

12th Eurados Winter School

EU Basic Safety Standards Directive Requirements on radon in workplaces - Ireland's approach

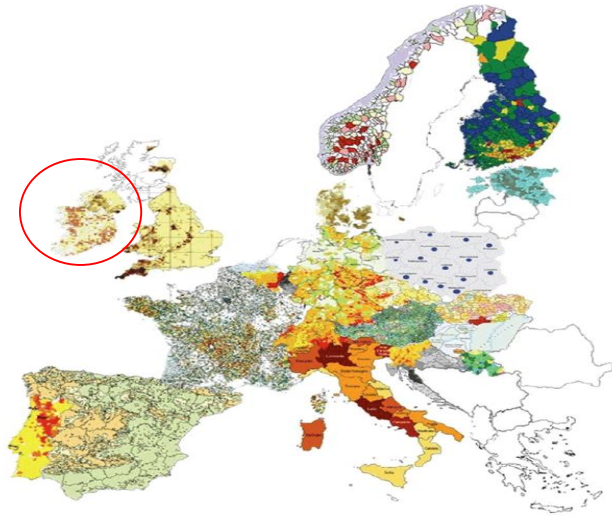


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What am I going to talk about?

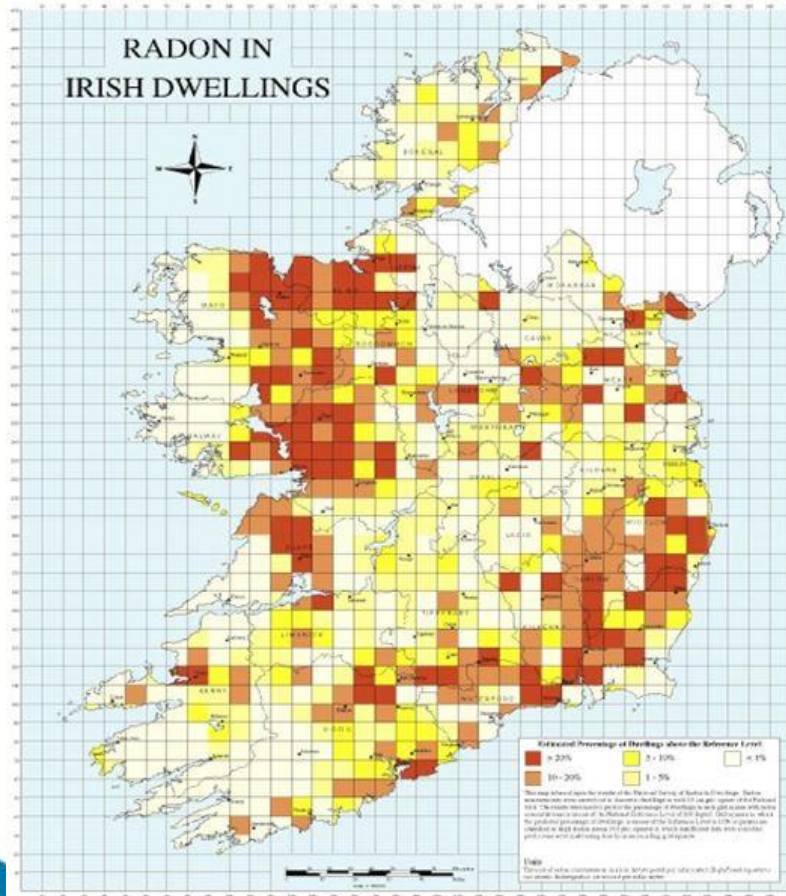
- Work done to date on radon in workplaces in Ireland
 - Regulatory actions 2001 – 2006
 - Strategy development 2012 - 2014
- National Radon Control Strategy for Ireland and the EU BSSD and the IAEA IRRS mission
- Initiatives of international agencies to produce guidelines
- Summary

Context



- Council Directive 2013/59/Euratom (EU BSSD) has been implemented in Ireland
- S.I. No. 30 of 2019, (Ionising Radiation) Regulations 2019.
- Environmental Protection Agency (EPA) is the Competent Authority

