

ACTIVITIES ON THE LEGAL FRAMEWORK FOR THE PROTECTION AGAINST THE RADON IN BOSNIA AND HERZEGOVINA

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Abstract: The legal framework for the protection against the radon in Bosnia and Herzegovina (hereinafter: B&H) is outdated. It covers the works involved in the practices with ionizing sources but does not clearly defines the activities which could involve NORM. The protection against the radon exposure goes beyond the radiation protection field, since it includes the building codes, the legal framework on air quality, and many other relevant legislations in B&H which now do not include the recommendation on protection against radon. As the B&H is a member of the International atomic energy agency (hereinafter: IAEA) and potential candidate for European union (hereinafter: EU) membership, activities of the State regulatory agency for radiation and nuclear safety (hereinafter: SRARNS), include activities on improvement and extension of the legal framework for protection against the radon exposure, which means the creation of new Regulation on monitoring of radioactivity in B&H. The most important activity concerning ^{222}Rn matter is the national technical cooperation project with the IAEA TC for the cycle 2020-2021. Through this project B&H will gather first comprehensive measurements of the radon concentration from the whole territory in systematic way. The result of this project will help to create a first versions of the database and map radon concentration. The working group, made of the representatives of the relevant institutions, will have to decide which following steps B&H's government will need to do to enable its citizens healthier living and working environment when it comes to the protection against the radon exposure

Keywords: radon, legal framework, public, occupational, radon concentration, environment.

1. THE CURRENT SITUATION OF THE B&H'S LEGISLATION REGARDING THE ^{222}Rn

The legal framework for the protection against the radon in Bosnia and Herzegovina (hereinafter: B&H) is at the stage of improvement and extension. The existing legal framework, related to protection against the radon, for the occupational exposure needs to be updated whereas the legal framework for the public exposure needs to be updated and extended. In this way the systematic measurements of radon concentration will be introduced in regular monitoring program.

The Regulation on radiation protection for occupational and public exposure (hereinafter: Regulation on O&P) [1] (Figure 1), which is the transposition of Council Directive 96/29 EURATOM in the legal system of B&H, defines that: measurements of radon concentration shall be performed within the monitoring of the workplace

(Article 35), action level for 1000 Bq/m^3 of ^{222}Rn in the air (Article 64), work activities which could involve NORM need to be investigated whether there is a significant increase in the exposure of workers or the population that cannot be disregarded from the radiation protection point of view (Article 69) and that the conventional conversion factors at work for ^{222}Rn is 1,4 and for ^{220}Rn is 0,5 Sv/(J.h.m-3). In addition, Regulation on the concentration limits for radionuclides in food, feed, medicines, items of general use, building materials, and other goods placed on the market [2], defines concentration limits of radionuclides, including ^{226}Ra , for indoor (Article 12), outdoor (Article 13) and construction (Article 14) building materials. These limits were prescribed by SRARNS. On the other hand, the building codes as well as the legal framework for air quality, which are out of the scope of SRARNS duties, have not yet included the protection against the radon exposure in their framework.

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Pursuant to Article 16(1) of the Law on Radiation and Nuclear Safety in Bosnia and Herzegovina ("Official Gazette of BiH" 88/07) and Article 61(2) of the Law on Administration ("Official Gazette of BiH" 32/02 and 102/09), the director of the State Regulatory Agency for Radiation and Nuclear Safety issues:

REGULATION
on the radiation protection in occupational exposure and public exposure

PART ONE – GENERAL PROVISIONS

Article 1
(Subject)

(1) This regulation shall govern the principles of radiation protection of exposed workers and the population in ordinary situations, radiological and nuclear emergencies; principles of the radiation protection system; dose limits for exposed workers, apprentices, high-school and university students in training, and the population; the estimation model for effective dose; requirements for individual monitoring and monitoring of the workplace; responsibilities of the radiation protection experts; actions in the event of significant increase of exposure from natural sources and during interventions in radiological, nuclear emergencies and lasting exposures, as well as other matters important for occupational exposure and public exposure.

(2) This regulation shall apply to all practices involving risk from ionizing radiation arising from an artificial or a natural source of ionizing radiation (hereinafter: source), when natural radionuclides are or have been processed in view of their radioactive, fissile or fertile properties, which implies:

- a) production, processing, handling, use, possession, storage, transport, import, export, relocation, and disposal of radioactive substances,
- b) the operation of any electrical equipment producing ionizing radiation and containing components operating at a potential difference of more than 5 kV,
- c) any other practice as defined by the State Regulatory Agency for Radiation and Nuclear Safety (hereinafter: Agency).

(3) This regulation shall apply to work activities that imply the presence of natural sources and lead to significant increase of exposure of exposed workers or the population, which cannot be disregarded from the radiation protection point of view.

