EAN Working Group on the Application of ALARA for Radon At Work
(Working Group A-RAW)

Meeting n°3 Minutes

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Meeting:	23 September 2021 (Microsoft Teams)
Members:	– Sylvain Andresz (CEPN, France), – Julie Morgan (PHE, United-Kingdom), – Cristina Nuccetelli (ISS, Italy), – Martha Palacios (SFOPH, Swtitzerland) – Caroline Schieber (CEPN, France), – Malgorzata Sneve (DSA, Norway) – Nicolas Stritt (SFOPH, Swtitzerland) – Hugh Synnott (RPII, Ireland), – Fernand Vermeersch (SCK•CEN, Belgium) In the absence of: Ulrike Kulka (BfS, Germany)

Status of the collection of information:

- Cases studies have been provided from **Belgium** (2 cases), **France** (1 form with 2 cases), **United Kingdom** (2 cases) and **Switzerland** (3 cases).
- In **Ireland**, a case study has been proposed and Hugh Synnott will adapt it to the form. Plus, another case study might be expected.
- In **Italy**, Crisitina Nuccetelli will contact a colleague of her to fill a case study about radon in school. Reflection about the management of radon below the Reference Level (RL) may also come from F. Bochicchio.
- Elements from regulation and guidance coming from **Norway** have been provided by colleagues[1] from Malgorzata Sneve. However, no case study is expected from Norway.

Case studies from **Germany**, **Slovenia** and **Sweden** could contribute usefully to the survey and a reminder will be send.

Discussion. Several differences in the national regulations have been spotted and discussed, inter alia:

- different share of responsibilities employer vs. building owner;
- measurement protocols and dosimetry follow-up;
- the decision to classify (or not) the personal;

However, the broad spirit of the regulations remains the same (the Swiss regulation being a bit more unique, notably with a 10 mSv Reference Level (RL)).

Several topics have been pinpointed in the discussion:

- The wide scope of the radon regulation (ex. 3.5 M workplace potentially concerned in France). Therefore; radon is a new topic for the employers and even for some Authorities (ex. Switzerland). It will take years for the new regulation to be disseminated.
- Meanwhile; there will be a need for education and trainings for almost all the affected

[1] Maria Larsen (maria.larsen@dsa.no) and Bård Olsen(bard.olsen@dsa.no).

parties: employers, employees, work inspectorate etc. It was suggested that all Members can collect elements/good practices to enrich this topic.

- There is sometimes a focus on the RL value, whereas some countries give provision for action even below the RL.
- Radon is tricky. It can be found even in upper floors or move from one remediated room to another room. There is no one-pill-solution and remediation can take time (ex. > 6 years).
- The impact of the usage of the most-recent ICRP dose coefficients for radon is foreseeably important in the number of radon area and exposure assessment. Only Italy has implemented the last coefficients in its regulation.
- Attention points about the management of specific exposure:
    - Mix-populations: employee vs. volunteer vs. public;
    - Mix-exposures: radon and 'traditional' occupational exposure;
    - Itinerary workers moving from one radon area to another.

  It was suggested that all Members can collect guidelines and experience on these attention points.

Finally, it was proposed that all Members read the submitted case studies and interact by emails for question if necessary.

Work of other organizations. Caroline Schieber and Cristina Nuccettelli have reported from the RadoNorm project where radon at work is currently a side topic, but its importance is expected to raise. Then Caroline Schieber communicated that a session of RICOMET seminar (10 September) focused on "*Societal aspects of radon at workplaces: from legal requirements to implementation*" with presentations from IAEA, ILO, EU-RAP, CEPN (France) and INAIL (Italy) – the latter three presentations will be send to the Members with the minutes.

