

The Application of the Security Audit Method on the Selected Objects of Critical Infrastructure

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Abstract—The paper is focused on the application of the security audit method on the selected objects of the critical infrastructure. The emphasis is put on security audit method to find gaps in the critical infrastructure security. The theoretical part describes objects of the critical infrastructure. The practical part describes using of the security audit method. The main emphasis was put on the protection of the critical infrastructure in the Czech Republic.

Keywords—Crisis management, critical infrastructure, object of critical infrastructure, security audit, extraordinary event.

I. INTRODUCTION

APPROACHES to the protection of the critical infrastructure have been long developing not only at home but also abroad. The biggest breakthrough in the approach to the protection of the critical infrastructure has occurred after September 11, 2001, when there was a terrorist attack in the United States. Based on this event protection of critical infrastructure against terrorist attacks came to the fore.

The European Union, including the Czech Republic, currently faces with the threat of terrorist attacks. An example of such attack was the use of hazardous substances to members of the Parliament of the Czech Republic or the attack on the London Underground by using explosive materials.

To ensure safety of endangered objects of the critical infrastructure by a terrorist attack, it is appropriate to apply the method of the security audit for identifying the weak points.

In dealing with these extraordinary events, there must be ensured rapid detection and identification of unknown hazardous substances, therefore it is necessary to develop and improve mobile analysers and detectors of the hazardous substances.

II. THE THEORETICAL PART

A. Critical Infrastructure of the Czech Republic

Critical infrastructure of the Czech Republic is defined as production and non-production systems and services, whose malfunction could have a serious impact on national security, the economy, public administration and on ensuring of fundamental life needs of the population. [1]

The object of critical infrastructure is then a building or facility to ensure the functioning of critical infrastructure. Objects of critical infrastructure are the production and non-production systems and services whose disruption or complete destruction would have a serious impact on the running

of the state, for its operations and performance of its functions. [1]

To enhance the protection of the objects of the critical infrastructure and minimize the risk of attack those objects, especially by terrorists, it is appropriate to apply the detectors and analysers of explosives.

B. Detection and Identification of the Explosives

Detection and identification of unknown suspicious substances, which are always considered as dangerous, is the first measure on sampling. In the Czech Republic the Fire and Rescue Service is carrying out the identification of explosives in collaboration with the Police and Pyrotechnic Services.

If circumstances allow, the explosives remove itself (especially in liquid or solid form). Otherwise, the sampling is done in areas with the highest concentration of the explosive that is as close to the source of the leak or dangerous substances. [2]

If the situation and character of contaminated material allows, is performed simultaneously with the sampling of an unknown substance as well taking blanks. Sample blank means demonstrably uncontaminated materials that are taken before and after removing of contaminated material. A blank sample is then used to check whether the contamination occurred during sampling, transportation, or dirt in the cab. [2]

C. Mobile Detectors and Analysers of Explosives

To explore and search for explosives and explosive devices serve a wide range of devices, detection systems, which easily and quickly detect a dangerous substance. These devices are used in fireworks, safety checks at airports and border crossings, and other security forces and services. These devices include pyrotechnic X-rays, metal detectors, means for detecting and searching of explosives, means for checking of inaccessible space, means for the sound amplifying, signalling and ionizing radiation. [3]

A mobile detector and analyser of explosives was developed by employees of the University of Defence in cooperation with the Academy of Sciences of the Czech Republic. The analyser operates on the principle micro column liquid chromatograph with chemiluminescence detector serves to detect explosive nitro-compounds various matrices after previous extraction. Its use is expected in the terrain.

All components of the analyser are located in a metal part with removable front cover. The analyser consists of an automated microcolumn liquid chromatograph, chemiluminescence detector and control unit, which is, before the measurement, connected by a network cable to the

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computer. Thanks to the integrated accumulator, it is possible to carry out the analysis for 2-3 hours. [2]

The mobile detector and analyses was developed to improve, accelerate and simplify the work of the Fire and Rescue Service and Pyrotechnic Services during intervention or liquidation of an extraordinary event.

III. METHODS

This paper uses basic methods of scientific work, like the analytic-synthetic method. Because the investigated area of critical infrastructure is very large, it was necessary to separate the important information from the irrelevant.

The theoretical part uses the method of literature review that summed up the knowledge about critical infrastructure and about detectors and analysers of explosives.

The practical part of the work uses mainly the method of security audit and the methods of hazardous substances detection.

IV. THE PRACTICAL PART

A. Selected Objects of the Critical Infrastructure

I History of Nuclear Power Plant Dukovany goes back to the early 70s when the then Czechoslovakia and the Soviet Union in 1970 signed an intergovernmental agreement on the construction of two nuclear power plants with outputs of 1,760 MW. [4]

The first reactor unit was put into operation in May 1985 and the last fourth unit in July 1987. The maximum project performance has reached 1760 MW power plant in July 1987. The launch of two nuclear units - the second and third - was in only one year, 1986, and in one area. It was in its time totally unique and it haven't yet happened in the world again. More than 80% of used equipment is made in the Czech Republic. [4]

From 1985 to January 2015 there were on all four units of the power plant produced more than 384 billion kWh of electricity, which is the highest of all power plants in the Czech Republic. Power plant Dukovany covers approximately 20% of electricity consumption in the Czech Republic. Annually produces more than 15 billion kWh, which would be enough to cover consumption of all households in the country.