Article 2
(Objective)

The objective of this regulation is to establish standards and criteria for the radiation protection of exposed workers and the population.

Article 35
(Monitoring of the workplace)

Monitoring of the workplace shall cover the measurement of:

- a) dose rates, specifying the nature and quality of the radiation in question,
- b) air activity concentration and surface contamination, specifying the nature of radioactive substances and their physical and chemical states, in the work with open sources,
- c) Radon concentration in the workplace in potential exposure to natural sources.

Article 54
(Concentration of radon in the workplace)

The action level for corrective measures in lasting exposures to radon in the workplace shall be equal to average annual concentration of 1000 Bq m⁻³ of Rn-222 in the air.

Article 69
(Exposure to natural sources)

(1) The Agency may require the holders of authorization for the practices not laid down in Article 1(2) but involving natural sources to conduct necessary investigations to determine whether there is a significant increase in the exposure of workers or the population that cannot be disregarded from the radiation protection point of view.

(2) The work activities that shall be subject to the investigations referred to in paragraph (1) are:

- a) activities where workers and the population can be exposed to the inhalation of thoron or radon daughters or gamma radiation or any other exposure in workplaces such as thermal sources, caves, mines, underground workplaces or aboveground workplaces in identified areas,
- b) activities involving storage or handling the materials that are usually not considered radioactive but contain natural radionuclides causing a significant increase in the exposure of workers and the population,
- c) activities leading to the production of the waste that is usually not considered radioactive but contains natural radionuclides causing a significant increase in the exposure of workers and the population,

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- d) activities involving exposure to cosmic radiation during flights.

Figure 1. Excerpt from the Regulation on radiation protection for occupational and public exposure

2. PAST AND PRESENT ACTIVITIES REGARDING THE ²²²Rn

The existing measurements of radon concentration in indoor air and in drinking water, in B&H, are made on investigation base or on order of the third party. Until now there has not been any systematic measurement for the whole territory of B&H. Based on the recommendations given by the World Health Organization, in The handbook on indoor radon from 2009 [3], the IAEA BSS GSR Part 3 [4] and the EURATOM/59/2013 Directive [5] recommends that the member states include the measurements of radon concentrations at the workplaces, homes and public buildings in their national legislation. Also, the 2013/51/EURATOM Directive [6] defines that the member states shall include the measurements of the radon concentration in their national legal framework.

As the B&H is a member of the IAEA since 1995 and in 2016 has formally applied for membership in the EU, activities of the SRARNS, since 2014-2015 till today, include activities on improvement and extension of the legal framework for protection against the radon exposure. The new Regulation on monitoring of the radioactivity [7] will create the legal baseline for systematic measurements of the radon concentration in indoor air and in drinking water within the regular monitoring

program. With the new Regulation on activities which could involve NORM [8] the Article 69 of the Regulation on O&P will be more in line with the international standards as the B&H does have industries such as steel production, cement production, thermal power plants, thermal spas, etc. Along with this, SRARNS works on drafting the new regulation on radiation safety which will be the transposition of the abovementioned international standards, and it will include the new reference level (most probably 300 Bq/m³) and the new conversion factor for ²²²Rn.

Considering that the protection against the radon exposure goes beyond the radiation protection, SRARNS cooperates with all relevant institutions, such as health, building, education, environment, occupational protection, etc. authorities, to introduce the protection against the radon exposure in their legal framework.

3. FUTURE PLANS REGARDING ²²²Rn LEGISLATION

There are activities on ongoing project, in the cooperation with the IAEA, for the TC cycle 2020-2021 regarding the radon. This project will help to gather first comprehensive measurements of the radon concentration from the whole territory of B&H

in systematic way. The results of this project will be used for different purpose such as creating the first version of the database on the radon concentration, the bases for the B&H's radon map, the baseline for the following, more narrowed, national project for the cycle 2022-2023 with the IAEA and possible projects in cooperation with EU.

The most important purpose will be the presentation of the findings to the working group, made of the representatives of the all relevant authorities. Alongside with the gathering the data within the national project, there are plans for participation on the regional project regarding the conduct of the survey on public awareness regarding ²²²Rn. The survey should be conducted within the IAEA TC project RER/9/153 "Enhancing the Regional Capacity to Control Long Term Risk to the Public due to Radon in Dwellings and Workplaces".

Working group will have the task to define the following steps of B&H's authorities, in their respective fields, regarding the protection against the radon exposure taking into account the survey results. These steps will include overall legal document (i.e. strategy, policy, action plan communication plan) as well as the state-of-the-art legislation in each respective field related to the protection against the radon exposure.

