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

Meeting Minutes

Meeting:	8 June 2021 (Microsoft Teams)
Members:	– Sylvain Andresz (CEPN, France), – Julie Morgan (PHE, United-Kingdom), – Cristina Nuccetelli (ISS, Italy), – Caroline Schieber (CEPN, France), – Nicolas Hugh Synnott (RPII, Ireland), – Fernand Vermeersch (SCK•CEN, Belgium) In the absence of: Sebastian Feige and Ulrike Kulka (BfS, Germany)

The **status of the contact** taken in each country was discussed:

- In Italy, Mr. F. Bochicchio (ISS) is the relevant contact person. Crisitina will contact F. Bochicchio to investigate if he contributes directly to the working group or delegate to another person at ISS. A focus from Italy could be the management of radon in NORM industries.
- In United Kingdom, Julie has reached colleagues at PHE who have experiences in the management of radon at legacy sites and mines which can support case studies.
- In Belgium, Fernand has contacted B. Dehandschutter from the FANC (also involved in ERA) who agreed to give feedback and provide practical cases.
- In France, P. Laurent from the CARSAT (private company linked with the State Institution for Pension, Health and Safety at Work) will be the hub to collect case studies. Mr. Laurent has experience in advising companies who have made radon measurements and need to proceed further.
  In addition, the experience from national utilities EDF will be looked for.
  Paul Livolsi (later, by phone) proposed a contact at CEA (formerly at Algade and at ASN) but his participation/contribution is subject to management approval.
- In Ireland, despite measurement in all Irish schools (N=4000), the application of the regulation for workplace is not supported with so many data. A focus from Ireland could be the long-term management of radon mitigation actions and the topic of communication.
- In Switzerland, the OFPH has recently turned its attention to the topic and workplaces have barely engaged radon measurements. N. Stritt will work in collaboration with colleagues at OFPH and SUVA to collect data and feedback from the field.

Set of questions. The current set of questions is relevant. The following modification have been proposed:

- Include a question about the criteria to select workplaces subject to radon measurement (‘the entry door’).
- Highlight what elements of the process are mandatory by law.
- Make sure the topic of ALARA is clearly investigated at each stage of the radon remediation process.

Documentation. The Euratom Directive provides the backbone for national regulation, however

dissimilarities are possible between. The *Radiation Protection No. 193 Radon at Workplace*[1] from EU already presents elements from the regulation for radon at work. The deliverable from RadoNorm WP5 could be checked to tune the questions.

The final set of questions is available in the Annexe II.

Way to proceed.
The members of the working group will proceed as they seem fit to collect information for their case studies: live interview, forwarding the questions to contact persons etc. The objective is 1~2 case studies per country.
Some members of the EAN Steering Group (Greece, Sweden, Norway) will also be invited to help in the collection of case studies.

Contact with other organizations.
The HERCA pre-workshop (March 2021) did not tacked much the topic (only general experience coming from Czech Republic; and this presentaion was sent to the working group 29/04). The HERCA workshop initially planned in September 2021 is postponed to June 2022. ERA will be incidentally engaged via Mr. Dehandschutter.

[1] https://op.europa.eu/en/publication-detail/-/publication/93cc4aff-47c5-11ea-b81b-01aa75ed71a1/language-en?WT.mc_id=Searchresult&WT.ria_c=37085&WT.ria_f=3608&WT.ria_ev=search

	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	Almost 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	
8	Contact T. Perko and/or RadoNORM Project Leader with regard to radon at work	Caroline Schieber	
9	Engaging contact in each country Objective: 1~2 case studies per country	All	
10	Forward the question to identified EAN SG Members (Greece, Norway, Sweden) to expand the scope	Sylvain Andresz	
11	Plan a remote meeting 23rd September	Sylvain Andresz	
12	Plan a remote meeting in coincidence with the EAN meeting (8 and 9 December 2021)	Sylvain Andresz	

Annex 1. Term of Reference.

Why a Working Group?

National regulations for the protection against radon at the workplace have recently evolved in Europe. In general, the number of workplaces affected by the regulations has increased; including many workplaces not previously aware of the radiation protection system. Furthermore, the practical application of the regulation for radon, using a step-by-step approaches, with reference level/exposure values, might be challenging in practice. It can raise questions from employers and other affected parties and communication might be an issue

As a consequence, the European ALARA Network has set up, in 2021, a working group to investigate the practical implementation of the ALARA principle in relation to exposure from Radon At the Workplace (A-RAW).

The objective

The objective of the working group is to collate a sample of practical experiences in Europe (1~2 case studies per country), detailing the controls and measures implemented to protect against radon exposure in the workplace.

A set of questions to assist the description of suitable case studies is proposed (cf. below). It focuses on the steps taken to identify and manage workplaces with regard to radon. A particular emphasis is given to the application of the ALARA principle at each stage.

The Working Group aims to synthesize the experiences collected from the field

1. Commonalities and differences
2. Lessons-learned,
3. good practices and difficulties in application etc.

These information can be useful to discuss the application of ALARA principle in these situations, address potential gaps and identify if actions (ex. guidance) are needed in the future and by who.

The Working Group aims to share these results to the concerned radiation protection community and will work on identifying opportunities to do so.

ANNEX 2. SET OF QUESTIONS.

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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