ON THE OCCASION OF THE 50TH ANNIVERSARY OF ORGANISED RADIATION PROTECTION

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INTRODUCTION

Radioactivity and radiation are parts of our natural environment that existed on Earth before any signs of life. When humans learned how to use radiation, these phenomena have become a part of our life that contributes greatly to the quality of life and the development of science, industry and medicine. Nuclear and isotopic techniques present a wide range of human activities. For more than a decade, they have been applied in different areas of human activities, which include nuclear energy, agriculture and biotechnology, in the management of water and marine resources, industry, science and research, archaeology, history and medicine. Different nuclear technologies bring on daily basis immense benefits in diagnosis and treatment of diseases, in control of industrial processes, as well as for development of science and power generation. In parallel with the expansion of application of radioisotopes and nuclear methods, awareness about the harmful effects of ionizing radiation has increased. The new findings resulted in the development of new scientific and professional discipline that is now known as the Radiation Protection. This discipline pervades all applications of radiation sources and nuclear methods with an aim to protect people and the environment from unnecessary and excessive exposure to ionizing radiation, seeking to maximize the benefit and minimize the risk in any practice that is associated with radiation.

Radiation protection, both as a multidisciplinary scientific discipline and as an attitude, has largely contributed to the protection of man and the environment against the potential harm of ionizing radiation, allowing their beneficial and safe use. It covers a wide range of domains and applications related to the development and operation of nuclear and radiation related technologies. Over the past decades, almost a century, professionals active in the domain of radiation protection have immensely contributed to the development of legislation and regulations, to monitoring and control, to prediction of consequences and to the assessment of risks.

Harmful effects of radiation and call for protection against it were recognized rather early, practically immediately upon the discovery of x-rays. In June 1896, Nikola Tesla, a scientist of the Yugoslav origin who worked in the USA, provided one of the earliest and, at the same time, one of the most fundamental principles of radiation protection: "Experimenters should not get too close to the x-ray tube" [1]. There were also many other examples pointing out the need for radiation protection. Still, in the first thirty years of use of radiation, radiation protection was the task performed by those dealing with it in their everyday practice only - in other words, it was not regulated. Radiation protection regulation, at international level, was related to the foundation of the International Commission on Radiological Protection. In the same period many national societies were established, bringing us in position to celebrate 50th anniversary of organized radiation protection, both on national and international scale.

Fifty years of organized professional activities in the area of radiation protection is certainly an excellent occasion to summarize evolution and achievements of the radiation protection professionals in the region known as former Yugoslavia.

FOUNDATION OF YUGOSLAV RADIATION PROTECTION ASSOCIATION

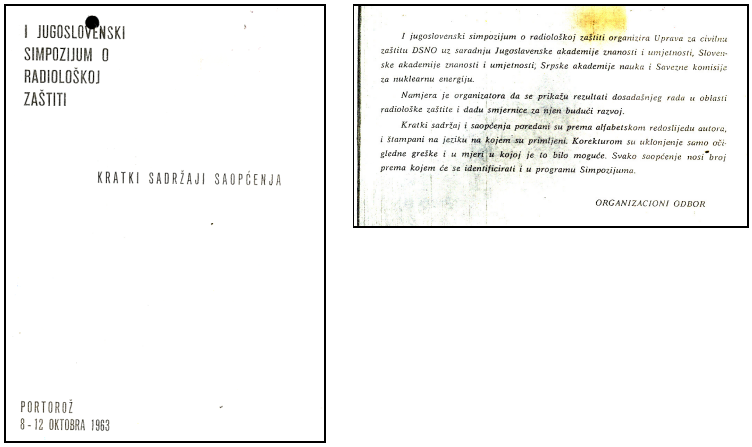
Activities in the radiation protection field in Yugoslavia diversified greatly in the beginning of the 60s of the 20th centuries. Only some four years after the adoption of the protection policy its first professional conditions were fulfilled for the organization of an expert meeting – a symposium. The Symposium was held in Portorož (Slovenia) on October 8-12, 1963. The program of the Symposium included plenary sessions with general topics and three parallel sessions on Radiation Protection in Medicine and Biology, Technical Radiation Protection, and Environmental Radiation. Short summaries of the presented papers were published in the Book of Abstracts was (Figure 1) [1-4].

Although the first in a series, it was the most attended meeting as 315 participants took part at that time. It was also a great confirmation that a large and already successful radiation protection professional community existed at that time. Established international cooperation and participation international meetings made professionals aware that national radiation professional societies had been already established in other countries.