Possible outcomes. Sylvain Andresz proposed to submit an abstract of the achievement of the Working Group to the European IRPA congress (Budapest, 30 May-2 June 2022) and this was accepted. An abstract will be circulated for comments (before 29 September).
The HERCA WG-NAT working group organize a workshop (Bucharest, 14-16 June 2022) and this will be another opportunity to present the work. Caroline Schieber will investigate with ASN if a presentation of the work is indeed suitable. The deadline for abstract submission is 31 December.
Finally, Nicolas Stritt proposed that a synthesis could also be prepared for publication in the EAN Newsletter in 2022.

	Actions list (March~June period).	In charge	Status
1	Report from HERCA Workshop (23/03) to the Working Group	Caroline Schieber	Done
2	Contact RadoNORM WP5 Leaders	BfS	Pending
3	Contact F. Bochicchio (ISS) who Chair of HERCA pre-workshop	Cristina Nuccetelli	Pending
4	Identify a basic list of cases in each country	All	done
5	Lay out a series of questions to be addressed by survey	All, by emails	Done
6	Plan a (remote) meeting at the occasion of the next EAN Meeting (8~9 June)	Sylvain Andresz	Done

	Actions list (June~December period).	In charge	Status
7	Agreement of the final list of questions	All	Done
8	Contact T. Perko and/or RadoNORM Project Leader with regard to radon at work	Caroline Schieber	Deleted
9	Engaging contact in each country Objective: 1~2 case studies per country	All	Almost done

10	Forward the question to identified EAN SG Members (Greece, Norway, Sweden) to expand the scope	Sylvain Andresz	Done
11	Plan a remote meeting 23rd September	Sylvain Andresz	Done
12	Plan a remote meeting in coincidence with the EAN meeting (8 and 9 December 2021)	Sylvain Andresz	Pending

	Actions list (September 2021~June 2022 period).	**In charge**	**Status**
13	Send a contribution from Italy and additional contribution from Ireland	Cristina Nuccetelli Hugh Synnott	Pending
14	Send a reminder to Germany, Sweden and Slovenia	Sylvain Andresz	Pending
15	Investigate the topics of education and training and the management of specific exposures situations.	All	Pending
16	Interact by emails and think about the focus point of the analysis (keeping Sylvain Andresz in .cc)	All	Pending
17	Draft an abstract for IRPA Budapest 2022 (Sylvain Andresz) and comment if necessary	Sylvain Andresz and All	Pending
18	Investigate with ASN if a presentation of the work is suitable for next HERCA workshop	Caroline Schieber	Pending
20	Plan an article for the EAN Newsletter in 2022	All	Pending

APPENDIX. QUESTIONNAIRE.

The check box (☐) are used to have a quick view of the regulation. The text inbox host experience from the practical case study.

ALARA FOR RADON AT WORK TEMPLATE FOR CASE STUDY
Could you please provide a short description of the case study and the workplace? *Context, sitting, number of workers etc.* **…**
 # IDENTIFICATION OF WORKPLACES Context: Radon measurements shall be carried out in identified workplaces
• **What are the criteria to select the workplaces?** ☐ *Workplace in basement* ☐ *Workplace in ground floor* ☐ *Map or radon-prone area* ☐ *Specific workplace* ☐ *former radon measurement* ☐ *other: …* • **Using the criteria**: ☐ *Mandatory* ☐ *Not mandatory*
What are your views about the system for the identification of workplaces? And what happens to all the other workplaces? …
 # RADON CONCENTRATION MEASUREMENT Context: Radon measurement protocol.
• **Normative protocol for radon concentration measurement** ☐ *Mandatory* ☐ *Not mandatory* • **Preference given to** ☐ *passive or* ☐ *direct-reading measurement devices?* • **Accredited/certified services for radon concentration measurements** ☐ *Mandatory* ☐ *Not mandatory* • **Are provisions for verification measurement provided in law?** ☐ *Yes* ☐ *No*
What are your views about the protocol for radon concentration measurement? Issues in practicality, cost, information to the workers and/or Health and Safety …
What if < reference level? Any (mandatory) requirements to reduce exposure ALARA? …
 # DIAGNOSIS AND REMEDIATION Context: If > reference level, remedial action to reduce radon concentration shall be taken.
• **Who is responsible?** ☐ *Employer* ☐ *Property Owner* • **Are accredited/certified services for radon concentration measurements mandatory?** ☐ *Mandatory* ☐ *Not mandatory* • **Are guidance available to help establish a diagnosis of the building and inform the type of mitigation required?** ☐ *Yes* ☐ *No* *Ex. Guidance on best practices, definition of standards for corrective measures (technical, organizational, cost) and their long-term follow-up.* • **Is it needed?** ☐ *Yes* ☐ *No* • **Time frame for remediation actions?** … (years) • **Time frame for remediation follow-up measurement?** … (years) • **Same protocol as initial measurement?** ☐ *Yes* ☐ *No*
Is the optimization principle considered in the implementation of the remedial action? Cost-efficacy consideration, numerical target, involvement of workers, … …