4. LITERATURE

– The certain regulation on radon protection and exposure to ionizing radiation has been used to describe pathways of development in this field in Bosnia and Herzegovina:

– The Regulation on radiation protection for occupational and public exposure (Official Gazette B&H, No. 102/11).

– The Regulation on the concentration limits for radionuclides in food, feed, medicines, items of general use, building materials, and other goods placed on the market (Official Gazette B&H, No. 54/14).

– The handbook on indoor radon A public health perspective (World Health Organization Publication).

– Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, General Safety Requirements Part 3 (IAEA Publication).

– Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionizing radiation, and repealing Directives: 89/618/Euratom, 90/641/Euratom,

96/29/Euratom, 97/43/Euratom and 2003/122/Euratom (EC Publication).

– Council Directive 2013/51/Euratom of 22 October 2013 laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption (EC Publication).

– The draft of the new Regulation on monitoring of radioactivity in B&H.

– The draft of the new Regulation on regulatory control of activities involving NORM.

5. CONCLUSION

Bearing in mind that the protection against the radon exposure must be covered by various competent authorities and governmental structures in B&H, it is to be expected that the transposition of radon standards to B&H's legislation will be difficult and time consuming. Therefore, the activity on defining the relevant authorities, not to mention interested parties outside of the government, for the working group will be very vital. Consequently, cooperation and harmonization of activities between all relevant governmental and non-governmental interested parties need to be carefully planned to maximally avoid the overlapping of the role and responsibilities of each of them.

Based on experience of the countries which have already transposed or are in process of transposition of the abovementioned international standards, it is to expect that these legislations updates could have the financial impact to the B&H. Therefore, it is crucial that this aspect is included at the very beginning of drafting the new legislations (especially for the building codes) so the governments of B&H could achieve the aim of creating the healthier living and working environment for its citizens.

6. REFERENCES

[1] B&H's counterpart for the IAEA TC project RER/9/127 *Establishing Enhanced Approaches to the Control of Public Exposure to Radon*, cycle 2014-2015

[2] B&H's counterpart for the IAEA TC project RER/9/136 *Reducing Public Exposure to Radon by Supporting the Implementation and Further Development of National Strategies*, cycle 2016–2017.

[3] B&H's counterpart for the IAEA TC project RER/9/153 *Enhancing the Regional Capacity*

to Control Long Term Risk to the Public due to Radon in Dwellings and Workplaces, cycle 2018–2021.

[4] B&H's counterpart for the IAEA TC project BOH2018001 *Further building of the national capacities and setting the standards for decreasing risk to public health due radon exposure*, cycle 2020–2021.

[5] *Participation at the International Workshop on the European Atlas of Natural Radiation (IWEANR 2015)*, International Workshop

on the European Atlas of Natural Radiation (IWEANR), 9–13 November 2015.

[6] *Participation at the 2nd International Workshop on the European Atlas of Natural Radiation (IWEANR 2017)*, Verbania, Italy, 6–9 November 2017.

[7] Participation at the one-day symposium on the topic *Impact of Radon and Thoron on Population Health*, Teslić, B&H, 13. April 2018.



АКТИВНОСТИ НА ПРАВНОМ ОКВИРУ ЗА ЗАШТИТУ ОД ИЗЛОЖЕНОСТИ РАДОНУ У БОСНИ И ХЕРЦЕГОВИНИ

Сажетак: Правни оквир за заштиту од радона у Босни и Херцеговини (у даљем тексту: БиХ) је застарио. Он обухваћа дјела укључена у праксе с изворима ионизирања, али не дефинира јасно активности које би могле укључивати НОРМ. Заштита од излагања радону надилази поље заштите од зрачења јер укључује грађевинске прописе, законске оквире о квалитети зрака и многе друге релевантне законе у БиХ који тренутно не укључују препоруку о заштити од радона. Будући да је БиХ чланица Међународне агенције за атомску енергију (у даљем тексту: ИАЕА) и потенцијални кандидат за чланство у Еуропској унији (у даљем тексту: ЕУ), активности Државне регулаторне агенције за радијацијску и нуклеарну сигурност (у даљем тексту: ДРАРНС) укључују активности на побољшању и проширењу законског оквира за заштиту од изложености радону, што значи доношење новог правилника о надзору радиоактивности у БиХ. Најважнија активност по питању 222 је национални пројект техничке сарадње с ИАЕА за циклус 2020–2021. Резултат овог пројекта помоћи ће стварању првих верзија базе података и мапирању концентрације радона. Радна скупина састављена од представника релевантних институција морат ће одлучити које ће следеће кораке Влада БиХ морати подузети како би грађанима омогућила здравије животно и радно окружење када је у питању заштита од изложености радону.

Кључне ријечи: радон, правни оквир, јавност, професионална изложеност, концентрација радона, околиш.



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