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**AUTHOR'S GUIDE OF DOCTORAL (PhD) DISSERTATION (THESES)**

The security of postal services and today's requirements of critical infrastructure protection in  
the light of postal liberalisation

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## INTRODUCTION

The long history of the humankind's scientific development demonstrates that problems once solved crop up again and again, in increasingly complex forms and higher levels. This phenomenon confirms the assumption that the more we know about the world around us, the more we find that "we know nothing". In other words, the maximum knowledge that could be attained theoretically, is far more than the knowledge base existing at any point in time.

Theme chosen for this paper prompts me to refer to Thomas Kuhn<sup>1</sup> who said that science progresses not always linearly or continuously but rather more typically by paradigms. The "paradigm changes" becoming necessary from time to time open up new, rivalling vistas for thinking. Paradigm-driven science is highly productive.

### **The reasons underlying the choice of the theme and its timeliness**

The /postal/ theme of this paper is, on the whole, quite a novel one. No publication on this topic has been brought out so far and it has not yet been processed in depth. It also enables a comparison of theory to practice. Its timeliness and importance for Magyar Posta Zrt. (hereinafter: Post Office) is beyond doubt since, after years of complex preparations and in accordance with the applicable EU directives, the market of the state-owned Company was fully liberalised from 1 January 2013. The time frame of the research (2009-2015) comprised the gradually institutionalised process of critical infrastructure (hereinafter: CI) protection as well.

Owing to the incompleteness of the applicable statutory regulations there was – there could not be – special CI protection at the Post Office during the entire period of my research. Since the start of my research even the term "critical infrastructure" has been replaced by a new concept "essential system elements".<sup>2</sup> I agree with researchers and teachers who emphasise that rather than science and research keeping up with legislation, it should be the other way around: there is a need for legislation based on matured scientific and research results.

### **The scientific problem**

The scientific problem that is the subject matter of the research comprises a theoretical and a practical component, studied through targeted basic research and applied research

- a) The targeted basic research (See Chapters 1-2) is focused on the following:
  - making proposals for new definitions to resolve terminology disputes, in line with the theme at hand,
  - possibilities of analysing processes ranging from business as usual to critical conditions, with a special focus on network specifics,
  - exploring the roles of integration theories and interrelations in CI protection, with a special focus on the security of public services,

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<sup>1</sup> Thomas Samuel Kuhn (1922-1996) was an American science historian and science philosopher who introduced the concept of "paradigm change", a term that has become a widely used expression.

<sup>2</sup> I use both terms in this paper.

- strengthening of the economic elements of sustainable protection, with a special focus on non-market based, unresolved background conditions of insurance,
  - analysis of new challenges facing the authorities' and operator' practices, with a special focus on the risk analysis and other practices.
- b) In accordance with the applied research objective the focus is narrowed down a general analysis of the situation in terms of the protection and security of postal services and then further down to that of specific processes and various types of services. (See Chapters 3-4). My research was carried based on a “Post Office as a CI segment” approach. All indicators having a material impact on the security of postal services are analysed. I am seeking for answers to the following:
- impacts of network, business division, technology and international relations on the security of postal services,
  - the impacts of the regulatory and market environment of the Post Office on CI protection, with a special focus on liberalisation's role in affecting security,
  - CI focused analysis of the protection/security system of postal services from aspect of the network and the various segments of postal operations,
  - the possibility to specify “horizontal” and “vertical/sectoral” criteria of postal services in the prospective identification/designation process,
  - the identifiability of organisational, sustainability, risk analysis and risk management related specifics of postal security.

## Hypotheses

I set up the following hypotheses at the beginning of the research:

- a) New terminology may need to be worked out, CI itself and some related terms and concepts may need to be redefined to enable implementation of state-of-the-art CI protection.
- b) The requisites for continuous sustainability of CI protection are not fully available from a variety of aspects (e.g. in economic and regulatory terms) therefore there may be a need for modernising subsystem components and for a significant improvement in underlying insurance conditions as well.
- c) The available security system of postal services may be suitable for maintaining the homogeneity of protection even in the circumstances of liberalisation, regardless of the CI categorisation of the various elements of the system. Postal services are likely to be mutually interdependent, the security systems are flexibly resilient thanks to their inherent features and the occurrence of critical conditions is determined more by external factors (transport, energy) and is closely associated with the given country's general operability.
- d) Just like in other industries, sectoral criteria reflecting the service's specifics may be worked out on a supplementary basis for CI protection in the case of the Post Office as well. The contents of such sectoral criteria should be aligned not only to the existing

regulatory environment but also to the assessment of the consequences of predominant events entailing major risks from the aspect of services.

- e) Statutory regulations pertaining to the identification, designation and protection of essential systems may include requirements that may cause duplicated operations (and, consequently, extra costs for the operator) for the society and the economy alike, as a result of their obligation to maintain business continuity. There may be a need for a method of risk analysis that does not necessarily follow the traditional procedures but focuses examining the processes leading to a critical status (namely, the necessary and sufficient conditions for their evolution).