Extent of the radon problem in Ireland



National Radon Survey

An interactive radon map is on EPA's radon website

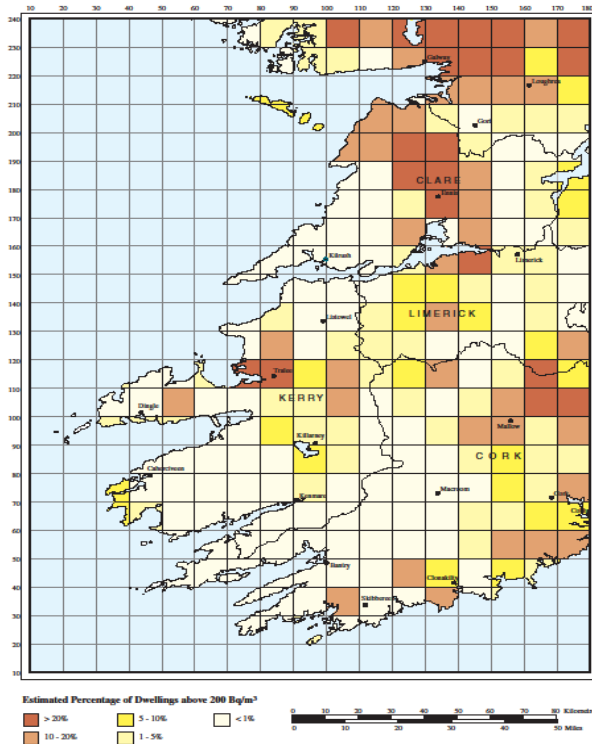
www.radon.ie

High Radon Areas:

10 km grid squares in which 10% or greater of houses are predicted to exceed the national Reference Level

Regulatory Actions: 2001-04 carried out under 1996 EU BSSD

Map 4 Radon Prediction Map for the South West of Ireland



Comments

- The large scale direction campaigns were found not to be a good approach and were not repeated. Problems included
 - Identifying the correct employer
 - Ensuring the direction letter was received
 - Follow up on such a large number was very difficult
 - The campaigns were not cost effective

Regulatory Actions: 2001-04 carried out under 1996 EU BSSD

- A repeat of large scale direction campaigns could not be recommended
- Colgan P A, et al., J Radiol Prot 24 (2004) 121 – 129.

Regulatory Actions: 2004-06 carried out under 1996 EU BSSD

- 60 employers were chosen in the same towns
- A protocol was developed to ensure the correct identity of the employer
- A protocol was developed to ensure the direction letter was correctly issued and was delivered.
- Eight cases went to court. Convictions were handed down to three. Three employers received the probation act and two cases were dismissed



Regulatory Actions: 2004-06 carried out under 1996 EU BSSD

- Radon legislation as well as EPA protocols and guidance were tested and stood up in court
- It showed the EPA was serious about radon
- Radon was made real to the EPA, other agencies and stakeholders
- The publicity surrounding the cases was helpful
- Weaknesses in the legislation were highlighted that otherwise might not have arisen



Regulatory Actions: 2004-06 carried out under 1996 EU BSSD

■ Weaknesses highlighted in the regulations

- The resources required were significant. It took a “man-year” from issuing the 60 directions to the final court appearance.
- a mechanism was needed to get employers to measure radon (other than issuing individual directions)
- There was no regulation requiring employers to remediate if high radon levels are identified
- There was no specific regulations governing radon in underground workplaces

National Radon Control Strategy 2014 - to date

- In 2011 the Irish Government decided to develop a National Radon Control Strategy for Ireland (NRCS)
- This was launched in 2014
- The NRCS took account of
 - Experience gained enforcing the 1996 EU BSSD and
 - The requirements of the 2013 EU BSSD (Schedule 14)
- NRCS meets the BSS Article 103 for a National Action Plan