Besides the outstanding program and number of participants, the Symposium was an occasion during which the Yugoslav Radiation

Protection Association (YRPA) was founded. At the inaugural meeting, the temporary management had been elected, consisting of: Grujica Žarković, president, Andrija Muhek, vice-president, Ljubomir Barberić, vice-president, Vladeta Gajić, general secretary, Zdenko Milavc, secretary, Milovan Vidmar, secretary, Dušan Srdoč, secretary, and members: Milan Babšek, Kazimir Baryla, Zdravko Buzančić, Borivoje Damjanović, Zoran Djukić, Aleksandar Gal, Dragutin Grozdanović, Srdjan Hajduković, Alenka Jeršić, Milica Kačarević, Dušan Kanazir, Miloš Kilibarda, Krista Kostijal, Branimir Miletić, Zoran Popović, Petar Mirić, Živana Petrović, Velimir Popović, Ante Spozna, Dušan Stojanović, Toma Tasovac, Velimir Vouk and Selimir Vrbić. At the meeting, held on 23 October 1963, the executive council was also established, consisting of: Grujica Žarković, the president, Andrija Muhek and Ljubomir Barberić, vice-presidents, Vladeta Gajić, general secretary, Predrag Bojović, Dušan Srdoč and Janez Kristan, secretaries, and members: Zdravko Buzančić, Zoran Djukić, Živana Petrović, Velimir Popović, Toma Tasovac and Gligor Tofoski.

During its foundation, it was underlined that Association should be the link between all professionals and organizations interested in radiation protection. All relevant organizations gave their support to the society foundation. It should help the scientific and professional work to be improved and safely applied in practice. The main task would be organizing the scientific meetings and conferences on the radiation protection topic.


I JUGOSLOVENSKI
SIMPOZIJUM O
RADIOLOŠKOJ
ZAŠTITI

KRATKI SADRŽAJI SAOPĆENJA

PORTOROŽ
8 - 12 OKTOBRA 1963

I jugoslovenski simpozijum o radiološkoj zaštiti organizira Uprava za civilnu zaštitu DSNO uz saradnju Jugoslavenske akademije znanosti i umjetnosti, Slovenske akademije znanosti i umjetnosti, Srpske akademije nauka i Savezne komisije za nuklearnu energiju.

Namjera je organizatora da se prikažu rezultati dosadašnjeg rada u oblasti radiološke zaštite i dadu smjernice za njen budući razvoj.

Kratki sadržaj i saopćenja poredani su prema alfabetskom redoslijedu autora, i štampani na jeziku na kojem su primljeni. Korekturom su uklonjene samo očigledne greške i u mjeri u kojoj je to bilo moguće. Svako saopćenje nosi broj prema kojem će se identificirati i u programu Simpozijuma.

ORGANIZACIONI ODBOR

Figure 1. Cover page of the Book of abstracts from the First Radiation Protection Symposium held in Portorož, 8-12 October 1963.

The main tasks and aims of the YRPA were at that time:

- organized activities on the continual environmental quality improvement and protection of the environment, human and animal population from the harmful effects of the radiation;
- organized initiation and support of scientific research in all fields where the radiation sources are used for peaceful purposes;
- continuous training of the workers and continual application of radiation protection principles;
- care for adequate social position of professionals dealing with radiation sources and working in radiation protection departments;
- promotion of professional and ethical principles application in the radiation sources use;
- organized efforts and requirements for continuous public education and information about radiation and radiation protection;
- collaboration with radiation protection associations and societies from other countries and international organizations and professional and scientific experience exchange;
- reviewing and following the radiation protection system organization and suggesting improvements;
- training of the professionals who work with radiation sources and in radiation protection services, for efficient work in accidental conditions;
- organization of symposia, conferences and other scientific meetings;
- active cooperation with International Radiation Protection Association (IRPA) and other international organizations and associations of radiation protection and participation in international professional and scientific conferences and meetings;
- cooperation with other associations professionally interested in radiation protection.

The goals of YRPA were outlined in the statute. The statute cover page and membership card are shown in Figure 2 [4]. The statute of the YRPA has been recommended by IRPA as an example of well designed statutes to other national societies during their foundations [3].

In the period 1963-1970 the name of the society was Yugoslav Society for Radiological Protection (Jugoslovensko društvo za radiološku zaštitu), in the period 1972-2003 it was Yugoslav Radiation Protection Association (Jugoslovensko društvo za zaštitu od zračenja), and in 2005 it became

Radiation protection association of Serbia and Montenegro (Društvo za zaštitu od zračenja Srbije i Crne Gore), which remained till present.

