencies related to the preparation and operation of safety management systems**. **As a further research target he identified the need to prepare the criteria system in this type**.

III. Regarding the research and development of the methodology for the preparation and operation of safety management systems

1. He thoroughly studied the relevant legal requirements for the preparation and implementation of systems, the related international and domestic professional literature, and publications of well-known authors in order that the concept, role and content elements of safety management systems can be put into system.

2. Based on sources in the international professional literature, experiences of authorities and industrial practices he prepared and summarised the practical implementation opportunities related to various new or amended legal requirements.

Putting the safety-critical organisational, personal and technical changes into system, and defining the types of changes covered by the relevant management system element are outstanding results in the field of change management.

3. During the research work he was engaged in the analysis of safety management systems operated in establishments involving upper tier dangerous substances and lower tier dangerous substances and sub-tier establishments.

During the analysis he came to the conclusion that **essential differences can be discovered only at the level of documentation of the systems.**

At the same time he found the performing the legal and regulatory requirements might impose a challenge for companies that operate with low headcount level or for companies operating several sites, thus he prepared guidelines how to manage these challenges.

4. Following the analysis of the international and domestic professional literature he concluded that the fundamental professional guidelines and recommendations are already available for the preparation of the key content elements of the safety management systems, and if they are applied the weak fundamental points of the systems and areas to be further developed can be identified.

5. He also concluded that certain content elements can cover wide special areas in order that the successful implementation can be expected from the stakeholder operators only after the preparation of further detailed guidelines.

6. As a result of detailed analysis he concluded that most of incidents that have recently occurred in Hungary were caused by human error and deficiencies in the safety management systems. Experiences of incidents investigation and evaluation of experiences gained from authority audits could also demonstrate that **in sub-areas, e.g. investigation of major accidents and incidents, monitoring and maintenance of technical status, and activities of sub-contractors, elimination of the identified regulatory deficiencies requires further and more detailed professional guidelines, because far the greatest part incidents recently occurred in Hungary can be linked to these areas.**

During his research work he set the target to prepare detailed guidelines for the preparation and operation of the content elements mentioned above and the collection of the related good operating practices.

7. He studied the analysed domestic and international professional literature published in the topics mentioned above and **came to the conclusion that none of the domestic authors has so far elaborated systematically and in details the issues related to the technical status monitoring and maintenance, and the management of sub-contractor's behaviour in respect of protection against major accidents.**

8. Following the study of conclusions drawn from investigation of actual events and professional literature recognised in international professional practice **he prepared a detailed criteria system for the relevant topics, which can also function as preparation of systems, audit by operators and audit tool for the authorities.**

9. He conducted on the site consultations le in establishments engaged in various industrial activities and involving dangerous substances with different size, composition and complexity. **The primary purpose of such consultations was to find the answers and collect the applied best practices related to the issues identified above.**

10. **He prepared professional recommendations and collected operating practices and summarised them in professional guideline drafts broken down to topics. These prepared recommendations are suitable for professional support both for law enforcement by operators and by authorities.**

NEW SCIENTIFIC RESULTS

Based on the hypothesis and targets of the thesis the author **presented proposals for accepting the following new <u>scientific results</u>**:

1. Based on results of the analysis of the EU and domestic legal regulation and the evaluation of investigation activity of the operators and authorities related to the incidents recently occurred in Hungary ***defined*** *the possibilities for further development of regulatory and methodology tools regulating the incidents investigation.* With the realised results ***he prepared the ground for developing a standardised scientific system for the investigation activity***.
2. Through the synthesis of the key elements in the internationally recognised and applied investigation approaches and based on conclusions drawn from the evaluation of domestic investigations ***he prepared detailed professional guidelines*** *in order that the methodology regulating the investigation activity can be further developed.* A To ensure further development for the legal regulatory system covering the investigation activity ***he prepared modification proposals for making the disaster management law and its implementation law more up-to-date*** primarily focusing onto the group of reportable events, definition of investigation activity, its content elements, depth and timeframe.
3. ***He prepared and summarised*** *the possibilities for practical implementation of requirements of the legal regulatory system for the domestic disaster management* - which was significantly modified due to introducing Seveso III. Directive - *and for the safety management systems or management systems.* ***He prepared detailed investigation criteria system*** *in order that the technical status of safety-critical equipment can be monitored and maintained, and sub-contractors' activities can be managed*.