NRCS

National Radon Control Strategy
Straitéis Náisiúnta um Rialú Radóin

IRRS Mission

- The Mission took place in September 2015



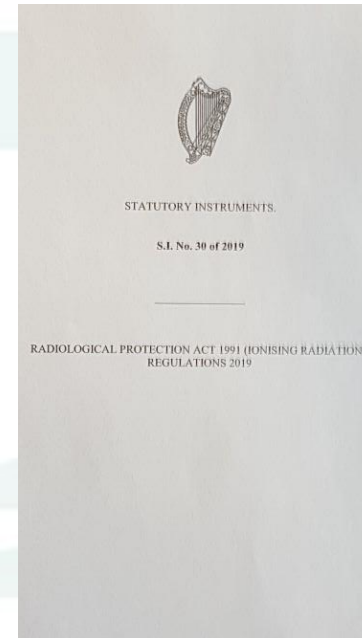
Integrated
Regulatory
Review Service

IRRS

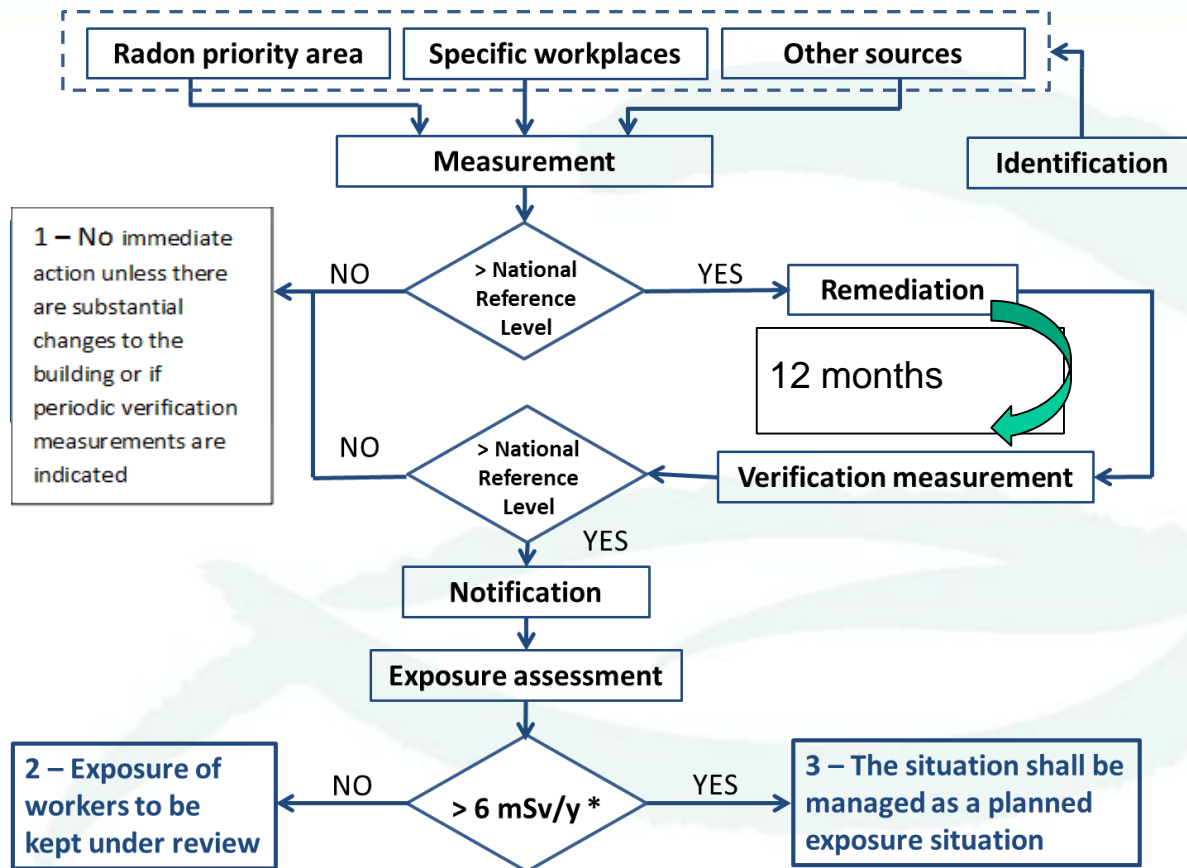
- IRRS noted the need to review and revise the specific regulations addressing radon in workplaces especially underground workplaces to enhance their effectiveness
- Ireland's NRCS was noted as a good practice by the IRRS team

Council Directive 2013/59/Euratom (BSSD)