The power plant belongs to the first third of the safest in the world, for the last 3 years there have been no fault greater than 0 degree INES scale. Since 2000, there was also no automatic reactor shutdown. The collective effective amount of plant workers is below the safety standards. Power Plant is the holder of the Safe Company certificate issued by the Ministry of Labour and social Affairs under the guarantee of the Czech Occupational Safety Office.[4], [5]

The second selected model of the object of the critical infrastructure is airport Brno-Tuřany. In 1946 it was decided to build a new airport in Brno in Tuřany. Later, in 1954 was airport put into operation as a national airport with military traffic. Then in 1958, was in the airport officially launched a civilian traffic. [7]

Southern Moravia Regional Council at its 169th meeting

held on 06.26.2008 approved the request for support of the project "Adding Brno Turany airport infrastructure" for submission to the Regional Operational Programme NUTS 2 Southeast, the area of support 1.1 Development of transport infrastructure in the region. Committee of the Regional Council of the SE project it approved on 07.10.2008. [7]

The aim of the project was to increase the safety of the airport operations and ensure separation of passengers from Schengen and outside the Schengen area. The project was divided into two phases. In the first phase were purchased two special airport buses, and in the second phase of airport car tanker syringe. [7]

Although the airport Brno one of the smaller the airport, number of passengers is steadily growing. In the pictures below, there is the statistics about the movement of the airport. Because there is quite high amount of movement, so that's why it is important to find the weak points in security by using method of the security audit.

B. Using of the Security Audit Method

The method of security audit will be used in the work to find weak points, gaps in security of the selected object of the critical infrastructure.

Audit is an integral part of the safety management and it is a very effective tool to check its status. It allows identifying strengths and weaknesses, and thus helps in the planning process to meet the objectives set out in security area. The audit is also a systematic, independent and documented process obtaining evidence order to determine whether the activities and their results are consistent with the defined audit criteria and to what extent. While the audit criteria may be policy, procedures, and requirements applying by organizations. [8]

The added value of the audit lies not only in assessing to what extent organizations fulfil their own regulations, but also in assessing the effectiveness of the safety management system, or the integrated system. That the audit provided to organizations such value, it must take into account and adequately assess:

- The overall efficiency of the company,
- Business risk,
- Level of management and process efficiency,
- The opportunities for cost reduction, waste and other forms of wasting,
- Opportunities to improve processes.[8]

To make this audit plan to function, it is necessary to pay great attention to the selection and qualification of auditors.

Procedures for carrying out the audits a company prepares itself and in accordance with the standard must include:

- The subject and scope of the audits and their frequency,
- Auditing methodology, defining responsibility and authority for the audit program, the audit arrangements in terms of management,
- Own auditing procedure,
- The conditions and specifications to present reports on the results of the audit,
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- Competence requirements and training of auditors,
- Way to discuss the audit findings with relevant staff,
- The monitoring and verification of the effectiveness of corrective measures. [8]

C. Using of the Mobile Analyser of Explosives to Increase Security of Object of the Critical Infrastructure

The usability of the mobile analyser of explosives:

- To the simple continuous well as discontinuous sampling and pre-concentration field samples of explosives aerosols and gases, precursors to explosives, hazardous substances, pollutants in the environment,

- To the rapid separation of mixtures of hazardous substances and their subsequent identification at the sampling site,
- To the protection of potential terrorist targets, central state administration bodies, objects of critical infrastructure, of the Ministry of Defence and the Army of the Czech Republic, the Czech Army formations objects abroad, Czech embassies, cultural centres, representing companies of the Czech Republic, etc.,
- To accelerate decision-making processes when dealing with accidents and terrorist attacks,
- To supplement the Fire-chemical laboratories in performing the tasks chemical reconnaissance. [2], [8]



Fig. 1 Passengers on regular and charter flights [6]

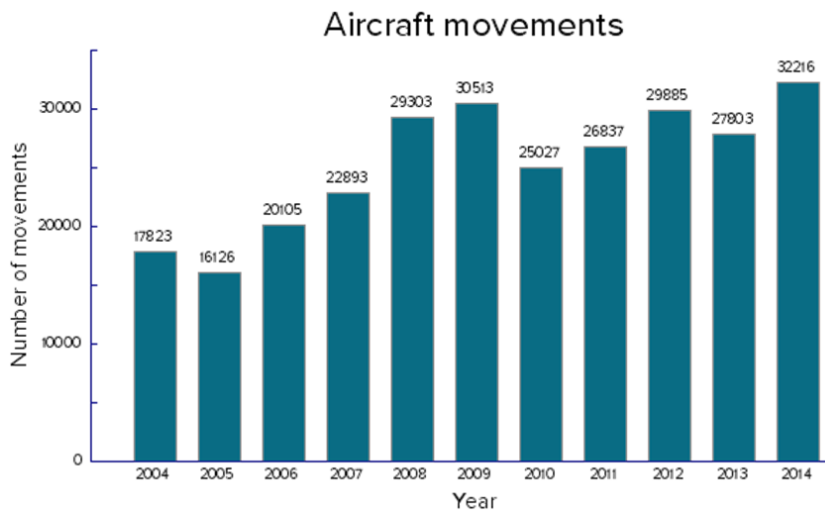


Fig. 2 Aircraft movements [6]