RECOMMENDATIONS OF THE THESIS

1. The methodology guidelines prepared for incidents investigation can be applied for providing professional support both incidents investigation.

2. The modification proposals prepared for ensuring further development of the legal regulatory system can be incorporated into the legal system of disaster management regarding the definition of investigation activity, its content elements and timeframe and as a result the presently existing uncertainties between law enforcement activities of operators and authorities can be eliminated.
3. Professional recommendations were prepared with respect of the requirements of the safety management systems modified due to the introduction of Seveso III. Directive monitoring and maintenance of the technical status of safety-critical equipment and the management of sub-contractors' activities, and recommendations can function also as the tools for the preparation and self-audit of system elements by the operators, as well as for the audits to be held by the authorities.
4. Professional recommendations prepared as part of the research work can be a solid basis for implementing the awareness improving measures related to the satisfactory performance of investigation activity, and the preparation, operation, audit and inspection of the safety management systems.

HOW TO UTILISE THE RESEARCH RESULTS

1. Incidents investigation, maintenance systems and management of sub-contractors' activities, and professional guidelines prepared for system elements of safety management will provide opportunities for the operators to satisfactorily preparing elements of safety management system and identifying deficiencies in the operated system and content elements to be further developed. At the same time they offer practical solutions for the further development of certain system elements through widely sharing the best operating practices.
2. Professional recommendations were prepared in accordance with international experiences of authorities and these can provide support for the disaster management authority in performing its licensing and supervising activities, because in the light of the prepared recommendations the criteria system for statutory investigations and audits can be supplemented and made more efficient.
3. Various parts of the thesis can be used in the training system of professional disaster management organisations when they prepare industrial safety notes, teaching aids and professional descriptions, during the activities of consulting agencies performing the audits of safety management systems, and in business organisations or companies involved in dangerous activities.

4. The professional guideline drafts, as presented in the thesis and its appendices may be usefully applied – after re-editing – as teaching aids in the National University of Public Service Disaster Management Institute, Szent István University Ybl Miklós Faculty of Architectural Engineering Fire and Disaster Management Institute, Disaster Management Training Centre and other institutions of higher learning, and professional institutes engaged in training of professional disaster management.
5. Conclusions and results of the thesis can be used for defining the research directions for further development of procedures, methodology and the system of technical tools to be applied in the area of protection against major accidents.

LIST OF PUBLICATIONS PREPARED BY THE PHD CANDIDATE RELATED TO THE TOPIC OF THE THESIS

ARTICLES REVIEWED AND SELECTED FROM PROFESSIONAL PERIODICALS (ON-LINE AS WELL)

In periodicals published in foreign language

[1] Mesics Zoltán: Possible Implementation Solutions For The New Safety Management Systems Related Legistalive Provisions Of the Seveso III Directive. BOLYAI SZEMLE XXVI. évf. 2. szám, pp. 109-124. – (2017) ISSN: 1416-1443

In periodicals published in Hungarian language

[2] Mesics Zoltán: A belső védelmi terv gyakorlatok tapasztalatai – 2012–2013. BOLYAI SZEMLE XXIII. évf. 3. szám, pp. 236-242. – (2014) ISSN: 1416-1443

[3] Mesics Zoltán, Kátai-Urbán Lajos: Veszélyes üzemi biztonsági irányítási rendszer működtetése – HADMÉRNÖK X évf. 1.szám: pp. 99-107. (2015) ISSN 1788-1919

[4] Mesics Zoltán, Kátai-Urbán Lajos: Biztonsági irányítási rendszer értékelése – HADMÉRNÖK X évf. 1.szám: pp. 108-118. (2015) ISSN 1788-1919

[5] Mesics Zoltán, Kovács Balázs: Mesics Zoltán, Kovács Balázs: Veszélyes üzemekben bekövetkezett üzemzavarok hatósági vizsgálatának tapasztalatai BOLYAI SZEMLE XXIV: évf. 3. szám, pp. 116-123. – (2015) ISSN: 1416-1443