## Research objectives

My research was aimed at accomplishing two objectives: to contribute to the development of the theoretical fundamentals of CI protection and to find ways for application of my findings and conclusions in practice. My objectives include:

- a) *To work out an analysis of the current situation* in CI protection, associated concepts and relationships and *to explore* the legal background and implementation environment of CI protection. Based on the results and findings *to make proposal* for working out terms and concepts relating to CI protection.
- b) *To evaluate* the economic and administrative aspects and implications of CI protection, with a special focus on new alternative solutions of general applicability as well.
- c) *To describe* the network related, functional and technological characteristics of the Post Office *analyse* postal logistics, international relations and product and service characteristics.
- d) *To examine* the standards of regulation of the mail delivery and payment services of the Post Office, the situation in terms of IT systems, multi-channel information flows, external relations and customer service positions as well as the event management. *To analyse* the categories of high risk products/product groups.
- e) *To analyse* whether the postal services will, even in the circumstances of the “liberalised” market conditions, meet at least the existing level of security, along with the challenges stemming from the new circumstances.
- f) *To elaborate* novel aspects to supplement or even nearly complete the sectoral (vertical) system of criteria pertaining to postal services.
- g) *To research* the possibility of a new risk analysis methodology /applying to postal services/ and to identify possible factors of the maintenance or improvement of the flexible resilience and resistance of the processes involved in postal service provision.
- h) *To render* the paper *suitable for use* in the preparations for decision making in legislation, for internal regulation, for further research and, in regard to some of its elements, even for education and training.

## Research methods

The following methods were applied in this research:

### *General methods:*

- a) Actual utilisation of the knowledge acquired at doctoral school, discussions with consultants and professors. Participation in workshop discussions and thesis defence sessions,
- b) A chronological study of the available relevant literature, processing of materials of conferences on the subject, review of public information available at the Post Office,
- c) Consultation with organisations involved in the subject matter, collection of information from international sources, drawing conclusions from analyses and syntheses,
- d) Working discussion and public information exchanges with Hungarian and foreign experts, review of applied protection technologies,
- e) Analysis and practical interfacing of the Post Office's protection and security functions. Processing of EU and domestic sources of information on market liberalisation and assessment of security challenges,
- f) My work was based on the approaches of “from the general to the specifics”, “from theory to practice” and “from conclusions to actual proposals”.

### *Special methods:*

- a) Primarily: comparative analysis and analogy.
- b) Explication and its theoretical and pragmatic application.
- c) The method of indirect logical conclusions.

My research was closed on 30 April 2015 therefore this paper covers neither events that occurred after the date of closure, nor conclusions that could have been drawn from them. The attachments, figures and tables accompanying the paper are aimed to help the reader understand its contents.

## **I. A BRIEF DESCRIPTION OF THE ANALYSES CARRIED OUT, IN A BREAKDOWN BY CHAPTER**

### **1. A terminology approach to critical infrastructure and the associated terms and theories**

Chapter One, laying down the theoretical fundamentals of my research assessed and analysed the current situation of CI protection from a variety of aspects. The terminological approaches

to CI protection were and are, for the most part owing to the appearance of their obvious influence, greatly complicated by the treatment of the following three subjects:

- the interrelationships between perception and definition, i.e. the relationship between the perception of phenomena and the creation of terms and concepts,
- the establishment of the possibilities for the application of a *cognitive approach* (a collective term for cognitive functions) in the field of CI protection,
- the application of the knowledge base of the *evolutionary epistemology, a term applied in philosophy*.

Issues such as the choice between possible versions of various schools of thought, the possibilities of combination and theoretical interoperability are highly important from the aspect of protection. There are major differences between technical and social science aspects since in the case of the former field certain mechanisms can be identified (e.g. thermal energy, pressure, force), no such thing is possible in the case of the latter, owing to the appearance of the human subject factor.

This Chapter discussed general and specific attributes of the domestic and international regulatory environment of CI along with proposals for the future.

The very concept of CI (including the definitions of infrastructure and criticality) is analysed in depth, giving a detailed account at each relevant point my position concerning the terminology issues discussed. Aspects proposed as conditions for identification criteria were worked out in regard to infrastructure. (See Table 1)

Table 1 (worked out by the author)	
PROPOSED IDENTIFICATION CRITERIA FOR INFRASTRUCTURE	
man-made	network type
the appearance of any public purpose	meeting sustainability and environmental security requirements
controllable access	sector neutrality
political, economic and social sensitiveness	

The components of the development of what is referred to as “critical state” were reviewed from a novel aspect. The Chapter discusses terminology analyses that might profoundly affect the performance of tasks relating to the protection of essential system elements.

