



**Radon in thermal waters and radon risk in chosen thermal water
spas in V4 countries**

V4 Standard Project No. 21320324

Kick-off meeting

Teplice, February 5. – 7. 2014

Meeting Minutes

The participants:

Karol Holý,
Monika Müllerová,
Iveta Smetanová and
Pavol Blahušiak from Slovakia.
Tibor Kovács,
Erika Nagy and
Amin Shahrokhi from Hungary.
Jadwiga Mazur,
Krzysztof Kozak,
Dominik Grzadziel and
Mariusz Mroczek from Poland
Martin Neznal and
Matěj Neznal from the Czech Republic.

February 5

Karol Holy greeted the participants.
The participants unanimously accepted the items of the agenda.

The participants from each of V4 countries (Faculty of Mathematics, Physics and Informatics, Department of Nuclear Physics and Biophysics, Comenius University, Slovakia; Social Organization for Radioecological Cleanliness, Hungary; Institute of Nuclear Physics PAN (IFJ PAN), Laboratory of Radiometric Expertise, Poland; RADON v.o.s., Czech Republic) presented a short summary about the current state of the radon monitoring and

research in thermal waters and spas (previous results, used methods, legislation, action plans for radon).

Jadwiga Mazur from the Institute of Nuclear Physics PAN (IFJ PAN), Laboratory of Radiometric Expertise, Poland and Tibor Kovács from the Social Organization for Radioecological Cleanliness, Hungary presented three thermal spas selected for radon monitoring in respective countries.

Martin Neznal from the RADON v.o.s., Czech Republic provided basic information about the RAMARN etch track detectors which will be used for the radon monitoring in air of spas.

The participants were informed about the goals, phases, planned PR activities and expected outputs of V4 Standard Project by the coordinator of the project Karol Holý from the Faculty of Mathematics, Physics and Informatics, Department of Nuclear Physics and Biophysics, Comenius University, Slovakia.

Monika Müllerová from the Faculty of Mathematics, Physics and Informatics, Department of Nuclear Physics and Biophysics, Comenius University, Slovakia gave information about the project's budget, its distribution among the participants and explained an accounting of the project expenses.

The details about the intercomparison measurements of radon in thermal water were provided by the Martin Neznal.

The proposal of the measuring protocol for radon in spas was distributed among all the participants and discussed.

Conclusions:

Because of the lowered budget, in Slovakia, Poland and Hungary only the three spas will be monitored, instead of four. In Czech Republic one spa was chosen for the radon monitoring purposes.

The time tables for the placing of the detectors and the water sampling in spas were suggested and arranged for all four monitoring periods.

February 6

Water sampling from two thermal water sources in two spas in Teplice, Czech Republic was performed for an intercomparison measurement of radon activity concentration in water. One sample was collected directly from the "Pravědlo" borehole, a hydrothermal water source ($T = 41^{\circ}\text{C}$) providing the water supply for Beethoven spa. The second sample was collected in "Kamenné lázně" spa, from a bath used for patients and from the tap supplying the bath. Each of the participants will measure radon activity concentration in collected water sample using their own methodology. The result will be sent to Martin Neznal and Monika Müllerová for the comparison.

The proposal of the measuring protocol for intercomparison measurement of radon in thermal waters in two spas in Teplice was presented by Martin Neznal and distributed among all the participants and discussed.

Martin Neznal and Karol Holý informed the participants about the methods of an effective dose calculation. Martin Neznal suggested two methods of an effective dose assessment on the basis of the previous experiences with radon measurements in Czech Republic. Karol Holý proposed to realize a supplementary radon monitoring in the air of spas for an effective dose assessment for the spa employees.

The detailed budget distribution was explained by Monika Müllerová and discussed, because the budget was changed.

Conclusions:

The harmonized measuring protocol for radon monitoring in spas and thermal waters was suggested and elaborated. The placing of the detectors, the choice of measured rooms in spa, information list in the measurement protocol, the determination of the average radon activity concentration during the working time for the employees in spas and the calculation of effective doses was discussed and arranged.

February 7

The detectors for the first period of the radon monitoring in the air of the selected spas were distributed to all participants. Each of the participants from Slovakia, Poland and Hungary was given 15 pieces of the RadoSys detectors and 15 pieces of NRPB detectors by Tibor Kovács and 30 of the RAMARN detectors by Matěj Neznal. Participants from Czech Republic obtained 10 pieces of the RAMARN detectors.