

ZRÍNYI MIKLÓS NATIONAL DEFENCE UNIVERSITY
DOCTORAL COUNCIL

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**The special use fortification facilities and their role
in the light of new security challenges**

doctoral (PhD) thesis
author's review and formal critiques

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Doctoral (PhD) thesis

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Draughting of the scientific problem

The natural one and the man-made specific fortification facilities (SFF in the future), the military and national security applications, more than 5000 years to play a role. The underground spaces are often used for reserved spaces and escape routes from BC 3500-3000, in Mesopotamia and Egypt, and their role now exists in the Afghanistan conflict. The SFF-s played an important role in the twentieth. century, when dozens of factories were hidden under the earth during World War II in Germany and the former Soviet Union. Mentionable, however the NORAD facility in the Cheyenne Mountain, and the demarcation line in Korea under the existing underground facilities are approximately 1000, or the countless amounts of artificial or natural caves, which ones useful for Al-Qaeda forces in Afghanistan today.

At the end of World War II in 1945, the world may have recognised the most destructive weapon of the age: the nuclear bomb (Hiroshima, Nagasaki). After the war, almost immediately entered the world of the Cold War era. The east and west, fighting together against fascism, state-ments were politically completely against each other. In 1949 the NATO was founded and after that the Warsaw Pact in 1955. The danger of a possible nuclear war intensified.

In Hungary first time — signed by the Defence Minister in 1939 — came into the sun a document for dealing with the technical specifications of the shelters¹. The design and strength calculations were published only in 1942. To keep quantity of production and provide appropriate conditions for the leadership came into the foreground. Military industrial facilities were built for defense military production management in a war, have been well served. In that time, brought up the idea that the country's continuing leadership of the so-called „protected leadership facilities be being built. These protected leadership shelters have belonged to a higher quality category, as some facilities can resist the effects of the nuclear bomb. Their sizing fundamentally happened against the effects of weapons of mass destruction – WMDs (nuclear, biological, chemical), and against the destructive effects of conventional weapons occurred.

Paralelly with the facilities for the protection of the country's leadership were flowing the construction of a protected command posts under the Hungarian Peoples Army, and other governmental and local bodies, have built a nationwide leadership fortification facilities. Facilities associated with the Hungarian Postal Service wire cable network.

In summary, what was previously described: the facilities were built against the effects of the nuclear and conventional weapons, formed a single system and have the following basic features:

— Government (provide non-stop working ability for the country's leadership);

¹ Shelter: in accordance with the technical requirements established technical facility, which is for his bordering construction, and inbuilt equipment provide protection against the means of offensive weapons and provides protection against the effects of disasters. Construction Sector Technical Directive MI-04-260-1. Environment and Regional Development. Budapest, 1993

- Military (command and control of the army);
- Public shelters (protection for population);
- Military industrial facilities (provide protection for management and workers in the territory of the military industrial factories).

Since 1990, the Hungarian Army has been suffered lot of changes and reorganizations and the fortification facilities were not spared, preserving a continuous reduction of the budget is becoming increasingly difficult, so peace-time recovery and practical use of these facilities are important issues.

The justification and the timelines of the topic

The disappearance of the Warsaw Pact ceased to exist at the same time, the bipolar world system as well. The threat of nuclear war ceased to exist, and in world politics has started a process of moderation. The role of SFFs began reassessed. Facilities — after the system has been transferred to the Civil Defense organization — were placed into hibernated² status.

In the status of few remaining facilities - operated by the Hungarian Army - the security review led to a significant change, is carried out in 2003. The review states: "The NATO and its member countries do not threatening by traditional, posing against their territorial integrity, strategic attack, and it can not be counted." Subsequently, it set the declining capabilities, which were among the command elements of the fixed installations (shelters, wire communication systems, etc). These reductions formulated in Governmental Resolution No 2236/2003. (X, 1).

Several alternatives have been published concerning the fate of the facilities, followed by a survey to determine the costs for its transformation. The alternatives were discussed, among them the complete closure of the facilities and complete recultivation of its full territory. This is cost a couple of billion forints, that would have represented from the country's budget, not to mention the fact that the SFFs represent a significant national values. SFFs construction costs — which able to provide a full spectrum of security and protection against the consequences of nuclear bomb — equal with 3–4 ministry's annual budget to the terms of today's prices.

The late 1990s, at international level, the focus of attention came onto the Critical Infrastructure (referred to as CI) and risk factors. On 17 November 2005, in Brussels the European Union Commission published the Green Paper on Critical Infrastructure Protection (COM (2005) 576 final). Hungary joined in the program.

More legislation affects the CI, but in fact the Governmental Resolution No 2080/2008. addresses the topic of the CI protection's national program. Lot of elements from this Governmental Resolution — from CI facilities — can be replaced easily in one of the SFFs.