- S.I. No. 30 of 2019
(Ionising Radiation)
Regulations, 2019



S.I. No. 30 of 2019 (Ionising Radiation) Regulations 2019



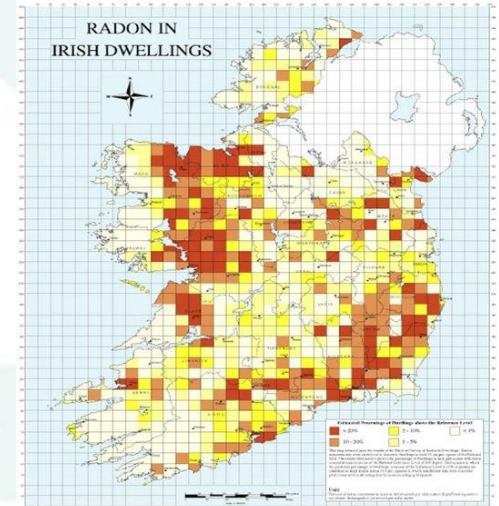
* or a corresponding time-integrated radon exposure value

Reference Levels and Measurement

- Reference Level is reduced
 - Now 300 Bq/m³ reduced from the previous value of 400 Bq/m³
- The radon measurements must
 - be carried out in accordance with guidelines issued by the EPA
 - the guidelines recommend:
 - the testing period should be at least three months (seasonally adjusted)
 - the measurement service should be registered with the EPA

Who must measure

- There is a general duty on employers in High Radon Areas to measure radon
- This applies to
 - underground workplaces
 - aboveground workplaces in High Radon Areas (based upon the EPA's radon map)



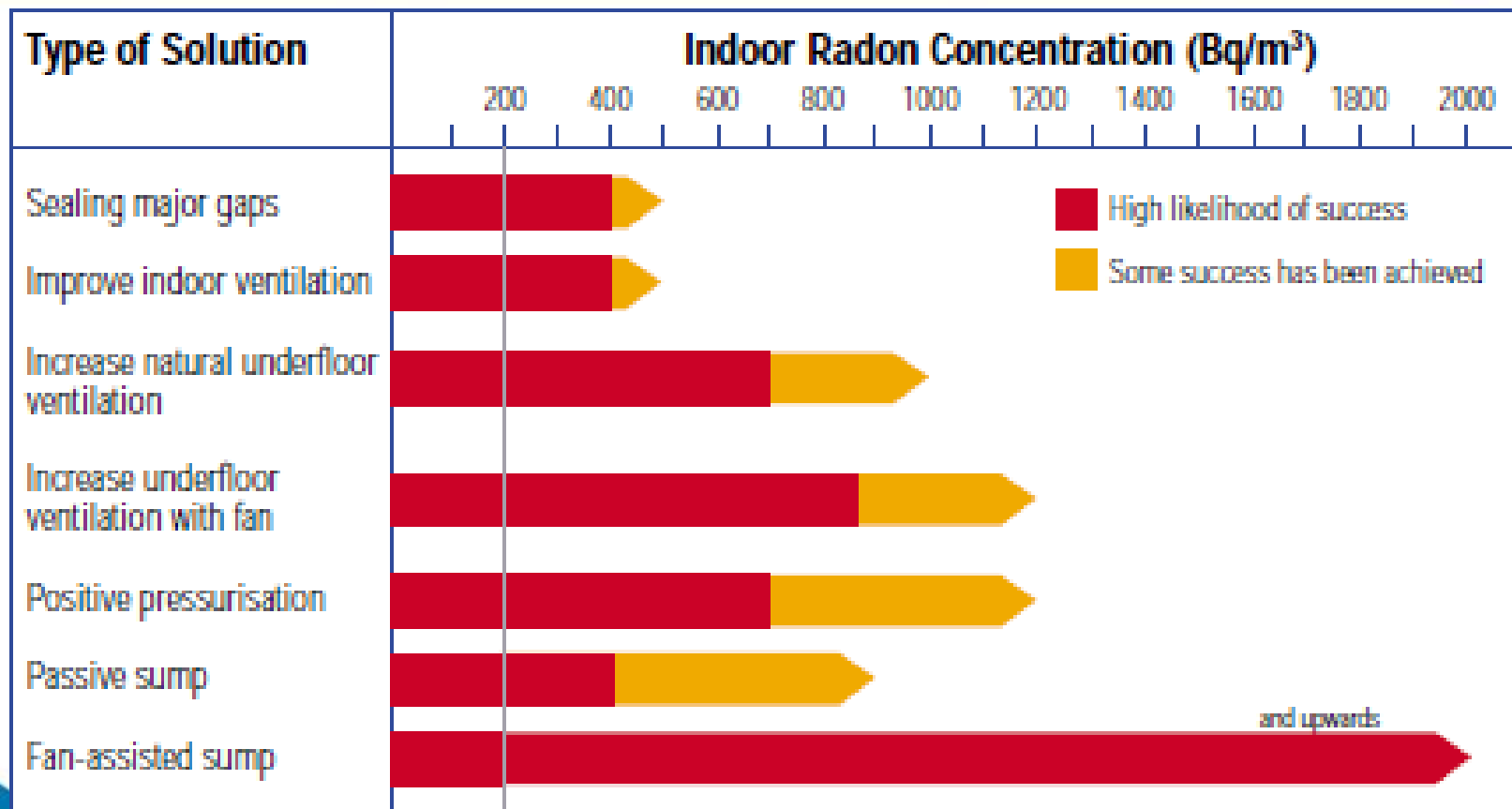
What if radon levels are greater than 300 Bq/m³ in a workplace?

