VÉDELEM TUDOMÁNY
KATASZTRÓFAVÉDELMI ONLINE TUDOMÁNYOS FOLYÓIRAT

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MODIFICATION OF THE HUNGARIAN RADIATION PROTECTION SUPERVISION ACTIVITY

Abstract

The Hungarian regulatory system was continuously changing in the field of radioactive waste and radiation protection. The reasons for this were varied in recent times. Currently, a seemingly permanent system has emerged, where the tasks of the Hungarian Atomic Energy Authority (hereinafter: HAEA) has increased in overseeing the peaceful uses of atomic energy. Among other things, HAEA became the main licensing and supervisory authority in the fields of physical protection, radioactive waste storage facilities, radiation protection and radioactive waste. Meanwhile, in addition to the significant number of existing domestic nuclear facilities, nuclear power plant expansion is being planned, therefore periodic evaluation of the research and development results of nuclear safety and security is a prerequisite for successful preparation and protection.

In our article, we present the most important results in the Hungarian regulations in recent years, which not only take into account the most important research and development and user results, but also try to adapt to the system of authorities that has developed over many years.

Keywords: radiation protection, legislation, radioactive waste

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A HAZAI SUGÁRVÉDELMI FELÜGYELETI TEVÉKENYSÉG VÁLTOZÁSAI

Absztrakt

A hazai hatósági rendszer a radioaktív hulladékok, valamint a sugárvédelem területén folyamatos változásban volt. Ennek okai szerteágazóak voltak az elmúlt időszakban. Jelenleg egy állandósulni látszó rendszer alakult ki, ahol az Országos Atomenergia Hivatal (a továbbiakban: OAH) szerepe megnövekedett az atomenergia békés célú felhasználásának felügyelete tekintetében.

Többek között az OAH lett a fő engedélyező és felügyeleti hatóság a fizikai védelem, a radioaktív hulladék tárolók, a sugárvédelem és a radioaktív hulladékok területén is. Mindeközben a meglévő jelentős számú hazai nukleáris létesítmény mellett az atomerőművi blokkok bővítését tervezzük, ezért a sikeres felkészüléshez és védekezéshez elengedhetetlen a nukleáris biztonság és védettség kutatási-fejlesztési eredményeinek az időszakos értékelése.

A cikkünkben bemutatjuk, hogy az elmúlt években a hazai szabályozásban milyen fontosabb eredmények történtek, melyek nem csupán a fontosabb kutatási-fejlesztési és felhasználói eredményeket veszik figyelembe, de a hosszú évek során kialakult hatósági rendszerhez is igyekeznek igazodni.

Kulcsszavak: sugárvédelem, szabályozás, radioaktív hulladék,

1. INTRODUCTION

The domestic regulatory system has been under constant change over the past decade in the area of overseeing the peaceful uses of atomic energy. With the amendments of Act CXVI of 1996 on Atomic Energy [1] (hereinafter: the Atomic Act), the HAEA became the main licensing

and supervisor authority in the field of physical protection, radioactive waste storage facilities, and from 1 January 2016 in the field of radiation protection and radioactive waste.

Meanwhile, in addition to the significant number of existing domestic nuclear facilities, nuclear power plant expansion is being planned, therefore periodic evaluation of the research and development results of nuclear safety and security is a prerequisite for successful preparation and protection.

In order to perform the new regulatory tasks, a new regulatory environment had to be created, while this evaluation had to be carried out as well. Today, the modernization of radiation protection regulations, procedures and devices has a key role to play in the changing regulatory system and in terms continuously expanding applications.

In addition, in order to ensure the success of nuclear safety and nuclear security, a regular review of the most important domestic research and development and user results achieved in the development of radiation protection procedures and instruments is essential.

In our article, we present the most important results in the Hungarian regulations in recent years, which not only take into account the most important research and development and user results, but also try to adapt to the system of authorities that has developed over many years.