² Comment: The aim of the hibernation is the prevention of deterioration of texture of the facilities

Treatment of the subject, has appeared in literature, publications of view is completely "virgin" unprocessed area said, so I chose my PhD dissertation topic "*The Special Fortification Facilities (SFF) and its role in the application in light of the new security challenges*"

The choice in my opinion is still relevant, because some elements of critical infrastructure protection, as well as the public administration and the world of business during the period of peace time these facilities is well-suited. Despite the fact that the abolition of the bipolar world, other countries continue to build and use a previously built SFFs.

The research carried out a conclusion that other states produced modern, high-impact, high-precision conventional and nuclear weapons, these weapon's presence, development, efficiency, applicability, and global threats in the future significantly affect to the special use special fortification facilities for the protection of people's and financial values.

The topic of research — testing in particula — and the great practical benefit of it is that the results of the tasks related to my current position may be used.

Research objectives

On the bases of my research work leading to doctoral dissertation, as well as my practical experiments in my recent military position gained in the field of SFFs I formulated the following research objectives:

— review the fundamental problems of new types of security challenges, to find answers from the security aspects of such interaction exists, and the position of the infrastructure within the security aspects;

— a brief overview of other States and the Republic of Hungary from critical infrastructure pont of view, and to examine whether the SFFs how to fall into one of the critical infrastructure elements;

— to examine examples from abroad of the original function is extracted for further use of SFFs, and thus draw conclusions about the recovery of the domestic facilities explotation and utilization;

— technical principles, public and commercial proposals for the development and recovery steam extracted from the original function SFFs for further use;

— justified, that the total or partial closure amounts a much higher cost than the reduced operational (operating Protective treatment) costs of SFFs, and how to get and should be update these specific engineering art-works.

Formulation of research hypotheses

The formulation of scientific results of my dissertation based on the following hypotheses:

1) According to the findings of the national security and military strategy, for Hungary are not accounted any conventional military attack.

2) The end of the Cold War, and the SALT agreements, taking into account Hungary is not threatened by the risk of nuclear attack.

3) Regarding the stable domestic political situation, the internal conflict can not be expected.

4) Threat of national economy with the consequences of natural, industrial and economic disaster has not calculated in a medium time period.

5) Hungary has a stable democracy, which guarantees the political and governmental stability.

6) Taking into account that in the case of the new types of security challenges, and some natural and industrial disasters strike, terrorist attacks, or if there is a need for continued government service work there is a need for some elements of critical infrastructure what is suitable for high-security sites to establish and maintain this opportunity.

Research Methods

In order to achieve the main research methods were used to:

- The topic of domestic and foreign literature concerning studied;
- Document analysis, and conclusions, the generalization was performed;
- I studied laws and the hungarian legal environment;
- Consultations with experts;
- Targeted search with computer went on the Internet worldwide network system;
- Systematized knowledge, experience;
- I participated in national and international conferences, lectures;
- Adaptation were used.

The brief description of the done examination by chapters

The goals described in my thesis is divided into the following chapters:

The first chapter

In the first part of the 1st. chapter I dealt with the security aspects, and the SFFs, with in the context of critical infrastructure. Within those areas detailed which directly affect our everyday lives. Examined the civilized and natural disasters, threats that are now also threatened Hungary also.

In the second part of the 1st chapter I described the critical infrastructure (hereinafter referred to as CI) and their protection. I presented couple of international and domestic examples for CI, and in order to protect them what they have set up organizations and how organizations work under the leadership. Given that the special fortification facilities are a part shall be considered as elements of the CI, and in this case I revealed in the context of the CI and SFF connections.

The second chapter

The chapter described the history of the SFFs starts from shelters and bunkers. Special attention was paid to the fact that some countries how to apply the SFFs, in harmony with this topic I touched upon in this context used in their construction requirements. I presented some examples of each foreign and domestic facilities. I touched upon Hungary for the shelters, and the SFFs technical requirements during the designation and construction of them. Much of the SFFs was built in 1960's and 70's, by the technical standard of these decades and their built-in equipment is accurately reflected to this timeframe. The challenges for XXI. centuries — which has already experienced at international level — highlight recovery and use of these systems that are attracted to you, and update and modernize for today's advanced technical levels and quality.

The third chapter

The recovery proposals are judged necessary to examine the facilities before the full closing³ costs and consequences of the impact, which I tried to present in a specific example, and then I turned to the specific grant proposals. The subsequent chapter is divided into two parts. One part of the chapter deals with state tasks for important functions, the other part deals with the services required by the economy. It later became home to two possible further functional elements, which are the protection of human and vegetable genetic materials.

