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Summary of the doctoral dissertation titled:

"Security assessment of the critical infrastructure facility on the example of the *Żelazny Most* Tailings Storage Facility"

The objective of the following doctoral dissertation is to introduce the issue of the security assessment of critical infrastructure and to present how spatial information systems can be used for crisis management and combating terrorism.

The first part is intended to analyze the shifting nature of terrorist threat which causes national security and critical infrastructure (CI) security to be of concern not only to the general public and politicians but also to the scientific community. There are numerous reasons for this situation, but the most important one seems to be the unpredictability of intentional terrorist activity and the resulting permanent state of danger amongst the citizens.

The second part of this work contains a revision of publicly available spatial information resources that are used in geographical information systems, since the critical element of counteracting acts of terrorism as well as crisis management is the possession of information about the geodata of the highest quality. The analysis and processing of such data is of vital importance to the internal security of the state, the citizens and its critical infrastructure.

The research scope of the following dissertation has an interdisciplinary character as it combines social aspects with engineering/technological ones. As such, it might fall into interests of other professionals such as lawyers, sociologists, economists, political scientists and safety specialists.

An attempt to combine social aspects with engineering/technological aspects has been made. For this purpose, a multi-criterion AHP data analysis has been used. As a result, an innovative decision-making model was constructed which can be employed to simulate the most probable way by which a terrorist will choose a critical infrastructure target.

The decision-making model was designed with the help of utilizing carefully selected and ranked criteria. The weight attached to each criterion has been calculated as a result based on eleven consultations with experts in the CI field.

The decision model presented is very universal and can be successfully used to evaluate a terrorist attack threat in regards to most existing CI objects. Used criteria were selected and ranked thorough analysis of the literature on the subject, with particular emphasis on their occurrence an repeatability over the period of many years as well as on the training, professional experience of the author so that it can be now used to assess the risk degree of a terrorist attack on most CI facilities.

The decision-making model and individual values of criteria employed, were used to evaluate the security of KGHM Polska Miedź S.A. facilities.

The security of the *Żelazny Most* Tailings Storage Facility in particular was analysed and reviewed, the facility itself being a part of the KGHM Polska Miedź S.A. plant. Interestingly, the result of our research shows that a successful terrorist attack against this facility and surrounding area is absolutely possible, which is in stark contrast to other studies conducted for *Żelazny Most*.

Our intention, apart from presenting the sensitive data and ways for potential sabotage, was to emphasize legal loopholes regarding the security of critical infrastructure and the recklessness of making some types of data public.

The multi-criterion research, or more precisely, Thomas L. Saaty's hierarchic analysis model, delivers quantitative and qualitative data which allows to reliably asses the security of the object.

The result of the analysis clearly indicates that the CI object discussed is threatened by a terrorist attack should have its security standards reestablished and redesigned.

Additionally, as a result of the analysis of the literature on the subject and the existing legal provisions, the need to urgently undertake work on legislative changes was observed in order to establish technical requirements for the placement of construction facilities and their location. This is an important consideration especially in relation to the public areas, administration buildings, CI and other areas of that type, as minimal security standards have to be in place in order to protect them from the results of possible terrorist hits.

USAGE

An economic and social development plays a key role in generating a sense of security and stability for the citizens. Infrastructure, CI in particular, grants access to services which enable an acceptable standard of living and a constructive relationship between a citizen and the state. In today's uncertain times, maintaining this status quo becomes a challenge for the state and emergency services.

This dissertation, especially the multi-criterion analysis model, may constitute the *point-of-entry* for the security evaluation of many CI installations and their preparedness for terrorist activities.

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