2. DIFFICULTIES IN THE OPERATION OF A DIVIDED AUTHORITY SYSTEM

In an article published in 2007, Rónaky et al. [2] wrote that the system of authorities in operation at the time was not working well enough, because the tasks were divided between different authorities. Among the problems mentioned were the following.

a) Legal regulatory issues: Legislation is complicated by the fact that legislative tasks are assigned to ministries where radiation protection is not the main issue, which is completely understandable in view of the many other tasks of Ministry.

b) It follows from the authority system that constructing new equipment and permitting modifications to the facilities, the facility must apply for a permit from the health, environmental and HAEA authorities.

c) Consequences of the division of the measuring networks: One of the main disadvantages of the fragmentation of the Hungarian regulatory system is the (human and cost-intensive) overlap resulting from the parallel work of the control systems (measuring networks) operated by different ministries.

d) Weaknesses of physical protection: comprehensive, coherent domestic regulation of the physical protection of nuclear and radioactive materials and nuclear facilities is very important.

In their article, they cited a number of countries where separate authorities have been merged and a single radiation protection and nuclear authority has been established. Such is the "Finnish Radiation Protection and Nuclear Safety Authority", which has been operating well in Finland ever since, and was established in 1984, or the Nuclear Safety and Radiation Protection Authority (SÚJB), established in the Czech Republic in 1993. The distributed tasks and other institutions, to create a single authority.

As a solution, it was stated that in Hungary it is essential to merge the authorities supervising the distributed tasks and other institutions, to create a single authority.

3. DEVELOPMENTS IN ESTABLISHING A SINGLE AUTHORITY

With the amendments to the Atomic Act, the HAEA became the main licensing and supervisory authority in the field of physical protection, radioactive waste storage facilities, and from 1 January 2016 also in the field of radiation protection and radioactive waste.

3.1. Taking over responsibilities for radioactive waste storage facilities

Since 30 June 2014, the Hungarian Atomic Energy Authority, as the nuclear energy supervisory body is responsible for the licensing and control of the selection, construction, operation, modification and closure of radioactive waste storage facilities, instead of the Radiation Health Decentrum of the Tolna County Government Office. As a result of the work of the working group led by the HAEA to take over the supervisory activity and create new legislation, Govt. Decree 155/2014. (VI. 30.) on the safety requirements for facilities ensuring interim storage or final disposal of radioactive wastes and the corresponding authority activities entered into force on 30 June 2014. Following the entry into force of Government Decree 155/2014 (VI.30.), the HAEA started its magisterial activities. [3]

Since 2014, it is also happened the first revision of the 155/2014. Government Decree, as a result of which the Decree has been supplemented. In addition, it is constantly expanding due to the ever-widening range of domestic application activities. In 2019, the Public Limited Company for Radioactive Waste Management received a permit[1] for the site inspection and evaluation of the Bodai Clay Stone Formation. [4]

The new facility will require new regulatory requirements. The structure of the 155/2014. Government Decree was therefore amended as follows.

[1] https://www.haea.gov.hu/web/v3/OAHPortal.nsf/web?OpenAgent&article=news&uid=DEAC6F66F05EE0CDC12584330023E589

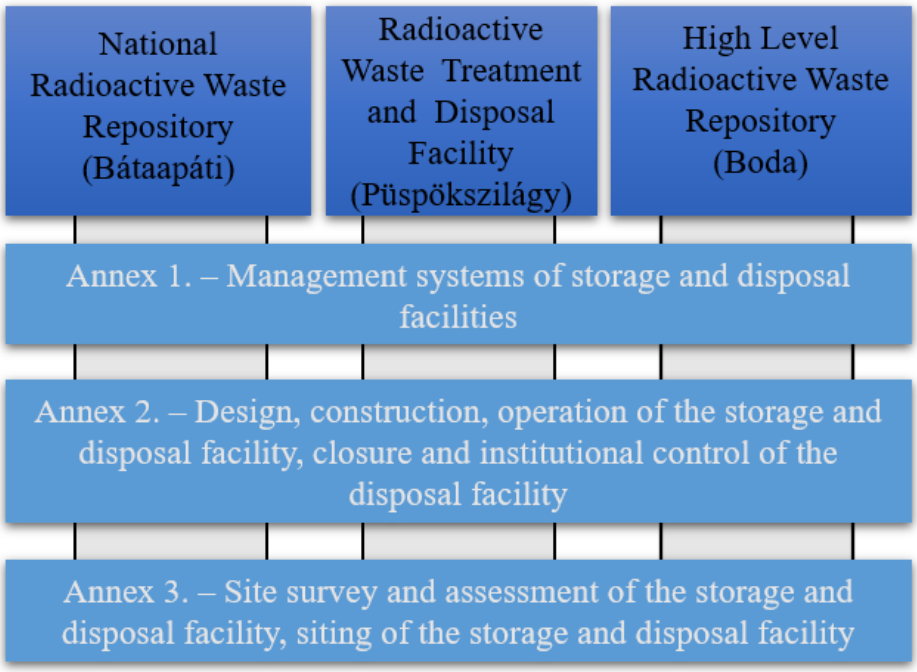


Figure 1. ***Annexes of the 155/2014. Government Decree*** [3]