Infrastructure and CI related concept development is organically complemented by sections of analysis and evaluation scrutinising the relevant terminologies (protection, threat, chance, opportunity, risk, network), strategies, integration theories and interdependencies,

accompanied by the author's position statements. Integration-related influences entail identifiable advantages for protection, along with certain risks as well.

It was found that the requirements of three key principles (subsidiarity, gradualness and sectorality) must – on account of a high level of social and economic embeddedness – be applied and the relevant theories of the sciences of organisation and management should also be utilised in the protection of public services.

Characteristics of public services and service security fundamentals (planning, modelling, embedded systems, fault tolerance) were also analysed in the way of introduction of research applied to postal services.

## PARTIAL CONCLUSIONS DRAWN IN THE CHAPTER

- 1) There is a need for updating the terminology background of the protection and security system. In this context CI and a number of related new conceptual interpretations were worked out from a variety of aspects.
- 2) Increased emphasis and focus will have to be laid in the future on special examinations of the constituents contributing to the development of critical states, particularly on identifying the conditions that are necessary and sufficient for the process leading to criticality (and, of course, on preventing their occurrence).
- 3) The application of the network theory will become particularly important in CI protection where in addition to the IN and OUT states the knowledge of interim states is also crucially important.
- 4) Public services constitute the most important field of operation of CI the continuous and proper functioning of which affects essential social, political, economic and international interests.

## **2. Sustainability in critical infrastructure protection**

Chapter Two, laying down the theoretical fundamentals of the research, discusses issues relating to the sustainability of CI protection. The analysis is focused on – the interrelated – economic and regulatory aspects of sustainability.

In the context of the economic aspects the domain of the interpretation of the security of the economy is separated from that of economic security, though these terms may be viewed as ones in mutual interaction with each other.

“Environment security” comprises all of the plausible events and series of actions actually or potentially posing threats to our environment as a consequence of natural or civilisation-related factors. Three of the possible environment security aspects (resource efficiency, global warming/climate change and ecological footprint) were analysed and evaluated. Sustainable security, as a concept, comprises theoretical, practical and methodological inputs that can – continuously and at a level at least equalling the pre-existing level – maintain a balance among the surrounding challenges, threats and risks and our response capability, in other



words, that can continuously provide for security, as a state of balance, despite potentially changing circumstances. In a functional interpretation sustainable security means, in regard to CI protection, the management of operational disorders. The subject of sustainable security has been rather insufficiently studied so far and in the majority of its discussions in literature it is – quite wrongly – treated from the aspect of environmental protection.

Basic considerations, specifics and possible sources of protection financing were discussed. From the aspect of financing there is a case for separating public functions from those of ownership. The financing of CI protection must be carefully planned, regardless of the underlying sources. An order of priority needs to be set up in the course of planning and costs must be coordinated with the expected results.

The research of insurance – as one of the economic background requisites for sustainability – is aimed in essence at assessing cost bearing (its assumption, sharing or denial) that should be proportionate to expected future risks and/or at strengthening of security awareness. After a review of the under-researched CI insurance background conditions four possible alternative solutions could be outlined, the potential introduction in Hungary of two of which justified more in-depth analysis and evaluation. It was clearly established that insurance-based CI protection may only be a supplementary component and that CI protection must be predominantly financed from combined sources (including the participation of the state). New solutions may be offered as a result of the research in relation to insurance facilities for so-called extreme situations.

The study of sustainability from the aspect of the involvement of competent authorities comprises not only an analysis and evaluation but comprises findings based on a new approach: it expresses a standpoint concerning a number of technical/professional issues relating to identification and designation: identification criteria, processes operated by functional authorities are analysed together with aspects of accessibility in the context of the preparation of the population. Based on a separate set of criteria possible/recommend/mandatory forms of cooperation among participants involved in CI protection were elaborated. The research comprised applicable methods of risk analysis along with the associated conclusions concerning probabilities enabling the identification of certain future challenges as well.

#### PARTIAL CONCLUSIONS DRAWN IN THE CHAPTER

- 1) Environment security and environmental protection are different terms, as the latter is a constituent element of the former.
- 2) Nearly all production systems, economic regulatory mechanisms and the applied extensive, intensive and integrated indicators are geared towards growth and, unfortunately, do not promote sustainable security. The integration of economy and ethics points to the requirements of transparency and the fight against corruption – this is a criterion that applies to protection and security as well.

- 3) The performance of CI protection tasks is not only in the interest of the owner/operator but at of the population as a whole. Sharing the financial burdens of financing between the operators and the state on the basis of regulated principles should be considered.
- 4) More attention should be paid to the insurance-related background conditions applying to non-commercial extreme situations. Two possible alternative solutions were worked out: in one case the state would be involved as the entity protecting the interests of the public, while in the other it would be present as provider of background security beyond commercial solutions, playing the role of a reinsurer. One of these two alternatives should be introduced in Hungary.
- 5) After the selection of the risk management methods further challenges are associated with the need to work out the parameters to be studied/measured/analysed in the appropriate proportions, applying correct weighting factors to each.
- 6) CI risk management methods to be applied or recommended in the future cannot be based exclusively on conclusions concerning probabilities.