 # GOING FURTHER

Context: Remedial action were not sufficient.

- **Is it clear how to notify the situation to the competent authority?** ☐ *Yes* ☐ *No*
- **Is then the exposure assessment always requested?** ☐ *Yes* ☐ *No*
- **Who can perform the exposure assessment** ☐ *Employer* ☐ *Property Owner* ☐ *In-house Radiation Protection Expert* ☐ *External Radiation Protection Expert*
- **Are data/guidance available for the determination of annual radon concentration and "theoretical" estimate of effective dose to workers?** ☐ *Yes* ☐ *No*
  Ex. calculation techniques for estimating the radon concentration average and effective dose: respiratory/breathing rate, time in contact with radon, which conversion factors do you use, equilibrium factor etc.
- **Is it needed?** ☐ *Yes* ☐ *No*

What are your views about the exposure assessment process?

…

 # CASE WHERE EFFECTIVE DOSE < 6 mSv

- **Is it clear how to notify the results of the exposure assessment to the competent authority?** ☐ *Yes* ☐ *No*
- **Who is responsible of implementing the requirements?** ☐ *Employer* ☐ *Property Owner* ☐ *In-house Radiation Protection Expert* ☐ *External Radiation Protection Expert*
- **Are there practical difficulties in?**

- The identification of radon prone area (zoning) …… ☐ *Yes* ☐ *No*
- Signage or warning system …….. ☐ *Yes* ☐ *No*
- Ventilation/airflow requirements? And checks on continued operation of radon countermeasures (fans/sumps)? …….. ☐ *Yes* ☐ *No*
- Control of exposure of workers …… ☐ *Yes* ☐ *No*
- Provision to "promote the development of an appropriate radiation protection culture" by the workers …….. ☐ *Yes* ☐ *No*
- Re-measurement/re-assessment …….. ☐ *Yes* ☐ *No*
- Other: …

Any details you would like to report?

…

 # CASE WHERE EFFECTIVE DOSE ≥ 6 mSv

- **Who is responsible for the implementation of licencing requirements for the workers?** ☐ *Employer* ☐ *Property Owner*
- **Are there practical difficulties in?**

- Individual radiological surveillance: dosimetry system (calculation hypothesis, EAP, personal dosimeter (incl. market analysis) against ambient measurement, etc.) …… ☐ *Yes* ☐ *No*
- Categorization of workers? …… ☐ *Yes* ☐ *No*
- Recording and reporting of result (dose register) and access to the results? …… ☐ *Yes* ☐ *No*
- Protection of outside workers? …… ☐ *Yes* ☐ *No*
- How do employers access/obtain advice from a radiation protection expert and training and education in radon ……. ☐ *Yes* ☐ *No*
- Other**: …**

Any details you would like to report? **…**
Are there practical difficulties for workplaces combining radon + other exposure from planned situation? (radiological surveillance, dose limit, …) …

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