3.2. Taking over responsibilities for radioactive waste management

In Hungary the Decree 47/2003 (VIII. 8.) ESZCSM of the Minister of Health, Social and Family Affairs on certain issues of interim storage and final disposal of radioactive wastes, and on certain radiohygiene issues of naturally occurring radioactive materials concentrating during industrial activity dealt with the classification of radioactive waste. [5] In this connection, several problems arose which made the regulation inadequate. The regulation has been amended with the change of responsibilities, a number of requirements have been moved to 155/2014. (VI. 30.) Government Decree.

a) In the annex of the 47/2003 ESzCsM decree the criteria for radioactive waste classification was found, but its provisions were removed. That means, the requirements were missed from the decree, which require it to be applied.

b) In the decree the classification used terms which were deleted from the 23/1997 NM decree on the determination of the concentration and level of extension activity of radionuclides due to the publication of the 487/2015 Governmental decree, where the extension activity of radionuclides can be found Act No. 23/1997 Coll., [6]

c) interim storage or final disposal is included in the title of the decree but is not addressed.

d) Other classification aspects are included in the number of MSZ 14344-1: 2004, the title of "Radioactive waste. Definitions and Classification" to review the classification aspects. [7]

e) The classification system of radioactive waste currently used in the domestic regulations does not take into account many factors of the international literature, however, it is now considered essential to apply them. Such is the very low-level waste class, which can also be considered a condition for sustainable development, as it not only takes into account economic aspects, but is also recommended for the protection of our environment.

A 47/2003. ESzCsM decree has been revised, the remaining parts of the decree have been incorporated after the revision as of 1 March 2018.

In their article, Sebestyén et al. showed how to modify the classification system of radioactive waste used in Hungary for many years. The proposed radioactive classification system was incorporated into the annex 12 of the 487/2015. Government Decree and entered into force on 1 March 2018. We have also established detailed rules for the management of radioactive waste, which can make the processing and treatment of radioactive waste in Hungary safer. [8]

The

Table shows the classification of radioactive waste proposed by the authors, which came into force by amending Government Decree 487/2015.

Table 1. ***Classification of Radioactive Waste based on the 487/20155. Gov. Decree***

Very Low Level Waste	**Low Level Waste**		**Intermediate Level Waste**		**High Level Waste**
$t_{1/2} \leq 30$ y $\sum_i \left(\frac{AK_i}{SMEAK_i}\right) \leq 50$ and $t_{1/2} > 30$ y $\sum_i \left(\frac{AK_i}{ÁMEAK_i}\right) \leq 1$	$\sum_i \left(\frac{AK_i}{SMEAK_i}\right) \leq 10^3$		$\sum_i \left(\frac{AK_i}{SMEAK_i}\right) > 10^3$		the heat production of which must be taken into account in the planning and operation of storage and disposal, but at least the heat production of which exceeds 2 kW/m^3, or the radioactive waste must be classified in category 1 from the point of view of physical protection.
	short lived, $t_{1/2} > 30$ y $\sum_i \left(\frac{AK_i}{SMEAK_i}\right) \leq 1$	long lived	short lived, $t_{1/2} > 30$ y $\sum_i \left(\frac{AK_i}{SMEAK_i}\right) \leq 1$	long lived	

3.3. Development of physical protection

The physical protection of nuclear materials was grounded by the International Convention on the Physical Protection of Nuclear Materials of 1980, which was signed and then ratified by Hungary with the Law Order 8 of 1987. Based on the experience gained in the meanwhile and the extension of the fight against terrorism, the Convention was modified with univocal agreement on a Diplomatic Conference held in Vienna in July 4-8, 2005. Hungary signed the Amendment among the first countries and then ratified it with Act LXII of 2008.

