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## Transport as a part of critical infrastructure in the Slovak Republic

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Tekst jest udostępniony do wykorzystania w ramach dozwolonego użytku.

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## **POSITION OF THE FACULTY OF SPECIAL ENGINEERING IN THE CRITICAL INFRASTRUCTURE PROTECTION SYSTEM OF THE SLOVAK REPUBLIC**

### **Introduction**

The questions of critical infrastructure protection started to be emphasized especially after tragic events of 11<sup>th</sup> September 2001, in the USA when the vulnerability of the critical infrastructure elements was confirmed and the first sophisticated measures for increasing the level of its protection were formulated. The reason is formation of super - terrorism as new dimension of terrorism against a background of "battle of civilizations".<sup>1</sup> Within the EU countries the European Programme for critical infrastructure protection KI-EPCIP was developed.<sup>2</sup> In December 2008 the Council of the European Union published the Council Directive 2008/114/EC on the identification and designation of European critical infrastructures (EKI) and the assessment of the need to improve their protection.<sup>3</sup> This Directive presents the first stage in the process of identification and designation of EKI and defines requirements for enhancing of its protection. It is concentrated on the main sectors energy and transport. NATO is also dealing with these problems. The Senior Civil Emergency Planning Committee and its sub - committees have published a lot of documents and studies dealing with critical infrastructure protection with recommendations whereby the option of access to these recommendations and their total implementation is in the competence of each member state.

### **1. Critical Infrastructure in the Slovak Republic**

The Slovak Republic as a member of the European Union participates in development of documents concerning the critical infrastructure and especially their incorporation into legislative framework. At present, the issues of critical infrastructure in the Slovak Republic are codified in the act No. 45/2011 Coll. of 8<sup>th</sup> February 2011 about critical infrastructure. This act determines competencies and responsibilities of the central bodies of state administration of the Slovak Republic. Municipalities and legal entities have also defined their responsibilities in this field. Strategic documents solving critical infrastructure in the SR are as follows:

- Decree of the Ministry of Defence of the SR No. 353/2004 Coll. stipulating criteria for inclusion of objects of defence infrastructure into the category of objects of special importance and the category of other important objects,
- Security strategy of the Slovak Republic of year 2005,

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<sup>1</sup> O. Krulík, *Zpráva komise kongresu o teroristických útocích z 11. září 2001* [http://www.army.cz/mo/obrana\\_a\\_strategie/1-2004cz/krulik.pdf](http://www.army.cz/mo/obrana_a_strategie/1-2004cz/krulik.pdf)

<sup>2</sup> The European Programme for Critical Infrastructure Protection (EPCIP) <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/06/477&format=HTML&aged=0&language=EN&guiLanguage=en>

<sup>3</sup> Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection. 2008. [cit. 28.04.2013] Available at: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:345:0075:01:EN:HTML>

- Conception of critical infrastructure in the SR and the ways of their protection and defence of year 2006,
- Act No. 45/2011 Coll. of 8 February, 2011 about critical infrastructure.

## **2. Scientific and research activities of Faculty of Special Engineering of the University of Žilina in the critical infrastructure protection**

The Faculty of Special Engineering of the University of Žilina has existed for 61 years as a part of the University of Žilina. In the first period, in the course of years 1953-1998, the faculty at that time called the Military faculty served as one of the most important military educational institutions. The faculty trained and educated university graduates for the needs of the Army of the Czechoslovakia and from 1993 the Slovak Republic military forces as well as for the needs of the Railway corps. The second period started in 1998, when in terms of the first stage of transformation the Military faculty was renamed the Faculty of Special Engineering.