### **3. Environmental characteristics of the performance of postal services**

In this Chapter of my applied research I discussed environmental characteristics of the performance of postal services. The first part of the chapter is an overview of the history of the Post Office dating back to hundreds of years, its social and economic embeddedness, infrastructure and general operational and financial management characteristics. This overview was necessary because without knowledge of certain basic postal technical/professional considerations and without a special knowledge base it would be rather difficult to assess specialised protection/security requirements. This Chapter sums up all of the network, process, technological, forwarding and protection factors that are equally required for the safe and secure performance of postal services.

The process of market liberalisation based on EU directives has been completed across Europe. During the past years the Post Office geared up for market liberalisation, the introduction of which was profoundly prepared. I worked out my standpoint concerning the *assessment* of the postal market and its regulatory environment (including liberalisation) *from the perspective of security*: the list of postal services to be actually protected is legally well-defined but in terms of functional aspects and operations it is significantly extended (namely, it includes activities actually performed and in need of protection that do not truly qualify as postal services). The situation would be substantially changed by the designation of multiple universal service providers. From the aspect of protection the following minor phenomena relating to liberalisation need further consideration:

- the network that is in need of protection in principle may be expanded by network access contracts,
- management of bilateral agreements in place with integrators and that

- the Post Office – as an universal service provider – may, based on authorisation by law, conclude contracts with partner organisations for the performance of parts of the collection, processing, transportation and delivery activities comprised in its own services.

One of the key assets of the Post Office is its possession of network facilities unmatched by any other organisation in Hungary.

I found it necessary to work out a more in-depth analysis of the mechanisms of the operation of postal services therefore I took account of the elements that may be regarded as directly related to protection/security issues (postal organisations, the product and service portfolio, technical processes and international relationships).

The functioning of postal services depends on a synergy between organisational effectiveness, a domestic and international product and service portfolio in line with the capabilities as well as being driven by technology.

#### PARTIAL CONCLUSIONS DRAWN IN THE CHAPTER

- 1) Postal security service must follow the Company's strategic programme based on new pillars, the key elements of which include: new alliances in the market of financial services, e-commerce driven parcel logistics, the protection of operations by diversifying the core operations and increased technological integration of IT.
- 2) The roles played by postal participants, intermediaries and consolidators in ensuring security needs to be examined because they may also perform component activities relating to postal services as well.
- 3) The interrelationship between security and liberalisation would truly be a timely question (necessitating further reviews and risk analyses if more than one or multiple independent universal postal service providers were designated).
- 4) The Post Office's internal operation is a practically technology-driven process and technologies are closely related to the security of the services.

#### **4. The security system of postal services**

In Chapter Four of my paper I aimed at working out practical applicability for the findings of my theoretical research. Chapter Four discusses the complex subject of the security of postal services, from four priority aspects [a) – d]):

- a) The *general aspects of postal security*. The analysis discusses the postal-specific regulatory environment, the interpretation of the concept of postal security and environmental loads. The Post Office's bilateral interdependencies and its activities performed in various forms of inter-organisational cooperation were also explored.
- b) The *examination of the system of protection of postal services* involves components and the state of organisational issues, applied risk analysis and risk and event management

developments in regard to business continuity rules within the organisation of the Post Office, financial and technical resources and the applied practices. Postal security was divided on the basis of a new approach, into object, process and IT components. The analysis shows that the practices of risk analysis are focused more on objects and less on processes and the key elements of the IT infrastructure are – even from the aspect of security – operated by external bodies, supporting them under complex service contracts.

- c) A review of the conditions of *security by specific functional* area is definitely justified by the dimensions and the complexity of the service security of the Post Office. It is concluded that the negative impacts of temporary operational disruptions in the Post Office's logistics network would be observed in the districts concerned i.e. the effects would be either nationwide (involving one or another product group) or they would be observed in the region, municipality or area served by the given mailman or mailwoman. Any unfavourable effect may be managed by functional reallocations, splitting of territorial units or assistance under cooperation agreements.
- d) The analysis of factors contributing to the occurrence of critical states and of key elements of postal services is discussed in part four of Chapter Four. A concrete proposal was worked out for the extents of the identification of the essential elements of postal services as special sectoral criteria, taking into account both mail delivery and payment transaction characteristics alike. Those criteria are also of relevance to international and domestic quality requirements and are aligned to the requirements of the four sectoral government decrees that have been adopted so far.