[6] Mesics Zoltán, Kovács Balázs: Új megközelítés a veszélyes anyagokkal kapcsolatos súlyos balesetek vizsgálatában BOLYAI SZEMLE XXIV: évf. 4. szám pp. 150-163. – (2015) ISSN: 1416-1443

[7] Időszakos hatósági ellenőrzések a Seveso III. irányelv tükrében Védelem Tudomány ISSN 2498-6194 I. évfolyam 1. szám, pp. 143-161. – 2016. március, ISSN 2498-6194

[8] Mesics Zoltán, Kovács Balázs: Új jogi szabályozási követelmények a biztonsági irányítási rendszerekkel kapcsolatban Védelem Tudomány; I. évfolyam 2. szám, pp. 620-644. – 2016. június, ISSN 2498-6194

[9] Mesics Zoltán: A veszélyes anyagokkal kapcsolatos súlyos balesetek megelőzésének és kezelésének hatékonyabbá tétele a biztonsági irányítási rendszerrel szemben támasztott követelményrendszer továbbfejlesztése által. Műszaki Katonai Közlöny (Online) XXVII. évfolyam. 2. szám. pp. 31-45. (2017) ISSN 2063-4986

[10] Mesics Zoltán: Irányítási rendszerek adaptálása a küszöbérték alatti üzemekben. HADMÉRNÖK XII évf. 1. szám. 146-157. (2017) ISSN 1788-1919

[11] Mesics Zoltán: A biztonsági irányítási rendszerek hatékonyságának fejlesztése: karbantartási rend BOLYAI SZEMLE XXVI. évf. 3. szám, pp. 72-91. (2017) ISSN: 1416-1443

[12] Mesics Zoltán: A biztonsági irányítási rendszerek hatékonyságának fejlesztése: karbantartások kivitelezése és alvállalkozók kezelése BOLYAI SZEMLE (ISSN: 1416-1443) XXVII. évf. 1. szám, pp. 1-16. (2018) ISSN: 1416-1443, Megjelenés alatt.

[13] Mesics Zoltán: Veszélyes anyagokkal kapcsolatos üzemzavarok vizsgálata, fejlesztése HADMÉRNÖK XIII:(2) pp. 211-227. (2018) ISSN 1788-1919

[14] Mesics Zoltán: A biztonsági irányítási rendszerek hatékonyságának fejlesztése: változtatások kezelése HADMÉRNÖK XIII:(3) pp. 1-16. (2018) ISSN 1788-1919 Megjelenés alatt.

THE DOCTORAL CANDIDATE'S PROFESSIONAL AND ACADEMIC BIOGRAPHY

Name: Mesics Zoltán

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Studies:

He first graduated in mechanical engineering at the Technical University of Budapest. Later he graduated as engineer-economist at the Economist University of Budapest, then he had a specialised degree in fire protection engineering at the Szent István University Ybl Miklós Faculty of Architecture and Civil Engineering.

Language skills: intermediate level "A" and „B" type language proficiency examination in English language, and intermediate level "C" type language proficiency examination in Russian language

Professional career:

1999-2001 developing engineer at Military Goods Developement Institute of Military of Hungary
2001-2010 senior desk officer at Major Accident Prevention and Supervision Department, National Directorate General for Disaster Management, Ministry of Interior
2011-2012 head of department, Industry Supervision Department, Industrial Safety Department, National Directorate General for Disaster Management, Ministry of Interior
2012-2015 deputy head of department, Department for Hazardous Establishment, National Directorate General for Disaster Management, Ministry of Interior
2016- head of department, Department for Hazardous Establishment, National Directorate General for Disaster Management, Ministry of Interior
2017- secretary of the Industrial Advisory Board, National Directorate General for Disaster Management, Ministry of Interior
2018- member of the Disaster Management Scientific Committee, National Directorate General for Disaster Management, Ministry of Interior

Recognitions: Service decoration as recognition of the 10 years' service spent as member of the professional disaster management staff and of the successful work.

Budapest, September 15, 2018.

Mesics Zoltán