The fourth chapter

I presented the summarized conclusions, the development of scientific advances, suggestions, recommendations, and areas requiring further research

³ Comment: The full closure under an expression the packing of the establishment's technical devices and the construction elements, as well the dismantling of constructions fully.

Summarized conclusions

1) Vulnerability factors are case a cross-country danger, so our country is — like other Western countries — faces a new type of threat to the security challenges that traditional tools do not allow the exclusion. These challenges threaten the state considered vital to the functioning of infrastructure.

2) In order to protect critical infrastructure, in many states of the world, knew the importance of applying a special fortification installations. The existence of a protected-approved facilities not only for the protection of critical infrastructure, but also to ensure the functioning of government processes is applied aspecially in the qualified periods. In contrast to the practice of international importance of SFFs, in Hungary they devalued, discarded the installations and began to close.

3) The total or partial closure of fortification considered a special case of plants in a major environmental rules because of closure costs, out of which for years operated under the cut-back using metods. During this time, SFFs re-use can be planned and started. All of a further result is provide the opportunity for the new professional staff to be able to prepare, which include training new people takes at least 3 years.

4) The physical capabilities of the specific fortification facilities based on ability to provide protection to their people and equipment are also places in the longer term. Function is extended in application to the public and economic spheres as well. With smaller conversion — suggested in the third chapter — I proposed the affiliation of new features and safety protection. The special fortification facilities for new functions, the original built-in technical systems constructed during the period of reconstruction, the technical standard of the era to be upgraded.

5) The special fortification facility is to apply a number of advantages, but it is necessary to highlight some of the existing disadvantages, which preclude the further use of this installation. The most recent facilities were built in the 1980s, but nowadays there is no need to build new ones, so the task is not in the absence of technical and economic awareness. The operation and maintenance tasks in terms of non-standard technology — work in an underground, enclosed and artificial climatic conditions — which is due to psychological pressure in many people (in a sense of claustrofoby). Due to the country's capital city orientation the government bodies based in Budapest, including their geographic location away from the recipient organizations, the administrative center, time-consuming approach (even though the distance that a security may mean).

New scientific results

1) Because of security issues has been not created correctly in referred laws, I tried to incorporat as one of the key security factors the infrastructure, as a new security and fundamental factor.

2) I found that the fortification of specific facilities, critical infrastructure elements are adopted, they will also become a critical element of infrastructure, and

determined the levels of vulnerability of critical infrastructure facilities within a specific fortification classification in terms of their protection ability.

3) Foreign experience proved that the special fortification facilities in many areas of public and economic areas have some usefulness. The measures taken for closure of Hungarian based SFFs were premature.

4) I made the analysis of technical installations of the special fortification facilities, and first determined the technical requirements for reconstruction and possible development directions. The economic analysis proved that, the reduced operation costs of SFFs are significantly lower than the costs of closure and recultivation. It also pointed out that the closure of SFFs is an irreversible processes, if the State for any reason decides to open again the facility or necessary to create such systems again, costs are ten times higher, and because of the time limit and creating a new infrastructure is nearly impossible. Based on these fact I proposed maintain existing facilities as a safety installation.

5) I pointed out suggestions for recovery of installations, extracted from special fortification facilities system. Abilities and functions of Special Fortification Facilities, provide many opportunities for their fit with public and economic tasks, which pose a high security for people, IT assets and technical equipment, also ensures the security requirements related issues as well. Maintain the special fortification installations as a security reserve installation suggested.

Recommendations

1) I suggest the special fortification facilities, host a critical elements of infrastructure installations of grading done. Principle, what should be followed, to choose that special fortification facilities threaten the destruction of the extent to which critical infrastructure elements put in danger.

2) For the new functions of special fortification facilities (both public and economic) of existing technology systems to propose changing the case, the feature matching task system (subsequent recovery) should be subject to reconstruction.

3) The solution for the commercial exploitation of the SFFs I propose to apply, in which the Defense Ministry as a unit trust, provide a rental agreement form to use a special type of fortification facilities. The operational management of the reservation will continue to carry out by the Defense Ministry.

4) I suggest that, the redundant specific fortification facilities has made a previous decision to review, and the SFFs put in to the service of critical infrastructure protection.

5) I Propos for a university course in each of the facilities design of procedures for training and facilities for training and further training of professionals engaged in the operation of the national list of training incorporated.

Practical applicability of research results

The results of my research work are summarized in my dissertation. During the research, the main emphasis was on the exploitation of the facilities re-examination of international and domestic field. In case of Hungary, the new feature requires the modernization of the earlier technology systems, has proposed. This viability of the facilities and their equipment on more security guaranteed. Avoid closure of SFFs due to a huge cost impact, as well as the environmental problems, which are subsequently charged to the Defense Department. SFFs represent a great national value, which is aggravated by specialis staff who operates them. Research results are used for the organizations, who are deal with the new recovery and reconstruction, in the public and economic spheres as well.