#### PARTIAL CONCLUSIONS DRAWN IN THE CHAPTER

- 1) There are multiple factors to be taken into account in the interpretation of postal security but “*balance*” is the single most important and most acceptable theoretical factor that is the most suitable for a general presentation of a desired condition.
- 2) It is concluded that few threats and dangers may be identified that could *universally affect the operations of the Post Office as a whole*. The involvement of specific functional segments also need to be analysed from the aspect of the sustainability of postal services.
- 3) All designated CI operators *must work out its own matrix of (bilateral) interdependencies* and provide for following it up. *Scientific and practical methods for the management of interdependencies must be worked out and the management of interdependencies must be elevated to the level of risk analysis and risk management by IC operators.*
- 4) The analysis of postal services must in the future be given priority rather than the examination and testing of elements, i.e. focus must be shifted from object security to process security. Accordingly, the *assumption that object protection ensures the protection of the service process does not apply* to the Post Office.

- 5) The operability of postal services is closely correlated with the functioning of the country as a whole, even without CI identification or designation.
- 6) The prospective sectoral criteria applying to postal services must be in compliance with the applicable statutory regulations (universal service provider, processing times) and they must reflect the specifics of mail delivery and payment transactions, the identification and designation of criticality must be aligned to the societally dominant extents and they must be consistently in line with the decrees introduced so far in regard to the CI sector.
- 7) Future essential system elements need not necessarily be identified in the future in regard to elements that clearly cannot meet at least one horizontal and one (prospective) sectoral criterion simultaneously.
- 8) A parallel study of horizontal criteria that can be regarded as having to do with disaster management and the effective legislation on CI may result in the identification and designation of too few essential system elements at an European and national level alike. This then
  - either indicates the possibility of the applied system of criteria being inadequate or,
  - justifies a shift in the approach or approaches taken. There probably is no system or process designed or intended to be operated as critical in the first place, only ones that may turn out to be in a critical state as a consequence of internal or external causes and/or their combined effect(s). Accordingly, in the course of identification instead of the element, the infrastructure or the object is to be sought for but *the factors contributing to the evolution of a critical state of a given system, system element or object or - in the case of the Post Office – the given process should be examined together with its necessary and sufficient requisites*. Working out the requisites is a great challenge, a technical/professional task for the operator concerned.
- 9) The guaranteeing of the resilient state of postal services from the aspect of security protection may be expressed in terms of the combined effect of three factors: *social embeddedness, the possibility of functional reallocation and dislocation*.

## II. SUMMARISED CONCLUSIONS

On the whole, I found that various postal objects, infrastructure elements or processes may be disrupted in a way that may make it impossible to maintain the service but the entirety of postal services cannot (apart from interdependencies resulting from major natural disasters or extraordinary events, civil wars or acts of war).

The hypotheses set up at the beginning of the research turned out to be valid because

- based on an assessment of the available terminology relating to CI protection *there was a need for working out new concepts and definitions* and for the preparation and development of a knowledge map based on a new kind of approach,
- various shortcomings of the theoretical fundamentals underlying CI protection really impede practical implementation which may be among the reasons for the delays in the identification/designation of the sectors specified by law (at present this is also causing delays in terms of specific segments even at the Post Office itself). It was demonstrated that a number of prerequisites for the continuous sustainability of protection are not available in a number of aspects, therefore there is a case for
  - updating subsystem components (financing of protection, preparation of the population, risk methodology), introduction of new risk analysis procedures and
  - *a significant improvement in the non-commercial background conditions of insurance as well.*

Sustainable security in SI protection entails strengthening of the capability of operational disruptions, i.e. the resiliency of protection,

- it was proven that the system in place to ensure the security of postal services is capable of maintaining the homogeneity of protection even in the circumstances of liberalisation regardless of the categorisation of the system elements according to CI criteria. The interrelationship between security and the liberalisation of the postal market would be an issue to be studied in the merits in a system in which multiple universal postal service providers are designated. The Post Office's bilateral interdependencies and its identifiable attributes were described. It was found that the protection of the Post Office is stable and *CI protection will depend on the combined effects of external, rather than internal, factors, since its security is closely correlated to the security of Hungary as a whole,*
- a proposal was worked out *containing possible sectoral criteria pertaining to postal services*, in view of legal and social requirements and expectations and those concerning the reflection of operational profiles,
- the statutory regulations applying to the identification, designation and protection of the essential systems do contain duplicated provisions – complicating identification or making it unnecessary – because the actions taken pursuant to Act CXXVIII of 2011 on Disaster management are substantially and materially overlapping – in regard to postal services – with activities to be carried out in the course of CI identification/designation, a significant proportion of which have already been carried out. A proposal was worked out concerning the method of examination of the components of processes leading to a critical state (to establish the necessary and sufficient prerequisites for the development of undesired processes) and for its application as a new risk analysis method.