- A requirement to reduce the radon levels or introduce a system of radiological protection. (Such a system would be very onerous for the employer).
- **Remedial work is therefore strongly recommended and the preferred choice.** EPA holds a list of registered Remediation contractors
- Follow up measurements are then required
- Remedial work and follow up measurement must take place within 12 months
- If remediation is unsuccessful then notification is required

What if radon levels in a workplace are still above 300 Bq/m³ following remedial work?

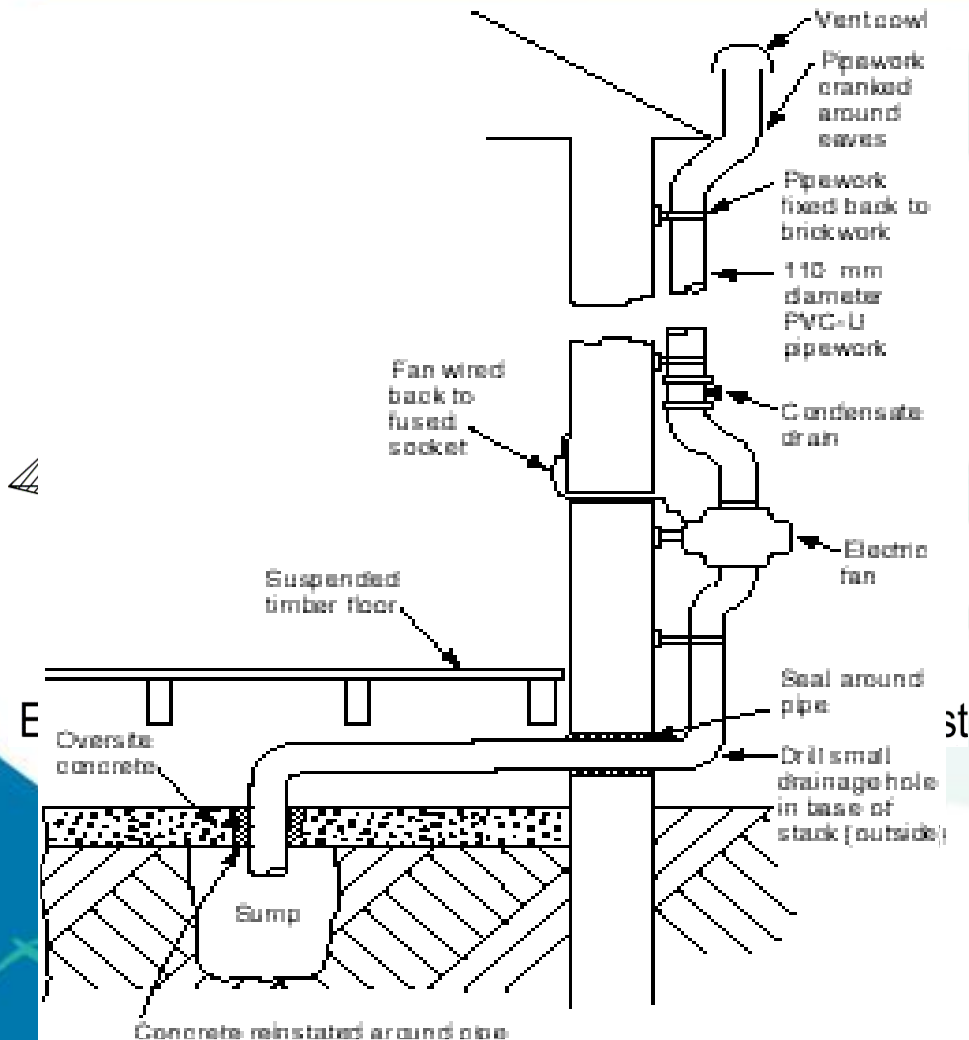
- Notification to competent Authority is required, but when?
 - Remediation may be unsuccessful at the first attempt but may after a second or third attempt be successful. (Above ground workplaces)
 - In Ireland, we are unaware of an above ground workplace where radon levels (or radon exposure) could not be reduced
 - In Ireland we propose notification if the first remediation attempt is unsuccessful