On the physical protection of nuclear materials and nuclear facilities, the International Atomic Energy Agency published the INFCIRC/225rev.5 requirement level document, which summarizes the elements of a state security regime, the categorization of nuclear materials, the

physical protection requirements for nuclear materials in use, storage or transport, as well as the physical protection requirements of nuclear facilities against sabotage.

The Atomic Act includes the fundamental security principles and establishes the frame of the detailed physical protection regulations.

The government decree on the physical protection and the connection licensing, reporting and inspection system come into force on October 4, 2011 based on the authorization provided in Article 67 q) and r) of the Atomic Act. Pursuant to Article 31 of the Govt. decree, the Hungarian Atomic Energy Authority performs the licensing and inspection of the establishment, operation and modification of the physical protection systems of nuclear facilities, radioactive waste repositories, nuclear materials, radioactive sources and radioactive wastes, with special authority contribution of the Hungarian Police Headquarters. [4][9]

3.4. Taking over responsibilities for radiation protection

In Hungary, perhaps one of the most distributed areas of tasks related to the use of nuclear energy was radiation protection. Previously, the regulatory activity was performed by 3 authorities in parallel. These were the National Office of Chief Medical Officer, the Radiation Health Centres and the HAEA. And we didn't even talk about the environmental authority. In many cases, responsibilities overlapped and in many cases supervisory activity did not take place. It was essential to review and reform the system of authorities. As a result, based on the amendments to the Atomic Act and the related implementing regulations, from 1 January 2016, the HAEA also became the main licensing and supervisory authority in the field of radiation protection. In connection with the extension of powers, the Ministerial Decree 16/2000 (VI. 8.) EüM of the Minister of Health on the Implementation of Certain Provisions of the Act CXVI of 1996 on Atomic Energy, a new implementing regulation was developed and introduced, the Govt. decree 487/2015. (XII. 30.) on the protection against ionizing radiation and the corresponding licensing, reporting (notification) and inspection system. [1] [8] [10]

A number of innovations have taken implementation into the regulation. In contrast to the previous regulation, it introduced centralized, one-step licensing:

a) at the national level the HAEA became the licensing authority;

b) as a result of this simplification, there is now a common license for both application and operation, reducing the number of license types;

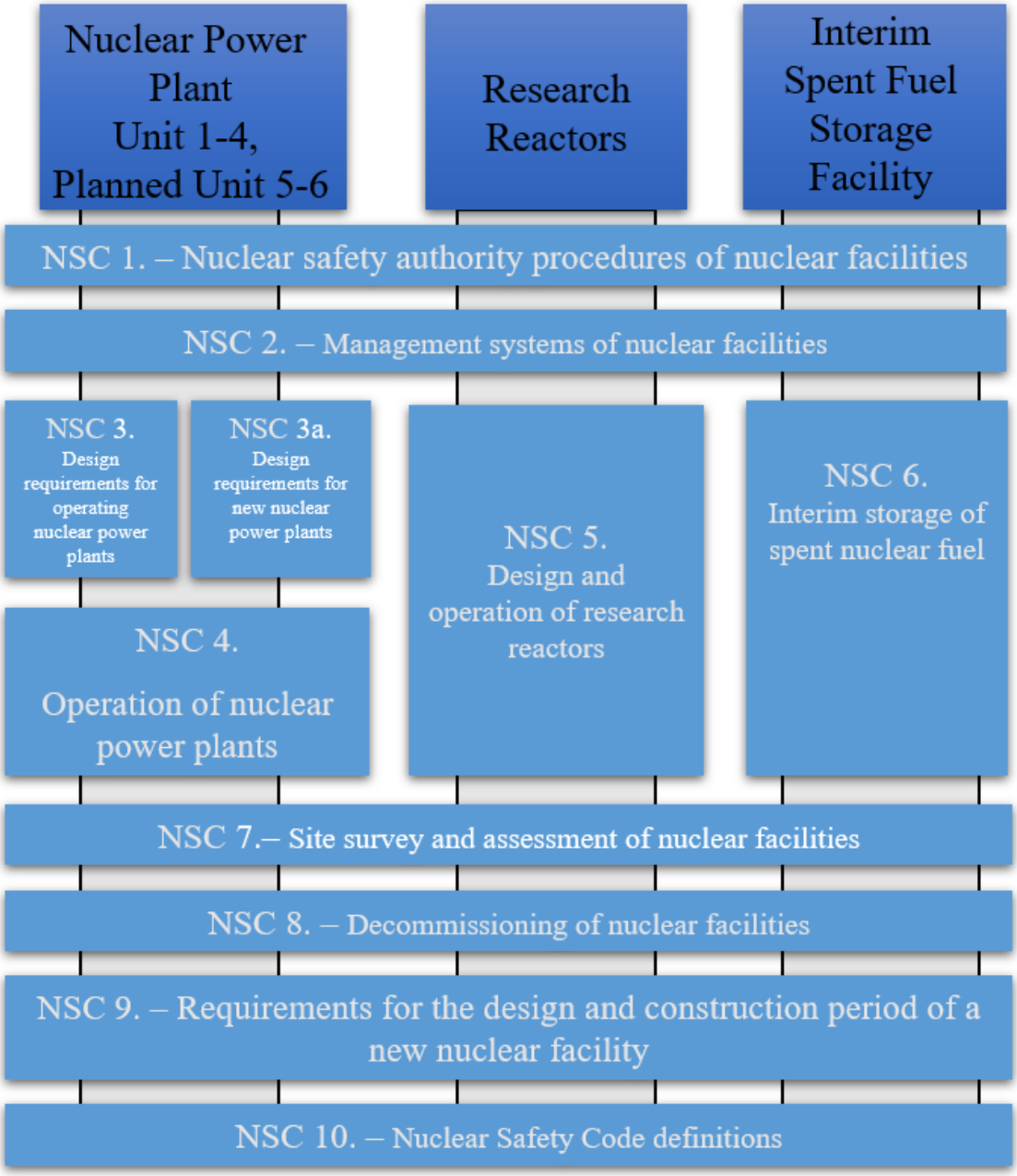
c) When the regulation was drafted, the Council Directive 2013/59/Euratom on laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation was also taken into account because it must be adapted into the Hungarian legislation by 6 February 2018. [11]