### **III. SCIENTIFIC RESULTS**

- 1) I worked out pioneering up-to-date methods for working out concepts and terms for critical infrastructure protection and to categorise forms of cooperation among specialised functional areas, classifications and characteristics for defining types and structural attributes by creating new systems of criteria.
- 2) As a result of my targeted basic research efforts I worked out and made a sectorally interpreted new definition for the concept of “critical infrastructure” and for “network” that may be regarded as essentially inseparable from CI.
- 3) In regard to non-commercially based background insurance conditions that may be linked to critical infrastructure protection I proved that any solution may only be provided – in the absence of conditions that could be insured – only in the form of supplementary variants of combined financing and I made proposals for two domestic solution models.
- 4) With the aid of a scientific model I proved that scientific embeddedness, the possibility of functional reallocation and dislocation provide for a sustainable and resilient state of postal services.
- 5) As a result of my groundbreaking systemic research activities focused on postal critical infrastructure I worked out a proposal for sectoral criteria of postal services comprising concrete temporal and quantitative values required for the delimiting of the critical element that can be used in both the area of mail delivery and payment transactions.
- 6) As a result of my analytical research I made a groundbreaking scientifically substantiated proposal for a method for examining components of processes leading to critical states and suggested that it be used as a new risk analysis method in the postal subsection.

### **IV. RECOMMENDATIONS**

- 1) There is a need for further continued research to consolidate CI protection in both general and segmental aspects.
- 2) International cooperation in CI protection should be stepped up.
- 3) Research financing should be institutionalised and prorated to the relevant risks.
- 4) Of the conceptual criteria pertaining to infrastructure cognitive contents according to criticality, temporal (operational continuity) characteristics, use-related, circumstances of application and purpose of use as well, had to be applied in the way of a novel approach.

## V. POSSIBLE PRACTICAL APPLICATIONS OF THE RESULTS OF THE RESEARCH

- 1) The contents and results of the research are disclosed to the public therefore – by properly applying the rules of citation and references – they can be used freely in technical/professional publications, studies, theoretical and practical sectoral discussions, domestic and international conference presentations and in project research efforts.
- 2) The new definitions of the thesis may contribute to the development of the theoretical background fundamentals of CI protection and the improvement of its practical methodology and they may also serve as a basis for new research.
- 3) The proposed sectoral criteria pertaining to the postal segment may be used in the phase of the preparations for decision making in relation to the prospective new legislation on the sector as well as in its implementation.
- 4) The new security concept appearing in the applied part of the thesis (object, IT and process security) may be used in a variety of service segments of CI protection designated by law (transport, telecommunication, finance etc.) as well.
- 5) I consider the findings and novel logical approach presented in the thesis to be suitable for use in the planning of protection for the Post Office.
- 6) The analytical and evaluatory conclusions of the thesis and its theoretical trains of thought may be integrated in syllabuses and form parts of tertiary studies.
- 7) The contents of the thesis may provide assistance, special arguments, literary supplements or ideas for research focused on the field concerned for researchers, teachers, practitioners, university students, Ph.D. students and citizens with a flair for security issues.
- 8) By my thesis I wish to contribute to the expansion of the knowledge base of CI protection, with a special focus on the efforts of this particular discipline aimed at specialisation.

## VI. LIST OF THE AUTHOR'S OWN PUBLICATIONS ON THE SUBJECT

### UNIVERSITY AND COLLEGE LECTURE NOTES

1. Dr. Bukovics István - Dr. Potóczki György: Közigazgatási logisztika (*Logistics in public administration*). pp.105-137. In: Közszolgálati logisztika. (Ed. Pohl Árpád-Szászi Gábor). NKE Közös modul. Nemzeti és Közszolgálati és Tankönyv Kiadó. Budapest. 2013. ISBN 978-615-5344-37-4.



2. Dr. Potóczki György: Nemzetközi postai küldeményforgalom (*International postal mail delivery services*). College lecture notes. Wekerle Sándor Üzleti Főiskola. Budapest. 2012. ISBN 978-963-87401-4-4. pp.1-177. [http://www.wsuf.hu/pub/nemzetkozi\\_kuldemenyforgalom.pdf](http://www.wsuf.hu/pub/nemzetkozi_kuldemenyforgalom.pdf) Download: 18.12.2014.
3. Dr. Potóczki György: Postalógisztika. (*Postal logistics*) College lecture notes. Wekerle Sándor Üzleti Főiskola. Budapest. 2012. ISBN 978-963-87401-5-1. pp.1-138. <http://www.wsuf.hu/pub/postalogisztika.pdf> Download 18.12.2014.