Choosing Remedial Solutions



Reductions achievable from different solutions

Remediating radon problem (radon sumps)



What if radon levels in a workplace are still above 300 Bq/m³ following remedial work?

- Sometimes further work is needed to ensure the correct operation of sump systems



In Ireland we propose notification if the first remediation attempt is unsuccessful

What if radon levels in a workplace cannot be reduced to below 300 Bq/m³ ?

- This will apply to underground workplaces (mines and show-caves), radon spas where radon risk has to be managed.
- Such workplaces will be subject to monitoring and inspection
- If doses > 6mSv further requirements as planned exposure situation



Radon Dose Coefficient

- Two international agencies UNSCEAR and ICRP have published dose coefficients on radon



- 1988 (2019?) (1993) 2018
- It is important to be aware of this and to select the correct dose coefficient

What is the difference?

<i>UNSCEAR 1988</i>	9 nSvBqh/m ³	7.5 mSv/WLM
<i>ICRP 1993</i>	6 nSvBqh/m ³	5 mSv/WLM
<i>ICRP 2018</i>	14 nSvBqh/m ³	10 mSv/WLM
<i>ICRP 2018 (Caves)</i>	28 nSvBqh/m ³	20 mSv/WLM

International Guidelines

- Heads of European Radiological Protection Competent Authorities (HERCA)



- European Commission



- UNSCEAR



- IAEA



Heads of European Radiological Protection Competent Authorities



- HERCA recognises the need for a cohesive approach
- The HERCA Working Group on Natural sources was mandated to identify the options for states and to develop a guide on the co-existence of the two dose co-efficient
- Chair - David Fenton (EPA - Ireland). Co-Chair – Marta Garcia Talavera San Miguel (CSN - Spain)
- Next meeting in Dublin 5th / 6th March. It will report during 2019



- BSSD requires MS to take account of the recommendations of ICRP
- Article 31 GoE are expected to publish in 2019 guidelines to assist MS implement BSSD on radon in workplaces. HERCA were included in these deliberations.
- EC guidelines should, among other things, clarify the use of the dose co-efficient.



- UNSCEAR are concluding a major project “Lung Cancer due to Exposure to Radon”. This may (or may not) result to a change to their 1988 dose co-efficient and a dose co-efficient different to ICRP.
 - UNSCEAR project is due to report in Summer 2019
- This work should clarify the use of the UNSCEAR dose co-efficient for radon. e.g. it should be used for their global pie chart only and not for Radiation Protection purposes in workplaces.

International Atomic Energy Agency



- IAEA GSR Part 3, the International Basic Safety Standards is largely harmonised with the EU BSSD. There are two differences
 - Reference Level: IAEA 1000 Bq/m³, EU 300 Bq/m³
 - The requirements around workplaces where the reference level may be exceeded. EU BSS (Article 35) sets out two levels of control. Treat as a planned exposure situation or keep exposures under review. IAEA has no such detailed requirement related to mentioned regimes is given
- IAEA will host a Technical Meeting on radon 1st – 3rd Oct 2019 at which the UNSCEAR 2019 report will be discussed

What will Ireland do

■ Existing situation (Ireland)

Homes: 9 nSvBqh/m³ (F=0.4) (UNSCEAR, 1988)

Workplaces: 6 nSvBqh/m³ 5 mSv/WLM. (ICRP 65,1993)

■ Future (Ireland – awaiting guidelines)

Homes: To be decided (UNSCEAR or ICRP)

Workplaces & mines: 10 mSv/WLM (F=0.4) ICRP?