The studies at the faculty are technologically and managerially oriented. The study programmes encompass specific subjects for preparing the bachelors and engineers for the needs of public administration, namely in the areas of civil and social security. To meet the requirements of various companies, social and other public institutions, the study programmes are oriented to issues of technological, economic, property and capital security, to safety at work, protection of persons, fire protection and solution of overall emergency and crises situations. Further, they are oriented to environmental problems including solutions of natural disasters and catastrophes, and specifically to the problems of critical phenomena in transport infrastructure, transport modes and logistics, too.<sup>4</sup>

### **Project - Critical infrastructure protection in sector transportation**

The project „Critical infrastructure protection in sector transportation” (2011-2014) coordinated by the FSE is funded by the Slovak Research and Development Agency. This project is oriented on critical infrastructure protection through development of new and application of known processes, tools and methods that will provide consistent, integrated and objective directions for risk management application in the process of critical infrastructure elements protection in transportation sector. The project outputs include evaluation methods of critical infrastructure vulnerability and risk assessment, risk management models and practices of creating the scenarios of possible violation of operational capability, principles and techniques of critical infrastructure elements protection and practices for removal of impacts caused by violation of functionality, as well as the models of rescue services activities in removal of accidents in critical points of critical infrastructure in sector transportation (CTI), principles of solving economic impacts of possible losses, methodology of CTI objects protection, new approaches for assessment of selected CTI elements performance based on mathematic-statistical methods and process simulation.

The project outputs will be contribution in the process of knowledge management development used in CTI protection and will put the base for development of decision support systems from the view of maximum effectiveness

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<sup>4</sup> web page of FSE [www.fsi.uniza.sk](http://www.fsi.uniza.sk)

of the first response on violation of critical infrastructure functionality caused by human activities or natural disasters.<sup>5</sup>

### **Project FP7 - Risk Analysis of Infrastructure Networks in response to extreme weather - RAIN**

In last years, a variety of extreme weather events, including droughts, rain induced landslides, river floods, winter storms, wildfire, and hurricanes, have threatened and damaged many different regions across Europe and worldwide. These events can have a devastating impact also on critical infrastructure systems. At present critical infrastructures (power plants, dams, dikes transport infrastructure, etc.) are more and more threatened because of the changing weather conditions. It is expected that the frequency of natural catastrophes caused by the extreme weather conditions will increase. Therefore preparing for these events is vital.

In this context, in the year 2012, the Faculty of Special Engineering of the Zilina University became a member of consortium that has prepared and submitted project proposal titled Risk Analysis of Infrastructure Networks in response to extreme weather - RAIN that achieved a very good evaluation and is well above the funding threshold. The project RAIN was elaborated within the activity of the FP7 Security Research Work Programme 2013 - "Security of infrastructures and utilities" and within its topic "Impact of extreme weather on critical infrastructure". The aim of this project is to develop a systematic risk management framework that explicitly considers the impacts of extreme weather events on critical infrastructure and develops a series of mitigation tools to enhance the security of the pan-European infrastructure network. Now we are in the process of preparing documents for the Grant Agreement.

**Picture 1:** Flooding in the Prague metro station in 2002



**Source:** <http://zpravy.e15.cz/>

<sup>5</sup> web page of project No 0471-10 <http://fsi.uniza.sk/kritinf/index.html>

The driver for the project were the complex interdependencies of the infrastructure networks that in recent years have been highlighted through multiple failures during extreme weather events. Example of such failures include, e.g. floods in Central Europe in August 2002, that resulted in the deaths of approximately 150 people and an estimated €150 Billion worth of damage. In Germany and in the Czech Republic, the worst affected areas, the effects on infrastructure consisted of electricity failures, disconnected telecommunication links, damage to approximately 250 roads and 256 bridge structures, disruption to the Gas service due to damaged pipelines and contamination of clean water with flood water. Restoration of important services to full capacity took approximately 1 month for electricity, 2 months for Gas and 3 months for telephone communications.<sup>6</sup>

**Picture 2:** Flooding in the Prague metro station in 2002



**Source:** <http://zpravy.e15.cz/>

The second example of such failures can be the storms in Finland in 2010 when in the period from 30th July to 8th August 2010, Finland was hit with severe storms, particularly 'downbursts' following an unusually period of high temperatures. Falling trees cut off roads, destroyed buildings and caused devastation to property. The water and electricity networks were cut off in wide areas in Central and South-East Finland. Forest damage represented some 8.1 million m<sup>3</sup> and 240, 000 hectares. As a result of the storms, a total of approximately 35,000 kilometres of the electricity net-work was destroyed or damaged. Consequently, nearly 9,000 distribution substations were left with-out electricity, leaving 480,000 households in the dark. Repair work to the damaged networks amounted to nearly 200,000 hours (over 120 man-years).