Own publicational register

- 1) Use of special underground facilities
AARMS, Volume 6, Issue 3, 2007.
- 2) The role and purpose of special fortification facilities from the beginning of Cold War until today.
Army Technical Bulletin (ISSN 1219-4166) 2003. Annual (volume XIII), number 1-4.
- 3) NBC types of protective filter systems
Army Technical Bulletin (ISSN 1219-4166) 2003. Annual (volume XIII), number 1-4.
- 4) FA 150 NC-type collective protective system for tents and military camps.
Army Technical Bulletin (ISSN 1219-4166) 2003. Act (volume XIII), number 1-4.
- 5) FA 300 N-type collective protective system, for tents and military camps.
Army Technical Bulletin (ISSN 1219-4166) 2003. Annual (volume XIII), number 1-4.
- 6) FA 300 NM-type collective, modular construction protective system, for tents and military camps.
Army Technical Bulletin (ISSN 1219-4166) 2003. Annual (volume XIII), number 1 -4.
- 7) The need of protection for electronic equipment against electromagnetic pulse of special fortification facilities.
Army Technical Bulletin (ISSN 1219-4166) 2004. Annual (volume XIV) number 1-4.
- 8) Questions of Designe and engineering issues of Special Fortification Facilities.
Army Technical Bulletin (ISSN 1219-4166) 2005. Annual (volume XV) number 1-2.
- 9) presentation of the design process in the underground structures.
Army Technical Bulletin (ISSN 1219-4166) 2005. Annual (volume XV) number 1-4.
- 10) Protection of Special Fortification Facilities against terrorist attacks.
Sword and pen. Selection of the PhD studies of military science. 2006 / 1st number.

- 11) Infrastructure protection – protective infrastructure
New Challenges in the field of military sciences 2005.
(Article appeared in a conference publication.)
- 12) Special Underground Facilities (UGF-s) serving for the critical infrastructure
New Challenges in the field of military sciences 2006.
(Article appeared in a conference publication..)
- 13) Use of Hardened Facilities in the US
New Challenges in the field of military sciences 2009.
(Article appeared in a conference publication..)
- 14) Historical overview of Special Fortification Facilities.
IIIth International Symposium on Defence Technology.
(Article appeared in a conference publication.)
- 15) Options for the protection of individual elements of critical infrastructure.
IVth International Symposium on Defence Technology
(Article appeared in a conference publication.)
- 16) Questions, related to facilities closure.
Vth International Symposium on Defense Technology
(Article appeared in a conference publication.)
- 17) Use of Special Fortification Facilities from the logistics aspect.
Military Logistics Number 2008 / 2

Scientific biography of the PhD/doctoral candidate

I, lieutenant-colonel eng. János Szalai was born on 6 February 1966 in Pásztó. After completion of primary school, in 1980, was admitted to the Vak Bottyán János Industrial Electrician School faculty. After graduation in 1984, successfully entered the Zalka Máté Military Technical College, on Air Defense Missile department continued my studies with excellent results in 1987. Between 1987 and 1990 I served in Miskolc, at 105th Home and Air Defense Missile Regiment, as an operator of command and control system. I was in this position until the end of the organization. Between 1990-1993 I served in the Central Garage and Materials Storage of Hungarian Army, as a staff member.

Between 1993-1995, with connection of the reorganization of the Hungarian Army I served in the Military Resort in Buják, fulfilled my professional military service as an operating group leader.

In 1995 I gained admission to the Budapest Technical University of Instrumentation and Control faculty, where in 1998 I was graduated with MSc degree in electrical engineering with good results. After graduation, from January 1999 to December 2000, I served at the Military Resort in Buják, as a deputy commander of the military organization..

After termination of the military unit, since 2000 to 2005 I had been working in different positions at the Joint Logistics Support Command (MH ÖLTP), in Property Directorate. In 2003, I was promoted to Lieutenant-Colonel.

Because of changes in the organization of the Hungarian Army, in 2005, I was nominated to the Defense Ministry's Property Management Office, as a senior officer (deputy department leader), and then from 2006, served as head of installation department of Defence Ministry's Infrastructure Agency, managing the facility operational and professional activities.

I am a member of the Military Section of Hungarian Association of Building and Engineering and also member of Technical Section of the Hungarian Military Science Society. In 1993, in organization of the Hungarian Defence Forces I successfully finished an industrial safety course, and the Budapest University of Technology in 2002, I was graduated as a project manager, finishing the training courses and obtained the required exams successfully.

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