487/2015 thus entered into force, but the Government Decree still did not specifically address nuclear facilities and radioactive waste repositories, so a review of these facilities has yet to be carried out.

The results of the review are presented in an article by Sebestyén et al. It presents the results of the review and the proposed legislative points to implement to the legislation. [12]

Based on the review, the Hungarian nuclear safety regulations (Government Decree 118/2011, Government Decree 155/2014) were supplemented, and on 1 March 2018 the requirements have entered into force by the Govt. decree 28/2018. (II.28.) on the modification of the Govt. Decree 118/2011 (VII. 11.) on the nuclear safety requirements of nuclear facilities and on related regulatory activities and the Govt. Decree 155/2014. (VI. 30.) on the safety requirements for facilities ensuring interim storage or final disposal of radioactive wastes and the corresponding authority activities. [13] [14]

As the nuclear safety regulations for nuclear installations consist of facility-specific annexes, also called as volumes, the legal clause had to be indicated for each facility. The structure of the 118/2011. Government Decree is shown as follows.



1. Figure: ***Nuclear Safety Codes*** [13]

4. SUMMARY

In our article, we have summarized due to what problems the Hungarian radiation protection authority system had to be modified. As you can see, this was already a long process. As early as 2007, analyses and theses were created, which showed that the radiation protection supervision may encounter difficulties due to the radiation protection division operating at that time. We did not present it in the article, but since then changes have taken place among the authorities and institutions, which have led to the reorganization of institutions almost every year. A very good example of this is the NRIRR (National Research Institute for Radiobiology and Radiohygiene), which operated as an independent Institute, functioned as the Directorate of a Center, but also functioned as a department of a larger institute. But the transformation of the Radiation Health Decentrums can be a similar example.

As of 2016, radiation protection supervision is in the hands of one authority, which is HAEA. Due to its ever-expanding tasks and changes in international recommendations, the HAEA had to introduce newer and newer legislation, which we outlined in our article.

In our article, we also summarize the previous results that helped shape the present environment.

With the modifications of the legislation, the regulation has become uniform and enforceable, which has not only made the licensing tasks more transparent and the supervisory activity clearer, but also includes the possibility of more effective enforcement of nuclear safety. This is not only due to the simplification of processes with standardization, but also to the clarification of the powers of the authorities.

LITERATURE

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