<sup>6</sup> RAIN - Risk Analysis of Infrastructure Networks in response to extreme weather. Project proposal submitted within FP7 call FP7-SEC-2013-1. 2012

**Picture 3:** Helsinki before storm in August 2010



Source: <http://www.sott.net>

### **Conclusion**

The changes in security environment, turbulences in all social events and processes in present globalized world, new possibilities of modern information – communication technologies, as well as new sophisticated equipment and technologies considerably contribute to world development but on the other hand they are also more and more threatening it. Investigation of these development factors relations, synergic nature of possible threats, risk analysing, defining the bounds of their acceptability, detailed scenarios of crisis events development, file libraries of measures for reducing and eliminating unacceptable risks are actual tasks of present security science.

### **Streszczenie**

Ochrona infrastruktury krytycznej jest integralną częścią zapewnienia wymaganego poziomu bezpieczeństwa społecznego i jego trwałego rozwoju. Jest to kompleksowe, interdyscyplinarne zagadnienie z wieloma aspektami o charakterze teoretycznym, prawnym, wiedzy, organizacyjnym, finansowym, technicznym, pedagogicznym i in. Pedagogiczne, naukowe i badawcze działania Wydziału Inżynierii Specjalnej Uniwersytetu Zilina (FSE), początkowo instytucji o charakterze militarnym funkcjonującej jako uniwersytet, przekształconej w 2001 r. w instytucję o charakterze cywilnym, skupiają się na zagadnieniach ochrony infrastruktury krytycznej. Artykuł opisuje naukowe i badawcze działania FSE w ramach projektu “Ochrona infrastruktury krytycznej w sektorze transportu”

koordynowanego przez FSE, a także działań FSE w projekcie FP7 BEZPIECZEŃSTWO o tematyce "DESZCZ", którego celem jest stworzenie planu zarządzania ryzykiem systemowym biorącego pod uwagę wpływ ekstremalnej pogody na infrastrukturę krytyczną i stworzenia serii kroków zapobiegawczych w celu wzmocnienia bezpieczeństwa paneuropejskiej sieci infrastruktury.

### Summery

Critical infrastructure protection is an integral part of ensuring required level of human society security and its sustainable development. It is complex interdisciplinary problem with many theoretical, legal, knowledge, organizational, financial, technical, educational and other aspects. Educational, scientific and research activities of the Faculty of Special Engineering of the University of Zilina (FSE), originally military educational institution of university character transformed in 2001 into a civil institution, are oriented also towards the question of the critical infrastructure protection. The paper is dealing with scientific and research activities of the FSE within the project "Critical infrastructure protection in sector transportation" coordinated by the FSE and participation of the FSE in the FP7 SECURITY theme project "RAIN" the aim of which is to develop a systematic risk management framework that explicitly considers the impacts of extreme weather events on critical infrastructure and develops a series of mitigation tools to enhance the security of the pan-European infrastructure network.

### Reference

1. Council Directive 2008/114/EC of 8 December 2008 on the identification and designation of European critical infrastructures and the assessment of the need to improve their protection. 2008. [cit. 28.04.2013] Available at: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:345:0075:01:EN:HTML>
2. Krulík O., *Zpráva komise kongresu o teroristických útocích z 11. září 2001*
3. Rain – Risk Analysis of Infrastructure Networks in response to extreme weather. Project proposal submitted within FP7 call FP7-SEC-2013-1. 2012. <http://europa.eu/rapid/pressReleasesAction.do?reference=MEM/O/06/477&format=HTML&aged=0&language=EN&guiLanguage=en>  
[http://www.army.cz/mo/obrana\\_a\\_strategie/1-2004cz/krulik.pdf](http://www.army.cz/mo/obrana_a_strategie/1-2004cz/krulik.pdf)
4. The European Programme for Critical Infrastructure Protection (EPCIP)
5. web page of FSE [www.fsi.uniza.sk](http://www.fsi.uniza.sk)
6. web page of project No 0471-10 <http://fsi.uniza.sk/kritinf/index.html>

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