## ARTICLES IN PROOF-READ PERIODICALS

1. Dr. Potóczki György: Terminológiai dilemmák az infrastruktúra és a biztonság fogalma körül I (*Terminology dilemmas relating to infrastructure and security*) online. Biztonságpolitika.hu. 28 December 2014, ISSN 2062-4379. pp.1-19. [http://www.biztonsagpolitika.hu/documents/1419769685\\_Potoczki\\_Gy-Terminologiai\\_problemak\\_I\\_-\\_biztonsagpolitika.hu.pdf](http://www.biztonsagpolitika.hu/documents/1419769685_Potoczki_Gy-Terminologiai_problemak_I_-_biztonsagpolitika.hu.pdf) Download: 30.12.2014
2. Bukovics István - Potóczki György: A logisztikai funkciók szerepe a közigazgatásban (*The role of logistics functions in public administration*). Pro Publico Bono – Magyar Közigazgatás. Public administration science periodical of Nemzeti Közszolgálati Egyetem (National University of Public Service). 2013. ed. 1, ISSN 2062-7165. ISSN 2062-9966 (online). pp.93-108. [http://www.ppb.mk.uni-nke.hu/downloads/lapszamok/PPB\\_13-01.pdf](http://www.ppb.mk.uni-nke.hu/downloads/lapszamok/PPB_13-01.pdf) Download: 10.03.2015
3. Prof. Dr. Bukovics István - Dr. univ. Potóczki György: Korunk kísérőjelensége: a gazdasági biztonság deficitje (*A phenomenon of our age: economic security deficit*). Rendvédelem Volume I. Ed. 2 Budapest, 2012. pp.84-99. <http://www.rvki.hu/images/downloads/rentudfoly/rendvedelem2.pdf>. Download: 15.01.2013
4. Potóczki György: Vannak-e továbbfejlesztési lehetőségek a katasztrófákat megelőző időszak lakosságfelkészítési tevékenységében (Are there any opportunities for further development in the preparation of the population before disasters)? Hadmérnök. Volume VI. Ed. 2. June 2011. ISSN 1788-1919. pp.324-338. [http://www.hadmernok.hu/2011\\_2\\_potoczki.php](http://www.hadmernok.hu/2011_2_potoczki.php) Download: 15.01.2015
5. Potóczki György: A katonai és a polgári logisztika határterületei civil szemmel (Borderline areas of military and civilian logistics in the eyes of a civilian). Hadmérnök. Volume VI. Ed. 1 March 2011. ISSN 1788-1919. pp.340-348. [http://www.hadmernok.hu/2011\\_1\\_potoczki.pdf](http://www.hadmernok.hu/2011_1_potoczki.pdf) Download: 15.01.2015
6. Prof. Dr. Bukovics István DSc - dr. univ. Potóczki György: Helyzetkép a nemzetközi katasztrófavédelmi elvárások hazai teljesítéséről és továbbfejlesztési lehetőségeiről, különös tekintettel az ENSZ, NATO és EU tagságunkra (An overview of the satisfaction of international disaster management requirements in Hungary and the possibilities of their further development, with a special focus on Hungary's UN, NATO and EU membership). VÉDELEM Online. 30 June 2010 ISSN: 1218-2958. pp.1-17. <http://vedelem.hu/letoltes/tanulmany/tan273.pdf> Download: 2014 05 03.

7. Potóczyki György: Áttekintés a kritikus infrastruktúra védelem jelenlegi helyzetéről, a továbblépést nehezítő tényezők elemzése útján (*A review of the current status of critical infrastructure protection through an analysis of factors complicating progress*). Hadmérnök. Volume V, ed. 2. 15 June 2010 ISSN 1788-1919. pp.203-218. [http://hadmernok.hu/2010\\_2\\_potoczki.pdf](http://hadmernok.hu/2010_2_potoczki.pdf) Download: 12.01.2015

#### FOREIGN LANGUAGE ARTICLES IN DOMESTIC PUBLICATIONS

1. István Bukovics – György Potóczyki: TQM as Nonprobabilistic Risk System. TQM, mint nem valószínűségi kockázati rendszer. VÉDELEM Online. January 2010. ISSN 1218-2958. pp.1-11. <http://vedelem.hu/letoltes/tanulmany/tan230.pdf> Download: 03.05.2014

#### FOREIGN LANGUAGE ARTICLES IN PUBLICATIONS ABROAD

1. György Potóczyki: Current issues of critical infrastructure protection. (Kijev). University of Law Kiev, Ukraine 2012. ISBN 978-966-301-200-1 pp. 50-58.

#### FOREIGN LANGUAGE PRESENTATIONS IN INTERNATIONAL CONFERENCE PUBLICATIONS

1. Dr. univ. George Potóczyki: „How could the education system help in the safe function of economy?” University of Defence Faculty of Economics and Management Department of Economics. International Conference BRNO, Czech Republic 20<sup>th</sup> October 2011. ISBN: 978-80-7231-884-1 pp.74-86. Sborník z teoreticko-praktické konference „Rozvoj ekonomického vzdělávání vojenských profesionálů jako reflexe požadavků praxe AČR” BRNO 2012.

#### FOREIGN LANGUAGE PRESENTATIONS IN NATIONAL CONFERENCE PUBLICATIONS

1. Prof. Dr. Istvan Bukovics DSc. - Dr. univ. George Potoczki: „The Public Administration such a critical infrastructure” National University of Public Service. Faculty of Public Administration. Budapest / HUNGARY. 4<sup>th</sup> Annual Conference of the European Decision Science Institute. EDSI 2013 Budapest/HUNGARY, 17<sup>th</sup> June 2013. BGF. .ppt. pp.1-45.