It must be noted that first days of the YRPA were also associated with certain difficulties related to the technical and financial problems. However, these difficulties were overcome thanks to the enthusiasm of the members who contributed to the organization of the society, so activities of the YRPA become normal in 1966. In the period 1979-1981, all republics and provinces of former Yugoslavia established their own radiation protection societies and these societies become collective members of YRPA [4]. Some of them, as Croatian and Slovenian national associations are presently/nowadays active professional societies and members of the IRPA. General assembly of YRPA was organized regularly, during symposia of YRPA, in particular in Banja Luka in 1967, Baško Polje in 1969, Bled in 1970, Ohrid in 1972, Kaštel Stari in 1973, Herceg Novi in 1975, Jajce in 1977, etc.

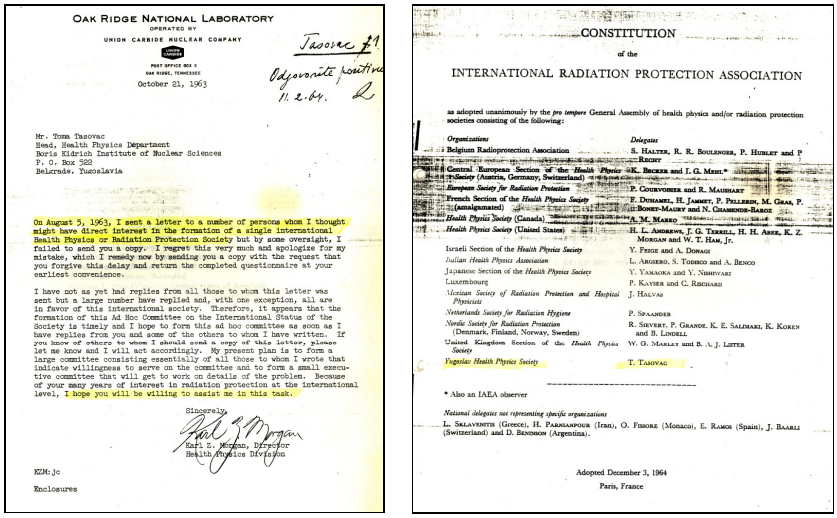
Figure 2. Cover page of the Statute and membership card of the YRPA

From the foundation of the YRPA, the executive board played an important role. It was a coordinator, initiator and executive body for all society's activities. During years the executive board has a number of successful meetings, and number of minutes from these meeting are sort of

proof of this success. Reports from these meetings were also published in the bulletins and become available to the members of the YRPA. Under certain circumstances, when there was a need the executive board established committees consisting of experts in the particular field of radiation protection.

MEMBERSHIP IN THE INETARNATIONAL RADIATION PROTECTION ASSOCIATION (IRPA)

Since foundation of YRPA, efforts had been made to contact and cooperate with similar organizations in country and abroad. YRPA representatives participated at the International Radiation Protection Association (IRPA) foundation meeting, held at Paris in 1964 (Figure 3), and its First annual meeting and Congress in Rome, in 1966. Yugoslav Radiation Protection Association became a full member of IRPA in 1969 [2,4].



OAK RIDGE NATIONAL LABORATORY
OPERATED BY
UNION CARBIDE NUCLEAR COMPANY

POST OFFICE BOX X
OAK RIDGE, TENNESSEE

October 21, 1963

Tasovac #1
Odgovorite pozitivno
11.2.64.

Mr. Toma Tasovac
Head, Health Physics Department
Boris Kidrich Institute of Nuclear Sciences
P. O. Box 522
Belgrade. Yugoslavia

On August 5, 1963, I sent a letter to a number of persons whom I thought might have direct interest in the formation of a single international Health Physics or Radiation Protection Society but by some oversight, I failed to send you a copy. I regret this very much and apologize for my mistake, which I remedy now by sending you a copy with the request that you forgive this delay and return the completed questionnaire at your earliest convenience.

I have not as yet had replies from all those to whom this letter was sent but a large number have replied and, with one exception, all are in favor of this international society. Therefore, it appears that the formation of this Ad Hoc Committee on the International Status of the Society is timely and I hope to form this ad hoc committee as soon as I have replies from you and some of the others to whom I have written. If you know of others to whom I should send a copy of this letter, please let me know and I will act accordingly. My present plan is to form a large committee consisting essentially of all those to whom I wrote that indicate willingness to serve on the committee and to form a small executive committee that will get to work on details of the problem. Because of your many years of interest in radiation protection at the international level, I hope you will be willing to assist me in this task.