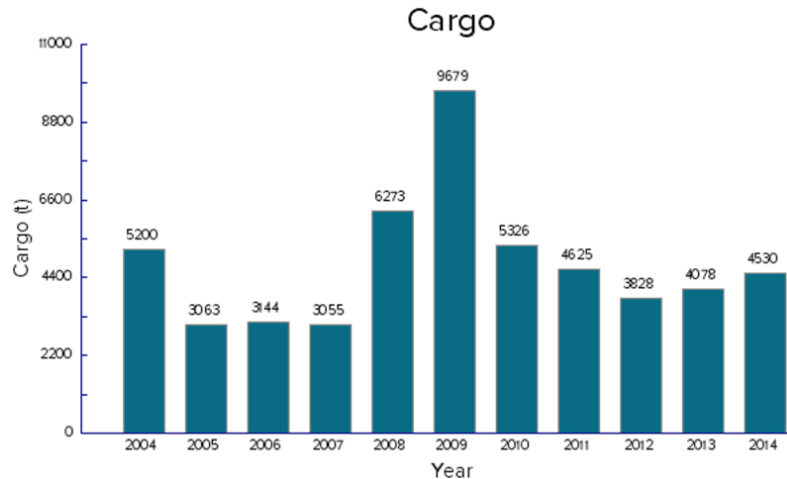


Fig. 3 Cargo [6]

V.CONCLUSION

The paper approaches the issue of the protection of the critical object of the critical infrastructure in the Czech Republic. The issue of critical infrastructure protection came to the fore after the events of September 11, 2001, and it still acquires new content and size. Terrorism, whether using conventional or unconventional weapons, has become the current central challenge for the global community. Therefore, it is necessary to the issue of protection of the critical infrastructure constantly deal with and try using the latest methods and technologies. One option to minimize the risks of "successful" completion of a terrorist attack is just the use of explosives detectors and analysers. A very advantageous in terms of time and off-road use, the use of explosives mobile analysers that are enable to prevent dangers. The theoretical part of the paper describes and defines critical infrastructure in the Czech Republic and the possibilities of the identification and detection of hazardous substances. The main part is focused on security audit method.

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REFERENCES

- [1] Kritická infrastruktura – Ministerstvo vnitra České republiky. Ministerstvo Vnitra České Republiky. *Úvodní strana – Ministerstvo vnitra České republiky* (online). ©2015 (cit. 2015-09-21). Dostupné z: <http://www.mvcr.cz/clanek/kriticka-infrastruktura.aspx>
- [2] *Funkční vzorek přenosného analyzátoru výbušnin na mikrofluidním principu*. Brno: Univerzita obrany, 2013, 4 s. (cit. 2015-09-15).
- [3] Bukovjan, Karel. *Metody a prostředky zneškodňování výbušných systémů* (online). Zlín, 2011 (cit. 2015-05-29). Dostupné z: http://digilib.k.utb.cz/bitstream/handle/10563/16171/bukovjan_2011_dp.pdf?sequence=1. Diplomová práce. Univerzita Tomáše Bati ve Zlíně.
- [4] Dukovany | Jaderná energetika | Skupina ČEZ. ČEZ, A. S. *Skupina ČEZ* (online). ©2015 (cit. 2015-09-23). Dostupné z: <http://www.cez.cz/cs/vyroba-elektriny/jaderna-energetika/jadernerne-elektrany-cez/edu.html>

- [5] Capanda, Filip. 25 let Jaderné elektrárny Dukovany. *News - časopis zaměstnanců skupiny ČEZ*. 4/2010, roč. 2010, čís. 4 (cit. 2012-10-069), s. 40.
- [6] Letiště Brno, mezinárodní letiště Brno Tuřany - Česká Republika. *Letiště Brno, mezinárodní letiště Brno Tuřany - Česká Republika* (online). ©2012 (cit. 2015-09-23). Dostupné z: <http://www.brno-airport.cz/letiste/projekty-financovane-eu/>
- [7] Šebestová, Marie; Staněk, Miroslav. *Komentované vydání ČSN EN ISO 19011:2003 Směrnice pro auditování systému managementu jakosti a/nebo systému environmentálního managementu*. Praha: Český normalizační institut, 2003, 74 s. ISBN 80-7283-112-7.
- [8] *Vymezení využitelnosti analyzátoru výbušnin v polních podmínkách*. Brno: Univerzita obrany, 2013, 6 s. (cit. 2015-09-05).