Show Caves: 20 mSv/WLM (F=0.4) ICRP?

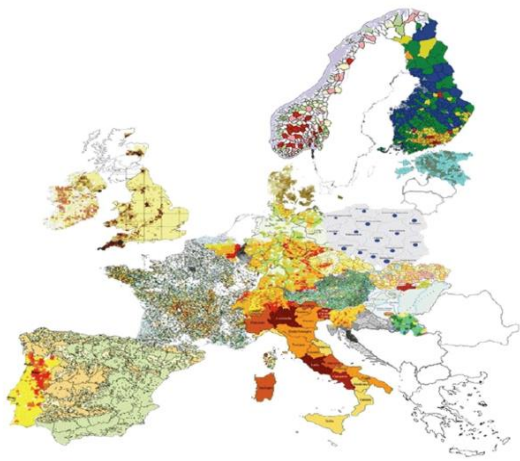
Summary – radon in workplaces in Ireland

- Various measures have been attempted in implementing regulations on radon in workplaces in Ireland
- Lessons have been learned and these lessons were included in the new regulations implementing EU BSSD
- In the context of the NRCS in Ireland, the EU BSS and IRRS recommendations, was a unique opportunity to improve regulations, especially for underground workplaces

The new requirements are an improvement but will be challenging

Ireland and HERCA are willing participants in this co-ordination

- Several states may not yet realise the impact of the new radon DC on the regulation of ionising radiation
- There is a need for co-ordination among States and this is recognised by International bodies and Agencies
- I would be optimistic about the future



A word cloud featuring the phrase "thank you" in various languages and scripts. The central text "thank you" is the largest and most prominent. Other visible words include:

- danke (German)
- 謝謝 (Chinese)
- ngiyabonga (Xhosa)
- teşekkür ederim (Turkish)
- спасибо (Russian)
- Баярлалаа (Mongolian)
- спасибі (Ukrainian)
- faafetai lava (Samoan)
- mersi (Arabic)
- kia ora (Māori)
- barka (Hausa)
- welalin (Yoruba)
- tack (Swedish)
- spas (Czech)
- vinaka (Samoan)
- спасиби (Chechen)
- blagodaram (Bulgarian)
- dank je (Dutch)
- misaotra (Malagasy)
- matondo (Kisumu)
- paldies (Latvian)
- grazzi (Italian)
- mahalo (Hawaiian)
- tapadh leat (Irish Gaelic)
- хвала (Serbian/Croatian)
- asante (Swahili)
- manana (Tagalog)
- obrigada (Portuguese/Spanish)
- tenki (Japanese)
- chokrane (Kisumu)
- murakoze (Kisumu)
- bedankt (Dutch)
- nami (Hindi)
- nandri (Hindi)
- kiitos (Finnish)
- dankie (Afrikaans)
- dhanyavad (Gujarati)
- hvala (Slovene)
- mauruuru (Māori)
- köszönöm (Hungarian)
- enkosi (Zulu)
- bayarlalaa (Mongolian)
- gracie (Polish)
- dziękuję (Polish)
- hvala (Slovene)
- mauruuru (Māori)
- köszönöm (Hungarian)
- obrigado (Portuguese/Spanish)
- sobodi (Slovak)
- děkuji (Czech)
- meszi (Hungarian)
- didi madoba (Sesotho)
- sagolun (Sesotho)
- chnorakaloutioun (Breton)
- gratias ago (Latin)
- grâcies (Breton)
- sulpáy (Breton)
- go raibh maith agat (Irish Gaelic)
- arigatō (Japanese)
- tak (Dutch)
- dakujem (Slovak)
- trugarez (Breton)
- shukriya (Urdu)
- mercé (Breton)
- merci (French)
- euχαριστώ (Greek)
- diolch (Welsh)
- dhanyavadagalu (Kannada)
- shukriya (Urdu)
- mercé (Breton)
- merci (French)
- terima kasih (Indonesian/Malay)
- raahmat (Arabic)
- najis tuke (Sinhala)
- kam sah hamnida (Sinhala)
- raahmat (Arabic)
- merci (French)
- xiexie (Chinese)
- 감사합니다 (Korean)