Sincerely,

Karl Z. Morgan, Director
Health Physics Division

KZM:jc

Enclosures

CONSTITUTION
of the
INTERNATIONAL RADIATION PROTECTION ASSOCIATION

as adopted unanimously by the *pro tempore* General Assembly of health physics and/or radiation protection societies consisting of the following:

Organizations	*Delegates*
Belgium Radioprotection Association	S. Halter, R. R. Boulenger, P. Hublet and P Recht
Central European Section of the *Health Physics Society* (Austria, Germany, Switzerland)	K. Becker and J. G. Meiß*
European Society for Radiation Protection	P. Courvoisier and R. Maushart
French Section of the *Health Physics Society* (amalgamated)	F. Duhamel, H. Jammet, P. Pellerin, M. Gras, P. Bonet-Maury and N. Chamenoir-Baroz
Health Physics Society (Canada)	A. M. Marko
Health Physics Society (United States)	H. L. Andrews, J. G. Terrill, H. H. Abee, K. Z. Morgan and W. T. Ham, Jr.
Israeli Section of the *Health Physics Society*	Y. Feige and A. Dubiaski
Italian Health Physics Association	L. Angeero, S. Tonnico and A. Benco
Japanese Section of the *Health Physics Society*	Y. Yamaoka and Y. Nishiyaki
Luxembourg	P. Kayser and C. Richard
Mexican Society of Radiation Protection and Hospital Physicists	J. Halvas
Netherlands Society for Radiation Hygiene	P. Spaander
Nordic Society for Radiation Protection (Denmark, Finland, Norway, Sweden)	R. Sievert, P. Grande, K. E. Salmaki, K. Koren and B. Lindell
United Kingdom Section of the *Health Physics Society*	W. G. Marley and B. A. J. Litter
Yugoslav Health Physics Society	T. Tasovac

* Also an IAEA observer

National delegates not representing specific organizations
L. Sklaventis (Greece), H. Parsianpour (Iran), O. Fisore (Monaco), E. Ramos (Spain), J. Baarli (Switzerland) and D. Benisson (Argentina).

Adopted December 3, 1964
Paris, France

Figure 3. Constitution of the IRPA and participation of the YRPA representative

SYMPOSIA, BULLETINS AND OTHER ACTIVITES

In the period 1963-1991 Yugoslav Radiation Protection Association organized number of symposia, few international and regional meetings, and number of specialized meetings related to the particular radiation protection topic. The symposia were the most important activity of the YRPA, both in terms of topics covered and in terms of number of participants, as presented in Table 1. Symposia were held regularly in biannual intervals in the period 1963-2013.

Table 1. Symposia on radiation protection held in the period 1963-2013

No	Year	Venue	Number of participants	Number of papers
I	1963	Portoroz	310	162
II	1965	Mostar	250	48
III	1967	Banja Luka	210	88
IV	1969	Basko Polje	250	151
V	1970	Bled	200	110
VI	1972	Ohrid	160	96
VII	1973	Kastel Stari	150	92
VIII	1975	Herceg Novi	150	83
IX	1977	Jajce	150	109
X	1979	Arandjelovac	120	88
XI	1981	Porotroz	150	116
XII	1983	Ohrid	200	139
XIII	1985	Pula	250	182
XIV	1987	Novi Sad	250	117
XV	1989	Pristina	150	119
XVI	1991	Neum	130	108
XVII	1993	Beograd	120	74
XVIII	1995	Bečići	106	86
XIX	1997	Golubac	95	75
XX	1999	Tara	105	90
XXI	2001	Kladovo	94	82
XXII	2003	Petrovac	100	80
XXIII	2005	Donji Milanovac	80	69
XXIV	2007	Zlatibor	95	75
XXV	2009	Kopaonik	74	64
XXVI	2011	Tara	82	78
XXVII	2013	Vrnjačka Banja	-	-

During 50 years history of radiological protection, 26 regular symposia were held with 2581scientific presentations and more than 4000

participants. In spite to all difficulties, the YRPA held traditions in publishing proceedings from the symposia. Unfortunately, some of them, in particular those from the early period of the YRPA, were not preserved either in the archive of the society or in public libraries. Also, a very nice tradition to publish selected number of contributions in the peer reviewed journals such as Health Physics was not kept, which increased likelihood that some of the activities of the members of the society will be irreversibly lost.

Based on the topics of the papers published in the proceedings, it is obvious that society kept a tradition of a multidisciplinary approach in radiation protection. Papers covered both fundamental and applied aspect of radiological protection. In many cases actual topics, related to the nuclear accidents or similar events related to radiation protection were also presented. Overall, the largest number of papers has been related to the problems in radioecology, followed by topics in radiobiology, dosimetry, radiation measurements and many others.