## VII. PROFESSIONAL AND SCIENTIFIC CV

NAME: Dr. univ. Potóczyki György

#### STUDIES

- 2009 - 2012: ZMNE Katonai Műszaki Doktori Iskola. Miklós Zrínyi National University of Defence. Doctoral School in Military Technology. Absolutorium
- 1983. University Doctor. „dr. oec”.

- 1991 - 1993: Külkereskedelmi Főiskola. College of International Trading. Forwarding, post-gradual education. Specialised economist.
- 1976 - 1981: Marx Károly Közgazdaságtudományi Egyetem. University of Economic Sciences. Faculty of Industry, Transport specialisation. Certified economist.
- 1969 - 1972: Közlekedési- és Távközlési Főiskola. Technical College of Transportation and Telecommunication. Motor vehicle specialisation – Operational engineer.

## EMPLOYMENTS

- 2006-2010 POZAX VÁMSPED Ltd.
- 1999-2005 GENERAL DIRECTORATE OF HUNGARIAN POST, POSTA Vámsted Ltd.
- 1996-99 BKIK (Budapest Chamber of Commerce and Industry)
- 1990-96 ALFA, POZAX International Ltd.
- 1975-90 VOLÁN TRUST, HEADQUARTERS OF VOLÁN COMPANIES
- 1972-75 SZÖVOSZ, SZÖVAUT

## ACTIVITIES IN EDUCATION

- 2012-15 NKE KTK (external lecturer), 2013-15 NKE HHK (external lecturer)
- 2012-15 Wekerle Sándor Üzleti Főiskola. Wekerle Business School (external lecturer)
- 2010-15 Wesley János Főiskola. John Wesley College. Faculty of environmental safety (external lecturer)
- 2013-14 MINERVA
- 2010 ZMNE. Miklós Zrínyi National University of Defence (external lecturer)
- 2000-2002 KOTK
- 1978-79 Közlekedési és Távközlési Műszaki Főiskola. Technical College of Transportation and Telecommunication (external lecturer)
- 1975-2002 VOLÁN TRUST National Education Centre.

## ACTIVITIES IN PUBLIC LIFE

### Domestic

- 2014- 13<sup>th</sup> District Government Financial and Budget Committee (chamber's delegate member)
- 2014 Member of Institution Councils (3 secondary schools in Budapest)
- 1993- Budapesti Kereskedelmi- és Iparkamara (Budapest Chamber of Commerce and Industry)

- 1996-2010 Magyar Vámügyi Szövetség (Hungarian Association of Customs Affairs)
- 1991-2008 Magyar Logisztikai Egyesület (Hungarian Logistics Association)
- 1972-1995 Közlekedéstudományi Egyesület (Scientific Association for Transport)
- 1983- expert activities

#### International

- 2006-2015 FNC World Organization of Freight Forwarding and Logistics. Member of Advisory's Board since 2012.
- 2001-2008 IFCBA (International Federation of Customs Brokers Associations), member of Board of Director's Body.

#### CONFERENCES

##### International conferences abroad in foreign language:

- Dr. George Potóczki: Current challenges – our network roles. 12<sup>th</sup> FNC World Conference. Ho Chi Minh City. 18 March 2015. .ppt. pp.1-30.
- Dr. George Potóczki: "We need a great team! The power of professional network" 10<sup>th</sup> FNC World Conference, London. 22 November 2013 .ppt. pp.1-39.
- Dr. George Potóczki: „Proposals to move forward. Some ideas on development of our profession”. 9<sup>th</sup> FNC World Conference, Kuala Lumpur. 17 March 2013. .ppt. pp.1-21.
- Dr. George Potóczki: „How can we manage some of our professional challenges?” 8<sup>th</sup> FNC World Conference, Hong Kong. 16 June 2012 .ppt. pp.1-48.
- Dr. George Potóczki: „How to develop the network of FNC?”. 7<sup>th</sup> FNC World Conference, Singapore. 25 November 2011 .ppt. pp.1-33.

##### Scientific and professional conferences in Hungary in Hungarian:

- Prof. Dr. Bukovics István DSc. - Dr. univ. Potóczki György ZMNE-KMDI: A közlekedési és logisztikai rendszer kritikus infrastruktúrájának védelme. A kritikus infrastruktúrák rendszerkonceptiója. (*Protection of the critical infrastructure of the transport and logistics system. System concept of critical infrastructures*). Zrínyi Miklós Nemzetvédelmi Egyetem. Scientific and professional conference. 31<sup>th</sup> May 2011 .ppt. pp.1-24.

#### LANGUAGE PROFICIENCY

Hungarian: native

English: Type „C” intermediate

Russian: Types „A” and „B” basic

Budapest, August 2015

Dr. univ. György Potóczki