As, mentioned above, besides regular biannual symposia, thematic meetings and conferences were organized occasionally. Some of them, followed by published proceedings, were:

- Population exposure from external radiation due to non-medical uses of radiation sources, Aranđelovac, 20-21 May 1976
- Health surveillance of workers in medicine, Cavtat, 13-15 October, 1988
- Natural sources of radiation, Belgrade, 1995 (ed. M Kovačević)
- Chernobyl, 10 years after the accident, Budva, 4-7 June, 1996.

Staring from the 1960-ties till the end of 1980-ties, YRPA regularly published bulletins, 3-4 times per year, bringing important information related to the activities of the society, its executive board, actual topics in the radiation protection, interactions with other similar professional societies, reports from relevant organizations working in the field of radiation protection, news from IRPA and latest literature. The first issue of the bulletin was published in 1965 [2,4]. According to the information provided in the bulletins, it was interesting to see that YRPA had an important liaison role between professional organizations in radiation protection, providing instructions how to implement new approaches, methodologies or how to unify the reports of measurements. It was interesting to note that members of the YRPA also provided educational

material for public related to radiological protection. Unfortunately, due to lack of adequate support, the material has never been published.

Although YRPA was not a direct organizer, many distinguished members of the society contributed to the establishment of the "Summer schools" in radiation protection during 1960-ties, with an idea to establish more intensive cooperation at the international level. Events known as "summer schools" played a very important role. A group of participants in the International Radiation Protection Colloquium held in Herceg Novi (Yugoslavia) in 1966: Ljubomir Barbarić, Predrag S. Bojović and Marko Ninković decided to initiate organization of international radiation protection schools in Yugoslavia. Eventually, four schools were organized in the period from 1970 to 1979, in particular:

- Radiation Dosimetry, Cavtat, 1970;
- Protection of Nuclear Facilities Surroundings, Herceg Novi, 1973;
- Current Problems and Concerns of Health Physicists, Herceg Novi, 1976; and
- Waste Disposal and other Problems in the Nuclear Industry, Dubrovnik, 1979 [1,4].

The most eminent radiation protection scientists (ten or more of them at each school) as K.Z. Morgan, W.S. Snyder, N.G. Gusev, Bo Lindel, H. Jammet, D. Beninson, and others, took part as lecturers, immensely contributing to the overall success of the Schools. It is interesting to note that already in 1976, during the third school, D.H. Sliney and R.T. Ham, from the USA, gave lectures on the danger and protection against non-ionizing radiation.

CURRENT SITUATION

Long tradition of radiological protection was a very good basis for the national societies currently existing in the region. At present, active societies are Croatian Radiation Protection Association (CRPA), Radiation Protection Association of Serbia and Montenegro and Slovenian Radiation Protection Association. All three organizations are members of the IRPA. Croatian and Serbian societies regularly organize biannual national symposia attracting a number of experts and professionals in radiation protection from the country and from the region. For many years, there is a formal cooperation between two societies consisting of regular exchange

delegates and participation of scientists from one country on the national Symposia in other country.

At present, Radiation Protection Association of Serbia and Montenegro has approximately 80 active members and acts as a professional and non-profitable organisation oriented towards improvement of protection of people and environment from harmful effects of radiation. Basic activity of the association is to encourage organized research in all fields of application and use of radiation sources and to stimulate and monitor the professional and ethical principles during use of radiation sources. The association actively participate in the drafting and reviewing the national regulation in the area of radiation protection, cooperates with other professional societies and radiation protection associations from other countries, as well as with international organizations and associations. Together with Serbian Nuclear Society, Radiation Protection Association of Serbia and Montenegro is a co-founder of a scientific journal Nuclear Technology and Radiation Protection. It is an international peer reviewed scientific journal covering the wide range of disciplines involved in nuclear science and technology as well as in the field of radiation protection. The journal is included in ISI Web of Knowledge - Web of Science, Science citation index expanded - SCI, and Journal Citation Reports/Science Edition. With current impact factor of 1.159, it is available for full download at National Library of Serbia - doiSerbia, Directory of open access journals - DOAJ, and Portal of open access e-journals - Open J-Gate.

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[2] Yugoslav Radiation Protection Association. Twenty years of YRPA, 1963-1983, Bulletin, Year XIV, January-April 1983, No 1, 1983. ed Ljiljana Knezevic

[3] Yugoslav Radiation Protection Association. Thirty years of YRPA. Bibliography, 1963-1993, YRPA, 1995, ed R. Kljajic

[4] Archive of the YRPA

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